Federal Energy Regulatory Commission
Office of Energy Projects
Washington, DC 20426

Algonquin Incremental Market Project
Draft Environmental Impact Statement

Algonquin Gas Transmission, LLC
Docket No. CP14-96-000
FERC/EIS-0254D

Cooperating Agencies:

U.S. Environmental Protection Agency

Pipeline and Hazardous Materials Safety Administration

U.S. Army Corps of Engineers

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

OFFICE OF ENERGY PROJECTS

In Reply Refer To:
OEP/DG2E/Gas 2
Algonquin Gas Transmission, LLC
Docket No. CP14-96-000
FERC/EIS-0254

TO THE PARTY ADDRESSED:

The staff of the Federal Energy Regulatory Commission (FERC or Commission) has prepared a draft environmental impact statement (EIS) for the Algonquin Incremental Market Project (AIM Project), proposed by Algonquin Gas Transmission, LLC (Algonquin) in the above-referenced docket. Algonquin requests authorization to expand its existing pipeline system from an interconnection at Ramapo, New York to deliver up to 342,000 dekatherms per day of natural gas transportation service to the Connecticut, Rhode Island, and Massachusetts markets.

The draft EIS assesses the potential environmental effects of the construction and operation of the AIM Project in accordance with the requirements of the National Environmental Policy Act (NEPA). The FERC staff concludes that approval of the proposed project would result in some adverse environmental impacts; however, most of these impacts would be reduced to less-than-significant levels with the implementation of Algonquin's proposed mitigation and the additional measures recommended in the draft EIS.

The U.S. Environmental Protection Agency, the U.S. Army Corps of Engineers, and the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration participated as cooperating agencies in the preparation of the EIS. Cooperating agencies have jurisdiction by law or special expertise with respect to resources potentially affected by the proposal and participate in the NEPA analysis. Although the cooperating agencies provided input to the conclusions and recommendations presented in the draft EIS, the agencies will present their own conclusions and recommendations in their respective records of decision or determinations for the AIM Project.

The draft EIS addresses the potential environmental effects of the construction and operation of about 37.6 miles of pipeline composed of the following facilities:

- replacement of 26.3 miles of existing pipeline with a 16- and 42-inch-diameter pipeline;

- extension of an existing loop [1] pipeline with about 3.3 miles of additional 12- and 36-inch-diameter pipeline within Algonquin's existing right-of-way; and
- installation of about 8.0 miles of new 16-, 24-, and 42-inch-diameter pipeline.

The AIM Project's proposed aboveground facilities consist of modifications to six existing compressor stations, to add a total 81,620 horsepower, in New York, Connecticut, and Rhode Island. Algonquin also proposes to abandon four existing compressor units for a total of 10,800 horsepower at one compressor station in New York.

The FERC staff mailed copies of the draft EIS 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; newspapers and libraries in the project area; and parties to this proceeding. Paper copy versions of this EIS were mailed to those specifically requesting them; all others received a CD version. In addition, the draft EIS is available for public viewing on the FERC's website (www.ferc.gov) using the eLibrary link. A limited number of copies 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 draft EIS may do so. To ensure consideration of your comments on the proposal in the final EIS, it is important that the Commission receive your comments on or before **September 29, 2014**.

For your convenience, there are four methods you can use to submit your comments to the Commission. In all instances, please reference the project docket number (CP14-96-000) 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 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;

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[1] A pipeline loop is a segment of pipe constructed parallel to an existing pipeline to increase capacity.

2) You can file your comments electronically by 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." If you are filing a comment on a particular project, please select "Comment on a Filing" as the filing type; 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

4) In lieu of sending written or electronic comments, the Commission invites you to attend one of the public comment meetings its staff will conduct in the project area to receive comments on the draft EIS. We encourage interested groups and individuals to attend and present oral comments on the draft EIS. Transcripts of the meetings will be available for review in eLibrary under the project docket number. **All meetings will begin at 6:30 p.m. and are scheduled as follows**:

Date	Location
Monday, September 8, 2014	Holiday Inn Dedham 55 Ariadne Road Dedham, MA 02026 (781) 329-1000
Tuesday, September 9, 2014	Holiday Inn Norwich 10 Laura Blvd. Norwich, CT 06360 (860) 889-5201
Wednesday, September 10, 2014	Danbury City Hall City Council Chambers 155 Deer Hill Ave Danbury, CT 06810 (203) 797-4514
Thursday, September 11, 2014	Muriel H. Morabito Community Center 29 Westbrook Drive Cortlandt Manor, NY 10567 (914) 739-5845

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).[2] 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.**

Questions?

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., CP14-96). 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; 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 that 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.

Kimberly D. Bose

Secretary

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

TABLE OF CONTENTS

Algonquin Gas Transmission, L.L.C.
Algonquin Incremental Market Project (AIM Project)
Draft Environmental Impact Statement

Page

TABLE OF CONTENTS (cont'd)

TABLE OF CONTENTS (cont'd)

TABLE OF CONTENTS (cont'd)

TABLE OF CONTENTS (cont'd)

TABLE OF CONTENTS (cont'd)

Page

TABLE OF CONTENTS (cont'd)

Page

LIST OF TABLES

TABLES (cont'd)

TABLES (cont'd)

LIST OF FIGURES

LIST OF APPENDICES

ACRONYMS AND ABBREVIATIONS

AAQS	ambient air quality standards
AC/DC	alternating current/direct current
ACHP	Advisory Council on Historic Preservation
AIM Project	Algonquin Incremental Market Project
Algonquin	Algonquin Gas Transmission, LLC
APA	Aquifer Protection Areas
APC	Air Pollution Control
APE	Area of Potential Effect
AQCR	Air quality control region
ATWS	additional temporary workspace
BA	biological assessment
Bay State	Bay State Gas Company d/b/a Columbia Gas of Massachusetts, Inc.
BCA	Bird Conservation Area
BCC	Birds of Conservation Concern
bcf/d	billion cubic feet per day
BCR	Bird Conservation Region
BDP Plan	Best Drilling Practices Plan
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practices
BNAN	Boston Natural Areas Network
BO	Biological Opinion
BOEM	Bureau of Ocean and Energy Management
Boston Gas	Boston Gas Company d/b/a National Grid
CAA	Clean Air Act
CDPH	Connecticut Department of Public Health
CEAs	critical environmental areas
CEQ	Council on Environmental Quality
Certificate	Certificate of Public Convenience and Necessity
CES	Comprehensive Energy Strategy
CFR	Code of Federal Regulations
CGS	Connecticut General Statutes
CH_4	methane
CHPE	Champlain Hudson Power Express
CMR	Code of Massachusetts Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalents
Colonial Gas	Colonial Gas Company d/b/a National Grid

ACRONYMS AND ABBREVIATIONS (cont'd)

Commission	Federal Energy Regulatory Commission
Connecticut Natural Gas	Connecticut Natural Gas Corporation
CTDEEP	Connecticut Department of Energy and Environmental Protection
CTransit	Connecticut Transit
CWA	Clean Water Act
CWRMP	Compensatory Wetland Restoration and Mitigation Plan
CZMA	Coastal Zone Management Act of 1972
CZMP	coastal zone management program
dB	decibels
dBA	decibels on the A-weighted scale
DCR	Division of Coastal Resources
DOE	U.S. Department of Energy
DOE/EIA	U.S. Department of Energy's Energy Information Administration
DPS	distinct population segment
DPW	Department of Public Works
Dth/d	dekatherms per day
E&SCP	Erosion and Sediment Control Plan
EDR	Environmental Data Resources, Inc.
EFH	Essential Fish Habitat
EI	Environmental Inspector
EIEA	Energy Improvement and Extension Act
EIS	environmental impact statement
EISA	Energy Independence and Security Act of 2007
Entergy	Entergy Nuclear Operations, Inc.
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPAct	Energy Policy Act of 2005
ESA	Endangered Species Act of 1973
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FWS	U.S. Fish and Wildlife Service
g	gravity
GHGs	greenhouse gases
GIS	Geographic Information System
GW	gigawatt
GWh	gigawatt hours
GWP	global warming potential
GZA	GeoEnvironmental, Inc.
HAP	Hazardous Air Pollutant

HAZWOPER	Hazardous Waste Operations and Emergency Response
HCA	high consequence area
HDD	horizontal directional drill
HMM	Hatch Mott MacDonald, LLC
hp	horsepower
HPU	hydraulic power unit
IBA	Important Bird Area
INGAA	Interstate Natural Gas Association of America
IPCC	Intergovernmental Panel on Climate Change
IPEC	Indian Point Energy Center
Iroquois	Iroquois Gas Transmission
IWWC	inland wetlands and watercourse agencies
kW	kilowatt
L_{90}	lowest background A-weighted sound level that is exceeded 90 percent of the time
LDCs	local distribution companies
L_{dn}	day-night sound level
L_{eq}	24-hour equivalent sound level
LNG	liquefied natural gas
LOS	current level of service
LWRP	Local Waterfront Revitalization Program
M&R	metering and regulating
MACZM	Massachusetts Office of Coastal Zone Management
MADCR	Massachusetts Department of Conservation and Recreation
MAEFSB	Massachusetts Energy Facilities Siting Board
MAEOEEA	Massachusetts Executive Office of Energy and Environmental Affairs
MAOP	maximum allowable operating pressure
MassDEP	Massachusetts Department of Environmental Protection
MassGIS	Massachusetts Geographic Information System
m_{bLg}	short-period body-wave magnitude
MBTA	Migratory Bird Treaty Act
MBTA MOU	Memorandum of Understanding Between the Federal Energy Regulatory Commission and the U.S. Department of the Interior United States Fish and Wildlife Service Regarding Implementation of Executive Order 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds"
MDFW	Massachusetts Division of Fisheries and Wildlife
MDOT	Massachusetts Department of Transportation
MECC	Massachusetts Electric Construction Company
Memorandum	Memorandum of Understanding on Natural Gas Transportation
MIPAG	Massachusetts Invasive Plant Advisory Group

MLR	mainline regulators
MLV	mainline valve
MMBtu/hr	million metric British thermal units per hour
MMPA	Marine Mammal Protection Act
MNHESP	Massachusetts Natural Heritage and Endangered Species Program
MP	milepost
MSA	Magnuson-Stevens Fishery Conservation and Management Act
msl	mean sea level
MW	megawatt
MWh	megawatt hours
N_2O	nitrous oxide
NAAQS	national ambient air quality standards
Narragansett Electric	The Narragansett Electric Company d/b/a National Grid
NEHC	New England Hydropower Company, LLC
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NGA	Natural Gas Act
NHPA	National Historic Preservation Act
NHT	National Historic Trail
NNSR	Nonattainment New Source Review
NO_2	nitrogen dioxide
NOAA Fisheries	National Oceanic and Atmospheric Administration, National Marine Fisheries Service
NOI	Notice of Intent to Prepare an Environmental Impact Statement for the Planned Algonquin Incremental Market Project, Request for Comments on Environmental Issues, and Notice of Public Scoping Meetings
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NPU	Norwich Public Utilities
NRC	U.S. Nuclear Regulatory Commission
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRI	National Rivers Inventory
NSA	noise-sensitive area
NSPS	New Source Performance Standards
NSR	New Source Review
NSTAR	NSTAR Gas Company
NWI	National Wetlands Inventory
NYCDEP	New York City Department of Environmental Protection

NYCRR	New York Codes, Rules and Regulations
NYNHP	New York Natural Heritage Program
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOS	New York State Department of State
NYSDOT	New York State Department of Transportation
NYSOPRHP	New York State Office of Parks, Recreation and Historic Preservation
NYSPSC	New York State Public Service Commission
OCRM	NOAA, Office of Coast and Management
OEP	Office of Energy Projects
OPS	Office of Pipeline Safety
ORW	Outstanding Resource Water
OSHA	Occupational Safety and Health Administration
PAR	permanent access roads
PCB	polychlorinated biphenyl
pCi/L	picocuries per liter
PEM	palustrine emergent wetlands
PFO	palustrine forested
PGA	peak ground acceleration
PHMSA	Pipeline and Hazardous Materials Safety Administration
PIPC	Palisades Interstate Park Commission
Plan	Upland Erosion Control, Revegetation, and Maintenance Plan
PM	particulate matter
PM_{10}	particulate matter less than 10 microns in aerodynamic diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in aerodynamic diameter
PNHP	Pennsylvania Natural Heritage Program
Primary Aquifers	Primary Water Supply Aquifers
Procedures	Wetland and Waterbody Construction and Mitigation Procedures
Project	Algonquin Incremental Market Project
PSD	Prevention of Significant Deterioration
PSS	palustrine scrub-shrub
PTE	potential-to-emit
PVC	Polyvinyl Chloride pipe
RCSA	Regulation of Connecticut State Agencies
RHA	Rivers and Harbors Act
RICE	reciprocating internal combustion engines
RIDEM	Rhode Island Department of Environmental Management
RIISC	Rhode Island Invasive Species Council
RINHP	Rhode Island Natural Heritage Program

RQD	rock quality designation
SCFWH	Significant Coastal Fish and Wildlife Habitat
SDWA	Safe Drinking Water Act
Secretary	Secretary of the Commission
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO_2	sulfur dioxide
SOP	standard operating procedure
Southern Connecticut	The Southern Connecticut Gas Company
SPCC Plan	Spill Prevention Control and Countermeasure Plan/Preparedness, Prevention, and Contingency Plan for the Algonquin Incremental Market Project
SPDES	State Pollution Discharge Elimination System
Spectra	Spectra Energy Corporation
SPL	sound pressure level
SSA	sole or principal source aquifer
SSURGO	Soil Survey Geographic Database
SWAP	Source Water Assessment Program
SWPPP	Stormwater Pollution Prevention Plan
TAR	temporary access roads
Tennessee	Tennessee Gas Pipeline
TSA	Office of Homeland Security's Transportation Safety Administration
TTC	temporary traffic control
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
USN	unique site number
VOC	volatile organic compound
WEG	wind erodibility group
WHPP	Wellhead Protection Program
WPP	West Point Partners
WPT	West Point Transmission
WQC	Water Quality Certification
Yankee Gas	Yankee Gas Services Company

EXECUTIVE SUMMARY

INTRODUCTION

The staff of the Federal Energy Regulatory Commission (FERC or Commission) has prepared this draft Environmental Impact Statement (EIS) to fulfill requirements of the National Environmental Policy Act of 1969 and the Commission's implementing regulations under Title 18 of the Code of Federal Regulations (CFR) Part 380. On February 28, 2014, Algonquin Gas Transmission, LLC (Algonquin) filed an application with FERC under sections 7(b) and (c) of the Natural Gas Act, as amended, and Part 157 of the Commission's regulations to construct, abandon, install, own, operate, and maintain expansions of its existing interstate natural gas pipeline systems in New York, Connecticut, Rhode Island, and Massachusetts. This project is referred to as the Algonquin Incremental Market Project (AIM Project or Project). The purpose of this document is to inform the public and federal and state agencies about the potential environmental impacts of the Project and its alternatives, and to recommend appropriate mitigation that would avoid or reduce significant adverse impacts.

The FERC is the federal agency responsible for authorizing interstate natural gas transmission facilities under the Natural Gas Act, and is the lead federal agency for the preparation of this EIS in compliance with the requirements of the National Environmental Policy Act. The U.S. Environmental Protection Agency, the U.S. Army Corps of Engineers (USACE), and the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration, participated as cooperating agencies in the preparation of the EIS. A cooperating agency has jurisdiction by law or has special expertise with respect to environmental resource issues associated with a project.

PROPOSED ACTION

The Project would involve the construction and operation of about 37.6 miles of natural gas pipeline and associated equipment and facilities in New York, Connecticut, and Massachusetts. The majority of the pipeline facilities (about 26.3 miles or 70 percent of the total 37.6 miles) would replace existing Algonquin pipelines, while the remainder of the pipeline facilities (about 11.3 miles or 30 percent) consists of new mainline pipeline, new loop pipeline, and one new lateral pipeline. In addition to the pipeline facilities, Algonquin would modify 6 existing compressor stations and 24 existing metering and regulating (M&R) stations; construct 3 new M&R stations; and remove an existing M&R station. Modifications to the six existing compressor stations include the installation of 81,620 total horsepower (hp) in New York, Connecticut, and Rhode Island. Algonquin also proposes to abandon four existing compressor units for a total of 10,800 hp at one compressor station in New York. Algonquin would also modify three existing mainline valve (MLV) sites and five existing pig[1] launcher/receiver sites, construct five new launcher/receiver sites, construct new MLV cross over piping at two locations, and construct a new MLV. Mainline regulation facilities would also be added at the terminus of one of the pipeline segments in New York.

According to Algonquin, the purpose of the AIM Project is to expand its existing pipeline system from an interconnection at Ramapo, New York to deliver up to 342,000 dekatherms per day of natural gas transportation service to the Connecticut, Rhode Island, and Massachusetts markets. Algonquin's stated objectives for the Project are:

- to provide the pipeline capacity necessary to transport additional natural gas supplies to meet the immediate and future load growth demands of local gas utilities in southern New England;

[1] 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.

- eliminate capacity constraints on existing pipeline systems in New York State and southern New England;
- provide access to growing natural gas supply areas in the Northeast region to increase competition and reduce volatility in natural gas pricing in southern New England; and
- improve existing compressor station emissions through the replacement of existing compressor units with new, efficient units.

PUBLIC INVOLVEMENT

On June 18, 2013, Algonquin filed a request with the FERC to implement the Commission's pre-filing process for its Project. At that time, Algonquin was in the preliminary design stage of its Project and no formal application had been filed. The purpose of the pre-filing process is to encourage the early involvement of interested stakeholders, facilitate interagency cooperation, and identify and resolve issues before an application is filed with the FERC. On June 28, 2013, the FERC granted Algonquin's request and established a pre-filing docket number (PF13-16-000) to place information related to the Project into the public record. The cooperating agencies agreed to conduct their environmental reviews of the Project in conjunction with the Commission's environmental process.

On September 13, 2013, the FERC issued a *Notice of Intent to Prepare an Environmental Impact Statement for the Planned Algonquin Incremental Market Project, Request for Comments on Environmental Issues, and Notice of Public Scoping Meetings* (NOI). The NOI was published in the Federal Register on September 19, 2013, and copies were mailed to over 1,800 parties, including representatives of federal, state, and local agencies; elected officials; environmental and public interest groups; Native American tribes; potentially affected landowners; other interested parties; and local libraries and newspapers. The FERC staff continued to receive and consider comments during the entire pre-filing period and throughout the development of this EIS. We[2] held four public scoping meetings in the AIM Project area to solicit and receive comments on environmental issues associated with this Project. The meetings were held September 30, 2013 through October 3, 2013 in the Town of Cortlandt, New York; Danbury and Norwich, Connecticut; and the Town of Dedham, Massachusetts.

Additionally, we participated in Algonquin's open houses, interagency meetings, conference calls, and site visits for the AIM Project to identify issues to be addressed in this draft EIS. The meetings, conference calls, and site visits provided a forum for the exchange of information and supported the FERC's responsibility to coordinate federal authorizations and associated environmental review of the AIM Project.

PROJECT IMPACTS AND MITIGATION

Construction and operation of the Project could result in numerous impacts on the environment. We evaluated the impacts of the Project, taking into consideration Algonquin's proposed mitigation measures on geology, soils, groundwater, surface water, wetlands, vegetation, wildlife, fisheries, special status species, land use, recreation, visual resources, socioeconomics, cultural resources, air quality, noise, and safety and reliability. Where necessary, we are recommending additional mitigation to minimize or avoid these impacts. Also, in some cases, we are recommending that Algonquin file certain information prior to the end of the public comment period to allow us to revise or potentially eliminate recommendations in the final EIS. Cumulative impacts of this Project with other past, present, and reasonably foreseeable actions in the Project area were also assessed. In section 3 of this EIS, we

[2] The pronouns "we," "us," and "our" refer to the environmental staff of the FERC's Office of Energy Projects.

summarize the evaluation of alternatives to the Project, including the No Action Alternative, energy alternatives, system alternatives, facility design and siting alternatives, route alternatives and variations, and aboveground facility siting alternatives.

Based on scoping comments, agency consultations, and our independent evaluation of resource impacts, the major issues identified in our analysis are in regard to blasting impacts, waterbody crossings, wetlands, special status species, land use and recreation, traffic impacts, safety, and alternatives. Our analysis of these issues is summarized below and is discussed in detail in the appropriate resource sections in sections 3 and 4 of this EIS. Sections 5.1 and 5.2 of this EIS contain our conclusions and a compilation of our recommended mitigation measures, respectively.

The potential for geologic hazards, including seismic events, to significantly affect construction or operation of the proposed Project facilities is low. Although the Ramapo Fault has been linked to recent earthquake occurrence in the area, the design of the pipeline takes into consideration site-specific conditions, including earthquakes. The recorded magnitude of earthquakes in the Project area is relatively low and the ground vibration would not pose a problem for a modern welded-steel pipeline.

The pipeline segments would traverse about 7.2 miles of shallow bedrock that may require blasting. In order to minimize potential impacts from blasting, Algonquin would comply with all federal, state, and local regulations for blasting and has developed an acceptable Rock Removal Plan to be used during construction.

Existing soil contamination could be encountered during construction. Algonquin has developed an *Unexpected Contamination Encounter Procedures* to address the measures it would implement if contaminated soils are crossed during construction. To-date, Algonquin has also determined that field sampling would be required at two locations (one in Connecticut and one in Massachusetts). However, the Connecticut Department of Energy and Environmental Protection (CTDEEP) also identified a concern at a third site. We are recommending that prior to construction, Algonquin develop a Field Sampling Plan for these and any other potential contaminated sites that could be encountered during construction.

The Project would cross 108 waterbodies, including 42 perennial streams, 62 intermittent streams, 3 ephemeral streams, and a ponded area. Algonquin proposes to use a dry crossing method (i.e., flume or dam-and-pump) to install all but two of the waterbody crossings. The other two waterbodies would be crossed using the horizontal directional drill (HDD) method (Hudson and Still Rivers). Dry crossing methods typically result in lower sedimentation and associated turbidity impacts when compared to conventional wet crossing methods.

The Project would cross the Hudson River in New York and the Still River in Connecticut using the HDD method. Algonquin performed geotechnical feasibility studies at the proposed HDD sites and developed site-specific crossing plans for both of the crossings. Algonquin has also developed a *Best Drilling Practices, Monitoring, and Clean-up of Horizontal Directional Drilling Inadvertent Returns Plan* (BDP Plan) that describes the measures that would be taken to minimize the potential for inadvertent returns and releases at these two locations. Algonquin's implementation of the HDD method at the Hudson and Still Rivers would avoid in-stream disturbance of these waterbodies.

Several comments were received about the Project's potential to impact the watersheds that supply water to the New York City metropolitan area, including the Croton, the Catskill, and the Delaware Water Supply Systems. As with the existing pipelines in the area, the replacement pipeline would be located above the Catskill Aqueduct on concrete pads to provide adequate separation and protection for the aqueduct pipe. Algonquin is consulting with the New York City Department of Environmental Protection to develop a final crossing plan for the Catskill Aqueduct. Construction activities would be conducted in accordance with Algonquin's *Erosion and Sediment Control Plan* (E&SCP), Spill Prevention Control and Countermeasure Plan, Unexpected Contamination Encounters Procedures, Rock Removal Plan, BDP Plan, and construction stormwater plans and permits. With these protection measures in place, construction and operation of the Project would not result in significant impacts on surface water resources, including the Croton, Catskill, and Delaware water supply systems.

Construction of the Project would impact 52.3 acres of wetlands, about 24.0 acres in New York and 28.3 in Connecticut. Of the total wetland acreage, about 35.3 acres (67 percent) would involve herbaceous and shrub-scrub wetlands, and the remaining 17.1 acres (33 percent) would involve forested wetlands. About 2.3 acres of the forested wetlands would be permanently converted to non-forested wetlands during operation of the pipeline facilities. The remaining 14.7 acres of forested wetlands would eventually revert to preconstruction conditions following construction. The Project would not result in any permanent loss of wetlands. In addition, two vernal pools would be located within the temporary construction area for the Project facilities in New York.

Construction and operation-related impacts on wetlands and vernal pools would be mitigated by implementing the wetland protection and restoration measures contained in Algonquin's E&SCP, Invasive Plant Species Control Plan, and any additional conditions of the wetland permits that could be issued by the USACE, New York State Department of Environmental Conservation (NYSDEC), and CTDEEP. Algonquin proposes to provide compensatory mitigation for the permanent conversion of forested wetlands to a non-forested wetland type. We are recommending that Algonquin develop a final Compensatory Mitigation Plan in consultation with the USACE, the NYSDEC, and the CTDEEP. We are also recommending that Algonquin identify any additional avoidance or mitigation measures for the two vernal pools through the permit review process with the applicable agencies, prior to construction.

Impacts on vegetation from the proposed Project would range from short-term to permanent due to the varied amount of time required to reestablish certain community types, as well as the maintenance of grassy vegetation within the permanent right-of-way and the conversion of aboveground facility locations to non-vegetated areas. Construction of the proposed Project facilities would temporarily disturb about 362.9 acres of vegetation (164.0 acres of open land and 198.9 acres of forested vegetation) and permanently affect 36.3 acres (8.3 acres of open land and 28.0 acres of forested vegetation). The Project would also affect vegetation communities of special concern, including chestnut oak forests. Algonquin would limit the amount of disturbance to chestnut oak forests by utilizing the existing pipeline right-of-way during construction to the extent possible. Overall, the Project would not contribute significantly to forest fragmentation because the proposed pipeline routes are located along existing rights-of-way and in areas that are already developed and highly fragmented.

The Project would affect wildlife and wildlife habitats, including migratory birds, along the pipeline route and at the aboveground facilities. Algonquin has minimized potential effects on significant or sensitive wildlife habitats by locating the majority of pipeline facilities within or adjacent to existing rights-of-way to the maximum extent possible. Algonquin would also use the HDD crossing method at the Hudson River crossing to avoid direct effects to the Hudson River Important Bird Area, aquatic habitats, and adjacent riparian habitats. Algonquin would implement its E&SCP and any permit conditions developed through consultation with the applicable federal and state agencies to minimize the effects of the Project on wildlife and their habitats. We find that these measures would minimize the effects of the Project on wildlife, including birds of conservation concern and other migratory birds. We are recommending that Algonquin obtain a FWS determination regarding migratory birds prior to construction.

Thirty-one of the Project waterbody crossings support fisheries of special concern. Eight waterbodies are waters with naturally occurring spawning populations of trout. One waterbody (the

Hudson River) contains threatened and endangered species and anadromous fisheries. Implementation of Algonquin's construction, restoration, and mitigation procedures would result in only limited, short-term impacts on fishery resources, and the aquatic habitats upon which these fishery resources depend. Invertebrate populations would recolonize the crossing area and all temporary construction workspace areas would revert to their original condition, including re-establishment of riparian cover. Furthermore, operation and routine maintenance of the pipeline rights-of-way are not expected to have any noticeable impact on fishery resources in the Project area.

Through consultation with National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries), we have determined that the only waterbody crossing where essential fish habitat species could potentially occur is the Hudson River. Given the proposed use of the HDD construction method and the fact that no water would be withdrawn from the Hudson River to support Project construction, we conclude that the Project would have *no effect* on essential fish habitat or managed species. We have also determined that the Project would have no effect on marine mammals protected under the Marine Mammal Protection Act because they are not anticipated to occur within the Project area of the Hudson River.

Based on Algonquin's consultations with NOAA Fisheries and the U.S. Fish and Wildlife Service (FWS) and our review of existing records, nine federally listed threatened or endangered species are potentially present in the vicinity of the Project (as well as one candidate species and one species proposed for listing as endangered). Based on these consultations, we determined that the AIM Project would have *no effect* on the shortnose sturgeon, Atlantic sturgeon, piping plover, roseate tern, Puritan tiger beetle, northern red-bellied cooter, and small whorled pogonia; *may affect, but would not likely adversely affect* the bog turtle; and would *not likely jeopardize the continued existence* of the New England cottontail. Surveys are pending for the Indiana and northern long-eared bats. NOAA Fisheries concurred with this determination for the Atlantic and shortnose sturgeon and consultation is complete for these species. In compliance with section 7 of the Endangered Species Act, we request the FWS consider the draft EIS as the draft Biological Assessment for the AIM Project and request FWS concurrence for the species with *no effect* determinations. The final EIS will include a revised Biological Assessment to address the remaining species. To ensure compliance with the ESA, we are recommending that Algonquin not begin construction of the Project until the FERC staff receives comments from the FWS regarding the Biological Assessment and consultation is complete. Algonquin is also continuing to consult with the NYSDEC and CTDEEP regarding impacts on state-listed species. No state-listed species would be affected in Rhode Island or Massachusetts.

Algonquin conducted bald eagle surveys for the Hudson River crossing area and identified wintering eagles. No bald eagle nests were observed in the Project area or within 0.5 mile of the Project. Algonquin would continue to consult with the FWS and NYSDEC to discuss survey results, and develop and implement appropriate avoidance and mitigation measures, including timing restrictions, as necessary, to avoid impacts on bald eagles both nesting and wintering within the Project area.

Construction of the Project would impact about 592.3 acres. About 76 percent of this acreage would be utilized for the pipeline facilities, including the construction right-of-way (64 percent) and additional temporary workspace (12 percent). The remaining acreage impacted during construction would be associated with aboveground facilities (16 percent), pipe and contractor ware yards (7 percent), and access roads (less than 1 percent). The primary land use types impacted during construction would be forest/woodland (34 percent), open land (28 percent), industrial/commercial land (26 percent), and residential land (9 percent). Agricultural land and open water would make up the remaining 3 percent of land types impacted during construction of the proposed Project.

Following construction, about 46.0 acres of new land outside of Algonquin's existing permanent right-of-way would be permanently encumbered by operation of the Project. About 82 percent of this acreage would be for the new pipeline right-of-way, 14 percent for aboveground facilities, and 4 percent for new permanent access roads. The primary land use types that would be permanently encumbered by new easements would be forest/woodland (61 percent), open land (18 percent), industrial/commercial land (11 percent), and agricultural land (6 percent). Open water and residential land would make up the remaining 4 percent of new permanent impacts.

Algonquin's proposed construction work areas would be located within 50 feet of 337 residential structures (i.e., houses and apartment buildings) and 95 non-residential structures (i.e., commercial or industrial facilities, sheds, garages). To address impacts on residences, Algonquin developed Residential Construction Plans to inform affected landowners of proposed measures to minimize disruption and to maintain access to the residences during construction. We have reviewed the Residential Construction Plans and do not find them acceptable. We are recommending that Algonquin provide a revised set of Residential Construction Plans that incorporate and address any comments received from affected landowners and also incorporate additional measures to minimize effects prior to construction.

In general, Project impacts on recreational and special interest areas 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 Algonquin's E&SCP, traffic management plans, our recommended Fugitive Dust Control Plan, as well as measures to ensure that noise is mitigated. In addition, we are recommending that Algonquin develop site-specific measures to further minimize impacts on St. Patrick's Church in Verplanck, New York; the Buchanan-Verplanck Elementary School in New York; Dodd Stadium in Norwich, Connecticut; the Norfolk Golf Club in Westwood, Massachusetts; Gonzalez Field in Dedham, Massachusetts; and St. Theresa of Avila School in West Roxbury, Massachusetts.

To address traffic impacts related to road crossings and in-street construction in densely populated areas, Algonquin has prepared separate Traffic Management Plans for the West Roxbury Lateral in Massachusetts and pipeline segments in New York. The plans include measures to address motor vehicles, parking, and considerations for pedestrians, bicycles, and construction workers. We have reviewed these plans and found them acceptable with the exception of a portion of the Traffic Management Plan for the New York pipeline segments. Therefore, we are recommending that Algonquin provide a revised plan that includes the site-specific details for several road crossings prior to construction. Impacts on traffic during construction along the West Roxbury Lateral would result in significant adverse impacts at one intersection. However, with the implementation of Algonquin's Traffic Management Plan for the West Roxbury Lateral, impacts resulting from in-street construction would be minimized to the extent possible and would be reduced to less than significant levels at all other locations along the West Roxbury Lateral.

Construction of the Project would result in minor beneficial socioeconomic impacts due to increases in construction jobs, payroll taxes, purchases made by the workforce, and expenses associated with the acquisition of material goods and equipment. Operation of the Project would have a minor to moderate positive effect on the local governments' tax revenues due to the increase in property taxes that would be collected from Algonquin.

Algonquin 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. Algonquin then conducted field surveys for aboveground properties and archaeological sites. Algonquin identified a total of 42 archaeological sites within the Project's area of potential effect. Of these, 27 require additional testing to determine eligibility for listing on the National Register of Historic Places (NRHP); 13 are not eligible; 1 is eligible for listing but would be avoided by the Project; and 1 is listed on the NRHP but would also be avoided by the Project. In addition, 387 historic aboveground resources were identified within the area of potential effect, the majority of which (358) are not eligible for listing on the NRHP and no further work is recommended. Of the remaining resources, effects to one (Letchworth Village Cemetery) have yet to be determined and are pending additional evaluation. The Project would not result in any significant or adverse effects on the remaining identified historic aboveground resources. To ensure that our responsibilities under section 106 of the National Historic Preservation Act are met, we are recommending that Algonquin not begin construction until any additional required surveys are completed, remaining survey reports and treatment plans (if necessary) have been reviewed by the appropriate parties, and we provide written notifications to proceed.

We consulted with nine federally recognized Indian tribes to provide an opportunity to identify any concerns about properties of traditional religious or cultural significance that may be affected by this undertaking. Eight of the tribes have contacted FERC staff to express an interest in the Project, request additional information, request to be kept apprised of the Project, and/or to accompany the archaeological field crews. Consultations with several other governmental organizations, non-governmental organizations, non-federally recognized tribes, and municipal historic preservation commissions in New York and Massachusetts were also conducted to provide them an opportunity to comment on the Project.

Air quality impacts associated with construction of the Project would include emissions from fossil-fueled construction equipment and fugitive dust. Such air quality impacts would generally be temporary and localized, and are not expected to cause or contribute to a violation of applicable air quality standards. Because the Project would cross many roads, would occur near many residences, and is located in a particulate matter maintenance area, we have recommended that Algonquin develop a Fugitive Dust Control Plan to further mitigate dust.

Due to modifications on existing equipment and/or removal of existing compressors, the potential emissions of most pollutants at the Stony Point and Southeast Compressor Stations would be reduced from their current potential levels. Further, based on the identified estimated emissions from operation of the proposed Project facilities and review of the modeling analysis for all compressor stations, the Project would result in continued compliance with the National Ambient Air Quality Standards, which are protective of human health, including children, the elderly, and sensitive populations. Therefore, with the mitigation measures proposed by Algonquin, we do not anticipate that construction and operation of the proposed Project facilities would have a significant impact on air quality in the Project area or in the region itself. Because the design of the modifications to several M&R stations is not yet complete, we are recommending that Algonquin provide an update regarding the air permitting requirements associated with the modifications to the M&R stations in New York, Connecticut, and Massachusetts.

Noise would be generated during construction of the pipeline and aboveground facilities. 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 Hudson River and Interstate 84/Still River crossings. Algonquin would implement mitigation at all proposed HDD entrance locations to reduce the predicted noise generated by the HDD operations below the FERC noise requirement of 55 decibels on an A-weighted scale – day/night average at the closest noise sensitive areas.

The modified compressor stations would generate noise on a continuous basis (i.e., 24 hours per day) once operating. Some noise would also be generated by the operation of M&R stations and the proposed mainline regulators. We reviewed the compressor station noise analyses and agree that, if properly implemented, the noise control measures would ensure that noise attributable to the modified compressor stations would be less than the FERC noise requirement at nearby noise sensitive areas. However, where the noise currently attributable to the compressor station is greater than our noise requirement, the noise attributable to the station modifications would cause no perceptible change to station noise levels. To ensure that the actual noise levels produced at the aboveground facilities are not significant, we are recommending that Algonquin submit operational noise surveys and add noise mitigation, as necessary, until noise levels are below our acceptable thresholds.

The pipeline and aboveground facilities associated with the AIM Project would be designed, constructed, operated, and maintained to meet or exceed the Pipeline and Hazardous Materials Safety Administration's Minimum Federal Safety Standards in 49 CFR 192 and other applicable federal and state regulations. The regulations include specifications for material selection and qualifications; minimum design requirements; and protection of the pipeline from internal, external, and atmospheric corrosion. By designing and operating the Project in accordance with the applicable standards, the Project would not result in significant increased public safety risk.

We received several scoping comments concerning the safety of the Project and its proximity to the Indian Point Energy Center (IPEC), a nuclear facility on the east bank of the Hudson River in Westchester County, New York. Algonquin identified that because of the distance of the proposed Project from the IPEC generating facilities and the avoidance and mitigation measures that it would implement, the proposed route would not pose any new safety hazards to the IPEC facility. Based on our consultation with the Nuclear Regulatory Commission, Entergy Nuclear Operations, Inc. (Entergy) is required to assess any new safety impacts on its IPEC facility and that analysis is provided to and reviewed by the Nuclear Regulatory Commission. Algonquin has coordinated with Entergy to provide information about its proposed pipeline and Entergy is currently performing a Hazards Analysis. To ensure that the AIM Project would not present new safety hazards to the IPEC facility, we are recommending that Algonquin file the final conclusions regarding any potential safety-related conflicts with the IPEC based on the Hazards Analysis performed by Entergy.

We also received several comments expressing safety concerns about potential interactions between Algonquin's proposed pipeline facilities and the West Point Partners' transmission line. Algonquin has committed to conduct an alternating current/direct current (AC/DC) interference study and incorporate field surveys and comprehensive modeling to identify potential adverse effects on the pipeline from stray currents. Although pipelines are routinely sited adjacent to electric transmission lines, we are recommending additional information to ensure that safety concerns about potential AC/DC interactions are adequately addressed. This includes receiving Algonquin's AC/DC interference study associated with the West Point Transmission Project and documentation of all consultations with West Point Partners, as well as any additional mitigation measures addressing safety-related issues or conflicts identified in the study.

We received numerous comments during scoping for the Project about cumulative impacts associated with development of natural gas reserves (including hydraulic fracturing) in the Marcellus shale region. Activities associated with Marcellus shale development would occur outside of the Project area's region of influence. 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. Impacts associated with the proposed Project in combination with other projects identified within the region of influence would be relatively minor overall. We have included recommendations in the EIS to further reduce the environmental impacts associated with the AIM Project, as summarized in section 5.2. Additionally, Algonquin selected a route that collocates with existing rights-of-way where feasible. Therefore, we conclude that the cumulative impacts associated with the AIM Project, when combined with other known or reasonably foreseeable projects, would be effectively limited.

ALTERNATIVES CONSIDERED

The No Action Alternative was considered for the Project. While the No Action Alternative would eliminate or delay the short and long-term environmental impacts identified in this EIS, Algonquin would be unable to supply an additional 342,000 dekatherms per day of natural gas to its existing mainline system; increase deliveries to the Project shippers at existing delivery points in southern New England; or provide three new delivery points for the Project shippers. We also considered the use of alternative energy sources and the potential effects of energy conservation, but these measures similarly would not satisfy the objectives of the Project, provide an equivalent supply of energy, or meet the demands of the Project shippers. We concluded that the No Action Alternative, alternative energy sources, and energy conservation were not viable alternatives to the proposed Project in the required timeframe.

Our analysis of system alternatives included an evaluation of the existing Tennessee Gas Pipeline and Iroquois Gas Transmission systems as well as the planned Connecticut Expansion and Northeast Energy Direct Projects. None of the existing, proposed, or planned natural gas pipelines reach the delivery points required by the Project shippers in southern New England. To provide service to these delivery points, the existing and planned systems would need to be modified by constructing hundreds of miles of new pipeline, much of which would duplicate the existing Algonquin system. This would result in greater environmental impacts than the Project. Consequently, none of the system alternatives provide an environmental advantage over the proposed Project.

We evaluated Algonquin's proposed design for the Project to determine if any alternative designs would be feasible and environmentally preferable to the Project. We determined that alternative designs would result in operational inefficiencies associated with flow characteristics of natural gas within the system, and would shift, but not avoid, environmental impacts from one location to another. For these reasons, we concluded that alternative designs would not be practical or provide an environmental advantage over the proposed Project.

We also considered the feasibility of electric-driven compressor units in lieu of gas-fired units at each of the existing compressor station sites. We concluded that use of electric-driven compressor units would result in additional environmental impacts due to the installation of non-jurisdictional facilities such as electric transmission lines and substations. Although electric-driven units would result in lower operating emissions, Algonquin would be required to comply with its existing air permits at each site. For these reasons, electric-driven compressors would not be preferable to or provide a significant environmental advantage over the proposed Project.

We evaluated route alternatives for the Hudson River crossing and for the West Roxbury Lateral; several minor route variations along different segments of the Project; and site alternatives for M&R stations at the new delivery points in Connecticut and Massachusetts. We determined that none of the route or site alternatives would offer significant environmental advantages over the Project.

MAJOR CONCLUSIONS

We determined that construction and operation of the Project would result in some adverse environmental impacts but most impacts would be reduced to less-than-significant levels. This determination is based on a review of the information provided by Algonquin and further developed from environmental information requests; site visits; scoping; literature research; alternatives analyses; and contacts with federal, state, and local agencies, and other stakeholders.

Although many factors were considered in this determination, the principal reasons are:

- About 35.1 miles (93 percent) of the 37.6 miles of AIM Project pipeline facilities would be within or adjacent to existing rights-of-way, consisting of Algonquin pipeline rights-of-way, public roadways, railways, and electric transmission line corridors.

- The majority of the pipeline facilities (70 percent) would replace existing Algonquin pipelines within existing rights-of-way.

- Algonquin would minimize impacts on natural and cultural resources during construction and operation of the Project by implementing its E&SCP; Spill Prevention, Control and Countermeasure Plan; Unexpected Contamination Encounter Procedures; Invasive Plant Species Control Plan; BDP Plan; Compensatory Mitigation Plan; Residential Construction Plans; Traffic Management Plans for New York and the West Roxbury Lateral; and *Procedures Guiding the Discovery of Unanticipated Cultural Resources and Human Remains*.

- Algonquin would utilize the HDD method to cross the Hudson and Still Rivers, which would avoid any direct impacts on these resources.

- We would complete Endangered Species Act consultations with the FWS prior to allowing any construction to begin.

- We would complete the process with section 106 of the National Historic Preservation Act and implementing the regulations at 36 CFR 800 prior to allowing any construction to begin.

- We would ensure compliance with all mitigation measures that become conditions of the FERC authorizations and other approvals during our oversight of an environmental inspection and mitigation monitoring program

In addition, we developed site-specific mitigation measures that Algonquin would implement to further reduce the environmental impacts that would otherwise result from construction of its Project. We determined that these measures are necessary to reduce adverse impacts associated with the Project, and in part, are basing our conclusions on implementation of these measures. Therefore, we are recommending that these mitigation measures be attached as conditions to any authorization issued by the Commission. These recommended mitigation measures are presented in section 5.2 of the draft EIS.

1.0 INTRODUCTION

On February 28, 2014, Algonquin Gas Transmission, LLC (Algonquin), an indirect wholly owned subsidiary of Spectra Energy Corporation (Spectra), filed an application with the Federal Energy Regulatory Commission (Commission or FERC) under sections 7(b) and 7(c) of the Natural Gas Act (NGA) and Part 157 of the Commission's regulations. The application was assigned Docket No. CP14-96-000 and a *Notice of Application* was issued on March 18, 2014[1] and noticed in the Federal Register on March 24, 2014. Algonquin is seeking a Certificate of Public Convenience and Necessity (Certificate) from the FERC to construct, abandon, install, own, operate, and maintain expansions of its existing interstate natural gas pipeline systems in New York, Connecticut, Rhode Island, and Massachusetts.

We[2] prepared this environmental impact statement (EIS) to assess the environmental impacts associated with construction and operation of the facilities proposed by Algonquin in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969, as amended. The U.S. Environmental Protection Agency (EPA), U.S. Army Corps of Engineers (USACE), and U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) are cooperating agencies assisting in the preparation of the EIS because they have jurisdiction by law or special expertise with respect to environmental impacts associated with Algonquin's proposal. The roles of the FERC and the cooperating agencies in the project review process are described in section 1.2.

Algonquin's proposal, referred to as the Algonquin Incremental Market Project (AIM Project or Project), involves the construction and operation of about 37.6 miles of natural gas pipeline and associated equipment and facilities in New York, Connecticut, and Massachusetts. The majority of the pipeline facilities (about 26.3 miles or 70 percent of the total 37.6 miles) would replace existing Algonquin pipelines, while the remainder of the pipeline facilities (about 11.3 miles or 30 percent) consists of new mainline pipeline, new loop pipeline, and one new lateral pipeline.

In addition to the pipeline facilities, Algonquin would modify 6 existing compressor stations and 24 existing metering and regulating (M&R) stations; construct 3 new M&R stations; and remove one existing M&R Station. Modifications to the six existing compressor stations include the installation of 81,620 total horsepower (hp) in Rockland and Putnam Counties, New York; New Haven, Middlesex, and Windham Counties, Connecticut; and Providence County, Rhode Island. Algonquin also proposes to abandon four existing compressor units for a total of 10,800 hp at one compressor station in Rockland County, New York. The 24 existing M&R station modifications include 3 in New York, 13 in Connecticut, and 8 in Massachusetts to accept the new gas flows associated with the proposed Project. The three new M&R stations to be constructed would be in Suffolk and Bristol Counties, Massachusetts and New London County, Connecticut. One M&R station would be decommissioned and removed in New London County, Connecticut. As part of the AIM Project, Algonquin would also modify facilities at three existing mainline valve (MLV) sites and five existing pig[3] launcher/receiver sites, and construct five new launcher/receiver sites, construct new MLV cross over piping at two locations, and construct a new MLV. Mainline regulation facilities would also be added at the terminus of one of the pipeline segments in New York.

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1 An errata notice was issued on March 19, 2014 to clarify that the Commission staff is preparing an environmental impact statement for the Algonquin Incremental Market Project.

2 The pronouns "we," "us," and "our" refer to the environmental staff of the FERC's Office of Energy Projects.

3 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.

1.1 PROJECT PURPOSE AND NEED

According to Algonquin, the purpose of the AIM Project is to expand its existing pipeline system from an interconnection at Ramapo, New York to deliver up to 342,000 dekatherms per day (Dth/d) of natural gas transportation service to the Connecticut, Rhode Island, and Massachusetts markets. Algonquin's stated objectives for the Project are:

- to provide the pipeline capacity necessary to transport additional natural gas supplies to meet the immediate and future load growth demands of local gas utilities in southern New England;

- eliminate capacity constraints on existing pipeline systems in New York State and southern New England;

- provide access to growing natural gas supply areas in the Northeast region to increase competition and reduce volatility in natural gas pricing in southern New England; and

- improve existing compressor station emissions through the replacement of existing compressor units with new, efficient units.

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

Algonquin has executed precedent agreements[4] with 10 shippers, including 8 local distribution companies (LDCs) and two municipal utilities (collectively with the LDCs referred to as the Project Shippers) for firm transportation service to deliver new natural gas supplies to the Northeast region. The precedent agreements with the Project Shippers account for the entire Project capacity of 342,000 Dth/d. The 10 Project Shippers include:

- Yankee Gas Services Company (Yankee Gas);
- NSTAR Gas Company (NSTAR);
- Connecticut Natural Gas Corporation (Connecticut Natural Gas);
- The Southern Connecticut Gas Company (Southern Connecticut);
- The Narragansett Electric Company d/b/a National Grid (Narragansett Electric);
- Colonial Gas Company d/b/a National Grid (Colonial Gas);
- Boston Gas Company d/b/a National Grid (Boston Gas);
- Bay State Gas Company d/b/a Columbia Gas of Massachusetts, Inc. (Bay State);
- Norwich Public Utilities (NPU); and
- Middleborough Gas and Electric.

Noting the growing need for additional natural gas capacity in New England to help ensure electric generation system reliability, the Connecticut Department of Energy and Environmental Protection (CTDEEP) and New England States Committee on Electricity commented that the FERC

[4] A precedent agreement is a binding contract under which one or both parties has the ability to terminate the agreement if certain conditions such as receipt of regulatory approvals, are not met.

should modify the scope of its NEPA analysis to include the Project both at its current size and for an alternative project of larger size such as the 433,000 Dth/d originally conceived by Algonquin. Algonquin reduced the scope of the AIM Project as a result of an open season. To follow the Certificate Policy Statement, Algonquin appropriately sized its proposal to ensure that there would be no subsidization from its existing shippers. The Commission analyzes a project as it is filed in an application and does not speculate on potential infrastructure. Additionally, the Commission cannot determine the environmental impacts of the larger version of the AIM Project without significantly more facility and siting information from Algonquin. Furthermore, the Commission has no authority to direct a pipeline company to construct facilities the company has deemed unnecessary for a project's objectives, which would be inefficient and costly.

Several comments were received during the scoping process expressing concern that the Project would be used to export natural gas. Algonquin is not constructing the AIM Project for the purpose of supporting the export of natural gas from the United States. As discussed above, Algonquin is proposing to transport natural gas to meet the demand for natural gas in the Northeast U.S. markets. Specifically, Algonquin is proposing to construct the AIM Project based on commitments from the Project Shippers, which include LDCs and two municipal utilities, which have statutory, regulatory, and/or contractual obligations to serve natural gas customers within their respective service areas in New England. Even if precedent agreements were not in place for the entire proposed capacity, to be exported, the natural gas would need to be liquefied for transportation in specialized container ships to overseas markets. The process of liquefying the gas involves specialized equipment at a specific export facility. Currently, no existing export facilities or infrastructure exists on the east coast.[5] In addition, the timing and need as expressed through the precedent agreements greatly proceeds the development of any potential nearby export facility as the facilities take several years to develop, advance through the regulatory process, and be constructed.

Comments were also received asking whether any of the natural gas would be, or has the potential to be, liquefied and stored at existing or proposed liquefied natural gas (LNG) facilities. As indicated above, the AIM Project is designed to transport natural gas to serve the Project Shipper's load in the Northeast markets. No new LNG storage facilities are proposed, and the Project is not designed for the purpose of the export of natural gas. However, it is unknown whether the natural gas transported on the AIM Project facilities would be liquefied and stored in existing LNG storage facilities after the natural gas is delivered by Algonquin to the Project Shippers. It is possible that the Project Shippers could use existing peak shaving[6] LNG facilities, but those facilities are not export terminal facilities.

We also received several comments regarding facility design and siting for the proposed replacement, loop, and lateral pipelines and other facilities for the Project and why they need to be located as proposed. Algonquin states that the design and configuration of the proposed facilities is based on flow dynamics and the pressure of natural gas as it moves through the pipeline system relative to the delivery points requested by the Project Shippers. An analysis of the Project's facility design and siting alternatives is provided in section 3.4.

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[5] Dominion has applied for FERC approval to convert its existing Cove Point LNG import facility in Maryland to an export facility. However, it has not yet been approved at the federal level.

[6] Peak shaving facilities store surplus natural gas to meet demand during high-use ("peak") consumption timeframes (e.g., winter cold snaps and summer heat waves).

1.2 PURPOSE AND SCOPE OF THE EIS

Our principal purposes for preparing the EIS are to:

- identify and assess the potential impacts on the natural and human environment that would result from the implementation of the proposed Project;
- describe and evaluate reasonable alternatives to the proposed Project that would avoid or minimize adverse effects on the environment;
- identify and recommend specific mitigation measures, as necessary, to minimize environmental impacts; and
- encourage and facilitate involvement by the public and interested agencies in the environmental review process.

The topics addressed in the EIS include alternatives; geology; soils; groundwater; surface waters; wetlands; vegetation; wildlife and aquatic resources; special status species; land use, recreation, special interest areas, and visual resources; socioeconomics (including transportation and traffic); cultural resources; air quality and noise; reliability and safety; and cumulative impacts. The EIS describes the affected environment as it currently exists, addresses the environmental consequences of the AIM Project, and compares the Project's potential impacts to those of the alternatives. The EIS also presents our conclusions and recommended mitigation measures for the Project.

We received comments that Marcellus shale production activity should be included in the scope of the proposed Project. The Project does not include the production of natural gas. The scope of this EIS focuses on the natural gas transmission facilities that Algonquin would construct and operate. Our authority under the NGA and NEPA review requirements relate only to natural gas facilities that are involved in interstate commerce. Thus, the facilities associated with the production of natural gas are not under FERC jurisdiction. We also received comments about cumulative impacts associated with development of natural gas reserves (including hydraulic fracturing) in the Marcellus shale region. Marcellus shale production and development of gas reserves are discussed in Cumulative Impacts in section 4.13.

1.2.1 Federal Energy Regulatory Commission Purpose and Role

The FERC is an independent federal agency responsible for evaluating applications for authorization to construct and operate interstate natural gas pipeline facilities. If the Commission determines that a project is required by the public convenience and necessity, Certificates are issued under sections 7(b) and 7(c) of the NGA and Part 157 of the Commission's regulations. As such, the FERC is the lead federal agency for the preparation of the EIS in compliance with the requirements of NEPA, the Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (Title 40 Code of Federal Regulations [CFR] Parts 1500-1508 [40 CFR 1500-1508]), and the FERC's regulations implementing NEPA (18 CFR 380).

This EIS presents our review of potential environmental impacts and reasonable recommendations to avoid or mitigate impacts. This EIS will be used as an element in the Commission's review of the Project to determine whether a Certificate would be issued. The FERC will also consider non-environmental issues in its review of Algonquin's application. A Certificate will be granted if the Commission finds that the evidence produced on financing, rates, market demand, gas supply, existing facilities and service, environmental impacts, long-term feasibility, and other issues demonstrates that the Project is required by the public convenience and necessity. Environmental impact assessment and mitigation development are important factors in the overall public interest determination.

1.2.2 U.S. Environmental Protection Agency Purpose and Role

The EPA is an independent federal agency responsible for protecting human health and safeguarding the natural environment. The EPA has delegated water quality certification, under section 401 of the Clean Water Act (CWA), to the jurisdiction of individual state agencies. The EPA may assume section 401 authority if no state program exists, if the state program is not functioning adequately, or at the request of the state. The EPA also oversees the issuance of a National Pollutant Discharge Elimination System (NPDES) permit by the state agency, under section 402 of the CWA, for point-source discharge of water used for hydrostatic testing of pipelines into waterbodies. The EPA also has the authority to review and veto permits issued by the USACE under section 404 of the CWA. In addition to its authority under the CWA, the EPA also has jurisdictional authority under the Clean Air Act (CAA) to control air pollution by developing and enforcing rules and regulations for all entities that emit toxic substances into the air. Under this authority, the EPA has developed regulations for major sources of air pollution, and has delegated the authority to implement these regulations to state and local agencies. State and local agencies are allowed to develop and implement their own regulations for non-major sources of air pollutants. The EPA also establishes general conformity applicability thresholds that a federal agency can utilize to determine whether a specific action requires a general conformity assessment.

In addition to its permitting responsibilities, the EPA is required under section 309 of the CAA to review and publicly comment on the environmental impacts of major federal actions including actions that are the subject of draft and final EISs, and is responsible for implementing certain procedural provisions of NEPA (e.g., publishing Notices of Availability of the draft and final EISs in the Federal Register) to establish statutory timeframes for the environmental review process.

1.2.3 U.S. Army Corps of Engineers Purpose and Role

The USACE is a federal agency within the U.S. Department of Defense with jurisdictional authority pursuant to section 404 of the CWA (Title 33 of the United States Code [USC], Section 1344 [33 USC 1344]), which governs the discharge of dredged or fill material into waters of the United States, and section 10 of the Rivers and Harbors Act (RHA) (33 USC 403), which regulates any work or structures that potentially affect the navigable capacity of a waterbody. Because the USACE would need to evaluate and approve several aspects of the Project and must comply with the requirements of NEPA before issuing permits under the above statutes, it has elected to participate as a cooperating agency in the preparation of this EIS. The USACE would adopt the EIS per 40 CFR 1506.3 if, after an independent review of the document, it concludes that the EIS satisfies the USACE's comments and recommendations. The Project occurs within the New York and New England Districts of the USACE.

The primary decisions to be addressed by the USACE include:

- issuance of a section 404 permit for wetland impacts associated with construction of the Project; and
- issuance of section 10 permit for construction activities within navigable waters of the United States.

This EIS contains information needed by the USACE to reach decisions on these issues. Through the coordination of this document, the USACE would obtain the views of the public and natural resource agencies prior to reaching decisions on the Project.

Algonquin submitted applications for section 404/10 permits to the New York and New England Districts on March 21 and March 25, 2014, respectively. The USACE will publish a public notice for Algonquin's applications in the Federal Register concurrent with this draft EIS. As an element of its review, the USACE must consider whether a proposed project avoids, minimizes, and compensates for impacts on existing aquatic resources, including wetlands, to strive to achieve a goal of no overall net loss of values and functions. Based on its participation as a cooperating agency and its consideration of the final EIS (including responses to public comments), the USACE would issue a Record of Decision to formally document its decision on the proposed action, including section 404 (b)(1) analysis and required environmental mitigation commitments.

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

PHMSA is the federal agency responsible for administering the national regulatory program to ensure the safe transportation of natural gas, petroleum, and other hazardous materials by pipeline under 49 USC 601. PHMSA's Office of Pipeline Safety (OPS) develops regulations and other approaches to risk management to ensure safety in design, construction, testing, operation, maintenance, and emergency response of pipeline facilities. The OPS is responsible for ensuring that Algonquin's proposed facilities are designed, constructed, and operated in compliance with the safety standards that the agency has established for natural gas pipeline facilities.

1.3 PERMITS, APPROVALS, AND REGULATORY REQUIREMENTS

As the lead federal agency for the AIM Project, the FERC is required to comply with section 7 of the Endangered Species Act of 1973 (ESA), the Migratory Bird Treaty Act (MBTA), the Magnuson-Stevens Fishery Conservation and Management Act of 1976 (MSA), the RHA, the CWA, the CAA, section 106 of the National Historic Preservation Act (NHPA), and section 307 of the Coastal Zone Management Act of 1972 (CZMA). These and other statutes have been taken into account in the preparation of the EIS.

Table 1.3-1 lists the major federal, state, and local permits, approvals, and consultations for construction and operation of the Project. The table also provides each status. The FERC encourages cooperation between applicants and state and local authorities, but this does not mean that state and local agencies, through applications of state and local laws, may prohibit or unreasonably delay the construction or operation of facilities approved by the FERC. Any state or local permits issued with respect to jurisdictional facilities must be consistent with the conditions of any authorization issued by the FERC.

1.3.1 Endangered Species Act

Section 7 of the ESA, as amended, states that any project authorized, funded, or conducted by any federal agency (e.g., FERC) should not "…jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined…to be critical…" (16 USC Section 1536(a)(2)(1988)). The FERC, or Algonquin as a non-federal party, is required to consult with the U.S. Fish and Wildlife Service (FWS) and the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NOAA Fisheries) to determine whether any federally listed or proposed endangered or threatened species or their designated critical habitat occur in the vicinity of the Project. If the FERC determines that these species or habitats may be impacted by the Project, the FERC is required to prepare a biological assessment (BA) to identify the nature and extent of adverse impact, and to recommend measures to avoid or reduce potential impacts on habitat and/or species. If, however, the FERC determines that no federally listed or proposed endangered or threatened species or their designated critical habitat would be impacted by the Project, no further action is necessary under the ESA. See section 4.7.1 of this EIS for the status of our compliance with section 7 of the ESA.

TABLE 1.3-1

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

Agency	Permit/Approval/ Consultation	Agency Action	Status
Federal			
FERC	Certificate	Consider issuance of a Certificate under sections 7(b) and (c) of the NGA.	Application filed February 28, 2014
USACE • New England District • New York District	Section 404, CWA Permit	Issuance of a section 404 permit for discharges of dredged or fill material into waters of the United States, including jurisdictional wetlands.	Applications filed March 21, 2014 (New York District; March 25, 2014 (New England District)
	Section 10 RHA Permit	Issuance of a section 10 permit for structures or work in or affecting navigable waters of the United States.	Application filed March 21, 2014 (only applicable to New York District)
EPA • Region 1 (New England) • Region 2 (New York)	Section 404, CWA	Review CWA, 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 process
	CAA	Determination of General Conformity applicability. Review and publicly comment on the environmental impacts of major federal actions.	Ongoing
NOAA Fisheries	Section 7 ESA Consultation	Finding of impacts on federally listed or proposed threatened and endangered (T&E) marine species and their habitat.	Complete
	MSA Consultation	Assess impacts and provide comments to prevent loss of and damage to essential fish habitat.	Complete
FWS • New England Field Office • New York Field Office	Section 7 ESA 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
	Fish and Wildlife Coordination Act	Provide comments to prevent loss of and damage to wildlife resources.	Ongoing
	MBTA	Provide comments to prevent taking or loss of habitat for migratory birds.	Ongoing
Advisory Council on Historic Preservation	Section 106 Consultation, NHPA	Comment on the Project and its effects on historic properties.	Ongoing
State of New York			
New York State Department of Environmental Conservation (NYSDEC), Division of Environmental Permits	Section 401, CWA	Issuance of Water Quality Certification (WQC).	Application filed April 10, 2014
		Consultation with Freshwater Wetlands, and Protection of Waters.	Consultations concurrent with WQC review
	State Environmental Quality Review Act	Coordination with the FERC NEPA process.	Ongoing

TABLE 1.3-1 (cont'd)

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

Agency	Permit/Approval/ Consultation	Agency Action	Status
NYSDEC, Division of Water Permits	State Pollution Discharge Elimination System (SPDES) Program	Issuance of SPDES Permit for Hydrostatic Test Water Discharge and Trench Dewatering.	Application filed April 10, 2014
		Issuance of SPDES Construction Stormwater General Permit; Stormwater Pollution Prevention Plan (SWPPP).	SWPPP to be filed by 4th quarter 2014
NYSDEC, Division of Fish, Wildlife and Marine Resources (DFWMR), Natural Heritage Program	New York State T&E Species Program	Consultation on state-listed T&E species.	Ongoing
NYSDEC, DFWMR Bureau of Wildlife and Fisheries	New York State T&E Species Program	Consultation on state-listed T&E species.	Consultation ongoing
NYSDEC, Division of Air Resources	CAA	Issuance of air permits for compressor station modifications.	Applications filed February 28, 2014 (Southeast Compressor Station) and March 3, 2014 (Stony Point Compressor Station)
New York State Department of State, Office of Communities & Waterfronts	Coastal Zone Consistency Program	Review Project for consistency with coastal zone plans and issue determination.	Application filed February 27, 2014
New York State Office of General Services, Real Estate Development – Land Management	Public Lands Law	Issuance of easement for use of lands underwater.	Application to be filed 4th quarter 2014
New York State Office of Parks, Recreation and Historic Preservation (OPRHP), Historic Preservation Field Services Bureau	Section 106, NHPA	Review and comment on the Project and its effects on historic properties.	Ongoing
OPRHP	New York State Parks Program	Consultation on potential encroachment on state lands.	Ongoing
Local			
New York City Department of Environmental Protection, Bureau of Environmental Planning and Assessment	Geotechnical Investigations	Issuance of permit to conduct geotechnical investigations at the Catskill Aqueduct crossing.	Application filed March 21, 2014
	Land Use Permit	Issuance of permit to cross the Catskill Aqueduct.	Application to be filed 4th quarter 2014
		SWPPP and erosion and sediment control.	SWPPP to be filed by 4th quarter 2014
Westchester and Rockland Counties	County Lands	Consultation regarding encroachment across county lands.	Ongoing
Connecticut			
CTDEEP, Bureau of Water Protection and Land Reuse	Section 401, CWA	Review and issuance of WQC.	Application filed March 28, 2014
	Inland Wetlands and Watercourses	Review and issuance of permit for wetland and waterbody crossings.	Application filed March 28, 2014
	Water Diversion	Issuance of water diversion permit (non-consumptive use).	Application filed March 28, 2014

TABLE 1.3-1 (cont'd)

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

Agency	Permit/Approval/ Consultation	Agency Action	Status
	Hydrostatic test water discharge (section 22a-430b of the Connecticut General Statutes)	Issuance of General Permit for Discharge of Hydrostatic Test Water.	Application filed March 28, 2014
	Stormwater discharge (section 22a-430b of the Connecticut General Statutes)	Issuance of General Permit for Discharges of Stormwater and Dewatering Wastewater from Construction Activities.	Application to be filed May 2014
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	CAA	Issuance of air permits for compressor station modifications.	Applications filed January 31, 2014 (Chaplin Compressor Station) and February 4, 2014 (Cromwell Compressor Station)
CTDEEP, Connecticut Siting Council	Facility Siting	Review and certification of energy facilities through the FERC process.	Ongoing
Connecticut Commission on Culture and Tourism	Section 106, NHPA	Review and comment on the Project and its effects on historic properties.	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.	Copy of section 401 permit application provided on April 14, 2014
Rhode Island			
Rhode Island Department of Environmental Management (RIDEM), Bureau of Environmental Protection, Office of Water Resources	Stormwater Discharge	Issuance of Stormwater General Permit for Construction Activities.	Application to be filed by 4th quarter 2014
	Rhode Island Pollutant Discharge Elimination System	Issuance of Waste Water Discharge Permit for Hydrostatic Test Water.	Application to be filed by 4th quarter 2014
RIDEM, Bureau of Environmental Protection, Office of Air Resource	CAA	Issuance of air permit for compressor station modifications.	Application filed February 3, 2014
Rhode Island Division of Planning and Development, Natural Heritage Program	Rhode Island T&E Species Program	Consultation on state-listed T&E species.	Complete
Rhode Island Historical Preservation & Heritage Commission	Section 106, NHPA	Review and comment on the Project and its effects on historic properties.	Ongoing

TABLE 1.3-1 (cont'd)

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

Agency	Permit/Approval/ Consultation	Agency Action	Status
Massachusetts			
Massachusetts Executive Office of Energy and Environmental Affairs (MAEOEEA), Massachusetts Environmental Protection Act (MEPA) Office	MEPA Certificate	Issuance of certificate for compliance with MEPA. March 31, 2014 decision that no further MEPA review required.	Complete
MAEOEEA, Office of Coastal Zone Management	Coastal Zone Consistency Program	Review Project for consistency with coastal zone plans and issue determination.	Application filed January 2014; consistency determination received February 6, 2014
Massachusetts Department of Environmental Protection	Section 401, CWA	Review and issuance of WQC.	Application filed April 11, 2014
Massachusetts Department of Transportation	Work within roadways	Review and issuance of permits and plans for construction within state road rights-of-way.	Application to be filed 3rd quarter 2014
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
Massachusetts Board of Underwater Archaeological Resources	Section 106, NHPA	Review and comment on the Project and its effects on historic properties.	Ongoing
Massachusetts Department of Conservation and Recreation	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 to be filed 3rd quarter 2014
Municipal Historical Commissions	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.

1.3.2 Migratory Bird Treaty Act

Migratory birds are species that nest in the United States and Canada during the summer and then migrate south to the tropical regions of Mexico, Central and South America, and the Caribbean for the non-breeding season. Migratory birds are protected under the MBTA (16 USC 703–711; MBTA). Executive Order (EO) 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. EO

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 Between the Federal Energy Regulatory Commission and the U.S. Department of the Interior United States Fish and Wildlife Service Regarding Implementation of Executive Order 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds"* (MBTA MOU) that focuses on avoiding or minimizing adverse impacts on migratory birds and strengthening migratory bird conservation through enhanced collaboration between the two agencies. See section 4.7.2 of this EIS for the status of our compliance with the MBTA.

1.3.3 Magnuson-Stevens Fishery Conservation Management Act

The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance essential fish habitat (EFH) for those species regulated under a federal fisheries management plan. The MSA requires federal agencies to consult with NOAA Fisheries on all actions or proposed actions authorized, funded, or undertaken by the agency that may adversely impact EFH (MSA section 305(b)(2)). Although absolute criteria have not been established for conducting EFH consultations, NOAA Fisheries recommends consolidating EFH consultations with interagency coordination procedures required by other statutes such as NEPA, the Fish and Wildlife Coordination Act, or the ESA (50 CFR 600.920(e)) in order to reduce duplication and improve efficiency. As part of the consultation process, we have prepared an EFH Assessment included in section 4.6.2.4.

1.3.4 Rivers and Harbors Act

The RHA pertains to activities in navigable waters as well as harbor and river improvements. Section 10 of the RHA prohibits the unauthorized obstruction or alteration of any navigable water of the United States. Construction of any structure or the accomplishment of any other work affecting course, location, condition, or physical capacity of waters of the United States must be authorized by the USACE. The only section 10 river crossed by the Project is the Hudson River. The Hudson River crossing is discussed in detail in section 4.3.2.

1.3.5 Clean Water Act

The CWA, as amended, regulates the discharges of pollutants into waters of the United States and regulates quality standards for surface waters. To enact this goal both the EPA and the USACE have regulatory authority under this statute. The EPA has implemented pollution control programs including setting wastewater standards for industry and creating water quality standards for all contaminants in surface waters. Under the CWA, it is unlawful to discharge any pollutant from a point source into waters of the United States without a permit. The EPA operates the NPDES permit program that regulates discharges by industrial, municipal, and other facilities, if discharges directly enter surface waters. Section 404 of the CWA regulates the discharge of dredged or fill material into waters of the United States and is under jurisdiction of the USACE. The status of NPDES and section 404 permitting requirements are further addressed in sections 4.3.2 and 4.4.3 of this EIS.

Section 401 of the CWA requires that an applicant for a federal permit who conducts any activity that may result in a discharge to waters of the United States must provide the federal regulatory agency with a section 401 certification. Section 401 certifications are made by the state in which the discharge originates and declares that the discharge would comply with applicable provisions of the act, including the state water quality standards. The New York State Department of Environmental Conservation

(NYSDEC), CTDEEP, and Massachusetts Department of Environmental Protection (MADEP) are the applicable regulatory authorities delegated with section 401 certification for the states of New York, Connecticut, and Massachusetts. A section 401 certification is not required for the modifications proposed in Rhode Island.

1.3.6 Clean Air Act

The CAA, as amended, defines the EPA's responsibilities for protecting and improving the nation's air quality and the stratospheric ozone layer. Under the CAA, the EPA sets limits on certain air pollutants and grants them the authority to limit emissions of air pollutants coming from sources such as industrial facilities. The EPA has delegated the authority to implement these regulations to state and local agencies. In New York, the NYSDEC is responsible for enforcement of air quality standards at a state level as well as enforcement of the State Implementation Plan (SIP) required under the CAA. In Connecticut, the CTDEEP is responsible for enforcement of air quality standards at a state level as well as enforcement of the SIP required under the CAA. In Rhode Island, the Rhode Island Department of Environmental Management (RIDEM) is responsible for enforcement of air quality standards at a state level as well as enforcement of the SIP required under the CAA. In Massachusetts, the MADEP is responsible for enforcement of air quality standards at a state level as well as enforcement of the SIP required under the CAA. The EPA issued a rule in 2010 finalizing greenhouse gas (GHG) reporting requirements for the petroleum and natural gas industry (40 CFR 98). New York, Connecticut, Rhode Island, and Massachusetts have each modified their respective SIPs to regulate GHGs and issue permits for GHGs for large and modified sources under the Prevention of Significant Deterioration (PSD) program. See section 4.11.1 of this EIS for additional information regarding our compliance with the CAA and SIPs.

1.3.7 National Historic Preservation Act

Section 106 of the NHPA, as amended, requires the FERC to take into account the impacts of its undertakings on historic properties, and afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment. Historic properties include prehistoric or historic sites, districts, buildings, structures, objects, or properties of traditional religious or cultural importance listed in or eligible for listing in the National Register of Historic Places (NRHP). In accordance with the ACHP's regulations for implementing section 106, at 36 CFR 800.2(a)(3), the FERC is using the services of Algonquin and its consultants to prepare information, analyses, and recommendations. However, we remain responsible for all findings and determinations. We will follow the process of complying with Section 106 outlined in Part 800 by consulting with each state's State Historic Preservation Office (SHPO), identifying historic properties in the area of potential effect (APE), and assessing potential project effects. Section 4.10.4 of this EIS summarizes the status of our compliance with the NHPA.

1.3.8 Coastal Zone Management Act

The CZMA calls for the "effective management, beneficial use, protection, and development" of the nation's coastal zone and promotes active state involvement in achieving those goals. As a means to reach those goals, the CZMA requires participating states to develop management programs that demonstrate how these states would meet their obligations and responsibilities in managing their coastal areas. In New York, the New York State Department of State (NYSDOS), Office of Communities and Waterfronts is the agency responsible for administering its Coastal Zone Management Program (CZMP). In Massachusetts, the responsible agency is the Massachusetts Executive Office of Energy and Environmental Affairs (MAEOEEA), Office of Coastal Zone Management. The coastal zone would not be affected by the Project in Connecticut or Rhode Island. Because section 307 of the CZMA requires federal agency activities to be consistent to the maximum extent practicable with the enforceable policies of a management program, the FERC has requested that Algonquin seek a determination of consistency with New York's and Massachusetts's CZMPs. Section 4.8.4 of this EIS summarizes our compliance with the CZMA.

1.4 PUBLIC REVIEW AND COMMENT

On June 18, 2013, Algonquin filed a request with the FERC to implement the Commission's NEPA pre-filing process for the AIM Project. The purpose of the pre-filing process is to encourage early involvement of interested stakeholders, facilitate interagency cooperation, and identify and resolve issues before an application is filed with the Commission. On June 28, 2013, the FERC granted Algonquin's request and established a pre-filing Docket Number (PF13-16-000) to place information related to the Project into the public record.

Prior to entering the pre-filing process, Algonquin began conducting outreach activities with governmental stakeholders in the fall of 2012 and landowners in early 2013. In April and May 2013, Algonquin held six landowner informational meetings in New York, four in Connecticut, and two in Rhode Island to acquaint landowners and public officials with the Project and to gather input. After entering the pre-filing process, Algonquin held one additional landowner informational meeting in Connecticut and two in Massachusetts in July 2013.

In conjunction with the pre-filing process, Algonquin implemented a Public and Agency Participation Plan to identify stakeholders, share information regarding the Project, seek input on environmental and other issues, and provide opportunities for public comment. As part of its plan, Algonquin communicated with landowners; elected officials and staff; community leaders; federal, state, and local agencies; non-governmental organizations; local businesses; nearby residents; civic organizations; and other interested individuals and organizations. Algonquin used direct mail to provide information on the AIM Project to stakeholders and established a toll-free Project hotline and targeted Project page on the Spectra website. The website includes a Project description and overview map, information on the FERC's environmental review process, and contact information for the AIM Project.

In May 2013, Algonquin wrote to nine federally recognized Indian tribes (the Delaware Nation of Oklahoma, Delaware Tribe of Indians, Mashantucket (Western) Pequot Tribal Nation, Mashpee Wampanoag Indian Tribe, Mohegan Indian Tribe, Narragansett Indian Tribe, Saint Regis Mohawk Tribe, Stockbridge-Munsee Community Band of Mohican Indians, and Wampanoag Tribe of Gay Head (Aquinnah)) to provide an opportunity to identify any concerns about properties of traditional religious or cultural significance that may be affected by this undertaking. In November 2013, the FERC wrote letters to the federally recognized tribes to request their comments on the proposed Project. Additional information on outreach to tribes is provided in section 4.10.1.3.

Algonquin held 10 public open house meetings in August and September 2013, including 4 in New York, 3 in Connecticut, 2 in Rhode Island, and 1 in Massachusetts, to provide information on the AIM Project and solicit feedback from stakeholders on environmental issues and other concerns. We participated in these open house meetings, provided information on the Commission's environmental review process for the AIM Project, and took comments about the Project and the alternatives.

We participated in interagency meetings, conference calls, and site visits for the AIM Project to identify issues to be addressed in this draft EIS. The meetings, conference calls, and site visits provided a forum for the exchange of information and supported the FERC's responsibility to coordinate federal authorizations and associated environmental review of the AIM Project. Additionally, we hosted 20 regular conference calls with Algonquin and other agencies to discuss AIM Project status and issues. We also hosted regular (mostly weekly) conference calls with tribes, Algonquin, and Algonquin's cultural resources consultant to discuss schedule and coordination for pending cultural resources field investigations. Summaries of the meetings and calls are available for viewing on the FERC's eLibrary website (www.ferc.gov).[7]

On September 13, 2013, the FERC issued a *Notice of Intent to Prepare an Environmental Impact Statement for the Planned Algonquin Incremental Market Project, Request for Comments on Environmental Issues, and Notice of Public Scoping Meetings* (NOI). The NOI was published in the Federal Register on September 19, 2013, and copies were mailed to over 1,800 parties, including representatives of federal, state, and local agencies; elected officials; environmental and public interest groups; Native American tribes; potentially affected landowners; other interested parties; and local libraries and newspapers. The NOI described the FERC's environmental review process for the AIM Project; provided a preliminary list of issues for review in this draft EIS; requested written comments from the public on the scope of the draft EIS; announced the time and location of public scoping meetings; and invited other federal, state, and local agencies to participate as cooperating agencies in the preparation of the EIS. The NOI opened the public scoping period and established a closing date of October 15, 2013 for receiving scoping comments.

The FERC held four public scoping meetings in the AIM Project area to solicit and receive comments on environmental issues associated with this Project. The meetings were held September 30, 2013 through October 3, 2013 in the Town of Cortlandt, New York; Danbury, Connecticut; Norwich, Connecticut; and the Town of Dedham, Massachusetts. The scoping meetings provided an opportunity for the public to learn more about the proposed AIM Project and to provide comments on environmental issues to be addressed in this draft EIS. A combined total of 31 individuals provided verbal comments at the scoping meetings. Transcripts of the meetings, as well as 579 unique written comment letters, were entered into the public record and are available for viewing on the FERC's eLibrary website (www.ferc.gov).

This EIS addresses all substantive comments submitted to the FERC or made at the open houses, scoping meetings, and interagency meetings. Table 1.4-1 lists the environmental issues and concerns identified by commenters during the scoping process and identifies the section where the issue is addressed.

This draft EIS has been filed with the EPA and mailed to federal, state, and local government agencies; elected officials; Native American tribes and regional organizations; local libraries and newspapers; property owners affected by the proposed facilities; individuals requesting intervenor status in the FERC's proceeding; and other interested parties (i.e., individuals, and environmental and public interest groups who provided scoping comments or asked to remain on the mailing list). The distribution list for the draft EIS is in appendix A. The draft EIS was also submitted to the EPA for issuing its formal public *Notice of Availability* in the Federal Register. The public has 45 days after the date of publication in the Federal Register to review and comment on the draft EIS either in the form of written comments and/or at public meetings to be held in the area of the Project. The dates and locations of these public meetings are listed in the To the Party Addressed letter that is included in the front of this draft EIS and in the Notice of Availability. All comments received on the draft EIS related to environmental issues will be addressed in the final EIS.

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[7] Public meeting transcripts and comment letters are available for viewing on the FERC website (http://www.ferc.gov). Using the "eLibrary" link, select "General Search" from the eLibrary menu, enter the selected date range and "Docket No." excluding the last three digits (i.e., PF13-16), and follow the instructions. For assistance, call 1-866-208-3676, or e-mail FERCOnlineSupport@ferc.gov. Because scoping was conducted during the pre-filing review (i.e., before Algonquin filed a formal application with the FERC), PF13-16 must be entered in the Docket No. field to view the public scoping transcripts and comment letters.

TABLE 1.4-1	
Issues Identified and Comments Received During the Scoping Process for the AIM Project	
Issue/Specific Comment	EIS Section Addressing Comment
General	
Potential for export of gas transported by the Project and the connection to any new or existing LNG facilities	1.1
Plans for abandonment of the pipeline segments that are being replaced	2.3.1.2
Discussion of regional/local need for capacity increase provided by the Project	1.1
Alternatives	
Consideration of alternative routes to avoid populated areas, sensitive resources, Indian Point Nuclear Facility, Hudson River, and Catskill Aqueduct	3.0
Consideration of alternate design with larger pipe diameter/higher capacity	3.4
Geology	
Potential Project implications of a seismic risk (i.e., Ramapo Fault)	4.1.5.1
Additive impact of blasting practices near existing quarry in West Roxbury, Massachusetts, within in the New York City Watershed, and Catskill Aqueduct	4.1.4, 4.1.6, 4.3.2, appendix E
Soils	
Associated protocols and/or assessment procedures for the discovery of contaminated soils during construction	4.2.2.6
Water Resources	
Impacts of horizontal directional drill (HDD) crossings, including inadvertent releases of drilling mud, drilling spoil management and disposal, and navigation channels	4.3.2, 4.3.2.6, appendix J
Assess the potential of wastewater radioactivity near Indian Point	4.3.1.6
Impacts on New York City drinking water supply and associated facilities (e.g., Catskill Aqueduct, New Croton Reservoir, Amawalk Reservoir)	4.3.2.1, 4.3.2.6
Wetlands	
Impacts on wetlands, including dredging, filling, clearing, and cover type conversion and proposed mitigation	4.4, appendices K and M
Vegetation	
Impacts on the removal of trees, including restoration/mitigation plans	4.5
Wildlife and Aquatic Resources	
Assess the impacts on Hudson River aquatic life, habitat in the Blue Mountain Reservation and Croton-to-Highlands biodiversity corridor (Westchester County)	4.6.1, 4.6.2, 4.7
Special Status Species	
Evaluation of potential impacts on threatened or endangered species and their habitat including rare plants and proposed avoidance and/or mitigation measures	4.7
Land Use	
Impacts on future development plans (e.g., West Point Partners transmission line)	4.8.3
Impacts on residential, farmland, recreational, and special interest areas (e.g., Blue Mountain Reservation) during construction and operation	4.8.1
Visual impacts of aboveground facilities	4.8.7.3

TABLE 1.4-1 (cont'd)

Issues Identified and Comments Received During the Scoping Process for the AIM Project

Issue/Specific Comment	EIS Section Addressing Comment
Socioeconomics	
Local employment opportunities and increased tax revenues	4.9.1, 4.9.8
Assessment of impacts on local energy and home heating costs	4.9.8
Construction traffic impacts around Legacy Place Shopping Center, along the West Roxbury Lateral, and in the Village of Buchanan	4.9.5
Cultural Resources	
Impacts on culturally and historically significant properties	4.10.4
Protocols for unanticipated discovery of historic properties and/or human remains during construction	4.10.3
Air Quality	
Construction air quality impacts and impacts during operation of the modified compressor stations	4.11.1.3
Greenhouse gas emissions and climate change	4.11.1, 4.13.8
Assessment of health issues associated with radon and air quality	4.11.1
Noise	
Construction noise impacts and proposed mitigation measures	4.11.2
Potential noise and health-related impacts resulting from compressor station operations	4.11.2.3
Reliability and Safety	
Safety standards and reliability associated with facilities near densely populated areas and public services (e.g., schools and hospitals)	4.12.1, 4.12.3
Emergency response plans, evacuation plans, and coordination with community public safety services	4.12.1
Analysis of cumulative safety risk associated with proximity to Indian Point nuclear facility, Ramapo Fault, and proposed West Point Partners transmission line	4.1.5.1, 4.8.3.2, 4.8.5.1, 4.12.3
Potential for pipelines to be contaminated with polychlorinated biphenyls	4.8.6.2
Cumulative Impacts	
Concern about additional impacts on ecosystems/communities stressed by existing power plants and heavy industrial activity	4.13
Request for analysis of cumulative climate impacts associated with shale gas development	4.13
Cumulative impacts associated with proposed West Point Partners transmission line	4.13

1.5 NON-JURISDICTIONAL FACILITIES

Non-jurisdictional facilities are those facilities related to the Project that are constructed, owned, and operated by others that are not subject to the FERC jurisdiction. There are no known non-jurisdictional facilities associated with the Project.

2.0 PROJECT DESCRIPTION

2.1 PROPOSED FACILITIES

Algonquin proposes to expand its existing natural gas transmission pipeline system in New York, Connecticut, Rhode Island, and Massachusetts. The AIM Project involves construction and operation of about 37.6 miles of replacement, loop, and lateral pipeline facilities; modifications to 6 existing compressor stations; modifications to 24 existing M&R stations; the removal of an existing M&R station; and the construction of 3 new M&R stations as described below. The Project would also involve the abandonment of one segment of existing mainline and four compressor units at one existing compressor station. An overview map of the Project locations and facilities is provided on figure 2.1-1. Detailed maps showing the pipeline routes, aboveground facilities, and pipe and contractor ware yards are contained in appendix B.

2.1.1 Pipeline Facilities

The AIM Project includes about 37.6 miles of pipeline composed of the following facilities:

- replacement of 20.1 miles (in three segments) of existing 26-inch-diameter mainline pipeline with a new 42-inch-diameter pipeline (take-up and relay [1]);
- extension of existing loop [2] pipeline with about 2.0 miles of additional 36-inch-diameter pipeline within Algonquin's existing pipeline right-of-way (Line-36A Loop Extension);
- replacement of about 9.1 miles of existing 6-inch-diameter pipeline with a new 16-inch-diameter pipeline (E-1 System Lateral Take-up and Relay);
- extension of an existing lateral loop pipeline with about 1.3 miles of additional 12-inch-diameter lateral loop pipeline within Algonquin's existing pipeline right-of-way (E-1 System Lateral Loop); and
- installation of about 5.1 miles of new lateral [3] pipeline off of Algonquin's existing I-4 System Lateral (West Roxbury Lateral).

Table 2.1.1-1 summarizes the proposed pipeline facilities associated with the Project.

[1] Take-up and relay refers to a construction method by which an existing pipeline is removed and replaced with a new pipeline in the same location and ditch.

[2] A pipeline loop is a segment of pipe constructed parallel to an existing pipeline to increase capacity.

[3] A pipeline lateral branches off of a mainline pipeline to connect with or serve a specific customer or group of customers.

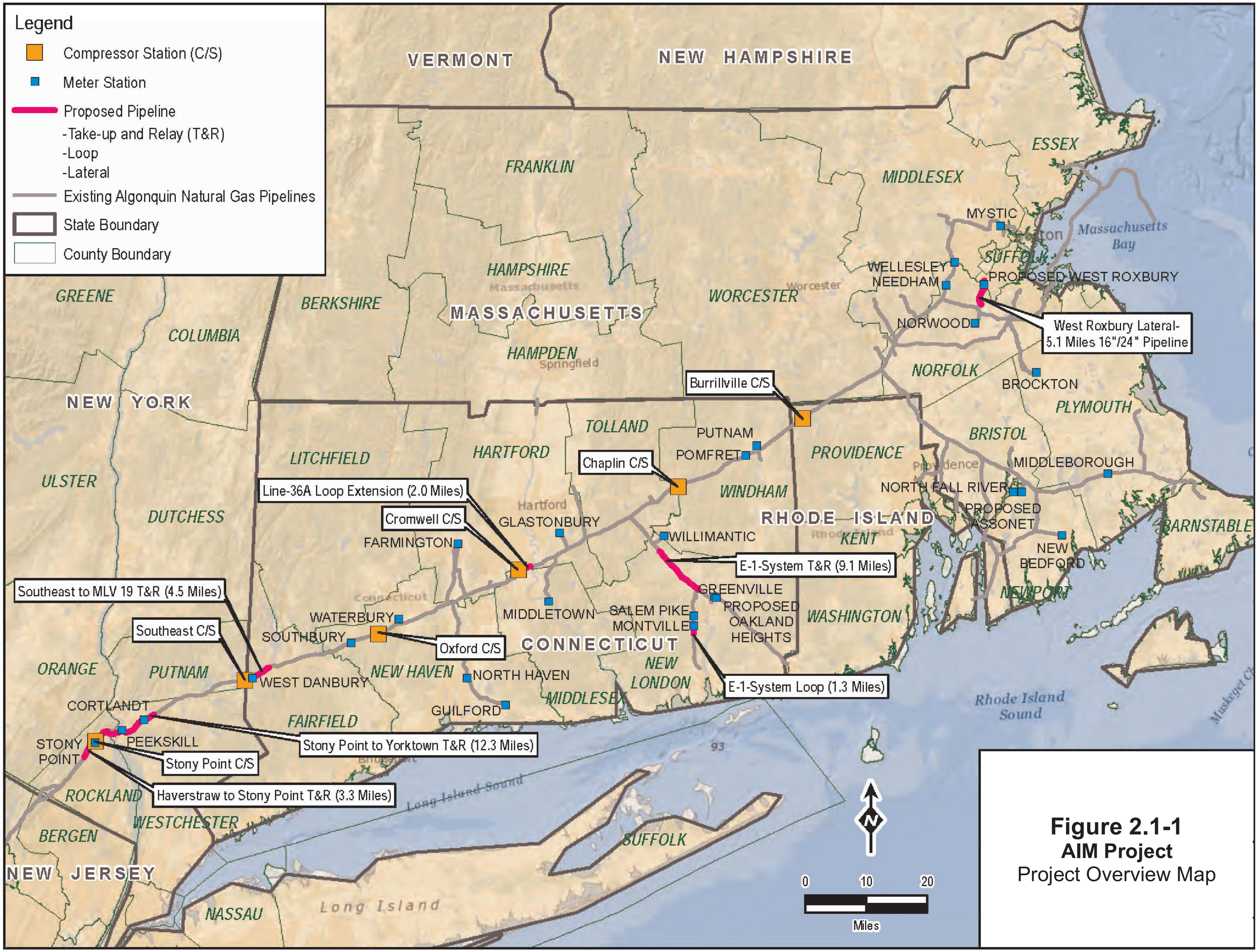

Figure 2.1-1
AIM Project
Project Overview Map

TABLE 2.1.1-1

Summary of Pipeline Facilities for the AIM Project

Facility	County, State [a]	Existing Diameter (inches)	New/ Replacement Diameter (inches)	Begin Milepost	End Milepost	Length (miles)
Replacement Pipeline						
Haverstraw to Stony Point Take-up and Relay	Rockland, NY	26	42	0.0	3.3	3.3
Stony Point to Yorktown Take-up and Relay [b]	Rockland, NY	26	42	0.0	3.5	3.5
	Westchester, NY	26	42	3.5	12.3	8.8
Southeast to MLV 19 Take-up and Relay	Putnam, NY	26	42	0.0	0.1	0.1
	Fairfield, CT	26	42	0.1	4.5	4.4
E-1 System Lateral Take-up and Relay	New London, CT	6	16	0.0	9.1	9.1
Loop Extension						
Line-36A Loop Extension	Middlesex, CT	NA	36	0.0	1.8	1.8
	Hartford, CT	NA	36	1.8	2.0	0.2
E-1 System Lateral Loop Extension	New London, CT	NA	12	0.0	1.3	1.3
New Pipeline						
West Roxbury Lateral	Norfolk, MA	NA	16	0.0	3.4	3.4
	Suffolk, MA	NA	16	3.4	4.2	0.8
	Suffolk, MA	NA	24	4.2	5.1	0.9
TOTAL						**37.6**

[a] No pipeline facilities would be located in Rhode Island.
[b] The total pipeline length for the Stony Point to Yorktown Take-up and Relay segment includes an approximately 2.9-mile-long section of new mainline pipeline and right-of-way associated with the crossing of the Hudson River.
NA = Not applicable

The majority of the pipeline facilities (about 26.3 miles or 70 percent of the total 37.6 miles) would replace existing Algonquin pipelines, while the remainder of the pipeline facilities (about 11.3 miles or 30 percent) consist of new mainline pipeline (Hudson River crossing, new loop pipeline, and one new lateral pipeline).

About 79 percent of the proposed pipeline facilities involve replacement and looping that occurs within or adjacent to existing Algonquin pipeline rights-of-way. The replacement work involves excavating a trench to remove the old pipe. Once the old pipe is removed the trench is re-excavated wider and deeper (as appropriate) to accommodate the new, larger diameter pipe. The replacement pipe would be installed at approximately the same location as the old pipe in the existing Algonquin right-of-way. The loop pipeline installation involves constructing a new pipeline adjacent and parallel with other existing Algonquin pipelines. The pipeline loops require new permanent right-of-way adjacent to the existing Algonquin right-of-way.

2.1.1.1 Haverstraw to Stony Point Take-up and Relay

Algonquin would replace about 3.3 miles of 26-inch-diameter mainline pipeline located upstream (southwest) of the existing Stony Point Compressor Station in Rockland County, New York with new 42-inch-diameter mainline pipeline. The installment of the new 42-inch-diameter pipeline would begin at the existing Algonquin MLV 13B (milepost [MP] 0.0) in the Town of Haverstraw and end at the Stony Point Compressor Station located in the Town of Stony Point (MP 3.3). 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.

2.1.1.2 Stony Point to Yorktown Take-up and Relay

Downstream (northeast) of the Stony Point Compressor Station, Algonquin would construct about 12.3 miles of 42-inch-diameter mainline pipeline in the Towns of Stony Point and Cortlandt (including the Hamlet of Verplanck and the Village of Buchanan), the City of Peekskill, and the Town of Yorktown. This pipeline section includes two segments of replacement pipeline and one segment of pipeline construction within a new permanent right-of-way across the Hudson River.

Algonquin would replace about 2.6 miles of 26-inch-diameter mainline pipeline starting at the Stony Point Compressor Station (MP 0.0) and extending to MP 2.6 in the Town of Stony Point. At MP 2.6, the 42-inch-diameter mainline pipeline installation would deviate from Algonquin's existing right-of-way and would be within a new permanent right-of-way as part of the Hudson River crossing until MP 5.5. Algonquin would not remove or replace any of the three existing pipelines that currently cross the Hudson River within the mainline right-of-way (i.e., two existing 24-inch-diameter pipelines and a 30-inch-diameter pipeline). Those existing pipelines across the river do not have sufficient available capacity to accommodate the additional volume of natural gas required by the Project Shippers but Algonquin states that it would maintain service on the three existing pipelines across the river to enhance system reliability (see section 3.5.1). Instead, Algonquin would install the pipeline below the Hudson River bed using the horizontal directional drill (HDD) construction method (see section 2.3.1.2). Between MPs 5.5 and 12.3, Algonquin would replace the existing 26-inch-diameter mainline with the new 42-inch-diameter pipeline. 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.

2.1.1.3 Southeast to MLV 19 Take-up and Relay

Algonquin would replace a 26-inch-diameter mainline pipeline segment with 42-inch-diameter pipeline located in Putnam County, New York, and Fairfield County, Connecticut. This 4.5-mile-long replacement segment would begin at the Southeast Compressor Station (MP 0.0) in the Town of Southeast, New York, and extend northeast across the New York/Connecticut state lines into the City of Danbury, Connecticut. Algonquin would install the new 42-inch-diameter pipeline beneath Interstate 84, the Still River, a railroad line, and Mill Plain Road using the HDD construction method (see section 2.3.1.2). The replacement segment would end at Algonquin's existing MLV- 19 site located east of State Route 39 (Clapboard Ridge Road). 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.

In addition to the replacement pipeline, about 0.7 mile of Algonquin's existing 26-inch-diameter Southeast to MLV 19 pipeline would be abandoned in place upon tie-in of the 42-inch-diameter pipeline along the Interstate 84/Still River HDD segment. Section 2.3.1.2 describes the abandonment procedures that would be followed in these areas.

2.1.1.4 E-1 System Lateral Take-up and Relay

Algonquin would replace about 9.1 miles of 6-inch-diameter pipeline with 16-inch-diameter pipeline along its existing E-1 System Lateral in New London County, Connecticut. The proposed 16-inch-diameter line would have the same MAOP of 750 psig as the existing 6-inch-diameter line. The replacement would begin at State Route 289 (MP 0.0) in the Town of Lebanon and extend to the southeast through the Town of Franklin, ending approximately 900 feet northwest of Plain Hill Road in the City of Norwich.

2.1.1.5 Line-36A Loop Extension

Algonquin would extend its existing Line-36A loop pipeline with about 2.0 miles of additional 36-inch-diameter pipeline in Middlesex and Hartford County, Connecticut. The proposed line would be designed for an MAOP of 850 psig. This loop extension would begin at Algonquin's existing Cromwell Compressor Station (MP 0.0) and extend downstream (east) to a termination point located approximately 1,400 feet west of the Connecticut River. The loop extension would be located within the Towns of Cromwell and Rocky Hill.

2.1.1.6 E-1 System Lateral Loop Extension

Algonquin would extend its existing Line-E-1L pipeline with about 1.3 miles of additional 12-inch-diameter loop pipeline along its existing E-1 System Lateral. The loop pipeline would begin at the existing Montville M&R Station (MP 0.0) located on the north side of Fitch Hill Road and end approximately 1.3 miles to the south, ending about 100 feet north of Raymond Hill Road. The entire loop pipeline would be located within the Town of Montville in New London County, Connecticut. The proposed pipeline would have an MAOP of 750 psig.

2.1.1.7 West Roxbury Lateral

Algonquin would install about 5.1 miles of new pipeline lateral off of its existing I-4 System Lateral in Norfolk County and Suffolk Counties, Massachusetts to provide Boston Gas with the service it has requested. The West Roxbury Lateral would consist of about 4.2 miles of new 16-inch-diameter pipeline and about 0.9 mile of new 24-inch-diameter pipeline in the Towns of Westwood and Dedham and the West Roxbury section within the City of Boston. The West Roxbury Lateral would have an MAOP of 750 psig.

2.1.2 Aboveground Facilities

The proposed aboveground facilities consist of modifications to six existing compressor stations, to install a total 81,620 hp, in New York, Connecticut, and Rhode Island; and abandon 10,800 hp in New York. Algonquin would modify 24 existing M&R stations in New York, Connecticut, and Massachusetts, including the replacement of existing heaters and metering facilities, piping modifications, and facility uprates, depending on facility needs. The AIM Project also includes the construction of three new M&R stations in Massachusetts and Connecticut to deliver gas to NSTAR, Boston Gas, and Norwich Public Utilities, and the removal of one existing M&R station in Connecticut. Algonquin would also modify three existing MLV sites and five existing launcher/receiver sites, construct five new launcher/receiver sites, construct new MLV cross over piping at two locations, and construct one new MLV. The Project aboveground facilities are described in table 2.1.2-1. The locations of the aboveground facilities are shown on the maps located in appendix B.

In addition to the M&R stations listed in table 2.1.2-1, the AIM Project would also increase gas flow to eight existing Algonquin M&R stations located in Connecticut and Massachusetts. However, the inlet pressure at these facilities would not increase and, therefore, would not result in any station modifications. Two M&R stations are in Hartford County, Connecticut (Bristol M&R Station and Kensington M&R Station) and six stations are in Middlesex, Plymouth, and Norfolk Counties, Massachusetts (Ashland M&R Station, Everett M&R Station, Pine Hills M&R Station, Polaroid M&R Station, Ponkapoag M&R Station, and Weston M&R Station). In addition, there are four M&R stations in Rhode Island and three M&R stations in Massachusetts that are delivery points on the AIM Project. Given that no work is proposed at these 15 existing stations as part of the AIM Project, they have not been included in table 2.1.2-1 or further evaluated in this draft EIS.

TABLE 2.1.2-1

Proposed New and Modified Aboveground Facilities for the AIM Project

Facility Type/Facility	County, State	MP [a]	Scope of Work
Existing Compressor Station Modifications			
Stony Point Compressor Station	Rockland, NY	NA	Install two new compressor units; restage [b] one existing compressor unit; install gas cooling for new units; install three new heaters; install one new emergency generator; remove existing 26-inch launcher/receiver barrels and MLV assembly; and install new 42-inch MLV and new suction/discharge connections. Four existing compressor units would be abandoned and removed at this location. A net total of 21,000 hp would be added to this station.
Southeast Compressor Station	Putnam, NY	NA	Install one new compressor unit; restage one existing compressor unit; install gas cooler for new unit; install two new heaters; install one new emergency generator; remove existing 26-inch launcher barrel and MLV; and install new 42-inch launcher barrel and new MLV and discharge connection. A total of 10,320 hp would be added to this station.
Oxford Compressor Station	New Haven, CT	NA	Restage one existing compressor unit. No additional horsepower would be added to this station.
Cromwell Compressor Station	Middlesex, CT	NA	Install one new compressor unit; install gas cooling for new unit and two existing turbines; install one new heater; install one new emergency generator; shutdown three existing emergency generators; and station piping modifications. A total of 15,900 hp would be added to this station.
Chaplin Compressor Station	Windham, CT	NA	Install one new compressor unit; restage two existing compressor units; install gas cooling for new unit and two existing compressor units; install one new heater; install one new emergency generator; shutdown an existing emergency generator; and station piping modifications. A total of 7,700 hp would be added to this station.
Burrillville Compressor Station	Providence, RI	NA	Install one new compressor unit; restage two existing compressor units; install gas cooling for new unit; install one new heater; install one new emergency generator; and re-pipe existing compressor unit. A total of 15,900 hp would be added to this station.
Existing M&R Station Modifications			
Stony Point M&R Station	Rockland, NY	3.0	Reconnect existing tap to new 42-inch-diameter pipeline.
Peekskill M&R Station	Westchester, NY	5.8	Replace inlet piping; install new heater; and install new regulation equipment.
Cortlandt M&R Station	Westchester, NY	10.3	Replace inlet piping; install new heater; and install new regulation equipment and gas chromatograph.
West Danbury M&R Station	Fairfield, CT	1.2	Uprate existing facilities and inlet piping for new 850-psig inlet pressure; replace existing ultrasonic meter with new ultrasonic meters and a low flow meter.
Southbury M&R Station	New Haven, CT	NA	Piping modifications; add low flow meter; and increase size of piping.
Waterbury M&R Station	New Haven, CT	NA	Replace existing meter with ultrasonic meters and a low flow meter; upgrade regulation equipment; and replace existing building.
North Haven M&R Station	New Haven, CT	NA	Replace existing meter with ultrasonic meters and a low flow meter.

TABLE 2.1.2-1 (cont'd)

Proposed New and Modified Aboveground Facilities for the AIM Project

Facility Type/Facility	County, State	MP [a]	Scope of Work
Guilford M&R Station	New Haven, CT	NA	Rebuild entire station within existing Algonquin property and add filter separator.
Farmington M&R Station	Hartford, CT	NA	Remove upstream pressure regulation; add low flow meter; and upgrade downstream pressure regulation.
Glastonbury M&R Station	Hartford, CT	NA	Replace inlet piping and inlet heater and replace existing meters with ultrasonic meters and low flow meter.
Middletown M&R Station	Middlesex, CT	NA	Add redundant turbine meter run.
Salem Pike M&R Station	New London, CT	NA	Minor modifications to aboveground station piping and regulation equipment.
Montville M&R Station	New London, CT	0.0	Replace existing metering with ultrasonic meters and low flow meter and replace inlet piping from heater to metering.
Willimantic M&R Station	Windham, CT	NA	Rebuild entire station on adjacent new parcel and remove existing M&R station except communications (after new station in-service).
Pomfret M&R Station	Windham, CT	NA	Add redundant meter run.
Putnam M&R Station	Windham, CT	NA	Add redundant meter run.
North Fall River M&R Station	Bristol, MA	NA	Add low flow meter.
New Bedford M&R Station	Bristol, MA	NA	Replace existing metering with ultrasonic meters and low flow meter; replace two existing heaters; and replace existing building.
Middleborough M&R Station	Plymouth, MA	NA	Add redundant meter run and low flow meter.
Brockton M&R Station	Plymouth, MA	NA	Replace existing meters with two ultrasonic meters and low flow meter and replace existing building.
Norwood M&R Station	Norfolk, MA	NA	Replace inlet piping and add new actuator and upgrade metering capacity with new meter runs.
Needham M&R Station	Norfolk, MA	NA	Add redundant meter run.
Wellesley M&R Station	Norfolk, MA	NA	Replace low flow meter with ultrasonic low flow meter.
Mystic M&R Station	Middlesex, MA	NA	Add redundant meter run and a low flow meter and replace existing building.
New M&R Stations			
Oakland Heights M&R Station	New London, CT	NA	Install new metering, regulating, and heating facilities.
Assonet M&R Station	Bristol, MA	NA	Install new metering, regulating, and heating facilities.
West Roxbury M&R Station	Suffolk, MA	4.2	Install new metering, regulating, and heating facilities.
Existing M&R Station Removal [c]			
Greenville M&R Station	New London, CT	NA	Remove existing M&R station (after Oakland Heights M&R Station in-service).
Other New Aboveground Facilities			
MLV 13B (Existing)	Rockland, NY	0.0	Remove launcher/receiver facilities and install new piping.
MLV 15 (Existing)	Westchester, NY	11.1	Replace 26-inch valve with 42-inch valve equipped with Remove Control Valve capability and cross over piping.
MLV 19 (Existing)	Fairfield, CT	4.5	Replace 26-inch valve with 42-inch valve equipped with remote control valve capability; install a 26-inch launcher barrel and 42-inch receiver barrel; and install mainline regulators and associated cross over piping.

TABLE 2.1.2-1 (cont'd)

Proposed New and Modified Aboveground Facilities for the AIM Project

Facility Type/Facility	County, State	MP [a]	Scope of Work
Launcher/Receiver (Existing)	Rockland, NY	0.0	Remove existing launcher/receiver and install new piping.
L-36A Cromwell Loop Receiver (Existing)	Middlesex, CT	0.0	Remove existing 36-inch receiver facility.
E-1 16-inch Launcher/Receiver (Existing)	New London, CT	0.0	Remove existing 16-inch receiver and 6-inch launcher facilities.
E-1 16-inch Launcher/Receiver (Existing)	New London, CT	9.1	Install 16-inch receiver and 6-inch launcher facilities and valve assembly at end of E-1 16-inch line at existing facility.
E-1 12-inch Launcher (Existing)	New London, CT	0.0	Remove 12-inch receiver.
Launcher/Receiver Pressure Regulating Facility (New)	Westchester, NY	12.3	Install 42-inch receiver barrel and 26-inch launcher barrel and install mainline regulators and associated cross over piping.
L-36A Cromwell Loop Receiver (New)	Hartford, CT	2.0	Install receiver facility, cross over piping, and launcher facilities.
E-1 12-inch Loop Receiver (New)	New London, CT	1.3	Install 12-inch receiver facility and interconnect with E-1 line.
West Roxbury Lateral Launcher/Block Valve (New)	Norfolk, MA	0.0	Install 16-inch launcher facility and lateral block valve.
West Roxbury Launcher/Receiver (New)	Suffolk	4.2	Install 16-inch receiver and 24-inch launcher facilities as well as lateral block valve at the new West Roxbury M&R Station.
Cross Over Piping (New)	Rockland, NY	2.6	Install new 42-inch MLV cross over piping to both the L30-B and 26-inch mainline and 26-inch launcher facility.
Cross Over Piping (New)	Westchester, NY	5.5	Install new 42-inch MLV cross over piping to both the L30-B and 26-inch mainline and 26-inch receiver facility.
MLV (New)	Putnam, NY	0.0	Install new 42-inch MLV with suction and discharge valves at the Southeast Compressor Station along with a new 42-inch launcher barrel assembly.

[a] MP information is only included for those aboveground facilities located along pipeline segments that are part of the AIM Project pipeline facilities. The remaining aboveground facilities would be located at other points along Algonquin's pipeline system and have been marked as not applicable (NA).

[b] "Restage" describes work internal to an existing compressor unit that is housed inside a compressor building. It involves removing and replacing certain existing compressor equipment to improve operating efficiency without increasing horsepower.

[c] The existing Willimantic M&R Station would be removed at its current location but would be rebuilt on an adjacent new parcel.

2.2 LAND REQUIREMENTS

Construction of the Project would impact a total of about 592.3 acres of land, including 451.9 acres for the pipeline facilities, 94.9 acres for the aboveground facilities, 43.6 acres for the pipe and contractor ware yards, and 1.9 acres for access roads. Following construction, about 46.0 acres of new land would be permanently maintained for operation and maintenance of the AIM Project facilities, including about 37.5 acres for the new pipeline right-of-way, 6.6 acres for the aboveground facilities, and 1.9 acres for access roads.

Table 2.2-1 summarizes the land requirements for the AIM Project. A detailed description and breakdown of land requirements and use is presented in section 4.8.1. Typical right-of-way configurations that reflect the majority of the pipeline routes are provided in appendix B.

TABLE 2.2-1

Summary of Land Requirements for the AIM Project

Facility	County, State	Land Affected During Construction (acres)	Land Affected During Operation (acres)
PIPELINE FACILITIES [a, b]			
Replacement Pipeline			
Haverstraw to Stony Point Take-up and Relay	Rockland, NY	45.5	0.0
Stony Point to Yorktown Take-up and Relay	Rockland, NY	41.5	3.9
	Westchester, NY	124.3	10.4
Southeast to MLV 19 Take-up and Relay	Putnam, NY	5.2	0.0
	Fairfield, CT	56.8	0.0
E-1 System Lateral Take-up and Relay	New London, CT	94.9	8.3
Loop Extension			
Line-36A Loop Extension	Middlesex, CT	20.5	6.1
	Hartford, CT	2.6	0.5
E-1 System Lateral Loop Extension	New London, CT	14.2	3.2
New Pipeline			
West Roxbury Lateral	Norfolk, MA	31.9	5.1
	Suffolk, MA	14.5	0.0
PIPELINE FACILITIES SUBTOTAL		**451.9**	**37.5**
ABOVEGROUND FACILITIES			
Existing Compressor Station Modifications			
Stony Point Compressor Station	Rockland, NY	20.3	1.6
Southeast Compressor Station	Putnam, NY	15.9	0.0
Oxford Compressor Stations	New Haven, CT	0.0	0.0
Cromwell Compressor Station	Middlesex, CT	14.9	1.9
Chaplin Compressor Station	Windham, CT	11.7	0.0
Burrillville Compressor Station	Providence, RI	16.7	0.0
Subtotal		79.5	3.5
Existing Metering and Regulating (M&R) Station Modifications			
Stony Point M&R Station	Rockland, NY	2.2 [c]	0.0
Peekskill M&R Station	Westchester, NY	2.1 [c]	0.0
Cortlandt M&R Station	Westchester, NY	3.8 [c]	0.0
West Danbury M&R Station	Fairfield, CT	0.3 [d]	0.0
Southbury M&R Station	New Haven, CT	0.6	0.0
Waterbury M&R Station	New Haven, CT	0.4	0.0
North Haven M&R Station	New Haven, CT	0.5	0.0
Guilford M&R Station	New Haven, CT	0.5	0.0
Farmington M&R Station	Hartford, CT	0.4	0.0
Glastonbury M&R Station	Hartford, CT	0.8	0.0
Middletown M&R Station	Middlesex, CT	0.5	0.0
Salem Pike M&R Station	New London, CT	0.2	0.0
Montville M&R Station	New London, CT	1.2 [c]	0.0
Willimantic M&R Station	Windham, CT	0.9	0.5
Pomfret M&R Station	Windham, CT	0.4	0.0
Putnam M&R Station	Windham, CT	0.3	0.0
North Fall River M&R Station	Bristol, MA	0.0 [e]	0.0
New Bedford M&R Station	Bristol, MA	1.8	0.0
Middleborough M&R Station	Plymouth, MA	0.6	0.0
Brockton M&R Station	Plymouth, MA	0.6	0.0
Norwood M&R Station	Norfolk, MA	0.8	0.0

TABLE 2.2-1 (cont'd)

Summary of Land Requirements for the AIM Project

Facility	County, State	Land Affected During Construction (acres)	Land Affected During Operation (acres)
Needham M&R Station	Norfolk, MA	0.4	0.0
Wellesley M&R Station	Norfolk, MA	0.5	0.0
Mystic M&R Station	Middlesex, MA	0.7	0.0
Subtotal		11.2	0.5
New M&R Stations			
Oakland Heights M&R Station [f]	New London, CT	2.4	1.4
Assonet M&R Station	Bristol, MA	1.5	0.2
West Roxbury M&R Station	Suffolk, MA	1.0 [c]	1.0
Subtotal		3.9	2.6
Existing M&R Station Removal			
Greenville M&R Station [f]	New London, CT	0.3	0.0
Other New Aboveground Facilities [g]			
MLV 13B (Existing)	Rockland, NY	0.0	0.0
MLV 15 (Existing)	Westchester, NY	0.0	0.0
MLV 19 (Existing)	Fairfield, CT	0.0	0.0
Launcher/Receiver (Existing)	Rockland, NY	0.0	0.0
L-36A Cromwell Loop Receiver (Existing)	Middlesex, CT	0.0	0.0
E-1 16-inch Launcher/Receiver (Existing)	New London, CT	0.0	0.0
E-1 16-inch Launcher/Receiver (Existing)	New London, CT	0.0	0.0
E-1 12-inch Launcher (Existing)	New London, CT	0.0	0.0
Launcher/Receiver Pressure Regulating Facility (New)	Westchester, NY	0.0	0.0
L-36A Cromwell Loop Receiver (New)	Hartford, CT	0.0	0.0
E-1 12-inch Loop Receiver (New)	New London, CT	0.0	0.0
West Roxbury Lateral Launcher/Block Valve (New)	Norfolk, MA	0.0	0.0
West Roxbury Launcher/Receiver (New)	Suffolk	0.0	0.0
Cross Over Piping (New)	Rockland, NY	0.0	0.0
Cross Over Piping (New)	Westchester, NY	0.0	0.0
MLV (New)	Putnam, NY	0.0	0.0
ABOVEGROUND FACILITY SUBTOTAL		**94.9**	**6.6**
PIPE AND CONTRACTOR WARE YARDS		**43.6**	**0.0**
ACCESS ROADS		**1.9**	**1.9**
PROJECT TOTAL		**592.3**	**46.0**

[a] The acreage shown for the land affected during construction includes all construction workspace, including the existing permanent right-of-way and includes the new land area that would be permanently affected during operation.

[b] The acreage shown for the land affected during operation includes only the new permanent right-of-way, not Algonquin's existing permanent easement.

[c] The temporary workspace shown for each of these M&R stations falls within the overall pipeline workspace area; therefore, these areas are not included in the acreage calculations.

[d] A portion of the West Danbury M&R Station temporary workspace would be located within the pipeline construction workspace (2.6 acres), so the 0.3-acre is the area that would be located outside of the temporary pipeline workspace.

[e] Work at the North Fall River M&R Station would take place within the existing station footprint.

[f] The acres of land affected during construction at these facilities includes staging areas located a short distance away from the actual M&R station site.

[g] This table does not include affected land calculations for MLVs, launcher/receiver facilities, and cross over piping because the land requirements for these facilities are included in the land requirements for the pipeline facilities, compressor stations, or M&R stations above.

2.2.1 Pipeline Facilities

2.2.1.1 Replacement

Construction of the proposed mainline replacement portions of the AIM Project (Haverstraw to Stony Point, Stony Point to Yorktown, and Southeast to MLV 19 Take-up and Relay) would generally require a 100-foot-wide construction right-of-way to permit 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 agricultural areas where other construction right-of-way widths would be employed.

In most areas, the construction right-of-way includes the use of Algonquin's existing 75-foot-wide permanent right-of-way. However, there are two segments where Algonquin's existing 75-foot-wide right-of-way would not be part of the construction right-of-way. This includes the new segment of 42-inch-diameter pipeline to be constructed in the Towns of Stony Point and Cortlandt between MPs 2.6 and 5.5 across the Hudson River. In addition, the pipeline segment that crosses the Blue Mountain Reservation in the Town of Cortlandt between Washington Street (MP 6.7) and Maple Avenue (MP 8.4) is located within a 6-foot-wide permanent right-of-way.

Between MPs 2.6 and 5.5 of the Haverstraw to Stony Point Take-up and Relay, Algonquin would utilize a 75-foot-wide construction right-of-way and a 50-foot-wide permanent right-of-way. There would be no construction right-of-way within the Hudson River itself with the use of HDD; however, Algonquin would establish a new 10-foot-wide permanent right-of-way across the river for the 42-inch-diameter pipeline. As stated above, Algonquin would not be removing or abandoning any of the existing pipelines that cross the Hudson River in the existing permanent easement to the north of the proposed crossing location.

For the E-1 System Lateral Take-up and Relay segment, Algonquin would utilize a 75-foot-wide construction right-of-way to accommodate construction of the 16-inch-diameter pipeline. The construction right-of-way would include Algonquin's existing 50-foot-wide permanent right-of-way in these areas and an additional 25 feet of temporary workspace. Algonquin's existing permanent right-of-way for the rest of the E-1 System Lateral is 60 feet. As part of the AIM Project, Algonquin would obtain an additional 10 feet of new permanent right-of-way along the portions of this segment where the current right-of-way is only 50 feet to match the rest of the system.

2.2.1.2 Loop Extension

Algonquin would use an 85-foot-wide construction right-of-way to construct the Line-36A Loop to permit the safe passage of equipment and materials associated with construction of the 36-inch-diameter pipeline. The existing permanent right-of-way width along the Line-36A Loop Extension is 75 feet. The proposed construction right-of-way would include the use of the existing permanent right-of-way, to the extent practicable, and an additional 10 to 35 feet of temporary workspace. Algonquin would obtain an additional 20 to 30 feet of new permanent right-of-way for the Line-36A Loop Extension.

Algonquin would use a 75-foot-wide construction right-of-way for the E-1 System Lateral Loop Extension. The construction right-of-way would include the use of Algonquin's existing 30-foot-wide permanent easement, an additional 20 feet of new permanent right-of-way, and an additional 25 feet of temporary workspace. Algonquin would obtain an additional 20 feet of new permanent right-of-way along the E-1 System Lateral Loop Extension segment.

2.2.1.3 New Pipeline

The West Roxbury Lateral would be primarily constructed along and within existing roads and in parking lots of commercial and industrial properties. The construction right-of-way would range between 15 and 75 feet in width. In public roadways, Algonquin would seek to obtain a permit or license agreement for the installation from the City of Boston and the Town of Dedham. The distribution of the construction right-of-way would vary depending on the location. Where there is sufficient room, the distribution of the construction right-of-way would be 25 feet on the spoil side and 50 feet on the working side. In sections where the new pipeline parallels existing road or property lines, the construction right-of-way would vary between 15 and 75 feet to accommodate field conditions at the time of construction. Where the pipeline is within existing streets, the construction right-of-way would be limited to the limits of the street right-of-way. The permanent right-of-way width for the West Roxbury Lateral would be 50 feet, where available.

2.2.1.4 Collocation with Existing Rights-of-Way

About 35.1 miles (93 percent) of the 37.6 miles of AIM Project pipeline facilities would be within or adjacent to existing right-of-way, consisting of Algonquin pipeline rights-of-way, public roadways, railways, and electric transmission line corridors. Table 2.2.1-1 provides locations by milepost where the AIM Project pipeline segments would be collocated with existing rights-of-way.

The Haverstraw to Stony Point Take-up and Relay segment would be entirely collocated with existing corridors, including Algonquin's existing 30-inch-diameter loop pipeline and an Orange and Rockland Utilities, Inc. transmission line corridor.

About 10.4 miles (85 percent) of the 12.3-mile-long Stony Point to Yorktown Take-up and Relay segment would also be collocated with existing utility corridors, including Algonquin's 30-inch-diameter loop pipeline; an Orange and Rockland Utilities, Inc. transmission line corridor; and a Consolidated Edison, Inc. transmission line corridor. The only exception to this would be a portion of the new permanent right-of-way proposed along the section of the 42-inch-diameter pipeline to be installed in the Town of Stony Point and the Town of Cortlandt. About 1.8 miles (62 percent) of this 2.9-mile new pipeline segment would not be adjacent to existing corridors.

The Southeast to MLV 19 Take-up and Relay, Line-36A Loop Extension, and E-1 System Lateral Loop Extension segments would be entirely collocated with Algonquin's existing pipeline easements.

The E-1 System Lateral Take-up and Relay would be collocated with Algonquin's existing 10-inch-diameter E-1 Pipeline, as well as a Connecticut Light & Power transmission line.

About 4.5 miles (88 percent) of the 5.1-mile-long West Roxbury Lateral would be collocated within or adjacent to existing roadways. Primary roads utilized for routing include Providence Highway, Washington Street, Grove Street, and Centre Street. The pipeline would also cross Interstate 95/State Route 128.

TABLE 2.2.1-1			
Summary of Existing Rights-of-Way Adjacent to Pipeline Facilities for the AIM Project			
Facility	County, State/Municipality	MP Range	Length Adjacent to or Within Existing Right-of-Way (miles)
Replacement			
Haverstraw to Stony Point Take-up and Relay	Rockland, NY/Haverstraw	0.0 to 1.2	1.2
	Rockland, NY/Stony Point	1.2 to 3.3	2.1
Stony Point to Yorktown Take-up and Relay	Rockland, NY/Stony Point	0.0 to 2.6	2.6
		2.7 to 2.8	0.1
		3.0 to 3.1	0.1
	Westchester, NY/Cortlandt	4.2 to 4.6	0.4
		5.0 to 5.4	0.4
		5.5 to 11.0	5.5
	Westchester, NY/Yorktown	11.0 to 12.3	1.3
Southeast to MLV 19 Take-up and Relay	Putnam, NY/Southeast	0.0 to 0.1	0.1
	Fairfield, CT/Danbury	0.1 to 4.5	4.4
E-1 System Lateral Take-up and Relay	New London, CT/Lebanon	0.0 to 3.9	3.9
	New London, CT/Franklin	3.9 to 8.4	4.5
	New London, CT/Norwich	8.4 to 9.1	0.7
Loop Extension			
Line-36A Loop Extension	Middlesex, CT/Cromwell	0.0 to 1.8	1.8
	Hartford, CT/Rocky Hill	1.8 to 2.0	0.2
E-1 System Lateral Loop Extension	New London, CT/Montville	0.0 to 1.3	1.3
New Pipeline			
West Roxbury Lateral	Norfolk, MA/Westwood	0.4 to 0.5	0.1
	Norfolk, MA/Dedham	0.6 to 2.4	1.8
		2.5 to 3.4	0.9
	Suffolk, MA/West Roxbury	3.4 to 5.1	1.7

2.2.1.5 Additional Temporary Workspace

In addition to the construction right-of-way configurations described above, Algonquin identified a wider construction workspace in several locations 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 associated disposal of excess blast rock; and
- parking areas.

Table C-1 in appendix C identifies the areas where Algonquin would require additional temporary workspace (ATWS), their dimensions, the acreage of impact, the justification for their use, and whether or not they require a modification from the *Erosion and Sediment Control Plan* (E&SCP) (see section 2.3).

2.2.2 Aboveground Facilities

The AIM Project would use about 94.9 acres of temporary workspace for the construction activities associated with the aboveground facilities and about 6.6 acres of land would be permanently maintained for operations (see table 2.2-1). For the compressor stations, Algonquin would use about 79.5 acres of temporary workspace during construction within its existing properties; no new property would be required for the compressor station modifications. Temporary workspace areas 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 Chaplin, Burrillville, and Southeast Compressor Stations, these wooded temporary workspace areas would be cleared for use during construction and allowed to naturally revegetate following post-construction restoration. No additional area would be permanently maintained. However, at the Stony Point and Cromwell Compressor Stations, a portion of the wooded areas cleared within Algonquin's existing property lines during construction would be permanently maintained as part of the facility operations. The 1.6-acre permanent impact area at the Stony Point Compressor Station consists of a wooded portion of the site that would be occupied by a portion of the AIM Project compressor building, cooler units, and the suction and discharge pipelines. At the Cromwell Compressor Station, the 1.9-acre wooded area in the northeast corner of the station site would be maintained in a non-forested state following completion of construction associated with the AIM Project to facilitate station operations. Modification work at the existing Oxford Compressor Station would take place entirely within the existing compressor building and would not require any temporary workspace or new permanent impact.

Algonquin would use about 15.4 acres of temporary workspace during construction at the existing M&R stations (11.2 acres), new M&R stations (3.9 acres), and the removal of the Greenville M&R Station (0.3 acre) (see table 2.2-1). For the existing M&R stations, Algonquin would use the developed station yards and in some cases adjacent pipeline rights-of-way and open land for temporary workspace. About 3.1 acres of new land would be permanently affected as part of the operation of the three new M&R stations (2.6 acres) and the rebuild of the Willimantic M&R Station (0.5 acre) on a new property adjacent to the existing station site.

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.

2.2.3 Pipe and Contractor Ware Yards

To support construction activities, Algonquin plans to use four pipe yards in Connecticut and New York on a temporary basis. 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 2.2.3-1 presents the land requirements for currently identified pipe yards and contractor ware yards proposed for temporary use during construction of the AIM Project facilities. The locations of these pipe yard sites are shown on the maps provided in appendix B. Upon completion of construction, yards would be restored to the extent practicable and allowed to revert to previous land uses.

TABLE 2.2.3-1

Pipe and Contractor Ware Yards for the AIM Project

State/Yard Name	Location	Size (acres)	Existing Land Use
Dansville-NY Yard	9431 Foster Wheeler Road, Dansville, NY	20.0	Industrial storage yard.
Yorktown – NY Yard	Stoney Street, Yorktown, NY	15.0 [a]	Town of Yorktown open space, undeveloped land with trails.
Danbury – CT Yard	93 Mill Plain Road, Danbury, CT	3.0	Construction equipment storage yard.
Franklin – CT Yard	32 New Park Road Franklin, CT	5.6	Box trailer truck parking lot used previously for an Algonquin project.
Project Total		**43.6**	

[a] This parcel is approximately 73 acres and Algonquin would use only 15 acres.

2.2.4 Access Roads

To the extent feasible, Algonquin would use existing public and private road crossings along the proposed Project routes as the primary means of accessing pipeline rights-of-way and aboveground facilities. In addition to the existing access available by the use of public roads, Algonquin has identified a total of 35 access roads for use on the AIM Project, including 27 temporary access roads (TAR) and 8 permanent access roads (PAR). With one exception, the existing roads are comprised of gravel roads, unimproved dirt roads, paved and gravel driveways, private industrial and commercial roads, paved parking lots, and golf course roads. The exception is a new PAR to be constructed for the new Assonet M&R Station.

Although Algonquin would be using existing roads for temporary and permanent access, seven of these existing roads would require minor upgrades and/or widening (by about 10 feet) to accommodate use during pipeline construction. These upgrades would result in about 1.9 acres of new land disturbance. Algonquin would also need to construct one new PAR from the existing North Fall River M&R Station site to the new Assonet M&R Station. This new PAR would permanently disturb less than 0.1 acre (0.03 acre) of land.

At the new Oakland Heights M&R Station, Algonquin would utilize Oakland Drive, an existing 25-foot-wide private paved road off of Hunters Road in the City of Norwich, to access the new M&R site for operation. No road upgrades are required for this new PAR. Table 2.2.4-1 identifies the locations of new and existing access roads associated with the AIM Project.

TABLE 2.2.4-1

Proposed Temporary and Permanent [a] Access Roads for the AIM Project

Access Road I.D.	Municipality, State	Approx. MP	Use (Permanent or Temporary)	Existing Road Description	Approx. Road Length (feet)	Acreage of Disturbance for Upgraded Road (acres)
PIPELINE FACILITIES						
Replacement Pipeline						
Haverstraw to Stony Point Take-up and Relay						
PAR-0.0	Haverstraw, NY	0.0	Permanent	Existing gravel road	304	NA
TAR-1.2	Stony Point, NY	1.2	Temporary	Existing paved road	493	NA
TAR-1.6 [b]	Stony Point, NY	1.6	Temporary	Unimproved Extension from Conklin Drive	192	0.1
TAR-2.5	Stony Point, NY	2.5	Temporary	Paved Private road	600	NA
Stony Point to Yorktown Take-up and Relay						
TAR-1.1 [b]	Stony Point, NY	1.1	Temporary	Paved and gravel Existing access from Franck Road	1,481	0.3
PAR-2.7	Stony Point, NY	2.7	Permanent	Dirt Existing dirt road off Mott Farm Road	233	NA
TAR-3.2	Stony Point, NY	3.2	Temporary	Gravel Existing gravel road off Elm Street	1,534	NA
TAR-4.4 [b]	Cortlandt, NY	4.4	Temporary	Dirt/Gravel Existing road off 11th Street	1,575	0.4
TAR-4.5	Cortlandt, NY	4.5	Temporary	Paved LaFarge Entrance Road	746	NA
TAR-5.7	Cortlandt, NY	5.7	Temporary	Paved Existing driveway off Rte. 9A	115	NA
TAR-6.3	Cortlandt, NY	6.3	Temporary	Paved Pine Lane	244	NA
TAR-6.4	Cortlandt, NY	6.4	Temporary	Paved Boulder Drive	194	NA
TAR-7.6 [c]	Cortlandt, NY	7.6	Temporary	Gravel, unimproved Existing station road in Blue Mountain Reservation	9,856	NA
TAR-8.3	Cortlandt, NY	8.3	Temporary	Paved Existing Montrose Station Road in Blue Mountain Reservation	255	NA
TAR-10.6 [c]	Cortlandt, NY	10.6	Temporary	Gravel Driveway off of Crompond Road	229	NA

TABLE 2.2.4-1 (cont'd)

Proposed Temporary and Permanent [a] Access Roads for the AIM Project

Access Road I.D.	Municipality, State	Approx. MP	Use (Permanent or Temporary)	Existing Road Description	Approx. Road Length (feet)	Acreage of Disturbance for Upgraded Road (acres)
Southeast to MLV 19 Take-up and Relay						
PAR-1.1	Danbury, CT	1.1	Permanent	Paved Existing West Danbury M&R Station road	652	NA
TAR-1.7	Danbury, CT	1.7	Temporary	Paved Private drive	1,015	NA
TAR-1.9	Danbury, CT	1.9	Temporary	Paved Parking lot	605	NA
TAR-2.0	Danbury, CT	2.0	Temporary	Paved Parking lot	318	NA
E-1 System Lateral Take-up and Relay						
TAR-2.5 [c]	Lebanon, CT	2.5	Temporary	Gravel Farm road	3,804	NA
TAR-3.2	Lebanon, CT	3.2	Temporary	Gravel Farm road	3,466	NA
TAR-4.5 [c]	Franklin, CT	4.5	Temporary	Gravel Farm road	3,778	NA
TAR-5.8 [b]	Franklin, CT	5.8	Temporary	Gravel Existing gravel road	1,498	0.3
TAR-6.7 [b]	Franklin, CT	6.7	Temporary	Unimproved Wood Road off of Lathrop Lane	2,700	0.6
PAR-7.4	Franklin, CT	7.4	Permanent	Paved Existing access to Franklin Meter Station	214	NA
TAR-7.7	Franklin, CT	7.7	Temporary	Unimproved Farm road	2,908	NA
PAR-9.1 [b]	Norwich, CT	9.1	Permanent	730 feet paved, 420 feet unimproved Existing access to valve site	1,150	0.1
Loop Extension						
Line-36A Loop Extension						
TAR-0.5	Cromwell, CT	0.5	Temporary	Unimproved Existing farm road	2,584	NA
PAR-1.7	Cromwell, CT	1.7	Permanent	Paved Golf Course Road	2,900	NA
TAR-1.8	Cromwell, CT	1.8	Temporary	Gravel Existing gravel drive off PAR-1.7	3,870	NA
E-1 System Lateral Loop Extension						
NA	NA	NA	NA	NA	NA	NA
TAR-0.3	Westwood, MA	0.3	Temporary	Paved Meditech Circle	273	NA

TABLE 2.2.4-1 (cont'd)

Proposed Temporary and Permanent [a] Access Roads for the AIM Project

Access Road I.D.	Municipality, State	Approx. MP	Use (Permanent or Temporary)	Existing Road Description	Approx. Road Length (feet)	Acreage of Disturbance for Upgraded Road (acres)
TAR-0.4	Westwood, MA	0.4	Temporary	Unimproved Access off Elm Street	244	0.1
PAR	Norwich, CT (Oakland Heights M&R Station)	NA	Permanent	Paved (25 feet wide) Oakland Drive (private), access off Hunters Road	3,270	NA
TAR	Freetown, MA (Assonet M&R) Station)	NA	Temporary	Paved Road to be used as temporary construction access for Assonet M&R Station construction	805	NA
PAR [b, d]	Freetown, MA (Assonet M&R) Station)	NA	Permanent	New Paved access to M&R station off existing access road	120	<0.1
						Total: 1.9

a Existing PARs currently used by Algonquin's Pipeline Operations Department at existing M&R station and compressor station facilities are not shown on this table or included as part of the Project.
b These roads would need to be upgraded for use by the project. The roads would be upgraded to a width of 20 feet.
c These roads would be graded and graveled as required for use by the project.
d This new permanent access road would be 12 feet wide.
NA = Not Applicable

2.3 CONSTRUCTION PROCEDURES

The AIM Project would be designed, constructed, operated, and maintained to conform to, or exceed, the minimum federal safety standard requirements of PHMSA in 49 CFR 192,[4] and other applicable federal and state regulations, including U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) requirements. 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.

To reduce construction impacts, Algonquin would implement the AIM Project-specific E&SCP.[5] The E&SCP is based on the mitigation measures contained in the FERC's *Upland Erosion Control,*

4 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.

5 Algonquin's E&SCP was included as appendix 1B to Resource Report 1 in its February 28, 2014 application (Accession No. 20140228-5269). 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 20140228-5269 in the "Numbers: Accession Number" field.

Revegetation, and Maintenance Plan (Plan) and *FERC's Wetland and Waterbody Construction and Mitigation Procedures* (Procedures),[6] as well as guidelines from the USACE and the FWS. We reviewed the E&SCP, found it to be acceptable, and have determined that Algonquin's adherence to the requirements in the E&SCP would reduce the impacts of the Project. As indicated in table C-1 in appendix C, the use of several ATWS would require alternative measures from the FERC's Plan and Procedures. These are discussed in more detail in sections 4.3.2.4 and 4.4.4. The E&SCP is further discussed in sections 4.2.2 and 4.4.3.

To avoid or minimize the potential for harmful spills and leaks during construction, Algonquin developed an acceptable *Spill Prevention, Control and Countermeasure Plan/Preparedness, Prevention, and Contingency Plan for the Algonquin Incremental Market Project* (SPCC Plan).[7] The SPCC Plan describes spill and leak preparedness and prevention practices, procedures for emergency preparedness and incident response, and training requirements. Additional discussion of the SPCC Plan is presented in sections 4.2.2.6, 4.3.1.7, and 4.3.2.6.

Other resource-specific plans that have been developed for the proposed Project are discussed in more detail in section 4.0.

2.3.1 Pipeline Facilities

The AIM Project pipeline facilities would be located in a wide variety of land use settings. For example, the mainline replacement segments in New York and Connecticut include areas of undeveloped woodlands, steep rocky slopes, suburban residential neighborhoods, and moderately populated urban areas. In contrast, the E-1 System Lateral Take-up and Relay and E-1 System Lateral Loop Extension segments would be located in rural areas with low-density residential population and abundant agricultural land. The proposed West Roxbury Lateral would be located in a densely developed urban area. Given the wide mix in land use types in the Project construction areas, several construction techniques would be utilized for the Project as described in the following sections.

Table 2.3.1-1 provides a summary of Algonquin's proposed construction methods for the Project. The construction methods are further described in sections 2.3.1.1 and 2.3.1.2. Table D-1 in appendix D provides a comprehensive listing of proposed construction techniques by milepost.

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6 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.

7 Algonquin's SPCC Plan was provided as part of its responses to the April 10, 2014 FERC Environmental Data Request filed on April 30, 2014 (Accession No. 20140430-5528). 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 20140430-5528 in the "Numbers: Accession Number" field.

TABLE 2.3.1-1 **Approximate Mileage by Construction Method for the AIM Project**	
Construction Method	Length (miles)
Standard	21.5
Drag-section	10.2
In-street [a]	4.2
Bore	0.3
HDD	1.4
Total	**37.6**

[a] In-street construction may involve a variety of construction methods including stove-pipe, drag-section, or open cut.

2.3.1.1 General Pipeline Construction Procedures

Standard pipeline construction consists of specific activities that make up a linear construction sequence (see figure 2.3.1-1). The required construction activities include the following:

- surveying and staking
- clearing operations, where required;
- right-of-way and temporary construction workspace grading;
- trench excavation;
- blasting, where required;
- pipe stringing, bending, and welding;
- lowering-in, tie-ins, and backfilling;
- cleaning and hydrostatic testing; and
- cleanup and restoration.

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 at 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

Clearing would be minimized for construction of the Project because existing pipeline rights-of-way, roadways, utility rights-of-way, and other industrial and commercial sites would be used for a significant portion of the construction right-of-way. The primary clearing work for the Project would occur in the temporary construction workspace beyond Algonquin’s existing maintained right-of-way. Initial clearing operations would include the removal of vegetation within the pipeline right-of-way and the temporary construction workspace either by mechanical or hand cutting methods. The limits of clearing would be identified and flagged in the field before beginning any clearing operations. 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 off at ground level, leaving existing root systems intact, and the aboveground vegetation 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. Stumps would be removed from the right-of-way to approved disposal locations. Brush and tree limbs would be chipped and removed from the right-of-way for approved disposal.

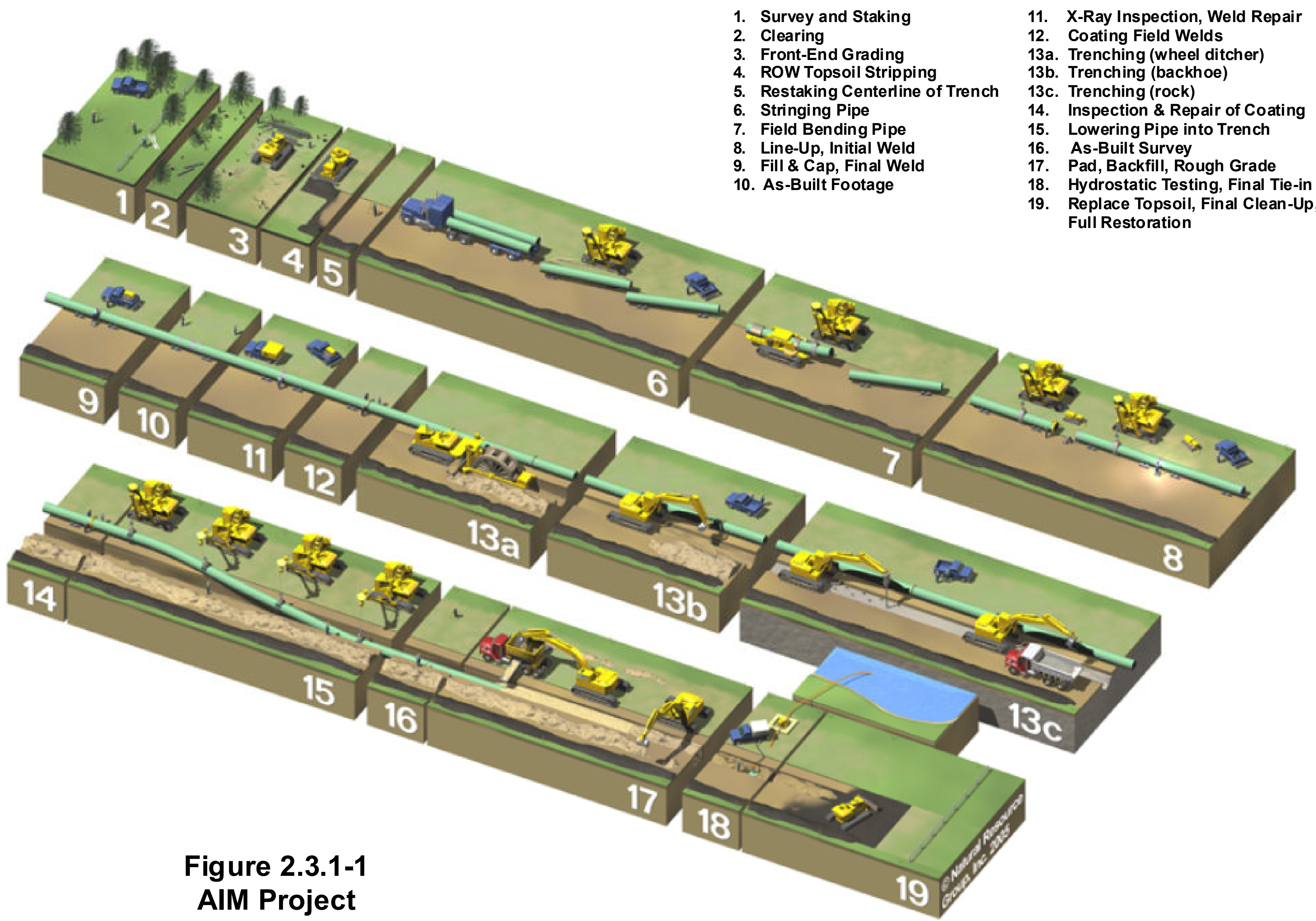

Figure 2.3.1-1
AIM Project
Typical Pipeline Construction Sequence

The cleared width within the right-of-way and temporary construction workspace would be kept to the minimum that would allow for spoil storage, staging, assembly of materials and all other activities required to safely construct the pipeline. Following clearing and before grading activities, erosion controls would be installed at the required locations as outlined in Algonquin's E&SCP, and maintained throughout the construction process.

Right-of-Way and Temporary Construction Workspace Grading

The entire width of the construction right-of-way, including the temporary construction workspace, would be rough graded as necessary to allow for safe passage of equipment and to prepare a work surface for pipeline installation activities. Typically, the grading of the right-of-way would be completed with bulldozers. Backhoes would be used in conjunction with bulldozers in areas where boulders and tree stumps require removal. A travel lane or traffic control would be maintained to allow for the passage of daily traffic.

The mainline replacement pipeline facilities cross numerous residential properties. At these locations, topsoil would be stripped and stockpiled 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 offsite. Topsoil would be replaced with appropriate imported material as required. The mixing of topsoil with subsoil would be minimized by using topsoil segregation construction methods in active agricultural lands and wetlands (except when standing water or saturated soils are present).

Trench Excavation

A trench would be excavated by a backhoe to the proper depth to allow for the burial of the pipe. The trench would be deep enough (about 7 feet deep for the 42-inch-diameter mainline pipeline and 36-inch-diameter loop extension pipeline and 6 feet deep for the 24-, 16-, and 12-inch-diameter loops and laterals) to provide for a minimum of 3 feet of cover over the pipe after backfilling; however, the smaller diameter pipelines could be installed with less than 3 feet of cover in areas of shallow bedrock. Deeper burial may be required in specific areas. The excavated material would be placed next to the trench or in approved ATWS or trucked offsite so as 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 a heavy rain. All trench water would be discharged into well-vegetated upland areas or properly constructed dewatering structures to allow the water to infiltrate back into the ground. If trench dewatering is necessary in or near a waterbody, the removed trench water would be discharged into an energy dissipation/sediment filtration device, such as a geotextile filter bag or straw bale structure located away from the water's edge to prevent heavily silt-laden water from flowing into nearby waterbodies in accordance with the AIM Project's E&SCP and all applicable permits.

A discussion on contaminated groundwater or soil that could be encountered during construction of the AIM Project is provided in sections 4.2.1.5 and 4.3.1.6.

Rock Removal and Blasting

Given the presence of surface rock in large portions of the Project area, blasting for rock removal would be required during construction of the AIM Project. Rock encountered during trenching would be removed using one of the techniques listed below. The technique selected is dependent 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 options may include:

- blasting followed by backhoe excavation; or
- blasting surface rock prior to excavation.

If blasting is required for the Project, it would be conducted in accordance with Algonquin's Rock Removal Plan (see appendix E) as well as applicable state blasting codes and any local blasting requirements. All blasting activity would be performed by state-licensed professionals according to strict guidelines designed to control energy release. Proper safeguards would be taken to protect personnel and property in the area. This includes conducting preconstruction surveys of homes and businesses, as approved by the landowner. Blasting mats or soil cover would be used as necessary to prevent the scattering of loose rock. Blasting would be conducted during daylight hours and would not begin until occupants of nearby buildings, stores, residences, and places of business have been notified. Algonquin would comply with applicable regulations that apply to blasting and blast vibration limits with regard to structures and underground utilities. Rock removal and blasting are further discussed in section 4.1.6 and in Algonquin's Rock Removal Plan (see appendix E). We have reviewed the Rock Removal Plan and find it to be acceptable.

Pipe Stringing, Bending, and Welding

Once the trench is excavated, the next process in standard pipeline construction is stringing the pipe along the trench. Stringing involves initially hauling the pipe by tractor-trailer, generally in 40-foot lengths from the pipe storage yard, onto the right-of-way. The pipe would be off-loaded from trucks and placed next to the trench using a side-boom tractor. The pipe joints would be lined up end-to-end to allow for welding into continuous lengths known as strings. For pipe construction in urban areas, Algonquin would likely utilize mini-crews where the pipe would be hauled to the work site daily. Some pipe may be stockpiled on the right-of-way and would be fenced and stabilized if left over night.

Once the sections of pipe have been placed on the right-of-way, the pipe is bent as necessary so the pipe fits the horizontal and vertical contours of the excavated trench. Pipe is usually bent with a hydraulic pipe-bending machine.

Professional welders qualified according to applicable industry standards and Algonquin's requirements would weld the joints of pipe together in two steps. The front-end welding crew would clean and align the pipe bevels in preparation for welding and place at least the first two passes in the welding process. The back-end welders would complete the welds started by the front-end welders. The pipe is welded into long strings to minimize the number of welds that have to be made in the trench (tie-in welds).

Each weld is inspected by an independent certified Non Destruction Test technician to ensure its structural integrity is consistent with 49 CFR 192 of PHMSA's regulations. X-ray or ultrasonic images are taken and processed on site for virtually instantaneous results. Those welds that do not meet the Algonquin's specifications would be repaired or replaced and re-inspected.

The pipeline is coated to prevent corrosion. The pipe lengths would be coated (usually with a heat-applied epoxy) at a coating mill prior to being delivered to the Project. The ends of each piece are left bare to allow for welding. After welding, the weld area is field coated by the coating crew. Because pipeline coatings are electrically insulating, the coating is inspected using equipment that emits an electric charge 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 has been coated and inspected, the trench is prepared for the installation of the pipeline. The trench is cleared of loose rock and debris. If water exists in the trench, the water is pumped out into a well-vegetated upland area and/or into an approved filter with the exception of wetland areas where the "push pull" installation may be required. In sandy soils, the trench is shaped to support the pipe. In areas where the trench contains bedrock, a sand bedding is placed on the bottom of the trench, and/or pads made of sandbags and/or clay are placed at regular intervals along the trench bottom to support the pipe. The lowering-in crew places the pipeline in the trench, usually with side-boom tractors.

Once the sections of pipe are lowered-in, the tie-in crew makes any final welds in the trench. Additional excavations as needed, lowering-in, lining up, welding, weld nondestructive inspection, and coating the final welds are accomplished by this crew.

All suitable material excavated during trenching would be redeposited into the trench. Where excavated material is unsuitable for backfilling, then additional select fill may be required. If the soil is rocky, the pipe would be padded with relatively rock-free material placed immediately around the pipe. This material may be obtained from commercial areas in the region. Where suitable, the subsoil may be mechanically screened to produce suitable padding material. Padding of the pipe is usually performed with backhoes. If padding is obtained from an offsite source, it is normally placed in the trench by front-end loaders. Topsoil would not be used as padding material. Once the pipe is padded, the trench is then backfilled with suitable excavated subsoil material. Before the completion of backfilling 12-inches below natural grade, 24-inch-wide bright yellow warning tape would be installed designating the location of the pipeline below. The yellow tape would have a warning notice indicating the presence of a high-pressure natural gas pipeline and provide Algonquin's toll free number for contact. The top of the trench may be slightly crowned to compensate for settling except for paved areas, where standard compaction methods would be employed. The topsoil is then spread across the graded construction right-of-way when applicable. The soil would be inspected for compaction, and scarified as necessary.

Cleaning and Hydrostatic Testing

Once the pipeline tie-ins are completed, it is internally cleaned with pipeline "pigs." A manifold is installed on one end of the long pipeline section and a pig is propelled by compressed air through the pipeline into an open pig catcher to remove any dirt, water, or debris that was inadvertently collected within the pipeline during installation.

After cleaning, the pipeline segments would be pressure tested in accordance with Algonquin's requirements to ensure that they are capable of operating safely at the intended design pressure. Hydrostatic testing would be conducted in accordance with applicable permits, and no chemicals would be added to the test water. The pipeline is hydrostatically tested with water that is normally obtained from water sources crossed by the pipeline, including available municipal supply lines. See section 4.3.2.5 for a discussion on water source(s) and quantities that would be required to hydrostatically test each of the AIM Project facilities. The water propels a pig through the pipeline in a manner that fills the pipeline with water. Test pressure is obtained by adding water to the test section of the pipeline with a high-pressure pump. At the completion of the hydrostatic test, the pressure is removed from the section and the water is released from the test section by propelling the pig with air, which forces the water from the pipeline. Additional “drying” pig runs are made, if necessary, to remove any residual water from the pipeline. All hydrostatic test water would be discharged within suitable vegetated upland areas in accordance with Algonquin’s E&SCP.

Cleanup and Restoration

Final cleanup (including final grading) and installation of permanent erosion control measures would be completed within 20 days after the trench is backfilled, weather and soil conditions permitting. In conjunction with backfilling operations, any woody material and construction debris would be removed from the right-of-way. The right-of-way would be fine-graded to prepare for restoration. Permanent slope breakers or diversion berms would be constructed and maintained in accordance with Algonquin’s E&SCP. Fences, sidewalks, driveways, stone walls, and other structures would be restored or repaired as necessary.

Revegetation would be completed 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 Algonquin’s E&SCP. The right-of-way would be seeded 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 left unstabilized by vegetation would be mulched in accordance with Algonquin’s E&SCP.

2.3.1.2 Special Construction Procedures

In addition to the standard pipeline construction methods described above, Algonquin would implement special construction procedures due to site-specific conditions and to reducer overall Project impacts.

Same Ditch Replacement Construction Method

About 26.3 miles of the Project would involve replacing existing pipeline with a larger diameter pipeline within the same ditch as the existing pipeline. This involves excavating a trench to remove the existing pipe; followed by the removal of the pipe. The removed pipe would then be transported away from the construction work area and properly disposed. Once the existing pipe is removed, the trench would be re-excavated wider and deeper (as appropriate) to accommodate the new, larger diameter pipeline, and the replacement pipe would be installed at approximately the same location as the existing pipe using standard construction methods (see section 2.3.1.1). Where the existing pipeline crosses major roadways and is cased, and the crossing method is bore or HDD, the carrier pipe would be removed and the casing pipe would be abandoned in place by capping and filling with appropriate material. Where casing pipe is not present, the carrier pipe would be abandoned in place. In these instances, the new pipeline would be installed with a 10-foot offset from the abandoned pipe or directly under the existing pipe, depending on the locations and depths of existing foreign utilities in the roadway. Where the pipeline to be removed or abandoned is in the proposed construction right-of-way for the new pipeline, the defined construction right-of-way would not be exceeded during removal.

Abandonment Construction Method

For the section of pipe that would be abandoned at the Interstate 84 crossing, the pipe would first be inspected for free flowing liquids and if present all free flowing liquids would be removed and disposed of in accordance with all federal and state requirements. Wipe samples would then be taken at each end of the 0.7-mile-long segment to check for residual polychlorinated biphenyls (PCBs) (see section 4.8.6.2). Each end would then be capped using a steel plate with a threaded fitting. The pipe would then be filled with cement grout and each end would be permanently closed using threaded plugs. Considering the 26-inch-diameter mainline would be in the same right-of-way as the existing 30-inch-diameter pipeline, Algonquin would continue to maintain the right-of-way.

Road and Railroad Crossing Construction Methods

The AIM Project would require 108 public road crossings and 5 railroad crossings. These roads and railroads are listed in table F-1 in appendix F. Constructing the AIM Project across public and private roadways and railroads, using either conventional open cut or road bore methods, would be based on site conditions and road opening permit requirements. Roadway opening permits would be obtained from applicable state and local agencies. Permit conditions would ultimately dictate the day-to-day construction activities at road crossings.

Construction would be scheduled for work within roadways and specific crossings so as to minimize impacts on commuter traffic. 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. Arrangements would be made with local officials to have traffic safety personnel or qualified and trained flaggers on hand during periods of construction. Provisions would be made for detours or otherwise to permit traffic flow if needed.

Crossings of private roadways would be coordinated with landowners to minimize access impacts. In those areas where the excavation of a longer length of trench would not pose a safety problem, the pipeline would be installed using the standard open trench method. Open trenches would either be backfilled or covered with steel plates during all non-working hours. Steel plates would be kept on site at each crossing so that a temporary crossing could be made across the trench as required (e.g., emergency vehicles).

Roadway crossing construction would occur using one of the methods described below.

Open-cut Crossing

This method is used on driveways, parking lots, and roads with low traffic densities where pipeline installation activities would not adversely impact the general public. The first step is to install the proper traffic control devices. Traffic would be detoured around the open trench during the installation process. The pipeline crossing would be installed one lane at a time. As the pipe is installed, successive lanes are alternately taken out of service for pipe installation until the crossing is completed.

Another option is to detour traffic around the work area through the use of adjacent roadways. If the roadway surface is paved, pavement over the proposed trench is cut, removed, and properly disposed. The trench would be excavated using a combination of a backhoe and hand shoveling around existing utilities once the ditch is completed and the pipe is installed (welded, inspected, and coated). All existing utilities exposed during excavation would be supported at their existing elevation to avoid damage. Support would be maintained until backfill of the pipeline ditch and the exposed utility are completed. The trench is then backfilled. A 15:1 sand to concrete mix called flowable fill, or Controlled Density Fill, may be used as backfill material to 1 foot over the pipeline. The additional backfill must be compacted to reduce stresses on the pipeline and to ensure the roadway supports the traffic load without settling. The existing trench subsoil may be used in the backfill if it can be compacted and is authorized by the permitting agency. In those cases where existing trench material is not used, backfill material would be obtained from an outside source and hauled in. The material used and methods of placement would comply with the requirements of the permitting agency.

Once the ditch line is backfilled, the contractor would install and maintain a temporary patch in the excavated areas. Final paving of existing roadways would be completed in accordance with applicable state and municipal requirements. With appropriate approvals, final paving may be accomplished the year following pipeline construction to allow for potential settlement of the ditch line in the road surface. Roadway markings and striping would be added as necessary. As required by PHMSA, pipeline markers would be placed adjacent to local roadways and decals would be placed on paved areas identifying the presence of a pipeline below the surface of the pavement.

Bore Crossing

On roads with higher traffic densities and for railroads where service must be maintained, the pipeline may be installed by boring a hole under the road or railway. The soil and/or rock are bored by a drill that contains a cutting head which cuts through the soil. Dummy casing, which is slightly larger in diameter than the pipeline, may be installed immediately behind the cutting head. An auger is placed inside the pipe to remove the cuttings. Once the bore is completed, the pipeline section is welded to the boring pipe and pulled into place as the boring pipe is removed. Any voids between the pipeline and the subsoil are filled with grout (a sand-cement mix) to prevent settlement of the roadway surface or railroad track. This method allows the road or railroad to remain in service while the installation process takes place and minimizes the potential for trench settlement.

Cased Crossing

The procedure for a cased crossing is similar to a bored crossing with one exception. A section of steel casing pipe, which is several inches in diameter greater than the pipeline, is bored into place. Casing sections are welded together to ensure the casing length is sufficient to cross the entire roadway. Once the casing pipe has been installed, the pipeline is pulled through the casing. To prevent potential corrosion of the pipeline due to contact between the pipeline and the casing, the pipeline is insulated from the casing pipe; usually the pipeline is coated with a layer of concrete. To prevent water from entering the casing, the ends of the casing are sealed with rubber or polyethylene seals. The space between the casing and the pipeline is vented to the atmosphere through the use of sections of small diameter pipe (vent pipe), which are welded to the casing ends and run from the casing to several feet above the surface of the ground. Casing pipe would be installed when required by permit or when there is a likelihood of encountering rock during the boring. Generally, crossings of major federal and state highways and certain railroads are installed using casings.

Hammer Technique

In addition to the boring techniques described above, one additional technique consists of driving casing pipe that is slightly larger in diameter than the proposed pipeline under the roadway with a horizontal air-operated reciprocating hammer. The casing pipe is placed against the end of the trench near the edge of the roadway and driven under the paved road. Once in place, the material inside the casing is augured out and the pipe is installed through the casing. The casing pipe is then removed while grout is placed around the pipeline.

In-street Construction Methods

In addition to road crossings, portions of the West Roxbury Lateral would be constructed within or along existing roadways. Algonquin would need to obtain road opening permits from the City of Boston and the Town of Dedham before conducting work in these roadways. For in-street construction, traffic control devices would first be installed. Traffic would be detoured around the construction area during the installation process. The working area along any street would be limited to areas designated in applicable road opening permits. All in-street construction activities would be limited to this section, and this work area would move along the street as construction advances. Pavement over the proposed trench is cut, removed, and properly disposed. The trench is excavated using a backhoe and the pipe is installed (welded, radiographed, and coated). Excavation of the trench would proceed ahead of pipe installation to provide the contractor information regarding the existing utilities that would have to be crossed and to make vertical or horizontal adjustments in the alignment of the pipeline. The trench is then backfilled.

No trench would be left unprotected overnight because the trench would be backfilled or plated to ensure public safety. A 15:1 sand to concrete mix called flowable fill, or Controlled Density Fill, may be used. The backfill must be compacted to reduce stresses on the pipeline and to ensure the roadway supports the traffic load without settling. The existing trench subsoil may be used in the backfill if it can be compacted and is authorized by the permitting agency. In most cases, backfill material would be obtained from an outside source and hauled in. The material used and methods of placement 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. Stockpiled soil would be sampled and evaluated to determine the proper receiving facility for the material. The material would be transported to the receiving facility with proper documentation in accordance with federal and state regulations.

As with road crossings, once the ditch line is backfilled, the contractor would install and maintain a temporary patch in the excavated areas. Final paving of existing roadways would be completed in accordance with applicable state and municipal requirements. With appropriate approvals, final paving may be accomplished the year following pipeline construction to allow for potential settlement of the ditch line in the road surface. Roadway markings and striping would be added as necessary. As required by PHMSA, pipeline markers would be placed adjacent to local roadways and decals would be placed on paved areas identifying the presence of a pipeline below the surface of the pavement.

Algonquin has developed acceptable traffic management plans for the New York and Massachusetts portions of the AIM Project. These plans are provided in appendix G and discussed in more detail in section 4.9.5.

Drag-Section and Stove-Pipe Specialized Construction Methods

Construction in commercial/industrial areas and high-density urban areas would be accomplished by conventional construction methods, or by implementing specialized construction methods such as the drag-section or stove-pipe methods. These specialized methods are used to reduce the amount of workspace and duration of construction activity in the immediate vicinity of commercial and other high-density urban areas. The pipeline trench would be excavated as the pipeline section is fabricated, inspected, and made ready for installation.

For the drag-section method, several sections of pipe are prefabricated, the trench is dug to accommodate only the distance that can be installed and backfilled, the prefabricated pipeline segments (or drag sections) are placed into the trench and backfilled. For the stove-pipe method, one short section of trench is dug, a section of pipe is laid in the trench and welded into place, and that section of the trench is backfilled. Both specialized construction methods minimize the amount of land required for construction and the time the trench is left open.

Residential Areas

Residential properties and other structures within 50 feet of construction work areas are identified in table H-1 in appendix H. Algonquin would undertake efforts in residential areas to minimize neighborhood and traffic disruption and to control noise and dust to the extent practicable.

The following measures would be taken on residential properties:

- notify local residents via U.S. mail 7 to 14 days in advance of construction activities;
- fence the boundary to the construction work area to ensure construction equipment, materials, and spoil remain in the construction right-of-way;
- preserve all mature trees and landscaping where practical;
- ensure piping is welded and installed as quickly as reasonably possible;
- backfill the trench as soon as the pipe is laid or temporarily steel plate the trench; and
- complete final cleanup (including final grading) and installation of permanent erosion control measures within 10 days after the trench is backfilled, weather conditions permitting.

For residences within 50 feet of the construction workspace, Algonquin has developed individual Residential Construction Plans noting special construction techniques and mitigation measures. These plans show the typical construction area to be disturbed and safety measures that would be implemented, such as construction fencing, access provisions, and use of steel plates. We reviewed the Residential Construction Plans, found them to be generally acceptable, and have determined that Algonquin's adherence to the requirements in the plans and our additional recommendations would reduce the potential impacts of construction on nearby residences. These plans are provided in appendix H. Additional analysis of the impacts on residential areas and residences is provided in section 4.8.3.

Rugged Topography

Both temporary and permanent erosion controls would be necessary to adequately minimize erosion and sedimentation during construction activities in steep and rugged terrain. Temporary slope breakers are intended to reduce the runoff velocity and divert water off of the right-of-way. Temporary trench breakers may be used in conjunction with the temporary slope breakers to adequately channel the surface flow off of the right-of-way. In terrain with slopes too steep to safely and adequately construct the temporary slope breakers and temporary trench plugs, they may be placed where practicable, at the discretion of the Environmental Inspector (EI). Section 2.5 further describes the role and responsibilities of the EI.

Permanent trench breakers consisting of sandbags, gravel, cement, or cement-filled sacks would be installed when the trench is backfilled in ditches over and around the pipe in areas of slope with erosion potential. Temporary trench plugs, usually composed of compacted earth or other suitable low-permeable material, would be used to isolate waterbodies and wet areas to minimize channeling of groundwater along the ditch line during construction.

The following special construction techniques would be used during construction along side slopes. During grading, the upslope side of the pipeline right-of-way would be cut. The material removed from the cut would be used to fill the downslope edge of the right-of-way in order to provide a safe and level surface from which to operate the heavy equipment. Side hills may require ATWS downslope in order to accommodate the fill material. During grade restoration, the spoil would be placed back in the cut and compacted. Any springs or seeps found in the cut would be carried downslope through polyvinyl chloride (PVC) pipe and/or gravel French drains installed as part of the cut restoration.

Permanent slope breakers would be constructed in coordination with the placement of the trench breakers in accordance with Algonquin's E&SCP. During restoration, seed would be applied at an increased application rate to increase the probability of establishment and rapid stabilization. In rugged terrain, additional types of temporary erosion controls such as super silt fence, erosion control matting, and hydro-mulching may be used during construction and restoration activities.

Active Agricultural Land

Topsoil would be segregated in agriculturally cultivated or rotated croplands, pastures, and hayfields. In these areas, topsoil would be stripped and placed separate from subsoil when excavating the trench. Excess rock would be removed from at least the top 12 inches of soil to the extent practical. The size, density, and distribution of rock left in construction work areas should be similar to adjacent areas not disturbed by construction, unless otherwise approved in writing by the landowner. ATWS may be required when topsoil segregation is required. After the pipe has been lowered into the ditch, subsoil is used for backfilling and topsoil is then spread across the graded right-of-way. Equipment traffic would be controlled within agricultural land to minimize rutting or compaction. Soil compaction would be treated, as necessary, in conjunction with the Algonquin's E&SCP. See section 4.8.1 for additional discussion on agricultural land.

Waterbody Construction Methods

Construction of the AIM Project would cross 39 waterbodies in New York, 67 in Connecticut, and 2 in Massachusetts (see table I-1 in appendix I). The waterbody crossings would be constructed in accordance with the methods and timing restrictions described in Algonquin's E&SCP and state and federal permit requirements. To minimize potential impacts, waterbodies, streams, and rivers would be crossed as quickly and as safely as possible. Adherence to the construction procedures would ensure stream flow would be maintained throughout construction. Flowing waterbodies would be crossed by the pipeline facilities using conventional backhoe type equipment and dry crossing techniques to isolate the work area.

Unless dry at the time of crossing, minor streams (those less than 10 feet wide) would be crossed using a dry crossing method. The dry crossing method would involve installation of a flume pipe(s) and/or dam and pump before trenching to divert the stream flow over the construction area and allow trenching of the stream crossing in drier conditions isolated from the stream flow (see figures 2.3.1-2 and 2.3.1-3). Spoil removed during the 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. Where these methods are employed, ATWS areas would be required for assembly of the pipe strings and spoil storage areas.

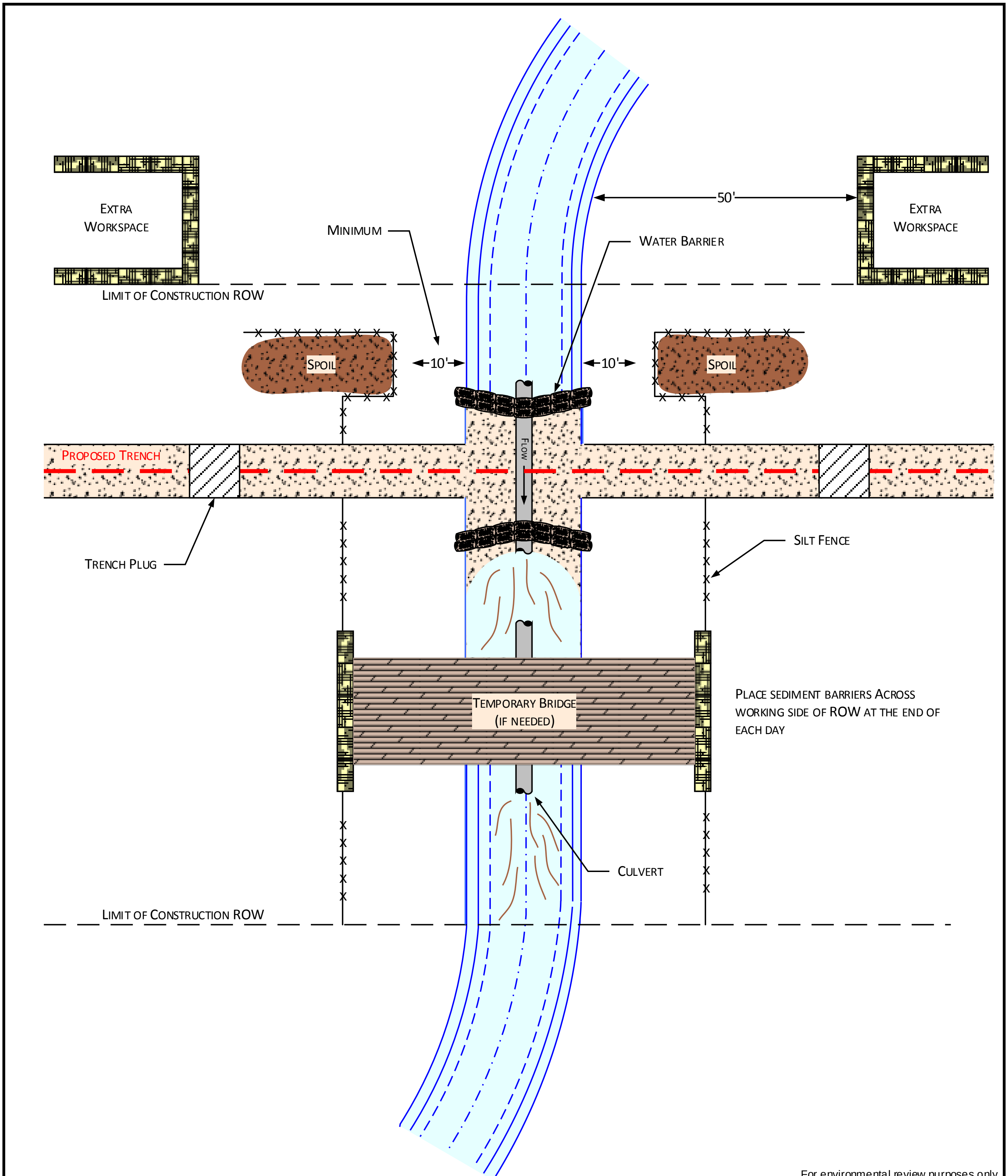

Figure 2.3.1-2
AIM Project
Typical Flume Method
Waterbody Crossing

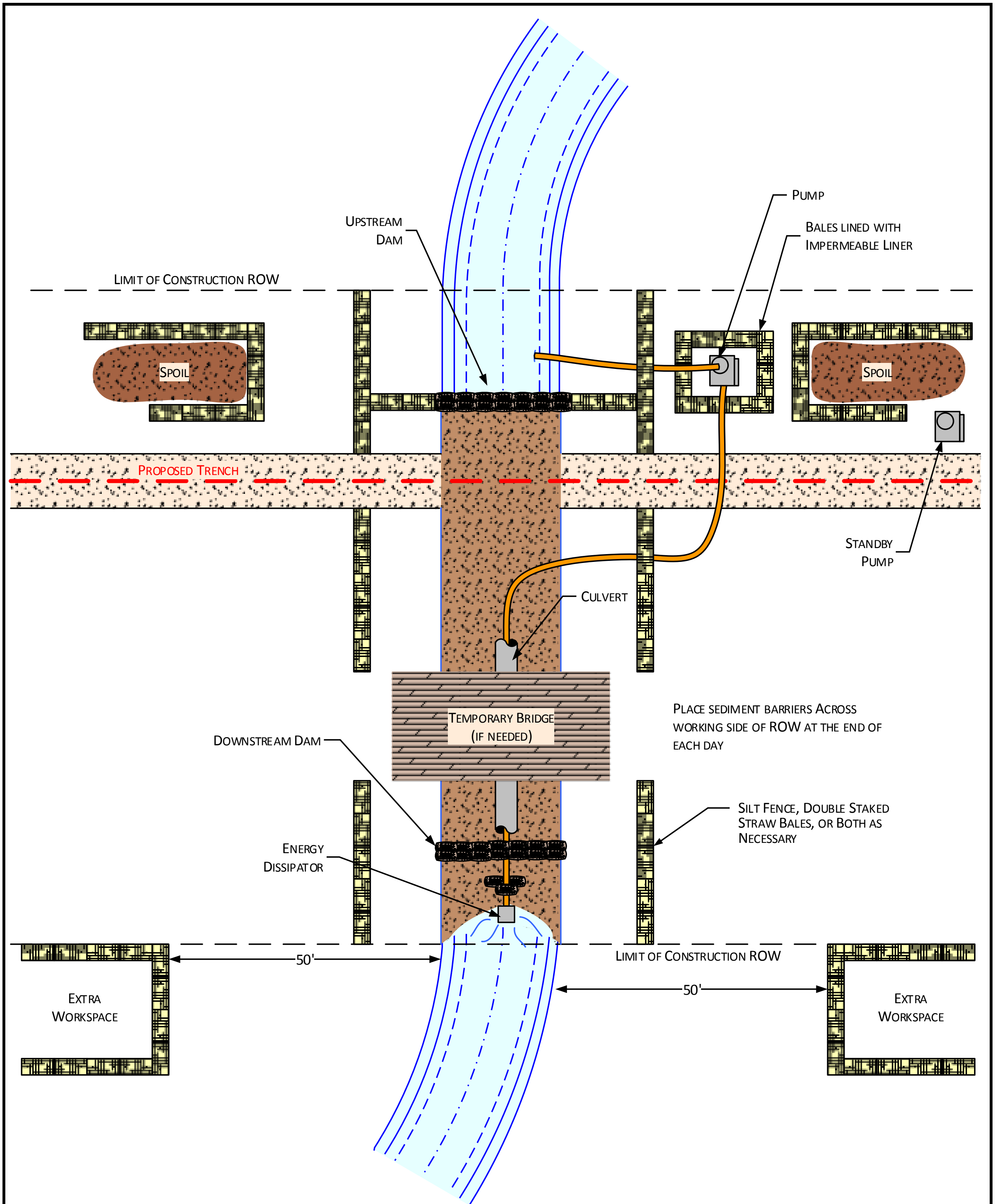

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Figure 2.3.1-3

AIM Project

Typical Dam and Pump Method
Waterbody Crossing

The open-cut crossing 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 flow from construction activities. This method would only be used at stream crossings where there is no perceptible water flow at the time of construction. Use of the open-cut crossing method on any waterbodies would be confirmed during the federal and state permitting processes. Excavation and backfilling of the trench would be accomplished 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, or carried into place and submerged into the trench. The trench would then be backfilled and the bottom of the watercourse and banks restored and stabilized. 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.

Except where reasonable alternative access is available, temporary construction equipment crossings would be installed across all waterbodies to gain access along the right-of-way for construction operations. 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, and the equipment crossings would be removed once access in the area is no longer needed. After clearing activities, construction equipment must cross waterbodies on bridges consisting of one of the following devices:

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

To facilitate pipeline construction across waterbodies, ATWS may be needed adjacent to the waterbody to assemble and fabricate the length of pipe necessary to complete the crossing. This work area is in addition to the standard construction right-of-way and would be located at least 50 feet away from the stream banks in cleared areas. If topographic conditions do not permit a 50-foot setback, then these areas would be located at least 10 feet away from the water's edge. If setbacks would not be able to be maintained due to construction limitations, such as slope and road crossing requirements, Algonquin would request modifications to the FERC Procedures (see section 4.3.2.4).

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.

Proposed waterbody crossing methods for each waterbody crossed by the proposed pipeline segments are provided in section 4.3.2.3 and are described in more detail in Algonquin's E&SCP.

Horizontal Directional Drill

Algonquin proposes to utilize the HDD method at two locations along the mainline replacement segments. The HDD method would be used to cross the Hudson River along the Stony Point to Yorktown Take-up and Relay segment in the Town of Stony Point and Town of Cortlandt, New York. The second HDD would be used to cross Interstate 84 and the Still River along the Southeast to MLV 19 Take-up and Relay segment in the City of Danbury, Connecticut.

The HDD method involves establishing land-based staging areas along both sides of the proposed crossing (see figure 2.3.1-4). The process commences with the boring of a pilot hole beneath the waterbody or road and then enlarging the hole with one or more passes of a reamer until the hole is the necessary diameter to facilitate the pull-back (installation) of the pipeline. Once the reaming passes are completed, a prefabricated pipe segment is then pulled through the hole to complete the crossing. As is discussed further in section 4.3.2.3, the Hudson River HDD would be completed in soft soils and the Interstate 84/Still River HDD would occur in rock. Algonquin anticipates utilizing the intersect method to compete the pilot hole for both HDDs. The intersect method involves drilling from both sides of the HDD and intersecting in the middle. This method is preferred as it is less time-consuming and the exact entry and exit locations can be predetermined by utilizing this method. This process also enables the drilling sequence to have an instant hydraulic connection once the intersect is complete providing for a cleaner pilot hole. Algonquin has prepared site-specific crossing plans for the Hudson River and Interstate 84/Still River HDD crossings. These plans are provided in appendix J and discussed in more detail in section 4.3.2.3.

While the HDD method is a proven technology, there are certain impacts that could occur as a result of the drilling such as the inadvertent release of drilling fluid, which is a non-hazardous fluid comprised primarily of water, inert solids, and bentonite, a naturally occurring clay mineral. Drilling fluids that are released typically contain a lower concentration of bentonite when they surface because the bentonite is filtered out as it passes through sandy soils.

Algonquin would implement preventive measures so that the HDDs are performed in a manner that prevents, to the extent reasonably practicable, an inadvertent release, such as monitoring the down-hole mud pressures and continually swabbing the hole to keep the annulus free of cuttings. Should an inadvertent release occur, Algonquin's contractor would stop the drilling process and secure the area with straw bales, silt fence, sand bags, or other means to stop the spread of the inadvertent release and secure a 50-foot perimeter. Typically, a pump is installed in the secured area and the bentonite/water mixture is pumped back to the mud rig. Algonquin would contain, control, and clean up any release of drilling fluid during the HDD operations. Should the release of drilling fluids occur in a waterbody, then Algonquin may utilize inert, non-toxic loss circulation materials such as mica, wood fibers, and other types of cellulous-like cotton dust to attempt to plug the fracture by pumping these products down hole through the drill string as part of the drilling fluid mixture. Impacts of a drilling mud release into a waterbody generally would be less than those associated with any drilling mud recovery operation and less than potential impacts associated with an open-cut crossing that would otherwise be required.

Should an inadvertent release occur, Algonquin would implement the following to minimize potential impacts:

- monitor mud pressures down-hole to ensure they do not get too high for the materials and depth of cover being penetrated;
- conduct frequent visual inspections of the drill path on the surface so that timely detection of a release can be achieved;
- stop the mud pumps once an inadvertent release has been detected so that the release does not spread and secure the perimeter with straw bales, silt fence, sand bags, or other means; and
- notify Algonquin's environmental monitors to ensure efforts are being undertaken to protect the waterbody and any associated wetlands.

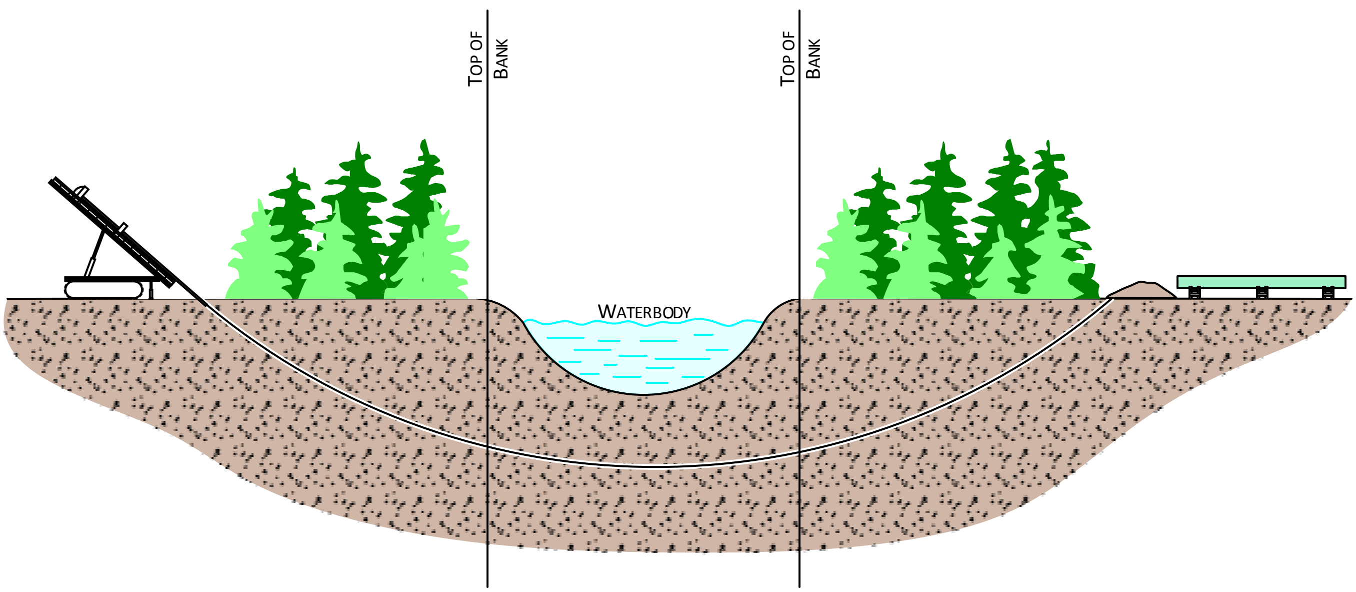

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Figure 2.3.1-4
AIM Project
Conceptual Horizontal Directional Drill
Waterbody Crossing

Algonquin has developed a *Best Drilling Practices, Monitoring, and Clean-up of Horizontal Directional Drilling Inadvertent Returns Plan* (BDP Plan) for monitoring the HDD program for the AIM Project (see appendix J). We reviewed the BDP Plan, found it to be acceptable, and have determined that Algonquin's adherence to the requirements in the BDP Plan would reduce the potential impacts of the HDDs, including an inadvertent release of drilling fluid.

To date, Algonquin has not provided a contingency plan that incorporates another location or another construction methodology for each HDD crossing. Therefore, if an 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.

Algonquin evaluated the feasibility of crossing other waterbodies using the HDD method in lieu of the conventional dry crossing methods described above. Factors in HDD design include the availability of a straight and relatively low relief laydown area for the pullback pipe section; the availability of large work areas at the HDD entry and exit points; surrounding terrain; land use; and operation concerns. In addition, for the larger diameter pipeline segments (i.e., 42- and 36-inch), the minimum drill length is quite long (around 2,000 feet or more). Some of the other major limiting factors in the more densely populated areas of the Project included new temporary impacts on nearby residences, direct impacts on residential homes, and the need to acquire new easement rights for the permanent right-of-way for operation and maintenance of the pipeline. Based on information from Algonquin, our review of Project mapping, and information we obtained during visits to the Project area, we conclude that the use of the HDD method at all waterbody crossings would be either technically infeasible, impractical, or would not result in a clear environmental advantage to the proposed dry crossing methods.

Wetland Construction Methods

Construction of the Project would result in 163 wetland crossings, including 77 in New York and 86 in Connecticut. In some cases the Project facilities would include multiple crossings of the same wetland. There would be no wetland impacts in Rhode Island or Massachusetts (see table K-1 in appendix K). Wetland crossings would be accomplished in accordance with Algonquin's E&SCP, which is consistent with the FERC Procedures, with one exception. In instances where wetlands are dry enough to support skids and pipe, Algonquin's E&SCP proposes to excavate the trench prior to the pipeline assembly. Otherwise, after the pipeline is assembled, equipment would not be able to access the area where trenching would occur nor would there be sufficient construction workspace to safely excavate the trench. See section 4.4.4 for additional discussion.

Construction methods would minimize the extent and time that construction equipment operates in wetland areas. When wetland soils are inundated or saturated to the surface, the pipeline trench would be excavated across the wetland by equipment supported on wooden swamp mats to minimize the disturbance to wetland soils. In wetlands that have firm substrates, and are unsaturated and not frozen, the top 12 inches of wetland soil over the trench line would be segregated. Trench spoil would be temporarily piled in a ridge along the pipeline trench. Gaps in the spoil pile would be left at appropriate intervals to provide for natural circulation or drainage of water. While the trench is excavated, where practicable, the pipeline would be assembled in a staging area located in an upland area. If dry conditions exist within the wetland, the pipe fabrication would occur in the wetland. For inundated or saturated wetland conditions, pipe strings would be fabricated on one bank and either pulled across the excavated trench in the wetland, floated across the wetland, or carried into place and submerged into the trench. After the pipeline is lowered into the trench, wide track bulldozers or backhoes supported on swamp mats would be used for backfill, grading, and final cleanup. This method would minimize the amount of equipment and travel in wetland areas. If conditions allow, such as low flow or unsaturated soils, normal cross-country construction practices would be used in wetlands. A complete description of construction methods can be found in Algonquin's E&SCP. The E&SCP also includes measures to mitigate unavoidable construction-related impacts on wetlands (e.g., cutting vegetation above ground level, returning wetland contours and drainage patterns to preconstruction configurations, installing sediment barriers immediately after initial ground disturbance, segregating topsoil from the trenchline, using low ground weight equipment or operating equipment on mats, etc.). These construction methods and mitigation measures are part of the proposed action and included in the environmental analysis in section 4.4.

ATWS may be needed adjacent to specific wetlands to facilitate the pipeline crossing. The staging areas are in addition to the typical construction right-of-way and may be used for the assembly and fabrication of the pipe section that would cross the wetland area. These work areas would be located at least 50 feet away from the wetland edge, topographic and other site-specific conditions permitting. If topographic conditions do not permit a 50-foot setback, these areas would be located at least 10 feet away from the wetland. In some instances, the setbacks would not be able to be maintained due to construction limitations, such as slope and road crossing requirements. In those cases, Algonquin has requested modifications to the FERC Procedures. A list of ATWS within 50 feet of a wetland and its purpose is provided in section 4.4.4.

2.3.2 Aboveground Facility Construction Procedures

The AIM 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 piping, metering facilities, and appurtenances. Initial work at the new M&R stations would focus on preparing the sites for equipment staging, fabrication, and construction. Following foundation work, station equipment and structures 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 Algonquin's E&SCP would be followed, as applicable, for the aboveground facilities as well.

2.4 CONSTRUCTION SCHEDULE AND WORK FORCE

Construction of the Project pipeline facilities, new M&R stations, and modifications to Algonquin's existing compressor stations and M&R stations would occur over a 1.5-year period to accommodate multiple work locations and the need for scheduled system outages for the numerous tie-ins along Algonquin's system. Construction would begin in the 1st Quarter of 2015 with a projected in-service date of November 2016. Table 2.4-1 provides a preliminary construction schedule by year and construction spread.

2.5 ENVIRONMENTAL TRAINING AND INSPECTION FOR CONSTRUCTION

In preparing construction drawings and specifications for the Project, Algonquin would incorporate all mitigation measures identified in its permit applications, as well as additional requirements of federal, state, and local agencies. Algonquin would provide the construction contractors with copies of applicable environmental permits as well as copies of "approved for construction" environmental construction alignment sheets and construction drawings and specifications.

Consistent with the FERC guidelines, Algonquin would conduct environmental training for its construction personnel, including EIs, 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 are expected to play an important role in maintaining strict compliance with all permit conditions to protect the environment during construction.

TABLE 2.4-1

Preliminary Construction Schedule for the AIM Project

AIM Project Facilities	Approximate MP Range	Start	Finish	Approximate Length (miles)	Estimated Number of Construction Personnel [a]	EI Responsibility [b]
PIPELINE CONSTRUCTION SPREADS						
2015 Pipeline Construction Spreads						
Construction Spread 1 – Hudson River HDD and mainline pipeline segments within new permanent easement in New York	2.6 to 5.5	March 2015	Oct. 2015	2.9	Mainline 180/ HDD 178	2015 EI A
Construction Spread 2 – I-84/Still River HDD	1.4 to 2.1	March 2015	Oct. 2015	0.7	86	2015 EI A
Construction Spread 3 – Cromwell Discharge (Line-36A Loop Extension)	0.0 to 2.0	April 2015	Oct. 2015	2.0	201	2015 EI B
Construction Spread 4 – E-1 System Take-up and Relay/ E-1 System Loop	0.0 to 9.1/ 0.0 to 1.3	April 2015	Oct. 2015	9.1/1.3	Take-up and Relay 158/ Loop 133	2015 EI C/ EI D
2016 Pipeline Construction Spreads						
Construction Spread 1 [c] – Haverstraw to Stony Point/Stony Point to the Tomkins Cove	0.0 to 3.3/ 0.0 to 2.6	March 2016	Oct. 2016	5.9	257	2016 EI A
Construction Spread 2 [c] – Mainline Take-up and Relay (East of the Hudson River to Yorktown)	5.5 to 12.3	March 2016	Oct. 2016	6.8	235	2016 EI B/ EI C
2015 Construction Spread 3 [c] – Southeast to MLV Take-up and Relay	0.0 to 4.4	March 2016	Oct. 2016	4.4	227	2016 EI D
2015 to 2016 Pipeline Construction Spread						
West Roxbury Lateral	0.0 to 5.1	May 2015	Oct 2016	5.1	162	2015 EI F/ 2016 EI G
				TOTAL	**1,817**	
ABOVEGROUND FACILITIES						
Existing Compressor Station Modifications	NA					
New York						
Stony Point Compressor Station [d]		March 2016	Oct. 2016	NA	76	2016 EI A
Southeast Compressor Station [d]		March 2016	Oct. 2016	NA	76	2016 EI D
Connecticut						
Oxford Compressor Station		May 2016	May 2016	NA	14	2016 EI E
Chaplin Compressor Station		March 2015	Oct. 2015	NA	38	2015 EI B
Cromwell Compressor Station		March 2015	Oct. 2015	NA	76	2015 EI B

TABLE 2.4-1 (cont'd)

Preliminary Construction Schedule for the AIM Project

AIM Project Facilities	Approximate MP Range	Start	Finish	Approximate Length (miles)	Estimated Number of Construction Personnel [a]	EI Responsibility [b]
Rhode Island						
Burrillville Compressor Station		March 2015	Oct. 2015	NA	76	2015 EI F
New M&R Stations	NA					
Connecticut						
Oakland Heights M&R Station		April 2016	Oct. 2016	NA	11	2016 EI E
Massachusetts						
Assonet M&R Station		April 2015	Oct. 2015	NA	11	2015 EI F
West Roxbury M&R Station		April 2016	Oct. 2016	NA	11	2016 EI G
Existing M&R Station Modifications	NA					
New York						
Stony Point M&R Station		April 2016	Oct. 2016	NA	0	2016 EI A
Peekskill M&R Station		April 2015	Oct. 2015	NA	13	2015 EI A
Cortlandt M&R Station		April 2016	Oct. 2016	NA	10	2016 EI A
Connecticut						
West Danbury M&R Station		April 2016	Oct. 2016	NA	11	2016 EI F
Southbury M&R Station		April 2015	Oct. 2015	NA	11	2015 EI B
Waterbury M&R Station		April 2016	Oct. 2016	NA	10	2016 EI F
North Haven M&R Station		April 2016	Oct. 2016	NA	10	2016 EI F
Guilford M&R Station		April 2015	Oct. 2015	NA	10	2015 EI B
Farmington M&R Station		April 2016	Oct. 2016	NA	11	2016 EI F
Glastonbury M&R Station		April 2015	Oct. 2015	NA	11	2015 EI B
Middletown M&R Station		April 2015	Oct. 2015	NA	10	2016 EI F
Montville M&R Station		April 2015	Oct. 2015	NA	10	2016 EI F
Salem Pike M&R Station		April 2015	Oct. 2015	NA	11	2016 EI F

TABLE 2.4-1 (cont'd)

Preliminary Construction Schedule for the AIM Project

AIM Project Facilities	Approximate MP Range	Start	Finish	Approximate Length (miles)	Estimated Number of Construction Personnel [a]	EI Responsibility [b]
Willimantic M&R Station		April 2015	Oct. 2015	NA	12	2016 EI F
Putnam M&R Station		April 2016	Oct. 2016	NA	11	2016 EI F
Pomfret M&R Station		April 2016	Oct. 2016	NA	11	2016 EI F
Massachusetts						
Mystic M&R Station		April 2015	Oct. 2015	NA	11	2015 EI F
Middleborough M&R Station		April 2015	Oct. 2015	NA	11	2015 EI F
North Fall River M&R Station		April 2016	Oct. 2016	NA	11	2016 EI F
New Bedford M&R Station		April 2016	Oct. 2016	NA	10	2016 EI F
Brockton M&R Station		April 2015	Oct. 2015	NA	13	2015 EI F
Norwood M&R Station		April 2015	Oct. 2015	NA	10	2015 EI F
Needham M&R Station		April 2016	Oct. 2016	NA	11	2016 EI F
Wellesley M&R Station		April 2015	Oct. 2015	NA	11	2015 EI F
M&R Station Removal	NA					
Connecticut:						
Greenville M&R Station		April 2016	Oct. 2016	NA	10	2016 EI F
				TOTAL	**649**	

[a] This number reflects the total anticipated peak construction workforce of craft workers. Algonquin will also add three full-time permanent operational workers, which are not shown in this table.

[b] At least seven EIs would be employed (A through G). Identifies the facilities under each of the EI's responsibility.

[c] Certain complex pipeline crossings (e.g., road, streams, railroads) may be constructed during the April to October 2015 construction season. Winter clearing in November 2015 to February 2016 may be necessary to address time of year restrictions.

[d] Civil site work at these two compressor stations will be completed in the April to October 2015 time frame.

NA = Not applicable

As outlined in Algonquin's E&SCP, full time EIs would be designated by Algonquin during active construction or restoration. Table 2.4-1 indicates the number of EIs proposed by year and construction spread as well as the facilities under each EIs responsibility. 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.

Although Algonquin has stated that sufficient qualified EIs would be available to implement their environmental inspection program, it has agreed to participate in a third-party Environmental Compliance Monitoring Program for sensitive environmental areas of the AIM Project. Under this program, Algonquin would fund a contractor, to be selected and managed by the FERC staff, to provide environmental compliance monitoring services. The FERC Third-party Compliance Monitor would provide daily reports to the FERC staff on compliance issues and make recommendations to the FERC Project Manager on how to deal with compliance issues and construction changes, should they arise. FERC staff would also conduct periodic inspections. As discussed in section 4.0, use of a third-party Environmental Compliance Monitoring Program would be particularly appropriate along the Haverstraw to Stony Point Take-up and Relay, Stony Point to Yorktown Take-up and Relay, Southeast to MLV 19 Take-up and Relay, and West Roxbury Lateral segments and related aboveground facilities due to concerns about construction in residential and commercial areas, the Hudson River crossing, and potential blasting. Development of the program would occur prior to construction.

After construction, Algonquin would conduct follow-up inspections of all disturbed upland areas after the first and second growing seasons to determine the success of restoration and would monitor the success of wetland revegetation annually for the first 3 years (or as required by permits) after construction, or longer, until wetland revegetation is successful. To ensure the restoration of all areas affected by the Project, we would continue to conduct oversight inspection and monitoring following construction. If it is determined that any of the proposed monitoring timeframes are not adequate to assess the success of restoration, Algonquin would be required to extend its post-construction monitoring programs.

Additionally, as discussed further in section 4.12.1, PHMSA is mandated to provide pipeline safety under 49 USC 601. PHMSA administers the national regulatory program to ensure the safe transportation of natural gas and other hazardous materials by pipeline. PHMSA 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 safety.

2.6 OPERATION, MAINTENANCE, AND SAFETY CONTROLS

Algonquin would operate and maintain the newly constructed pipeline facilities in the same manner as they currently operate and maintain their existing systems in compliance with PHMSA regulations provided in 49 CFR 192, the FERC guidance at 18 CFR 380.15, and the maintenance provisions in Algonquin’s E&SCP. Algonquin would add three full-time permanent workers for operation of the proposed and modified facilities.

2.6.1 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 proper and 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, railroads, and other key points. Markers would clearly 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 Algonquin has operational facilities.

2.6.2 Compressor Stations

Algonquin would continue to operate and maintain the modified compressor stations in accordance with PHMSA requirements and standard procedures designed to ensure the integrity and safe operation of the facilities and to maintain firm natural gas transportation service. 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 also include the periodic checking of safety and emergency equipment and cathodic protection systems.

2.6.3 M&R Station Sites and other Aboveground Facilities

Algonquin personnel would perform routine checks of the new and modified facilities, including 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.

3.0 ALTERNATIVES

As required by NEPA, FERC policy, and CWA 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, energy alternatives, 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, Algonquin's stated objectives for the Project are:

- provide an additional 342,000 Dth/d of additional natural gas supplies in southern New England and satisfy Algonquin's precedent agreements to deliver natural gas to the Project Shippers by November 2016;

- eliminate capacity constraints on existing pipeline systems in New York State and southern New England; and

- provide access to growing natural gas supply areas in the Northeast region to increase competition and reduce volatility in natural gas pricing in southern New England.

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 Algonquin and reviewed by FERC staff; our review of aerial photographs, U.S. Geological Survey (USGS) topographic maps, and other publicly available information; input from cooperating and other agencies; and our site visits, including a flyover 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 4.0, which is based on Project-specific data derived from field surveys and engineered drawings.

Algonquin participated in our pre-filing process during the preliminary design stage for the Project (see section 1.4). This process emphasized identification of potential stakeholder issues, as well as identification and evaluation of alternatives that could avoid or minimize impacts. During this process, Algonquin made several modifications to its proposed pipeline route to address stakeholder concerns. The majority of route changes were made to avoid conflicts with existing land uses or to increase the distance of the pipeline from residences and commercial business, recreation areas, or other infrastructure. These changes were subsequently made part of Algonquin's proposed route when it filed its FERC application, and are presented in this EIS. Route variations that were incorporated into the proposed route are identified in section 3.5.4.

Through the application of evaluation criteria and subsequent environmental comparisons, each alternative 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. Those alternatives that appeared to be viable with less than or similar levels of environmental impact are reviewed in the text below.

3.1 NO-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 EIS would not occur, but the objectives of the Project would not be met. The Project would create an additional 342,000 Dth/d of natural gas delivery from growing supply areas in the Northeast region to local distribution companies and municipal utilities (i.e., the Project Shippers) in southern New England. This would help meet existing and future demand for natural gas in the Project area, eliminate supply constraints on existing systems, and increase competition in regional energy markets. The Project additionally would provide new delivery points for local gas utilities in Connecticut and Massachusetts, which would provide natural gas in areas where it is needed and enhance the reliability of local distribution systems, particularly in Boston.

If Algonquin's proposed facilities are not constructed, the Project Shippers may need to obtain an equivalent supply of natural gas from new or existing pipeline systems. In response, Algonquin 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. Alternatively, customers of the Project Shippers could seek to use alternative fuel or renewable energy sources, which could require new facilities. In either case, construction of new pipelines or other energy infrastructure would result in environmental impacts that could be equal to or greater than those of the Project. For these reasons, the no-action alternative would not be preferable to or provide a significant environmental advantage over the Project.

3.2 ENERGY ALTERNATIVES

3.2.1 Energy Conservation

Energy conservation measures, as encouraged or required by federal and state law, have and will likely continue to play an important role in reducing energy demand in the United States. At the federal level, for example, the Energy Policy Act of 2005 (EPAct) contained provisions for diversifying America's energy supply, reducing dependence on foreign sources of energy, increasing residential and business energy efficiency and conservation, improving vehicular energy efficiency, and modernizing domestic energy infrastructure. EPAct additionally directed the U.S. Secretary of Energy to conduct research and develop programs for energy efficient commercial applications (U.S. Congress, 2005).

Several laws enacted since EPAct have enhanced the federal role in energy conservation and efficiency. The U.S. Congress passed the Energy Independence and Security Act of 2007 (EISA), for example, to increase the efficiency of products, buildings, and vehicles; protect consumers; and improve federal energy performance by establishing new incentive programs and expanding certain programs created under EPAct (U.S. Congress, 2007). According to the U.S. Department of Energy (DOE), key highlights of the EISA include improved corporate fuel efficiency, a renewable fuels standard, and new energy efficiency standards for lighting and other appliances, such as lamps, dishwashers, dehumidifiers, and clothes washers (Congressional Research Service, 2007).

Two bills containing energy provisions were passed by the U.S. Congress between October 2008 and February 2009 in response to the economic downturn in the United States: the Energy Improvement and Extension Act and the American Recovery and Reinvestment Act of 2009. The Energy Improvement and Extension Act included provisions to extend tax credits for energy-efficient residential properties and appliances, bicycle commuting, and renewable and alternative fuels usage, to limit consumption and increase efficiency (U.S. Congress, 2008). The American Recovery and Reinvestment Act of 2009 provided more than $16 billion for the DOE's Office of Energy Efficiency and Renewable Energy for the Weatherization Assistance Program, Energy Efficiency and Conservation Block Grants, Energy Efficient Appliance Rebate and ENERGY STAR® programs, and various alternative fuel programs for both transportation and energy production (U.S. Congress, 2009).

In addition to the federal programs, state-led initiatives have contributed to or encouraged energy conservation and efficiency in the Project area. One of the goals identified in the 2013 Connecticut Comprehensive Energy Strategy (CES), for example, is an expanded commitment to reducing energy consumption through "all cost-effective" energy efficiency programs (CTDEEP, 2013a). Other objectives promote new financing mechanisms for energy conservation and efficiency, performance-based rates of return for Connecticut utilities, and efficiency standards for new building construction or retrofits. The CES notes that a reduction in energy consumption through conservation and efficiency is one of the most cost-effective ways to lower Connecticut's contribution to air pollution.

Massachusetts, Rhode Island, and New York State similarly have implemented energy conservation plans which include efficiency initiatives. Each of the plans enumerates a series of policy objectives or actions designed to reduce energy consumption. The Massachusetts Clean Energy and Climate Plan for 2020, for example, promotes all cost-effective energy efficiencies, advanced building energy codes, and an expanded renewable portfolio standard for electricity (MAEOEEA, 2010). It also includes a Building Energy Rating and Labeling program designed to facilitate "apples-to-apples" comparisons of energy efficiency among and between buildings. Rhode Island's Comprehensive Energy, Conservation, and Affordability Act of 2006 requires local utilities to invest in all cost-effective energy efficiencies, prepare long- and short-term energy efficient procurement plans, and purchase least cost-supply and demand resources (Rhode Island General Assembly, 2006). The 2009 New York State Energy Plan encourages energy efficiency through a variety of policies and objectives, including the coordination of end-use efficiency programs, improved energy efficiency in public buildings, and improved training and compliance initiatives (New York State Energy Planning Board, 2009).

EPAct and the other federal and state programs collectively promote increased energy efficiency and conservation by supporting new technologies and increasing funds for research and conservation. However, while these initiatives may minimize energy use, they are not expected to eliminate the increased demand for energy or natural gas in the Project area. The implementation and success of energy conservation and efficiency programs in curtailing energy use is a long-term goal requiring large-scale public education efforts, significant incentives, and government intervention extending well beyond the timeframe of the proposed Project. We also note that each of the states in the Project area recognizes energy conservation as one component of a larger portfolio of solutions, including increased use of natural gas, to provide clean, secure, reliable, and less expensive energy. Therefore, while energy conservation and efficiency would reduce demand for new energy supplies to some degree, we conclude it would not eliminate the need for additional natural gas supplies in southern New England.

3.2.2 Renewable Energy

Renewable energy sources are another long-term fuel source alternative to natural gas, including wind, hydropower, biomass, solar, and tidal and wave energy. The DOE's Energy Information Administration (DOE/EIA) (2013) projects rapid growth in renewable fuel consumption due primarily to the implementation of a federal renewable fuels standard for transportation fuels and state renewable portfolio standard programs for electricity generation. Nationally, the share of U.S. electricity generation from renewable energy is projected to increase from 13 percent in 2011 to 16 percent in 2040, with wind, solar, and biomass accounting for most of the growth.

Wind

Wind power is a proven technology that has experienced significant advances in recent years, including reduced installation costs, improved turbine performance, and reduced maintenance costs. Although wind projects have no emissions, such developments can affect wildlife, such as birds, as well as other resources. Additionally, many of the windiest sites in the Project region tend to be located along shorelines that are challenging to access, densely populated, and highly valued for other uses.

Current wind generation capacities in the Project area by state are 0 megawatts (MW) for Connecticut, 9 MW for Rhode Island, 103 MW for Massachusetts, and 1,638 MW for New York State (American Wind Energy Association, 2013). In southern New England, most of the existing wind farms are small operations that individually generate less than 15,000 kilowatts (kW) of power. In New York State, there are several large operating wind farms in upstate areas, such as the Maple Ridge Wind Farm (320 MW) in Lewis County and Noble Clinton Windpark in Franklin County (NYSDEC, 2014g). In general, the major wind farms in New York are located in the northern and western portions of the state far from major downstate load areas.

Several new wind farm projects have been permitted or proposed in the Project area, particularly offshore. Cape Wind Associates, for example, plans to install 130 turbines off the coast of Cape Cod in Nantucket Sound. This project, which has been approved by federal and state regulatory agencies, will be capable of generating up to 468 MW of power. Financing of the project is expected to be completed in the second half of 2014. Construction of the project is expected to be completed between 2015 and 2016 (Cape Wind, 2014; Mohl, 2014).

Deepwater Wind proposes to construct two offshore facilities, the Block Island Wind Farm and the Deepwater Wind Energy Center, each of which would provide power to the Project area. The Block Island Wind Farm is a proposed 30 MW facility that would be built about 3 miles south of Block Island in Rhode Island state waters. The wind farm would connect to onshore electric transmission facilities in Narragansett, Rhode Island via a 21-mile submarine cable. Construction of the Block Island Wind Farm could begin as soon as 2015 (Deepwater Wind, 2014a).

The Deepwater Wind Energy Center, if approved and constructed, would be the first, 1,000 MW-scale offshore regional energy center to be built in the United States. In 2013, Deepwater Wind won an exclusive right from the U.S. Department of the Interior to develop wind facilities within a 256-square-mile area on the outer continental shelf in the Atlantic Ocean. As currently envisioned, the project would consist of 150 to 200 turbines to be built about 30 miles east of Montauk, New York between Block Island and Martha's Vineyard. The facility would connect to the Long Island Power Authority's existing transmission grid via a 98-mile subsea cable, which would make landfall on Long Island. The Deepwater Wind Energy Center would produce between 900 and 1,200 MW of power for sale in Long Island and southern New England. Construction of the project could begin as early as 2017 with operations beginning as early as 2018 (Deepwater Wind, 2014; Marcacci, 2013).

Further south in New York State, the New York Power Authority, Long Island Power Authority, and Consolidated Edison are developing a proposal to build a wind farm about 13 to 17 miles offshore of the western end of the Rockaway Peninsula in the New York Bight. The Bureau of Ocean and Energy Management (BOEM) currently is evaluating a lease application from the project proponents for lands on the outer continental shelf, and may proceed with a competitive lease auction for these lands. If approved and constructed, the wind farm would generate 350 MW of electricity (with the potential to expand to 700 MW in later phases) for use in the New York City and Long Island markets (BOEM, 2014; Long Island–New York City Wind Farm Project, 2014). Although this project has demonstrated continued interest, its development is still in its early stages and its future is uncertain. Additional site-specific engineering and environmental studies need to be completed, agencies need to release a request for proposal to select a private developer to build and operate the wind farm, the filing of permit applications needs to be made, and environmental reviews need to be conducted.

It is likely that wind projects will continue to be pursued in the Northeast region assuming continued financial incentives, state and public support, improvements in technology, and available transmission capacity for new electricity. In the long-term, wind energy may be able to replace some of the demand in the Project area for electricity generation from fossil-fuel sources. However, in the short-term, sufficient wind energy is not available in the Project vicinity that could provide the 342,000 Dth/d (100,205 MWh or 8,350 MW per 12-hour day) of energy that would be provided by the proposed Project. Increased wind energy would not meet the objectives of the Project, which would provide additional natural gas supplies to local distribution companies and municipal utilities for residential and commercial uses, eliminate capacity constraints on existing natural gas transmission systems, and provide access to new natural gas supplies. The Project additionally would leverage existing delivery points on the Algonquin system and create new delivery points in southern New England at points where natural gas supplies are needed. In contrast, new wind facilities could require upgrades to or construction of new electric transmission facilities to transport power to market. It is unlikely that the environmental impacts associated with construction of these facilities would be significantly less than those of the Project.

For all the reasons discussed above, the use of wind energy would not meet the Project objectives or provide a significant environmental advantage over the Project.

Hydroelectric

Hydroelectric generation is fully commercialized, including run-of-river and large impoundment facilities ranging in electricity generation capacity from less than one to hundreds of MWs. Current hydroelectric generation in the Project area by state is 4 gigawatt (GW) hours (GWh) in Rhode Island, 312 GWh in Connecticut, 912 GWh in Massachusetts, and 24,652 GWh in New York State (National Hydropower Association, 2014).

The DOE/EIA (2013) projects that hydropower will continue as a leading source of renewable electricity generation in the U.S. through 2040, but little new hydroelectric capacity is expected to be developed in this period. Nevertheless, several recent, small-scale hydroelectric projects have been licensed or proposed in southern New England and New York State. New England Hydropower Company, LLC (NEHC), for example, has been granted five preliminary permits from the FERC to develop new, small-scale, renewable electricity generation facilities in Connecticut, Massachusetts, and Rhode Island. If all five projects are constructed, the peak capacities of the new facilities would range from 30 to 300 kilovolts (kV) (NEHC, 2013).

In addition to small-scale projects, there have been several recent proposals to construct high-voltage transmission lines to transport hydroelectric power produced in Canada to New England and New York State. The Northern Pass Transmission Line Project is a proposal to construct 147 miles of high voltage, direct current, 1,200 MW transmission line from the U.S./Canadian border to New Hampshire. From there, about 34 miles of alternating current transmission line would be built to interconnect with existing grid facilities in Deerfield, New Hampshire. Northern Pass submitted an application to DOE in October 2010 and filed an amended application in June 2013 (Northern Pass Transmission, LLC, 2014).

The New England Clean Power Link Project is a recently announced proposal to construct about 150 miles of high voltage, direct current, 1,000 MW transmission line from the U.S./Canadian Border to a location in Ludlow, Vermont. The transmission line would interconnect with the Vermont Electric Power Company's existing transmission grid for delivery service in Vermont and throughout the New England market (TDI New England, 2014).

Several large-scale projects have been announced to transport hydroelectric power from Canada to New York State. These include the West Point Transmission (WPT) and Champlain Hudson Power Express (CHPE) projects. The WPT is a proposal to construct an 80-mile-long, 1,000 MW transmission line between Athens and Buchanan, New York (West Point Partners, LLC, 2014). The CHPE is a proposal to construct over 300 miles of 1,000 MW transmission line from Quebec to Astoria, New York (Transmission Developers, Inc., 2014). The projects would service downstate markets in New York State, but would not provide power to southern New England as currently proposed.

Hydroelectric power may be able to replace some of the demand in the Project area for new electricity generation. However, regulatory review of these new projects is ongoing and therefore, their future is uncertain. Also, as is the case with wind, hydroelectric power would not meet the objectives of the Project. For example, new or expanded hydroelectric facilities would not provide additional natural gas supplies to southern New England, provide access to new source areas, utilize existing infrastructure, or provide new delivery points where natural gas supplies are needed. We additionally note that new hydroelectric facilities would require upgrades to or construction of new transmission facilities to bring power to market. It is unlikely that the environmental impacts associated with construction of these transmission facilities would be significantly less than those of the Project. For all these reasons, the use of hydroelectric energy would not be practical or provide a significant environmental advantage over the Project.

Biomass

Combustion of biomass (e.g., wood, crops, landfill gas, or solid wastes) is a proven technology using biomass feedstock. Each of the states in the Project area is a participant in the Regional Greenhouse Gas Initiative cap-and-trade emissions reduction program, and each incentivizes energy retailers to derive a certain amount of the energy they sell from biomass. Recent studies, however, have called into question previously held views of biomass as a "carbon-neutral" fuel source. As a result, in 2012, Massachusetts suspended consideration of applications for certain biomass generation units pending a rulemaking.

By state, current net electricity generation from biomass in the Project area is 8 GW in Rhode Island, 55 GW in Connecticut, 149 GW in Massachusetts, and 204 GW in New York State (DOE/EIA, 2014). Recent proposals for new biomass facilities in New England include a pilot program in Dartmouth, Massachusetts for a digester to convert food and other organic wastes into about 650 megawatt hours (MWh) per year (Commonwealth of Massachusetts, 2014); and a wood burning facility in Plainfield, Connecticut to convert clean wood waste from construction sites into 37.5 MW of power per year (Enova Energy Group, 2014).

Biomass fuels used to generate electricity may be able to replace some of the demand in the Project area for new electricity generation, but this would not meet the objectives of the Project. Certain types of biomass fuels, such as landfill or digester waste gas, could potentially replace some of additional natural gas supply that would be provided by the Project. However, there currently is a lack of adequate infrastructure to convert biomass to power and transport the energy to market on a large scale. As a result, additional use of biomass fuels as a substitute for natural gas would require the construction of new facilities, including pipelines, which could result in impacts similar to or greater than those of the Project. For all these reasons, the use of biomass energy would not be practical or provide a significant environmental advantage over the Project.

Solar/Photovoltaic

Solar or photovoltaic power systems convert sunlight directly into electricity. While each of the states in the Project area has implemented policies or incentives to encourage development of solar resources, solar energy represents a small fraction of energy production and consumption in the Northeast region. Net generation from solar sources is 10 GW combined for all of New England and 2 GW for New York State (DOE/EIA, 2014).

Several recent solar energy projects have been proposed or announced in the Project area. HelioSage Energy is planning to construct a 20 MW, alternating current, photovoltaic system on a 145-acre site in Sprague and Lisbon Counties, Connecticut (HelioSage, 2014; Howard, 2013). Massachusetts Electric Construction Company (MECC) is in the process of constructing several ground-mounted solar arrays ranging in capacity from 1.5 to 5.9 MW at 12 sites in Connecticut and Massachusetts (MECC, 2014). RS Energy is planning to develop solar farms at four sites in Massachusetts with a combined generating capacity of 3.5 MW (AZoCleanTech.com; 2014). The HelioSage Energy and RS Energy projects are still in early development stages and their future is uncertain.

While solar initiatives could potentially bring additional energy to the Project area, solar energy is least available during winter months when demand for natural gas is highest. Additionally, the scale at which customers would choose to install solar panels based on existing or future incentives is unclear. These systems generally are not well suited for use as large-scale generation in the Northeast region due to relatively low direct insolation, lower efficiencies, and higher capital costs. Further, solar power generation on an industrial/commercial scale requires large, permanent facilities with impervious cover and no shading to allow for the photovoltaic panels to gather energy. In contrast, the permanent right-of-way of the proposed Project area would be restored to pre-construction contours and maintained as herbaceous cover. Therefore, a large, industrial/commercial scale, solar power generation facility would result in greater visual, vegetation, and habitat impacts than the proposed Project. Impacts of new electric transmission lines associated with solar power generation facilities would be similar to or greater than the impacts from the proposed Project because Algonquin would primarily use its existing right-of-way whereas a new electric transmission line would need to acquire and disturb new land.

Like other renewable energy fuels, solar power may be able to replace some of the demand in the Project area for new electricity generation. However, solar energy would not meet the objectives of the Project. Additionally, construction of commercial-scale solar facilities would require development of large sites and construction of new electric transmission facilities, which could result in impacts similar to or greater than those of the Project. For all these reasons, solar energy would not be practical or provide a significant environmental advantage over the Project.

Tidal and Wave

Wave energy technology is in the early stages of development and not commercially available. Additionally, the high cost of construction and potential for environmental impacts on marine resources may limit development of this resource. In contrast, capture of tidal power is a proven technology, but criteria for suitable site selection limit the areas available for development. Suitable sites require large water flows through a narrow channel into a substantial tidal basin.

The Muskeget Tidal Energy Project in Edgartown, Massachusetts is an example of a recent tidal energy project in southern New England. The Town of Edgartown, in conjunction with nearby towns, universities, and government agencies, is developing a proposal to construct a 5 MW pilot project in the Muskeget Channel. The project would deploy new marine hydrokinetic technologies to produce electricity from incoming and outgoing tides in the channel (New England Marine Renewable Center, 2014).

Like the other renewable fuels, tidal and wave energy may be able to replace some of the demand in the Project area for new electricity generation. However, tidal and wave energy would not meet the objectives of Project. Additionally, it is unlikely that the environmental impacts associated with construction and operation of large-scale hydrokinetic facilities, including any electric transmission lines needed to bring the power to market, would be significantly less than those of the Project. This is due to the potential construction and operational impacts on the marine environment associated with a permanent, large-scale hydrokinetic generating facility. For all these reasons, tidal and wave energy would not be preferable to or provide a significant environmental advantage over the Project.

Summary of Renewable Energies

While the renewable energy projects that have been and will be proposed in the Project area will help diversify the electricity market and decrease the need for traditional fossil fuel energy sources, there still would be issues associated with the siting and development of renewable energy facilities. Other issues would include high costs and the time required to develop new energy infrastructure, including electricity generation and transmission facilities. Construction of new facilities would result in impacts on air, water, wildlife, and other resources, which could be similar to or greater than those for natural gas pipelines.

We also note that renewable energy is not 100 percent interchangeable with natural gas. Most renewable energy sources are used to generate electricity. While natural gas is used to generate electricity, it is also used for heating and cooking. These uses could be served by electricity instead of natural gas, but existing natural gas-based heating and cooking systems in the Project area would need to be converted to electric-based systems, which could be prohibitively expensive for many consumers. In contrast, the Project would provide additional natural gas supplies for direct residential and commercial uses, including heating and cooking. Therefore, renewable energy alternatives were eliminated from further consideration.

3.2.2.1 Nuclear Energy

Another traditional, non-renewable fuel source alternative to natural gas for electricity generation is nuclear power. There currently are four active nuclear power plants in New England and four in New York State, though one of these facilities, Vermont Yankee in Vernon, Vermont, is scheduled to close in 2014. By state, current net generation from nuclear facilities in the Project area are 0 GWh in Rhode Island, 1,565 GWh in Connecticut, 441 GWh in Massachusetts, and 3,765 GWh in New York State (DOE/EIA, 2014). No substantive increase in the use of nuclear power in New England or the Mid-

Atlantic region is expected to occur between 2012 and 2040 based on projections by the DOE/EIA (2013).

Because the subject of nuclear power remains controversial, any future proposals to construct new or expand existing facilities in the region would likely involve prolonged regulatory review and public opposition. Furthermore, there are environmental and regulatory challenges concerning safety and security, the disposal of toxic materials (spent fuel), and alterations to hydrological/biological systems (for cooling water) that would need to be addressed before any new plants could be constructed. Even if these challenges could be overcome, a new plant would not likely be operational for many years. For these reasons, new sources of nuclear power could not meet the schedule of the Project and are not currently a practicable alternative to the proposed Project.

3.2.2.2 Fossil Fuels

Coal potentially could be used to provide additional electrical generation in the Project area, but this would not meet the objectives of or provide the same benefits as the Project. We also note that life-cycle greenhouse gas emissions for coal-fired electricity generation range from 36 to 47 percent higher than for natural gas-fired electricity (ICF International, 2012).

Additional use of oil by existing facilities, development of new oil-fired generating plants, or conversion of natural gas home heating systems to oil burning furnaces could provide additional electricity and heat during peak winter demand periods. However, an increase in the use of petroleum and oil-fired energy or heat sources would produce greater quantities of sulfur dioxide (SO_2), nitrogen oxides (NO_x), GHGs, and airborne mercury than natural gas heating units and boilers (EPA, 1995). This would reduce regional air quality and would be in conflict with the state energy plans and the Policy Statement of the New England Governors, each of which identify natural gas as a key component of sustainable energy.

Increased reliance on other fossil fuels would result in secondary impacts associated with their production (such as oil drilling and coal mining); transportation via truck, rail cars, and/or pipelines; and crude oil refinement. In addition, unlike natural gas, coal use results in waste coal ash that requires disposal.

For all the reasons stated above, the use of other fossil fuels would not be practical or provide a significant environmental advantage over the Project.

3.3 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 an additional 342,000 Dth/d of natural gas at the contracted volumes and to the delivery points required by the precedent agreements signed by Algonquin and the Project Shippers. A viable system alternative additionally would need to eliminate capacity constraints on existing pipeline systems in New York State and southern New England, and provide access to the growing supply areas in the

Northeast region. A viable system alternative would 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 would 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.

3.3.1 Status of Existing Systems

In addition to the existing Algonquin system, two other existing interstate pipelines provide natural gas transmission service into southern New England: Tennessee Gas Pipeline (Tennessee) and Iroquois Gas Transmission (Iroquois) (see figure 3.3.1-1). Like the Algonquin system, each of these pipelines currently are at or near capacity. Consequently, use of either 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. Figure 3.3.1-1 depicts the location of the Tennessee and Iroquois systems relative to Algonquin's existing system in southern New England.

The existing Tennessee pipeline reaches western Connecticut, northern Rhode Island, and central Massachusetts. As currently configured, the system cannot service eastern Connecticut, southern Massachusetts, or southern Rhode Island. The existing Iroquois pipeline services southwestern Connecticut and Long Island, New York, but does not reach eastern Connecticut, Rhode Island, or Massachusetts. As a result, significant expansion of the Tennessee or Iroquois systems would be necessary to provide service to the delivery points required by the Project Shippers. Expansion of these systems would require construction of hundreds of miles of new pipeline, much of which would duplicate the existing Algonquin system, to reach the delivery points required by the Project Shippers. This would result in much greater environmental impact than the Project, which would use a combination of pipeline replacements, loops, and a lateral, as well as additional compression, to deliver the additional volume of natural gas required by the Project Shippers. Therefore, expansion of the Tennessee or Iroquois systems would not be a reasonable alternative to or provide an environmental advantage over the Project.

3.3.2 Proposed Systems

We identified two planned projects in southern New England which, if modified, could provide additional volumes of natural gas to the Project Shippers in southern New England. These are Tennessee's Connecticut Expansion Project in New York, Massachusetts, and Connecticut, and Tennessee's Northeast Energy Direct Project in New York and Massachusetts.

Connecticut Expansion Project

As currently planned, the Connecticut Expansion Project would provide about 72,000 Dth/d of additional transportation capacity on the existing Tennessee system for delivery to customers in Connecticut. The project would require the construction of about 13 miles of pipeline loops at various points along Tennessee's existing Line 200 pipeline in New York, Massachusetts, and Connecticut (Dubay, 2013; Santa Maria, 2013; Hamilton, 2014). To meet the objectives of the Project, the Connecticut Expansion Project would need to be expanded to provide additional capacity and reach the delivery points required by the Project Shippers. This would require the construction of hundreds of miles of additional pipeline, much of which would duplicate the existing Algonquin system. The additional pipeline construction would result in much greater environmental impact than the proposed modifications to the Algonquin system. Therefore, the Connecticut Expansion Project would not be preferable to or provide a significant environmental advantage over the Project.

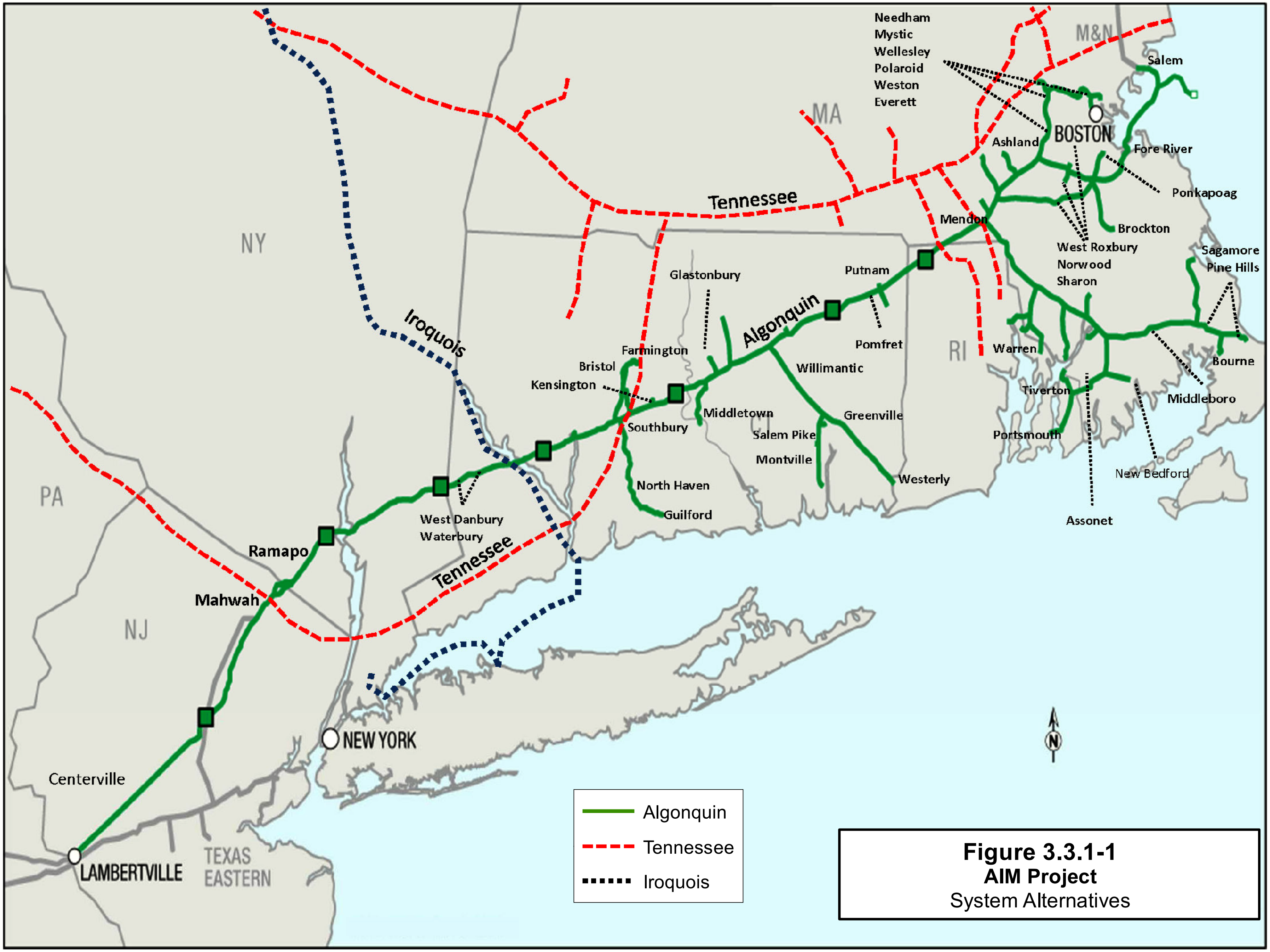

Figure 3.3.1-1
AIM Project
System Alternatives

Northeast Energy Direct Project

The Northeast Energy Direct Project, as currently envisioned, would provide between 0.6 and 2.2 billion cubic feet per day of natural gas to southern New England. The project would require the construction of about 200 miles of new greenfield pipeline from Wright, New York to Dracut, Massachusetts (Dubay, 2013; GazetteNet.com, 2014). To meet the objectives of the Project, the Northeast Energy Direct Project would need to be modified to reach the delivery points required by the Project Shippers. This would require the construction of hundreds of miles of additional pipeline, much of which would duplicate the existing Algonquin system. The additional pipeline construction would result in greater environmental impact than the Project. Moreover, if the project is proposed before the Commission in the future and subsequently approved and constructed, the Northeast Energy Direct Project would be in-service no sooner than November 2018, so it would not meet the objectives of the Project within a reasonable timeframe. For all these reasons, the Northeast Energy Direct Project would not be preferable or provide a significant environmental advantage over the Project.

3.4 FACILITY DESIGN AND SITING ALTERNATIVES

Algonquin states that its existing mainline system does not have adequate unsubscribed capacity to accommodate the additional volume of natural gas required by the Project Shippers. Algonquin's system has a capacity of 2.6 billion cubic feet per day (bcf/d) along its 1,127 mile length between Lambertville, New Jersey and the Boston area in Massachusetts. The new and modified facilities would create an additional 342,000 Dth/d of natural gas transportation capacity on Algonquin's system for delivery to the Project Shippers at various points in southern New England (see figure 3.4-1).

We received several comments from stakeholders regarding facility design and siting for the proposed replacement, loop, and lateral pipelines and other facilities for the Project. Algonquin's 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 and friction. The pressure continues to drop until the gas is re-compressed at the next compressor station along the system. In general, the pressure of gas in a pipeline must be equal to or greater than 450 psig where it enters a compressor station to ensure efficient operation of the system; the pressure is greater, up to the MAOP of the pipeline, where the gas leaves the compressor station.

Algonquin states that it designed and sited the proposed Project facilities to increase capacity and maintain the required pressure profiles along each pipeline segment between the existing compressor stations along the system. We independently verified Algonquin's mainline system expansion and the flow dynamics of its existing system. In some of the segments on Algonquin's mainline pipelines, the additional volume of natural gas required by the Project Shippers would be provided by increased compression without the need for a larger diameter pipeline or a new pipeline loop. For example, this is the case of the mainline segments at points downstream of the Chaplain Compressor Station in Windham County, Connecticut and the Burrillville Compressor Station in Providence County, Rhode Island. In these pipeline segments, the existing flow rates and pressures in the mainline pipelines are lower than at upstream segments due to customer deliveries of natural gas out of the system. As a result, these segments can accommodate additional volumes of natural gas with increased compression alone.

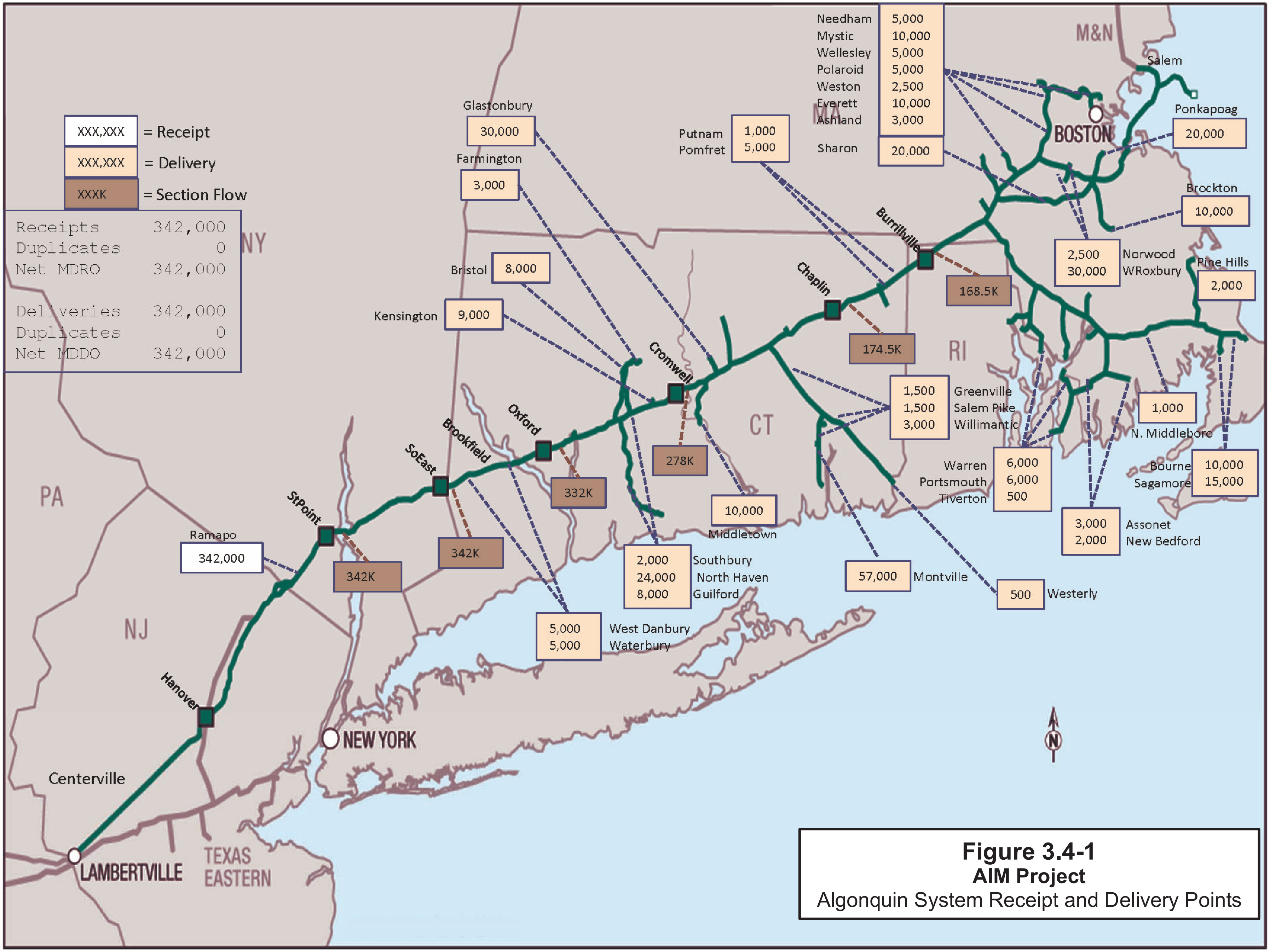

Figure 3.4-1
AIM Project
Algonquin System Receipt and Delivery Points

In other segments along the system, there is little or no capacity to transport additional volumes of natural gas because of higher flow rates and pressures within the pipelines. In these areas, a combination of new pipeline construction and increased compression would be necessary to create additional capacity to transport the volume of natural gas required by the Project Shippers. This is the case, for example, of the mainline segment between the existing Stony Point Compressor Station in Rockland County, New York and the existing Southeast Compressor Station in Putnam County, New York (i.e., the Stony Point to Yorktown Take-up and Relay segment). For this segment, Algonquin proposes to increase compression at the Stony Point Compressor Station and replace about 12.3 miles of 26-inch-diameter pipeline downstream of the compressor station with a new, 42-inch-diameter pipeline. The larger diameter pipeline is necessary to increase capacity and maintain the required pressure profile of the pipeline segment downstream of the Stony Point Compressor Station until the gas in the pipeline can be re-compressed at the Southeast Compressor Station.

Because the locations of the proposed pipeline replacements and loops are based on flow dynamics within the system, alternative locations or configurations would not be practical. Shifting the proposed facilities upstream or downstream of their current 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.

As an example, Algonquin is proposing to replace about 4.5 miles of 26-inch-diameter pipeline with a new, 42-inch-diameter pipeline in Putnam County, New York and Fairfield County, Connecticut downstream of the existing Southeast Compressor Station (i.e., the Southeast to MLV 19 Take-up and Relay segment). The pipeline replacement would create the additional capacity and flow characteristics necessary to operate the Project downstream of the Southeast Compressor Station. Shifting the pipeline replacement segment upstream of the compressor station would increase capacity on that segment, but create a bottleneck for delivery in areas downstream of the compressor station. This is because Algonquin would be unable to deliver additional volumes of natural gas downstream of the Southeast Compressor Station without a larger diameter pipe.

Additional information on facility design and siting is provided by Project component in the subsections below. The location of each facility component is described in section 2.1 and depicted on figure 2.1-1.

3.4.1 Take-up and Relay

At three locations (i.e., the Haverstraw to Stony Point, Stony Point to Yorktown, and Southeast to MLV-19 Take-up and Relay segments), Algonquin proposes to replace the existing 26-inch-diameter mainline with a new 42-inch-diameter pipeline. In conjunction with increased compression, the larger diameter pipeline in these segments would increase the carrying capacity of the mainline system, allowing Algonquin to meet its contractual obligations to existing customers and also provide the additional volumes of natural gas required by the Project Shippers. In each of these locations, replacement of the existing pipeline would maximize the use of existing right-of-way, which would minimize impacts on the environment during construction. While new pipeline loops in these same areas could similarly create additional capacity on the system, these are not considered feasible alternatives due to urbanization in the vicinity of the mainline and encroachment on the existing right-of-way. Relative to pipeline replacements, pipeline loops would require a wider construction corridor in areas where available space is limited and existing land uses preclude expanding the width of the existing right-of-way.

In another location (i.e., the E-1 System Lateral Take-up and Relay segment), the existing 6-inch-diameter pipeline cannot support the proposed incremental capacity of the Project. A larger, 16-inch-diameter pipeline is necessary to increase capacity to facilitate the transportation of additional natural gas volumes to an existing delivery point on the system. As with the other take-up and relay segments, replacement of the existing pipeline would maximize use of the existing right-of-way and minimize impacts on the environment during construction.

3.4.2 Loop Extension

At two locations (i.e., the Line-36A Loop Extension and E-1 System Lateral Loop), Algonquin proposes to extend existing pipeline loops to increase the transmission capacity of the system. In each of these areas, Algonquin's engineers have determined that extension of existing pipeline loops would be preferable to pipeline replacements to create the required pressure profiles to operate the system efficiently. There is less urbanization along the existing pipeline right-of-way in these areas to preclude expansion of the existing right-of-way width. Additionally, extending the existing loops would minimize the duration of outages on Algonquin's system during construction, which would minimize service disruptions to downstream customers. For each of the pipeline loops, outages would be limited to a short period of several hours during tie-in operations. In contrast, outages of several weeks would be required to remove and replace the existing pipelines in these areas.

3.4.3 New Pipeline

According to Algonquin, Boston Gas has requested a new delivery point in the West Roxbury section of the City of Boston to enhance and reinforce the existing Boston Gas delivery system and support long-term growth in the area. The proposed delivery point would be located at an interconnection with the Boston Gas delivery system in an area where additional supplies of natural gas are needed. Algonquin proposes to construct about 5.1 miles of new pipeline lateral (West Roxbury Lateral) and a new M&R facility to provide Boston Gas with the service it has requested.

Algonquin states that the proposed delivery point for the West Roxbury Lateral would be located in a low-pressure area on the Boston Gas delivery system, which would enhance operating pressures and improve the reliability of that system. Additionally, because the West Roxbury Lateral would be supplied from Algonquin's I-System Lateral, the risk of outages on the system due to low supplies from the existing Commercial Point LNG peak shaving facility would be greatly reduced. Information on specific route and site alternatives for the proposed lateral and M&R station are provided in sections 3.5 and 3.6 below.

3.4.4 Compressor Station Modifications

In addition to the pipeline facilities described above, the Project would require additional compression to transport the additional volume of natural gas required by the Project Shippers. To provide the additional compression, Algonquin proposes to install two new gas-fired compressor units at the existing Stony Point Compressor Station, install one new gas-fired compressor unit at each of the existing Southeast, Cromwell, Chaplin, and Burrillville Compressor Stations, and restage one existing compressor unit at the existing Oxford Compressor Station. No new compressor stations are proposed for the Project. In conjunction with the new pipeline facilities, the additional compression provided by the new/restaged compressor units would increase the maximum design capacity of Algonquin's mainline system from about 2.6 to 2.9 bcf/d.

One of the new units to be installed at the Stony Point Compressor Station would replace four existing reciprocating units on Algonquin's existing 26-inch-diameter mainline. The new unit would be rated to replace the capacity of the existing reciprocating units while also providing the additional horsepower needed to operate the Project. The Mars 100 is the preferred unit model for the replacement because it would meet the horsepower requirements of the mainline system as well as the air emissions thresholds required in the existing air permits for the Stony Point Compressor Station. Other potential models, such as the Mars 90 or Taurus 70, were dismissed because they would not provide the required horsepower to operate the system and/or do not provide sufficient air emission reductions.

3.4.5 Conclusions Regarding Facility Design and Siting

We evaluated information filed by Algonquin and conducted our own engineering analysis to assess the facility design and locations proposed by Algonquin for the Project. We conclude that Algonquin designed the Project to maximize the efficient transportation of additional natural gas supplies through its mainline system. Additionally, the new and modified facilities would maximize the use of existing pipeline rights-of-way and aboveground facility sites, which would minimize environmental impacts during construction.

Alternative facility designs or locations potentially could increase capacity on certain segments of the system, but would result in operational inefficiencies that would inhibit the delivery of additional natural gas supplies to the Project Shippers. Moving the locations of pipeline replacement segments, for example, would fail to create additional transportation capacity at locations where it is needed to transport additional volumes of natural gas on the system. Moreover, we note that alternative designs or locations would not avoid environmental impacts, but shift them from one location to another. Therefore, for all the reasons discussed above, the alternative designs or locations considered would not be practicable or provide an environmental advantage over the Project.

3.4.6 Compressor Units

At the request of FERC staff, Algonquin evaluated the feasibility of installing electric-driven compressor units in lieu of gas-fired units at each of the compressor station sites. Algonquin states that it considered several factors 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.

Algonquin consulted with regional power providers in the vicinity of each compressor station to determine the need for new electric distribution facilities to provide power for electric-driven compressor units at each of the compressor station sites. Based on these consultations, between 1.5 and 8.0 miles of new electric distribution line would need to be constructed to each compressor station site to provide a primary, dedicated power source for new electric-driven compressor units. Additionally, upgrades to existing electric substations would be required at three locations, and new substations would need to be built at each existing compressor station site. It is estimated that a minimum of 2 years would be required to design, permit, and construct these new facilities.

As shown in table 3.4.6-1, construction of the new electric distribution facilities and substations would collectively affect a total of about 58.0 acres of residential, rural, and commercial lands. This would result in visual impacts on existing homes as well as impacts on wetlands, waterbodies, trees, and habitat for state-listed sensitive species. The new electric distribution line to the Chaplin Compressor Station would additionally cross the Mansfield Hollow State Park in Mansfield, Connecticut.

Another issue with the installation of electric-driven compressor units in lieu of gas-fired units is availability of backup power to each site (i.e., access to a secondary substation in the event of an outage at the primary substation). No backup power would be available to the Stony Point, Southeast, and Burrillville Compressor Stations. Backup power would be available to the Cromwell and Chaplin Compressor Stations, but would require the construction of an additional 16 miles and 10.7 miles, respectively, of new electric distribution lines. Construction of these lines would result in additional impacts on residential and rural areas as well as environmental resources.

TABLE 3.4.6-1

Additional Power Facilities Required to Install Electric-Driven Compressor Units at Compressor Station Sites for the AIM Project

New Electric Transmission Facilities	Additional Area Affected by Construction	Land Uses	Minimum Time to Permit, Design, and Construct	Potential Issues
Stony Point Compressor Station – Rockland County, New York				
2.0 miles of buried 138 kV distribution cable in or along streets; upgrades to an existing substation; construction of a new substation	14 acres	Residential – 87 percent Commercial – 13 percent	2 years	Would require installation within the existing right-of-way for New York State Highway 210; if this is not feasible, the transmission cable would be longer; no backup power available
Southeast Compressor Station – Putnam County, New York				
2.0 miles of aboveground 46 kV distribution line in or along highways and roads; upgrades to an existing substation; construction of a new substation	4 acres	Residential – 21 percent Rural – 79 percent	2 years	Visual impacts in residential and rural areas associated with the installation of new power poles; no backup power available
Cromwell Compressor Station – Middlesex County, Connecticut				
1.5 miles of aboveground 23 kV distribution line, including 1 mile of greenfield corridor; construction of a new substation	11 acres	Rural – 100 percent	2 years	Up to 6 acres of tree clearing and visual impacts due to the installation of new power poles; the route would cross 4 wetlands and 1 stream; the route would affect habitat for state-listed species; a second distribution line measuring 16 miles in length would be needed for backup power
Chaplin Compressor Station – Windham County, Connecticut				
6.0 miles of aboveground 13.8 kV distribution line, mostly in or along existing roads or rights-of-way; construction of a new substation	17 acres	Residential – 57 percent Rural – 43 percent	2 years	Visual impacts in residential and rural areas; the route would cross Mansfield Hollow State Park; the route would 12 streams and 2 wetlands; the route would affect habitat for state-listed species; a second distribution line measuring up to 10.7 miles in length would be needed for backup power
Burrillville Compressor Station – Providence County, Rhode Island				
8.0 miles of aboveground 34 kV distribution line in or along roads; upgrades to an existing substation; construction of a new substation	12 acres	Residential – 82 percent Rural – 18 percent	2 years	Visual impacts in residential and rural areas due to installation of new power poles; the route would cross 9 streams and 9 wetlands; no backup power available

We evaluated Algonquin’s proposal to install gas-fired compressor units rather than electric-driven units at the existing compressor station sites along the mainline. The use of electric-driven compressor units would result in additional environmental impacts during construction due to installation of non-jurisdictional facilities such as electric transmission lines and substations. Also, installation of electric-driven compressors would limit the Algonquin's ability to satisfy the Project's schedule due to the time needed to permit, design, and construct these non-jurisdictional facilities. While electric-driven units would result in lower operating emissions, we note that Algonquin would be required to comply with its existing Title V permits for air emissions at each compressor station site under the proposed action to modify these stations (see section 4.11.1). In consideration of all these factors, we conclude that use of electric-driven compressor units would not be preferable to or provide a significant environmental advantage over the proposed Project.

3.4.7 Waste Heat Generation

A recent paper by the Interstate Natural Gas Association of America (INGAA, 2008) considers the potential for energy efficiency at natural gas compression facilities via recovery of waste heat. The paper identifies threshold criteria for determining whether waste heat cogeneration is feasible at these facilities. The criteria include a total of 15,000 hp of compression provided by gas turbine units operating for at least 5,250 hours per year with a 60 percent load factor.

The potential to install waste heat cogeneration facilities was evaluated at Algonquin's compressor stations that would meet the horsepower and load factor thresholds identified in the INGAA paper. Because there are no existing facilities in the vicinity of the compressor stations to utilize waste heat, such as heat recovery steam generators or steam turbines, it was determined that waste heat recovery is not currently a viable option for the compressor stations.

3.5 ROUTE ALTERNATIVES AND VARIATIONS

We evaluated a route alternative at the Hudson River crossing of the Stony Point to Yorktown Take-up and Relay segment to address geological and constructability issues along Algonquin's existing mainline. We evaluated two route alternatives along the proposed West Roxbury Lateral to address impacts on existing land uses, primary residential and commercial areas. We additionally evaluated a number of minor route variations along different components of the Project to resolve or address localized resource issues or stakeholder concerns. Each of the route alternatives and the minor route variations are discussed in the subsections below.

3.5.1 Hudson River Northern Route Alternative

Algonquin's mainline system includes two existing 24-inch-diameter pipelines and one existing 30-inch-diameter pipeline across the Hudson River between the Town of Stony Point, Rockland County, New York, and the Village of Buchanan in the Town of Cortlandt, Westchester County, New York. As part of the Project, Algonquin proposes to install a new 42-inch-diameter pipeline across the river in conjunction with the Stony Point to Yorktown Take-up and Relay segment. The proposed river crossing would be located about 0.5 mile south of Algonquin's existing mainline right-of-way. The three existing pipelines and the proposed pipeline would provide transportation service across the river.

We received a comment from the NYSDEC questioning the need for an additional 42-inch-diameter pipeline across the Hudson River when the three existing pipelines would continue to remain in service. Based on information filed by Algonquin, the three existing pipelines across the river do not have sufficient available capacity to accommodate the additional volume of natural gas required by the Project Shippers. The two existing 24-inch-diameter pipelines each have an MAOP of 674 psig, and the 30-inch-diameter pipeline has an MAOP of 750 psig. None of the three existing pipelines can be upgraded to a higher MAOP to accommodate additional volumes of natural gas.

Algonquin additionally states that it would maintain service on the three existing pipelines across the river to enhance system reliability. In the event of an outage on the existing 30-inch-diameter pipeline or the proposed 42-inch-diameter pipeline across the river (e.g., due to upstream maintenance activities), the two existing 24-inch-diameter pipelines could continue to provide service (at lower operating pressures) to minimize the interruption of service or reduction of flows to downstream points on the system. Without the two existing 24-inch-diameter pipelines across the river, an outage of either the existing 30-inch-diameter pipeline or proposed 42-inch-diameter pipeline could result in significant natural gas losses in the system, which would impact power producers and industrial, commercial, and residential consumers in southern New England.

We evaluated two potential crossings of the Hudson River (i.e., the proposed route and the Hudson River Northern Route Alternative) for the Project. As shown in figure 3.5.1-1, each route originates at MP 2.6 and terminates at MP 5.5 of the Stony Point to Yorktown Take-up and Relay. From the starting point, the proposed route initially heads south/southeast for about 0.5 mile away from the existing mainline right-of-way. It then heads east/southeast for about 1.0 mile crossing from the west to the east bank of the river. It then heads northeast for about 1.3 miles, terminating at the existing mainline right-of-way. The Hudson River Northern Route Alternative is parallel to and on the north side of the existing mainline right-of-way across the river. Both routes cross portions of the existing Indian Point Energy Center (IPEC) nuclear facility on the east bank of the river in Westchester County, New York. We assumed use of an HDD construction method for the river crossing along either the proposed or alternative routes to avoid in-water impacts within the Hudson River.[1]

Table 3.5.1-1 compares engineering and select environmental data for each route. The Hudson River Northern Route Alternative is about 0.6 mile shorter and would cross less wetland than the proposed route. The alternative route, however, would pass near more houses than the proposed route, though the total number of houses potentially affected by either route would be small.

TABLE 3.5.1-1

Comparison of the Hudson River Northern Route Alternative to the Corresponding Segment of the Proposed Route for the AIM Project

Environmental/Engineering Factor	Unit	Proposed Route	Alternative Route
Length (mileposts 2.6 to 5.5)	miles	2.9	2.3
Length adjacent to the existing right-of-way	miles	0.0	2.3
Length of the horizontal directional drill	feet	3,800	6,550
Number of residences within 50 feet [a]	number	2	3
Number of residences within 100 feet [a]	number	3	7
Wetland crossings	linear feet	842	376
Wetland impacts	acres	1.9	0.7
Waterbody crossings	number	2	2

[a] Includes residential housing complexes. Each contiguous building was counted as a single residence.

One major difference between the two routes would be the length of the HDD crossing. Due to differences in the width of the river at each crossing, the HDD for the alternative route would be 2,750 feet longer than the proposed route. The differences in the length of the HDD would be compounded by bedrock conditions along the alternative route, which are unfavorable to a successful HDD crossing, and by land use conflicts within the IPEC nuclear facility, which would provide limited workspace for the HDD on the east side of the crossing.

[1] The existing 24-inch-diameter pipelines and 30-inch-diameter pipeline across the river were installed in the late 1950s and early 1960s using the open-cut construction method.

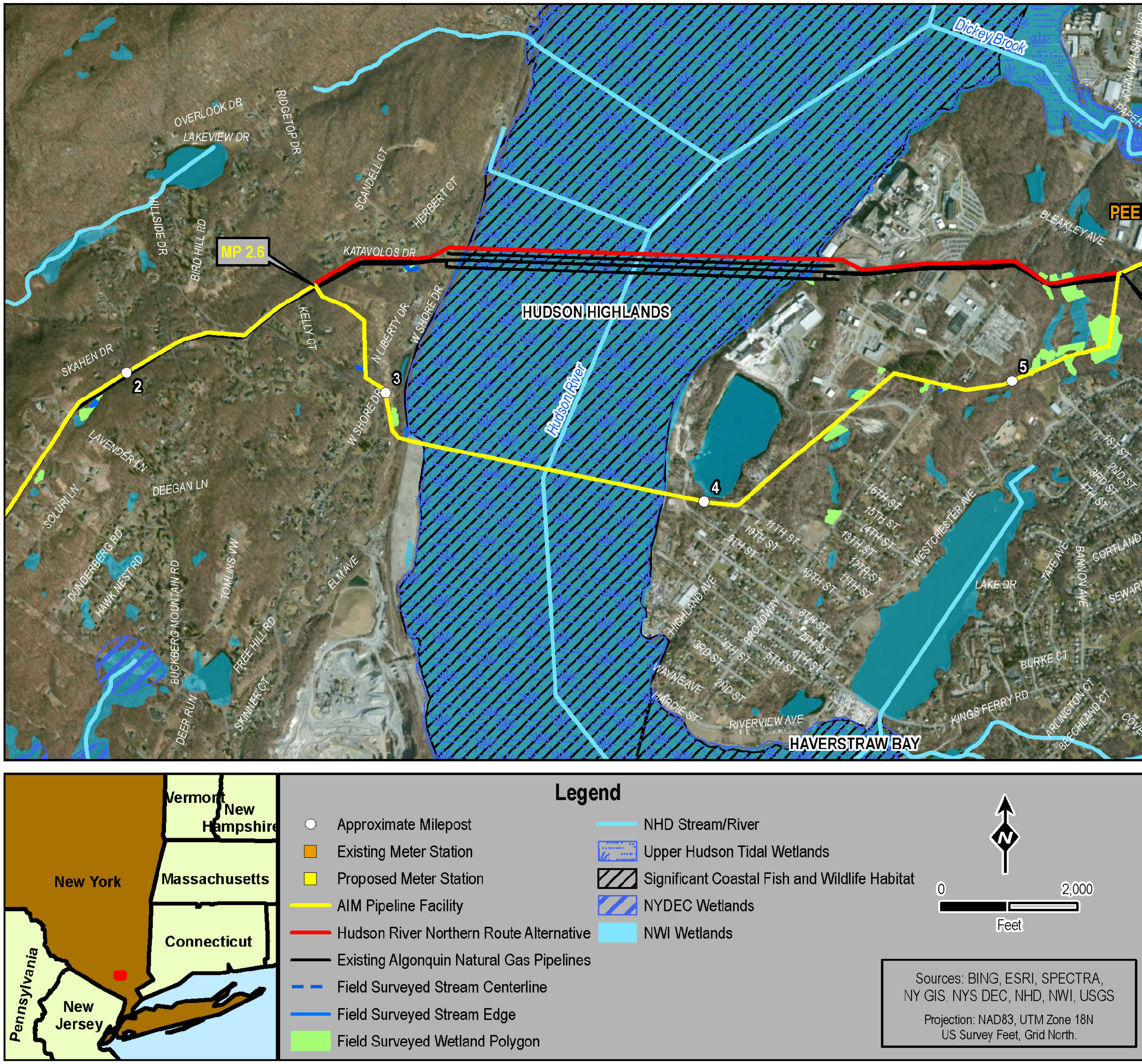

Figure 3.5.1-1
AIM Project
Hudson River Northern Route Alternative

The depth of the hard bedrock at the river crossing on the alternative route is a significant issue. Based on publicly available geotechnical information, the bedrock profile near the middle of the Hudson River in the area of the HDD drill path is up to 300 feet below river bottom. A shallower drill profile in these conditions would require passing into and out of bedrock in several places and into the glacial till, sand, and clay deposits. This would increase the risk of inadvertent returns of drilling fluid or complications during construction, potentially including failure of the drill. A deeper drill profile entirely within bedrock would require extreme pull loads during pullback, resulting in the risk of structural failure of the pipeline.

The difficulties of an HDD crossing of the Hudson River on the alternative route would be compounded by the length of the HDD, which would be about 6,550 feet long. A successful HDD of this length and in these geological conditions would be technically challenging and unprecedented. We are not aware of any previous HDDs of the same diameter and length that have been attempted in similar bedrock conditions in North America. Additionally, the time required to complete a drill at this crossing would exceed 12 months.

The existing geological conditions along the proposed route are more favorable for a successful HDD crossing of the Hudson River. As discussed in detail in sections 4.1.7 and 4.3.2.3, geotechnical studies conducted by Algonquin indicate that an HDD along the proposed route could be completed within soft clay by passing over the bedrock and glacial till deposits beneath the river. Moreover, the shorter length of the HDD along the proposed route (3,800 feet) is less technically challenging for a 42-inch-diameter pipe, and would reduce the time required to complete the HDD across the river (relative to the alternative route) by 9 to 10 months. We also note that several previous HDD crossings at this length and in these conditions have been completed in North America, including a recent crossing of the Hudson River. Spectra Energy completed an HDD of the Hudson River between Jersey City, New Jersey and lower Manhattan as part of the New Jersey-New York Expansion Project in geological conditions similar to those along the proposed route.

In addition to complications resulting from the drill profile, hard bedrock at the surface on the west of side of the Hudson River crossing along the alternative route would make it difficult to install a steel casing at the drill entry site, which is necessary to maintain and control drilling fluid during the HDD operation. The softer surface sediments on the west side of the river crossing along the proposed route would make it easier to install a steel casing at this location. This, along with the shorter time required to complete the HDD along the proposed route, would help reduce the potential for inadvertent returns of drilling fluid during construction.

Another disadvantage of the Hudson River Northern Route Alternative is the limited amount of space available for pullback operations within the IPEC facility on the east side of the crossing.[2] Algonquin would be limited to about 500 feet of workspace to assemble the pipe string for the HDD. As a result, Algonquin would need to assemble the pipe string (i.e., position, weld, x-ray, and coat individual pipe joints) in 13 sections. This would increase the risk of the pipeline becoming stuck in the drill hole during the pullback operation because the pipeline would be idle as each section of the pipe string is assembled. Algonquin estimates that pullback operations for the Hudson River Northern Route Alternative crossing would require one week or more to complete. Two existing access roads within a security zone at the IPEC facility would need to be closed for this entire period.

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2 There is insufficient available space on the west side of the Hudson River in the vicinity of Algonquin's existing mainline to assemble the HDD pipeline for pullback operations. The existing mainline passes through residential areas on the west side of the river.

In contrast, there is more available workspace for pullback operations on the east side of the Hudson River along the proposed route. As a result, only three pipe string sections would be required, which would reduce the time needed to complete pullback operations and the risk of the pipeline becoming stuck in the drill hole. Additionally, although the workspace for the pullback operation would be within the IPEC facility, it would be outside the security zone and would not require the closure of any exiting access roads.

While the alternative route crossing for the Hudson River provides several environmental advantages over the proposed crossing, the Hudson River Northern Route Alternative would not be technically feasible and would not provide any significant advantages over the proposed route. The probability of drill failure is significantly higher for the alternative route. If this were to occur, multiple attempts at the HDD or an alternative crossing method (such as the open cut method) could be required, which would increase the time required to complete the crossing and/or result in additional impacts on the environment. Therefore, the alternative route would not be preferable to or provide a significant environmental advantage over the proposed route.

3.5.2 West Roxbury Lateral Alternative Route

As shown in figure 3.5.2-1, the West Roxbury Lateral Alternative Route originates at about MP 3.0 of the proposed route in the Town of Dedham, Norfolk County, Massachusetts. From this point, the alternate route extends to the northwest for about 0.7 mile, paralleling Incinerator Road and crossing several parking lots and driveways. It then heads north for about 0.5 mile, parallel to and on the east side of State Route 1, crossing into West Roxbury in the City of Boston, Suffolk County, Massachusetts. The alternative route then follows an abandoned right-of-way for about 0.5 mile to the north before intersecting Belle Avenue. From there, the alternative route continues to the north for about 1.0 mile following a number of roads through residential and commercial areas, including Belle Avenue and Baker, Spring, and Alaric Streets. It intersects the proposed route at about MP 5.0.

Table 3.5.2-1 compares crossings of select environmental and other features along the West Roxbury Lateral Alternative Route to the corresponding segment of the proposed route. As shown in the table, the alternative route is about 0.1 mile longer, but would require 0.5 mile less construction within roadways and cross five fewer roads. The alternative route would pass within 50 and 100 feet of fewer residences than the proposed route, but more of the alternative route would pass through residential neighborhoods. Both routes would avoid wetlands and cross the same number of waterbodies.

TABLE 3.5.2-1

Comparison of the West Roxbury Lateral Alternative Route to the Corresponding Segment of the Proposed Route for the AIM Project

Environmental/Engineering Factor	Unit	Proposed Route	Alternative Route
Length (MPs 3.0 to 5.0)	miles	2.0	2.1
Construction within roadway	miles	1.8	1.3
Number of residences within 50 feet [a]	number	161	83
Number of residences within 100 feet [a]	number	185	132
Wetland crossings	feet	0	0
Waterbody crossings	number	1	1
Road crossings	number	24	19

[a] Includes residential housing complexes. Each contiguous building was counted as a single residence.

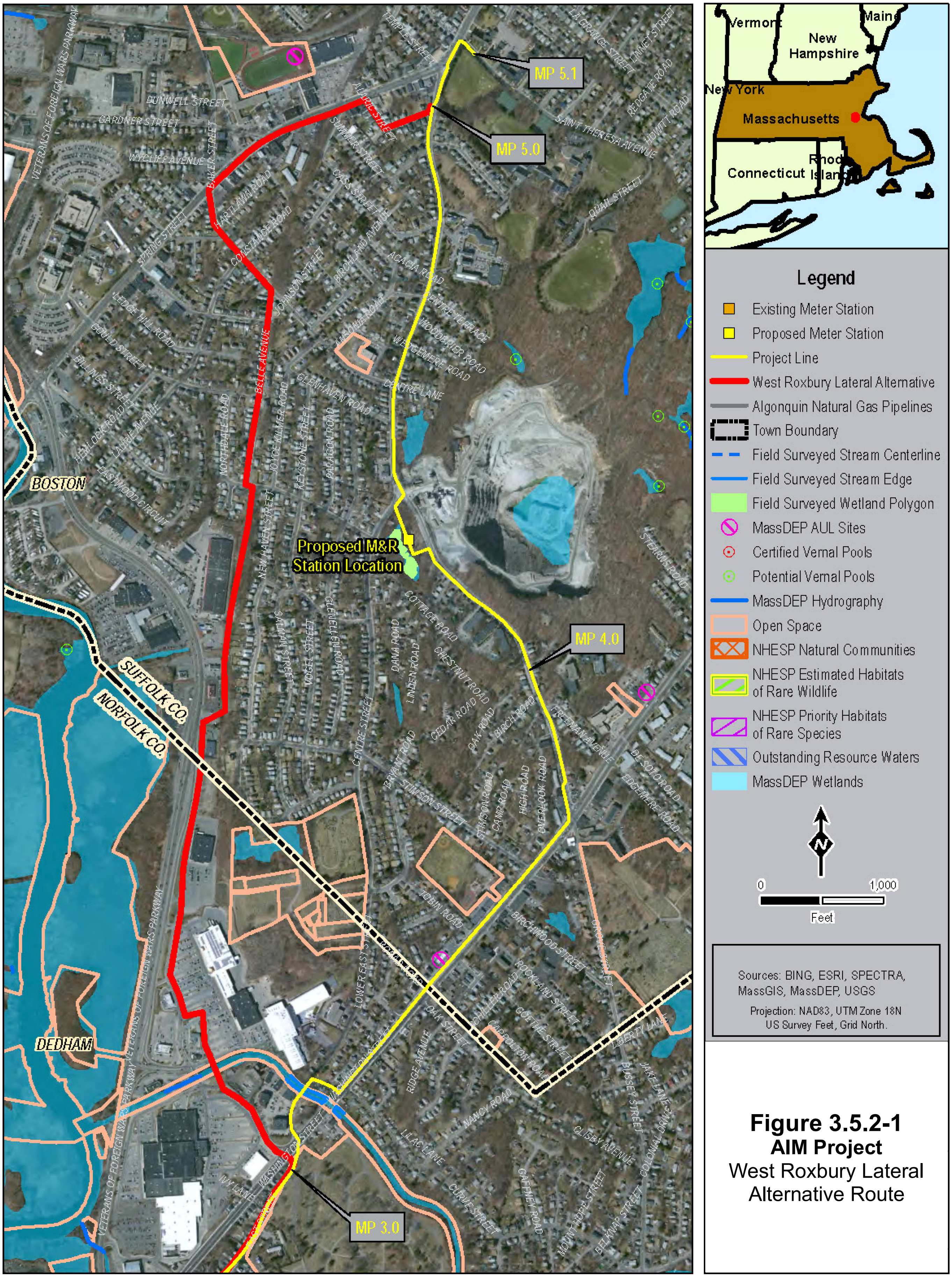

Figure 3.5.2-1
AIM Project
West Roxbury Lateral Alternative Route

During the initial stakeholder outreach, public officials representing the City of Boston expressed concern to Algonquin regarding the alternative route because of its proximity to residential neighborhoods. The alternative route would cross through the backyards of houses, impact residential streets, and cause significant disruption to the surrounding neighborhoods, particularly along Belle Avenue in West Roxbury. Construction along the alternative route would require the complete closure of streets within these areas. Although the proposed route would pass near more residences, it primarily would be constructed along and within more established roadways (e.g., Washington, Grove, and Centre Streets) and in parking lots of commercial and industrial properties. Additionally, the proposed route would avoid the residential area along Belle Avenue and result in fewer impacts on homes and neighborhoods. For this reason, the West Roxbury Lateral Alternative Route would not be preferable to or provide a significant environmental advantage over the proposed route.

3.5.3 West Roxbury Lateral South End Alternative Route

As shown in figure 3.5.3-1, the West Roxbury Lateral South End Alternative Route originates just north of Interstate 95 at about MP 0.5 of the proposed route in the Town of Westwood, Norfolk County, Massachusetts. From this point, the alternate route extends to the east/northeast for about 0.5 mile, parallel to and on the north side of Interstate 95, including an off ramp connecting to the Boston Providence Turnpike. The alternative route then heads north for about 0.2 mile, parallel to and east of the Boston Providence Turnpike. It intersects the proposed route at about MP 1.2.

Table 3.5.3-1 compares the West Roxbury Lateral South End Alternative Route to the corresponding segment of the proposed route. While both routes measure about 0.7 mile in length, the alternative route would require 0.5 mile less of construction within roads, pass near fewer residences, and cross two fewer roads than the proposed route. Both routes would avoid wetland and waterbody crossings.

TABLE 3.5.3-1

Comparison of the West Roxbury Lateral South End Alternative Route to the Corresponding Segment of the Proposed Route for the AIM Project

Environmental/Engineering Factor	Unit	Proposed Route	Alternative Route
Length (MPs 0.5 to 1.2)	miles	0.7	0.7
Construction within roadway	miles	0.6	0.1
Number of residences within 50 feet [a]	number	11	5
Number of residences within 100 feet [a]	number	13	7
Road crossings	number	5	3
Railroad crossings	numbers	1	1

[a] Includes residential housing complexes. Each contiguous building was counted as a single residence.

The primary advantage of the West Roxbury Lateral South End Alternative Route is that it would avoid construction within Rustcraft Road and Elm Street, which would eliminate impacts adjacent to an apartment complex and several businesses, particularly along Elm Street. The primary disadvantages of the alternative route are that it would parallel Interstate 95, which would result in limited construction workspace; require the removal of existing sound abatement walls along the highway; and result in impacts on several houses. Moreover, installation of the pipeline lateral adjacent to Interstate 95 would be inconsistent with MassHighway's "Policy on the Accommodation of Utilities Longitudinally, Along Controlled-Access Highways," which precludes the placement of utility infrastructure parallel to the interstate highway system absent extenuating circumstances.

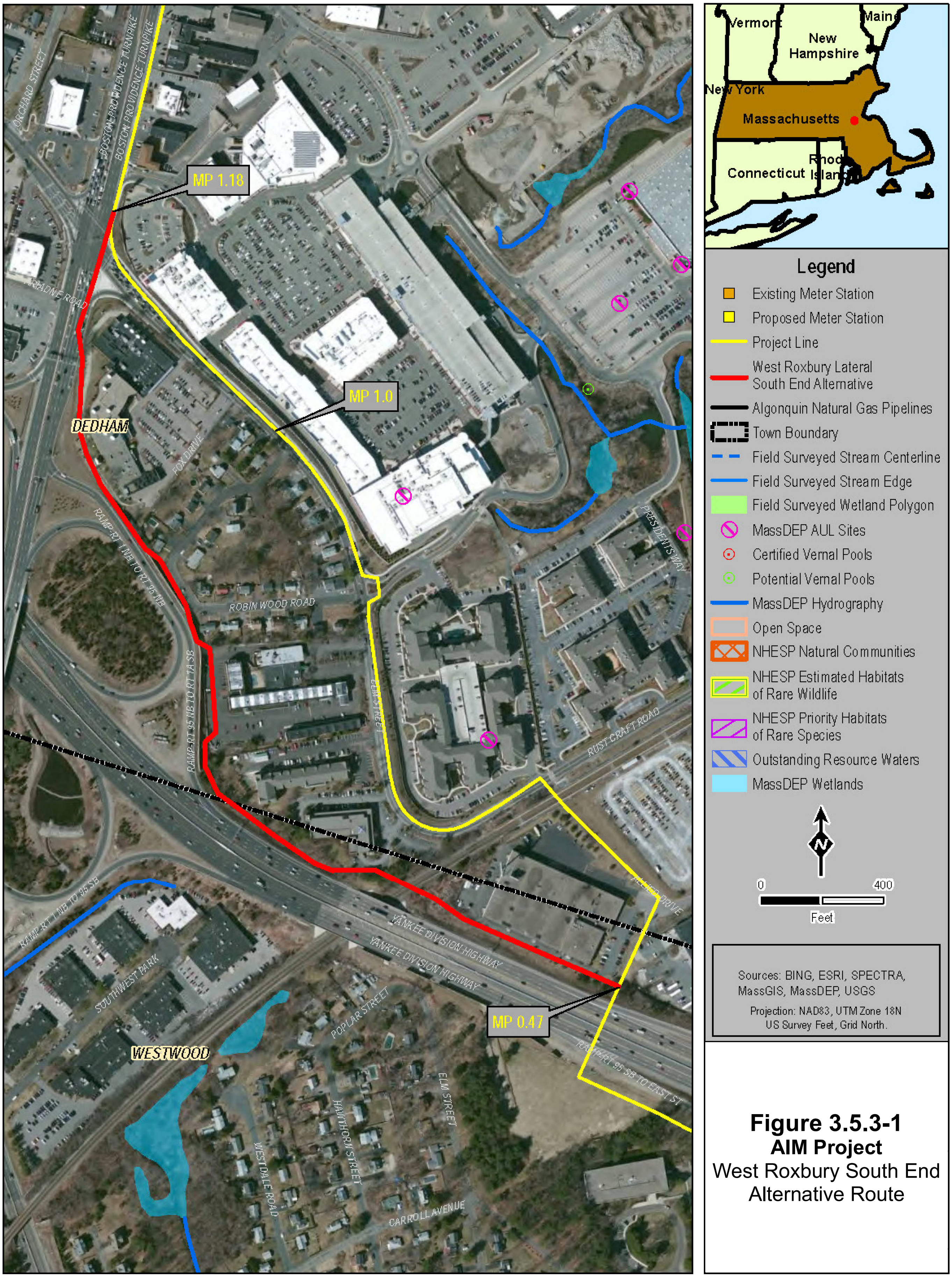

Figure 3.5.3-1
AIM Project
West Roxbury South End Alternative Route

The West Roxbury Lateral South End Alternative Route would result in direct impacts on two residences adjacent to the off ramp connecting Interstate 95 with State Route 1A, near Robinwood Road. The residences are located about 10 and 20 feet from the sound abatement wall for the highway. Installing the pipeline through this area would require the temporary removal of the sound abatement wall resulting in highway traffic noise for several months at the residences until the wall could be replaced.

The alternative route would also impact three commercial properties and two motel properties. Due to the existing elevated slope along Interstate 95, extensive grading would be required to install the pipeline adjacent to the highway. This would require ATWS and additional tree clearing along the highway. The additional tree clearing would result in the permanent removal of privacy/nuisance screening between the commercial and motel properties along the Interstate 95 corridor.

Another disadvantage of the alternative route would be traffic impacts on the Legacy Place shopping area in the Town of Dedham. The focus of Legacy Place's concern at the shopping mall is the ability to manage traffic impacts during construction. The West Roxbury Lateral South End Alternative Route would affect traffic at two of the three ingress/egress points for Legacy Place. Additionally, the crossing of the intersection of Elm Street and the Providence Highway could disrupt traffic entering and exiting Legacy Place along Elm Street. See section 4.9.5 for a discussion of traffic impacts that would result from construction of the proposed route.

In consideration of the potential impacts on residences and businesses, as well as constraints associated with installation of the pipeline adjacent to an interstate highway, as documented in our analysis, the West Roxbury Lateral South End Alternative Route would not be preferable to or provide an environmental advantage over the proposed route.

3.5.4 Minor Route Variations

Algonquin incorporated six minor route variations along different segments of the proposed pipeline facilities to avoid or reduce impacts on environmental or other resources, resolve engineering issues, or address stakeholder concerns (e.g., to minimize impacts on a golf course). Each of these route variations was incorporated into the Project design by Algonquin as part of the proposed action. Information on the six route variations, including their purpose and primary advantages and disadvantages relative to the original route, is provided in table 3.5.4-1. We have reviewed the information filed by Algonquin on these six route variations and our analysis of the proposed route in section 4.0 of this EIS includes these variations as part of the proposed action. Based on this review, we concur with these route variations.

We evaluated an additional route variation, the Catskill Aqueduct Variation, between MPs 10.2 and 10.3 of the Stony Point to Yorktown Take-up and Relay segment in Westchester County, New York. The existing mainline pipelines at this location cross the Catskill Aqueduct near its intersection with Croton Avenue. Algonquin's proposed action is to replace the existing 26-inch-diameter pipeline with a 42-inch-diameter pipeline along the same alignment. The existing 26-inch-diameter pipeline would be removed and the new 42-inch-diameter pipeline would be installed inside a casing pipe above the aqueduct.

Pending the results of soil investigations at the site, Algonquin indicated that it may revise its proposed alignment at this location to incorporate a route variation extending about 50 feet south of the current alignment to provide better alignment of the pipeline at the aqueduct crossing. Environmental impacts associated with the proposed route and the Catskill Aqueduct Variation would be similar, though the route variation would affect slightly more wetland and require more tree clearing than the proposed action. While either route would be acceptable, the proposed pipeline replacement route would be preferable to the Catskill Aqueduct Variation.

TABLE 3.5.4-1

Minor Route Variations Incorporated into the AIM Project

Milepost Start	Milepost End	County/ State	Length (feet)	Description	Primary Advantages	Primary Disadvantages
Haverstraw to Stony Point Take-up and Relay – Stacey Court Variation						
1.7	1.9	Rockland, NY	1,000	The route variation is offset about 40 feet to the south of the existing pipeline.	The route variation would reduce impacts on existing and planned future residences.	The route variation would require an additional 0.8 acre of tree clearing.
Stony Point to Yorktown Take-up and Relay – Route 9 Route Variation						
5.8	5.9	Westchester, NY	528	The route variation is offset between about 20 and 50 feet to the north of the existing pipeline.	The route variation would provide a better alignment for a trenchless crossing of U.S. Highway 9.	The route variation would require an additional 0.1 acre of temporary workspace and 0.1 acre of permanent easement.
West Roxbury Lateral – Norfolk Golf Club Variation						
0.0	0.1	Norfolk, MA	370	The route variation is offset about 175 feet to the southwest of the original route.	The route variation would avoid a compost area at the Norfolk Golf Club, which was requested by the landowner.	The route variation would cross a tee box, fairway, and water hazard on the golf course.
West Roxbury Lateral – Soccer Field Variation						
2.4	2.6	Norfolk, MA	792	The route variation is offset about 175 feet to the east of the original route.	The route variation would avoid placement of the pipeline within a roadway entrance to Staples; the route variation additionally would avoid land use conflicts with planned future expansions of the Harris Street Bridge and Boston Providence Turnpike by Massachusetts Department of Transportation.	The route variation would result in an additional 0.3 acre of impact within a soccer field at Gonzalez Field.
West Roxbury Lateral – Mother Brook Variation						
3.0	3.2	Norfolk, MA	845	The route variation is offset up to about 250 feet to the northwest of the original route.	The route variation would allow for a crossing of Mother Brook without the need to close Washington Street, which would minimize traffic impacts.	The route variation would result in temporary construction impacts on businesses and homes along Eastbrook Road and Post Lane.
West Roxbury Lateral – Centre Street Variation						
5.1	5.1	Suffolk, MA	422	The route variation extends the northern terminus of the West Roxbury Lateral to facilitate a tie-in with existing Boston Gas facilities.	The route alternative would avoid construction activities at the intersection of Centre and Spring Streets, which would minimize traffic impacts.	The route variation would require construction adjacent to St. Theresa of Avila Parish and School.

3.6 ABOVEGROUND FACILITY SITE ALTERNATIVES

3.6.1 Compressor and M&R Station Modifications

Algonquin proposes to modify six existing compressor stations and 24 existing M&R stations along its mainline system in New York, Connecticut, Rhode Island, and Massachusetts. The modifications at the compressor stations would occur within the existing sites; the modifications at the meter stations would occur within or directly adjacent to the existing sites. Because the proposed modifications would occur at existing facilities along Algonquin's mainline system, no alternative sites were identified or evaluated. See section 3.4 above for discussions regarding facility design and siting considerations for the Project.

3.6.2 New M&R Stations

Algonquin proposes to construct three new M&R stations as part of the Project, one in Connecticut and two in Massachusetts. Information on site alternatives for each of these facilities is provided below.

3.6.2.1 Oakland Heights M&R Station

Algonquin proposes to construct the Oakland Heights M&R facility in the City of Norwich, New London County, Connecticut to deliver natural gas to NPU. The proposed station site is located adjacent to Algonquin's existing E-3 Lateral System along Oakland Heights Road (see figure 3.6.2-1). The site would allow NPU to provide natural gas service to an adjacent trailer park community currently serviced by propane, and provide an alternate feed to its distribution system in the area. The proximity of the site to Algonquin's existing lateral and the trailer park community would minimize the required length of the interconnecting pipeline needed by NPU to provide new delivery service to the trailer park community. Algonquin would maintain a 50-foot-wide forested buffer between the proposed facility and the trailer park as a visual screen from nearby houses. No impacts on wetlands would result from construction at the proposed site.

We evaluated two alternative sites (A and B) upstream of the proposed site for the Oakland Heights M&R Station (see figure 3.6.2-1). Alternative sites downstream of the proposed site were not considered because of flow dynamics on the system: a new site downstream of the trailer park community would require an upgrade of the existing E-3 Lateral from 4-inch-diameter to 12-inch-diameter pipeline to maintain the required pressure profile on the lateral.

Alternative Site A is located in a wooded lot just south of Algonquin's existing E-3 Lateral and about 0.2 mile west of the proposed station site. The primary advantage of this site, like the proposed site, is its proximity to the existing E-3 Lateral. However, this site would require longer interconnecting pipeline to provide delivery service to the trailer park community. The interconnecting pipeline would need to cross the existing E-3 Lateral as well as a steep draw and a forested wetland.

Alternative Site B is located in a wooded lot north of the existing E-3 Lateral and west of the trailer park community, about 0.1 mile west of the proposed station site. The primary advantage of Alternative Site B is its proximity to both the existing lateral and the trailer park community, which would limit the length of the required interconnecting pipeline. The primary disadvantage is that the site is located on a steep slope adjacent to a waterbody and nearby wetlands.

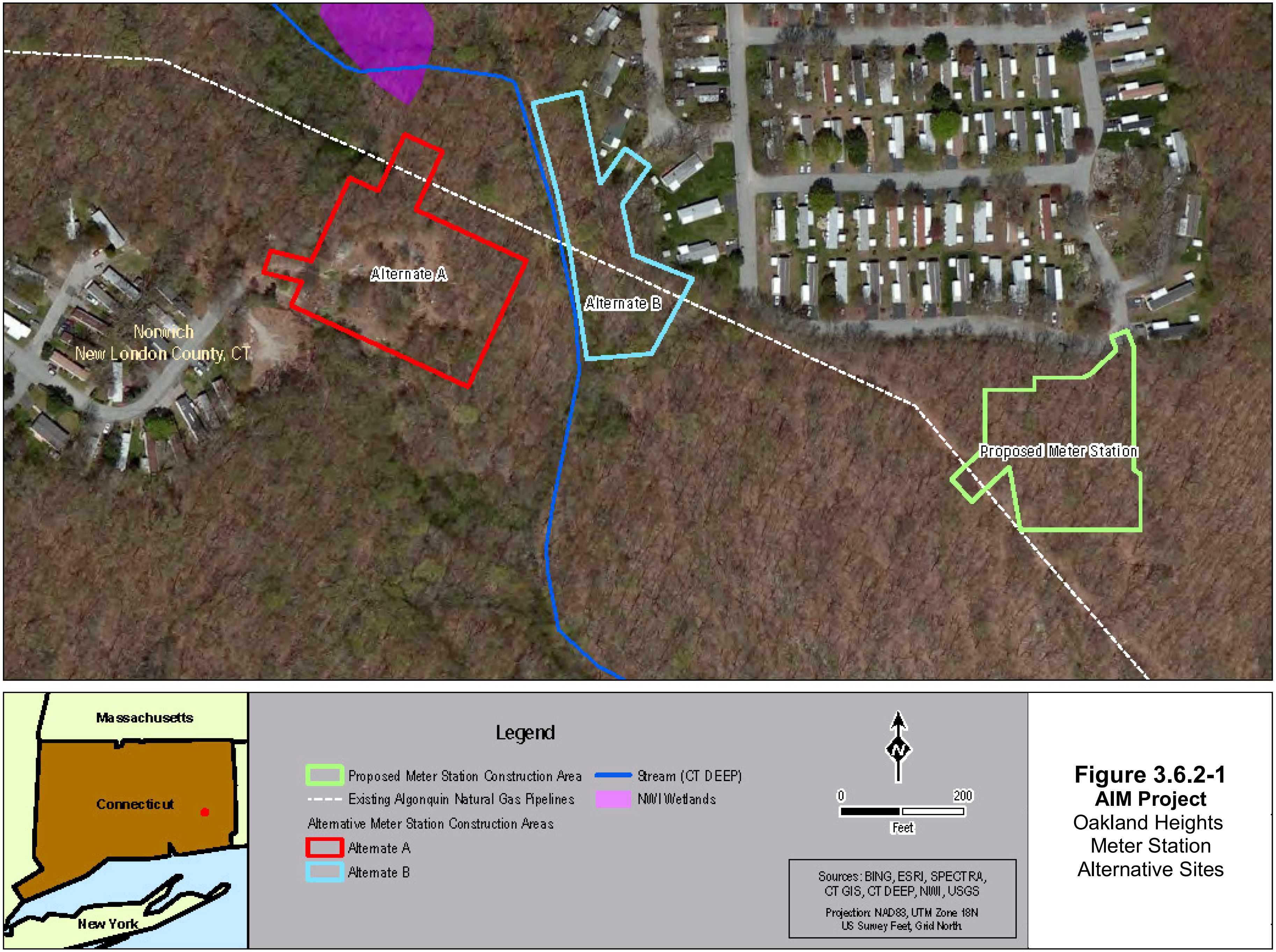

Figure 3.6.2-1
AIM Project
Oakland Heights
Meter Station
Alternative Sites

Based on the above discussion, the proposed site is strategically situated to interconnect with NPU's system for delivery service to the trailer park community. Use of the proposed site would avoid impacts on wetlands and eliminate the need to construct across or within steep terrain. Moreover, we note that Algonquin has stated that representatives of the City of Norwich are opposed to the alternative locations. For all these reasons, the alternative sites would not be preferable to or provide a significant environmental advantage over the proposed site.

3.6.2.2 Assonet M&R Station

Algonquin proposes to construct the new Assonet M&R Station in the Town of Freetown, Bristol County, Massachusetts to deliver natural gas to NSTAR. The new M&R facility would be built adjacent to Algonquin's existing North Fall River M&R Station, west of South Main Street in Freetown. NSTAR is currently supplied natural gas from the North Fall River M&R Station pursuant to an agreement with Fall River. However, NSTAR now has enough gas deliveries in its service area to warrant a new gate station directly with Algonquin. NSTAR requested that the new meter station be sited as close as possible to the North Fall River M&R Station to minimize the amount of new distribution pipeline that would need to be installed.

Algonquin sited the proposed M&R facility adjacent to an existing aboveground facility as well as NSTAR's existing distribution system. The proposed site for the new meter station is located in an existing Algonquin easement that has been modified to include the new facility. No significant environmental features, such as wetlands or waterbodies, would be affected by construction at the proposed site. As a result, we have not identified any specific alternative sites for the proposed facility.

The proposed Assonet M&R Station has been strategically sited to leverage existing transmission and distribution systems and minimize impacts on the environment. Any alternative site along or in the vicinity of Algonquin's system in Bristol County, Massachusetts would require construction of aboveground facilities away from existing, aboveground, pipeline infrastructure. An alternative site additionally would require construction of a longer distribution pipeline by NSTAR, which would result in greater environmental impact than the proposed action.

3.6.2.3 West Roxbury M&R Station

Algonquin proposes to construct the West Roxbury M&R Station at MP 4.2 of the proposed West Roxbury Lateral pipeline to deliver natural gas to Boston Gas (see figure 3.5.2-1). The proposed site for the new facility is located at the intersection of Centre Street and Grove Street on an undeveloped, partially forested tract adjacent to an active quarry operation. No wetlands, waterbodies, homes, or businesses would be affected by construction of the M&R facility at this site.

We evaluated a potential alternative site for the M&R Station at the point where the West Roxbury Lateral Alternative Route intersects the proposed route (i.e., at about MP 5.0 of the proposed route). The alternative site is located on residential land at the intersection of Centre Street and Alaric Street. Use of the site would require the purchase and demolition of an existing residence to provide sufficient space for the M&R facility. Additionally, construction at this site would result in significant traffic impacts along Centre and Alaric Streets due to the limited space available for construction. For these reasons, we did not consider the alternative site technically feasible or environmental preferable to the proposed site. No other viable alternative sites were identified for the proposed West Roxbury M&R Station.

4.0 ENVIRONMENTAL ANALYSIS

The environmental consequences of constructing and operating the proposed AIM Project would vary in duration and significance. Four levels of impact duration were considered: temporary, short term, long term, and permanent. Temporary impacts generally occur during construction with the resource returning to preconstruction condition almost immediately afterward. Short-term impacts could continue for up to 3 years following construction. Impacts were considered long term if the resource would require more than 3 years to recover. A permanent impact could occur as a result of any activity that modified a resource to the extent that it would not return to preconstruction conditions during the life of the project, such as the construction of an aboveground facility. We considered an impact to be significant if it would result in a substantial adverse change in the physical environment.

In this section, we discuss the affected environment, general construction and operational impact, and proposed mitigation for each resource. Algonquin, as part of its proposal, agreed to implement certain measures to reduce impacts. We evaluated Algonquin's proposed mitigation measures to determine whether additional measures are necessary to reduce impacts. These additional measures appear as bulleted, boldfaced paragraphs in the text. We will recommend that these measures be included as specific conditions to any authorization that the Commission may issue Algonquin.

Conclusions in this EIS are based on our analysis of the environmental impacts and the following assumptions:

- Algonquin would comply with all laws and regulations;
- the proposed facilities would be constructed as described in section 2.0 of this document; and
- Algonquin would implement the mitigation measures included in its application and supplemental filings to FERC.

4.1 GEOLOGY

4.1.1 Geologic Setting

The proposed Project is 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, as well as the Burrillville Compressor Station in Rhode Island, would be located in the New England Upland section, which is characterized by rolling hills with streams located in rounded and well-graded valleys. Relief ranges from 100 to 1,000 feet in the more mountainous regions, including the Ramapo Mountains in New York, and the Bolton and Mohegan ranges in Connecticut (USGS, 1999).

The Haverstraw to Stony Point Take-up and Relay segment begins in the Ramapo Mountains of southeastern New York State in the Mahwah River Valley. The pipeline route starts along gentle slopes and continues to traverse along hills of moderate relief (less than 200 feet) and moderate slope. Elevations along this pipeline segment range from approximately 200 feet above mean sea level (msl) near Cedar Pond Brook to about 660 feet above msl on a hill near Rider Hill.

From Algonquin's existing Stony Point Compressor Station, the Stony Point to Yorktown Take-up and Relay segment extends about 12.3 miles to the Town of Yorktown, traversing areas of moderate to steep relief. The pipeline segment crosses Bensons Point and Buckberg Mountain (about 450 feet of relief) before descending to the western shore of the Hudson River. After crossing the Hudson River, the pipeline segment continues eastward along gentle to moderate slopes, passing the Peekskill M&R Station and the Cortlandt M&R Station. Elevations across the segment range from sea level at the Hudson River to about 700 feet above msl on Buckberg Mountain.

From Algonquin's existing Southeast Compressor Station, the Southeast to MLV 19 Take-up and Relay segment traverses rolling hills with moderate slope. The pipeline segment continues along gentle slopes in the area of West Danbury, Connecticut and steep slopes on the east side of Interstate 84. The pipeline segment then crosses gentle to moderate slopes on the north side of a series of drumlins with moderate to steep slopes. Elevations across the segment range from about 300 feet above msl near Interstate 84 to about 720 feet above msl east of Sawmill Road.

The E-1 System Lateral Take-up and Relay segment starts by crossing Owunnegunset Hill over moderate to steep slopes. The pipeline segment continues across moderate to gentle side slopes along Susquetonscut Brook before crossing moderate to steep slopes over Meeting House Hill and Misery Hill (about 300 feet of relief). It then rises about 350 feet up Turkey Hill and traverses moderate slopes before reaching its terminus. Elevations across the segment range from about 220 feet above msl at the Central Vermont Railroad crossing to about 550 feet above msl on Owunnegunset Hill.

The Line 36-A Loop Extension segment crosses about 2.0 miles of flat to gently sloping land west of the Connecticut River. Elevations range from about 20 feet above msl at the Connecticut River to approximately 150 feet above msl near the existing Cromwell Compressor Station.

The E-1 System Lateral Loop segment begins at Algonquin's existing Montville M&R Station in a flat area on the southwestern side of Stony Brook. The pipeline segment crosses moderately sloping terrain with a steeper section on the south side of Cochegan Hill. Elevations along this segment range from about 20 feet above msl near the existing Montville M&R Station to about 320 feet above msl on top of Cochegan Hill.

The proposed facilities in Massachusetts would be located 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 a land surface that slopes 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). The West Roxbury Lateral traverses gently sloping land in a highly developed area along existing roadways. Elevations along this segment range between about 15 to 45 feet above msl.

Algonquin's existing and new aboveground facilities are primarily located in areas with gentle to moderate slopes. Exceptions to this type of topography include:

- Bensons Point near the Stony Point Compressor Station and M&R Station;
- drumlins near the Southeast Compressor Station and West Danbury M&R Station;
- Woodruff Hill near the Oxford Compressor Station;
- a hill near Hope River at the Chaplin Compressor Station; and
- hills near the Oakland Heights, Southbury, and Middletown M&R Stations.

Construction and operation of the Project facilities would not materially alter existing geologic conditions in the area. In addition, the overall effect of the Project on topography would be minor. The primary effects would be limited to construction activities and would include temporary disturbance to slopes within the right-of-way resulting from grading and trenching operations. Algonquin would minimize the impacts by returning contours to preconstruction conditions to the maximum extent practicable. This may not be the case at the aboveground facilities, where grading and filling may be required to create a safe and stable land surface to support the facility.

4.1.2 Surficial Geology

The landscape in the area of the proposed Project consists primarily of glacial till with intermittent bedrock outcrops, sand and gravel deposits, and fine-grained lacustrine and swamp sediment deposits. A review of surficial geology maps provided information regarding the nature of deposits expected in the Project area. Table 4.1.2-1 summarizes surficial geology in the vicinity of the proposed pipeline facilities.

The aboveground facilities in New York and Rhode Island are all located on till. The aboveground facilities in Connecticut are located on a variety of surficial geologic surfaces including till, sand and gravel, sand, and alluvium. The aboveground facilities in Massachusetts are located on a variety of surficial geologic surfaces including till or bedrock, sand and gravel, fine-grained deposits, and coarse glacial stratified deposits.

The overall effect of the Project on surface geology would be minor. The effects would mostly be limited to construction activities and would include temporary disturbance to surficial deposits within the right-of-way resulting from grading and trenching operations. Algonquin would minimize the impacts on surface geology by returning contours to preconstruction conditions to the maximum extent practicable immediately after construction. This may not be the case at the aboveground facilities, where grading and filling may be required to create a safe and stable land surface to support the facility.

4.1.3 Bedrock Geology

Bedrock geology of the AIM Project area is dominated by igneous and metamorphic rocks with limited amounts of carbonate rock. A review of bedrock geology maps provided information regarding the nature of units expected in the Project area. Tables L-1 and L-2 in appendix L summarize bedrock geology in the vicinity of the proposed pipeline and aboveground facilities, respectively.

The effect on bedrock geology would be minor. The primary effects would be associated with areas of shallow bedrock where rock would need to be removed during the construction of pipeline facilities. See section 4.1.6 for more information on areas of shallow bedrock and mitigation measures that would be taken during rock removal.

4.1.4 Mineral Resources

Mineral resources in the Project area consist mainly of commercial sand and gravel, crushed stone, and a gypsum quarry. Sands and gravels are commercially extracted from widely distributed glacial outwash deposits at locations in the general area of the Project. Upon review of the USGS topographic maps and recent aerial photography, three extraction facilities were found to be located in close proximity to the Project as described below.

An unnamed sand and gravel operation is located less than 20 feet from the E-1 System Lateral Take-up and Relay right-of-way in Lebanon, Connecticut at MP 3.1 (USGS, 2013b). This portion of the Project is being constructed within the existing right-of-way, which already precludes the expansion of the sand and gravel operation in direction of the proposed pipeline. As a result, the Project would not affect operations nor would operations impact the Project.

TABLE 4.1.2-1

Surficial Geology of the Pipeline Facilities for the AIM Project

Facility/Surficial Geology	Length (miles)	Description
Replacement Pipeline		
Haverstraw to Stony Point Take-up and Relay		
Till	3.3	A variable texture, usually poorly sorted diamict deposited beneath glacier ice. It tends to be impermeable, have variable clast content, and range in thickness from 3 to 165 feet.
Stony Point to Yorktown Take-up and Relay		
Till	7.7	See description above.
Bedrock	2.1	Bedrock is at the surface or generally within 1 meter of the surface.
Lacustrine sand	1.0	Well sorted/stratified quartz sand deposits attributed to deposition in nearshore environments in large bodies of water.
Outwash sand and gravel deposits	0.8	Well rounded, stratified, coarse to fine gravel with sand of proglacial fluvial deposition. Finer texture indicates increased distance from ice border. Thickness of the deposit varies from 7 to 66 feet.
Water	0.7	Water
Southeast to MLV 19 Take-up and Relay		
Till	3.7	See description above.
Thick Till	0.4	Areas where till is greater than 10 to 15 feet thick and includes drumlins where till thickness is typically greater than 100 feet.
Sand and Gravel	0.3	Material composed of mixture of sand and gravel within individual layers and as alternating well to poorly sorted layers. Typical ranges are 25 to 50 percent gravel particles and 50 to 75 percent sand particles.
Swamp	0.1	Deposits of peat and muck that may contain minor amounts of silt, sand, and clay. Deposits are typically less than 10 feet thick. Often underlain by glacial till.
E-1 System Lateral Take-up and Relay		
Till	6.3	See description above.
Sand and Gravel	1.3	See description above.
Swamp	0.3	See description above.
Sand	0.8	Material composed primarily of very coarse to fine sand, typically in well-sorted layers. Coarse layers may contain a maximum of 25 percent gravel particles. Fine layers may contain very fine sand, silt, and clay particles.
Thick till	0.4	See description above.
Alluvium overlying sand and gravel deposits	<0.1	Alluvium (sand, gravel, silt, and some organic material found on the floodplains of modern streams) overlying undifferentiated coarse deposits.
Loop Extension		
Line-36A Loop		
Sand overlying fines	1.5	Stacked coarse deposit overlying fine deposit where sand is of variable thickness and overlies thinly bedded fines of variable thickness.
Sand and gravel overlying sand and overlying fines	0.5	Deposits where sand and gravel is typically less than 20 feet thick, horizontally bedded and overlies thicker inclined beds of sand that, in turn, overlie thinly bedded fines of variable thickness.
E-1 System Lateral Loop		
Till	1.3	See description above.

TABLE 4.1.2-1 (cont'd)

Surficial Geology of the Pipeline Facilities for the AIM Project

State/Facility/Geologic Unit	Length (miles)	Description
New Pipeline		
West Roxbury Lateral		
Sand and gravel deposits	3.5	Material composed of a mixture of sand and gravel within individual layers and as alternating well to poorly sorted layers. Typical ranges are 25 to 50 percent gravel particles and 50 to 75 percent sand particles.
Floodplain alluvium deposits	0.2	Well sorted to poorly sorted stratified sand, gravel, silt, and some organic material located beneath floodplains of modern streams.
Till or Bedrock	1.4	See descriptions above.

Sources: Cadwell, 1989; CTECO, 2010; CTDEEP, 2009a, 2009b, 2009c; RIGIS, 1998; Massachusetts Office of Geographic Information Systems, 1999

The West Roxbury Crushed Stone Quarry is located adjacent to the West Roxbury Lateral along Grove Street from MPs 4.2 to 4.4 and adjacent to the proposed West Roxbury M&R Station. Many scoping comments were received regarding the potential effect, if any, that the blasting operations at the West Roxbury Crushed Stone Quarry would have on the proposed pipeline or West Roxbury M&R Station. Blasting at the Quarry is performed under a permit issued by the City of Boston Fire Department, which specifies a limit on the allowable blast-induced vibration magnitude (e.g., amplitude or peak particle velocity) at any abutting property of 1.0 inch per second.

Algonquin discussed with the owners of the quarry the anticipated schedule and logistics associated with constructing the West Roxbury Lateral and M&R station, as well as the long-term operations of these facilities. No direct conflicts were identified that would inhibit the construction of the Project or the continued day-to-day operation of the quarry. Algonquin also retained the services of a local third-party geotechnical consultant (GeoEnvironmental, Inc. [GZA]) to analyze the potential effects on the proposed pipeline and M&R station from the blasting operations at the quarry, including ground vibrations, air vibrations, hydrogeologic disturbance, and projectiles (e.g., flying rock). The future extent of quarry expansion is not known at this time (GZA, 2014); however, as discussed below, a hypothetical separation was assumed in GZA's analysis.

Since the proposed pipeline is closer to the West Roxbury Crushed Stone Quarry than the M&R station, the focus of the analysis performed by GZA (2014) was directed toward the potential for ground vibrations to impact the pipeline. The pipeline would be constructed approximately 5 feet below grade, so the discussion of fly rock was limited to the potential effects on the aboveground structures proposed for the West Roxbury M&R Station. Algonquin states that the pipeline would consist of externally coated high strength steel with welded connections. The pipeline would be installed within an excavation and enveloped in an engineered backfill consisting of either compacted sand or flowable fill (a low density concrete sand mixture) extending a minimum of 8 inches below the pipe, a minimum of 6 inches on both sides of the pipe, and a minimum of 6 inches over the pipeline. This engineered backfill is designed to support the pipe evenly while maintaining the integrity of the pipe's protective coating. The flowable fill layer would also provide a warning barrier to protect the pipe from third-party contractors.

GZA's analysis assumed a hypothetical aggressive set of circumstances where the quarry might extend its operation to within 5 feet of Grove Street. The GZA report determined that the proposed West Roxbury Lateral pipeline would be subject to vibrations well within pipeline design, with a minimum factor of safety of 10 to 20 times for the proposed pipeline (GZA, 2014). Therefore, further blasting at the quarry would not damage the proposed pipeline. The GZA report also concluded that the components of the M&R station would not be any more sensitive to vibration disturbance or damage than the underground pipeline and that ground vibrations from blasting at the quarry would not be disruptive or damaging to the M&R station. The M&R station buildings would be engineered pre-fabricated pre-cast concrete structures designed for industrial use and would not contain large exterior glass windows, or finishes susceptible to cracking. The in-line tool receivers/launchers and the heaters would be above-grade, steel construction, and are not considered especially sensitive to vibrations. The M&R station facilities would all be bolted onto foundations and well supported.

Fly rock from blasting operations at the quarry was reported to have landed on property located on Centre Lane to the north of the quarry in 2009. As a result, the quarry changed its blasting operations to reduce the potential for fly rock, and since incorporating these changes, fly rock has not been reported from abutting landowners. GZA's report states that, based on the location of the proposed M&R station relative to the Quarry, the probability of a projectile stemming from a blast operation at the Quarry (i.e., fly-rock) landing on the M&R station site is highly unlikely, potentially in the range of 10,000,000 to 1, with the probability of such a rock inflicting a direct strike on a segment of the limited amount of exposed pipe much lower still. Based on its analysis, the GZA report concludes, and we concur, that fly rock does not pose a concern for interruption of service or the release of natural gas at the M&R station (GZA, 2014).

Hydrogeologic disturbance (i.e., changes in rock fracture and joint opening size and chemical/sediment content) can change water supply well yield and quality; however, the M&R station would not have an on-site water supply well.

Although not a mining resource, the Buchanan Gypsum Plant is located in the Village of Buchanan, New York, approximately 0.25 mile northwest of the Stony Point to Yorktown Take-up and Relay segment on the eastern shore of the Hudson River at MP 4.5 (USGS, 2013a). The plant is owned and operated by Lafarge Corporation. According to the company's website, the drywall produced at the Buchanan Gypsum Plant is made from 99 percent recycled material and uses synthetic gypsum. The Project is not expected to affect the drywall plant nor are plant operations expected to impact the Project.

4.1.5 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, soil liquefaction), landslides, flash flooding, and ground subsidence. 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 proposed Project facilities is low.

4.1.5.1 Seismicity and Faults

The majority of significant earthquakes around the world are associated with tectonic subduction zones, where one crustal plate is overriding another (e.g., the Japanese islands), where tectonic plates are sliding past each other (such as California), or where tectonic plates are converging (e.g., the Indian Sub-Continent). Unlike these highly active tectonic regions, the east coast of the United States is a passive tectonic plate boundary located on the "trailing edge" of the North American continental plate, which is relatively seismically quiet.

Earthquakes, however, do occur in the Project area, largely due to trailing edge tectonics and residual stress released from past orogenic (mountain-building) events. The shaking during an earthquake can be expressed in terms of the acceleration due to gravity (g). The Project would not be located in a region that represents a serious seismic risk to the proposed facilities. Based on USGS seismic hazard mapping, the seismic risk in the area of the Project facilities in New York, Connecticut, Rhode Island, and Massachusetts is low. The greatest seismic risk to Project facilities is encountered around the Haverstraw to Stony Point and Stony Point to Yorktown Take-up and Relay segments in New York, where the Project is located near the Ramapo Seismic Zone. Seismic risk can be quantified by the motions experienced by the ground surface or structures during a given earthquake, expressed in terms of (g). For reference, peak ground acceleration (PGA) of 10 percent of gravity is generally considered the minimum threshold for damage to older structures or structures not made to resist earthquakes. The following summarizes the seismic risk present along these pipeline segments:

- PGA with a 2 percent incidence per 50 years (recurrence interval of 1:2,500 years) ranges from 0.20 to 0.06 g (USGS, 2008a); and

- PGA with a 10 percent incidence per 50 years (recurrence interval of 1:475 years) ranges from 0.04 to 0.02 g (USGS, 2008b).

Many scoping comments were received regarding faults in the Project area, specifically the Ramapo Fault. The Ramapo Fault, which extends from Pennsylvania and New Jersey into southern New York, has been linked to more recent earthquake occurrence in the area. The Ramapo Fault is part of a system of northeast-striking faults that were active approximately 200 million years ago. The fault system is a remnant of an active extensional tectonic boundary that once existed in the area. Although there is no ongoing movement along the Ramapo Fault, seismologists have drawn a relationship between identified earthquake epicenters and the trendline of the Ramapo Fault within the Ramapo Seismic Zone (Sykes et al., 2008). This is attributed to manifestations of modern crustal stresses along pre-existing fractures related to the Ramapo Fault (Jacob et al., 2004). However, identification of active faults (i.e., faults that have moved in the last 10,000 years) in the Project area is very difficult due to Pleistocene glaciation (which cover pre-existing linear features) (Sykes et al., 2008).

Repeat times along the Ramapo Seismic Zone for events of short-period body-wave magnitude (m_{bLg}) 6 and 7 are about 670 and 3,400 years, respectively (Sykes et al., 2008). This magnitude scale is used in the more tectonically stable part of eastern North America (McCalpin, 2009). The largest known event related to the Ramapo Seismic Zone was a m_{bLg} 5.1 earthquake centered northwest of New York City in 1783. There have been a total of three earthquakes greater than 5.0 m_{bLg} in the area. Notably, recent earthquakes in the vicinity of the Project include a m_{bLg} 3.3 earthquake in Wappingers Falls, New York in June 1974 and a m_{bLg} 2.9 event near Peekskill, New York in January 1980 (Jacob et al., 2004).

During field investigations conducted by Hatch Mott MacDonald for the Project's HDD Geotechnical Reports, potential faults were noted. Hatch Mott MacDonald reports the presence of a high-angle normal fault (part of the Ramapo Seismic Zone) located at the Hudson River HDD between the Manhattan Formation and hornblende granite to the west of the route. This seismic zone has been seismically active in the past 200 years. Core boring at the Hudson River HDD also noted a possible fault within bore B-27, located within the Hudson River near the eastern shore. The possible fault was noted at a depth of about 260 feet within dolomitic shale. At this location the HDD alignment places the pipeline at a depth of about 90 feet within overburden material. At the Interstate 84/Still River HDD, a thrust fault was noted by Hatch Mott MacDonald north of Mill Plain Road. Core borings at the Interstate 84/Still River HDD noted decomposed bedrock at multiple bore locations in the same general area as this fault. It was noted that the fault may be the cause of the decomposed bedrock. In addition, bore B-2 indicated a possible fault. This bore was taken just west of Interstate 84. The possible fault was noted at a depth of about 103 feet within schistose gneiss. At this location, the HDD alignment places the pipeline at a depth of about 350 feet within bedrock (Hatch Mott MacDonald, 2014a and 2014b).

Specific site conditions, including earthquakes, are considered in the design of the pipeline. The recorded magnitude of earthquakes in the Project area is relatively low and the ground vibration would not pose a problem for a modern welded-steel pipeline. Even under much higher ground vibrations, the main risk to pipelines would be where the pipeline is buried along a hillside coupled with unstable soils that could become displaced laterally during an earthquake.

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. 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.

Secondary seismic effects triggered by strong ground shaking are often more serious than the shaking itself. The most damaging secondary seismic effect is often soil liquefaction, a physical process in which saturated, non-cohesive soils temporarily lose their strength and liquefy (i.e., behave like a viscous liquid). Areas typically susceptible to liquefaction may include soils that are generally sandy or silty and are typically along rivers, streams, lakes, and shorelines, or in areas with shallow groundwater. Soil liquefaction can result in surface settlement in areas where the ground surface is flat, and soil flow or slope instability in areas where the landscape is sloped. Soil conditions necessary for liquefaction to occur would likely be present in the Project area. However, due to the low potential for strong and prolonged ground shaking associated with a seismic event, we find the potential for soil liquefaction to be low. In addition, no modern occurrences of soil liquefaction due to earthquake shaking in the Project area have been documented (Brankman and Baise, 2008).

4.1.5.2 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 located in an area considered to have a low incidence of landslides (Radbruch-Hall et al., 1982). In addition, the physiography of the Project area is characterized by bedrock overlain with till-covered uplands; lowlands consisting of glacial outwash, glacio-fluvial, and fluvial deposits; and many of the slopes in the Project area consist of till or bedrock, which are less vulnerable to landslides and slumping.

During construction, Algonquin would implement the measures outlined in its E&SCP to minimize potential risks from landslides and soil erosion. Where slopes are encountered along the pipeline alignment, the upslope side of the construction right-of-way would be cut during grading and used to fill the downslope side of the right-of-way, thereby providing a safe and level surface on which to operate heavy equipment. During grade restoration, the spoil would be placed back in the cut, compacted to restore original contours, and reseeded. Once grade and drainage patterns have been reestablished, permanent erosion controls (e.g., slope breakers) would be installed as needed. These activities would minimize the potential for man-induced landslides and erosion in the Project area.

The construction techniques described in section 2.3.1 would also minimize the potential for slope failure and erosion. These techniques include the use of erosion control devices (e.g., silt fences, slope breakers) and other best management practices (BMPs) to stabilize soils. Algonquin's 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.

4.1.5.3 Flash Flooding

Flash flooding has the potential to occur in streams within the Project area, particularly in areas of higher relief and narrower stream valleys in Connecticut; however, no such features are located along the Project route or in proximity to aboveground features. Concerns over flash flooding have increased in recent years due to significant rainfall events associated with tropical storms that have passed close to the Project area. Flooding can also be caused by seasonal variations in precipitation.

No permanent aboveground facilities are located within 100-year floodplains as reported by the Federal Emergency Management Agency (FEMA). The only locations where there are aboveground facilities located near mapped 100-year floodplains are the eastern edge of the Cromwell Compressor Station property and the construction workspace for the Stony Point M&R Station. None of the permanent aboveground facilities associated with the Project would add fill or impervious surfaces that would impact flood storage. Aboveground facilities located in and near floodplains and pipeline stream crossings would be designed to prevent potential impacts from high-velocity flows, largely by controlling erosion, in accordance with Algonquin's E&SCP.

Construction of Project pipelines through 100-year floodplains would not result in the loss of floodplain storage as the pipelines are installed below the ground surface and would not displace flow waters. 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, impacts on Project facilities from flash flooding are not expected.

4.1.5.4 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.

Karst terrain can form by the long-term action of groundwater or surface water on soluble bedrock (e.g., limestone, dolostone, and gypsum). Two mapped calcareous bedrock deposits would be crossed by the AIM Project: the Balmville Limestone in New York and the Stockbridge Marble in Connecticut. The Stony Point to Yorktown Take-up and Relay segment crosses the Balmville Limestone from approximately MPs 3.9 to 4.3. The Southeast to MLV 19 Take-up and Relay segment crosses the Stockbridge Marble at MP 1.6 and again from approximately MPs 1.9 to 2.0. We conclude that subsidence due to karst conditions is not anticipated to be a concern for the Project due to the minimal occurrence of calcareous bedrock crossed by the Project, and because no mapped karst features have been identified in these areas (National Cave and Karst Research Institute, 1984).

Underground mining poses risks to engineered structures due to the potential for the overlying strata to collapse into the void formed by the extraction of minerals. As discussed above, there are no current or former underground mining activities in the vicinity of the Project (Altamura, 1987; USGS, 2013a, 2013b, 2013c). Therefore, we find that the Project would not be subject to hazards associated with underground mines.

4.1.6 Rock Removal and Blasting

Algonquin anticipates that some rock removal would be required during construction of the pipeline and compressor station facilities. About 7.2 miles of shallow bedrock in the Project area is characterized as lithic and would likely need to be removed via blasting. Algonquin has prepared a Rock Removal Plan, which we reviewed and found acceptable, to be used at each site where solid rock is encountered as either part of the pipeline trench excavation, the grading to prepare a level linear work area, or the excavation for aboveground facilities (see appendix E). 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 the suitable rock removal technique. Approval by Algonquin would be required for the selection of all rock removal techniques. 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.

4.1.7 Geotechnical Investigations for the Proposed HDDs

Algonquin proposes to cross the Hudson River along the Stony Point to Yorktown Take-up and Relay segment and the Still River along the Southeast to MLV 19 Take-up and Relay segment using the HDD method. Geotechnical feasibility studies were performed to evaluate subsurface conditions at the proposed HDD sites. The purpose of the geotechnical investigations was threefold:

- to understand if the existing condition would be suitable to use the HDD method;
- to help design each HDD crossing, and
- to identify the location of a deep historic river channel that was known to exist further to the north of the proposed Hudson River HDD.

Table 4.1.7-1 summarizes the results of the geotechnical investigations that have been conducted to date for each of the proposed HDD crossings.

The investigations indicate that the Hudson River HDD would be located entirely within the overburden material above the bedrock. The majority of the Interstate 84/Still River HDD would be located in bedrock and would only cross overburden material near the HDD entry and exit holes. As indicated in table 4.1.7-1, the overburden material at the Interstate 84/Still River HDD is up to 140 feet thick. This thickness occurs under the wetland on the east side Interstate 84. The HDD alignment would be at a depth of about 150 feet in this location. For additional information on these crossing and feasibility studies, see section 4.3.2.3.

TABLE 4.1.7-1 **Summary of Geotechnical Investigations for the HDD Crossings Along the AIM Project**					
		MP			
Facility/HDD	Pipe Diameter	Begin	End	Maximum Depth Below Grade (feet)	Description
Stony Point to Yorktown Take-up and Relay					
Hudson River HDD	42-inch	3.2	3.9	160	Overburden material 20 to 65 feet thick consisting of unconsolidated soil, very soft clays, and loose sands, underlain by limestone, dolostone, and schist.
Southeast to MLV 19					
Interstate 84/Still River	42-inch	1.4	2.1	235	Gneissic bedrock overlain by 5 to 140 feet of coarse-grained deposits of sand and gravel.

Sources: Hatch Mott MacDonald 2014c and 2014d

4.1.8 Paleontological Resources

Paleontological resources are vertebrate and invertebrate fossils that are sometimes discovered at locations under excavation or in areas exposed by erosion. Direct effects on paleontological resources could occur during Project construction by activities such as grading or trenching. Indirect effects on fossil beds could result from erosion caused by slope regarding, vegetation clearing, and/or unauthorized collection.

The majority of the bedrock units crossed by the proposed Project are either metamorphic or igneous in origin and do not contain fossils. Sedimentary rocks identified underlying the Project include the Balmville Limestone in New York, the Portland Arkose and New Haven Arkose in Connecticut, and the Roxbury Conglomerate in Massachusetts. The Balmville Limestone contains significant amounts of brachiopod and conodont fossils (Zen, 1983). These fossils are frequently found in Paleozoic strata across New York State and are not considered significant paleontological resources. No significant fossils have been identified in the Roxbury Conglomerate.

Paleontological resources along the Connecticut portions of the Project have the potential to be of greater significance than those located elsewhere along the Project. The sedimentary rock units underlying the Connecticut portions of the Project are the Portland Arkose and the New Haven Arkose. Both were deposited during the Mesozoic era, also known as the age of the reptiles. Few remains of reptile tracks have been found in the New Haven Arkose, dinosaur bones and reptile tracks have been found in the Portland Arkose, and fossil fishes have been found in black shale beds within the two arkoses. Mesozoic fossils of the Connecticut Valley are typically reptile tracks and other imprints in stone with fewer findings of dinosaur bones. Dinosaur tracks are more prominent in Triassic age strata across the region (Colbert, 1970).

The Portland Arkose underlies the Cromwell Compressor Station and the entire Line-36A Loop Extension, whereas the New Haven Arkose underlies the North Haven M&R Station. Glaciofluvial surficial geological deposits have been mapped at each of these locations that overly the sedimentary bedrock. Proposed activities on each of these portions of the Project would only involve the expansion of existing facilities or the expansion of the existing pipeline within the right-of-way. Based on the presence of a mapped surficial layer and the nature of the work proposed, we find that paleontological resources associated with Mesozoic strata in Connecticut would not be affected by the Project.

4.2 SOILS

4.2.1 Existing Soil Resources

The descriptions and characteristics of soils discussed in this section were compiled from a variety of data sources including soil surveys and website databases published and maintained by the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). Soil surveys referenced include those for Rockland, Westchester, and Putnam Counties in New York; Fairfield, New Haven, Hartford, Middlesex, New London, and Windham Counties in Connecticut; Providence County in Rhode Island; and Bristol, Plymouth, Suffolk, Norfolk, and Middlesex Counties in Massachusetts. Websites used include the NRCS "Official Series Description" website (USDA, 2010) and the NRCS "Web Soil Survey" website (USDA, 2013c).

Soils within the Project area were mapped utilizing the NRCS digital Soil Survey Geographic Database (SSURGO), which includes geospatially referenced Geographic Information System (GIS) soil map unit polygons at a scale of 1:24,000 (USDA, 2013d). SSURGO data contain the most detailed level of soil mapping performed by the NRCS, and corresponds with or supersedes the original county soil survey mapping.

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. 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 or coal ash.

4.2.1.1 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, prime farmland, hydric soils, compaction-prone soils, shallow bedrock, and soils with poor revegetation potential. Additional soil-related impacts due to construction or operation include disruption of agricultural drainage or irrigation systems. Table 4.2.1-1 provides a summary of the significant soil characteristics that would be crossed by the proposed pipeline facilities. Tables 4.2.1-2 and 4.2.1-3 provide summaries, in acres, describing the construction and operation impacts, respectively, on significant soil characteristics associated with the pipeline facilities. Individual soil characteristics and the potential mitigation measures that would be employed by Algonquin are discussed in the sections below.

Erosion by Water and Wind

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. Soils typically more resistant to erosion by water include those that occupy low relief areas, are well vegetated, and have high infiltration capacity and internal permeability. Wind erosion processes are less affected by slope angles than water processes. Wind-induced erosion often occurs on dry soil where vegetative cover is sparse and strong winds are prevalent.

TABLE 4.2.1-1

Summary of Soil Characteristics Along the Pipeline Facilities for the AIM Project (miles)

Pipeline Facility	Right-of-Way Length [a]	Highly Erodible Water	Highly Erodible Wind [b]	Prime Farmland [c]	Hydric	Compact Prone [d]	Shallow Bedrock [e]	Soils with Revegetation Concern [f]
Replacement Pipeline								
Haverstraw to Stony Point Take-up and Relay	3.3	0.0	0.0	0.1	0.6	0.1	0.4	2.8
Stony Point to Yorktown Take-up and Relay	12.3	0.0	0.7	1.8	1.7	1.0	3.3	7.3
Southeast to MLV 19 Take-up and Relay	4.5	0.0	0.0	1.9	0.9	0.8	0.4	2.4
E-1 System Lateral Take-up and Relay	9.1	0.7	1.0	3.1	2.0	1.5	1.1	5.5
Loop Extension								
Line-36A Loop Extension	2.0	<0.1	0.3	1.1	0.3	0.3	0.0	1.4
E-1 System Lateral Loop Extension	1.3	0.6	0.0	0.1	0.2	<0.1	0.6	0.8
New Pipeline								
West Roxbury Pipeline Lateral	5.1	0.0	0.0	0.0	0.0	0.0	1.2	1.1
Total	**37.6**	**1.3**	**2.0**	**8.1**	**5.7**	**3.7**	**7.2**	**21.3**

[a] Several soil types have multiple characteristics. As a result, the sum of the rows will not total the pipeline length.
[b] Includes soils in wind erodibility groups 1 and 2.
[c] Prime Farmland includes Farmland of Statewide Importance and Unique Farmland.
[d] Compact prone soils include those ranked as moderate and high.
[e] All shallow bedrock associated with the Project is lithic.
[f] The ability of soils within the AIM Project area to support successful revegetation were determined by evaluating the range of slope, erosion potential, and drainage class.

Source: USDA, 2013c, 2013d

TABLE 4.2.1-2

Summary of Soil Characteristics Affected During Construction of the Pipeline Facilities for the AIM Project (acres) [a]

Pipeline Facility	Total Acres [b]	Highly Erodible Water	Highly Erodible Wind [c]	Prime Farmland [d]	Hydric	Compact Prone [e]	Shallow Bedrock [f]	Soils with Revegetation Concern [g]
Replacement Pipeline								
Haverstraw to Stony Point Take-up and Relay	45.5	0.0	0.0	3.0	7.0	1.8	2.4	37.2
Stony Point to Yorktown Take-up and Relay	165.8	0.0	6.5	24.6	17.4	13.2	56.3	92.8
Southeast to MLV 19 Take-up and Relay	62.0	0.0	0.0	25.1	8.7	7.5	4.0	38.6
E-1 System Lateral Take-up and Relay	94.9	6.5	10.4	37.8	19.0	21.1	15.5	58.7
Loop Extension								
Line-36A Loop Extension	23.1	<0.1	4.1	9.3	3.3	3.8	0.0	15.9
E-1 System Lateral Loop Extension	14.2	1.9	0.0	2.3	1.3	3.4	6.2	8.6
New Pipeline								
West Roxbury Pipeline Lateral	46.4	0.0	0.0	0.0	0.0	0.0	4.9	9.5
Total	**451.9**	**8.4**	**21.0**	**102.1**	**56.7**	**50.8**	**89.3**	**261.3**

[a] Includes all construction workspace, including the existing permanent right-of-way and includes the new land area that would be permanently affected during operation.
[b] Several soil types have multiple characteristics. As a result, the sum of the rows will not total the pipeline acreage.
[c] Includes soils in wind erodibility groups 1 and 2.
[d] Prime Farmland includes Farmland of Statewide Importance and Unique Farmland.
[e] Compact prone soils include those ranked as moderate and high.
[f] All shallow bedrock associated with the Project is lithic.
[g] The ability of soils within the AIM Project area to support successful revegetation were determined by evaluating the range of slope, erosion potential, and drainage class.

Source: USDA, 2013c, 2013d

TABLE 4.2.1-3

Summary of Soil Characteristics Affected During Operation of the Pipeline Facilities for the AIM Project (acres) [a]

Project Facility	Total Acres[b]	Highly Erodible Water	Highly Erodible Wind[c]	Prime Farmland[d]	Hydric	Compact Prone[e]	Shallow Bedrock[f]	Soils with Revegetation Concern[g]
Replacement Pipeline								
Haverstraw to Stony Point Take-up and Relay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stony Point to Yorktown Take-up and Relay	14.3	0.0	0.6	0.2	1.7	0.8	4.2	7.2
Southeast to MLV 19 Take-up and Relay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E-1 System Lateral Take-up and Relay	8.3	0.7	0.9	2.9	1.9	1.8	1.0	4.8
Loop Extension								
Line-36A Loop Extension	6.6	0.0	0.8	2.8	1.2	1.0	0.0	0.0
E-1 System Lateral Loop Extension	3.2	0.5	0.0	1.3	0.3	0.8	1.5	2.0
New Pipeline								
West Roxbury Pipeline Lateral	5.1	0.0	0.0	0.0	0.0	0.0	0.0	2.4
Total	**37.5**	**1.2**	**2.3**	**7.2**	**5.1**	**4.4**	**6.7**	**16.4**

[a] Includes only the new permanent right-of-way, not Algonquin's existing permanent easement.
[b] Several soil types have multiple characteristics. As a result, the sum of the rows will not total the pipeline length.
[c] Includes soils in wind erodibility groups 1 and 2.
[d] Prime Farmland includes Farmland of Statewide Importance and Unique Farmland.
[e] Compact prone soils include those ranked as moderate and high.
[f] All shallow bedrock associated with the Project is lithic.
[g] The ability of soils within the AIM Project area to support successful revegetation were determined by evaluating range of slope, erosion potential, and drainage class.

Source: USDA, 2013a, 2013b

The potential for soils in the Project area to be eroded by water was evaluated based on the K factor. The K factor represents a relative quantitative index of the susceptibility of bare soil to particle detachment and transport by water. K factor values are primarily based on soil texture, although organic matter content, structure size class, and permeability are also pertinent factors. The higher the K factor value the more susceptible the soil is to water erosion (Multimedia Environmental Pollutant Assessment System, 2010).

The potential for soils in the Project area to be eroded by water was determined by averaging K factor values for all soil horizons for each soil type. K factors were obtained from the NRCS Web Soil Survey website (USDA, 2013c). Based on the average K factor, each soil type was grouped into a water erosion class of "Low," "Moderate," and "High." Low values ranged from 0.02 to 0.2, moderate values ranged from 0.2 to 0.4, and high values ranged from 0.4 to 0.7. For map units comprised of a complex of different soil types, the soil type with the most limiting average K factor was used to categorize the map unit into a low, medium, or high class.

Susceptibility to wind erosion was based on the wind erodibility group (WEG) designation, where available. WEG is a grouping of soils that have similar surface-soil properties affecting their resistance to soil blowing, including texture, organic matter content, and aggregate stability. WEGs may range from 1 to 8, with 1 being the highest potential for wind erosion, and 8 the lowest (USDA, 2014a). A WEG designation and/or K factor is not available for some of the map units consisting of pavement/developed land, some tidal marsh soils, or fill materials (e.g., Udorthents, Urban Land). Pavements and buildings have a low potential for erosion because they consist primarily of impervious surfaces. Soils derived from fill material occur primarily on flat to gently sloping terrain, and have predominantly sandy to loamy sand textured surface horizons, and a low to moderate potential to generate runoff. Map units consisting of fill material and developed land were not assigned a K factor value for the purpose of this EIS as fill materials vary in consistency, even within the same mapping unit. Where WEG data were not available, a WEG of 8 was assigned to map units comprised entirely or principally of paved areas or tidal marshes, and a WEG of 5 was assigned to map units comprised of fill materials and natural soils. This is consistent with the WEGs assigned by the NRCS to the other comparable map units in the Project area.

Based on the K factor designations discussed above, approximately 1.3 miles (4 percent) of the soils along the proposed Project pipeline segments are considered highly water erodible. These soils are found entirely along the pipeline segments in Connecticut. About 8.4 acres (2 percent) of soils within the proposed pipeline workspaces and 1.2 acres (3 percent) of the soils within the permanent right-of-way are considered highly erodible by water.

Based on the WEG designation discussed above it was determined that about 2.0 miles (5 percent) of the soils along the Project pipeline segments are considered highly wind erodible. About 21.0 acres (5 percent) of soils within the proposed pipeline workspaces and 2.3 acres (6 percent) of the soils within the permanent right-of-way are considered highly erodible by wind.

Prime Farmland Soils

The USDA defines prime farmland as “land that is best suited to food, feed, fiber, and oilseed crops.” This designation includes cultivated land, pasture, woodland, or other lands that are either used for food or fiber crops or are available for these uses. The fact that a particular soil is considered prime farmland does not mean that it is currently in agricultural use, some prime farmland soils may be located in forested, open, or residential areas. Urbanized land and open water are excluded from prime farmland. Prime farmland typically contains few or no rocks, is permeable to water and air, is not excessively erodible or saturated with water for long periods, and is not subject to frequent, prolonged flooding during the growing season. Soils that do not meet the above criteria may be considered prime farmland if the limiting factor is mitigated (e.g., artificial drainage). The numbers presented in tables 4.2.1-1 through 4.2.1-4 and the paragraph below include Farmland of Statewide Importance and Unique Farmlands.

About 8.1 miles (22 percent) of the soils along the proposed pipeline segments are considered prime farmland. About 102.1 acres (23 percent) of soils within the proposed pipeline workspaces and 7.2 acres (19 percent) of the soils within the permanent rights-of-way are considered prime farmland. Of these acres, about 17.7 acres of the soils within the proposed pipeline workspaces and 2.6 acres of the soils within the permanent rights-of-way are active agricultural land. The land uses for the remaining 84.4 acres of the soils within the proposed pipeline workspaces and 4.6 acres of the soils within the permanent rights-of-way consist of forest/woodland, industrial, open land, and residential.

Hydric Soils

Hydric soils are defined as “soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part” (Federal Register, 1994). Soils that are artificially drained or protected from flooding (e.g., by levees) are still considered hydric if the soil in its undisturbed state would meet the definition of a hydric soil. Generally, hydric soils are those soils that are poorly and very poorly drained. Hydric soils may indicate the presence of wetlands. Wetland areas containing hydric soils were delineated within the entire Project area as described in section 4.4.1. During Project surveys, some wetlands were delineated in areas that were not mapped as hydric soils in SSURGO data. In these instances, wetland field data was used to supplement the SSURGO hydric data. Due to extended periods of saturation, hydric soils can be prone to compaction and rutting. In addition, high groundwater levels associated with hydric soils could create a buoyancy hazard for the pipeline. Detailed information about the location of wetlands affected by the Project is provided in appendix K table K-1.

About 5.7 miles (15 percent) of the soils along the proposed Project pipeline segments are considered hydric. About 56.7 acres (13 percent) of soils within the proposed pipeline workspaces and 5.1 acres (14 percent) of the soils within the permanent rights-of-way are considered hydric.

Compaction Potential

Soil compaction modifies the structure and reduces the porosity and moisture-holding capacity of soils. Construction equipment traveling over wet soils could disrupt the soil structure, reduce pore space, increase runoff potential, or cause rutting. The degree of compaction depends on moisture content and soil texture. Fine-textured soils with poor internal drainage that are moist or saturated during construction are most susceptible to compaction and rutting.

Many soils along the proposed pipeline segments have likely already been compacted due to past development and some areas being covered by paved surfaces. The degree of compaction was evaluated based on the drainage class of the soils. Very poorly and poorly drained soils were considered to have a high potential for compaction. Somewhat poorly to moderately well drained soils were considered to have a moderate potential for soil compaction. Well drained to excessively drained soils were considered to have a low potential for soil compaction.

Soils with a high potential for compaction and structural damage in the Project area are typically very poorly drained soils located in wetlands with an organic soil component. Special construction procedures within wetlands are discussed in section 4.4 and Algonquin's E&SCP.

About 3.7 miles (10 percent) of the soils along the proposed Project pipeline segments are soils with a high compaction potential. About 50.8 acres (11 percent) of soils within the proposed pipeline workspaces and 4.4 acres (12 percent) of the soils within the permanent rights-of-way are soils with a high compaction potential.

Revegetation Potential

The ability of soils within the Project area to support successful revegetation was determined by NRCS official series descriptions and county soil surveys. The drainage class, slope class, and erosion potential of each soil type within the Project area was evaluated to determine revegetation potential. Other considerations included whether or not the mapped soils were natural, human transported, or disturbed.

Droughty soils that have coarse-textured surface layers and are moderately well to excessively drained may prove difficult to revegetate. The drier soils have less water to aid in the germination and eventual establishment of new vegetation. The coarser textured soils also have a lower water holding capacity following precipitation, which could result in moisture deficiencies in the root zone, creating unfavorable conditions for many plants. Droughty soils along the Project were identified by querying the SSURGO database for component soils series that have a surface texture of sandy loam or coarser, and are moderately well to excessively drained. In addition, steep slopes along the Project may make the reestablishment of vegetation difficult. Soils that occur on slopes greater than 8 percent are also considered areas with a revegetation concern.

About 21.3 miles (58 percent) of the soils along the proposed Project pipeline construction segments are soils with a revegetation concern. About 261.3 acres (58 percent) of soils within the proposed pipeline workspaces and 16.4 acres (44 percent) of the soils within the permanent right-of-way are soils with a revegetation concern (see tables 4.2.1-1 through 4.2.1-3).

Shallow Bedrock

Introducing stones and other rock fragments to surface soil layers may reduce soil moisture-holding capacity, resulting in a reduction of soil productivity. Additionally, some agricultural equipment may be damaged by contact with large rocks and stones. Rock fragments at the surface and in the surface layer may be encountered during grading, trenching, and backfilling. Construction through soils with shallow bedrock could result in the incorporation of bedrock fragments into surface soils.

A large portion of the soils to be affected along the Project pipeline segments are considered stony/rocky soils. The potential to introduce stone and rock into surface soils in those areas could be significant. However, the soils in those areas already contain surface layers with significant quantities of rock fragments. The potential for introducing rock into the topsoil was evaluated based on bedrock depth, and the presence of fill material and disturbed soils. USDA data were used to identify soil map units where depth to bedrock is generally anticipated to be less than 5 feet (60 inches) from the soil surface (USDA, 2010).

With regard to fill materials and disturbed soils, soil map units comprised entirely or partially of fill materials and disturbed soils were also considered areas where rock could potentially be introduced into the topsoil, because these areas often contain concrete and other demolition debris. The Official Series Descriptions and county soil survey descriptions were used to identify areas with fill materials and disturbed soils. Within the Project area, the urban land, Udorthents, Pits, and quarry soil series are comprised of fill materials or disturbed soils. Soil complexes including any of these map units may also be partially or entirely comprised of fill materials and disturbed soils. Given the industrial and highly developed nature of most of the proposed West Roxbury Lateral area, fill materials may also exist in areas that have been mapped by the NRCS as natural soils.

About 7.2 miles (20 percent) of soils that would be affected along the proposed Project pipeline segments have shallow depth to bedrock. About 89.3 acres (20 percent) of soils within the proposed pipeline workspaces and 6.7 acres (18 percent) of the soils within the permanent right-of-way are soils with shallow depth to bedrock.

Scoping comments were received regarding shallow bedrock and the potential need for blasting within the New York City Watershed. Portions of the Stony Point to Yorktown Take-up and Relay and the Southeast Compressor Station are found within the Croton River Watershed, which is part of the New York City Watershed. No soils along the pipeline segment within the Croton River Watershed were mapped by SSURGO as having shallow bedrock (i.e., bedrock within 60 inches of the soil surface). Approximately 2.1 acres of soil within the Southeast Compressor Station has a shallow depth to bedrock. The eastern portion of the temporary workspace at this compressor station has shallow bedrock that would be used for storage of excess fill, and no excavation is planned. Blasting would also not be needed at the Southeast Compressor Station site.

4.2.1.2 Aboveground Facilities

Table 4.2.1-4 summarizes the soil characteristics affected during construction of the aboveground facilities. None of the soils at the aboveground facility sites have a high potential to be eroded by water. However, some aboveground facility sites have soils considered highly erodible by wind; 5.9 acres at the existing compressor station sites, 2.4 acres at the new M&R station sites, and 4.3 acres at existing M&R stations to be modified or removed.

TABLE 4.2.1-4

Summary of Soil Characteristics Affected During Construction of Aboveground Facilities for the AIM Project (acres)

Facility	Total Acres [a]	Highly Erodible		Prime Farmland [c]	Hydric	Compact Prone [d]	Shallow Bedrock [e]	Soils with Revegetation Concern [f]
		Water	Wind [b]					
Existing Compressor Station Modifications								
Stony Point Compressor Station	20.3	0.0	0.0	0.4	1.3	0.0	0.0	20.3
Southeast Compressor Station	15.9	0.0	0.0	4.0	0.0	<0.1	2.1	15.9
Oxford Compressor Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cromwell Compressor Station	14.9	0.0	5.9	5.9	0.4	0.4	0.0	12.8
Chaplin Compressor Station	11.7	0.0	0.0	0.0	0.2	0.2	0.0	11.5
Burrillville Compressor Station	16.7	0.0	0.0	0.0	1.4	1.4	0.0	0.0
Subtotal	79.5	0.0	5.9	10.3	3.3	2.0	2.1	60.5
Existing M&R Station Modifications								
Stony Point M&R Station	2.2 [g]	0.0	0.0	0.3	1.3	1.3	0.0	2.2
Peekskill M&R Station	2.1 [g]	0.0	0.0	0.0	0.0	0.0	2.1	0.0
Cortlandt M&R Station	3.8 [g]	0.0	0.0	2.6	0.0	0.0	1.2	0.9
West Danbury M&R Station	2.9 [h]	0.0	0.0	0.0	0.3	0.3	0.0	2.7
Southbury M&R Station	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6
Waterbury M&R Station	0.4	0.0	0.2	0.0	0.0	0.0	0.0	0.4
North Haven M&R Station	0.5	0.0	0.4	0.1	0.1	0.1	0.0	0.2
Guilford M&R Station	0.5	0.0	0.1	0.0	0.5	0.5	<0.1	<0.1
Farmington M&R Station	0.4	0.0	0.2	<0.1	0.0	<0.1	0.0	0.4
Glastonbury M&R Station	0.8	0.0	0.3	0.3	0.0	0.0	0.0	0.8
Middletown M&R Station	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Salem M&R Station	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Montville M&R Station	1.2 [g]	0.0	0.7	1.2	0.0	0.0	0.0	0.0
Willimantic M&R Station	0.9	0.0	0.4	0.0	0.0	<0.1	0.2	0.9
Pomfret M&R Station	0.4	0.0	0.4	0.4	0.0	0.0	0.0	0.1
Putnam M&R Station	0.3	0.0	0.3	0.3	0.0	0.0	0.0	0.1
North Fall River M&R Station	0.0 [i]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
New Bedford M&R Station	1.8	0.0	0.0	0.1	0.1	0.1	0.0	0.0
Middleborough M&R Station	0.6	0.0	0.6	0.6	0.0	0.0	0.0	0.0
Brockton M&R Station	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Norwood M&R Station	0.8	0.0	<0.1	0.0	0.0	0.0	0.0	0.0
Needham M&R Station	0.4	0.0	0.4	0.4	0.0	0.0	0.0	0.0
Wellesley M&R Station	0.5	0.0	<0.1	0.0	0.0	0.0	0.0	<0.1
Mystic M&R Station	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal	13.8 [j]	0.0	4.0	3.6	1.0	1.0	0.2	6.6
New M&R Stations								
Oakland Heights M&R Station	2.4	0.0	2.4	0.0	0.0	0.0	0.6	1.4
Assonet M&R Station	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
West Roxbury M&R Station	1.0 [g]	0.0	0.7	0.0	0.0	0.0	0.5	0.5
Subtotal	3.9	0.0	2.4	0.0	0.0	0.0	1.1	1.4
Existing M&R Station Removal								
Greenville M&R Station	0.3	0.0	0.3	0.2	0.0	0.0	<0.1	<0.1
Total	**97.5** [j]	**0.0**	**12.6**	**14.1**	**4.3**	**3.0**	**3.4**	**68.5**

TABLE 4.2.1-4 (cont'd)

Summary of Soil Characteristics Affected During Construction of Aboveground Facilities for the AIM Project (acres)

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[a] Includes acres of construction workspace. Several soil types have multiple characteristics. As a result, the sum of the rows will not total the pipeline length. The summary does not include access roads or ATWS.
[b] Includes soils in WEGs 1 and 2.
[c] Prime Farmland includes Farmland of Statewide Importance and Unique Farmland
[d] Compact prone soils include those ranked as moderate and high
[e] All shallow bedrock associated with the Project is lithic.
[f] The ability of soils within the AIM Project area to support successful revegetation were determined by evaluating range of slope, erosion potential, and drainage class.
[g] The temporary workspace shown for each of these M&R stations falls within the overall pipeline workspace area; therefore, these areas are not included in the acreage calculations.
[h] Of the 2.9 acres associated with the West Danbury M&R Station, 2.6 acres would be located within the pipeline construction workspace.
[i] Work at the North Fall River M&R Station would take place within the existing station footprint.
[j] Includes the 2.6 acres at the West Danbury M&R Station that would be located within the pipeline construction workspace and included in the pipeline facilities acreage.

Source: USDA, 2013c, 2013d

About 14.1 acres of the soils mapped at these facilities are considered prime farmland, and about 1.3 of these acres would be permanently impacted by the Project. None of the new proposed aboveground facilities are greater than 5 acres. In addition, the lands associated with the aboveground facility sites are not currently being used for agricultural purposes and are not available for future production; therefore, the Farmland Protection Policy Act would not apply (USDA, 2014b). While there are mapped hydric soils and delineated wetlands at some of the proposed aboveground facilities, no wetlands would be impacted by any of the facilities.

4.2.1.3 Pipe and Contractor Ware Yards

Algonquin has identified four pipe and contractor ware yards that would be used during construction. These yards would temporarily affect about 43.6 acres of land, all but 13.8 acres of which is industrial/commercial land. Vegetation removal and site grading would be required at the Yorktown Yard to allow for safe passage of equipment and to prepare a work surface to safely store and stockpile equipment and other construction materials. It is not anticipated that the use of this yard would require significant earth disturbance; therefore, the impact on soil types would be minimal, keeping the existing soil properties intact. The remaining three pipe and contractor ware yards that would be used during construction of the pipeline facilities are located in existing yards or in industrial/commercial areas. If necessary, rough grading and vegetation clearing of temporary construction yards would be conducted. No significant impacts on soils in the pipe and contractor ware yards are anticipated.

4.2.1.4 Access Roads

In addition to existing public roads, Algonquin proposes to utilize 27 TARs and 8 PARs to access its facilities. The existing roads are comprised of gravel roads, unimproved dirt roads, paved and gravel driveways, private industrial and commercial roads, paved parking lots, and golf course roads. The one exception is the new PAR to be constructed for the new Assonet M&R Station, which would permanently disturb less than 0.1 acre (0.03 acre) of land. None of the proposed access roads would have a significant impact on soils.

4.2.1.5 Contaminated Soils

Algonquin conducted a corridor database search using Environmental Data Resources, Inc. (EDR) to identify various facilities with potential and/or actual sources of contamination that may impact nearby soils along the existing and proposed pipeline and aboveground facilities in New York, Connecticut, and Massachusetts. Rhode Island was not included in the search, because only one facility (Burrillville Compressor Station) would require work and that activity would take place within Algonquin's existing facility. A list of databases searched is included in table 4.2.1-5.

The review of these sources resulted in the identification of a number of sites with documented soil impacts in the vicinity of Project facilities. Algonquin reviewed the sites located within 500 feet of Project facilities to evaluate their distance from and hydrologic setting relative to Project areas (i.e., whether up-gradient, down-gradient, or cross-gradient) and their current regulatory status (i.e., whether available documentation indicates the continued presence of contamination). The more significant sites identified in the database search are discussed below.

Three documented spills or properties where a release of contaminants occurred were identified with a potential to impact soils along the proposed pipeline facilities in New York. Potential contaminants that may be encountered in soils proximate to these facilities include volatile organic compounds (VOC), petroleum hydrocarbons, polychlorinated biphenyls, and other industrial chemicals.

Numerous underground storage tanks that have had reported releases were historically located along the Connecticut pipeline segments. Therefore, petroleum hydrocarbon-impacted soils may be encountered during pipeline construction activities. Several industrial facilities with documented releases are also located in the vicinity of the Connecticut pipeline segments. Contaminants at these properties may include VOCs, petroleum hydrocarbons, metals, and/or other industrial chemicals. Algonquin identified one site that warrants the potential for field sampling. The site is located about 200 feet north of MP 8.6 along the E-1 System Lateral Take-up and Relay segment and is referred to as the Collins and Jewel site. The facility is listed multiple times in the Manifest database with listings associated with solvents and heavy metals. The CTDEEP also identified a concern about a second site, the Lightolier property, which is crossed by the E-1 System Lateral Take-up and Relay segment at about the same location. This site was found on multiple database searches and is listed for chlorinated VOCs and heavy metals.

Numerous filling stations and commercial properties that currently store or have historically stored petroleum are located along the West Roxbury Lateral in Massachusetts, many of which have had reported releases. The urban nature of the area suggests that fill materials were likely used to level ground surfaces during urban development. Therefore, it is possible that urban fill soils containing polycyclic aromatic hydrocarbons, metals, and petroleum hydrocarbons and other petroleum-related constituents may be encountered within the pipeline construction workspace due to the urban nature of the pipeline segment. One site was identified that warranted the potential for field sampling. The site is located adjacent to the West Roxbury Lateral at MP 2.2. According to the database search, residual concentrations of total petroleum hydrocarbons remain in the soil near the limits of the property at concentrations above Method 1 S-1 cleanup standards.

Several industrial facilities with documented releases are also located in the vicinity of the existing and proposed M&R stations in New York, Connecticut, and Massachusetts. However, most of these facilities are located far enough away that they would not impact soil conditions at the M&R stations. The one exception is the Mystic M&R Station in Massachusetts, where polycyclic aromatic hydrocarbons, metals, and/or cyanide have been detected in the soils based on past reports. No listed release sites were identified that would impact soils at the compressor stations.

TABLE 4.2.1-5

Databases Used to Identify Potentially Contaminated Sites for the AIM Project

New York	Connecticut	Massachusetts
• EPA, National Priorities List • EPA, Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) • EPA, CERCLIS – No Further Remedial Action Planned • EPA, Resource Conservation and Recovery Information System (RCRIS) – Corrective Action Facilities (CORRACTS) • RCRIS non CORRACTS Treatment, Storage, and Disposal Facilities (TSDFs) • RCRIS – for Hazardous Waste Generators (large and small quantity generators) • RCRIS – for Hazardous Waste Generators (conditionally exempt small quantity generators and non-generators) • EPA, Emergency Response Notification System (ERNS) • EPA, Facility Index System (FINDS) • U.S. Brownfields • Hazardous Substance Waste Disposal Site Inventory • Inactive Hazardous Waste Disposal Sites in New York State • Environmental Restoration Program Listing (ERP) • Solid waste facilities/landfill sites Conn(SWF/LF) • Leaking storage tank incident reports (LTANKS) • Leaking underground and aboveground storage tanks (HIST LTANKS) • Facilities that have petroleum storage capacities in excess of 1,100 gallons and less than 400,000 gallons (Underground Storage Tanks (UST) and Aboveground Storage Tanks (AST) Petroleum Bulk Storage (PBS) Database) • Major Oil Storage Facilities Database (MOSF UST and AST) Facilities that have petroleum storage capacities in excess of 400,000 gallons • New York State Hazardous Waste Manifest Database • Resource Conservation and Recovery Act (RCRA) – NonGen/ No Longer Regulated (NLR) • Spills incident database (SPILLS) • Engineering and Institutional Controls (ENG/INST Controls) • Voluntary Cleanup Agreements • Drycleaners • Brownfields • State Pollutant Discharge Elimination System	• EPA, National Priorities List • Aerometric Information Retrieval System (AIRS) • EPA, CERCLIS • EPA, CERCLIS – No Further Remedial Action Planned • EPA, RCRIS – CORRACTS) • RCRIS non CORRACTS TSDFs • RCRIS – for Hazardous Waste Generators (large and small quantity generators) • RCRIS – for Hazardous Waste Generators (conditionally exempt small quantity generators and non-generators) • EPA, ERNS • EPA, FINDS • US Brownfields • Inventory of Hazardous Disposal Sites • Site Discovery and Assessment Database (SDADB) • List of Landfills/Transfer Stations (SWF/LF) • Leaking Underground Storage Tank (LUST) • Connecticut Leachate and Wastewater Discharge Sites (LWDS) • UST Data (UST) • Oil & Chemical Spill Database (SPILLS) • Engineering Control Listing (ENG Controls) • Environmental Land Use Restriction Sites (AUL) • Voluntary Cleanup Agreements • Drycleaners • Brownfields • New York, New Jersey, Rhode Island, and Connecticut Hazardous Waste Manifest Database (Manifest) • Connecticut National Pollutant Discharge Elimination System • Contaminated or Potentially Contaminated Sites (CPCS) • RCRA TSDF • RCRA – NonGen/NLR • 2020 Corrective Action Database (2020 COR ACTION) • Connecticut Property Database (CT Property) • EDR Manufactured Gas Plant (MGP)	• EPA, National Priorities List • EPA, CERCLIS • EPA, CERCLIS – No Further Remedial Action Planned • EPA, RCRIS – CORRACTS • RCRIS non CORRACTS TSDFs • RCRIS – for Hazardous Waste Generators (large and small quantity generators) • RCRIS – for Hazardous Waste Generators (conditionally exempt small quantity generators and non-generators) • EPA, ERNS • EPA, FINDS • US Brownfields • State Hazardous Waste Sites • State Landfill or Solid Waste Disposal sites • State Registered UST • State LUST • State Leaking Aboveground Storage Tanks (LAST) • State Registered Aboveground Storage Tanks (AST) • State Release facilities (Release) • State Institutional Control/Engineering Control Registry (INST CONTROL) • State MA Spills • Drycleaners • RCRA – NonGen/NLR

4.2.2 General Impacts and Mitigation

Construction activities, such as clearing, grading, trench excavation, backfilling, and the movement of construction equipment, along the right-of-way may affect soil resources. Clearing removes protective vegetative cover and exposes the soil to the effects of wind and rain, which increases the potential for soil erosion and sedimentation of sensitive areas. Grading, spoil storage, and equipment traffic can compact soil, reducing porosity and increasing runoff potential. Excess rock or fill material brought to the surface during trenching operations could hinder the restoration of the right-of-way.

The majority of the proposed facilities would be located within or along existing utility rights-of-way to the maximum extent feasible. Utilizing existing rights-of-way would limit new soil disturbance by working within previously developed or disturbed soils and minimize land use change. To further reduce the impacts of construction on soils, Algonquin would implement its E&SCP, which incorporates all of the applicable mitigation measures outlined in the FERC Plan (FERC, 2013a) and the majority of the measures outlined in the FERC Procedures (FERC, 2013b). The E&SCP has been designed for use by Algonquin and its contractors as a guidance manual for minimizing soil disturbance and transportation of sediments off the right-of-way or into sensitive resources (wetlands, streams, and residential areas) during natural gas pipeline construction. The procedures presented in Algonquin's E&SCP represent BMPs and are designed to accommodate varying field conditions while maintaining strict minimum standards for the protection of soil resources and environmentally sensitive areas.

4.2.2.1 Soil Erosion

Algonquin would implement the measures specified in its E&SCP to avoid or minimize potential impacts due to soil erosion and sedimentation. As outlined in the E&SCP, Algonquin would have an EI monitoring all phases of construction to ensure Project plans are followed and would use erosion control devices and construction practices that would minimize erosion during and after construction. Wetland and waterbody crossings would be designed to minimize erosion. At the end of construction, Algonquin would return surface contours and drainage patterns to as close to original conditions as practicable and reestablish vegetation as soon as possible following final grading. Algonquin would inspect the right-of-way and maintain erosion and sediment controls as necessary until final stabilization is achieved. Once revegetation is satisfactory, temporary erosion control measures would be removed. Significant soil erosion is not expected during or after Project construction.

4.2.2.2 Prime Farmland and Drain Tiles

Construction activities such as clearing, grading, and equipment movement can result in soil compaction and an increased susceptibility to erosion. The loss of topsoil due to erosion or the mixing of topsoil with the subsoil during construction could result in a loss of soil fertility and impair revegetation.

Drain tiles are subsurface structures used in agricultural areas to improve the productivity of the land by increasing drainage of the soils. Drain tile damage can occur with rutting due to operation of heavy construction equipment in wet soils and excavation of the pipeline trench. Based on field surveys, the proposed Project may cross areas with drain tiles, particularly along the E-1 System Lateral Take-up and Relay in New London County, Connecticut, and along the Line-36A Loop Extension in Hartford and Middlesex Counties, Connecticut. These segments cross active agricultural fields.

Algonquin would implement the following measures for maintaining soil fertility in active agricultural lands temporarily impacted by construction activities:

- segregating up to 12 inches of topsoil to maintain surface horizons with higher organic matter content;

- backfilling rock fragments to only the top of the natural bedrock profile. Excess fragments would be disposed of in an approved manner and would not interfere with agricultural activities;
- testing topsoil and subsoil for compaction at regular intervals. Severely compacted topsoil would be plowed or a green manure such as alfalfa would be planted and plowed to decrease bulk density and improve soil structure; and
- where drain tiles are crossed, maintaining flow to the drainage system during construction. Drain tile systems would be probed beyond the trenchline to determine if any damage occurred beyond the Project excavation area. Any damage to or temporary manipulation of a drain tile system would be repaired to a level of function that meets the original condition.

We conclude that with the implementation of these mitigation measures, impacts on prime farmland and drain tiles would not be significant and would be temporary in nature.

4.2.2.3 Hydric Soils and Compaction Potential

As discussed in section 4.2.1.1 above, very poorly and poorly drained soils are prone to compaction and structural damage if disturbed due to permanent or frequent saturation at or near the soil surface. Algonquin's E&SCP provides detailed descriptions of wetland and waterbody crossing techniques designed to minimize damage to saturated soils, as well as other soils that may be vulnerable to such damage when wet. Wetland and waterbody construction methods and mitigation are also described in sections 4.3.2 and 4.4.2.

To the extent practicable, Algonquin would avoid construction during periods of heavy rainfall, snowmelt, or unusual soil saturation. Topsoil would be segregated in wetlands and residential areas and then later returned as the surficial layer. Timber mats would be used to minimize rutting and compaction within saturated wetland soils. Grading to restore natural site contours and repair rutted areas would be completed before final revegetation, seeding, and mulching, which would initiate natural restoration of soil structure and bulk density. Given these measures, that Project activities would not result in significant adverse soil structural damage or compaction. Any impacts on soil structure would be temporary.

4.2.2.4 Post Construction Revegetation

As described in Algonquin's E&SCP, soils disturbed by the Project would be revegetated using a seed mix composed primarily of grasses, herbaceous plants, and legumes or as specified by landowners. Algonquin would also segregate topsoil, where required, to optimize revegetation potential as described in its E&SCP. The E&SCP guidelines and requirements were developed based on the guidelines and recommendations from the FERC, USACE, FWS, and the NRCS. Appendix B of the E&SCP contains seed mix recommendations.

Soils in the Project area typically exhibit characteristics sufficient for successful revegetation, and where limitations exist, they would easily be overcome by implementing construction and BMP procedures. Standard revegetation measures include fertilizer and pH amendments (except in wetlands), seedbed preparation, use of a proven seed mix, consideration of seasonal constraints, and mulch application. Where necessary, erosion control fabric or matting would be used on steep slopes to ensure that soils successfully revegetate. Algonquin would monitor all disturbed areas for two growing seasons after construction to evaluate revegetation success of the Project area in accordance with the E&SCP. Areas that have not revegetated successfully would be corrected to ensure the right-of-way conditions are similar to the surrounding undisturbed areas. Based on previous experience with revegetation of pipeline facilities, Algonquin does not anticipate significant problems with revegetation. With adherence to the protocols outlined in Algonquin's E&SCP, revegetation should be successful.

4.2.2.5 Shallow Bedrock

It is anticipated that widespread areas of soils with shallow bedrock would be encountered in the Project area. As a result, Algonquin anticipates that rock excavation and/or rock blasting during construction activities would be necessary. The new West Roxbury Lateral would be located through an area of shallow bedrock, including an area adjacent to the West Roxbury Crushed Stone Quarry.

For the segments of the pipeline that would be replaced, a trench was previously excavated to install the existing pipelines so substantial bedrock removal in these locations is not anticipated. However, it is possible that limited bedrock removal may be required with blasting to widen or deepen the trench to accommodate the installation of the larger diameter replacement pipeline. Rock removal activities are discussed in more detail in section 4.1.6 and in the AIM Project Rock Removal Plan provided as appendix E.

The introduction of subsoil rocks into agricultural topsoil would be minimized by segregating topsoil from trench spoil and replacing topsoil in agricultural areas after cleanup. Algonquin would make diligent efforts to remove excess rock from surficial soils to the extent practicable in cultivated and rotated croplands, hayfields, pastures, residential areas, and at landowner's request in other areas. Algonquin would remove excess rock from surface soils disturbed by construction such that the size, density, and distribution of rock on the construction right-of-way would be similar to adjacent non-right-of-way areas. Algonquin would not remove rocks from backfilled areas, if the rock in the backfill is consistent in size and density with conditions in adjacent undisturbed areas. If bedrock is encountered, Algonquin would take precautions to minimize the mixing of excavated bedrock with backfill and would replace rock in the trench to a level that is not higher than the original bedrock profile. If blasting is required, Algonquin would use the minimum explosive charge necessary to fracture bedrock and minimize shot-rock from leaving the construction right-of-way. Where necessary, excess rock would be hauled off the right-of-way or left on the right-of-way, subject to landowner approval and applicable permit conditions.

In the event that bedrock is encountered within the trench depth in residential or agricultural lands crossed by the Project, several measures to prevent incorporation of rock into the topsoil would be implemented. These measures include topsoil segregation and protection along the trench, rock backfill in residential and agricultural areas only to the top of bedrock, and disposal of excess rock fragments in an approved manner so as to not incorporate rock fragments into topsoil layers. Through adherence to these measures, no significant increase in the rock content of topsoil in residential or agricultural areas is anticipated.

4.2.2.6 Contaminated Soils

Soil contamination along the proposed Project may result from at least two sources: hazardous material or fuel spills during construction and/or those occurring before construction in pre-existing contaminated areas that are encountered during construction. Contamination from spills or leaks of fuels, lubricants, and coolant from construction equipment could adversely affect soils. The effects of such contamination are typically minor because of the low frequency and volumes of spills and leaks. Algonquin has developed an acceptable SPCC Plan that specifies cleanup procedures to minimize the potential for soil contamination from spills or leaks of fuel, lubricants, coolants, or solvents. Algonquin and its contractors would use the SPCC Plan to minimize accidental spills of materials that may contaminate soils, and to ensure that inadvertent spills of fuels, lubricants, or solvents are contained, cleaned up, and disposed of as quickly as possible and in an appropriate manner.

To-date, Algonquin has determined that field sampling would be required at two locations prior to construction. The first location is along the E-1 System Lateral Take-up and Relay segment near MP 8.6 (Collins and Jewel site) and the other is along the West Roxbury Lateral Pipeline near MP 2.2. However, the CTDEEP also identified a concern about encountering contamination at a third site near the Lightolier property (also near MP 8.6 along the E-1 System Lateral Take-up and Relay). Although the Collins and Jewel site is located in this same area, it is unclear whether or not sampling would also occur on the Lightolier property. In addition, Algonquin continues to research other locations where sampling may be necessary and has not yet provided details on the protocols for any sampling. Therefore, **we recommend that:**

- **<u>Prior to construction of the AIM Project</u>, Algonquin should file with the Secretary of the Commission (Secretary), for review and written approval of the Director of the Office of Energy Projects (OEP), a Field Sampling Plan for potential contaminated sites that could be encountered during construction. The Field Sampling Plan should include the locations of all proposed sampling, the number of samples to be taken, how and where the samples will be analyzed, the schedule for when the sampling would occur, and the process for providing the results to the applicable agencies.**

In the event that contamination is encountered during construction, Algonquin would implement the protocols in its Unexpected Contamination Encounter Procedures.[1] If contaminated soils are encountered during construction, all personnel would stop work, leave the contaminated area, and notify the chief inspector on site. Additional notifications would then be made including outside agencies if required. Algonquin would implement the following measures to transport and manage excavated soil to designated soil staging areas, characterize the soils for waste disposal, and ensure that all soils are managed in accordance with state and federal regulations:

- limit personnel working within the contamination area during cleanup operations to individuals with current Hazardous Waste Operations and Emergency Response (HAZWOPER) training;
- stockpile material on impermeable sheeting;
- rope off stockpiled area to prevent unauthorized entry; and
- place contaminated material in appropriately labeled and stored containers.

We have reviewed the Unexpected Contamination Encounter Procedures and find it acceptable.

Contamination may be present within surficial soils at locations where a HDD is proposed. Algonquin conducted a review of each of the planned HDD entry/exit locations and found no documented soil contamination. The only site where there was a record of historic contamination was at the former Mirant Lovett property in New York, where the entry hole for the HDD crossing on the west side of the Hudson River would be located. A Remedial Action Closeout Report was filed with the NYSDEC in 2008 demonstrating that a past fuel oil release at the site had been effectively remediated. Therefore, contamination is not expected to be encountered during HDD activities.

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[1] Algonquin's Unexpected Contamination Encounter Procedures was provided as part of its responses to the April 10, 2014 FERC Environmental Data Request filed on April 30, 2014 (Accession No. 20140430-5528). The Unexpected Contamination Encounter Procedures 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 20140430-5528 in the "Numbers: Accession Number" field.

4.3 WATER RESOURCES

4.3.1 Groundwater Resources

4.3.1.1 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 three main consolidated bedrock aquifer types are carbonate rock, crystalline rock, and sandstone (Olcott, 1995). Carbonate rock aquifers are predominately located in the Project area in eastern New York and western Connecticut. Carbonate rock aquifers are composed primarily of limestone, dolomite, and marble, and are characterized by dissolution by slightly acidic groundwater that enlarges pre-existing openings such as pores, joints, and fractures (Miller, 1999). Water from these aquifers is generally very hard and slightly alkaline (Olcott, 1995). Wells in carbonate-rock aquifers generally yield 10 to 30 gallons per minute (gpm). Yields can be larger or smaller, however, depending on the degree of fracturing and the number and size of dissolution features in the rock. For example, yields of as much as 1,000 gpm have been reported in some wells in carbonate-rock aquifers with numerous dissolution openings (Olcott, 1995).

All of the existing and proposed Project facilities in Rhode Island and Massachusetts, and a majority of the facilities in Connecticut, would be located within crystalline-rock aquifers. Crystalline-rock aquifers are formed of igneous and metamorphic rocks, and water transmission through this type of substrate is very low and the volume of water storage capacity is generally small (Olcott, 1995). 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 water in nearby streams or other surface waterbodies is commonly connected hydraulically 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 (Olcott, 1995). Groundwater quality in the crystalline-rock aquifer system is generally suitable for most uses because the rock is composed of nearly insoluble minerals, groundwater is in contact with relatively small surface areas within the joints and fractures, and water movement through the joints and fractures is generally rapid (Olcott, 1995). In some areas, excessive concentrations of iron, manganese, and sulfate are present. Large concentrations of radon, a radioactive gas, have been reported in water from the crystalline-rock aquifers in all of the New England States except Vermont (Olcott, 1995).

Two pipelines segments and some Project facilities are located over sandstone aquifers in New York and Connecticut. The sandstones are productive aquifers with well yields ranging from 50 to 100 gpm. Water in these aquifers generally is confined (Olcott, 1995). The sandstone aquifers in the Project area are characterized by fracture permeability. Water in the upper 200 to 300 feet of the aquifer is moderately hard and slightly alkaline (Olcott, 1995).

Surficial aquifers are scattered throughout New York, Connecticut, Massachusetts, and Rhode Island. A majority of the surficial aquifers along the Project area are present from central Connecticut to Massachusetts. The surficial aquifer system consists of glacial deposits of sand and gravel that were laid down 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).

4.3.1.2 Sole Source Aquifers

The EPA defines a sole or principal source aquifer (SSA) area as one that supplies greater than 50 percent of 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 (EPA, 1992). According to the EPA's designated SSA maps for the Project area (EPA, 1992), the majority of the Project facilities are not located within a designated SSA. However, one designated SSA (the Ramapo River Basin Aquifer System) would be crossed by the Haverstraw to Stony Point Take-up and Relay segment in New York. The pipeline segment would cross about 0.6 mile of the Ramapo River Basin Aquifer System near the northern edge of the SSA between MPs 0.0 and 0.6.

The Ramapo River Basin Aquifer System is located in Bergen and Passaic Counties, New Jersey and Orange and Rockland Counties, New York. The area is underlain primarily by Precambrian metamorphic rocks; Triassic-age sedimentary bedrock; unconsolidated Quaternary-age, glacial outwash deposits; and more recent alluvial deposits. This aquifer system supplies about 57 percent of the population with drinking water within the SSA, including the Towns of Haverstraw and Stony Point (EPA, 1992).

4.3.1.3 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. State-designated aquifers are discussed further below.

The NYSDEC designates highly productive aquifers presently being utilized as sources of water supply by municipal water supply systems as Primary Water Supply Aquifers (Primary Aquifer) (1990). The only Primary Aquifer crossed by the Project in New York is the Ramapo River Basin Aquifer System. This aquifer comprises valley-fill deposits consisting of alluvial silt and sand, glacial outwash (sand and gravel), ice-contact sand and gravel, till, and lacustrine silt and clay. The sand and gravel beds have relatively high permeability, whereas the till, silt, and clay deposits have relatively low permeability. Water table conditions prevail in unconfined sand and gravel buried under silt, clay, and till in parts of the Mahwah River valley. Artesian conditions prevail in confined sand and gravel buried under silt and clay and till in parts of the Mahwah valley. The aquifer is recharged throughout, where the land surface is most permeable and is greatest along the margin of the valley, where runoff from the hillsides is concentrated (Moore et al., 1982).

Connecticut Water Quality Standards provide a groundwater quality classification scheme that differentiates groundwater by designated use and discharge restrictions that are applied across the entire state (CTDEEP, 2013o). The proposed Project is located primarily within groundwater quality class GA. The GA designation indicates groundwater within the designated area is used for existing private and potential public or private supplies of water suitable for drinking without treatment and baseflow for hydraulically connected surface waters (CTDEEP, 2013r).

The most productive aquifers in Rhode Island are located in areas of glacial deposits of stratified drift, though the fractured bedrock throughout the state serves as an important aquifer to many public and private wells. RIDEM reports that about 26 percent of the population in Rhode Island relies on groundwater from public and private wells throughout roughly two-thirds of the state's municipalities (RIDEM, 2013a). The Burrillville Compressor Station in Rhode Island is not located within any significant state aquifer system.

The MADEP defines a Potentially Productive Aquifer as any aquifer delineated by the USGS to have either medium or high yield (Massachusetts Office of Geographic Information Systems [MassGIS], 2012). The West Roxbury Lateral crosses a portion of the Charles River Basin, a state-designated aquifer, from MPs 1.8 to 2.9. This portion of the aquifer is designated as a medium yield aquifer. In addition, Algonquin's existing Wellesley M&R Station is located within the Charles River Basin aquifer where it is designated as a high yield aquifer (MassGIS, 2013a).

4.3.1.4 Wellhead and Aquifer Protection Areas

Under the Safe Drinking Water Act (SDWA), each state is required to develop and implement a Wellhead Protection Program (WHPP) in order to identify the land and recharge areas contributing to public supply wells, and prevent the contamination of drinking water supplies. The SDWA 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 WHPP in New York is administered by the New York State Department of Health (NYSDOH) as part of the SWAP. The SWAP provides information on 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 WHPAs in the Project area in New York (NYSDOH, 2013a). The Project facilities in New York are not located within any state-designated well head protection zones.

The CTDEEP refers to WHPAs as Aquifer Protection Areas (APA). The APA 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 (CTDEEP, 2013g). The APAs are delineated by the individual water companies owning the well fields and approved by the CTDEEP. The Project facilities in Connecticut cross three state-designated APAs. Algonquin's proposed Line-36A Loop Extension in Cromwell crosses one state-designated APA between MPs 1.4 and 2.0. Algonquin's Southeast to MLV-19 Take-up and Relay segment crosses a second state-designated APA between MPs 2.3 and 2.6 in the City of Danbury. Algonquin's existing Farmington M&R Station is located within a state-designated APA.

Groundwater in Rhode Island is generally free of pollutants and over 90 percent of the state is classified as suitable for drinking water use without treatment (RIDEM, 2013a). The state's groundwater resources are considered vulnerable to contamination because of the generally shallow depth to groundwater, aquifer permeability and the absence of subsurface confining layers. RIDEM has designated wellhead protection areas for all 665 public wells in Rhode Island identified as of January 2009 (RIDEM, 2013a). The existing Burrillville Compressor Station in Rhode Island is not located within any state-designated wellhead protection areas.

The MADEP requires public water utilities to protect Zone II recharge areas with municipal bylaws, ordinances, and/or health regulations. If the Zone II area is outside a public water system's municipality, the municipalities where the Zone II area is located must demonstrate to the MADEP that best efforts are being made to protect the Zone II area (MADEP, 2013a). Algonquin's existing Brockton M&R Station is the only Project facility located within a state-designated wellhead protection area.

4.3.1.5 Water Supply Wells and Springs

To obtain information on water supply wells and springs within the Project area, data were reviewed from the NYSDEC Water Well Information Search Wizard (NYSDEC, 2013c); CTDEEP's geospatial data for public supply wells in designated APAs (CTDEEP, 2013g); GIS data provided by the Connecticut Department of Public Health (CDPH) (CDPH, 2013); and the MADEP's Water Quality Testing System (MassGIS, 2013b). Additional information was also requested from the NYSDOH regarding the locations of public water supply wells and springs within 150 feet of the Project. Information on the locations of private wells and springs from landowners along the Project route was also collected. Based on available information, 93 private domestic wells, 1 public well, and no springs were identified within 150 feet of the construction work area for the Project (see table 4.3.1-1).

In addition to these features, the proposed Stony Point to Yorktown Take-up and Relay segment crosses the Catskill Aqueduct near MP 10.3 and the Cortlandt M&R Station. Additional discussion of the crossing of this aqueduct is provided in section 4.3.2.1.

4.3.1.6 Potential Contaminated Groundwater

As discussed in section 4.2.1.5, Algonquin conducted a corridor database search using EDR to identify various facilities with potential and/or actual sources of contamination that may impact nearby groundwater along the existing and proposed pipeline and aboveground facilities in New York, Connecticut, and Massachusetts. Rhode Island was not included in the search, because only one facility (Burrillville Compressor Station) would require work and that activity would take place within Algonquin's existing facility. A list of databases searched is included in table 4.2.1-5. Algonquin reviewed the sites located within 500 feet of Project facilities to evaluate their distance from and hydrologic setting relative to Project areas (i.e., whether up-gradient, down-gradient, or cross-gradient) and their current regulatory status (i.e., whether available documentation indicates the continued presence of contamination). Information on the documented sites that were determined to potentially affect construction of the pipeline segments and aboveground facilities is provided in section 4.2.1.5. To-date, Algonquin has indicated that there are only two sites within the Project area in Connecticut and Massachusetts where groundwater contamination could be encountered during construction (table 4.3.1-2).

Numerous residential petroleum storage tanks and commercial filling stations that currently store or have historically stored petroleum are located along the Stony Point to Yorktown Take-up and Relay segment and have had reported releases. However, most of the Project facilities are located in a presumed down- or cross-gradient direction, or are considered to be located at a great enough distance away from the release sites that those releases are unlikely to impact groundwater beneath the pipeline segments in New York. Based on review of additional site information, there are no sites in New York that would require field sampling investigations.

We received a scoping comment related to existing groundwater contamination at the IPEC. In 2005, Entergy Nuclear Operations, Inc. (Entergy), the IPEC operator, discovered water leaking from a crack in the exterior of the Unit 2 spent fuel pool. Following the report of the leak to the NYSDEC and the Nuclear Regulatory Commission (NRC), Entergy conducted an investigation, supervised by NYSDEC and NYSDOH staff, to evaluate the leak and assess potential environmental effects. The investigation identified a plume of tritium (radioactive hydrogen) contamination in groundwater coming from the Unit 2 spent fuel pool and a plume of strontium-90 contamination associated with the Unit 1 spent fuel pool complex. In addition to the radioactive hydrogen and strontium-90, three other radionuclides (Nickel-63, Cobalt-60, and Cesium-137) were also sporadically detected during the groundwater monitoring study, but were isolated to specific locations within the IPEC site. Hydrogeological analysis of the plumes and groundwater movement at the site demonstrated that groundwater from the site flows east to west, directly toward and into the Hudson River; groundwater does not flow off site to the north, south, or east (NYSDEC, 2014d, 2014b; NRC, 2014).

TABLE 4.3.1-1

Water Supply Wells and Springs Within 150 Feet of the Construction Work Area for the AIM Project

Facility/Municipality, State	Supply Type	Approximate MP [a]	Approximate Distance from Pipeline (feet)	Approximate Distance from Construction Work Area (feet)	Direction from Construction Work Area
PIPELINE FACILITIES					
Replacement Pipeline					
Haverstraw to Stony Point Take-up and Relay					
Haverstraw, NY	Public, Community	1.1	125	100	NW
	Domestic	1.1	175	150	SE
Stony Point, NY	Domestic	1.1	150	125	NW
	Domestic	1.4	200	125	NW
	Domestic	1.6	100	25	NW
	Domestic	1.6	75	25	NW
	Domestic	1.7	150	75	NW
	Domestic	2.5	150	100	NW
	Domestic	2.5	100	150	NW
	Domestic	2.6	200	150	NW
	Domestic	2.6	200	150	NW
	Domestic	2.6	175	125	NW
	Domestic	2.7	175	125	N
	Domestic	2.7	100	75	N
	Domestic	2.7	225	150	N
	Domestic	2.8	225	150	NW
	Domestic	2.8	225	150	NW
	Domestic	2.8	225	150	NW
	Domestic	2.9	225	125	NW
	Domestic	2.9	225	125	NW
	Domestic	2.9	100	25	NW
Stony Point to Yorktown Take-up and Relay					
Stony Point, NY	Domestic	0.2	102	67	SE
	Domestic	0.4	61	11	SE
	Domestic	0.4	102	56	NW
	Domestic	0.5	169	144	NW
	Domestic	0.5	222	89	SE
	Domestic	1.4	144	89	SE
	Domestic	1.5	172	122	SE
	Domestic	1.7	178	89	SE
	Domestic	1.7	64	39	NW
	Domestic	2.0	122	72	NW
	Domestic	2.2	44	64	NW
	Domestic	2.2	125	50	S
	Domestic	2.2	133	158	NW
	Domestic	2.3	59	39	N
	Domestic	2.4	72	20	S
	Domestic	2.4	194	150	SE

TABLE 4.3.1-1 (cont'd)

Water Supply Wells and Springs Within 150 Feet of the Construction Work Area for the AIM Project

Facility/Municipality, State	Supply Type	Approximate MP [a]	Approximate Distance from Pipeline (feet)	Approximate Distance from Construction Work Area (feet)	Direction from Construction Work Area
	Domestic	2.4	69	44	NW
	Domestic	2.4	132	77	S
	Domestic	2.5	>150	150	N
	Domestic	2.5	>125	125	NE
	Domestic	2.5	>100	100	W
	Domestic	2.9	>100	100	SW
	Domestic	3.1	75	50	W
	Domestic	3.1	150	125	W
	Domestic	3.1	>150	150	W
	Domestic	3.1	>150	150	W
Southeast to MLV 19 Take-up and Relay					
Danbury, CT	Domestic	2.0	160	120	NW
	Domestic	2.3	300	160	NW
	Domestic	2.4	100	50	N
	Domestic	2.4	110	40	N
	Domestic	2.5	85	65	SE
	Domestic	3.2	233	150	NW
	Domestic	3.2	110	30	NW
	Domestic	3.2	110	33	NW
	Domestic	3.4	111	55	NW
	Domestic	3.4	28	0	NW
	Domestic	3.4	177	122	NW
	Domestic	3.4	166	95	NW
	Domestic	3.4	100	15	NW
	Domestic	3.4	100	20	NW
	Domestic	3.4	110	60	SE
	Domestic	3.5	118	62	SE
	Domestic	3.5	200	150	NW
	Domestic	3.5	110	55	NW
	Domestic	3.8	160	55	NW
	Domestic	3.8	150	88	NW
	Domestic	3.9	123	66	NW
	Domestic	3.8	125	90	SE
	Domestic	3.9	50	5	NW
	Domestic	3.9	144	55	SE
	Domestic	3.9	172	121	NW
	Domestic	4.0	168	150	NW
	Domestic	4.0	200	150	NW
	Domestic	4.0	134	77	NW
	Domestic	4.0	77	28	NW
	Domestic	4.2	94	60	SE
	Domestic	4.3	150	84	N

TABLE 4.3.1-1 (cont'd)

Water Supply Wells and Springs Within 150 Feet of the Construction Work Area for the AIM Project

Facility/Municipality, State	Supply Type	Approximate MP [a]	Approximate Distance from Pipeline (feet)	Approximate Distance from Construction Work Area (feet)	Direction from Construction Work Area
	Domestic	4.3	126	111	SE
	Domestic	4.3	150	117	N
	Domestic	4.4	117	55	S
	Domestic	4.4	95	55	N
	Domestic	4.4	227	18	N
	Domestic	4.4	194	150	N
E-1 System Lateral Take-up and Relay					
Lebanon, CT	Domestic	0.0	165	15	SW
Franklin, CT	Domestic	5.9	100	30	NE
	Domestic	7.3	80	0	SW
E-1 System Lateral Loop Extension					
Montville, CT	Domestic	0.0	152	100	NE
	Domestic	0.0	170	140	W
	Domestic	0.1	30	25	W
	Domestic	0.2	128	98	W
	Domestic	1.3	73	35	W
	Domestic	1.3	182	150	SW
ABOVEGROUND FACILITIES					
E-1 12-inch Loop Receiver Facility					
Montville, CT	Domestic	0.0	152	100	NE

TABLE 4.3.1-2

Potential Contaminated Groundwater Sites Crossed by the Pipeline Route for the AIM Project[a]

State/Segment/Site Name	MP	Distance/Direction from Right-of-Way	Contaminants
PIPELINE FACILITIES			
Connecticut			
E-1 System Lateral Take-up and Relay			
Collins & Jewel	8.6	~200 feet north	Solvents and heavy metals.
Massachusetts			
West Roxbury Lateral Pipeline			
580 Providence Hwy, Dedham, MA	2.2	Adjacent	Petroleum hydrocarbons. Gasoline in soils.

[a] Due to the extensive number of releases in this pipeline corridor, those releases that have achieved permanent regulatory closure without use limitations were not evaluated in this review, unless located in the immediate vicinity of the pipeline. In addition, those listings greater than 1,000 feet from the pipeline were excluded from this review. It should be anticipated that urban fill soils containing polycyclic aromatic hydrocarbons, metals, and petroleum hydrocarbons would be encountered throughout the corridor due to the urban nature of the pipeline segment.

The proposed Project facilities near the IPEC would be located south and east of the IPEC site. The closest point of the proposed workspace to the IPEC site would be about 1,560 southeast of the security fence. The proposed workspace would be more than 2,300 feet southeast of the mapped plumes of strontium-90 and radioactive hydrogen contaminated groundwater. As noted above, groundwater flow at the IPEC site moves westward toward and into the Hudson River; there is no flow of contaminated groundwater off site to the south, east, or north. As a result, the proposed Project facilities would not interact with radiologically contaminated groundwater at the IPEC site.

Numerous releases at underground storage tanks or industrial facilities have been reported within 1 mile of the pipeline route and aboveground facilities in Connecticut. However, most of the Project facilities are located in a presumed down- or cross-gradient direction, or are located at a great enough distance from the Project, that those releases would be unlikely to impact groundwater beneath the pipeline segments in Connecticut. Based on review of additional site information, Algonquin would undertake field sampling investigations at the Collins and Jewel site at MP 8.6 of the E-1 System Lateral Take-up and Relay segment in Connecticut. However, the CTDEEP also identified a concern about encountering contaminated groundwater near the Lightolier property (near MP 8.6). Although the Collins and Jewel site is located in this same area, it is unclear whether or not sampling would also occur on the Lightolier property itself. Therefore, we have recommended that Algonquin develop a Field Sampling Plan that includes the locations of all proposed sampling as well as proposed sampling protocols (see section 4.2.2.6).

Numerous filling stations and commercial properties that currently store, or have historically stored, petroleum are located along the West Roxbury Lateral pipeline. The EDR report indicates that many of these properties have had reported releases. Additionally, the urban nature of the area suggests that fill materials were likely used to level ground surfaces during urban development. Therefore, it is anticipated that groundwater may be impacted by contaminants such as polycyclic aromatic hydrocarbons, metals, and petroleum hydrocarbons throughout the pipeline corridor. However, based on the average depth to groundwater (i.e., 10 to 15 feet below ground surface), groundwater is not expected to be encountered in the majority of the corridor during pipeline construction activities. Therefore, the majority of release sites in the vicinity of the pipeline corridor are not expected to impact pipeline construction with respect to groundwater contamination. Based on review of additional site information, Algonquin has indicated it would undertake field sampling investigations at one site along the proposed West Roxbury Lateral pipeline in Massachusetts (MP 2.2 in Dedham). As discussed above, we have recommended that Algonquin develop a Field Sampling Plan that includes the locations of all proposed sampling as well as proposed sampling protocols (see section 4.2.2.6).

4.3.1.7 General Impacts and Mitigation

Project construction activities with the potential to impact groundwater include trench dewatering, blasting, spills or leaks of hazardous materials, and HDD. Shallow aquifers could sustain minor, indirect impacts from changes in overland sheet flow and recharge caused by clearing and grading of the proposed right-of-way. Near surface soil compaction caused by heavy construction equipment could reduce the ability of soils to absorb water in isolated areas. Aboveground facilities could add minor impervious surfaces; however, they are unlikely to affect groundwater recharge outside of the facility limits. Local water table elevations could be affected by trenching and backfilling. These minor impacts would be temporary and would not significantly affect groundwater resources. 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.

In areas where groundwater is near the surface, trench excavation may intersect the water table in low-lying areas. Dewatering of trenches may result in temporary fluctuations in local groundwater levels. Trench water would be discharged into well-vegetated upland areas to allow infiltration and to minimize impacts on the water table. These potential impacts would be avoided or further minimized by use of construction techniques described in Algonquin's E&SCP, such as the use of temporary and permanent trench plugs and interceptor dikes. After installation of the proposed pipeline and aboveground facilities, the ground surface would be restored as close as possible to original contours and any exposed soils would be revegetated to ensure restoration of preconstruction overland flow and recharge patterns. Therefore, these minor, direct, and indirect impacts would be temporary and would not significantly affect groundwater resources.

Public and private water supply wells within 150 feet of the Project could be impacted by construction activities, including areas where blasting of bedrock would be required. These affects would be monitored and would be minimized by following the procedures outlined in Algonquin's Rock Removal Plan (see appendix E), which we find acceptable. Two wells are located within the construction workspace. Both would be protected by safety fencing during construction. Algonquin would contact any landowner with water supply wells within 150 feet of the construction workspace and offer to conduct pre- and post-construction monitoring of well yield and water quality. 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 would be provided, or the landowner would be fairly compensated for damages. Given the number of water supply wells within 150 feet of the construction workspace associated with the Project facilities, **we recommend that:**

- **<u>Within 30 days of placing the AIM Project facilities in service</u>, Algonquin should file with the Secretary a report discussing whether any water supply well complaints concerning well yield or quality were received and how each was resolved.**

Unconfined aquifers and shallow groundwater areas could be vulnerable to contamination caused by inadvertent surface spills of hazardous materials used during construction. Accidental spills and leaks associated with refueling or storage of fuel, oil, or other fluids pose the greatest risk to groundwater resources. If not cleaned up, contaminated soil could continue to leach and add pollutants to groundwater long after a spill has occurred. Impacts associated with spills or leaks of hazardous liquids would be avoided or minimized by restricting the location of refueling and storage facilities and by requiring cleanup in the event of a spill or leak.

Implementation of the measures in Algonquin's SPCC Plan would minimize the potential for groundwater impacts associated with an inadvertent spill of hazardous materials. The SPCC Plan identifies preventive measures to reduce the likelihood of a spill, such as secondary containment for petroleum products, daily equipment inspections for leaks, and restrictions on the transport of potentially hazardous materials to the construction work areas. The SPCC plan also specifies measures to contain and clean up a spill should one occur. Implementation of Algonquin's SPCC Plan would adequately address the storage and transfer of hazardous materials and petroleum products. Therefore, we find the potential for the Project to contaminate local aquifers or water supply wells would be minimal.

Impacts associated with unexpected contaminated groundwater would be avoided or minimized by following the procedures outlined in Algonquin's Unexpected Contamination Encounter Procedures, which we find to be acceptable. Contractors would be trained to assess any potential contamination by assessing the Project and surrounding area and/or past history of the site. Should contamination be encountered, sampling would be conducted and appropriate cleanup measures would be undertaken. Work would continue only after appropriate cleanup has occurred. By implementing the measures included in the Unexpected Contamination Encounter Plan, the potential impacts on soils and groundwater due to construction activities would be minimized.

Contamination may be present within shallow groundwater at locations where a HDD is proposed. Algonquin conducted a review of each of the planned HDD entry/exit locations and found no documented groundwater contamination. The only site where there was a record of historic contamination was at the former Mirant Lovett property in New York, where the entry hole for the HDD crossing on the west side of the Hudson River would be located. A Remedial Action Closeout Report was filed with the NYSDEC in 2008 demonstrating that a past fuel oil release at the site had been effectively remediated. Therefore, contamination is not expected to be encountered during HDD activities.

Algonquin would employ several EIs to ensure compliance with the E&SCP, SPCC Plan, the Unexpected Contamination Encounter Plan, and other Project-specific plans and specifications during construction and restoration. The EI(s) would have the authority to stop work and order corrective actions for activities that violate the environmental conditions of the FERC Certificate and other authorizations.

Construction activities are not likely to significantly impact groundwater resources because the majority of construction would involve shallow, temporary, and localized excavation. Because Project disturbances would generally be temporary and limited to the ground surface and shallow excavation, erosion controls and stormwater management would be implemented, and natural ground contours and vegetation would be restored, we conclude that construction and operation of the Project would not result in significant impacts on groundwater resources or users of groundwater in the Project area.

4.3.1.8 Groundwater Uses During Construction

As discussed in sections 2.3.1.2 and 4.3.2.3, Algonquin would use the HDD intersect method at two locations along the proposed pipeline route. This intersect method involves drilling from both sides of the waterbody and intersecting in the middle. This method allows the exact drill entry and exit locations to be predetermined. This process also enables the drilling path to have an instant hydraulic connection once the intersect is complete providing for a cleaner pilot hole. The installation is a multi-stage process consisting of establishing a small diameter pilot hole followed by enlargement of the pilot hole through successive reaming passes until the hole is large enough to accommodate the pipe. Throughout the process of drilling, a slurry made of non-toxic/non-hazardous bentonite clay, additives, and water, referred to as drilling mud, would be circulated through the drilling tools to lubricate the drill bit, remove drill cuttings, and hold the hole open. Algonquin is proposing to use municipal sources of water for the HDD operations. The estimated requirements for each of the proposed HDDs are listed in table 4.3.1-3.

TABLE 4.3.1-3 **Estimated Fresh Water Usage for Horizontal Directional Drills for the AIM Project**			
HDD	MP	Maximum Estimated Volume (gallons)	Water Source
New York			
42-inch-diameter Hudson River HDD	3.2 to 3.9	800,000	Municipal
Connecticut			
42-inch-diameter Interstate 84/Still River HDD	1.4 to 2.1	2,000,000	Municipal
TOTAL		**2,800,000**	

During the HDD installation, the drilling mud returns would be circulated through mud pits to remove the drill cuttings and the bentonite would be recycled for use as the drilling operation continues. After completion of the HDD operations, the recovered drilling mud would be recycled or disposed of at an approved disposal site and would not be expected to impact water resources.

4.3.2 Surface Water Resources

4.3.2.1 Existing Surface Water Resources

Surface water resources were initially identified using USGS topographic maps and subsequently surveyed during wetland field delineations conducted in 2013. In areas where access was not granted, environmental information was determined using USGS mapping, aerial imagery, and other GIS-based information. Table I-1 in appendix I lists the waterbodies that would be crossed by name, location, crossing width, flow type, FERC classification, fishery type, state water quality classification, and proposed crossing method. A total of 108 waterbody crossings would be required for the Project. These include 42 perennial streams, 62 intermittent streams, 3 ephemeral streams, and 1 ponded area.

Pipeline Facilities

The New York portion of the Project crosses 39 waterbodies within 8 subbasin level watersheds in Rockland, Westchester, and Putnam Counties. Of these 39 waterbodies, 20 are perennial streams and 19 are intermittent streams. The Hudson River is the only major waterbody (greater than 100 feet wide) crossed by the pipeline segments. Six of the proposed crossings are intermediate crossings (between 10 and 100 feet wide), and the remaining 32 crossings are minor crossings (less than 10 feet wide). In addition to these features, the proposed Stony Point to Yorktown Take-up and Relay segment crosses the Catskill Aqueduct near MP 10.3.

Several comments were received during scoping about the Project's potential to impact the watersheds that supply water to the New York City metropolitan area. Water supply to the New York City metropolitan area is provided from three primary sources: the Croton, the Catskill, and the Delaware Water Supply Systems. While the Catskill and Delaware Water Supply Systems are located about 50 miles north and northwest of the AIM Project facilities, portions of the AIM Project facilities would be located within the Croton Water Supply System. The Croton Water Supply System receives its supply of water from the Croton Watershed, which is also part of the New York City East of Hudson Watersheds. The Croton Watershed is generally bordered by the Hudson River to the west, Dutchess County to the north, the Connecticut state border to the east, and Kensico Reservoir to the south. This watershed is part of the system that serves 9 million people in urban areas of New York, as well as the 250,000 people in Westchester and Putnam counties. The Croton Watershed is protected under a long-term management plan by the New York City Department of Environmental Protection (NYCDEP). As shown on figure 4.3.2-1, the Croton Watershed would be crossed by the Stony Point to Yorktown Take-up and Relay segment between MPs 10.0 and 12.3 in the Town of Cortlandt and by the Southeast to MLV-19 Take-up and Relay segment between MPs 0.0 and 0.1 in the Town of Southeast.

The Catskill Aqueduct is part of the New York City water supply system. It brings water from the Catskill Mountains to Yonkers where it connects to other parts of the system. During the scoping process, several comments were also received about the Project's impact on the aqueduct. Algonquin's existing pipelines currently cross over the aqueduct. As currently proposed, Algonquin would remove its existing 26-inch-diameter pipeline and replace it with the proposed 42-inch-diameter pipeline in the same location. The 26-inch-diameter pipeline and associated casing pipe that crosses the aqueduct would be removed and the 42-inch-diameter pipeline would be installed within a new casing pipe above the aqueduct. As with the existing pipeline, the new pipeline would be located above the aqueduct and would rest on concrete pads to provide adequate separation and protection for the aqueduct pipe. Algonquin continues to consult with the NYCDEP regarding this crossing. Algonquin is also evaluating a route variation that would relocate this segment 50 feet to the south of the existing 26-inch-diameter pipeline. This modification would place the new 42-inch-diameter pipeline at the edge of Algonquin's existing right-of-way and would require additional permanent easement and temporary construction workspace. We analyzed this variation in section 3.5.4. NYCDEP would require a Land Use Permit with detailed descriptions of work and additional information regarding impacts on the aqueduct resulting from construction and operation of the Project facilities. Algonquin is also working with the NYCDEP to develop a Stormwater Pollution Prevention Plan (SWPPP) that addresses NYCDEP's requirements for constructing within a New York City watershed.

Because Algonquin is still working with NYCDEP to develop a final crossing plan for the Catskill Aqueduct, **we recommend that:**

- **<u>Prior to the end of the draft EIS comment period</u>, Algonquin should file with the Secretary a site-specific crossing plan for the Catskill Aqueduct developed in consultation with the NYCDEP. At a minimum, the plan should include the location of the proposed pipeline relative to the aqueduct, the proposed construction methods, the timing of construction, any mitigation measures that would be implemented to minimize impacts on the aqueduct, and documentation of consultation with the NYCDEP.**

The Connecticut portion of the Project crosses 67 waterbodies within 6 subbasin level watersheds. Of these 67 waterbodies, 20 are perennial streams, 43 are intermittent streams, 3 are ephemeral streams, and 1 is a pond. Ten of the proposed crossings are intermediate crossings and 57 are minor crossings.

The Massachusetts portion of the Project crosses two perennial streams, one intermediate crossing, and one minor crossing within two subbasin level watersheds.

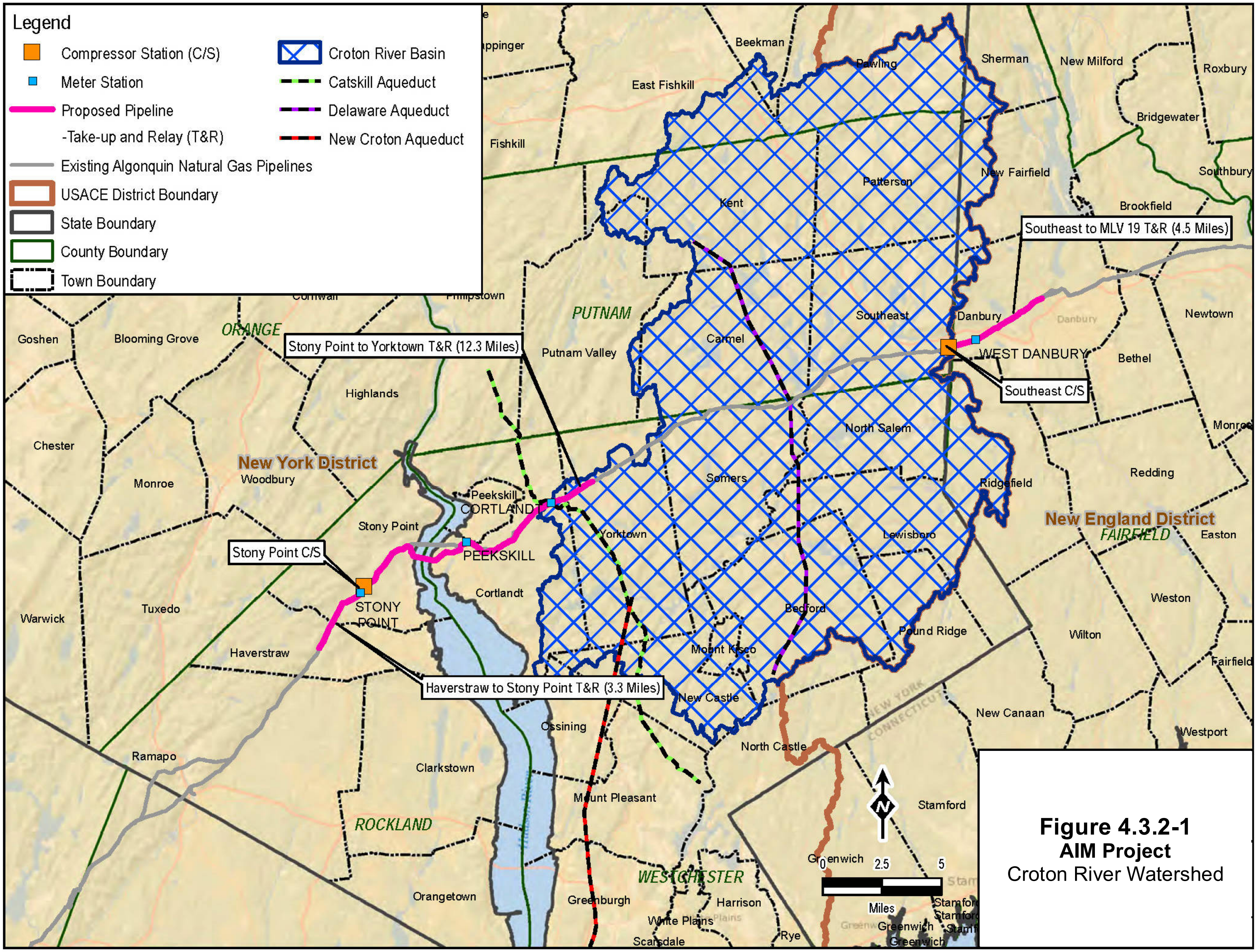

Figure 4.3.2-1
AIM Project
Croton River Watershed

Aboveground Facilities

No waterbodies would be impacted by the work at the existing and proposed aboveground facilities. However, a few aboveground facility sites are located in relatively close proximity to mapped waterbodies as detailed below.

The Stony Point M&R Station in New York is located just northeast of Cedar Pond Brook. An unnamed tributary to Cedar Pond Brook is also located adjacent to the north boundary of the Stony Point M&R Station. The Stony Point Compressor Station is located to the east of an unnamed tributary to Cedar Pond Brook. This waterbody flows through a culvert under the permanent access road to the Station and would not be impacted during construction. The Cortlandt M&R Station in New York is located adjacent to an unnamed tributary to Hunter Brook. None of these waterbodies would be directly affected by construction or operation of these facilities.

In Connecticut, Coles Brook flows adjacent to the Cromwell Compressor Station and an unnamed tributary to Mount Hope River flows through a culvert under the permanent access road for the Chaplin Compressor Station. The Putnam M&R Station is about 0.1 mile northeast of the Quinebaug River and the Montville M&R Station is located to the north of an unnamed tributary to Stony Brook. The Farmington M&R Station is located about 0.1 mile north of Scott Swamp Brook. None of these waterbodies would be directly affected by construction and operation of these facilities.

The existing permanent access road to the Burrillville Compressor Station in Rhode Island crosses an unnamed stream near the entrance to the facility. The stream flows through a culvert under the access road and no impacts are anticipated during construction as the station.

In Massachusetts, the Norwood M&R Station is about 0.1 mile north of the Neponset River. The Wellesley M&R Station is less than 0.1 mile west of the Charles River. Neither of these waterbodies would be directly affected by construction and operation of these facilities.

Pipe and Contractor Ware Yards

As described in Section 2.2.3, Algonquin would make use of four locations for pipe and contractor ware yards. Three of these locations consist of existing industrial/commercial lands and would result in no impacts on waterbodies. The fourth site in Yorktown, New York would be located on 15 acres within a 73-acre open space owned by the Town of Yorktown. No waterbodies would be impacted as a result of the use of these yards for the Project.

Access Roads

As described in section 2.2.4, Algonquin would use existing roads in the Project area as temporary and permanent access roads to the extent feasible. One new PAR would be constructed from the existing North Fall River M&R Station site to the new Assonet M&R Station. No waterbodies would be impacted by this new PAR. Five waterbodies would be crossed by the existing access roads. We do not anticipate impacts on any waterbodies as a result of the use of these existing access roads.

4.3.2.2 Sensitive Waterbodies

Waterbodies may be considered sensitive to pipeline construction for a number of reasons, including, but not limited to:

- waters that do not meet state water quality standards associated with the water's designated beneficial uses;
- surface waters that have been designated for intensive water quality management;
- waterbodies that support fisheries of special concern (i.e., EFH);
- waterbodies that are crossed less than 3 miles upstream of a potable water intake;
- waterbodies afforded national or state status for exceptional quality; and
- waterbodies listed on the National Rivers Inventory (NRI).

Other factors that can provide a basis for sensitivity include waterbodies located within a protected watershed, waterbodies and intermittent drainages that have steep banks and other characteristics that might contribute to high risk of erosion impacts, and surface waters that have important riparian areas. Table 4.3.2-1 identifies sensitive waterbodies that would be crossed by the Project. The table also provides details of known contamination, which is addressed in the following section. None of the proposed crossings are designated as EFH, though the proposed Hudson River crossing is located north of a designated EFH area as described in section 4.6.2.4.

Impaired Surface Waters and Contaminated Sediments

Algonquin reviewed the EDR Report and the Section 303(d) lists of impaired waterbodies for New York, Connecticut, Rhode Island, and Massachusetts (NYSDEC, 2013d; CTDEEP, 2013e; RIDEM, 2012; MADEP, 2013b). Table 4.3.2-1 summarizes the waterbodies that were determined to have surface water impairment and/or potential sediment contamination. The proposed aboveground facilities would not affect any waterbodies.

As described in section 2.3.1.2, the Hudson River would be crossed using the HDD method. Algonquin proposes to construct the remaining pipeline crossings using a dry construction technique (i.e., dam and pump, and/or flume) if flowing water is present at the time of the crossing to minimize soil erosion and sedimentation downstream.

Waterbodies Containing Threatened or Endangered Species or Critical Habitat

Algonquin consulted with the various federal and state agencies to identify waterbodies that may contain federally or state-listed threatened or endangered or candidate species and their habitat. Additional information regarding special status species is provided in section 4.7.

Waterbodies that Support Fisheries of Special Concern

Thirty-one of the Project waterbody crossings support fisheries of special concern. Eight waterbodies are waters with naturally occurring spawning populations of trout. One waterbody (the Hudson River) contains threatened and endangered species and anadromous fisheries. Fisheries of special concern are discussed in greater detail in section 4.6.2.2.

TABLE 4.3.2-1

Sensitive Waterbodies Crossed by the AIM Project

State/Facility/Waterbody I.D.	Waterbody Name	MP	Basis for Sensitivity	Detail [a]
NEW YORK				
Stony Point to Yorktown Take-up and Relay				
Hudson River	Lower Hudson River	3.2	Impaired	Listed impaired for PCBs and other toxics from contaminated sediment (NYSDEC, 2013d).
CONNECTICUT				
Line-36A Loop Extension				
B13-CLR-S1	Coles Brook	0.1	Impaired	Listed impaired for *E. coli* with a designated use as ‘Recreation’ (CTDEEP, 2013e).
MASSACHUSETTS				
West Roxbury Lateral				
B13-WRL-S3	Mother Brook	3.11	Impaired	Listed impaired for Color, DDT, E. Coli (TMDL #2592), Fecal Coliform (TMDL #2592), Mercury in fish tissue, dissolved oxygen, PCB in fish tissue, total phosphorus, and taste and odor (MADEP, 2013b).

[a] E. Coli = *Escherichia coli*, DDT = dichlorodiphenyltrichloroethane, TMDL = total maximum daily load

National or State Recognized Exceptional Quality Waters

The NYSDEC maintains a list of high quality Wild, Scenic and Recreational Rivers, rivers that have excellent scenic, ecological, recreational, historic, and scientific values (NYSDEC, 2013l). No State Recognized Exceptional Quality Waters would be affected by the Project facilities.

New York State has adopted a Hudson River Estuary Action Agenda 2010-2014 (NYSDEC, 2010a). Some of the specific goals of the Action Agenda are:

- signature fisheries;
- river and shoreline habitats;
- streams and tributaries;
- contaminant reduction; and
- improvement and protection of the water quality of the Hudson River.

Algonquin proposes to cross the Hudson River using the HDD method. Therefore, construction would not result in any adverse impacts on water quality in the Hudson River (see section 4.3.2.6).

The CTDEEP does not have a formal published list of state recognized exceptional or high-quality waters. The state designates surface waters as one of three Inland Surface Water Classifications that include Class AA (suitable for drinking), Class A (habitat and potential drinking water) and Class B (suitable for recreation) (CTDEEP, 2013r). The proposed Project would cross 10 Class AA waters and 57 Class A waters.

The RIDEM has no available list of exceptional quality waters and no waterbodies would be crossed in Rhode Island (RIDEM, 2013b).

The MADEP Surface Water Quality Standards (314 Code of Massachusetts Regulations [CMR] 4.00) define Outstanding Resource Waters (ORW), which include all Class A Public Water Supplies and their tributaries and any other waters specially designated by the MADEP because of their outstanding socioeconomic, recreational, ecological, and/or aesthetic values. ORWs along the proposed route were identified using the watershed delineations depicted in the MassGIS ORW datalayer (MassGIS, 2013b) and the Massachusetts Surface Water Quality Standards Program publication *Designated Outstanding Resource Waters of Massachusetts*. No ORWs would be impacted by the Project (MassGIS, 2013b).

Public Water Supply Intakes

Based on a review of available information, there are no surface water supply intakes located within 3 miles downstream of any waterbodies affected by the Project facilities in New York, Connecticut, Massachusetts, or Rhode Island (NYSDOH, 2014; CDPH, 2013; MassGIS, 2013b).

National Rivers Inventory

No federal wild and scenic rivers or Natural Heritage Areas would be crossed by the Project (National Wild and Scenic Rivers System, 2013; National Park Service, 2013). However, the Hudson River has been designated by the EPA as an American Heritage River. Pursuant to Executive Order 13061, *Federal Support of Community Efforts Along American Heritage Rivers*, issued on September 11, 1997, the American Heritage Rivers initiative directs federal agencies to provide effective and efficient federal assistance to river communities, with the goal of enhancing natural resource and environmental protection, economic revitalization, and historic and cultural preservation.

4.3.2.3 Waterbody Construction Procedures

As described above, the pipeline segments would cross 108 waterbodies consisting of 90 minor crossings, 17 intermediate crossings, and 1 major crossing, the Hudson River. The Hudson River in New York and the Still River in Connecticut would be crossed using the HDD method. The remaining 106 crossings would be completed using a dry crossing method. At the result of the NYSDEC, Algonquin prepared a crossing methods analysis for all protected streams in New York. This information was included in appendix E of the section 401 Water Quality Certification (WQC) Application filed with the NYSDEC. A copy was also filed with the Secretary at the same time it was filed with the NYSDEC. Following the crossing methods analysis, Algonquin determined that using the HDD method would not be feasible at the remaining waterbodies when compared to the dry crossing method. The reasons varied from site to site, but, in general, included new temporary impacts on nearby residences, direct impacts on residential homes, and the need to acquire new easement rights for the permanent right-of-way for operation and maintenance of the pipeline. Therefore, Algonquin has committed to using the dry crossing method to install the pipeline at all waterbody crossings in New York except the Hudson River. Similarly, HDDs at each of the waterbody crossings in Connecticut and Massachusetts would not be feasible. Factors in HDD design include the availability of a straight and relatively low relief laydown area for the pullback pipe section; the availability of large work areas at the HDD entry and exit points; surrounding terrain; land use; and operation concerns. Based on information from Algonquin, our review of Project mapping, and information we obtained during visits to the Project area, we conclude that the use of the HDD method at all waterbody crossings would be either technically infeasible, impractical, or would not result in a clear environmental advantage to the proposed dry crossing methods.

Dry Crossing Methods

The dry crossing method would be used to install Project pipeline facilities at all waterbody crossing locations if there is flowing water at the time of construction. Dry crossing methods involve installation of a flume pipe(s) and/or dam and pump prior to trenching to divert the stream flow over or around the construction area and allow trenching of the stream crossing in drier conditions isolated from the stream flow. Spoil removed during the 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. Where these methods are employed, ATWS areas would be required for assembly of the pipe strings and spoil storage areas.

Horizontal Directional Drill

Algonquin would use the HDD crossing method at the Hudson River in New York and the Still River in Connecticut. At both crossings, Algonquin anticipates using the intersect method to complete the pilot hole. Additional details of the two HDD installations are provided below. These descriptions are based on the HDD feasibility report for each crossing provided by Algonquin (Hatch Mott MacDonald, 2014c and 2014d). To date, Algonquin has not provided a contingency plan that incorporates another location or another construction methodology for each of these HDD crossings. Therefore, if an 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.

Hudson River HDD

For the Hudson River HDD, the proposed entry location would be located within an abandoned and remediated power plant facility on the west side of the river. The site is relatively flat but would require crossing two sets of CSX railroad tracks to access the entry side of the drill. The exit hole location on the east side of the river would be located in a moderately sloping area that is part of an abandoned quarry operation. The east side would also function as the pipe string staging area. The staging area on the east side is limited and would require intermediate welds to fabricate the pipe string during pullback operations. It is estimated that the HDD would take about 5 months to complete.

Algonquin conducted an evaluation of the geological and geotechnical conditions of the proposed HDD alignment at the Hudson River. The exploration program consisted of 11 geotechnical boreholes in the vicinity of the Hudson River crossing. Two borings were drilled on the western and eastern shores of the Hudson River, respectively. The remaining nine borings were drilled within the limits of the Hudson River. Soil/sediment samples were collected with a standard 2-inch split spoon sampler, and rock coring was conducted within the bedrock utilizing a 2.5-inch-inside diameter core barrel. Bedrock cores were measured for recovery and rock quality designations (RQD), described for lithology, and recorded. In addition to these boreholes, three bedrock probe holes were also drilled to the top of bedrock on the west side of the Hudson River to better define the bedrock surface on that side of the river.

The locations of the boreholes were selected to provide geotechnical information to support design efforts for the crossing and to identify the location of a deep historic river channel that was known to exist further to the north of the Project area (in the vicinity of the Interstate 84 crossing of the Hudson River). The historic channel was intersected about 825 feet offshore of the west bank of the river where a soil boring encountered soil materials to a depth of about 285 feet below the river surface (about 220 feet below the river bottom). This channel was in-filled with about 40 feet of gravels, cobbles, and boulders. Soil materials above this consisted of a thick (125 feet) deposit of very soft clays, overlain by a layer of unconsolidated soil materials varying in thickness from about 35 to 60 feet. Gravels, cobbles, and boulders were also encountered just above the bedrock surface on the east side of the river, about 100 feet below the bottom of the river. These materials were overlain by up to 90 feet of very soft clay and unconsolidated soils. Bedrock consisting of limestone/dolostone was encountered at the bottom of each boring; however, the bedrock in the westernmost bore hole consisted of schist.

Sands, silts, and clays typically present no significant challenge to an HDD installation. These materials are often described as good to excellent materials with regard to the feasibility of an HDD. Soils containing gravels and larger size particles (cobbles and boulders) range from marginally acceptable to unacceptable relative to the feasibility of an HDD, depending on the percentage of gravels by weight. Only those particles that can be suspended within the drilling fluid can be removed from the HDD bore hole. Gravel-sized particles tend to settle out and accumulate along the bottom of the bore hole. Large soil particles cannot be suspended by the drilling fluid. To properly remove the cuttings and support the open bore, the drilling fluid must remain within the bore without excessive loss to the surrounding formations. Deposits of gravel and cobble-sized clasts can allow drilling fluids to escape into the surrounding formations. As a result, the bore may collapse, making reaming and pipe pullback operations extremely difficult, if not impossible.

Algonquin proposes to install the HDD using a drill path in the soft soils above the bedrock and old channel lag deposits. The intersect HDD installation technique would be required for the Hudson River Crossing. This is primarily due to the required length of the installation, anticipated soil conditions, and requirements for temporary conductor casings on each end of the HDD alignment. This method consists of drilling the pilot hole from both ends of the alignment and meeting at a target location established within the middle section of the HDD bore. The true length of the proposed HDD installation would be 4,476 feet (the horizontal length from entry to exit would be 4,452 feet). The depth of cover beneath the Hudson River bottom would range from 20 feet at the western shore to 26 feet at the eastern shore. At its deepest point the pipe would be installed 100 feet below the river bed. A site-specific crossing plan is provided in appendix J.

Prior to initiating the drill at the Hudson River, Algonquin would install telescoping casings of decreasing sizes on both sides of the crossing to a depth of about 90 feet. The largest diameter casing would be a minimum of 60 inches. The casings would not reach the bedrock interface at the Hudson River crossing because they would be installed completely in soft sediments and would not cross the barrier between the upper and lower aquifer at this location. Grouting of the casing annulus would not be necessary as the casing would be driven or vibrated into the sediments and would not require installation inside a pre-drilled bore hole, thus there is no annulus outside the casing. The smaller diameter steel casings located on both sides of the crossing would be removed prior to pullback, whereas the larger diameter casings would stay in place during pullback operations.

The larger diameter casing on the eastern side of the river would be removed once the pullback is complete. The larger diameter casing on the western side of the river would remain in place permanently. This is because the drill path and temporary conductor casing on the west side of the crossing would penetrate through the existing sheet pile wall along the west bank of the river at the former Mirant Lovett site. Algonquin has indicated it would employ a casing design prepared by a licensed professional engineer for this penetration, which would mitigate any impacts on the sheet pile wall. The work to prepare the design would involve nondestructive examination of the existing sheet pile wall to determine its actual depth. Additional work to install the casing would involve the installation of temporary trench shoring to expose the land side of the sheet pile wall for penetration. The use of low strength grouting may also be required to stabilize the surrounding soils. An oversize casing would then be permanently installed through the sheet piling prior to initiating the drill.

Algonquin completed a hydraulic fracture evaluation for the Hudson River HDD generally in accordance with the Delft Geotechnics Method outlined in appendix B of the USACE report *Installation of Pipelines beneath Levees Using Horizontal Directional Drilling* (Staheli et al., 1998). This method is used to estimate the maximum effective pressure (i.e. drilling fluid pressure) that can be induced during an HDD operation within a particular soil horizon. This pressure is then compared with the fluid pressure required to induce slurry flow within the HDD bore to determine the potential for a hydraulic fracture (resulting in the potential for an inadvertent release of drilling fluid) for a given HDD alignment. The required fluid pressure for an HDD installation is governed by the drilling fluid weight (commonly referred to as the mud weight), installation length and depth, and drilling fluid flow properties (plastic viscosity, yield point, etc.). The Delft Geotechnics Method assumes a uniform column of soil above any point of interest along the HDD alignment. Where an increased risk of hydraulic fracture is identified, it does not necessarily mean that a hydraulic fracture would occur.

The results of the preliminary hydraulic fracture evaluation suggest a relatively high potential for hydraulic fracture in the soft sediments of the Hudson River HDD alignment. Generally, when hydraulic fracture potential is high or anticipated for a given installation, the bore can be placed within geotechnical materials that are more favorable for an HDD and reduce the hydraulic fracture potential. This typically involves increasing the installation depth, thereby increasing the depth of cover above the drill path and pipeline. However, for the proposed Hudson River crossing, a deeper drill path option that would provide sufficient resistance to the predicted fluid pressure is not practicable due to the presence of shallow bedrock on either side of the crossing, the extreme depth of the historic river channel on the western side of the crossing, and the presence of gravel and cobble channel lag deposits in portions of the subsurface. An HDD alignment entirely within the bedrock is also not practicable due to the depth of the soil/bedrock interface at the crossing location. The depth and topography of the bedrock profile along the proposed crossing is a result of the historic river channel, particularly on the western side of the crossing.

The risk of hydraulic fracture and a potential inadvertent release of drilling fluid is highest during completion of the pilot hole. As described above, Algonquin would install the HDD crossing of the Hudson River using the intersect HDD installation technique. This approach essentially reduces the length and duration of completing the pilot hole by 50 percent, since the drill path is advanced from both sides of the crossing and meets near the middle of the drill path. Additionally, installing the HDD crossing in the softer sediments, as proposed, rather than in bedrock would significantly shorten the duration of construction required to complete the HDD operation. As noted above, where model calculations identify an increased risk of hydraulic fracture, it does not necessarily mean that a hydraulic fracture will occur during actual drill operations. With advanced knowledge of the higher potential for hydraulic fracture the drilling contractor can also adjust drill conditions to reduce the risk of fracture. If an inadvertent release is observed in an accessible upland area near shore, proper containment structures would be used to contain the release. If the release cannot be contained, the operator would suspend drilling operations until appropriate containment is in place. It is possible that some drilling fluid would be released into the river during a hydraulic fracture; however, the volume would be minimal and would not accumulate due to the rapid drilling rates. Due to the river current, marine traffic, existing turbidity, and other pollutants that contribute to the discoloration of a major waterbody like the Hudson River, it is unlikely that an inadvertent release would be identifiable. It is also unlikely that the drilling fluid would accumulate in the navigation channel or a major waterbody like the Hudson River. Additional information is presented in the BDP Plan (see appendix J).

Based on our assessment of the geotechnical conditions at the proposed HDD crossing of the Hudson River, we conclude that the HDD method is an appropriate technique for installing the pipeline at this river crossing, and that the HDD crossing could be completed successfully, despite the risk of hydraulic fracture during completion of the pilot hole. We also find that the BDP Plan and additional measures identified above would minimize the possibility of an inadvertent release to the extent feasible, and that, if an inadvertent release was to occur, appropriate measures would be implemented to minimize any resulting impacts.

Interstate 84/Still River HDD

The proposed HDD crossing of Interstate 84 and the Still River is located in the City of Danbury, Connecticut. The proposed HDD entry location would be located within a rest area southwest of Interstate 84. The HDD entry location is relatively flat and easily accessed. The entry location would also serve as the preferred pipe string staging area. The staging area is limited and would require intermediate welds to fabricate the pipe string during pull back operations. The proposed exit location would be to the east of Mill Plain Road. The HDD crossing method would be used in this location to avoid impacts on Interstate 84, the Still River, and a large wetland complex associated with the river. It is estimated that the HDD would take about 7 months to complete.

Algonquin conducted an evaluation of the geological and geotechnical conditions of the proposed HDD alignment at the Interstate 84/Still River crossing. The exploration program consisted of nine geotechnical boreholes completed in the vicinity of the crossing. Two borings were drilled to the south of Interstate 84 and one boring was drilled to the north of Mill Plain Road. The remaining six borings were drilled between Interstate 84 and Mill Plain Road in the vicinity of the wetland and auto dealership property. Soil/sediment samples were collected with a standard 2-inch split spoon sampler, and rock coring was conducted within the bedrock utilizing a 2.5-inch-inside diameter core barrel. Bedrock cores were measured for recovery and RQDs, described for lithology, and recorded. The locations of the boreholes were selected to provide geotechnical information to support design efforts for this crossing and to identify areas of increased risk resulting from potential subsurface conditions.

In general the geotechnical borings indicated the presence of coarse-grained deposits of sand and gravel overlying gneissic bedrock. On the southwest side of the crossing, in the vicinity of the entry location, deposits of dense sand and gravel about 80 feet thick overlying alternating layers of schistose gneiss and granitic gneiss were encountered. As the alignment progresses to the northeast, the bedrock surface becomes much more shallow, rising to between 19 and 37 feet below ground surface, as the alignment approaches the wetland area. The three borings collected within the wetland contained much thicker overburden deposits of sand and gravel overlying decomposed gneissic bedrock materials. The sand and gravel deposits beneath the wetland ranged from 86 to 140 feet thick. At one boring location beneath the wetland, no competent bedrock was encountered and no bedrock core was recovered to the termination depth of the boring at 250 feet below ground surface. Farther northeast, the two cores drilled on the auto dealership property showed that the bedrock surface becomes shallower as the alignment progresses northeast, with bedrock ranging between 121 feet and 52 feet below ground surface. Both borings also encountered extensive deposits of gravel, cobbles, and boulders overlying the bedrock. The last core in the vicinity of the exit location encountered decomposed bedrock at a depth of just 5 feet below ground surface; competent bedrock was not encountered until 47 feet below ground surface in this location.

The presence of cobbles and boulders, and zones of poor bedrock quality encountered during the geotechnical investigation would pose significant risks to borehole stability, steering and guidance of drilling equipment during pilot hole completion, and could potentially result in damage to the pipeline during installation. Bedrock can be highly variable and can be classified as being excellent to unacceptable with respect to HDD feasibility. Competent bedrock is well suited for HDD as the bore tends to remain open for extended periods of time. However, heavily weathered, jointed, fractured, or fissured bedrock can present challenges with respect to bore stability and drilling fluid migration away from the HDD bore. Poor quality bedrock can present the same challenges as coarse granular deposits, if fracturing and jointing is extensive, and can present an unacceptable risk in terms of feasibility for an HDD installation. The risk associated with poor quality bedrock stems from the inability to support and maintain stability of the borehole. This risk increases with RQD ratings below 60 percent, with lower RQD ratings presenting higher risks. A small zone of low RQD within a drill path can often be accommodated and does not present a significant risk to an HDD installation. However, an extensive zone of low RQD can present challenges. For the proposed Interstate 84 crossing, Algonquin has designed the drill to avoid areas containing low RQD ratings to the maximum extent possible; however, there exists a portion of the drill alignment that is located within an area of low RQD and could pose a risk during the drilling of the initial pilot borehole. This area is located between stations 24+00 and 32+00 (borings B-4, B-7, and B-9) where decomposed bedrock consisting of saprolotoc (highly decomposed) gneiss and RQDs were either mixed or non-existent.

To address these risks, Algonquin has designed the crossing to install the pipeline within the highest quality bedrock to the maximum extent practicable. Additionally, Algonquin would install temporary conductor casings at both the entry and exit points. The casings would be installed to bedrock at the entry and exit holes, minimizing the potential for inadvertent returns in these shallower areas of the drill path where the drill would encounter deposits of sands and highly weathered bedrock materials. Algonquin would also use the intersect HDD installation strategy for the Interstate 84 HDD crossing. This method would be used primarily due to the required length of the installation, strength of the bedrock materials, and requirement for temporary conductor casings on both sides of the crossing. The true length of the proposed HDD installation would be 3,736 feet (the horizontal length, entry to exit, would be 3,697 feet). The minimum depth of cover would be about 65 feet as the alignment approaches Mill Plain Road. At its deepest point, between the wetland and Interstate 84, the pipe would be installed about 172 feet below ground surface. A site-specific crossing plan is provided in appendix J.

The results of the preliminary hydraulic fracture evaluation for the Interstate 84/Still River HDD indicate that the required bore pressure to facilitate the installation process would be well below the allowable bore pressure along the majority of the installation. This suggests there is little risk of hydraulic fracture along the drill path and a low probability for inadvertent returns of drilling fluid. The risk of hydraulic fracture (resulting in the potential for an inadvertent return of drilling fluid) is highest during completion of the pilot hole, particularly near the entry and exit holes due to the shallow depth of cover. To minimize the potential for inadvertent returns near the entry and exit sides of the drill, and to facilitate HDD operations and drilling fluid recycling, Algonquin would install telescoping casings of decreasing sizes on both sides of the crossing. The casings would be installed to a depth sufficient to intercept the bedrock at each end of the crossing. The largest diameter casing would be a minimum of 60 inches. Grouting of the casing annulus would not be necessary as the casing would be driven/vibrated into overburden sediments and not be installed inside a pre-drilled hole, thus there is no annulus outside the casing. The smaller diameter steel casings located on both sides of the crossing would be removed prior to pullback whereas the larger diameter casings would stay in place during pullback operations.

Based on our initial assessment of the geotechnical conditions at the proposed HDD crossing of Interstate 84 and the Still River, we conclude that the HDD method is an appropriate technique for installing the pipeline at this crossing, and that with the implementation of the mitigation measures Algonquin proposes to employ, the HDD crossing could be completed successfully. However, Algonquin has indicated that additional investigation would be required to verify the existence, type, and depth of any existing bridge foundations where the HDD alignment would cross Ridgebury Road. This investigation could identify additional mitigation measures that are needed to address any existing bridge foundations associated with Ridgebury Road. Therefore, **we recommend that**:

- **<u>Prior to construction of the Interstate 84/Still River HDD</u>, Algonquin should file with the Secretary, for review and written approval of the Director of OEP, a revised site-specific plan for the crossing if additional measures are needed to address any existing bridge foundations associated with the alignment across Ridgebury Road.**

Drilling and Blasting at Waterbodies

Some limited blasting may be required along the Project pipeline segments to increase the depth and width of the existing trenches to accommodate the larger diameter pipeline. Based on a review of the USDA soils data and field surveys, there are nine streams (see table 4.3.2-2) with shallow bedrock that may require blasting during construction (USDA, 2013d). Trench crews would determine if rock is present and if blasting would be required.

TABLE 4.3.2-2

Waterbody Crossings That May Require Blasting During Construction for the AIM Project

State/Facility/Stream Name [a]	Stream I.D.	MP	Crossing Width (feet)	Soil type	Depth to bedrock (Inches)
NEW YORK					
Stony Point to Yorktown Take-up and Relay					
UNT to Cedar Pond Brook	A13-SPLR-S1	0.4	25	Charlton-Rock outcrop complex	0
UNT to Dickey Brook	B13-SPLR-S7	6.7	3	Chatfield-Hollis-Rock outcrop complex	20
UNT to Furnace Brook	B13-SPLR-S13	7.6	2	Chatfield-Hollis-Rock outcrop complex	20
CONNECTICUT					
Southeast to MLV 19 Take-up and Relay					
UNT to Kohanza Brook	B13-SELR-S6	3.0	4	Charlton-Chatfield complex, very rocky	20
Kohanza Brook	B13-SELR-S7	4.1	12	Charlton-Chatfield complex, very rocky	20
E-1 System Lateral Take-up and Relay					
UNT to Susquetonscut Brook	B13-ELR-S9C	5.0	2	Hollis-Chatfield-Rock outcrop complex	20
UNT to Susquetonscut Brook	B13-ELR-S9B	5.3	3	Rippowam fine sandy loam	>60
Susquetonscut Brook	B13-ELR-S5B	5.8	18	Rippowam fine sandy loam	>60
E-1 System Lateral Loop					
UNT to Stony Brook	B13-ELP-S6	0.9	5	Hollis-Chatfield-Rock outcrop complex	15

[a] UNT = Unnamed tributary.

Only two of the waterbodies listed in table 4.3.2-2 contain fisheries of special concern. Susquetonscut Brook crossed by the E-1 System Lateral Take-up and Relay segment in Connecticut is considered a warmwater fishery, and the Unnamed Tributary to Stony Brook crossed by the E-1 System Lateral Loop segment is considered a coldwater fishery (see section 4.6.2). None of the other waterbodies that may require blasting are considered sensitive.

4.3.2.4 Extra Workspaces Within 50 Feet of Waterbodies

The FERC's Procedures stipulates that all ATWS should be located at least 50 feet from waterbodies except where an alternative measure has been requested by Algonquin and approved by the FERC. Algonquin identified certain areas where they believe site-specific conditions do not allow for a 50-foot setback of ATWS from waterbodies. Table 4.3.2-3 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.

4.3.2.5 Hydrostatic Test Water

Algonquin would verify the structural integrity of the piping associated with the Project facilities before placing them in service by conducting hydrostatic testing. Testing would be completed by capping installed pipe segments with test manifolds, filling these segments with water, pressurizing the water, then checking for pressure losses due to pipeline leakage. The integrity of the piping at aboveground facilities would also be hydrostatically tested. Algonquin estimates a need for a total of about 10,082,645 gallons of water to conduct the hydrostatic testing of pipeline segments and aboveground facilities. Of this total, about 9,610,245 gallons would be for testing pipeline segments and 472,400 gallons would be for testing aboveground facilities. The estimated hydrostatic test water requirements for each facility are listed in tables 4.3.2-4 and 4.3.2-5. Following testing, all test water would be discharged into dewatering structures located in upland areas and within the construction work area at a rate of 1,000 to 1,200 gpm in accordance with Algonquin's E&SCP and all applicable permits. Samples of the discharge water would be collected and tested in accordance with federal and state permit requirements.

The Hudson River HDD and the Interstate 84/Still River HDD pipe segments would be hydrostatically tested before and after the HDD pull back activities are completed. The other pipeline segments would be hydrostatically tested in one section, with the exception of the Stony Point to Yorktown Take-up and Relay and West Roxbury Lateral segments, which would be tested in two sections.

Following testing of the pipeline, the water would be discharged into dewatering structures located in upland areas and within the construction work area in accordance with Algonquin's E&SCP. The discharge rate would range between 1,000 and 1,200 gpm and would be regulated to maintain proper function of the dewatering structure. The majority of this water would infiltrate the soil and recharge the local groundwater system. NYSDEC requested that Algonquin comply with the hydrostatic testing best management practices provided to them by NYSDEC. Algonquin would follow the procedures outlined in the E&SCP.

TABLE 4.3.2-3

Requested Modifications for Additional Temporary Workspace Near Waterbodies for the AIM Project

State/Facility/Waterbody ID	ATWS MP	ATWS Size (acres)	Distance from Resource Area (feet)	ATWS Justification
NEW YORK				
Haverstraw to Stony Point Take-up and Relay				
B13-RLR-S3D B13-RLR-S3I B13-RLR-S3J	1.1	0.5	0-30	Extra workspace is required for multiple wetland and waterbody crossings at Call Hollow Road crossing
B13-RLR-S6	2.2	0.9	0	Extra workspace is required for Palisades Interstate Parkway crossing
B13-RLR-S10	3.0	0.1	0	Extra workspace is required for wetland and Highway 210 crossings
B13-RLR-S10A	3.0	0.3	0	Extra workspace is required for wetland and Highway 210 crossings
Stony Point to Yorktown Take-up and Relay				
A13-SPLR-S1	0.4	0.1	30	Extra workspace is required for waterbody crossing with steep slopes near residential development
B13-SPLR-S2	5.9	0.6	0	Extra workspace is required for wetland and waterbody crossings
B13-SPLR-S21A B13-SPLR-S21B	10.3	0.5	0	Extra workspace is required for wetland and waterbody crossings at Cortlandt M&R Station
CONNECTICUT				
Southeast to MLV 19 Take-up and Relay				
B13-SELR-S1	3.3	0.1	0	Extra workspace is required for wetland and waterbody crossings near residential development at Westville Road crossing
E-1 System Lateral Take-up and Relay				
A13-ELR-S1	0.7	0.1	35	Extra workspace is required for wetland and waterbody crossings
B13-ELR-S11	4.9	0.2	0	Extra workspace is required for multiple wetland and waterbody crossings
B13-ELR-S5B	5.8	0.1	35	Extra workspace is required for railroad, waterbody and wetland crossings
B13-ELR-S18	8.5	0.2	0	Extra workspace is required for Wisconsin Avenue road crossing (waterbody flows diagonally under road)
B13-ELR-S18	8.5	0.2	30	Extra workspace is required for Wisconsin Avenue road crossing (waterbody flows diagonally under road)
B13-ELR-S24	8.9	0.1	35	Extra workspace is required for large wetland complex

TABLE 4.3.2-4

Potential Hydrostatic Testing Water Sources for Pipeline Facilities for the AIM Project

State, Facility	Estimated Volume (gallons)	Water Source	Discharge (MP)
New York			
Haverstraw to Stony Point Take-up and Relay	1,242,537	Municipal	0.0/3.3
Stony Point to Yorktown Take-up and Relay	4,677,562	Municipal/ Old Verplanck Quarry Lake	0.0/2.6/3.2/3.9/5.5/12.3
Hudson HDD [a]	284,985	Old Verplanck Quarry Lake	3.2/3.9
Southeast to MLV 19 Take-up and Relay	56,997	Municipal	0.0
Connecticut			
Southeast to MLV 19 Take-up and Relay	1,614,918	Municipal	1.5/2.2/4.4
Interstate 84/Still River HDD [a]	296,385	Municipal	1.5/2.2
Line-36A Loop Extension	558,339	Municipal	0.0/2.0
E-1 System Lateral Take-up and Relay	501,816	Municipal	0.0/9.1
E-1 System Lateral Loop Extension	40,324	Municipal	0.0/1.3
Massachusetts			
West Roxbury Lateral	336,382	Municipal	0.0/4.3/5.1
TOTAL PIPELINE FACILITIES	**9,610,245**		

[a] HDD sections would be tested immediately after installation. These sections may additionally be tested with the mainline.

TABLE 4.3.2-5

Potential Hydrostatic Testing Water Sources for Aboveground Facilities for the AIM Project[a]

State/Facility	Estimated Volume (gallons)	Water Source	Discharge
New York			
Stony Point Compressor Station	351,000	Municipal	On site
Southeast Compressor Station	22,000	Municipal	On site
M&R Stations (total of 3)	800	Municipal	On site
Connecticut			
Cromwell Compressor Station	35,000	Municipal	On site
Chaplin Compressor Station	33,500	Municipal	On site
M&R Stations (total of 14)	5,600	Municipal	On site
Rhode Island			
Burrillville Compressor Station	20,500	Municipal	On site
Massachusetts			
M&R Stations (total of 10)	4,000	Municipal	On site
TOTAL ABOVEGROUND FACILITIES	**472,400**		

[a] M&R station facilities and/or certain equipment at these facilities may be tested pneumatically.

4.3.2.6 General Impacts and Mitigation

Project construction activities that potentially can affect water resources include clearing and grading, pipeline installation across waterbodies, HDD, 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. Clearing and grading of streambanks, in-stream trenching and backfilling, and trench dewatering can introduce sediment directly or indirectly into the water column. Surface water impacts can also result from inadvertent releases of drilling fluids in the water column during HDD operations, hydrostatic test water discharges that erode stream beds and banks, and potential spills of hazardous liquids such as fuels and lubricants.

The clearing and grading of the waterbody banks associated with dry crossings (i.e., flume or dam-and-pump crossing methods) would disturb riparian vegetation and soils. Blasting could permanently alter the stream channel. Heavy equipment used during construction could also compact upland and riparian soils, which could reduce infiltration and cause greater runoff to waterbodies.

Long-term impacts on water quality can result from alteration of the waterbody banks. If not stabilized and revegetated properly, soil erosion can continue after construction, depositing sediments in the waterbodies. The level of impact of the proposed Project on surface waters would depend on precipitation events, sediment loads, stream area/velocity, channel integrity, and bed material.

Trench Dewatering

During construction, the open trench may accumulate water, either from the seepage of groundwater or from precipitation. Where dewatering is necessary, the trench water would be removed and directed into well-vegetated uplands and/or filter bags, as described in Algonquin's E&SCP to remove sediment or other contaminants and prevent heavily silt-laden water from flowing into any adjacent waterbodies or wetlands. We find these measures acceptable; however, NYSDEC was particularly concerned about trench dewatering and requested that Algonquin commit to isolating shorter portions of trench to reduce the volume of trench water that would need to be handled at one time. Algonquin's E&SCP does not make this specific commitment, though it does mention that trench plugs could be used. Therefore, **we recommend that**:

- **<u>Prior to the end of the draft EIS comment period</u>, Algonquin should file with the Secretary additional details describing how it would minimize trench dewatering as recommended by the NYSDEC and file documentation of its consultations with the NYSDEC.**

Dry Crossings

Construction-related impacts associated with the dry crossing method would be limited to short periods of increased turbidity before installation of the pipeline during the assembly of the upstream and downstream dams and following installation of the pipeline when the dams are pulled and flow across the restored work area is re-established. Use of the measures identified in the E&SCP would minimize these potential short- and long-term impacts, including minimization of clearing of streamside vegetation, installation and maintenance of temporary and permanent erosion controls, and minimization of the duration of in-stream construction.

Stream bed and bank contours would be re-established and stabilized prior to returning flow to the waterbody channel. Otherwise, completed stream crossings would be stabilized within 24 hours of backfilling. Original stream bed and bank contours would be reestablished and biodegradable material, such as mulch, jute thatching, or bonded fiber matrix blankets, would be installed on the stream banks to prevent erosion and encourage reestablishment of vegetation cover. Where necessary, slope breakers would be installed adjacent to stream banks to minimize the potential for erosion.

Long-term impacts associated with pipeline operation and maintenance would be relatively minor. Stream banks would be stabilized and revegetated following installation of the pipeline and post-construction vegetation maintenance would be limited to the permanent right-of-way pursuant to the E&SCP.

Blasting

If blasting in waterbodies is required, the primary impact that could occur is a permanent alteration of the stream channel. Algonquin would follow the procedures identified in its E&SCP and Rock Removal Plan (see appendix E) to minimize impacts associated with blasting. We find these procedures to be acceptable.

In-stream work in Susquetonscut Brook would occur during the appropriate timing window for warmwater fisheries (June 1 through November 30) and in the Unnamed Tributary to Stony Brook within the appropriate coldwater fisheries timing window (June 1 through September 30). Additional measures to minimize impacts on fisheries are described in section 4.6.2.3. Also, in accordance with the FERC Procedures, Algonquin would need to file with the Secretary a schedule identifying when blasting would occur within each waterbody greater than 10 feet wide and within any designated coldwater fishery.

Algonquin would restore steam beds following blasting and installation of the pipeline. Prior to backfilling, the trench would be inspected for any significant bedrock cracks or fissures. Any fissures would be filled with bentonite to seal the gap and prevent any infiltration of stream flow into the ground. Restoration of the stream bed would include backfilling the trench with sand to protect the newly installed pipeline and then replacement of appropriately sized trench spoil. Algonquin would replace the native stream bed material on top of the excavated trench-line to restore the original stream bed contours. Impacts would be temporary in nature and would be restored as near as practicable to preconstruction contours. With these measures, we conclude that blasting, if required, would not result in any significant impacts on streams.

Algonquin is continuing to consult with CTDEEP during the review of its section 401 WQC application. Algonquin has indicated it would address any impact minimization or mitigation measures for blasting in streams during the review process. Algonquin is also consulting with NYSDEC during the State's review of the New York section 401 WQC. NYSDEC has requested that Algonquin provide its in-stream blasting procedures and evaluate other methods of construction to avoid blasting in streams. Algonquin has indicated it will continue to discuss the construction method with the NYSDEC as part of the permit process.

Horizontal Directional Drill

The primary impact that could occur as a result of the HDD method is the inadvertent release of drilling fluid (or drilling mud) directly or indirectly into the waterbody. Drilling fluid may leak through previously unidentified fractures in the material underlying the river bed, in the area of the mud pits or tanks, or along the drill path due to unfavorable ground conditions. Although drilling fluid consists of non-toxic materials, in large quantities the release of drilling fluid into a waterbody could affect fisheries or other aquatic organisms by causing turbidity in a waterbody and/or temporary coating the waterbody bed with a layer of clay. The probability of an inadvertent release is greatest when the drill bit is working near the surface.

When surface waters are crossed by HDD within bedrock, the most common way for drilling fluids to reach the surface of the river bottom is along vertical fractures. This event is commonly referred to as hydro-geologic fracture. The geotechnical borings along the alignment of the proposed Hudson River HDD crossing alignment indicated the presence of a range of soil materials including gravel, cobbles, boulders, bedrock, very soft clays, unconsolidated soil, loose sands, and sand and gravel. The results were used to develop a conceptual profile for the Hudson River HDD alignment that would place the drill path in areas of very soft clays, loose sand, and unconsolidated sediments, avoiding the gravel, cobble, boulders, and bedrock areas identified**.** Preliminary estimates of the potential for hydraulic fracture at the Hudson River crossing indicated a relatively high potential for fracture (potentially leading to an inadvertent return of drilling fluid), particularly during pilot hole completion. Drilling through areas of softer sediments as planned for the Hudson River HDD would shorten the amount of time required to complete the HDD operation and, thus, the amount of time inadvertent releases of drilling fluid to the river could occur. Additionally, prior to drilling Algonquin proposes to use telescoping casings on both sides of the Hudson River prior to drilling to a depth of about 90 feet. The smaller diameter steel casings would be removed prior to pullback while the larger casings would remain in place permanently. Presence of the casings would further reduce any inadvertent releases into the waterbody.

Preliminary estimates of the potential for hydraulic fracture at the Interstate 84/Still River crossing in Connecticut indicated a very low potential for fracture (potentially leading to an inadvertent return of drilling fluid). To further minimize the potential for inadvertent returns, particularly near the entry and exit locations, Algonquin proposed to install telescoping casings on both sides of the crossing. The casing would be installed to intersect the bedrock at both sides of the drill path and would minimize the potential for inadvertent returns to the ground surface near the entry and exit sides of the drill and facilitate drilling fluid recycling.

Algonquin has developed a BDP Plan (see appendix J) that describes how the HDD operations would be monitored to minimize the potential for inadvertent returns and includes general procedures for cleanup of drilling mud releases at the two HDD locations. We find the BDP Plan to be acceptable. In the event an HDD hole needed to be abandoned during construction, Algonquin would implement measures to seal the abandoned portion of the hole and drill path. Abandonment procedures would include leaving the bore hole full of bentonite slurry and soils/cuttings. The bentonite slurry and soils/cuttings would fill the void and the upper 50 to 100 feet of the bore hole would be grouted with concentrated cement. The drill pipe would be inserted into the hole to a designated distance below ground. The initial grout would be light-weight, expansive and quick-setting. A plug would then be set over a distance of about 30 feet as the volume of the abandoned hole is filled. The drill pipe would then be retracted and the grout would be allowed to set. The drill pipe or a tremie tube would then be reinserted to the top of the plug, and expansive grout would be pumped to fill the hole as the drill pipe is retracted. Algonquin would attempt to salvage a portion of the hole that was not abandoned and drill the balance of the new hole within a few feet of the existing hole, if the near surface area were abandoned. If the near surface area is still suitable for the HDD, then Algonquin would adjust the pilot hole or reaming activities downhole and continue drilling operations.

With these measures, we conclude that the HDD construction method would not significantly impact surface water resources.

Hydrostatic Test Water

Algonquin developed a hydrostatic testing procedure that is included in the E&SCP and describes how the hydrostatic testing would be conducted and how the water would be discharged. During water intake, downstream flow rates would be maintained to protect aquatic life, waterbody uses, and provide downstream withdrawals of water by existing users. Algonquin is not proposing to use any chemicals for testing or for drying the pipeline following hydrostatic testing; therefore, there would be no surface water impacts due to hydrostatic testing activities. Sampling of discharge water would be conducted in accordance with Algonquin's E&SCP to document water quality at the time of discharge in accordance with applicable discharge permits. Additionally, discharge rates would be regulated using energy dissipation devices to prevent erosion, streambed scour, suspension of sediments, flooding, or excessive stream flow. Therefore, we conclude that hydrostatic testing would not significantly affect water resources.

Hazardous Material Spills and Contaminated Sediments

Accidental spills and leaks of hazardous materials associated with equipment trailers, the refueling or maintenance of vehicles; and the storage of fuel, oil, and other fluids can have immediate effects on aquatic resources and could contaminate a waterbody downstream of the release point. Impacts associated with the spills or leaks of hazardous liquids would be avoided or minimized by restricting the location of refueling (at least 100 feet from a wetland or waterbody) and storage facilities and by requiring cleanup in the event of a spill or leak.

Implementation of the measures in the Algonquin's SPCC Plan would minimize the potential for surface water impacts associated with an inadvertent spill of hazardous materials. The SPCC Plan identifies preventive measures to reduce the likelihood of a spill, such as secondary containment for petroleum products, daily equipment inspection for leaks, and restrictions on the transport of potentially hazardous materials to the construction work area. The SPCC Plan also specifies measures to contain and clean up a spill should one occur. Implementation of the Applicant's SPCC Plan would adequately address the storage and transfer of hazardous materials and petroleum products, and the appropriate response in the event of a spill.

Unexpected contamination would be addressed by following the Unexpected Contamination Encounter Procedures developed by Algonquin, which we find to be acceptable. Sites would be assessed for their historical land use and by evaluating the area. If contamination is encountered, work would be stopped and appropriate cleanup measures would be employed. Work would resume only after cleanup has been completed. By following these procedures, there would be no significant impacts on surface waters if unexpected contamination is encountered.

Conclusion

Pipeline construction activities would be conducted in accordance with the Algonquin's E&SCP; SPCC Plan; Unexpected Contamination Encounters Procedures; Rock Removal Plan; BDP Plan; and construction stormwater plans and permits, including the SWPPP being developed in consultation with the NYCDEP to address concerns about crossing New York City watersheds. Applicable construction stormwater BMPs would be implemented to prevent runoff from contaminated and non-contaminated sites to impaired waters. Construction activities would be temporary in nature and consist primarily of shallow excavation for pipeline installation. Waterbody crossings that do not require blasting would be completed within 24 to 48 hours and stream bed and bank contours would be restored and stabilized following construction activities. With these protection measures in place, and our additional recommendations, we conclude that construction and operation of the Project would not result in significant impacts on surface water resources.

The operation of the new Project facilities would not result in any impacts on surface water use or quality unless maintenance activities involving pipe excavation and repair in or near streams are required. In such a case, the impacts would be similar to those described for pipeline construction.

4.4 WETLANDS

Wetlands are areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (Environmental Laboratory, 1987). Wetlands are often a source of significant biodiversity and serve a variety of functions including flood control, wildlife habitat, recreational opportunities, and improving water quality.

Wetlands in the Project area are regulated at the federal and state levels. At the federal level, the USACE has authority under section 404 of the CWA to review and issue permits for activities that would result in the discharge of dredged or fill material into waters of the United States, including wetlands. Section 401 of the CWA requires that proposed dredge and fill activities under section 404 be reviewed and certified by the designated state agency so that the proposed Project would meet state water quality standards. The designated state agencies in the Project area are the NYSDEC, CTDEEP, and MADEP (no wetlands would be affected in Rhode Island). In New York and Connecticut, wetlands are also regulated at the local level. For this Project, activities in New York will be reviewed by Rockland and Westchester Counties; the Towns of Southeast, Yorktown, Cortlandt, Haverstraw, and Stony Point; the City of Peekskill; and the Villages of Buchanan and Pomona. Activities in Connecticut will be reviewed by municipal inland wetlands and watercourse agencies (IWWC). The municipal Connecticut agencies that will review Project information are the Cromwell IWWC, Danbury Environmental Impact Commission, Franklin IWWC, Lebanon IWWC, Montville IWWC, Norwich Inland Wetland, Watercourse and Conservation Commission, and Rocky Hill IWWC. Each IWWC will have an opportunity to review Project information and provide comments, but Algonquin is not required to obtain local wetland permits in Connecticut.

4.4.1 Existing Wetland Resources

Wetlands within the majority of the Project area were delineated during field surveys conducted in 2013 and are identified in table K-1 in appendix K. Algonquin delineated wetland boundaries using the methodologies described in the USACE Wetlands Delineation Manual (Environmental Laboratory, 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2) (USACE, 2011). Portions of three wetlands located outside the permanent easement in New York and one in Connecticut were delineated using aerial photo interpretation, existing hydric soil data, and an evaluation of local hydrologic conditions and drainage patterns in the area to provide wetland boundaries because the landowner did not grant survey permission.

The proposed pipeline facilities would result in 163 wetland crossings, including 77 in New York and 86 in Connecticut. In some cases the Project facilities would include multiple crossings of the same wetland. There would be no wetland impacts in Rhode Island or Massachusetts. Detailed information about each wetland potentially affected by the Project is provided in table K-1 in appendix K. A summary of the wetland impacts associated with construction and operation of the Project is presented in section 4.4.4. No wetlands would be affected at any of the aboveground facility sites.

Algonquin proposes to use four locations for pipe and contractor ware yards. Three of these sites are existing industrial/commercial facilities with no wetlands present within the area proposed for use. The fourth site in Yorktown, New York is a 15-acre site within a 73-acre open space area owned by the Town of Yorktown. The area would be cleared of vegetation and site grading would occur as part of the proposed Project. No wetlands or waterbodies would be impacted as a result of the use of this site for the Project.

Algonquin would use existing roads for temporary and permanent access along the Project route and would not impact any wetlands. In areas were wetlands are adjacent to an existing access road, construction crews would avoid the wetland.

4.4.1.1 Wetland Types

Wetland types were assigned based on the National Wetlands Inventory (NWI) classifications as described in Cowardin et al. (1979). Four basic wetland types were delineated in the Project area. Wetlands that are classified as riverine and lacustrine are listed under waterbodies in section 4.3.2. The basic wetland types that were delineated in the proposed Project area are discussed below.

Palustrine Forested Wetlands

The majority of forested wetlands identified in the Project area are classified as palustrine forested (PFO) broad-leaved deciduous wetlands, found in association with streams and seeps or as isolated depressions. These wetlands typically occur in areas where the topography is low and flat or along waterbodies. PFO wetland cover types are dominated by trees and shrubs that have developed a tolerance to a seasonal high water table. In order to be characterized as forested, a wetland must be dominated by trees and shrubs that are at least six meters tall (Cowardin et. al., 1979). PFO wetlands typically have a mature tree canopy which, depending upon the species and density, can have a broad range of understory and groundcover community components. Tree species identified in the Project area include red maple, yellow birch, black birch, green ash, slippery elm, and American elm.

Palustrine Scrub-Shrub Wetlands

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 structure and composition of the vegetation within this cover type may be influenced by the water regime and, where located within existing right-of-ways, by utility maintenance practices. Most of these communities are seasonally flooded and often saturated to the surface. Many of the PSS wetlands along the Project pipeline segments are associated with emergent wetlands as part of large complexes. These PSS wetlands are also the dominant along existing electric transmission right-of-ways. Shrub species identified in the Project area include speckled alder, northern arrowwood, southern arrowwood, silky dogwood, highbush blueberry, spicebush, and sweet pepperbush. Within the utility right-of-way, the invasive multiflora rose is frequently dominant along the Project routes.

Palustrine Emergent Wetlands

Palustrine emergent wetlands (PEM) are characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens (Cowardin et. al., 1979). The PEM wetlands along the route include areas commonly referred to as marshes, wet meadows, and beaver flowage communities. The PEM wetland type exists on its own as well as in conjunction with other wetland types, creating a more heterogeneous wetland system. PEM wetlands are often associated with utility right-of-ways, abandoned agricultural areas, and open waterbodies. Vegetation in these wetlands along the Project route include cattail, tussock sedge, woolgrass, green bulrush, great bulrush, soft rushes, fox sedge, hop sedge, and shallow sedge. Many of the PEM wetlands along the Project routes are dominated by invasive species such as common reed, reed canary grass, and purple loosestrife.

4.4.1.2 Vernal Pools

Vernal pools are a subclass of emergent wetland that consist of intermittently to ephemerally ponded, small, shallow depressions usually located within an upland forest. They are typically flooded in spring or after a heavy rainfall, usually dry during summer, and are frequently filled again in autumn.

To identify vernal pools in all states within the Project, including New York, Algonquin evaluated wetlands within the study corridor in 2013 and 2014 based on the field methodology required in the USACE New England District. These evaluations were conducted by qualified biologists who identified areas with the potential to serve as vernal pool habitat based on an evaluation of visible vernal pool indicators. For each wetland evaluation, field scientists relied on direct evidence of amphibian breeding activity, and evidence of seasonal flooding and drying within a topographic depression not connected to a river, stream, or brook.

4.4.2 Wetland Construction Procedures

Construction of the pipeline would require 163 wetland crossings. One of the proposed crossings located in Connecticut would be conducted using the HDD method. Construction in the remaining wetlands would be conducted in accordance with the wetland construction and mitigation measures contained in Algonquin's E&SCP. The method of pipeline construction used in wetlands would depend largely on the stability of soils at the time of construction. Where wetland soils are relatively stable, the pipeline would be installed using methods similar to those used in uplands (with addition of certain protective measures that are specific to wetlands (i.e., segregation of topsoil over the trenchline)). Upland construction techniques may include stringing and welding the pipeline within the wetland and using sideboom tractors and trackhoes within the wetland to lower and backfill the pipeline. Where wetland soils are saturated and/or inundated, the pipeline may be installed using the push-pull technique, floating technique, or carried into place and submerged into the trench. The construction right-of-way width in wetlands would generally be 75 feet wide, except in areas where additional width has been requested by Algonquin (see section 4.4.4). Wetland construction procedures are discussed in more detail in section 2.3.1.2.

4.4.3 General Impacts and Mitigation

4.4.3.1 Wetlands

Table 4.4.3-1 summarizes the impacts of the proposed Project facilities on wetlands. A detailed listing of the Project impacts on each wetland is included in table K-1 in appendix K. In total, construction of the Project would impact 52.3 acres of wetlands during construction. Of that, about 24.0 acres would be impacted in New York and 28.3 acres would be impacted in Connecticut. No wetlands would be affected in Rhode Island or Massachusetts. The majority of this acreage (35.3 acres) would involve PEM and PSS wetlands. These impacts would be temporary and short term. The remaining 17.1 acres of impact would be on PFO wetlands. About 2.3 acres of PFO wetland would be permanently converted to non-forested wetland during operation of the pipeline facilities. The remaining 14.7 acres of PFO wetland would be allowed to revert to preconstruction conditions following construction, but would result in long-term impacts. About 1.7 acres of non-forested wetland would be affected by operation of the pipeline facilities. There would be no wetland impacts from proposed aboveground facilities or access roads. The Project would not result in any permanent loss of wetlands.

TABLE 4.4.3-1 **Summary of Wetland Impacts Resulting from Construction and Operation of the AIM Project**					
Facility/State	Total Crossing Length (feet)[a]	Total Wetland Impacts (acres)		Forested Wetland Impacts (acres)	
		Construction	Operation	Construction	Operation
PIPELINE FACILITIES					
New York					
Haverstraw to Stony Point Take-up and Relay	2,373.6	5.1	0.0	1.0	0.0
Stony Point to Yorktown Take-up and Relay	10,876.0	18.9	1.0	6.1	0.8
New York Subtotal	**13,249.6**	**24.0**	**1.0**	**7.1**	**0.8**
Connecticut					
Southeast to MLV 19 Take-up and Relay	5,435.2	8.2	0.0	2.5	0.0
Line-36A Loop Extension	1,676.2	2.6	0.8	0.9	0.5
E-1 System Lateral Take-up and Relay	8,979.2	15.8	1.7	5.5	0.6
E-1 System Lateral Loop	1,080.5	1.7	0.5	1.1	0.4
Connecticut Subtotal	**17,171.2**	**28.3**	**3.0**	**10.0**	**1.5**
ABOVEGROUND FACILITIES	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
PROJECT TOTAL	**30,420.8**	**52.3**	**4.0**	**17.1**	**2.3**

[a] Crossing length of pipeline where the pipeline center crosses the wetland.

No wetlands would be filled in New York, but pipeline construction would affect about 24.0 acres of wetlands. The majority of the affected wetlands would be PEM and/or PSS wetlands; about 7.1 acres would be PFO wetlands. Of the 7.1 acres of PFO wetlands, about 0.8 acre would be located within the new permanent right-of-way and would be subject to periodic vegetation maintenance during operation of the pipeline. Site-specific impacts on specific wetlands are discussed below.

The proposed Project would impact a large wetland system (B13-RLR-W3) between about MPs 0.8 and 1.0 of the Haverstraw to Stony Point Take-up and Relay segment. This wetland system is associated with tributaries to Minisceongo Creek. The portion of the wetland within the existing maintained right-of-way that would be used for construction is classified as PEM. The portion of the wetland within the proposed temporary construction right-of-way is classified primarily as PFO. Following construction, the PFO portions affected by construction would be allowed to return to their preconstruction condition, and those portions of the existing right-of-way would be maintained as PEM wetland.

NYSDEC requested specific information about how dewatering would be conducted during pipeline installation at wetland B13-SPLR-W26. This wetland is currently impounded by beavers and the wetland is flooded. The entire area along Lexington Avenue and Route 35 is prone to flooding during excessive precipitation events. As part of its application for section 401 WQC in New York, Algonquin provided a detailed construction plan illustrating pipeline construction staging at this wetland and an associated waterbody. Algonquin would use pumps with secondary containment for dewatering at this wetland. Discharge hoses with energy dissipation devices would be utilized to pump water into dewatering structures. The exact location of pumps, intake hoses, discharge hoses and the dewatering structures would be determined based on site-specific conditions at the time of construction. In addition, Algonquin would implement trench dewatering activities to comply with conditions of the section 401 WQC.

No wetlands would be filled in Connecticut, but pipeline construction would affect about 28.3 acres of wetlands. The majority of the affected wetlands would be PEM or PSS wetlands and the remaining 10.0 acres would be PFO wetlands. A total of 3.0 acres of wetlands including 1.5 acres of PFO wetlands would be located within in the new permanent right-of-way and would be subject to periodic vegetation maintenance during operation of the pipeline. All other wetland areas are located within the existing and currently maintained pipeline right-of-way.

The primary direct impact of pipeline construction and right-of-way maintenance activities on wetlands would be the short and long-term alteration of wetland vegetation. Other direct impacts associated with construction of the pipeline facilities could include changes in wetland hydrology and water quality. Trenching and backfilling activities would also directly impact wetlands. During construction, failure to segregate topsoil over the trenchline could result in the mixing of topsoil with the subsoil. This disturbance could result in altered biological activities and chemical conditions in wetland soils and could affect the re-establishment and natural recruitment of native wetland vegetation after restoration. In addition, inadvertent compaction and rutting of soils during construction could result from the movement of heavy machinery and the transport of pipe sections within the wetland areas. The resulting alteration of the natural hydrologic patterns could inhibit seed germination or increase the potential for siltation in wetlands. The discharge of stormwater, trench water, or hydrostatic test water could result in silt-laden water entering a wetland and cause the release of chemical and nutrient pollutants from sediments. Construction clearing activities and disturbance of wetland vegetation could also affect the wetland's capacity to buffer flood flows and/or control erosion. Secondary or indirect impacts could include reduced riparian buffers, disturbance to adjacent habitats, and incremental fragmentation of forested wetlands.

These effects would be greatest during and immediately following construction. The majority of these effects would be short term in nature and would cease shortly after the wetlands are restored. Following construction, new wetland vegetation would become established and eventually revert to a plant community similar to the one that existed prior to construction. In PEM wetlands, the herbaceous vegetation would regenerate quickly (within 1 to 3 years). Following revegetation, the permanent impact on emergent vegetation in the maintained right-of-way would be minimal because these areas consist of and would remain as open and herbaceous communities.

The duration of the impact on PSS and PFO wetlands would be longer. Woody vegetation may take several years to regenerate and the re-establishment of large woody vegetation would be precluded on a portion of the permanent right-of-way by routine vegetation maintenance activities during pipeline operation. This would convert previously PFO wetland areas to non-forested wetlands and PSS wetland areas to PEM wetlands. The conversion from one vegetation cover type to another could result in changes in wetland functions and values. In general, however, it is expected that the affected wetlands would continue to provide important ecological functions such as sediment/toxicant retention, nutrient removal and transformation, flood attenuation, groundwater recharge/discharge, and wildlife habitat.

Algonquin proposes to use the HDD method to avoid impacts on one wetland associated with the Interstate 84/Still River crossing in Connecticut. Use of the HDD method would eliminate the need for mechanical clearing, trenching, and the operation of heavy construction equipment within the wetland. Activities between HDD entry and exit points would be limited to foot traffic required for the placement of wire grids needed to guide the drill alignment.

Algonquin would mitigate unavoidable construction-related impacts on wetlands by implementing the wetland protection and restoration measures contained in its E&SCP. Specific measures that would be implemented, and included in the environmental analysis, include:

- locating ATWS at least 50 feet from wetland boundaries except where site-specific conditions warrant otherwise and FERC approval has been obtained;
- cutting vegetation above ground level, leaving existing root systems in place, and limiting stump removal to directly over the trenchline except where these activities are required outside the trenchline area for safety reasons;
- returning wetland contours and drainage patterns to their preconstruction configurations;
- installing sediment barriers immediately after initial ground disturbance within the right-of-way at the edge of the boundary between wetlands and uplands, across the entire right-of-way immediately upslope of the wetland boundary, and along the edge of the right-of-way as necessary to contain spoil within the right-of-way and to protect adjacent off right-of-way wetland areas;
- segregating the top 12 inches of topsoil from the trenchline in wetlands, except in areas where standing water is present or soils are saturated or frozen. Immediately after backfilling is completed, the segregated topsoil would be restored to its original location to expedite revegetation;
- prohibiting the use of rock, soil imported from outside the wetland, tree stumps, or brush riprap to stabilize the right-of-way;
- using low ground weight equipment or operating equipment on timber riprap, prefabricated equipment mats, or terra mats on saturated soils or where standing water is present;
- installing trench plugs as necessary to maintain the original wetland hydrology;
- prohibiting the use of lime, or fertilizer during the restoration of wetlands; and
- seeding freshwater wetlands with a wetland seed mix specified by relevant land management agencies unless standing water is present.

Algonquin would minimize wetland impacts during pipeline operation by:

- limiting vegetation maintenance in wetlands to a 10-foot-wide herbaceous corridor centered over the pipeline, and the cutting and removal of trees and shrubs greater than 15 feet in height that are within 15 feet of the pipeline centerline; and
- prohibiting the use of herbicides or pesticides within 100 feet of wetlands or waterbodies except as specified by the appropriate land management or state agency.

Overall, secondary impacts would be minimized through use of the measures described above and because most the facilities affecting wetlands would be installed within Algonquin's existing right-of-way. For example, only incremental fragmentation would occur within PFO wetlands as a result of expanding the existing right-of-way, no new fragmentation would occur in these areas.

Algonquin would also comply with any additional conditions of the wetland permits that could be issued by the USACE, NYSDEC, and CTDEEP. This includes Algonquin committing to provide compensatory mitigation for the permanent conversion of 0.8 acre of PFO wetlands to a non-forested wetland type in New York and 1.5 acres of PFO wetlands to a non-forested wetland type in Connecticut. Details of the compensatory mitigation are described in greater detail in section 4.4.5.

In accordance with its E&SCP and the Conceptual Mitigation Plan (see appendix M), Algonquin would conduct post-construction monitoring. Monitoring efforts would include documenting occurrences of exotic invasive species to compare to preconstruction conditions. In the event that nuisance plant species spread into the new right-of-way areas where not documented prior to construction, Algonquin would implement removal and eradication measures. Additional post-construction wetland monitoring requirements would be included as conditions of the section 404 CWA permits that could be issued by the New York and New England USACE Districts, including an adaptive management plan.

Post-construction monitoring would, at minimum, be conducted annually for 3 years for all wetlands affected by construction to assess the condition of revegetation and the success of restoration. According to Algonquin's Invasive Plant Species Control Plan[2], post-construction monitoring of invasive species would be conducted for at least 4 years. Wetland revegetation would be considered successful when the cover of herbaceous and/or woody species is at least 80 percent of the type, density, and distribution of the vegetation in adjacent wetland areas that were not disturbed by construction. If wetlands were not showing signs of re-establishment of native wetland vegetation, Algonquin would consult with the appropriate federal and state agencies to develop a remedial action plan and produce quarterly monitoring reports. Upon determination of successful revegetation, sediment barriers would be removed and disposed of properly in accordance with the E&SCP.

Construction impacts would be mitigated in accordance with Algonquin's E&SCP and Invasive Plant Species Control Plan. Wetlands disturbed by construction would be restored and monitored, and appropriate compensatory mitigation would be provided to offset the permanent conversion of PFO wetlands to PEM wetlands. Therefore, we conclude that the Project would not result in adverse impacts on the functions that wetlands provide.

4.4.3.2 Vernal Pools

Algonquin identified eleven vernal pools in the Project study corridor (300 feet) including seven in New York, three in Connecticut, and one in Rhode Island (see table 4.4.3-2). No vernal pools were identified in Massachusetts. Two vernal pools in Cortlandt, New York are located within the temporary construction area for the Project. About 1,948 square feet of vernal pool habitat would be affected by Project construction. The remaining nine vernal pools were identified within the study corridor, but are not located within the proposed construction area and would not be directly affected by the Project.

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[2] Algonquin's Invasive Plant Species Control Plan was included as Appendix 3F to Resource Report 3 in its February 28, 2014 application (Accession No. 20140228-5269). 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 20140228-5269 in the "Numbers: Accession Number" field.

TABLE 4.4.3-2

Vernal Pools Along the Pipeline Facility Study Corridor for the AIM Project

Facility/State/Vernal Pool	MP	Town	Description	Construction (square feet)[a]	Operation (square feet)[b]
PIPELINE FACILITIES					
New York					
Stony Point to Yorktown Take-up and Relay					
B13-SPLR-VP4	5.6	Cortlandt	Vernal pool located within the 300-foot study corridor, not directly affected by construction or operation	0.0	0.0
B13-SPLR-VP6	5.8	Cortlandt	Vernal pool located within the 300-foot study corridor, not directly affected by construction or operation	0.0	0.0
B13-SPLR-VP11	6.5	Cortlandt	Vernal pool located within the 300-foot study corridor, not directly affected by construction or operation	0.0	0.0
B13-SPLR-VP8	6.8	Cortlandt	Vernal pool located within the temporary workspace of the Project	1,770.0	0.0
B13-SPLR-W51	7.2	Cortlandt	Vernal pool located along TAR 7.6, outside of the study corridor, not directly affected by construction or operation	0.0	0.0
B13-SPLR-VP19	8.3	Cortlandt	Vernal pool located within the 300-foot study corridor, not directly affected by construction or operation	0.0	0.0
A13-SPLR-VP2	8.7	Cortlandt	Vernal pool located within the temporary workspace of the Project	177.8	0.0
Connecticut					
Southeast to MLV 19 Take-Up and Relay					
A13-SELR-VP4	2.7	Danbury	Vernal pool located along the edge of the temporary workspace, not directly affected by construction or operation	0.0	0.0
E-1 System Lateral Take-Up and Relay					
A13-ELR-VP6	2.7	Lebanon	Vernal pool located within the 300-foot study corridor, not directly affected by construction or operation	0.0	0.0
A13-ELR-VP13	6.9	Franklin	Vernal pool located within the 300-foot study corridor, not directly affected by construction or operation	0.0	0.0
ABOVEGROUND FACILITIES					
Rhode Island					
Burrillville Compressor Station					
A13-BCS-VP1	NA	Burrillville	Vernal pool located within the compressor station study area, not directly affected by construction or operation	0.0	0.0

[a] The amount of area (in square feet) of the feature that would be affected by the construction workspace of the Project. These areas would be allowed to revegetate.

[b] The amount of area (in square feet) of the feature that would be permanently converted from forested upland vegetative habitat to an open land vegetative habitat.

NA = Not applicable

The primary effects of construction-related activity on vernal pools located in the temporary workspace would be similar to those described for emergent wetlands. However, vernal pools may also be affected by the conversion of adjacent forested habitat to early successional stage habitats. Impacts from pipeline maintenance activities would include the periodic removal of emergent and woody vegetation. To minimize direct and indirect or secondary impacts during construction, all vernal pools would be treated as wetlands and protected by adherence to the measures outlined in Algonquin's E&SCP. These measures would protect vernal pools from siltation and stormwater runoff, and provide a barrier to alert construction workers of the presence of sensitive habitat.

Algonquin submitted wetland and water quality permit applications to the USACE, CTDEEP, and NYSDEC in March and April 2014. As part the section 401 WQC application to the NYSDEC, Algonquin included site-specific crossing plans for the two vernal pools in New York. These site-specific plans illustrate the placement of sedimentation and erosion controls. Because the permits are currently under review with the applicable agencies, **we recommend that:**

- **<u>Prior to construction in the vicinity of the two vernal pools in New York</u>, Algonquin should file with the Secretary, for review and written approval of the Director of the OEP, revised site-specific crossing plans incorporating any additional avoidance or mitigation measures for the two vernal pools as required through the permit review process with the applicable agencies.**

4.4.4 Alternative Measures Requiring FERC Approval

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 the FERC. Algonquin identified numerous 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 4.4.4-1 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 workspace in those wetland areas. Algonquin also identified locations where it believes site-specific conditions do not allow a 50-foot setback of ATWS from wetlands. Table 4.4.4-2 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.

In addition, Algonquin's E&SCP is not consistent with section VI.B.2.d of the FERC Procedures. In accordance with section VI.B.2.b of the FERC Procedures, when wetlands are dry enough to support skids and pipe, the pipeline would be assembled in the wetlands. In these instances, Algonquin proposes to excavate the trench prior to the pipeline assembly. Otherwise, after the pipeline is assembled, equipment would not be able to access the area where trenching would occur nor would there be sufficient construction workspace to safely excavate the trench. Excavating the trench prior to stringing and assembling the pipe segments in non-saturated wetlands is generally acceptable; however, a blanket approval for implementing this practice would not provide the site-specific justification required by our Procedures, **therefore we recommend that:**

- **<u>Prior to the end of the draft EIS comment period</u>, Algonquin should file with the Secretary site-specific information regarding the location of those wetlands it believes would meet the criterion of non-saturated conditions at the time of construction.**

TABLE 4.4.4-1

Locations Where the Construction Right-of-way is Greater Than 75 Feet in a Wetland

State, Facility, Wetland ID	MP	Crossing Width (>75 Feet Right-of-Way)	ATWS Justification [a]
NEW YORK			
Haverstraw to Stony Point Take-up and Relay			
B13-RLR-W2	0.5	25	A
B13-RLR-W3	0.8	10	B
B13-RLR-W4	1.6	10	B
B13-RLR-W9	3.0	55	B and C
B13-RLR-W10	3.0	30	B and D
Stony Point to Yorktown Take-up and Relay			
B13-SPLR-W50	4.4	25	B
B13-SPLR-W203	4.6	25	B
B13-SPLR-W205	4.7	25	B and E
B13-SPLR-W202	4.8	25	B
B13-SPLR-W16	5.1	25	B
B13-SPLR-W16	5.2	25	B
B13-SPLR-W16	5.3	25	B
B13-SPLR-W17	5.6	25	B
B13-SPLR-W2	5.9	35-135	B
B13-SPLR-W3	6.0	25	B
B13-SPLR-W7	6.7	25	B
B13-SPLR-W8	6.8	25	B
B13-SPLR-W12	7.3	25	B
B13-SPLR-W13	7.6	25	B
B13-SPLR-W14	8.2	25	B
B13-SPLR-W15	8.4	25	B
B13-SPLR-W2	8.5	10	B
B13-SPLR-W18	8.8	10	B
B13-SPLR-W21	10.3	265 at greatest extent, necks down to 75	F
B13-SPLR-W25	10.8	45	B and G
B13-SPLR-W41	11.0	25	B
B13-SPLR-W26	11.1	25	B
B13-SPLR-W27	11.5	25	B
B13-SPLR-W28	11.7	25	B
B13-SPLR-W29	12.0	25	B

TABLE 4.4.4-1 (cont'd)

Locations Where the Construction Right-of-way is Greater Than 75 Feet in a Wetland

State, Facility, Wetland ID	MP	Crossing Width (>75 Feet Right-of-Way)	ATWS Justification [a]
CONNECTICUT			
Southeast to MLV-19 Take-up and Relay			
B13-SELR-W8	0.2	10	B
B13-SELR-W9	0.7	10	B
A13-SELR-W1	1.0	10	B
A13-SELR-W2	1.2	60	B
A13-SELR-W3	1.2	55	B
B13-SELR-W10	2.1	10	B
A13-SELR-W4	2.6	10	B
A13-SELR-W6	3.0	10	B
B13-SELR-W3	3.5	10	B
B13-SELR-W4	3.7	10	B
B13-SELR-W5	3.8	10	B
B13-SELR-W7	4.1	10	B
Line-36A Loop Extension			
B13-CCS-W1	0.0	10	B
B13-CLR-W2	0.7	10	B
B13-CLR-W3	1.2	10	B
B13-CLR-W4	1.3	10	H

[a] A = Extra workspace required to facilitate wetland topsoil, wetland subsoil segregation through the short length of wetland crossing. This would allow the saturated wetland soils to be stockpiled within the wetland rather than relaying the wetland soils to an upland area. Determining the time period in which the wetland subsoil would be dry is not possible as the wetland area is saturated by a hill-side spring and run-off from the surrounding watershed.

B = Extra workspace required for spoil storage due to saturated subsoil and the use of heavy equipment required to install large diameter pipe.

C = Algonquin would install the pipeline by using the open-cut method.

D = Culvert Replacement

E = Road crossing

F = Extra workspace required for saturated soils and the crossing of the Catskills Aqueduct. Extra workspace is also necessary due to the proximity of the existing Cortlandt M&R Station.

G = Extra workspace required for transition of the "working side" of the right-of-way from the southern side of the centerline to the northern side.

H = Extra workspace required because wetland boundaries are crossing the right-of-way at oblique angles, upland inclusions within the wetland boundaries, and waterbody crossings within the wetland boundaries. These factors would require additional space for spoil storage and segregation.

TABLE 4.4.4-2

Locations of Additional Temporary Workspace Within 50 Feet of a Wetland Along the AIM Project

State, Facility, Wetland ID	ATWS MP	ATWS Size (acres)	Distance From Resource	Justification
NEW YORK				
Haverstraw to Stony Point Take-up and Relay				
B13-RLR-W3	1.1	0.5	0	This area is required for spoil storage at Minisceongo Creek, associated wetland crossing (B13-RLR-W3), and crossing of Calls Hollow Road.
B13-RLR-W9 B13-RLR-W10	3.0	0.3	0-20	This area is required for spoil storage at the Cedar Pond Brook and associated wetland crossing, and it is required for the crossing of Highway 210, which also intersects Johnson Drive nearby.
B13-RLR-W10	3.0	0.1	40	This area is required for spoil storage at the wetland and stream crossing, and it is also required for the crossing of Cedar Flats Road. Extra workspace is also necessary due to the proximity of the existing Stony Point Meter Station.
Stony Point to Yorktown Take-up and Relay				
B13-SPLR-W17	5.6	0.1	0	Extra workspace required for saturated soils, working around existing development and constraints associated with proximity to Dickey Brook.
B13-SPLR-W2	5.9	1.4	0	This area is required for crossing extensive wetland system with saturated soils, Dickey Brook, and the Briarcliff Peekskill Parkway.
B13-SPLR-W7	6.7	0.2	20	This area is required for the crossing of Washington Street which abuts the edge of the wetland.
B13-SPLR-W12	7.4	0.2	0	Extra workspace required for saturated soils.
A13-SPLR-W2	8.5	0.2	30	This area is required for the crossing of Maple Avenue which abuts the edge of the wetland.
A13-SPLR-W2	8.6	0.1	40	Extra workspace required for saturated soils associated with the extensive wetland system.
A13-SPLR-W2 B13-SPLR-W18	8.8	0.4	40	Extra workspace required for saturated soils associated with the extensive wetland system.
A13-SPLR-W4	9.2	0.1	25	This area is required for the crossing of Diamond Avenue and also necessary due to the proximity of residences.
B13-SPLR-W43 B13-SPLR-W206	9.6	0.1	0	Extra workspace required for saturated soils and the crossing of Forest Avenue and proximity of residences.

TABLE 4.4.4-2 (cont'd) **Locations of Additional Temporary Workspace Within 50 Feet of a Wetland Along the AIM Project**				
State, Facility, Wetland ID	ATWS MP	ATWS Size (acres)	Distance From Resource	Justification
B13-SPLR-W20	9.9	0.5	45	Extra workspace required for saturated soils and because of its proximity to a residential cul de sac.
B13-SPLR-W22	10.5	0.2	0	Extra workspace required for saturated soils and the crossing of Croton Road.
B13-SPLR-W23	10.7	0.1	0	Extra workspace required for saturated soils and the crossing of Baron de Hirsh Road.
B13-SPLR-W41	11.0	0.1	30	Extra workspace needed for saturated soils and Lexington Road crossing.
CONNECTICUT				
Southeast to MLV-19 Take-up and Relay				
B13-SELR-W8	0.4	0.6	25	Extra workspace needed for saturated soils and for multiple road crossings.
A13-SELR-W4	2.7	0.1	5	Extra workspace required for multiple road crossings, extensive wetland crossing with saturated soils, and proximity to existing development.
E-1 System Lateral Take-up and Relay				
B13-ELR-W200	0.0	0.1	0	Workspace is required for crossing Highway 289 and work in wetland.
A13-ELR-W1	0.7	0.1	20	Workspace is required for crossing Susquetonscut Brook and wetland which intersect on either side of a hill in the right-of-way.
A13-ELR-W2	1.9	0.1	0	Workspace is required in this area where the right-of-way crosses Highway 207, Susquetonscut Brook and associated wetland.
B13-ELR-W22	7.3	0.5	0	This area is required for spoil storage at the wetland and Johnny Cake Brook crossing, and it is also required for the crossing of Route 32. Extra workspace is also necessary due to the proximity of the existing Franklin Meter Station.
B13-ELR-W22	7.3	1.2	0	This area is required for spoil storage at the wetland and Johnny Cake Brook crossing, and it is also required for the crossing of Route 32. Extra workspace is also necessary due to the proximity of the existing Franklin Meter Station.

4.4.5 Compensatory Mitigation

The proposed facilities in New York, Connecticut, Rhode Island, and Massachusetts would not result in the permanent loss of any wetland (i.e., conversion to upland). However, a total of 52.3 acres of wetlands would be impacted in New York and Connecticut by construction of the proposed Project. No wetlands would be impacted by Project facilities in Rhode Island or Massachusetts. The majority of wetland impacts would be on PEM and PSS wetlands, with only 17.1 acres of PFO wetland impacts. In most cases, the PFO wetlands would be allowed to return to their preconstruction condition. About 2.3 acres of PFO wetlands would be permanently converted to non-forested conditions as a result of Project operations. About 0.8 acre of this would be in New York and the remaining 1.5 acres would be in Connecticut. Algonquin would provide compensatory mitigation for the permanent conversion of PFO wetlands to non-forested wetlands in New York and Connecticut and the USACE expects that additional compensation may be necessary for temporal loss of aquatic habitat function associated with the discharge of temporary fill and secondary project impacts.

Algonquin developed a Conceptual Mitigation Plan for the Project (see appendix M). As part of that plan, Algonquin proposed to provide compensatory mitigation for both the temporary impacts and permanent conversion of PFO wetlands to another cover type. To satisfy USACE requirements for the New England District, Algonquin proposes to make a contribution to an approved in-lieu fee program in Connecticut. The USACE New York District would require on-site restoration for temporary PFO wetland impacts and would require off-site mitigation for the permanent conversion of PFO wetlands within the maintained right-of-way. Off-site mitigation must be in-kind, located in the same watershed as the impact, and provided at a 2:1 ratio. Both USACE Districts have indicated what would be required, but final mitigation plans have not been developed.

NYSDEC regulates impacts on “mapped wetlands” larger than 12.4 acres in size. Impacts that occur on wetlands that are not mapped would be subject to the mitigation requirements of the USACE New York District. At this time, Algonquin has not confirmed New York’s compensatory mitigation requirements for both temporary and permanent PFO wetlands impacts, and has assumed that the compensatory mitigation proposal submitted to the USACE New York District for PFO impacts would be acceptable to NYSDEC.

In Connecticut, wetland impacts that require mitigation at the state level are determined on a case-by-case basis. Algonquin has not confirmed state compensatory mitigation requirements for both temporary and permanent forested wetland impacts in Connecticut. Algonquin’s discussions with CTDEEP have indicated that while they typically do not accept payment to an in-lieu fee program as mitigation, for linear projects, they would consider it when determining appropriate mitigation. Algonquin is continuing to discuss mitigation requirements with CTDEEP.

Conclusions

As discussed in section 4.4.3.1, based on the avoidance and minimization measures developed by Algonquin, including the E&SCP, we conclude that impacts on most wetland resources would be minimal and would be temporary in duration. Also, Algonquin’s implementation of a final, agency-approved Compensatory Mitigation Plan, would further offset any adverse impacts on wetland functions that would result from the permanent conversion of 0.8 acre of PFO wetlands to a non-forested wetland type in New York and 1.5 acres of PFO wetlands to a non-forested type in Connecticut. However, to adequately capture and document the final agency requirements for compensatory mitigation commitments, **we recommend that**:

- **<u>Prior to construction in New York and Connecticut</u>, Algonquin should file with the Secretary the final Compensatory Mitigation Plan, developed in consultation with the USACE, the NYSDEC, and the CTDEEP and file documentation of consultation with these agencies regarding the Compensatory Mitigation Plan.**

4.5 VEGETATION

4.5.1 Existing Vegetation Resources

Ecoregions are areas that have similar environmental resources and characteristics, including geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology (EPA, 2013). Classification at the ecoregion level describes the broad-scale environmental factors that contribute to the dominant natural vegetation that may be present within a particular region. The AIM Project facilities would be located in three EPA ecoregions: the Northeastern Highlands, Northeastern Coastal Zone, and Atlantic Coastal Pine Barrens Ecoregions (USGS, 2013).

All of the Project facilities in New York would be located in the Northeastern Highlands Ecoregion. The Northeastern Highlands Ecoregion is an area with topography ranging from low mountains in portions of southern New York, western Connecticut, and western Massachusetts, to open high hills in Vermont, New Hampshire, and Maine (Kambly, 2013). The ecoregion also shows many remnants of glaciation, including rocky soils, glacial lakes, and wetlands. The ecoregion is generally sparsely populated, and land cover in the region is largely forested with naturally occurring northern hardwood and spruce fir forests growing on nutrient poor soils (USGS, 2013).

With the exception of the existing Middleborough M&R Station in Plymouth County, Massachusetts, all of the Project facilities in Connecticut, Rhode Island, and Massachusetts would be located within the Northeastern Coastal Zone Ecoregion. The Northeastern Coastal Zone Ecoregion has relatively low but irregular topography that was created by glaciation. Vegetative communities naturally consist of hardwood and mixed forests and smaller areas of inland and coastal wetlands. Land use is predominantly forested and urban (Auch, 2013).

The Middleborough M&R Station would be located in southeastern Massachusetts, which is part of the Atlantic Coastal Pine Barrens Ecoregion. This ecoregion is found along the coastal plain from Massachusetts to New York. Natural ecosystems present within this ecoregion include cedar swamps, pitch pine and oak forests, sphagnum bogs, coastal salt ponds, dune systems, and maritime grasslands (Sohl, 2013). Portions of this ecoregion are highly urbanized.

The vegetative cover types within the Project area are consistent with typical plant communities found in New York, Connecticut, Rhode Island, and Massachusetts. Plant community types along the proposed pipeline routes and at aboveground facility sites were determined based on a review of aerial photography, existing land use classifications, and field surveys. Field surveys for wetlands and waterbodies were completed in January 2014, and encompassed all proposed construction work areas. During these surveys, in addition to wetland vegetation, field observations and notes were made to identify the upland vegetation communities and their associated habitats. Descriptions of existing typical vegetative cover types in the Project area are based on the field observations and the natural community classification systems described in *Draft Ecological Communities of New York State* (Edinger et al., 2002), *The Vegetation of Connecticut: A Preliminary Classification* (Metzler and Barrett, 2006), and *Classification of the Natural Communities of Massachusetts* (Swain and Kearsley, 2011).

4.5.1.1 Pipeline Facilities

About 11 percent (50.0 acres) of the land that would be required for construction and operation of the pipeline facilities is unvegetated industrial/commercial land. Of the vegetated areas, forested upland is the most common vegetation type that would be affected by the pipeline followed by open upland (see section 4.5.4). The common species associated with each of these cover types is described below.

Forested Uplands

Typical forested upland community types in the Project area include, but are not limited to, dry-mesic inland mixed oak forest, Appalachian oak-hickory forests, successional northern hardwood forests, and chestnut oak forests (Edinger et al., 2002).

In New York, forested upland vegetation along the Project pipeline routes is best classified as dry-mesic inland mixed oak forest, which is typically dominated by northern red oak (*Quercus rubra*), white oak (*Quercus alba*), and eastern black oak (*Quercus velutina*) (Breden, 1989). Forested vegetation on uplands along the pipeline routes is mostly dominated by northern red oak, chestnut oak (*Quercus prinus*), white oak, and other oaks (*Quercus* spp.), sweetgum (*Liquidambar styraciflua*), American beech (*Fagus grandifolia*), and shagbark hickory (*Carya ovata*). Chestnut oak forests crossed by the Project in Rockland County, New York are considered to be a significant natural community within the state (New York Natural Heritage Program [NYNHP], 2013). Chestnut oak forests can be found within the Project area along the Haverstraw to Stony Point Take-up and Relay and a portion of the Stony Point to Yorktown Take-up and Relay segments. See section 4.5.2 for more information regarding this community type.

In Connecticut, forested upland vegetation along the pipeline routes is best classified as beech-maple mesic forests and successional northern hardwood forests. Beech-maple mesic forests are hardwood forests with sugar maple (*Acer saccharum*) and beech (*Fagus* spp.) co-dominance. Successional northern hardwood forests in Connecticut are hardwood or mixed forests that occur on sites that have been cleared or otherwise disturbed. Common tree species identified during field surveys along the pipeline routes included red maple (*Acer rubrum*), American beech, red oak, red cedar (*Juniperus virginiana*), black cherry (*Prunus serotina*), and eastern hemlock (*Tsuga canadensis*). Species commonly observed in the understory include multiflora rose (*Rosa multiflora*) and red raspberry (*Rubus idaeus*).

In Rhode Island, forested upland vegetation is limited to the Burrillville Compressor Station and is best classified as a Northern Hardwood/Hemlock/White Pine forest. Northern Hardwood/Hemlock/White Pine communities are closed canopy forests dominated by a mix of evergreen and deciduous trees, with sparse shrub and herbaceous layers (Massachusetts Division of Fisheries and Wildlife [MDFW], 2013). Common tree species identified during field surveys at the compressor station included red maple, red oak, yellow birch (*Betula alleghaniensis*), eastern hemlock, and white pine (*Pinus strobus*). The understory includes sapling and shrub white pine, red maple and American beech with some common barberry (*Berberis vulgaris*) and highbush blueberry (*Vaccinium corymbosum*) shrubs. Canada mayflower (*Maianthemum canadense*) is a common groundcover in these forested areas.

In Massachusetts, forested upland vegetation in the Project area is limited to the Assonet and West Roxbury M&R Stations (see section 4.5.1.2).

Open Uplands

The proposed pipeline segments would cross primarily open upland areas associated with the existing, maintained pipeline rights-of-way in New York and Connecticut. Open upland communities can generally be subdivided into the following vegetation communities:

- grasslands – communities dominated by grasses and sedges with less than 50 percent shrub cover, sometimes with scattered trees;

- meadows – plant communities with co-dominant forbs, sedges, grasses and shrubs, sometimes with scattered trees; and
- shrublands – plant communities that have more than 50 percent shrub cover (Edinger et al., 2002).

Much of the Project pipeline segments would be located within or parallel to existing utility rights-of-way. In other locations, the pipeline segments would be located along an existing roadway or in previously disturbed developed areas. Vegetation management practices along rights-of-way, roadways, or other previously disturbed areas typically result in early successional vegetative cover that ranges from early successional upland scrub-shrub to field and roadside habitats.

Species observed in the open, upland areas within the existing pipeline rights-of-way throughout the AIM Project area included red fescue (*Festuca rubra*), common milkweed (*Asclepias syriaca*), Timothy-grass (*Phleum pretense*), red clover (*Trifolium pratense*), white clover (*T. repens*), garlic mustard (*Alliaria petiolata*), Virginia creeper (*Parthenocissus quinquefolia*), and poison ivy (*Toxicodendron radicans*).

Wetland Vegetation Communities

Wetland vegetation community types observed along the pipeline facilities included PFO wetlands, PSS wetlands, and PEM wetlands. These wetland vegetation types and the potential impacts on these communities are described in detail in section 4.4.

4.5.1.2 Aboveground Facilities

About 34 percent (32.2 acres) of the land that would be required for construction and operation of aboveground facilities would be unvegetated industrial/commercial land. Portions of some aboveground facility sites contain forested upland and open upland communities and palustrine wetlands. In general, construction and operation of new proposed aboveground facilities and changes to existing facilities would primarily affect open upland communities; however, in a few locations, forested land or wetland communities may be affected. The new Assonet M&R Station would be located in an area of mixed oak forest interspersed with shrub/scrub stands. The dominant tree species are black oak, red oak, pignut hickory (*Carya glabra*), white ash (*Fraxinus americana*), and sugar maple. The shrub/scrub understory is dominated by multiflora rose and autumn olive (*Elaeagnus umbellata*). The West Roxbury M&R Station would be located in an old quarry that been has re-vegetated. The dominant tree species include sugar maple, shagbark hickory, black locust (*Robinia pseudoacaia*), and red oak. The understory is a mix of multiflora rose and glossy buckthorn (*Frangula alnus*).

4.5.1.3 Pipe and Contractor Ware Yards

Algonquin has identified four proposed pipe and contractor ware yards for potential use during the construction of the AIM Project. The location of these yards, and their existing conditions, are provided in table 2.2.3-1. The Dansville, New York, and Danbury and Franklin, Connecticut yards are existing construction or industrial sites with no vegetative communities or other natural resources present.

The Yorktown, New York Yard is an approximately 73-acre parcel of undeveloped, open space land owned by the Town of Yorktown, containing an assemblage of early successional plant communities. A number of small wetland features are also located on the parcel, but would be avoided as part of the Project. The 73-acre parcel is vegetated with a mixture of open shrubland and mixed deciduous woodlands with sugar maple as the dominant species and lesser amounts of apple (*Malus* spp.), black locust (*Robinia pseudoacaia*), and black walnut (*Juglans cinerea*). The actual pipe yard would be about 15 acres in size.

4.5.1.4 Access Roads

To the extent feasible, existing public and private road crossings along the proposed Project pipeline segments would be used as the primary means of accessing rights-of-way. Algonquin would also use existing public roads near proposed compressor stations and M&R stations. In addition to the existing access available by the use of public roads, Algonquin has identified 27 existing TARs, and 8 PARs along the pipeline route, including one new PAR to be constructed at the Assonet M&R Station. A comprehensive list of the proposed TARs and PARs can be found in table 2.2.4-1.

4.5.2 Vegetation Communities of Special Concern or Value

This section summarizes unique, sensitive, and protected vegetation that could be affected by the AIM Project facilities in each state. Federal and state resource agencies have been consulted to determine if any federally or state-listed threatened and endangered plant species (including federal and state species of special concern) or their designated communities occur within the Project area, which is discussed further in section 4.7. Agencies contacted include the FWS (New York and New England Field Offices), NYNHP, CTDEEP, MDFW, and RIDEM.

The federally and state-endangered small whorled pogonia (*Isotria medeolodes*) has historically been recorded in Rockland County, New York. Algonquin continues to consult with the FWS to plan surveys and to devise a mitigation strategy to minimize impacts on the small whorled pogonia (see section 4.7).

Chestnut oak forests are considered a significant natural community in New York. They are globally listed as G5 (demonstrably secure globally) and in New York listed as S4 (apparently secure) (NYNHP, 2013e). There are several hundred occurrences in New York State. In the Project area, the NYNHP has identified chestnut oak forests within Harriman State Park and the surrounding environs as high quality.

Chestnut oak forests comprise the upland forest type west of the Hudson River, including land crossed by the Haverstraw to Stony Point and Stony Point to Yorktown Take-up and Relay segments and the existing Stony Point Compressor Station. Threats to chestnut oak forests within this region generally include changes in land use (e.g., clearing for development), forest fragmentation (e.g., roads), and invasive species (e.g., insects, diseases, and plants). Other threats may include over-browsing by deer, fire suppression, and air pollution (e.g., ozone and acidic deposition).

Algonquin would limit the amount of disturbance to chestnut oak forests by utilizing the existing pipeline right-of-way during construction to the extent possible. However, some clearing of chestnut oak forest for the temporary construction work areas would be required to safely install the new 42-inch-diameter pipeline in Rockland County, New York. In addition, construction at the Stony Point Compressor Station would require tree clearing for temporary construction work areas, and about 7.6 acres of woodland would be temporarily affected by installation of the new facilities at the station.

The CTDEEP identified extant records for eight rare plant species in the vicinity of the AIM Project pipeline segments in Connecticut and Algonquin's existing Cromwell Compressor Station. These species include climbing fern (*Lygodium palmatum*), Collins' sedge (*Carex collinsii*), field paspalum (*Paspalum laeve*), hard-stemmed bulrush (*Scoenoplectus acutus*), three-leaved false Solomon's seal (*Maianthemum trifolium*), threadfoot (*Podostemum ceratophyllum*), twinflower (*Linnaea borealis* spp. *americana*), and the yellow fringed orchid (*Platanthera ciliaris*) (CTDEEP, 2013d). These species are discussed in detail in section 4.7.

No unique, protected, or sensitive vegetation has been identified at the Burrillville Compressor Station site in Rhode Island or along the proposed Project facilities in Massachusetts.

4.5.3 Noxious Weeds and Other Invasive Plant Species

This section summarizes the noxious and invasive vegetation identified during field observations that would be crossed by the AIM Project in each state. Invasive species are species that display rapid growth and spread, becoming established over large areas (USDA, 2013a). Invasive plant species can change or degrade natural vegetation communities, which can reduce the quality of habitat for wildlife and native plant species.

The proposed pipeline facilities extend across four states that are represented by a variety of habitat including forests, open fields, wetlands, agriculture, residential development, and industrial development). Much of this area has been disturbed by past land use practices, such as agriculture and residential development. As observed during field surveys, there are many non-native species of vegetation found throughout the Project area. Non-native species commonly observed include non-native honeysuckles (*Lonicera* spp.), Japanese barberry (*Berberis thunbergii*), Japanese knotweed (*Polygonum cuspidatum*), Japanese stiltgrass (*Microstegium vimineum*), autumn olive, buckthorns (*Frangula* or *Rhamnus* spp.), European common reed grass (*Phragmites australis*), reed canarygrass (*Phalaris arundinacea*), purple loosestrife (*Lythrum salicaria*), and garlic mustard. Invasive plant species commonly observed during the Project field surveys for each state are detailed below.

Algonquin would conduct post-construction maintenance and monitoring of the right-of-way in affected wetlands to assess the success of restoration and revegetation in accordance with its E&SCP and final Compensatory Mitigation Plan. Monitoring efforts would include documenting occurrences of exotic invasive species to compare to preconstruction conditions. During the 2013 wetland field surveys, Algonquin documented the presence of any invasives that comprised a significant percent of the vegetative cover. Algonquin would use this information in conjunction with its Invasive Plant Species Control Plan and Compensatory Mitigation Plan to address the spread of invasive plants within the Project rights-of-way and control invasive populations that might prevent successful mitigation of impacts on wetlands.

The CTDEEP has indicated that they would incorporate a special permit condition for invasive species management into the section 401 WQC for the Project (CTDEEP, 2013n). The NYSDEC has also provided comments and recommendations for controlling invasive species in wetlands (NYSDEC, 2013m). Algonquin would continue to consult with the CTDEEP and the NYSDEC as part of the 401 WQC permit process.

New York State has an Invasive Species Council that was created to coordinate among multiple state entities and partners in addressing the environmental and economic threats of invasive species. New York State defines invasive species as "a species that is: (a) non-native to the ecosystem under consideration; and (b) whose introduction causes or is likely to cause economic or environmental harm or harm to human health" (NYSDEC, 2013k).

New York has designated 71 plants as invasive species (NYSDEC, 2013j). Listed invasive plants commonly observed during the AIM Project field surveys in New York include: multiflora rose, Norway maple (*Acer platanoides*), Japanese barberry, autumn olive, Japanese honeysuckle (*Lonicera japonica*), oriental bittersweet (*Celastrus orbiculatus*), mugwort (A*rtemisia vulgaris*), Japanese knotweed, garlic mustard, reed canarygrass, European common reed grass, and purple loosestrife.

Connecticut has designated 102 plants as invasive species (USDA, 2013b). CTDEEP defines invasives as, "Non-native species are those that are alien to the ecosystem that they have been introduced into and whose introduction causes or is likely to cause harm to the environment or human health. Some non-native species exhibit an aggressive growth habit and can out-compete and displace native species" (CTDEEP, 2013q). Listed invasive plants commonly observed during the AIM Project survey efforts in Connecticut include: multiflora rose, Japanese barberry, autumn olive, oriental bittersweet, mugwort, Japanese knotweed, garlic mustard, reed canarygrass, European common reed grass, purple loosestrife, Japanese stiltgrass, Canada thistle (*Cirsium arvense*), and glossy buckthorn. CTDEEP has developed a set of BMPs to reduce the spread of invasive species within the state (CTDEEP, 2013q).

The Rhode Island Invasive Species Council (RIISC) is an outreach program of the Rhode Island Natural History Survey, the Rhode Island Agricultural Experiment Station, and the University of Rhode Island Cooperative Extension. According to the Executive Order on Invasive Species, "invasive species means an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health." Rhode Island recognizes 69 invasive plant species (RIISC, 2013). Of those 69 species, none were observed during the field efforts at the Burrillville Compressor Station.

The Massachusetts Invasive Plant Advisory Group (MIPAG) is a voluntary collaborative, representing organizations and professionals concerned with the conservation of the Massachusetts landscape. MIPAG defines invasive plants as "non-native species that have spread into native or minimally managed plant systems in Massachusetts, causing economic or environmental harm by developing self-sustaining populations and becoming dominant and/or disruptive to those systems." MIPAG recognizes 66 plant species as Invasive, Likely Invasive, or Potentially Invasive (MIPAG, 2013). Listed plants commonly observed during the AIM Project survey efforts include: multiflora rose, autumn olive, oriental bittersweet, mugwort, Japanese knotweed, garlic mustard, reed canarygrass, European common reed grass, purple loosestrife, Japanese stiltgrass, Canada thistle, tree of heaven (*Ailanthus altissima*), tartarian honeysuckle (*Lonicera tartarica*), black locust, common buckthorn (*Rhamnus cathartica*), and Japanese wineberry (*Rubus phoenicolasius*).

4.5.4 General Impacts and Mitigation

Table 4.5.4-1 lists the amount of forested and open land vegetation cover types that would be affected by construction and operation of the proposed Project. In total, construction of the proposed Project facilities would temporarily disturb about 362.9 acres of vegetation and permanently affect 36.3 acres. The proposed Project would temporarily affect about 164.0 acres of open land, including 128.8 acres of open upland and 35.2 acres of open wetland vegetation. These impacts would be short term. The proposed Project would temporarily affect about 198.9 acres of forested vegetation, including 181.8 acres of forested upland and 17.1 acres of forested wetland vegetation. Impacts on forested areas would be longer term. The AIM Project would permanently affect about 8.3 acres of open land, of which 6.6 acres are open upland and 1.7 acres are open wetlands, and 28.0 acres of forested vegetation, of which 25.7 acres are forested upland and 2.3 acres are forested wetland. See section 4.8 for additional information on land use impacts. Additional wetland impact information is provided in section 4.4.

4.5.4.1 Pipeline Facilities

The primary impact on vegetation would be the temporary and permanent alteration of vegetative cover along the pipeline construction rights-of-way. The pipeline right-of-way and ATWSs would be cleared of vegetation prior to construction to provide a safe working area. The limits of clearing would be identified and flagged in the field prior to the start of clearing operations and Algonquin would install erosion control measures following initial disturbance of the soil as described in its E&SCP. The cleared width within the right-of-way and ATWSs would be kept to the minimum required to safely construct the pipeline. Impacts on forest habitat could include fragmentation, edge effects, and increased opportunity for invasive species establishment. Construction in forest lands would remove mature trees in the construction right-of-way. In addition, the canopy overhanging the right-of-way may be trimmed as needed. Felled trees would be cut into lengths, chipped on the right-of-way, or removed to an approved site. In temporary construction work areas, tree stumps and rootstock would be left in place, wherever possible, to facilitate natural revegetation.

TABLE 4.5.4-1

Acres of Vegetation Potentially Affected by the AIM Project

		Open Land						Forested							
		Upland		Wetland		Total		Upland		Wetland		Total		Total	
Facility Type/Facility	State	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.
PIPELINE FACILITIES															
Replacement Pipeline															
Haverstraw to Stony Point Take-up and Relay	NY	13.7	0	4.1	0	17.8	0	14.3	0	1.0	0	15.3	0	33.1	0
Stony Point to Yorktown Take-up and Relay	NY	43.4	0.2	12.8	0.2	56.2	0.4	64.6	10.7	6.1	0.8	70.7	11.5	126.9	11.9
Southeast to MLV 19 Take-up and Relay	NY	0.9	0	0	0	0.9	0	0.4	0	0	0	0.4	0	1.3	0
	CT	15.4	0	5.7	0	21.1	0	15.1	0	2.5	0	17.6	0	38.7	0
E-1 System Lateral Take-up and Relay	CT	34.9	3.3	10.3	1.1	45.2	4.4	28.8	2.4	5.5	0.5	34.3	2.9	79.5	7.3
Loop Extension															
Line-36A Loop Extension	CT	2.8	0.3	1.7	0.3	4.5	0.6	7.1	2.8	0.9	0.6	8.0	3.4	12.5	4.0
E-1 System Lateral Loop Extension	CT	2.8	0.3	0.6	0.1	3.4	0.4	8.4	2.2	1.1	0.4	9.5	2.6	12.9	3.0
New Pipeline															
West Roxbury Lateral	MA	5.0	1.5	0	0	5.0	1.5	3.7	1.0	0	0	3.7	1.0	8.7	2.5
PIPELINE FACILITIES TOTAL		**118.9**	**5.6**	**35.2**	**1.7**	**154.1**	**7.3**	**142.4**	**19.1**	**17.1**	**2.3**	**159.5**	**21.4**	**313.6**	**28.7**
ABOVEGROUND FACILITIES															
Existing Compressor Station Modifications															
Stony Point Compressor Station	NY	1.0	0	0	0	1.0	0	7.6	0.9	0	0	7.6	0.9	8.6	0.9
Southeast Compressor Station	NY	0.2	0	0	0	0.2	0	5.1	0	0	0	5.1	0	5.3	0
Oxford Compressor Station	CT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cromwell Compressor Station	CT	0.2	0	0	0	0.2	0	3.2	1.7	0	0	3.2	1.7	3.4	1.7
Chaplin Compressor Station	CT	1.6	0	0	0	1.6	0	3.0	0	0	0	3.0	0	4.6	0
Burrillville Compressor Station	RI	0.2	0	0	0	0.2	0	5.9	0	0	0	5.9	0	6.1	0
Existing Compressor Station Modifications Total		**3.2**	**0**	**0**	**0**	**3.2**	**0**	**24.8**	**2.6**	**0**	**0**	**24.8**	**2.6**	**28.0**	**2.6**

TABLE 4.5.4-1 (cont'd)

Acres of Vegetation Potentially Affected by the AIM Project

		Open Land						Forested						Total	
		Upland		Wetland		Total		Upland		Wetland		Total			
Facility Type/Facility	State	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.
Existing Metering and Regulating (M&R) Station Modifications															
Stony Point M&R Station [a]	NY	0.6	0	0	0	0.6	0	0.8	0	0	0	0.8	0	1.4	0
Peekskill M&R Station [a]	NY	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cortlandt M&R Station [a]	NY	1.2	0	0	0	1.2	0	1.4	0	0	0	1.4	0	2.6	0
West Danbury M&R Station [b]	CT	1.2	0	0	0	1.2	0	1.3 [b]	0	0	0	1.3 [b]	0	2.5 [b]	0
Southbury M&R Station	CT	0.1	0	0	0	0.1	0	0.3	0	0	0	0.3	0	0.4	0
Waterbury M&R Station	CT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North Haven M&R Station	CT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Guilford M&R Station	CT	0	0	0	0	0	0	0.1	0	0	0	0.1	0	0.1	0
Farmington M&R Station	CT	0	0	0	0	0	0	0.1	0	0	0	0.1	0	0.1	0
Glastonbury M&R Station	CT	0	0	0	0	0	0	0.4	0	0	0	0.4	0	0.4	0
Middletown M&R Station	CT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Salem Pike M&R Station	CT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Montville M&R Station [a]	CT	0	0	0	0	0	0	0.6	0	0	0	0.6	0	0.6	0
Willimantic M&R Station	CT	0	0	0	0	0	0	0.7	0.5	0	0	0.7	0.5	0.7	0.5
Pomfret M&R Station	CT	0.1	0	0	0	0.1	0	0	0	0	0	0	0	0	0
Putnam M&R Station	CT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North Fall River M&R Station [c]	MA	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Bedford M&R Station	MA	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Middleborough M&R Station	MA	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brockton M&R Station	MA	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Norwood M&R Station	MA	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Needham M&R Station	MA	0.1	0	0	0	0.1	0	0	0	0	0	0	0	0.1	0
Wellesley M&R Station	MA	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mystic M&R Station	MA	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing M&R Station Modifications Total [d]		**0.3**	**0**	**0**	**0**	**0.3**	**0**	**1.7**	**0.5**	**0**	**0**	**2.3**	**0.5**	**2.6**	**0.5**

TABLE 4.5.4-1 (cont'd)

Acres of Vegetation Potentially Affected by the AIM Project

		Open Land						Forested						Total	
		Upland		Wetland		Total		Upland		Wetland		Total			
Facility Type/Facility	State	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.
New M&R Stations															
Oakland Heights M&R Station	CT	0.8	0	0	0	0.8	0	1.6	1.4	0	0	1.6	1.4	2.4	1.4
Assonet M&R Station	MA	0.3	0.1	0	0	0.3	0.1	0.7	0.1	0	0	0.7	0.1	0.9	0.2
West Roxbury M&R Station [d]	MA	0	0	0	0	0	0	1.0	1.0	0	0	1.0	1.0	1.0	1.0
New M&R Stations Total		**1.1**	**0.1**	**0**	**0**	**1.1**	**0.1**	**2.3**	**2.5**	**0**	**0**	**3.4**	**2.5**	**4.5**	**2.6**
Existing M&R Station Removal															
Greenville M&R Station	CT	0.2	0	0	0	0.2	0	0	0	0	0	0	0	0.2	0
ABOVEGROUND FACILITIES TOTAL [d]		**4.8**	**0.1**	**0**	**0**	**4.8**	**0.1**	**28.8**	**5.6**	**0**	**0**	**28.8**	**5.6**	**33.6**	**5.7**
ACCESS ROADS															
	NY	0.5	0.5	0	0	0.5	0.5	0.2	0.2	0	0	0.2	0.2	0.7	0.7
	CT	0.4	0.4	0	0	0.4	0.4	0.7	0.7	0	0	0.7	0.7	1.1	1.1
	RI	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MA	0	0	0	0	0	0	0.1	0.1	0	0	0.1	0.1	0.1	0.1
ACCESS ROAD TOTALS		**0.9**	**0.9**	**0**	**0**	**0.9**	**0.9**	**1.0**	**1.0**	**0**	**0**	**1.0**	**1.0**	**1.9**	**1.9**
PIPE YARDS AND CONTRACTOR WARE YARDS															
Yorktown Yard	NY	4.2	0	0	0	4.2	0	9.6	0	0	0	9.6	0	13.8	0
PROJECT TOTAL [c]		**128.8**	**6.6**	**35.2**	**1.7**	**164.0**	**8.3**	**181.8**	**25.7**	**17.1**	**2.3**	**198.9**	**28.0**	**362.9**	**36.3**

[a] The temporary workspace for these M&R Stations is already included in the vegetation impact acreages for the pipeline segments. These numbers are not included in the subtotals and totals for aboveground facilities.

[b] A portion of the temporary workspace at the West Danbury M&R Station would fall within the overall temporary workspace area for pipeline facilities; only the portion outside the overall pipeline workspace (0.1 acre of forested upland) is included in subtotal and total calculations.

[c] The construction workspace of the North Fall River M&R station is already included in the Assonet M&R temporary/permanent workspace areas.

[d] Vegetation impacts in the subtotal and totals rows do not include the aboveground facilities that are marked with an "a." The construction workspaces from those facilities are already included in the pipeline facilities.

The removal of mature trees and other vegetation could also result in secondary impacts such as increased erosion. Incremental fragmentation of forest habitat could occur due to the expansion of Algonquin's existing right-of-way. The loss of forest habitat and the expansion of existing corridors could also decrease the quality of habitat for forest wildlife species, including alteration of habitat resulting from increased light levels and a subsequent loss of soil moisture as a result of an expanded right-of-way. Expansion of the existing corridor could also result in an increased opportunity for invasive plants to displace native species. However, the Project would not contribute significantly to forest fragmentation. Forest fragmentation generally occurs when a new corridor or clearing is cut through a forested area. Much of the proposed pipeline routes are located along existing rights-of-way and in areas that are already developed and highly fragmented. As a result, the forested areas that are present are predominantly edge habitats.

In total, construction of the proposed pipeline facilities, which includes the ATWSs required for construction, would disturb about 313.6 acres of vegetation. The proposed Project would have a temporary, short-term effect on about 154.1 acres of open land, including 118.9 acres of open upland and 35.2 acres of open wetland vegetation. The proposed Project would affect about 159.5 acres of forest vegetation, including 142.4 acres of forested upland and 17.1 acres of forested wetland vegetation. Impacts on these areas would be long term. Permanent vegetation impacts from the pipeline facilities would include about 7.3 acres of open land, of which 5.6 acres are open upland and 1.7 acres are open wetlands, and 21.4 acres of forest vegetation, of which 19.1 acres are forested upland and 2.3 acres are forested wetland (see table 4.5.4-1).

Following construction, all disturbed areas would be restored. The ATWSs used during construction (other than areas already existing as gravel or pavement) would be seeded and allowed to revegetate to preconstruction cover types, with no further maintenance or disturbance associated with operation of the pipeline. Clearing for construction of the pipeline would not result in any permanent impacts on wetland vegetation communities located outside of the permanent right-of-way and other maintenance areas, which would be allowed to revegetate naturally following construction. Long-term impacts on forested communities would occur because of the time required for woody vegetation to revert to preconstruction conditions. Herbaceous vegetation would be short term, recovering within one to two growing seasons. In accordance with the E&SCP, Algonquin would monitor to determine the post-construction revegetative success. In addition, Algonquin would implement its Invasive Plant Species Control Plan to address the spread of invasive plants within the Project rights-of-way and control invasive populations that might prevent successful revegetation.

During operation, routine maintenance of the right-of-way would occur to allow continued access for routine pipeline patrols, maintaining access in the event of emergency repairs, and visibility during aerial patrols. In upland areas, maintenance of the right-of-way would involve clearing the entire permanent right-of-way of woody vegetation. As such, the maintained permanent rights-of-way would be subjected to mowing every 3 years. To facilitate periodic corrosion surveys, a 10-foot-wide strip centered on the pipeline would be mowed annually to maintain herbaceous growth. Algonquin would not apply herbicides for general right-of-way maintenance.

These maintenance activities would result in permanent conversion of some areas of existing upland forested vegetation to herbaceous or scrub-shrub vegetation. However, because Algonquin has routed the pipeline facilities to use existing utility rights-of-way and road corridors to the extent possible, impacts on forested vegetation would be minimized.

In summary, Algonquin would implement the measures in its E&SCP and Invasive Plant Species Control Plan to minimize impacts on vegetation within the construction and permanent rights-of-way and improve revegetation success. In general, impacts on non-forested vegetation generally would be temporary or short term and would not be significant. Construction of the proposed pipeline facilities would have a long-term effect on forested wetland and upland vegetation within the construction right-of-way and a permanent affect within the maintained operational right-of-way. We find that Project-specific minimization and mitigation measures, and mitigation measures described in Algonquin's E&SCP and Invasive Plant Species Control Plan would be sufficient to offset adverse impacts on vegetation in the Project area. Therefore, we conclude that constructing and operating the pipeline facilities would not significantly affect existing vegetation populations.

4.5.4.2 Aboveground Facilities

In total, construction of the proposed new M&R stations, modifications to existing compressor and M&R stations, and removal of the Greenville M&R Station would disturb about 33.6 acres of vegetation, including about 4.8 acres of open upland and 28.8 acres of forest upland vegetation. Construction and operation of aboveground facilities would not affect wetland vegetation. Temporary impacts on vegetation and revegetation plans within the construction workspace areas for the aboveground facilities would be similar to those described above for the pipeline facilities. Many of the ATWSs to be used during construction would be utilized for both pipeline and aboveground facilities. Areas that were included in the vegetation impacts for the pipeline facilities are not included in this section (see table 4.5.4-1).

Permanent vegetation impacts from the aboveground facilities would include about 0.1 acre of open upland and 5.6 acres of forest upland vegetation.

Existing compressor stations that would have temporary impacts on vegetation include the Stony Point, Southeast, Cromwell, Chaplin, and Burrillville Compressor Stations. There would also be some permanent vegetation impacts associated with operation of the existing Stony Point and Cromwell Compressor Stations. Work at these compressor stations would permanently convert about 2.6 acres of forested upland vegetation to open upland vegetation. The effects on vegetation from each of the existing compressor stations are provided in table 4.5.4-1.

The effects on vegetation due to the modification of the existing M&R stations are provided in table 4.5.4-1. All of the temporary effects on vegetation from the Stony Point, Peekskill, Cortlandt, West Danbury, and Montville M&R Stations are associated with construction of the pipeline segments. Additionally, the temporary effects on vegetation from the North River M&R Station are included in the acreage of disturbance for the new Assonet M&R Station. Of the existing M&R stations, only the Willimantic M&R Station would permanently affect vegetation, converting about 0.5 acre of forested upland vegetation to open upland vegetation.

Each of the proposed new M&R stations would have temporary and permanent impacts on vegetation. The effects on vegetation from each of the new M&R stations are provided in table 4.5.4-1. In total, between these three facilities, about 4.5 acres (3.4 acres of forested upland and 1.1 acres of open uplands) would be temporarily affected by the new facilities. These facilities would permanently convert about 2.5 acres of forested upland vegetation to open upland vegetation.

The removal of the Greenville M&R Station would temporarily affect 0.2 acre of open uplands. There are no temporary impacts on forested upland or any permanent impacts on vegetation associated with the Greenville M&R Station.

In summary, construction of the proposed aboveground facilities and modifications to existing stations would result in the long term and permanent impacts on forested vegetation. However, Project-specific minimization and mitigation measures and mitigation measures described in Algonquin's E&SCP

are determined to be sufficient to offset adverse impacts on vegetation in the Project area. Therefore, construction and operation of the aboveground facilities would not significantly affect existing vegetation populations.

4.5.4.3 Pipe and Contractor Ware Yards

Algonquin would use four pipe and contractor ware yards, two in Connecticut and two in New York, during construction of the AIM Project facilities. Three of these yards consist of existing construction or industrial sites that would not require any modification or upgrade work that would affect vegetation. The fourth yard would be located in the Town of Yorktown, New York. The property is currently undeveloped and managed as open space by the Town of Yorktown. Algonquin would need to clear the property of vegetation on about 13.8 acres of the 15 acres to be used on the 73-acre parcel, including 4.2 acres on open upland and 9.6 acres on forested upland. Algonquin would also perform site grading to prepare it for use as a pipe yard. Due to the large size of the property parcel, and availability of dry uplands on the property, no impacts on wetland communities would occur at this location. Algonquin is working with the Town of Yorktown on the temporary use of this property during construction. Algonquin would obtain all necessary environmental and cultural resources clearances for this pipe yard prior to its use during construction. Following construction, the yard would be restored as described above or as required by the Town of Yorktown. Project disturbances to vegetation at the Town of Yorktown pipe and contractor yard would be temporary (short term in the open areas and long term in the forested areas). Natural vegetation would be restored following construction. Therefore, use of the Town of Yorktown yard would not result in significant impacts on existing vegetation in the Project area.

4.5.4.4 Access Roads

Algonquin would use existing access roads during construction to the maximum extent practicable, minimizing major impacts on vegetation communities. The majority of the roads identified by Algonquin have existing gravel, asphalt, or concrete surfaces that can be used with little or no preconstruction improvements. In a few locations, upgrades would be required, such as brush removal and tree trimming, to allow safe access along the existing access roads. However, we have determined that no significant effects on vegetation would occur during the use of existing access roads required for the pipeline facilities.

Six of the TARs and one of the PARs are unimproved dirt or gravel roads that would require minor (e.g., about 10-foot) upgrades prior to pipeline construction. These upgrades would result in about 1.9 acres of temporary and permanent vegetation disturbance during Project construction and operation. In addition, Algonquin would also need to construct a new 120-foot-long by 12-foot-wide paved PAR from the existing North Fall River M&R Station site to the new Assonet M&R Station, which would affect about 0.1 acre of forested upland. The vegetative community present is a mixed oak forest, with red oak dominant, and areas of early successional growth. Total vegetative impacts for these access roads in each state are provided in table 4.5.4-1.

Based on the characteristics of the identified vegetation communities in the vicinity of the access roads, the implementation of Project-specific minimization and mitigation measures, and the mitigation measures described in Algonquin's E&SCP, we conclude that the use and improvement of existing access roads and construction of a new access road would not result in significant impacts on existing vegetation in the Project area.

4.6 WILDLIFE AND AQUATIC RESOURCES

4.6.1 Wildlife

4.6.1.1 Existing Wildlife Resources

The AIM Project would traverse terrestrial and wetland habitats that support a diversity of wildlife species. For the purposes of this EIS, the wildlife habitats along the pipeline segments and at the aboveground facility sites are described regionally and are representative of the vegetation community structure and composition of the terrestrial and wetland habitats present within the Project area. The dominant wildlife habitat types that have been identified along the proposed pipeline route and at the aboveground facility sites include: upland forest, open uplands (early successional scrub-shrub and herbaceous vegetation cover), forested wetlands, open wetlands (both palustrine/freshwater and estuarine wetlands), urban, and open water estuarine habitats. Table N-1 in appendix N lists the common wildlife species often associated with the vegetative cover types found within the Project area. Wetland habitat types are further described in section 4.4. Special status species, such as federally and state-listed threatened or endangered species, are discussed in section 4.7.

Upland Forest

Upland forest is present along portions of the pipeline segments and adjacent to many of the aboveground facilities. It generally consists of either mixed oak forest or successional forests dominated by species such as sweetgum, paper birch, and/or tree-of-heaven. Hardwood forests provide year-round food resources, cover, and nesting habitat for a variety of wildlife species, including large and small mammals, reptiles and amphibians, insects, and both migratory and non-migratory birds.

Open Uplands

This cover type includes successional scrub-shrub areas, fields, and disturbed and/or maintained areas, such as existing utility rights-of-way or other open space areas. Early successional and grassland habitats provide valuable nesting and foraging habitats for grassland bird species. Species such as the Eastern cottontail prefer shrubby, overgrown open habitats and other early successional, while grassy areas offer habitat for ground-nesting birds. Forests adjacent to open space areas create edge habitats that are used by numerous mammals, reptiles, and bird species.

Wetlands

Wetland vegetation community types along Project facilities include palustrine forested wetlands, palustrine scrub-shrub wetlands, and palustrine emergent wetlands. The forested wetlands crossed by the Project facilities are largely dominated by red maple and provide important food, shelter, migratory and overwintering areas for multiple songbird species, waterfowl, small mammals, and amphibians (see section 4.4.1).

Open wetlands are found throughout the Project area and include freshwater scrub-shrub and emergent wetland areas, along with estuarine tidal rivers and creeks. Scrub-shrub wetland habitats contain vegetation that is characteristically low and compact. The plant species in a scrub-shrub wetland offer excellent nesting sites for many bird species. These wetland habitats are also used by reptiles and amphibians.

Freshwater emergent wetlands include wet meadows and emergent marshes characterized by a variety of grasses, sedges, and rushes. Many of the freshwater emergent wetlands in the Project area are dominated by invasive species, such as common reed that provide relatively low quality wildlife habitat. However, many common species of birds, small and large mammals, reptiles, and amphibians are associated with emergent wetlands.

Urban Environment

Urban environments are characterized by a low diversity of wildlife species that are tolerant of human development and activity. Common bird species in cities and residential areas include European starlings, house sparrows, rock pigeons, mourning doves, and Northern mockingbirds. Mammals that have become adapted to living in human environments, such as the Norway rat, are also common.

Open Water

The Project would cross under the Hudson River Estuary, a 153-mile-long tidal system that stretches from the Troy Dam to New York Harbor (NYSDEC, 2014a). Open water estuarine habitats support a diverse array of coastal wildlife, providing foraging areas for coastal breeding and migratory birds, and supporting both breeding and wintering waterfowl populations. Mudflats exposed by tidal waters in the estuary can support a variety of migratory shorebirds. Marine mammals, such as the harbor seal and gray seal, have been reported in the lower Hudson River Estuary (FWS, 1997).

4.6.1.2 Significant or Sensitive Wildlife Habitats

This section identifies and describes the significant or sensitive wildlife habitats within the AIM Project area, such as vernal pools, sensitive coastal habitats, and other known wildlife resources not specific to threatened and endangered species.

Vernal Pools

As described in section 4.4.1.2, vernal pools are intermittently to ephemerally ponded, small, shallow depressions usually located within an upland forest (NYNHP, 2013a). These pools typically flood in spring or after a heavy rainfall, are dry throughout the summer, and then fill again in autumn. The substrate consists of dense leaf litter over hydric soils. Vernal pools typically occupy a confined basin (i.e., a standing waterbody without a flowing outlet), but may have an intermittent stream flowing out of it during high water (NYNHP, 2013a). Vernal pools provide breeding habitat for many species of amphibians, reptiles, crustaceans, mollusks, annelids, and insects. Rare species, such as the Jefferson's salamander, are known to use vernal pools near the Project area (see section 4.7).

As discussed in section 4.4.3.2, Algonquin identified 11 vernal pools within the Project study corridor in 2013 and 2014. Two vernal pools are located in the proposed temporary workspace in the Town of Cortlandt, New York. The other nine vernal pools are located outside of the proposed construction workspace areas for the Project.

Hudson River Significant Coastal Fish and Wildlife Habitat

The Stony Point to Yorktown Take-up and Relay segment would cross the lower Hudson River Reach, an area designated as Significant Coastal Fish and Wildlife Habitat (SCFWH) by the NYSDEC (NYSDOS, 2013). The lower Hudson River Reach contains the Hudson Highlands, which extend roughly from Denning's Point to Stony Point, New York. This SCFWH encompasses 6,700 acres of the main river channel below mean low water and adjacent shallows and shoals, over an approximate 20-mile reach (NYSDOS, 2013). This area contributes directly to the production of in-river and ocean populations of food, game, and forage fish species.

The Hudson Highlands supports the deepest (up to 200 feet deep) and narrowest segment of the Hudson River. The deepwater areas of the Hudson Highlands area are also used by concentrations of species that spawn elsewhere in the Hudson River Estuary. These deep areas are also used as migration routes by the federally endangered Atlantic and shortnose sturgeon, and are important nursery and summering areas for juvenile Atlantic sturgeon and summering areas for post-spawn adults (NYSDOS, 2013). A discussion of fisheries and aquatic resources is presented in section 4.6.2, and special status species, such as Atlantic and shortnose sturgeon, are discussed further in section 4.7.

The Lower Hudson River Estuary is also a significant habitat and habitat complex as defined by the FWS (FWS, 1997). The Lower Hudson River Estuary, Complex #21 of the New York Bight Watershed, is the portion of the Hudson River extending from the Battery at the southern tip of Manhattan to Stony Point at the northern end of Haverstraw Bay (FWS, 1997). This productive estuary is a regionally significant nursery and wintering area for anadromous, estuarine, and marine fish species, as well as a migratory and feeding area for birds and fish (FWS, 2014k). The proposed pipeline would cross the lower Hudson River Reach using the HDD method to minimize effects on this significant habitat complex, and the riparian and estuarine areas of the Lower Hudson River Important Bird Area (IBA) (see section 4.7.2 for further discussion of IBAs).

Associated with the fisheries resources in Hudson Highlands are significant concentrations of wintering bald eagles. Winter residence in the area generally extends from December through March throughout the Hudson Highlands and on Iona Island. Iona Island has been designated as an eagle sanctuary by the Palisades Interstate Park Commission (PIPC) (NYSDOS, 2013). See section 4.7.3 for further discussion on bald eagles.

4.6.1.3 Wildlife Management Areas or Refuges

In New York, the proposed Project pipeline segments would cross designated wildlife management areas, including Harriman State Park in Rockland County and the Blue Mountain Reservation in Westchester County, as discussed below. AIM Project facilities in Connecticut, Rhode Island, and Massachusetts would not affect any wildlife management areas or refuges.

Harriman State Park

The Haverstraw to Stony Point Take-up and Relay segment would cross Harriman State Park in two locations within existing rights-of-way between MPs 0.0 to 0.3 in the Town of Haverstraw and between MPs 2.5 to 2.6 in the Town of Stony Point. Harriman State Park is the second largest park in the New York State Parks system, located in Rockland and Orange Counties. The 46,613-acre park holds 31 lakes and ponds, has over 200 miles of trails, and provides a number of recreation areas for camping, swimming, and hiking (New York State Office of Parks, Recreation and Historic Preservation [NYSOPRHP], 2013). Harriman State Park supports 18.8 miles of the Appalachian Trail, portions of the Harriman and Sterling Forests IBA (see section 4.7.2), and the Iona Island Bird Conservation Area (BCA). The Iona BCA is an important tidal wetland for migratory waterfowl. Iona Island is located 2 miles north of the nearest proposed AIM Project facility and would not be disturbed by Project construction (NYSOPRHP, 2013).

Blue Mountain Reservation

In New York, the Stony Point to Yorktown Take-up and Relay pipeline segment would pass through Blue Mountain Reservation in Westchester County between MPs 6.7 and 8.1 and again between MPs 8.4 and 8.5. Blue Mountain Reservation is a 1,538-acre county-owned park in the northwest section of Westchester County that features miles of trails for mountain biking, walking, nature study, and challenging hikes to the tops of two large peaks, Mt. Spitzenberg and Blue Mountain.

The reservation is also classified as a biodiversity hub in the Croton-to-Highlands Biodiversity Plan, because it provides an area of high-quality wildlife habitat in a densely developed area for many wildlife species, including amphibians and reptiles, such as spotted salamanders, gray tree frogs, wood frogs, garter snakes, milk snakes, and the black rat snake (Miller and Klemens, 2004). The mixed hardwood forest also provides habitat for many forest-dwelling bird species including owls, woodpeckers, thrushes, and wood warblers.

4.6.1.4 General Impacts and Mitigation

The construction of the AIM Project facilities would affect about 198.9 acres of forested land and 164.0 acres of open land (see section 4.5.1). Construction of the pipeline segments account for 159.5 acres (80 percent) of estimated effects on forested land and 154.1 acres (94 percent) of effects on open land. Aboveground facilities account for about 28.8 acres (14 percent) of estimated effects on forested land and 4.8 acres (3 percent) of effects on open land. The construction of access roads would affect about 1.0 acres of forested land and 0.9 acre of open land. About 9.6 acres of forested land and 4.2 acres of open land habitat would be affected by the construction of pipe yards and contractor ware yards.

Pipeline Facilities

The majority of the pipeline routes are located within or adjacent to existing Algonquin rights-of-way, roadways, railways, and/or utility rights-of-way. These existing rights-of-way are routinely maintained as part of regular facility operations to control vegetative growth, which prevents many areas from reverting back to forested land. Many species of resident and migratory wildlife in the Project area use these existing utility corridors as preferred habitat.

Following construction, temporarily disturbed areas would be seeded and left to revegetate via natural succession. About 19.2 acres of forested upland habitat and 2.2 acres of forested wetland would be permanently converted and maintained in an early successional stage by mowing and periodic tree removal during operation.

Wildlife could be affected by clearing of vegetation; alteration of the landscape from scraping the ground, soil disturbance, and recontouring; deposition of trash and debris; the use of chemicals or exposure to contaminated soil or groundwater; conflicts with vehicles; human presence; activities associated with trenching; increased predation; and edge effects and habitat fragmentation. During construction, more-mobile species would be temporarily displaced from the construction right-of-way and surrounding areas to similar habitats nearby. Some wildlife displaced from the right-of-way would return to the newly disturbed area and adjacent, undisturbed habitats after completion of construction. Less-mobile species, such as small mammals, reptiles, amphibians, and nesting birds, may experience direct mortality or permanent displacement. Displacement of species could lead to increased competition for some resources.

The clearing of vegetation on the construction right-of-way and ATWS areas would reduce cover, foraging, breeding, and nesting habitat for some wildlife. The degree of effects would depend on the type of habitat affected, the timing of clearing and construction activities, and the rate at which the area recovers after disturbance from construction. The effect on species that rely on open land habitats would be short term, because these areas would be reseeded after construction and likely recover within 1 to 3 years.

Habitat areas comprising tree- and shrub-dominated vegetation and their associated wildlife may be affected on a longer-term basis. Clearing these workspace areas would affect forest-dwelling wildlife species to a greater extent than open habitat wildlife species, because forested ATWS areas would be prevented from reestablishing on the permanent right-of-way. Algonquin has minimized the potential for these long-term effects by collocating and overlapping the proposed ATWS areas with their existing rights-of-way to reduce the amount of forest clearing required for the Project.

The FWS expressed concern for the fragmentation of forest along the Hudson River in relation to migratory birds (Algonquin, 2014b). A discussion of migratory birds is provided in section 4.7.2. Forest fragmentation generally occurs when a new corridor or clearing is cut through a forested area. Much of the proposed pipeline routes are located along existing rights-of-way and in areas that are already developed and highly fragmented. As a result, the forested areas that are present are predominantly edge habitats that are unlikely to support forest interior species. Therefore, the effect on forest-dwelling wildlife would be minimal. Tree clearing for the construction and maintenance of the Stony Point to Yorktown Take-up and Relay segment would fragment small areas of continuous forest. However, the Project would not contribute significantly to forest fragmentation.

The alteration of the landscape through removal of vegetation, scraping of the ground, soil disturbance, and recontouring would reduce seed banks, disturb soil-dwelling species, and could temporarily alter drainage patterns. The degree of effects would depend on the species present during the time of construction. Soil-dwelling invertebrates would be directly affected through movement of soil from one place to another, resulting in some mortality and displacement. This could reduce the forage potential for insectivores that inhabit the area. Other animals would be indirectly affected through the reduction in seed banks, resulting in longer recovery times for vegetation that could provide forage, cover, and nesting habitat. However, the regional influence of these effects would be minor due to the temporary nature of the effects and limited area affected by construction.

Increased predation could occur during construction and operation of the proposed Project facilities due to the removal of vegetation and the temporary increase in line-of-sight that would result. Although this could lead to higher mortality rates for certain animals, the Project is unlikely to have any population-level impact due to these effects.

Trenching activities and the spoil piles generated during construction could create potential traps for wildlife species and barriers to movement for less mobile species. Wildlife could fall into trenches, and spoil piles could create barriers to some less mobile species, such as small reptiles and amphibians. Where the existing AIM Project pipeline crosses major roadways and sensitive areas, such as the Hudson River and Still River, Algonquin would use the HDD method to minimize effects on wildlife due to trenching.

To further minimize the potential for wildlife to become trapped, Algonquin plans to not have extensive lengths of trench open at one time during pipeline installation. Furthermore, Algonquin would conduct preconstruction sweeps and construction inspections along specific sections of right-of-way, and specific surveys for the following designated federally and state-listed species:

- timber rattlesnake in Stony Point, Rockland County, New York;
- eastern hognose snake along the E-1 System Take-up and Relay segment in New London County, Connecticut; and
- box turtles along the Line-36A Loop pipeline in Cromwell and Rocky Hill, Connecticut.

Algonquin would also incorporate additional conservation measures for bog turtles developed through consultation with the FWS at the crossing of specific wetlands. These measures would minimize the potential for this species to become trapped in trenches during construction. See section 4.7.1.2 for further discussion.

Trash and debris could affect wildlife by encouraging certain species to move into areas where humans are working, resulting in potential wildlife–human interaction and conflict and increased predation. To minimize the potential for wildlife attraction, food wastes from the construction area would be maintained in a neat and orderly manner. Solid wastes, such as food wrappings, cigarette butts and packets, Styrofoam cups and plates, and similar wastes would be routinely collected and disposed off-site.

A spill of hazardous materials during construction, such as diesel or oil, or the excavation and exposure of contaminated soil or groundwater could directly affect wildlife through direct ingestion or ingestion of contaminated material. The effects on wildlife from chemicals or contaminants would be minimized by Algonquin's adherence to their SPCC Plan. Thus, the risk of chemical exposure to individual animals would be low, and there would be no risk of population-level effects on any wildlife species.

Project-related traffic on paved and unpaved roads during construction could temporarily disturb birds and other wildlife near roadways, resulting in an increase in direct mortality of certain wildlife from animal/vehicle collisions. Due to the short timeframe of construction for the AIM Project, the effects on animals from increased vehicular traffic would be minor.

In an effort to minimize permanent effects on wildlife and to promote the rapid stabilization and revegetation of the disturbed areas, Algonquin would comply with its E&SCP to minimize disturbance to vegetation and provide for stabilization of affected areas to mitigate direct and indirect effects on wildlife. Revegetation would be completed in accordance with permit requirements and consultation with agency and non-agency stakeholders affected by the Project.

After the right-of-way is revegetated, the Project would not be expected to have a significant effect on wildlife due to planned maintenance of the right-of-way. With the exception of a 10-foot-wide strip that may be mowed annually in upland areas, vegetative maintenance on the right-of-way would occur no more frequently than once every 3 years. In addition, maintenance clearing would not be conducted between April 15 and August 1 to avoid direct and indirect effects on wildlife during the nesting and breeding season (e.g., grassland birds). In wetland areas, trees located within 15 feet of either side of the pipeline that are greater than 15 feet in height may be selectively cut and removed from the right-of-way. However, trees and shrubs that become reestablished beyond 15 feet on either side of the pipeline would not be disturbed. Algonquin would retain a riparian strip within 25 feet of a stream as measured from the mean high water mark. This riparian area would be allowed to permanently revegetate with native woody plant species across the entire right-of-way, with exception of a 10-foot-wide corridor centered on the pipeline that would be maintained in an herbaceous state. In the riparian area, trees and shrubs greater than 15 feet in height may also be selectively cut within 15 feet on either side of the pipeline.

Because Algonquin would largely make use of its existing rights-of-way and would adhere to its SPCC Plan, E&SCP, and other measures discussed in this EIS, we conclude that Algonquin's proposed pipeline facilities would not substantially alter local wildlife populations.

Aboveground Facilities

The majority of the work at aboveground facilities would take place within existing, developed properties and would not result in significant disturbance to or destruction of wildlife or their habitat. Portions of some aboveground facility sites contain forested upland and open upland communities. Construction and operation of new proposed aboveground facilities and changes to existing facilities would primarily affect forested upland communities (28.8 acres); however, in a few locations, open upland communities may be affected (4.8 acres). For the five compressor stations requiring expansion beyond the current developed footprint, Algonquin has designed the proposed modifications to minimize the amount of forest clearing required for construction.

Further, to minimize effects on wildlife and wildlife habitat at aboveground facilities, Algonquin would:

- retain the existing forest buffers at all the compressor station sites;
- expeditiously restore vegetative cover in areas not occupied by permanent structures at the compressor stations and M&R stations by grading, fertilizing, seeding, and mulching these areas immediately following construction; and
- install permanent erosion controls, as needed, to ensure stabilization and minimize effects of long-term erosion and sedimentation.

While construction and operation of the modified and new aboveground facilities would, in some cases, have permanent impacts on vegetation and wildlife habitat, most of the work would occur at existing facilities where similar habitat exists adjacent to these sites. Further, Algonquin would retain much of the existing forest buffers at the compressor station sites. Therefore, we find that impacts on wildlife from construction and operation of the Project aboveground facilities would not be significant.

Pipe Yards and Contractor Ware Yards

Algonquin has identified four proposed pipe and contractor ware yards for potential use during the construction of the AIM Project. The Dansville, New York, and Danbury and Franklin, Connecticut yards are existing construction or industrial sites with no vegetative communities or other natural resources present. The Yorktown, New York Yard is an approximately 73-acre parcel of undeveloped, open space land owned by the Town of Yorktown. Algonquin's pipe yard would be about 15 acres in size of predominantly forested upland and open upland type communities. Algonquin is working with the Town of Yorktown on the temporary use of this property during construction prior to the Town's development of a new recreational area. To use the area as a pipe yard, Algonquin would need to clear the property of vegetation, perform site grading, and construct a gravel parking area and access road off Stoney Street. Algonquin would obtain all necessary environmental and cultural resources clearances for this pipe yard prior to its use during construction. Following construction, the yard would be restored to preconstruction conditions or as required by the Town of Yorktown. Overall, we conclude that the temporary use of these yards would not result in a significant impact on wildlife or wildlife habitat.

Access Roads

To the extent feasible, existing public and private road crossings along the proposed AIM Project pipeline segments would be used as the primary means of accessing the rights-of-way. Algonquin would also use existing public roads near proposed compressor stations and M&R stations. Although Algonquin would be using existing roads for temporary and permanent access, seven of these roads would require minor upgrades and/or widening (by about 10 feet) to be used during pipeline construction. These upgrades would result in about 1.9 acres of new permanent land disturbance dispersed among the states of New York, Connecticut, and Massachusetts. Algonquin would also need to construct one new permanent access road from the existing North Fall River M&R Station site to the new Assonet M&R Station. This new access road would permanently disturb less than 0.1 acre of land; however, its location next to an existing industrial facility would not result in any significant effects on local wildlife populations. The use and modification of these access roads would not result in a significant impact on wildlife or wildlife habitat.

4.6.1.5 Significant or Sensitive Wildlife Habitat Impacts and Mitigation

Algonquin has minimized potential effects on significant or sensitive wildlife habitats by locating the majority of pipeline facilities within or adjacent to existing Algonquin pipeline rights-of-way or along existing utility rights-of-way, roads, and railroads to the maximum extent possible. Algonquin would also use the HDD crossing method at the Hudson River crossing to avoid direct affects to aquatic habitats and adjacent riparian habitats. Algonquin continues to address potential effects on significant, sensitive, and managed habitats through consultation with the appropriate federal and state agencies.

Vernal Pools

Pipeline construction within vernal pools could have a number of potential effects including alteration of a pool's capacity for holding water, direct disturbance to amphibian adults, eggs and larvae, and removal of vegetation that could serve as egg attachment sites and cover. Pipeline construction activities near vernal pools could disturb or alter adjacent upland habitats for which vernal pool species also inhabit. The primary effects on vernal pools from pipeline maintenance activities would include the periodic removal of emergent and woody vegetation. This activity would potentially remove the vegetative structure that may serve as amphibian-egg-attachment sites and cover, and could disturb adult amphibians, eggs, and larvae in the pool.

The Project would not directly affect wildlife in nine of the 11 vernal pools identified by Algonquin in the study corridor, because these pools are located outside of the Project's proposed construction workspace areas and no clearing or crossing of these resources would occur. The Project may indirectly affect vernal pool wildlife temporarily during construction in adjacent upland habitats if vernal pool-associated species are present in those habitats during the time of construction. The Project may directly affect vernal pools and the associated wildlife during construction in and around the two vernal pools located in the construction workspace in the Town of Cortlandt, New York. To minimize direct and indirect effects on vernal pools and their associated wildlife during construction and maintenance activities, Algonquin would treat all vernal pools as wetlands and protect them through adherence to the measures outlined in Algonquin's E&SCP. These measures would protect vernal pools from siltation and stormwater runoff, and provide a barrier to alert construction workers of the presence of this sensitive habitat. In addition, Algonquin would adhere to any permit conditions developed through consultation with the applicable federal and state agencies (see section 4.4). Therefore, while Project-related impacts could occur, they would be temporary in nature and would not significantly affect wildlife in these areas.

Hudson River Significant Coastal Fish and Wildlife Habitat

Based on implementation of the HDD construction method for crossing of the Hudson River and the associated BDP Plan for monitoring the HDD program, the Project would not affect the lower Hudson River Reach SCFWH, which contains the Hudson Highlands, and the adjacent Lower Hudson River IBA.

Harriman State Park and Blue Mountain Reservation

Algonquin's existing pipeline right-of-way is currently recognized as existing scrub-shrub and open field wildlife habitats, which are used by a variety of species inhabiting Harriman State Park and Blue Mountain Reservation. In general, the existing right-of-way is bordered by upland forest areas. Temporary, short-term impacts on wildlife species during construction of the pipeline may occur. However, long term significant habitat changes are not anticipated following right-of-way restoration, because the right-of-way would be revegetated following construction and continue to provide the same wildlife habitat functions and values that currently exist.

Algonquin met with the PIPC on January 8, 2014, to discuss the AIM Project's impacts on Harriman State Park. As a result of the meeting, Algonquin would conduct tree counts for the portions of the Project's pipeline construction work area located inside Harriman State Park and coordinate with the PIPC to address compensation for trees removed as part of the AIM Project. Because the majority of construction would be confined to Algonquin's existing right-of-way, long-term impacts on sensitive wildlife habitat within the park are not anticipated. However, Algonquin continues to consult with the NYSOPRHP and PIPC to address impacts on Harriman State Park. Given that consultation with NYSOPRHP and PIPC is not complete, **we recommend that:**

- **<u>Prior to construction of the Haverstraw to Stony Point Take-up and Relay segment</u>, Algonquin should file with the Secretary, for review and written approval of the Director of the OEP, a site-specific plan for the Harriman State Park, including any avoidance or mitigation measures developed with the NYSOPRHP and PIPC.**

4.6.2 Aquatic Resources

4.6.2.1 Existing Aquatic Resources

A total of 108 waterbody crossings (42 perennial streams and 65 streams with intermittent or ephemeral flow, and 1 pond) would be required for the AIM Project (see section 4.3.2). This section describes the fisheries resources present in the streams and rivers in the Project area based on the review of USGS quadrangle maps and aerial photographs, on-site wetland and waterbody field surveys, and consultation with federal and state agencies.

Classification of fisheries habitat includes consideration of both chemical and biological characteristics and whether they support anadromous or catadromous fish. Physical and chemical properties that can be used to determine fishery classification include water temperature, salinity, and whether the waterbody is part of a marine, estuarine, or freshwater system.

The marine system occurs in areas of open ocean that are exposed to waves and currents, where hydrology is determined primarily by the ebb and flow of oceanic tides, and the salinity exceeds 30 parts per thousand (ppt) with little or no dilution or input from freshwater rivers and/or runoff (Cowardin, 1979).

In the estuarine system, water is at least occasionally diluted by freshwater runoff from the land. Estuarine fish species reside in tidal waters with salinities ranging from 0.5 to 20 ppt and spawning is typically in waters with salinities ranging between 5 and 20 ppt, from late spring through summer (Cowardin, 1979).

Freshwater systems have low salinity ranges and contain fisheries that are typically classified as coldwater, coolwater, or warmwater. Coldwater fisheries are characterized by lower than average water temperatures and the ability to support breeding fish, such as brook trout. Coolwater fisheries typically support mixed communities and/or fish species with optimal temperature ranges between warmwater and coldwater communities. Warmwater fisheries are characterized by fish, such as largemouth bass and common carp (Cowardin, 1979).

Anadromous fish are marine-living fish that travel upstream to spawn in freshwater (e.g., American shad or blueback herring). Conversely, catadromous fish are freshwater-living fish that travel downstream to breed in saltwater (e.g., American eel).

With the exception of the Hudson River and Dickey Brook, the majority of fisheries habitat crossed by the AIM Project pipeline facilities is classified as freshwater. Both the Hudson River and Dickey Brook support estuarine fisheries. Fish known to occur in the proposed Project area are summarized in table 4.6.2-1. Impacts on and mitigation for aquatic resources are discussed in section 4.6.2.3. Notably, no waterbodies are located within the proposed construction workspace areas at the existing compressor stations, existing M&R stations, or new M&R stations. As such, aquatic resource impacts would be limited to the proposed construction of Algonquin's pipeline facilities.

New York

The waterbodies crossed by the pipeline segments in New York are located entirely within sub-basin level watersheds of the Lower Hudson Watershed in Rockland, Westchester, and Putnam Counties. These include the crossings of Minisceongo Creek, Cedar Pond Brook on the west side of the Hudson River, and Dickey Brook on the east side of the Hudson River. Streams found in these areas support primarily warmwater fishery species, but there are a number of waterbodies that are classified as coldwater because they support trout populations and/or provide trout spawning habitat. In addition, the NYSDEC stocks trout in a number of these waterbodies.

The largest waterbody crossed by the AIM Project is the Hudson River. This river is about 0.7 mile wide at the proposed pipeline crossing location. This crossing area is at the northern end of a nearly 50-mile tidal estuary that extends from the Bear Mountain Bridge in the north to Manhattan in the south. The pipeline crossing would be in an area considered to be part of the Hudson Highlands, which supports the deepest (up to 200 feet deep) and narrowest segment of the Hudson River as previously described.

Connecticut

Waterbodies crossed by the proposed pipeline segments in Connecticut range from small intermittent headwaters and tributaries (such as the unnamed tributaries found along Susquetonscut Brook) to mid-reach perennial waterways (such as Dividend Brook and Elisha Brook). The pipeline facilities would also cross a few larger streams and rivers including the Sawmill River, Still River, Kohanza Brook in Western Connecticut, and Dividend Brook in central Connecticut near its confluence with the Connecticut River. These waterbodies area classified as either coldwater or warmwater systems. Connecticut stocks trout in both warmwater and coldwater perennial waterbodies to support recreational fishing (CTDEEP, 2013h).

Massachusetts

The West Roxbury Lateral would cross one perennial waterbody, Mother Brook, and one perennial waterbody draining from an existing man-made pond at a golf course. Mother Brook is a perennial stream that flows into the Charles River in Dedham, which flows into the Neponset River in Boston and has a crossing width of 41 feet. Mother Brook would be crossed by the pipeline in the Town of Dedham at MP 3.1. The perennial stream exiting the golf course pond is an unnamed tributary of Purgatory Brook. This tributary has a crossing width of 9 feet, and would be crossed by the pipeline in the Town of Dedham at MP 0.1. Mother Brook and the unnamed tributary of Purgatory Brook are classified as warmwater waterbodies according to the Massachusetts Surface Water Quality Standards (314 CMR: 4.00).

TABLE 4.6.2-1

Representative Fish Species in Waterbodies Crossed by the Pipeline Facilities for the AIM Project

Freshwater	
Black crappie (*Pomoxis nigromaculatus)*	Pumpkinseed (*Lepomis gibbosus*)
Bluegill (*Lepomis macrochirus)*	Redbreast sunfish (*Lepomis auritus*)
Brown bullhead (*Ameiurus nebulosus*)	Redfin pickerel (*Esox americanus americanus*)
Carp (*Cyprinus carpio)*	Redside dace (*Clinostomus elongates*)
Chain pickerel (*Esox niger)*	Rock bass (*Ambloplites rupestris*)
Common shiner (*Luxilus cornutus*)	Smallmouth bass (*Micropterus dolomieui*)
Creek chub (*Semotilus atromaculatus*)	Spottail shiner (*Notropis hudsonius*)
Cutlips minnow (*Exoglossum maxillingua*)	Sunfish (hybrid)
Fallfish (*Semotilus corporalis*)	Tesselated darter (*Etheostoma olmstedi*)
Gizzard shad (*Dorosoma cepedianum*)	White sucker (*Catostomus commersoni*)
Golden shiner (*Notemigonus crysoleucas*)	Yellow bullhead (*Ameirus natalis*)
Largemouth bass (*Micropterus salmoides*)	Yellow perch (*Perca flavescens*)
Pumpkinseed (*Lepomis gibbosus*)	
Coldwater	
Blacknose dace (*Rhinichthys atratulus*)	Longnose dace (*Rhinichthys cataractae*)
Brook trout (*Salvelinus fontinails*)	Rainbow Trout (*Oncorhynchus mykiss*)
Brown trout (*Salmo trutta*)	Tiger Trout (*Salmo trutta X salvelinus fontinalis*)
Anadromous	
Alewife (*Alosa pseudoharengus*)	Hickory shad *(Alosa mediocris)*
American shad (*Alosa sapidissima*)	Rainbow smelt *(Osmerus mordax)*
Atlantic sturgeon *(Acipenser oxyrhynchus)*	Shortnose sturgeon *(Acipenser brevirostrum)*
Blueback herring *(Alosa aestivalis)*	Striped bass *(Morone saxatilis)*
Catadromous	
American eel *(Anguilla rostrata)*	
Estuarine	
Atlantic silverside (*Menidia menidia*)	Striped killifish (*Fundulus majalis*)
Bay anchovy (*Anchoa mitchilli*)	Striped mullet (*Mugil cephalus*)
Four-spined stickleback (*Apeltes quadracus*)	Three-spined stickleback (*Gasterosteus aculeatus*)
Grubby sculpin (*Myxocephalus aeneus*)	Tidewater silverside (*Mendia peninsulae*)
Hog choker (*Trinectes maculatus*)	White catfish (*Ameiurus catus*)
Inland silverside (*Menidia beryllina*)	White perch (*Morone Americana*)
Mummichog (*Fundulus heteroclitus*)	Winter flounder (*Pleuronectes americanus*)
Northern pipefish (*Syngnathus fuscus*)	
Marine	
Anchovy *(Anchoa mitchilli)*	King mackerel *(Scomberomorus cavalla)*
Atlantic butterfish *(Peprilus triacanthus)*	Red Hake *(Urophycis chuss)*
Atlantic mackerel *(Scomber scombrus)*	Sandbar shark *(Carcharinus plumbeus)*
Atlantic silversides *(Menidia menidia)*	Sand tiger shark *(Odontaspis taurus)*
Atlantic sea herring *(Clupea harengus)*	Scup *(Stenotomus chrysops)*
Black sea bass *(Centropristus striata)*	Spanish mackerel *(Scomberomorus maculatus)*
Bluefish *(Pomatomus saltatrix)*	Summer flounder *(Paralichthys dentatus)*
Cobia *(Rachycentron canadum)*	Windowpane flounder *(Scopthalmus aquosus)*
Dusky shark *(Carcharinus obscurus)*	Winter flounder *(Pleuronectes americanus)*

4.6.2.2 Fisheries of Special Concern

Consultations with the FWS, NOAA Fisheries, NYSDEC, CTDEEP, MDFW, and Rhode Island Natural Heritage Program (RINHP) were conducted to identify waterbodies that may contain federally or state-listed threatened, endangered, or candidate species and their habitat; EFH; coldwater fisheries; and other fisheries resources that could be considered fisheries of special concern (see section 4.7 for a discussion of threatened and endangered species).

Fisheries of special concern in the AIM Project area are listed in table 4.6.2-2 and described below. Potential construction impacts on aquatic resources, including fisheries of special concern, are discussed in section 4.6.2.3. Algonquin proposes to use a dry crossing method further described in section 4.3.2.3 for all waterbody crossings along the proposed pipeline route except for the crossing of the Hudson River in New York and the Still River in Connecticut, which would be crossed using the HDD method.

Minisceongo Creek and Tributaries

The Haverstraw to Stony Point Take-up and Relay segment would cross Minisceongo Creek in Rockland County at MP 1.1 and 14 tributaries of Minisceongo Creek between MPs 0.6 and 2.3. Minisceongo Creek is a large boulder strewn perennial waterway with a gravel bottom and moderate flow. Its surrounding tributaries include both perennial and intermittent streams with sand/gravel substrates and moderate flow rates. Minisceongo Creek and its tributaries are designated as trout streams under New York Water Quality Standards. The river is used for recreational fishing and is stocked with brown trout (*Salmo trutta*) by the NYSDEC (NYSDEC, 2013h).

Cedar Pond Brook

The Haverstraw to Stony Point Take-up and Relay segment would cross Cedar Pond Brook in Rockland County at MP 3.0. Cedar Pond Brook is a large perennial waterway with a gravel bottom and moderate flow. Cedar Pond Brook is designated as trout spawning waters under New York Water Quality Standards. The river is used for recreational fishing and is stocked with brown trout (*Salmo trutta*) by the NYSDEC (NYSDEC, 2013h, 2013i).

Hudson River

The Stony Point to Yorktown Take-up and Relay segment would cross the Hudson River between MPs 3.2 and 3.9 using the HDD method. The Hudson River has semi-diurnal tides of 3 to 5 feet and moderate to high salinities up to 26 ppt over the course of the year due to a small percentage of freshwater inflows. Water temperature also varies throughout the year from 35.6 to 82.4 degrees Fahrenheit (°F). Additionally, high turbidity decreases the amount of light penetration to 3 to 16 feet below the surface. Dissolved oxygen levels are generally above 4.0 milligrams per liter; however, lower values may occur towards the bottom or at certain lagoon, inter-pier, and combined sewer outflow areas (FWS, 1997).

The lower Hudson River Estuary is designated as EFH. Anadromous fish in the Hudson River include the federally listed endangered shortnose and Atlantic sturgeon (see section 4.7.1 for discussion of these federally listed species), as well as American shad, striped bass, alewife, and blueback herring. The catadromous American eel can also be found in the lower reaches of the Hudson River.

TABLE 4.6.2-2

Fisheries of Special Concern Crossed by the Pipeline Facilities for the AIM Project

Facility/Waterbody Name	MP	County	State	Fishery Concern[a,b]
Replacement Pipeline				
Haverstraw to Stony Point Take-up and Relay				
Unnamed Tributary (UNT) to Mahwah River	0.3	Rockland	NY	Trout Stocked Waters Downstream of Crossing Location
UNT to Minisceongo Creek	0.6	Rockland	NY	Trout Stocked Waters
UNT to Minisceongo Creek	0.8	Rockland	NY	Trout Stocked Waters
UNT to Minisceongo Creek	0.8	Rockland	NY	Trout Stocked Waters
UNT to Minisceongo Creek	0.9	Rockland	NY	Trout Stocked Waters
UNT to Minisceongo Creek	0.9	Rockland	NY	Trout Stocked Waters
UNT to Minisceongo Creek	0.9	Rockland	NY	Trout Stocked Waters
UNT to Minisceongo Creek	0.9	Rockland	NY	Trout Stocked Waters
UNT to Minisceongo Creek	1.0	Rockland	NY	Trout Stocked Waters
UNT to Minisceongo Creek	1.0	Rockland	NY	Trout Stocked Waters
UNT to Minisceongo Creek	1.0	Rockland	NY	Trout Stocked Waters
UNT to Minisceongo Creek	1.1	Rockland	NY	Trout Stocked Waters
UNT to Minisceongo Creek	1.1	Rockland	NY	Trout Stocked Waters
Minisceongo Creek	1.1	Rockland	NY	Trout Stocked Waters
UNT to Minisceongo Creek	1.7	Rockland	NY	Trout Stocked Waters
UNT to Minisceongo Creek	2.2	Rockland	NY	Trout Stocked Waters
Cedar Pond Brook	3.0	Rockland	NY	Trout Spawning Habitat
UNT to Cedar Pond Brook	3.0	Rockland	NY	Trout Spawning Habitat
Stony Point to Yorktown Take-up and Relay				
Hudson River	3.2	Rockland/ Westchester	NY	Threatened and endangered species, anadromous fisheries, commercial/recreational
Southeast to MLV 19 Take-up and Relay				
Still River	1.7	Fairfield	CT	Trout Stocked Waters
E-1 System Lateral Take-up and Relay				
Susquetonscut Brook	0.7, 2.0, 5.8	New London	CT	Trout Stocked Waters
UNT to Elisha Brook	8.3	New London	CT	Trout Stocked Waters
Elisha Brook	8.5	New London	CT	Trout Stocked Waters
Loop Extension				
Line-36A Loop Extension				
Dividend Brook	0.9, 1.3, 1.3, 1.3, 1.3	Middlesex	CT	Trout Stocked Waters
E-1 System Lateral Loop Extension				
UNT to Stoney Brook	0.0	New London	CT	Trout Spawning Habitat
UNT to Stoney Brook	0.2	New London	CT	Trout Spawning Habitat
UNT to Stoney Brook	0.3	New London	CT	Trout Spawning Habitat
UNT to Stoney Brook	0.3	New London	CT	Trout Spawning Habitat

TABLE 4.6.2-2 (cont'd)				
Fisheries of Special Concern Crossed by the Pipeline Facilities for the AIM Project				
Facility/Waterbody Name	MP	County	State	Fishery Concern[a,b]
Falls Brook	0.8	New London	CT	Trout Stocked Waters
UNT to Stoney Brook	0.9	New London	CT	Trout Spawning Habitat
UNT to Stoney Brook	1.2	New London	CT	Trout Spawning Habitat

a Threatened and endangered species = federally or state-listed threatened, endangered, or candidate species.

b Trout Stocked Waters = waters where trout are stocked for recreational fishing. Trout Spawning Habitat = waters with naturally occurring spawning populations of trout.

Currently, regulated recreational fishing for striped bass, American eel, alewife, blueback herring, and other species is permitted in the Hudson River; however, the sustainability of alewife and blueback herring fisheries is currently being assessed by the NYSDEC. Commercial fishing for striped bass and most other species, besides baitfish, remains closed in the lower Hudson River due to concerns with PCB (NOAA Fisheries, 2001; NYSDEC, 2009). Blue crab and shellfish species are also present in the Hudson River estuary, although harvest of these species is restricted.

Dickey Brook

Dickey Brook is classified as a freshwater stream that transitions to an estuarine environment along its lower reach where it joins the Hudson River. The separation point between these two systems is the bridge over Route 9 and Route 9A in the Town of Cortlandt. West of the bridge, Dickey Brook is designated as marine waters (Class SC) and is tidally influenced by the Hudson River. East of the Route 9/9A Bridge, Dickey Brook is designated as a freshwater system Class C waterbody by the NYSDEC. The Stony Point to Yorktown Take-up and Relay segment would cross this estuarine section once at MP 5.7 and then the freshwater section at MP 6.0. The Class SC and C designations indicate that the waters are not fit for swimming or human consumption, and fishing is the best use for this waterbody.

Still River

The Southeast to MLV 19 Take-up and Relay segment crosses the Still River at MP 1.7 in the City of Danbury, Connecticut. This waterbody crossing is part of the larger Interstate 84/Still River HDD that would extend from MPs 1.4 to 2.1. The river is a large, warmwater, perennial waterway with a sand substrate. Common warmwater game species within the Still River include largemouth bass, smallmouth bass, and common carp (CTDEEP, 2013f). The Still River is a recreational fishery that is stocked with rainbow trout and brown trout by the CTDEEP during the spring (CTDEEP, 2013p).

Sawmill River

One of the principal tributaries to the Still River, flowing north from the southern uplands, is the Sawmill River. The Southeast to MLV 19 Take-up and Relay segment would cross the Sawmill River at MP 0.3, where the river is about 8 feet wide.

Dividend Brook

The Line-36A Loop Extension pipeline segment would cross Dividend Brook in the Town of Cromwell, Connecticut at five locations (MPs 0.9, 1.3, 1.3, 1.3, and 1.3). Dividend Brook is a coldwater, perennial waterway with a silt and sand substrate and heavily undercut banks. Dividend Brook is used for recreational fishing and was identified as containing trout populations by the CTDEEP (CTDEEP, 2013f).

Susquetonscut Brook

The E-1 System Take-up and Relay segment would cross the Susquetonscut Brook in New London County, Connecticut at three locations: MPs 0.7, 2.0, and 5.8. Two crossings are in the Town of Lebanon and one is in the Town of Franklin. Susquetonscut Brook is a large, warmwater, perennial waterway with a sand and silt substrate. It has a moderately slow flow rate with a number of beaver impoundments, oxbows, and other backwaters located along its reach in the Project area. The Susquetonscut Brook supports a varied assemblage of warmwater game fish species, including largemouth bass and chain pickerel (CTDEEP, 2013f), and is stocked with brook trout and brown trout by the CTDEEP during the spring and fall stocking seasons (CTDEEP, 2013p).

Elisha Brook and Tributaries

The E-1 System Take-up and Relay segment would cross Elisha Brook in the City of Norwich, Connecticut at MP 8.5, and one of its unnamed tributaries at MP 8.3. Elisha Brook is a minor, coldwater, perennial waterway with a sand, gravel, and cobble substrate. Its unnamed tributary is a minor intermittent stream that feeds the main channel. Elisha Brook has the potential for recreational fishing, and contains populations of brook trout (CTDEEP, 2013f).

Unnamed Tributaries to Stony Brook

The E-1 System Lateral Loop Extension segment would cross six unnamed tributaries of Stony Brook in the Town of Montville, Connecticut at the following locations: MPs 0.0, 0.2, 0.3, 0.3, 0.9, and 1.2. Stony Brook is rated a Class 3 wild trout management area and contains spawning populations of brook trout (CTDEEP, 2013h). Stony Brook is also stocked with brown and rainbow trout (CTDEEP, 2013f, 2013p), and has more stringent fishing regulations in place than other waterbodies in the state (CTDEEP, 2013h). The unnamed tributaries of Stony Brook crossed by the proposed pipeline facilities contain both perennial and intermittent waterbodies, all of which likely contain trout feeding, and possibly spawning habitat. The tributaries likely support limited levels of recreational fishing.

Falls Brook

The E-1 System Lateral Loop Extension segment would cross Falls Brook in the Town of Montville, Connecticut at MP 0.8. Falls Brook is a high velocity, shallow, perennial stream that provides coldwater fishery habitat and contains large boulders on a gravel and cobble substrate. It supports a varied assemblage of coldwater fish species, including four species of trout: brook, brown, rainbow, and tiger trout (*Salmo trutta X salvelinus fontinalis*) (CTDEEP, 2013f). Tiger trout are a hybrid species derived from a cross between brook and brown trout, and are highly prized by anglers (CTDEEP, 2013p). Falls Brook is used for recreational fishing, and is stocked by the CTDEEP with all four of the above-mentioned trout species (CTDEEP, 2013p).

4.6.2.3 General Impacts and Mitigation

This section describes general impacts and measures that would be implemented to minimize impacts on fisheries and aquatic resources in the Project area, including EFH and other fisheries of special concern. Specific effects on EFH are discussed in section 4.6.2.4.

Construction and modifications to existing aboveground facilities are not expected to result in significant affects to any waterbodies or fisheries. Thus, the following section focuses on activities associated with the construction of the proposed pipeline facilities. Additional details regarding waterbody crossing methods are provided in sections 2.3 and 4.3.2.3, and the proposed crossing method for each waterbody potentially affected by the Project is listed in table I-1 in appendix I.

Dry Crossing Method

As discussed previously, Algonquin proposes to use a dry crossing method (i.e., flume or dam-and-pump) to install all but two of the waterbody crossings along the proposed pipeline segments. None of these other waterbodies includes designated EFH. The other two waterbodies would be crossed using the HDD method. Dry crossing methods involve the installation of a flume pipe(s) and/or dam and pump prior to trenching to divert the stream flow around the construction area and allow trenching of the stream crossing in drier conditions, isolated from the stream flow. These methods typically result in lower sedimentation and associated turbidity impacts when compared to conventional wet crossing methods.

The impacts of the dry crossing methods on fishery resources could include:

- increased sedimentation and water turbidity immediately downstream of the construction work area;
- direct contact with relatively immobile prey organisms (e.g., benthic and epibenthic) that may be food resources for fish;
- 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; and
- downstream scour associated with use of pumps or flume discharge.

In addition, removal of streamside vegetation at the crossings may 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 use of dry crossing construction techniques would minimize the potential for erosion and sedimentation within the stream channel by confining impacts to the construction work areas and minimizing impacts on downstream reaches. Additionally, Algonquin would strive to complete each pipeline installation and the associated bed and bank restoration work within 24 hours for minor crossings and 48 hours for intermediate crossings. Algonquin would also implement the erosion and sedimentation control measures described in its E&SCP to contain materials within the construction work areas and minimize impacts on fisheries due to changes in water quality.

Use of a flume or dam and pump crossing would have a direct impact on benthos and alteration of aquatic habitats. The impact would result from installation and removal of the temporary dams built to isolate the construction work areas, and from excavation of the pipeline trench. Installation of the temporary dams typically involves the placement of sand bags or equivalent dam diversion structures upstream and downstream of the construction work areas. The footprint of the dams is typically small but would temporarily bury existing benthic organisms within the footprint of the dams. Excavation of the pipeline trench would also directly impact existing benthos through removal and temporary stockpiling in upland areas of bottom sediment. These effects would be limited to a relatively small area. Following installation of the pipeline, the bed and banks would be restored and the temporary dams would be removed. The pipeline trench would be backfilled with the original sediment, restoring similar habitat conditions. Both the restored stream bed and the area beneath the dams would likely be colonized fairly quickly by benthic species from the adjacent areas of the waterbody.

The use of pumps to maintain stream flow around the construction work areas could entrain or impinge fish and ichthyoplankton. This potential impact would be minimized by screening the intakes of the pumping system, as described in Algonquin's E&SCP. However, some small fish and larvae as well as all forms of ichthyoplankton would still be subject to entrainment, although the duration of this effect would be short (24 to 48 hours) and would cease when the crossing is completed and normal streamflow is restored.

The dam and pump crossing method could also result in sediment scour downstream of the crossing if measures were not implemented to dissipate the energy of the pump discharge. As described in the E&SCP for the AIM Project, Algonquin would direct all discharges from the pumps through energy dissipaters to minimize scour and downstream siltation.

The use of the dam and pump crossing method could also temporarily restrict fish passage during the 24 to 48 hours it takes to install the pipeline. This short-term and localized interruption of fish passage is not anticipated to dramatically affect the migration of fish within the stream systems that would be crossed by the Project.

Impacts resulting from tree clearing adjacent to each crossing would be minimal due to Algonquin's use of existing cleared rights-of-way and/or previously developed corridors for the majority of the proposed pipeline route. Moreover, following the installation of the pipeline, streambanks would be restored, stabilized with erosion control measures, and revegetated.

Algonquin would implement procedures to further minimize potential impacts associated with loss of riparian shade and vegetation cover. 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 rights-of-way would minimize these impacts. 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 AIM Project E&SCP, would minimize the potential for erosion from the surrounding landscape.

In Connecticut, the standard dry crossing methods would be augmented to include recommendations set forth by the CTDEEP (CTDEEP, 2013s). The CTDEEP recommended that the restoration of all stream crossings in Connecticut, not just coldwater resources, have the top 12 inches of native streambed armament scraped off from the existing streambed, stockpiled, and restored back to its original profile, mimicking the physical habitat (riffle, pool, run, etc.) that was present prior to disturbance. The CTDEEP also recommended photo-documentation of the pre-existing stream conditions to assist in the restoration work. The CTDEEP has specific recommendations for rock used for any stream bank restoration (i.e., use more natural rounded stone cobbles as opposed to riprap) and the planting of shrubs in riparian zones to restore riparian functions (CTDEEP, 2013s). Algonquin would adhere to all of CTDEEP's recommendations and will finalize the details with the CTDEEP through the permitting processes.

Similarly, the NYSDEC has recommended that the top 12 inches of native streambed material be removed from the crossing area, stockpiled, and placed back in the channel and restored to preconstruction condition. The NYSDEC also recommends that dry stream crossings be conducted using the dam and pump method and that Algonquin require the contractor to have back-up pumps on-site and available in case of mechanical failure. Algonquin would also have 24-hour on-site monitoring during pumping operations, to minimize the chances of any problems at the crossing sites. To achieve a good seal with the channel bottom, Algonquin would use a combination of plastic sheeting and sand bags at the stream dam locations. As per the NYSDEC's requirement, no liquid concrete is to be placed into any watercourse. The NYSDEC has specific recommendations on the rock used for any stream bank restoration and no riprap armoring or geotextile fabric is to be used for stream bank stabilization. The NYSDEC recommends using a combination of jute matting, seed mixes, and riparian vegetation plantings for stream bank restoration.

In summary, implementation of Algonquin's construction, restoration, and mitigation procedures would result in only limited, short-term impacts on fishery resources, and the aquatic habitats upon which these fishery resources depend. Invertebrate populations would recolonize the crossing area and all temporary construction workspace areas would revert to their original condition, including re-establishment of riparian cover. Furthermore, operation and routine maintenance of the pipeline rights-of-way would not have any noticeable impact on fishery resources in the Project area.

HDD Crossing Method

Algonquin proposes to utilize the HDD method to cross the Hudson River in New York along the Stony Point to Yorktown Take-up and Relay and the Still River in Connecticut along the Southeast Take-up and Relay segment. The Hudson River HDD crossing would take place in soft soils above the bedrock and old channel lag deposits. The results of the preliminary hydrologic fracture evaluation are discussed in section 4.3.2.3. Algonquin has prepared and would implement the measures identified in its BDP Plan (see appendix J). Algonquin is proposing to use municipal sources of water for the HDD operations. As such, the Project would not significantly affect aquatic resources in the Hudson River in New York or the Still River in Connecticut.

Blasting

Some limited blasting could be required along the AIM Project pipeline segments to increase the depth and width of the existing trenches to accommodate the larger diameter pipeline. Most streambeds with shallow bedrock would likely be of sedimentary rock and thus would not require blasting. In instances where the rock would not be rippable, drilling and blasting would be used to install the pipeline. Potential rock removal and blasting in waterbodies is further discussed in section 4.3.2.3. Rock removal is also discussed in sections 2.3.1 and 4.1.6 and a Rock Removal Plan is provided in appendix E.

Potential adverse effects of blasting in waterbodies could include direct mortality of organisms in the immediate vicinity of the blast. Blasting can also have same short-term adverse impacts, similar to trenching, including reduced macroinvertebrate prey base, alteration of substrate characteristics, and loss of large woody debris and structure.

Algonquin would mitigate the effects of blasting on fish species in several ways. The blasting contractor would use delays and stemming to dampen the shock wave. The nature of the material that would require blasting and the short duration of blasting activities would help minimize the amount of fine-grained material released to the aquatic habitat. Furthermore, resident fish inhabiting the area would already be dispersed due to active drilling and preparation of the construction workspace area at the crossing for the particular dry crossing technique selected. Once complete, debris would be removed as needed so as not to interfere with downstream flow. Therefore, by implementing the measures identified in the Rock Removal Plan and additional measures identified above, impacts on aquatic resources from blasting would be adequately minimized and short-term.

Hydrostatic Test Water

Algonquin would ensure that hydrostatic test water appropriations and discharges would not result in a significant entrainment of fish, loss of habitat, or an adverse effect to water quality. The withdrawal intake hoses would be fitted with intake screen devices that would eliminate the entrainment of fingerling and small fish during water withdrawal. Discharge would comply with regulatory permit conditions and be controlled to prevent scour and sedimentation, flooding, or the introduction of foreign or toxic substances into the aquatic system. With these measures, the intake of water for hydrostatic testing would not significantly impact aquatic resources.

Spill Prevention and Control Countermeasures

Accidental spills of construction-related fluids (e.g., oil, gasoline, or hydraulic fluids) on the landscape or directly into waterbodies could be debilitating to biota, depending on the type and quantity of the spill, and the dispersal and attenuation characteristics of the waterbody. To reduce the potential for surface water contamination, Algonquin would adhere to its SPCC Plan.

Potential impacts on fish are largely attributable to effects on water quality and other habitat factors that influence the health of the aquatic ecosystem. Minimization and mitigation procedures related to water quality are discussed in detail in section 4.3.2.6. To minimize the potential for spills from equipment use, Algonquin's SPCC Plan would be implemented. Refueling or other handling of hazardous materials within 100 feet of wetland and waterbody resources would not be allowed. If the 100-foot setback could not be met, these activities would be performed under the supervision of an EI in accordance with Algonquin's SPCC Plan. Algonquin would conduct routine inspections of tank and storage areas to help reduce the potential for spills or leaks of hazardous materials, as specified in the SPCC Plan. Implementation of these measures would adequately minimize the chances of a spill.

4.6.2.4 Essential Fish Habitat

The MSA (16 USC 1801 et seq.) established a management system for marine fisheries resources in the United States. In particular, Congress charged the NOAA Fisheries and the fishery management councils, along with other federal and state agencies and the fishing community, to identify habitats essential to managed species, which include marine, estuarine, and anadromous finfish, mollusks, and crustaceans. The habitat is identified as EFH and defined to include "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity."

Federal agencies that authorize, fund, or undertake activities that may adversely impact EFH must consult with NOAA Fisheries. Although absolute criteria have not been established for conducting EFH consultations, NOAA Fisheries recommends consolidated EFH consultations with interagency coordination procedures required by other statutes, such as NEPA or the ESA, in order to reduce duplication and improve efficiency.

We reviewed the information provided by Algonquin, conducted our own analysis, and consulted with NOAA Fisheries. Our analysis of the potential for Project-related effects on EFH and managed species is provided in this draft EIS. As a result, FERC requests NOAA Fisheries consider the information provided here as the EFH assessment for the Project.

Managed Fish Species and Essential Fish Habitats

NOAA Fisheries Northeast Regional Office EFH designation tables were reviewed to identify managed species for which EFH could potentially occur within the Project area. This review identified 16 managed species that could occur in the Project area. Information on these 16 managed species and the EFH characteristics of the various life stages is provided in table 4.6.2-3. A list of the waterbodies containing EFH species is included in table 4.6.2-2.

The proposed Hudson River crossing area for the Stony Point to Yorktown Take-up and Relay segment is located to the north of the designated EFH associated with the lower Hudson River Estuary (NOAA Fisheries, 2013a, 2013c). The estuarine water column provides seasonal nursery areas for young developmental stages, but also as migratory habitat for anadromous species.

Although the Stony Point to Yorktown Take-up and Relay segment would cross the Hudson River up-river of the lower Hudson River designated EFH area, the crossing area may contain habitat that is essential to certain EFH species. The area of the Hudson River that would be crossed by the Project is characterized by an estuarine water column with a lower relative salinity ranging from 0 to 6 ppt (Yozzo et al., 2005). The Hudson River system has a large mixing zone, where fresh and tidal waters come together. NOAA Fisheries expressed concern regarding the Project's proposed crossing of other tidally influenced or freshwater streams that could support EFH species and is reviewing the proposed waterbody crossings and crossing methods for the Project. Through consultation with NOAA Fisheries, we have determined that the only waterbody crossing where EFH species could potentially occur is the Hudson River (see table 4.6.2-2).

Assessment of Potential Impacts on EFH

Many of the potential effects on EFH and managed fish species would be similar to those discussed for surface waters and aquatic species and their habitats in sections 4.3.2.6 and 4.6.2.3

Because the Hudson River Estuary supports EFH and managed fish species, Algonquin proposes to install the Stony Point to Yorktown Take-up and Relay across the Hudson River using the HDD method and employing the BMPs outlined in Algonquin's BDP Plan (see appendix J). Algonquin has performed geotechnical analysis of the proposed crossing and identified that drilling would occur in soft soils. If successfully employed, the HDD method would avoid direct effects, including disturbance to the bed, banks, and EFH species, as well as non-mobile life stages of managed species.

While avoiding direct impacts, the HDD method is not without risks. The potential effects on aquatic resources associated with HDD can include:

- erosion or sedimentation associated with onshore operation of the HDD equipment;
- inadvertent hazardous material spills associated with operation of construction equipment; and
- inadvertent release of drilling fluids.

TABLE 4.6.2-3

Summary of Essential Fish Habitat and General Habitat Parameters for the AIM Project [a]

EFH Species	Life Stage [b]	EFH Characteristics [c]
Red hake	Egg	Surface waters; <10 °C; <25 ppt
Urophycis chuss	Larvae	Surface waters;<19 °C; <200 m; >0.5 ppt
	Juvenile	Shell fragment bottom habitats; <16 °C; <100 m; 31-33 ppt
	Adult	Sand/mud bottom depressions; <12 °C; 10-130 m; 33-34 ppt
Winter flounder	Egg	Demersal; sand/muddy sand/mud/gravel bottom; <10 °C; <5 m; 10-30 ppt
Pleuronectes americanus	Larvae	Pelagic and bottom waters; <15 °C; <6 m; 4-30 ppt
	Juvenile	Mud/fine sand bottom habitats; <28 °C; 0.1-10 m; 5-33 ppt
	Adult	Mud/sand/gravel estuarine bottom habitats; <25 °C; 1-100 m; 15-33 ppt
Windowpane flounder	Egg	Surface waters; <20 °C; <70 m
Scophthalmus aquosus	Larvae	Pelagic waters; <20 °C; <70 m
	Juvenile	Mud/fine sand bottom habitats; <25 °C; 1-100 m; 5.5-36 ppt
	Adult	Mud/fine sand bottom habitats; <26.8 °C; 1-75 m; 5.5-36 ppt
Atlantic herring	Larvae	Pelagic waters; <16 °C; 50-90 m; 32 ppt
Clupea harengus	Juvenile	Pelagic waters and bottom habitats; <10 °C; 15-135 m; 26-32 ppt
	Adult	Pelagic waters and bottom habitats; <10 °C; 20-130 m; >28 ppt
Bluefish	Juvenile	Mixing/seawater portions of estuaries
Pomatomus salatrix	Adult	Estuarine waters; >25 ppt
Atlantic butterfish	Larvae	Pelagic waters; mixing portions of estuaries; 9-19 °C; 10-1,800 m
Peprilus triacanthus	Juvenile	Pelagic waters; mixing/seawater portions of estuaries; 3-28 °C; 10-365 m
	Adult	Pelagic waters; mixing/seawater portions of estuaries; 3-28 °C; 10-365 m
Atlantic mackerel	Juvenile	Pelagic waters; mixing/seawater portions of estuaries; 4-22 °C; shore to 320 m
Scomber scombrus	Adult	Pelagic waters; mixing/seawater portions of estuaries; 4-16 °C; shore to 380 m
Summer flounder	Larvae	Pelagic shelf waters; mixing/seawater portions of estuaries; nearshore 10-70 m
Paralicthys dentatus	Juvenile	Demersal; mixing/seawater portions of estuaries; salt marsh creeks/ seagrass beds/mudflats/open bays; >3 °C; 10-30 ppt
	Adult	Demersal waters; shallow mixing/seawater portions of estuaries; shallow coastal waters
Scup	Egg	Mixing/seawater portions of estuaries; 13-23 °C; >15 ppt
Stenotomus chrysops	Larvae	Mixing/seawater portions of estuaries; 13-23 °C; >15 ppt
	Juvenile	Demersal waters; mixing/seawater portions of estuaries; sand/mud/mussel and eelgrass beds; >7 °C; >15 ppt
	Adult	Demersal waters; mixing/seawater portions of estuaries; >7 °C
Coastal Migratory Pelagics		
Black sea bass *Centropristis striata*	Juvenile	Demersal waters; mixing/seawater portions of estuaries; rough bottom; shellfish/eelgrass beds; structures >6 °C; >18 ppt
	Adult	Demersal waters; mixing/seawater portions of estuaries; structured habitat; >6 °C

TABLE 4.6.2-3 (cont'd)

Summary of Essential Fish Habitat and General Habitat Parameters for the AIM Project [a]

EFH Species	Life Stage [b]	EFH Characteristics [c]
King mackerel	Egg	Pelagic waters; > 17 °C; 32-36 ppt
Scomberomorus cavalla	Larvae	Pelagic waters; 26-31 °C; 26-37 ppt
	Juvenile	Pelagic waters; > 20 °C
	Adult	Pelagic waters; > 20 °C
Spanish mackerel	Egg	Pelagic waters; > 17 °C; 32-36 ppt
Scomberomorus maculatus	Larvae	Pelagic waters; 19-30 °C; > 28 ppt
	Juvenile	Estuaries; > 17 °C; 32-26 ppt
	Adult	Estuaries; pelagic waters; 21-31 °C; 32-36 ppt
Cobia	Egg	Offshore
Rachycentron canadum	Larvae	Offshore
	Juvenile	Coastal waters; high salinity
	Adult	Estuaries; mud, sand, coral reef substrates
Highly Migratory Species		
Sandbar shark *Carcharhinus plumbeus*	Neonates	Shallow coastal waters; < 25 m
Dusky shark *Carcharhinus obscures*	Neonates	Shallow coastal waters, inlets, estuaries; < 25 m
Sand tiger shark *Carcharias taurus*	Neonates	Shallow coastal waters; < 200 m

[a] Based on 10-minute by 10-minute latitudinal/longitudinal designated EFH quadrants.
[b] Designated EFH along the Project only in areas where EFH characteristics are present.
[c] °C = degrees Celsius; m = meters; ppt = parts per thousand; > = greater than; < = less than
Source: NOAA Fisheries, 2013c

Construction related to the onshore operation of the HDD equipment could cause run-off of sediment into the waterbody, which could adversely affect managed fish species. Also, accidental spills of petroleum products or hazardous materials into or near the waterbody could be toxic to any life stage, depending on the type and quantity of the spill. As discussed in sections 4.3.2.6 and 4.6.2.3, Algonquin would minimize the potential impacts on aquatic resources during construction through implementation of the measures identified in its E&SCP and BDP Plan (see appendix J), which we find acceptable.

NOAA Fisheries concurred with the assessment that the Project would have *no effect* on federally listed sturgeon (see section 4.7.1.1) given the proposed use of the HDD construction method and implementation of Algonquin's proposed BDP Plan for the Hudson River crossing. Additionally, no water would be withdrawn from the Hudson River to support Project construction, such that direct effects from entrainment of managed fish species and their prey would also be avoided. As indicated in section 4.3.2.3, if some drilling fluid is released into the river during a hydraulic fracture, the volume would be minimal and would not accumulate due to the rapid drilling rates. Due to the river current, marine traffic, existing turbidity, and other pollutants that contribute to the discoloration of a major waterbody like the Hudson River, it is unlikely that an inadvertent release would be identifiable. Therefore, we conclude that the Project would have *no effect* on EFH or managed species associated with the proposed HDD of the Hudson River.

4.7 SPECIAL STATUS SPECIES

Special status species are those for which federal or state agencies afford an additional level of protection by law, regulation, or policy. Included in this category are federally listed threatened or endangered species, migratory birds protected by the MBTA; eagles protected by the Bald and Golden Eagle Protection Act (BGEPA); marine mammals protected by the Marine Mammal Protection Act (MMPA); and species that are designated as state-listed or receive special management consideration by New York State, Connecticut, Rhode Island, and Massachusetts. Species listed as candidates, petitioned, or proposed for federal listing by the FWS or NOAA Fisheries are also included here as special status species due to the potential for these species to become listed as threatened or endangered during the term of the Project.

4.7.1 Federally Listed Species

Section 7 of the ESA requires federal agencies to ensure that any actions authorized, funded, or carried out by the agencies do not jeopardize the continued existence of a federally listed threatened or endangered species, or result in the destruction or adverse modification of designated critical habitat for a federally listed species. The FWS, which is responsible for terrestrial and freshwater species and NOAA Fisheries, which is responsible for marine and anadromous species, jointly administer the law. As the lead federal agency for authorizing the Project, FERC is required to consult with the FWS and NOAA Fisheries to determine whether federally listed endangered or threatened species or designated critical habitat are found in the vicinity of the Project, and to evaluate the proposed action's potential effects on those species or critical habitat.

For actions involving major construction activities with the potential to affect listed species or designated critical habitat, the FERC must report its findings to the FWS and NOAA Fisheries in a BA for those species that may be affected. If it is determined the action is likely to adversely affect listed species or designated critical habitat, the FERC is required to initiate formal consultation with the appropriate agency. In response, the FWS or NOAA Fisheries would issue a Biological Opinion (BO) as to whether or not the action would likely jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat.

Algonquin, acting as the FERC's non-federal representative for the purpose of complying with section 7(a)(2) of the ESA, initiated informal consultation with NOAA Fisheries Protected Resources Division on May 20, 2013. NOAA Fisheries identified two federally listed threatened or endangered species (Atlantic and shortnose sturgeon) under their jurisdiction that are known to occur in the Hudson River within the Project area. As discussed in section 4.7.1.1, the Project would have *no effect* on the shortnose or Atlantic sturgeon. In a letter dated April 18, 2014, NOAA Fisheries concurred with this determination and consultation for the Atlantic and shortnose sturgeon is complete (NOAA Fisheries, 2014a).

Algonquin also initiated informal consultation with the FWS Ecological Field Services Office in New England on May 17, 2013 and New York on May 20, 2013 regarding federally listed threatened or endangered species potentially occurring in or near the Project area. The FWS identified seven federally listed threatened or endangered species (piping plover, roseate tern, Puritan tiger beetle, Indiana bat, bog turtle, northern red-bellied cooter, and small whorled pogonia), as well as one candidate species (New England cottontail) and one species proposed for listing as endangered (northern long-eared bat) that are known to occur in the Project area. These species are summarized in table 4.7.1-1 and discussed in sections 4.7.1.2 (federally listed) and 4.7.1.3 (proposed and candidate).

TABLE 4.7.1-1

Federally Listed Species Potentially Occurring Within the Vicinity of the AIM Project

		Pipeline Facilities								Aboveground Facilities [b]																						
		NY			CT				MA	NY					CT													RI	MA			
Species/ Common Name (*Scientific Name*)	Federal Status [a]	Haverstraw to Stony Point T&R	Stony Point to Yorktown T&R	Southeast to ML V 19 T&R	Southeast to ML V 19 T&R	Line 36A Loop Extension	E-1 System Lateral T&R	E-1 System Lateral Loop	West Roxbury Lateral	Stony Point Compressor Station	Southeast Compressor Station	Stony Point M&R	Peekskill M&R	Cortland M&R	Cromwell Compressor Station	Chaplin Compressor Station	Oakland Heights M&R	West Danbury M&R	Southbury M&R	Waterbury M&R	Guilford M&R	Farmington M&R	Glastonbury M&R	Middletown M&R	Montville M&R	Willimantic M&R	Pomfret M&R	Burrillville Compressor Station	Assonet M&R	West Roxbury M&R	Middleborough M&R	Determination [c]
Fish																																
Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*)	E		X																													*No effect*
Shortnose sturgeon (*Acipenser brevirostrum*)	E		X																													*No effect*
Birds																																
Piping plover (*Charadrius melodius*)	T																															*No effect*
Roseate tern (*Sterna dougallii dougallii*)	E																															*No effect*
Invertebrates																																
Puritan tiger beetle (*Cicindela puritan*)	T																															*No effect*
Mammals																																
Indiana bat (*Myotis sodalis*)	E	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		Pending Surveys
Northern long-eared bat (*Myotis septentrionalis*)	PE	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		Pending Surveys
New England cottontail (*Sylvilagus transitionalis*)	C		X		X		X																									*Not likely to jeopardize*
Reptiles																																
Bog turtle (*Glyptemys muhlenbergii*)	T	X	X	X	X					X	X	X	X	X																		*Not likely to adversely affect*
Northern red-bellied cooter (*Pseudemys rubriventris*)	E																														X	*No effect*
Plants																																
Small whorled pogonia (*Isotria medeolodes*)	E	X	X							X																						*No effect*

[a] Abbreviations: (E) Endangered; (T) Threatened; (C) Candidate; (PE) Proposed Endangered.

[b] Aboveground facilities include facilities where the FWS expressed concern with regards to a particular species or facilities where vegetation would be affected as described in section 4.5 of this EIS.

[c] The FERC's determination for federally listed threatened and endangered species and preliminary determination for candidate and proposed species should they be listed during the term of the Project.

In compliance with section 7 of the ESA, FERC requests the FWS to consider the draft EIS, along with various survey reports prepared by Algonquin, as the draft BA for the AIM Project and requests FWS concurrence for the species with *no effect* determinations. The final EIS will include a revised BA to address the remaining species. To ensure compliance with the ESA, **we recommend that:**

- **Algonquin should not begin construction of the AIM Project <u>until</u>:**
  - **a. the FERC staff receives comments from the FWS regarding the BA;**
  - **b. the FERC staff completes consultation with the FWS; and**
  - **c. Algonquin has received written notification from the Director of OEP that construction or use of mitigation may begin.**

4.7.1.1 Species under NOAA Fisheries Jurisdiction

NOAA Fisheries identified two species under their jurisdiction that are likely to occur where the Stony Point to Yorktown Take-up and Relay segment would cross the Hudson River. These fish species include the Atlantic sturgeon and shortnose sturgeon, for which all life stages are known to transit through the Project area. Atlantic sturgeon are also known to concentrate and overwinter within the Project area. As such, both species have the potential to be present throughout the year.

Atlantic Sturgeon

The Atlantic sturgeon is listed as an endangered species for the New York Bight distinct population segment (DPS) located within the Hudson River (NOAA Fisheries, 2013a). Atlantic sturgeon of the New York Bight DPS are also listed as protected/critically imperiled in New York (NYNHP, 2013b). The New York Bight DPS is the only DPS of Atlantic sturgeon known to spawn in the Hudson River, although other DPSs of Atlantic sturgeon are known to be present within the Hudson River. As such, sub-adult and adult Atlantic sturgeon from any DPS may be present within the Hudson River as far north as the Troy Dam, and have the potential to occur within the Project area (NYNHP, 2013d; NOAA Fisheries, 2013d).

The Atlantic sturgeon is a large, anadromous fish that prefers deeper parts of large rivers with moderate flow. Adults typically spawn between April and June from Canada to the mid-Atlantic, with timing depending on the latitude. Following spawning, males may remain in the river or lower estuary until the fall; females typically exit the rivers within 4 to 6 weeks. Juveniles move downstream and inhabit brackish waters for a few months, and when they reach a size of about 30 to 36 inches, they move into near shore coastal waters (NOAA Fisheries, 2013a).

Catches of immature sturgeon (age 1 year and older) suggest that juveniles occupy waters in the Hudson River within the Project area in both summer and fall (NOAA Fisheries, 2013d). Atlantic sturgeon adults are likely to migrate through the proposed crossing area in the spring as they move from oceanic overwintering sites to upstream spawning sites and back to lower reaches of the estuary or oceanic areas in the late spring and early summer. Atlantic sturgeon adults are most likely to occur in the AIM Project area from May through September (NOAA Fisheries, 2013d).

Shortnose Sturgeon

The federally endangered shortnose sturgeon is also state-listed as endangered/critically imperiled in New York (NYNHP, 2013b). Shortnose sturgeon is a large, long-lived benthic-feeding species of anadromous fish. Habitats primarily include slow-moving riverine, estuarine and marine near shore habitats. Shortnose sturgeons are known to occur in the Hudson River from the tip of Manhattan north to the Troy Dam (NOAA Fisheries, 2013d, 2013f).

Shortnose sturgeon travel upriver to spawn (NOAA Fisheries, 2013f). In the Hudson River, adults have been reported throughout the year in both freshwater and upper tidal saline areas. From late spring to early fall, sturgeon typically use the deep channels in fresh and brackish habitats. In late fall, most adults congregate in a single wintering site (Bain et al., 2007), located south of Kingston New York (NOAA Fisheries, 2013d). Each year, spawning begins in late March through mid-April, when water temperatures increase to 8 to 9 degrees Celsius (°C), and usually ends once temperatures reach 12 to 15 °C (NOAA Fisheries, 1998, 2013b). Reproductively active adults begin their upstream migration to the spawning grounds that extend below the federal dam at Troy to about Coeymans, New York (NOAA Fisheries, 2013d).

After spawning, adults quickly disperse, traveling to their summer feeding grounds, which encompass approximately 86 river miles from north of Yonkers to South of Coxsackie, New York (NOAA Fisheries, 2013d.). Juveniles are found typically at the saltwater/freshwater interface, and move back and forth in the low salinity area during the summer. In the Hudson River, juveniles are usually found in channels over silt substrates (NOAA Fisheries, 1998). Age to maturity varies throughout the range, but appears to be at approximately 7 to 10 years to first spawn for females in the Hudson River, with males maturing slightly earlier (NOAA Fisheries, 1998).

Conclusions for Atlantic and Shortnose Sturgeon

NOAA Fisheries indicated that shortnose and Atlantic sturgeon are present in the Hudson River near Algonquin's proposed pipeline crossing location year-round (NOAA Fisheries, 2013d). In a letter dated May 30, 2014, NOAA Fisheries requested Algonquin avoid in water work from October 1 through April 1 of any year to avoid adverse effects on the Atlantic and shortnose sturgeon (NOAA Fisheries, 2013d). Adhering to NOAA Fisheries request, Algonquin would install the Stony Point to Yorktown Take-up and Relay segment across the Hudson River using the HDD method, avoiding any in water work in the Hudson River. The primary environmental concern associated with an HDD is the potential for an inadvertent release of drilling fluids into waterbodies or wetlands during drilling operations. Algonquin has developed a BDP Plan (see appendix J) for monitoring the HDD and responding in the event of an inadvertent release. If an inadvertent release were to occur, the Atlantic and shortnose sturgeon would not be effected since the HDD drilling fluids are believed non-toxic to sturgeon. Additionally, the increase in turbidly associated with an inadvertent release would be temporary, confined to the area of the release due to the rapid settling rate of bentonite, and considered insignificant due to the existing turbidly levels in the Hudson River (NOAA Fisheries, 2014b).

Based on implementation of the HDD method for crossing the Hudson River with the associated BDP Plan and existing turbidity levels in the Hudson, the Project would have *no effect* on the shortnose or Atlantic sturgeon. In a letter dated April 18, 2014, NOAA Fisheries concurred with this determination and consultation for the Atlantic and shortnose sturgeon is complete (NOAA Fisheries, 2014a).

4.7.1.2 Species under FWS Jurisdiction

Piping Plover

The piping plover is a federally listed threatened species that is also state-listed as endangered in New York (NYSDEC, 2014c) and threatened in Massachusetts (MDFW, 2014a) and Connecticut (CTDEEP, 2014a). The piping plover is a shorebird found on coastal beaches in counties where AIM

Project facilities are located, including Plymouth and Bristol Counties in Massachusetts and New Haven County, Connecticut (FWS, 2014a). The AIM Project facilities in these three counties are not located on or near any coastal beaches. As such, we conclude that the Project would have *no effect* on the piping plover.

Roseate Tern

The roseate tern is a federally listed endangered species and is also state-listed as endangered in New York, Massachusetts, and Connecticut (CTDEEP 2013a; FWS, 2014b; MDFW, 2014b; NYSDEC, 2014c). Like the piping plover, the roseate tern is a shorebird found on coastal beaches in counties where AIM Project facilities are located including Plymouth and Bristol Counties in Massachusetts and New Haven County, Connecticut. However, the facilities in these counties would not be located on or near any coastal beaches. Therefore, we conclude that the Project would have *no effect* on the roseate tern.

Puritan Tiger Beetle

The puritan tiger beetle is a federally listed threatened species and Connecticut state-listed endangered species that has been documented within sandy beach habitats along the Connecticut River in the Town of Cromwell, Middlesex County, Connecticut (FWS, 2014c; CTDEEP, 2014b). The closest AIM Project facility to the Connecticut River is the Line-36A Loop Extension located in the Towns of Cromwell and Rocky Hill. The proposed facilities would not be located on sandy beach habitat on the shore of the Connecticut River. Therefore, we conclude that the Project would have *no effect* on the puritan tiger beetle.

Indiana Bat

The Indiana bat is a federally listed endangered species and is also a state-listed endangered species in New York, Connecticut, and Massachusetts. During the winter months, from late October to April, Indiana bats hibernate in caves and abandoned mineshafts. Hibernation can begin as early as September and can extend to late May (NYSDEC, 2013a; Massachusetts Natural Heritage and Endangered Species Program [MNHESP], 2013a). The bats emerge in the spring and travel to summer roost sites and maternity colonies in wooded or semi-wooded habitats (FWS, 2004). Females give birth during this period, typically forming small colonies located in the crevices or under loose bark in large dead or living trees. Roost trees may be in upland areas or floodplain forests and occasionally in man-made structures, such as sheds or bridges (FWS, 2004). Large trees of species such as shagbark hickory and white oak are often preferred roost sites.

Indiana bats have the potential to occur in New York in Rockland, Westchester, and Putnam Counties, and in Connecticut in Fairfield and New Haven Counties. Project pipeline facilities in these counties include the Haverstraw to Stony Point, Stony Point to Yorktown, and the Southeast to MLV 19 Take-up and Relay segments. Aboveground facilities include the existing Stony Point and Southeast Compressor Stations and four existing M&R stations (Guilford, North Haven, Southbury, and Waterbury). The FWS identified a section of the Stony Point to Yorktown Take-up and Relay segment as having the potential to provide suitable summer habitat for the Indiana bat, due to the proximity of an active hibernaculum 12 miles away in Blooming Grove New York (FWS, 2013a). The FWS also indicated that Indiana bats have active hibernacula in New York and the potential to occur throughout the Project area (Algonquin, 2014a).

The FWS identified that wooded areas, open fields and lawns may provide suitable roosting and/or foraging habitat for Indiana bats (FWS, 2013a) and recommended presence/absence surveys if suitable habitat is present in the Project area. If bats are present in suitable summer habitat, tree clearing could potentially kill, injure, or disturb breeding or roosting bats. Indiana bats could also be impacted by the loss of tree habitat or changes to other vegetation if significant amounts of clearing were to occur (FWS, 2013a). To determine if Indiana bats are present within these areas, Algonquin will be conducting surveys of the Project area in the summer of 2014 to identify potential summer roosting habitat (Algonquin, 2014a) for facilities planned for construction in 2015 (Algonquin, 2014b). Algonquin is developing a study plan through consultation with the FWS (Algonquin, 2014c) that employs a combination of mist netting and acoustic surveys in areas identified as potential summer roosting habitat. The mist netting/acoustic survey is ongoing between May 15 and August 15, 2014, as specified by protocol (FWS, 2014d).

Algonquin continues to consult with the FWS to plan surveys and develop and implement appropriate avoidance and mitigation measures including timing restrictions, as necessary, to avoid adverse effects on the Indiana bat within the Project area. We recognize final survey reports would be prepared and submitted to the FWS upon completion of surveys. However, in order to complete our analysis, results of surveys can be filed for our initial review. Given that consultation and surveys for the Indiana Bat are not yet complete and to aid in the development of our revised BA, **we recommend that**:

- **Prior to the end of the draft EIS comment period, Algonquin should file with the Secretary all survey results for the Indiana bat, any avoidance or mitigation measures developed in consultation with the FWS and state agencies, correspondence from the FWS and state agencies confirming the adequacy of the proposed measures, and a statement regarding Algonquin's intention to comply with the recommended measures.**

Bog Turtle

The bog turtle is a federally listed threatened species that is also listed as endangered in New York, Connecticut, and Massachusetts (NYNHP, 2013b; NYSDEC, 2013e; CTDEEP, 2013b; MNHESP, 2013b). 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 hibernate through the winter in a muskrat lodge or burrow, emerging by around mid-April (NYSDEC, 2013e). Bog turtles live in habitats with cool, shallow, slow-moving water, soft muck soils, and tussock-forming herbaceous vegetation. Preferred habitats include wet meadows or open calcareous bogs dominated by sedges or sphagnum moss (NYSDEC, 2013e).

Based on initial information from the FWS and CTDEEP, bog turtles could be present in suitable wetlands along Algonquin's proposed Southeast to MLV 19 Take-up and Relay segment in Putnam County, New York and Fairfield County, Connecticut (Algonquin, 2014a; CTDEEP, 2013d). No potential habitat for bog turtles has been identified at Project facilities in Rhode Island or Massachusetts. Further consultation with the FWS identified historic occurrences of bog turtles in Danbury, Connecticut and known bog turtle habitat within 16 miles of the proposed Project pipeline facilities in New York (Algonquin, 2014a).

To address the potential occurrence of bog turtles in the Project area, Algonquin conducted Phase 1 surveys for the AIM Project facilities in New York, and the Southeast to MLV-19 Take-up and Relay segment and the Southeast Compressor Station in Connecticut during the spring of 2014. Based on Phase 1 survey results, and through consultation with the FWS, Algonquin conducted Phase 2 surveys for seven wetland sites that would be directly affected by the Project. All bog turtle surveys were conducted by a permitted bog turtle surveyor during March, April, and May 2014 corresponding with the prescribed spring/summer survey period. For three additional wetland sites that contained suitable habitat for bog turtles but would not be directly affected by the Project, Algonquin would implement site-specific conservation measures approved by the FWS. These conservation measures include:

- erecting a double layer of heavy duty silt fence around the work area near potential habitat; and
- retaining a qualified herpetologist to clear the work area of any wildlife prior to the start of any earth moving activity.

Based on the summary of Phase 2 survey results for bog turtles that Algonquin filed with FERC, no bog turtles were detected during Phase 2 surveys and the FWS found the conservation measures presented above adequate for avoiding adverse impacts on bog turtles. As such, we conclude that the Project would *not likely adversely affect* the bog turtle.

Northern Red-bellied Cooter

Northern Red-bellied cooter is a federally endangered species that inhabits a small geographic range in Massachusetts (FWS, 2014e). The Middleborough M&R Station is located in the town of Middleborough in Plymouth County where historical records indicate that the northern red-bellied cooter may be present (FWS, 2013a).

Northern red-bellied cooters inhabited ponds, lakes, and other large waterbodies. During their active season they are almost exclusively found in open water habitats (MDFW, 2014c). Northern red-bellied cooters normally nest within 100 yards of their home waterbody, in exposed locations with minimal canopy coverage.

The existing Middleborough M&R Station would undergo modifications as part of the AIM Project. The existing station is surrounded by paved roadways, residential developments, and a closed canopy red-maple swamp. The nearest open waterbody is a small manmade pond located approximately 400 feet to the northwest of the existing station. There is no suitable foraging or nesting habitat for northern red-bellied cooters located within 200 feet of the existing station. All proposed modification work at the Middleborough M&R Station would take place within the existing fence line and developed portion of the site and would not disturb any vegetation as described in section 4.5.4.

Due to the absence of suitable habitat for the northern red-bellied cooter in the areas to be disturbed by the Project, we have determined that the Project would have *no effect* on the northern red-bellied cooter.

Small Whorled Pogonia

Small whorled pogonia is a federally listed threatened species and a New York State-listed endangered species that has been historically recorded in Rockland County, New York (NYSDEC, 2010b; FWS, 2013a). The plant is a small orchid that grows in mature hardwood forests of beech, birch, maple, oak and hickory, preferring acidic soils with thick leaf litter (FWS, 2013b).

Algonquin consulted with the FWS regarding the potential for small whorled pogonia habitat to occur in the AIM Project area in Rockland County, New York and the need for field surveys (Algonquin, 2014a). During a meeting on March 20, 2014, the FWS identified six areas of concern in the Project area. To determine if the small whorled pogonia is present in the proposed construction work area within the six areas of concern, Algonquin conducted botanical surveys between July 1 and 3, 2014, which is a time when the small whorled pogonia is considered easily identifiable. No small whorled pogonia plants were observed during these surveys and only a few suitable microhabitats were observed. Based on our review of Algonquin's survey report that was filed with the FWS and FERC on July 10, 2014, we conclude that the Project would have *no effect* on the small whorled pogonia.

4.7.1.3 Federally Petitioned Species

Although candidate and petitioned species do not receive federal protection through the ESA, the FWS requested that the FERC consider the potential effects on northern long-eared bat and New England cottontail so that section 7 consultations could be facilitated in the event these species become listed before or during Project construction (FWS, 2013a, Algonquin, 2014a, Algonquin, 2014b).

New England Cottontail

New England cottontail is currently a candidate species for listing under the ESA (FWS, 2013c). The New England cottontail prefers early successional forests (e.g. thickets with thick and tangled vegetation) that are generally less than 25 years old.

Algonquin's existing pipeline rights-of-way are maintained in an early vegetative successional state, and may provide suitable shrub habitat for New England cottontails. Information on potential vegetation impacts and mitigation is provided in section 4.5.4. The FWS indicated that the New England cottontail is currently undergoing review for listing by the FWS and has the potential to be present near AIM Project facilities (Algonquin, 2014a). These facilities include the Stony Point to Yorktown Take-up and Relay segment in Westchester County, New York; the Southeast to MLV 19 Take-up and Relay segment in Putnam and Fairfield Counties, Connecticut; and the E-1 System Lateral Take-Up and Relay segment in Connecticut (Algonquin, 2014a). However, the FWS explained that the final rule and list status for New England Cottontail would not likely occur until after the AIM Project completed construction (FWS, 2014f; FWS, 2014g). As such, the FWS indicated that the New England cottontail was not an issue for the Project (FWS, 2014f). The FWS also reviewed photo documentation taken along Algonquin's right-of-way during bog turtle surveys in 2014 and concluded that the habitat in the proposed AIM Project area is not likely suitable for the New England cottontail (FWS, 2014g). Therefore, we conclude that the Project *would not likely jeopardize the continued existence* of the New England cottontail.

Northern Long-eared Bat

The northern long-eared bat is currently proposed for federal listing as an endangered species (FWS, 2013d) and is also a state-listed endangered species in Massachusetts (MDFW, 2014d). The northern long-eared bat was not initially identified by the FWS as rare or a species of concern during consultation in 2013. However, due to rapid and profound declines in Northeast bat populations due to white-nose syndrome, the species was proposed for listing as endangered by the FWS in October 2013 and a final rule is anticipated in 2014 (FWS, 2013a).

During the summer, northern long-eared bats hunt and roost in forests, roosting in stands of dead hardwoods with large vertical cavities (FWS, 2014h; MDFW, 2014d). During the winter months, from late October to April this species returns to historic hibernacula sites. Suitable winter hibernacula for this species includes underground caves and cave-like structures (such as mines or railroad tunnels), typically with large passages and significant cracks and crevices for roosting. Northern long-eared bats typically occupy their summer habitat from early April through mid-September each year.

To determine if northern long-eared bats are present within the Project area, Algonquin will be conducting surveys in potential summer habitat for this species concurrent with surveys for the Indiana bat and through consultation with the FWS for both bat species (see discussion for Indiana Bat above). Specific to the northern long-eared bat, the FWS recommended that Algonquin use the Northern long-eared bat Interim Conference and Planning Guidance document (FWS, 2014i) to guide identification of suitable summer habitat prior to implementing mist netting or acoustic surveys.

If northern long-eared bats are present, tree clearing could potentially kill, injure, or disturb breeding or roosting bats. Northern long-eared bats could also be impacted by the loss of tree habitat if significant amounts of tree clearing were to occur. Algonquin continues to consult with the FWS to assess the potential occurrence of northern long-eared bat in the Project area, plan surveys, and develop and implement appropriate avoidance and mitigation measures. We recognize final survey reports would be prepared and submitted to the FWS upon completion of surveys. However, in order to complete our analysis, results of surveys can be filed for our initial review. Given that consultations and surveys for the northern long-eared bat are not yet complete, **we recommend that:**

- **<u>Prior to the end of the draft EIS comment period</u>, Algonquin should file with the Secretary all survey results for the northern long-eared bat, any avoidance or mitigation measures developed in consultation with the FWS and state agencies, correspondence from these agencies confirming the adequacy of the proposed measures, and a statement regarding Algonquin's intention to comply with the recommended measures.**

4.7.2 Migratory Birds

Migratory birds are species that nest in the United States during the summer and make short or long-distance migrations for the non-breeding season. Neotropical migrant birds migrate south to the tropical regions of Mexico, Central and South America, and the Caribbean for the non-breeding season. Migratory birds are protected under the MBTA (16 USC 703-711). The MBTA, as amended, prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, or nests unless authorized under a FWS permit. 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 MBTA MOU that focuses on avoiding or minimizing adverse impacts on migratory birds and strengthening migratory bird conservation through enhanced collaboration between the two agencies. This voluntary MBTA MOU does not waive legal requirements under the MBTA, BGEPA, ESA, Federal Power Act, NGA, or any other statutes and does not authorize the take of migratory birds.

To assist in our review of the AIM Project, Algonquin provided the Commission with the FWS list of Birds of Conservation Concern (BCC) for the Bird Conservation Regions (BCR) where AIM Project facilities would be located, including the Appalachian Mountains (BCR 28) and New England/Mid-Atlantic Coast (BCR 30), as published by the FWS. In this list Algonquin also included the Atlantic Northern Forest BCR (14) as referenced by the FWS (FWS, 2013a). This table identifies 127 species occurring in BCRs 30 and 28 where AIM Project facilities would be located, including 89 species that breed in these BCRs. All of the migratory BCCs and other sensitive bird species that occur in BCRs

14, 28, and 30 are listed in table O-1 in appendix O. See section 4.7.1 for discussion of potential effects on migratory birds that are also federally listed as threatened or endangered.

The potential impact of the Project on migratory birds, including BCC-listed birds, would include the temporary and permanent loss of habitat associated with the removal of existing vegetation during construction (see section 4.5.4). Noise and other construction activities could potentially affect foraging and breeding activities of birds in nearby areas, or temporarily displace birds into adjacent habitats. Construction activities that occur during the nesting season for migratory birds (generally April 1 to August 31) could result in abandonment or destruction of nests and mortality of eggs and young birds that have not yet fledged. Migratory birds could also be affected by operation and maintenance of the new facilities, which would permanently convert approximately 27.9 acres of upland forest to an herbaceous state. Potential effects would include a reduction in available forest habitat associated with the conversion of forested land to open land on the permanent right-of-way possibly resulting in increased competition, a potential increase in parasitic bird species, edge effects, and ongoing disturbances associated with periodic mowing and other right-of-way maintenance activities. The FWS expressed specific concern regarding impacts on forest-interior birds and their habitats due to fragmentation (FWS, 2013a).

The Haverstraw to Stony Point Take-up and Relay segment would run adjacent to and across a section of the Harriman and Sterling Forests IBA in Rockland County, New York (Audubon, 2014). About 15.3 acres of forested land would be affected by this segment. The Harriman and Sterling Forests IBA is a 63,800-acre area that is part of the Hudson Highlands (see section 4.6.1.2 for discussion of the Hudson Highlands). This IBA is 90 percent forest, including Appalachian oak-pine, deciduous wetland, evergreen northern hardwood, oak, and sugar maple mesic forests (Burger and Liner, 2005). This diverse, forested area supports a healthy representative breeding community of forest birds including state-listed species of concern including the sharp-shinned hawk, Coopers hawk, northern goshawk, red-shouldered hawk, golden-winged warbler, and cerulean warbler (Burger and Liner, 2005; NYSDEC, 2014c). Tree removal and construction associated disturbance in the area of the IBA could potentially harm or disturb these birds during their breeding season.

The Stony Point to Yorktown Take-up and Relay segment would involve 70.7 acres of tree clearing and diverges from Algonquin's existing rights-of-way where it would cross the Hudson River and the associated Lower Hudson River IBA in Rockland and Westchester Counties, New York (Audubon, 2014). The Lower Hudson River IBA is a 28,000-acre area that extends from just north of the Newburgh-beacon Bridge and south to, and including, Croton Point Park (Burger and Liner, 2005). This area also includes surrounding upland areas that are important winter roost sites for state-listed threatened bald eagle (NYSDEC, 2014c). The Lower Hudson River IBA is one of the most critical wintering bald eagle sites in New York and is becoming an important breeding area (Burger and Liner, 2005). In addition to bald eagles, Croton Park also supports wintering and breeding grassland birds including the state-listed endangered short-eared owl, threatened northern harrier and Henslow's sparrow, and special concern grassland sparrow and vesper sparrow (Burger and Liner, 2005; NYSDEC, 2014c). The proposed pipeline crossing of the Hudson River is approximately 6 miles north of Croton Point Park. As such, the Project would not disturb this park or the park's resident birds. Potential effects to bald eagles for the area of the Lower Hudson River IBA crossed by the Project are discussed in section 4.7.3.

The Project has been designed to minimize potential impacts on migratory birds and Algonquin would take other measures during Project construction and operation to limit migratory bird impacts. 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 Algonquin's E&SCP during construction of the Project facilities; and
- limiting routine right-of-way maintenance clearing and prohibiting clearing during the migratory bird nesting season (April 15 to August 1).

In addition to the measures presented above, Algonquin commits to conducting surveys prior to clearing along the 5.1-mile West Roxbury Lateral in Massachusetts. Excluding the proposed West Roxbury Lateral, 94 percent of the proposed pipeline facilities are located within existing pipeline corridors, and other utility rights-of-way. Thus, tree-clearing activities would be limited in scope and spread over the entire Project area. We find that these measures would minimize the effects of the Project on BCCs and other migratory birds. The FWS is still reviewing the AIM Project for migratory bird impacts. Therefore, **we recommend that:**

- **<u>Prior to the end of the draft EIS comment period</u>, Algonquin should file with the Secretary any updated consultations with the New York and New England Field Offices of the FWS regarding migratory birds, including any avoidance or mitigation measures developed with these field offices.**

4.7.3 Bald Eagles

Although the bald eagle was removed from the federal list of threatened and endangered species by the FWS on July 9, 2007 (FWS, 2007a), bald and golden eagles are still protected under the BGEPA (16 USC 668-668d), which prohibits the taking of eagles, their eggs, or their nests. Bald eagles are also state-listed as threatened in all states crossed by the Project. Bald eagles forage primarily for fish in large bodies of waters such as lakes, rivers, and coastal areas. Large nests are built near the tops of tall trees, or occasionally on cliffs, often overlooking open water (FWS, 2014j). During the summer, the eagle pairs defend territories that may include the active nest along with one or more alternate nests (FWS, 2007a). Wintering habitat consists of areas of ice-free open water with nearby foraging perches (FWS, 2014j).

According to information published by the FWS New York Field Office (FWS, 2013e) bald eagles occur in portions of Rockland and Westchester Counties in New York. As previously mentioned, the Lower Hudson River IBA located in these counties is an important wintering and breeding area for bald eagles in New York State (Burger and Liner, 2005; NYSDEC, 2014c) and the NYSDEC identified the area in and around the Hudson River as their main area of concern for the Project (NYSDEC, 2013b). Wintering roost locations occur in and around the proposed crossing location of the Stony Point to Yorktown Take-up and Relay including (but not strictly limited to) Bear Mountain, the Hudson River shoreline, Lake Meahagh, and Iona Island.

To assess and address potential Project impacts on bald eagles, the NYSDEC recommends adherence to the FWS' 2007 *National Bald Eagle Management Guidelines* (FWS, 2007b). The NYSDEC stated that, generally avoiding Project activities during the wintering period (December 1st to March 31st) is sufficient to avoid impacts on wintering bald eagles (Algonquin, 2014a). Also, the NYSDEC asked that any Project-related blasting be reviewed for potential impacts in areas indicated for bald eagle (i.e., in and around the Hudson River). A meeting between Algonquin and the FWS on January 23, 2014, addressed the potential for bald eagle nests to be present near the Hudson River crossing (Algonquin, 2014a). The FWS' primary concern was noise mitigation and proximity of work to active nesting sites.

Algonquin conducted bald eagle surveys for the Hudson River crossing area in March and April 2014 to assess winter roosting activity and to investigate the presence of bald eagle nests (Algonquin, 2014c). During the surveys conducted in March, adult and immature bald eagles were observed flying, foraging from ice flows, and perching along the shorelines and hillsides of the Hudson River. These eagles were not observed during the April survey and are considered wintering eagles. No bald eagle nests were observed in the Project area or within 0.5 mile of the Project. The closest active nest to the Project is located more than 6,000 feet south of the proposed crossing location.

Algonquin continues to consult with the FWS and NYSDEC to discuss survey results, and develop and implement appropriate avoidance and mitigation measures, including timing restrictions, as necessary, to avoid impacts on bald eagles both nesting and wintering within the Project area. Given that consultation for bald eagles is not yet complete, **we recommend that:**

- **<u>Prior to the end of the draft EIS comment period</u>, Algonquin should file with the Secretary any updated consultations with the FWS and NYSDEC regarding bald eagles, including any avoidance or mitigation measures developed with these agencies.**

4.7.4 Marine Mammals

Marine mammals are federally protected under the MMPA, which prohibits the taking of these species except under certain circumstances (NOAA, 2014a). Common marine mammals, such as harbor seals (*Phoca vitulina)*, are found in the New York Bight. Federally listed species including cetacean species, such as humpback whale (*Megaptera noveangliae*), have been reported at times in New York Harbor (FWS, 1997) and are theoretically possible within deeper portions of the Hudson River estuary. The Harbor porpoise (*Phocoena phocoena*) is listed as a species of special concern in New York and has historically been an occasional visitor (FWS, 1997) in the Hudson River estuary. Records of any cetaceans in the estuary are rare and generally thought to represent individuals that are unhealthy or lost (FWS, 1997).

We have reviewed the information provided by Algonquin, conducted our own research, and consulted with NOAA Fisheries. Through consultation with NOAA Fisheries, we have concluded that the Project would have *no effect* on marine mammals because they are not anticipated to occur within the Project area of the Hudson River. Additionally, Algonquin would also cross the Hudson River using the HDD method with no associated in-water work proposed. Since no in-water work would occur, the Project would avoid impacts on any rare marine mammals present in the Hudson River during construction. NOAA Fisheries concurred with this determination and consultation regarding marine mammals is complete (NOAA Fisheries, 2014a).

4.7.5 State-listed Species

New York, Connecticut, Rhode Island, and Massachusetts have all passed laws to protect state-listed species. The overall goal of each of the state endangered species laws is to conserve, protect, restore, and enhance any threatened or endangered species and their essential habitat. The state-specific regulations are as follows:

- the New York ESA (New York Environmental Conservation Law § 11-0535 and 6 New York Code of Rules and Regulations [NYCRR] Part 182);
- the Connecticut ESA (Connecticut General Statutes Chapter 495);
- the Rhode Island ESA (Rhode Island Title 20. Fish and Wildlife. Chapter 37. Endangered Species of Animals and Plants); and
- the Massachusetts ESA (Massachusetts General Law section 131A).

To determine if state-listed species or their habitats are known or have the potential to occur within the AIM Project area, Algonquin consulted with the NYNHP, NYSDEC, CTDEEP, Connecticut Natural Diversity Data Base, RIDEM, RINHP, MDFW, and MNHESP.

Through consultation with the state agencies, 29 state-listed threatened, endangered, or special concern species were identified as potentially occurring in the New York and Connecticut sections of the Project area. Eight species are also afforded federal protection including seven federally listed threatened and endangered species discussed above in section 4.7.1 and the bald eagle discussed above in section 4.7.3. No state-listed species were identified as a concern for the Project in Rhode Island and Massachusetts. A discussion of agency consultation, survey results, and proposed mitigation for the remaining 21 species potentially occurring in the Project area are provided below and summarized in table 4.7.5-1.

In general, impacts on state-listed species would typically be similar to those described for other plant and animal species in sections 4.5 and 4.6. Species-specific discussions of potential Project impacts for each state are presented below.

4.7.5.1 New York

In addition to the federally listed species discussed in section 4.7.1 and the bald eagle discussed in section 4.7.3, the following is a discussion of state-listed species that may occur near AIM Project facilities in New York (NYSDEC, 2013b).

Least Bittern

The least bittern is a state threatened species that typically inhabits fresh or brackish emergent marsh and/or shallow pond habitats (NYNHP, 2013f). Least bitterns have been documented in Rockland and Westchester Counties. The NYSDEC reviewed the Project and reported that there were no records of least bittern within 0.5 mile of the proposed facilities, and, as such, they have no concerns related to this species (NYSDEC, 2013b). We conclude that the least bittern would not be affected by the Project.

TABLE 4.7.5-1

State-Listed Species Potentially Occurring Within the Vicinity of the AIM Project

Species	State Status[a]	Habitat	Project Component	Field Survey Results	Seasonal Timing Restrictions and Proposed Mitigation
New York					
Least bittern (*Ixobrychus exilis*)	T	Fresh or brackish emergent marsh and/or shallow pond habitats.	None. No records within 0.5 mile of AIM Project facilities	None	None; no impact
Timber rattlesnake (*Crotalus horridus*)	T	Deciduous forests in rugged terrain.	Stony Point to Yorktown Take-up and Relay	Habitat survey not complete	Survey sweeps; on-site monitor; temporary barriers; and education.
Connecticut					
American bittern (*Botaurus lentiginosus*)	E	Freshwater wetlands and occasionally coastal salt marshes.	Pomfret M&R Station	None	None; no impact
American kestrel (*Falco sparverius*)	T	Open habitats with nesting cavities and hunting perches.	Pomfret M&R Station	None	Pending consultation
Pied-billed grebe (*Podilymbus podiceps*)	E	Freshwater to brackish seasonal and permanent ponds with dense stands of deep water emergent vegetation.	Pomfret M&R Station	None	None; no impact
Savannah Sparrow (*Passerculus sandwichensis*)	SC	Open areas with low vegetation, including most of northern North America, from tundra to grassland, marsh, and farmland.	Pomfret M&R Station	None	Pending consultation
Red bat (*Lasiurus borealis*)	SC	Deciduous forest habitat.	Pomfret M&R Station	None	Pending consultation
Eastern cougar (*Puma concolor cougar*)	SC	Presumed to be extirpated.	None; presumed extirpated	None	None-no impact
Eastern box turtle (*Terrapene carolina carolina*)	SC	Deciduous woodlands and overgrown old fields where turtles have ample cover and sunlight and wetlands.	Line-36A Loop Extension, Cromwell Compressor Station, Middletown M&R Station, and North Haven M&R Station	Survey not complete	Pending survey results and consultation
Eastern hognose snake (*Heterodon platirhinos*)	SC	Open, sandy woodlands and extensive glacial sand deposits.	E-1 System Lateral Take-up and Relay	Surveys planned prior to construction	Surveys prior to and during clearing and grading activities; periodic inspections of the work area after the clearing and grading; educate construction staff
Ground beetle (*Scaphinotus viduus*)	SC	Older growth mature floodplain forests.	Line-36A Loop Extension, Cromwell Compressor Station, and Middletown M&R Station	None	Pending further consultation

TABLE 4.7.5-1 (cont'd)

State-Listed Species Potentially Occurring within the Vicinity of the AIM Project

Species	State Status[a]	Habitat	Project Component	Filed Survey Results	Seasonal Timing Restrictions and Proposed Mitigation
Pine barrens tiger beetle (*Cicindela formosa generosa*)	SC	Blowouts and sand plains of dry -xeric, loose shifting sand, without water and that are sparsely vegetated, such as pine barrens.	Line-36A Loop Extension	None	Pending further consultation
Jefferson salamander 'complex' (*Ambystoma jeffersonianum*)	SC	Breeds in vernal pools and requires extensive tracts of forest surrounding these pools to survive.	Southeast to MLV 19 Take-up and Relay	One vernal pool is located outside of the temporary workspace for the Project	Pending further consultation
Climbing fern (*Lygodium palmatum*)	SC	Grows in moist, open woods or thickets with acidic soil.	Line-36A Loop Extension and Cromwell Compressor Station	Botanical surveys not complete	Pending survey results and consultation
Collins' sedge (*Carex collinsii*)	SC	Presumed to be extirpated.	Line-36A Loop Extension and Cromwell Compressor Station	Botanical surveys not complete	Pending survey results and consultation
Field paspalum (*Paspalum laeve*)	E	Perennial grass found in damp meadows, fields, mowed roadsides, mowed grounds, and lawns.	Line-36A Loop Extension and Cromwell Compressor Station	Botanical surveys not complete	Pending survey results and consultation
Hard-stemmed bulrush (*Schoenoplectus acutus*)	T	Grows in wetlands, and can be found in the shallow water along the edges of lakes or ponds	Southeast to MLV 19 Take-up and Relay	Botanical surveys not complete	Pending survey results and consultation
Three-leaved false Solomon's seal (*Maianthemum trifolium*)	T	Found in cool bogs and wetlands with peat soils	Line-36A Loop Extension and Cromwell Compressor Station	Botanical surveys not complete	Pending survey results and consultation
Threadfoot (*Podostemum ceratophyllum*)	SC	Found on rocks in rapids, fast-moving streams, headwater streams and other high-energy stream systems.	E-1 System Lateral Take-up and Relay	Botanical surveys not complete	Pending survey results and consultation
Twinflower (*Linnaea borealis spp. Americana*)	E	Inhabits cool wetlands and swamps.	Line-36A Loop Extension and Cromwell Compressor Station	Botanical surveys not complete	Pending survey results and consultation
Yellow fringed orchid (*Platanthera ciliaris*)	T	Inhabits open mat of Sphagnum bogs.	Line-36A Loop Extension and Cromwell Compressor Station	Botanical surveys not complete	Pending survey results and consultation

[a] (E) Endangered; (T) Threatened; (SC) Special Concern

Timber Rattlesnake

The Timber rattlesnake is a state-listed threatened species that inhabits deciduous forests in rugged terrain. According to the NYSDEC, timber rattlesnakes are known to occur along the Stony Point to Yorktown Take-up and Relay segment from approximately MPs 0.7 (Franck Road) to 2.9 (Route 202/9W) in the Town of Stony Point (NYSDEC, 2013b). The NYSDEC's primary concerns are the Franck Road TAR installation (TAR-1.1), possible laydown yards, and the proposed timing of grading activities. Impacts on the timber rattlesnake could include alteration of forested habitat and direct impacts including mortality if individuals are struck by construction vehicles or if occupied dens are crushed or excavated.

The NYSDEC has requested Algonquin assess the construction work areas in Rockland County for potential habitat (NYSDEC, 2014c). Additionally, the NYSDEC provided a list of potential BMPs that may be used to avoid or minimize Project-related impacts, but noted that not all the methods are appropriate for all projects, and should be considered where appropriate (NYSDEC, 2013b). These BMPs include the following:

Seasonal Restrictions

All allowable disturbance activities, including movement of construction vehicles, excavation, and alteration of vegetation, should be conducted during the period when the snakes would be expected to be hibernating and are less likely to be directly impacted by aboveground disturbances. This acceptable work period is November 1 through March 31.

Habitat management (including timber harvesting) and trail maintenance activities should also be timed to minimize the potential for injury/death to snakes. Habitats that are actively managed (e.g. mowing and prescribed burning) and trail edges that are cleared using a brush hog may increase mortality as snakes are killed by machinery or incinerated by fire.

In addition to the seasonal restrictions applied to all vegetation management practices, disturbance to non-transient habitats should be avoided at all times. Roads, skid trails, and landings should be kept within at least 330 feet from all known or potentially suitable basking and gestating habitats, and to minimize the potential for collapse or disturbance of dens, heavy equipment and site preparation work (e.g., disk-harrowing, shearing, root raking) should be prohibited within 660 feet of any known hibernacula.

Timber Rattlesnake Monitor

If any Project-related work is to occur (in whole or in part) during April 1 through October 31, the project sponsor should retain the services of a snake monitor. The snake monitor must be a qualified biologist that has knowledge of timber rattlesnake ecology and relocation procedures. The monitor should be on site during all construction activities and would be responsible for: 1) conducting reconnaissance surveys for timber rattlesnakes within the work area prior to the initiation of any disturbance activities, and 2) relocating snakes as required.

Temporary Barrier

When disturbance is likely to occur from actions occurring outside of the acceptable work period, a temporary restrictive barrier may help to avoid impacts if installed around the perimeter of the disturbance footprint of small projects (less than 1 acre). The barrier should be:

1. installed before the end of the acceptable work period and maintained until the end of the construction phase of the Project or until the beginning of the next acceptable work period, whichever occurs first;

2. inspected daily and, if necessary, repaired immediately to a fully functional condition; and

3. constructed in accordance with NYSDEC-approved design specifications.

The effectiveness of the barrier is diminished and snakes may be able to gain access to the disturbance area if debris (e.g., tree limbs, soil) is allowed to overtop or pile up alongside the barrier.

Education

The NYSDEC reports that persecution by humans is a significant source of timber rattlesnake mortality and is thought to be a major contributing factor to the population decline experienced by the species over the past 100 years. Misconceptions about the actual verses perceived threat posed by timber rattlesnakes often leads to the snakes being injured or killed by humans who, when encountering a timber rattlesnake, are fearful of being attacked. Given this, the NYSDEC supports efforts to educate residents located near known den sites to help identify timber rattlesnakes and accurately describe the snakes' non-aggressive behavior.

Summary and Conclusion for the Timber Rattlesnake

Given the complex construction schedule that includes pipeline outages, Algonquin would not be able to adhere to the NYSDEC's recommended seasonal restrictions for timber rattlesnakes. Therefore, Algonquin would, at a minimum, implement the following measures to minimize potential impacts on timber rattlesnakes during construction.

- Algonquin would conduct pre-construction survey sweeps of the Stony Point to Yorktown Take-up and Relay segment, with particular emphasis on the pipeline segment from approximately MPs 0.7 to 2.9 using an experienced, New York-licensed rattlesnake monitor.

- The monitor would be on site during all construction related activities, would conduct reconnaissance surveys for timber rattlesnakes prior to the initiation of any disturbance activities, and relocate any rattlesnakes encountered.

- Temporary barriers would be used when applicable, likely to isolate equipment storage yards.

- Construction staff would be educated about the presence of timber rattlesnakes, and provided with contact numbers to call if a timber rattlesnake is encountered.

Algonquin continues to consult with the NYSDEC to identify potential existing habitat in construction work areas in Rockland County and determine the proper mitigation measures to address the agency's concerns about timber rattlesnakes and their habitat. Given that surveys for potential habitat and consultation regarding the timber rattlesnake are not complete, **we recommend that:**

- **Prior to construction in New York, Algonquin should file with the Secretary all survey results for timber rattlesnake habitat, permit requirements, and avoidance or mitigation measures developed in consultation with the FWS and NYSDEC, and documentation of its correspondence with these agencies regarding the proposed measures.**

4.7.5.2 Connecticut

In addition to the federally listed species discussed in section 4.7.1, the CTDEEP has identified the potential for the presence of state-listed species near AIM Project facilities (CTDEEP, 2013d). Algonquin is in the process of preparing a conservation plan that discusses each of the species identified by the CTDEEP, addresses potential impacts and, if necessary, avoidance, minimization, and mitigation measures. The information presented in the conservation plan will include the results of the wildlife and botanical surveys listed in this section. A discussion of each of the identified species is presented below.

State-listed Wildlife Species in Connecticut

American Bittern

The American bittern is listed as a state endangered species (CTDEEP, 2013b) and is found in interior freshwater wetlands. The American bittern has been documented in Windham County (CTDEEP, 2013d), which is where Algonquin's existing Pomfret M&R Station is located. No habitat for American bittern occurs near the M&R station site and none would be affected by the proposed station modifications, which would take place within the existing fence line of the Pomfret M&R Station site. Based on the absence of suitable habitat, the Project would not affect this species.

American Kestrel

The American kestrel is listed as a state threatened species (CTDEEP, 2013b), which is found in open grassy or shrubby areas with short vegetation in which to hunt for their prey. In Connecticut, American kestrels are usually observed near open roadsides and agricultural areas, airports, large parks, and power line rights-of-way. American kestrels also occur in urban and suburban areas and will use manmade structures (e.g. buildings, barns, silos, cornices, etc.) for nest sites.

American kestrels have been documented in Windham County (CTDEEP, 2013d) where Algonquin's existing Pomfret M&R Station is located. While potential habitat for the American kestrel occurs near this site, the proposed station modifications would take place within the existing fence line of the Pomfret M&R Station site.

We have concluded the Project would not significantly affect this species. However, because suitable habitat for the species occurs near the M&R station site, and the activity associated with modifications at the M&R station site could potentially disturb nesting American kestrels near the existing M&R station we are recommending that Algonquin continue to consult with the CTDEEP to ensure agency concerns for state-listed species, including the American kestrel, are met and addressed as needed in Algonquin's conservation plan for the Project (see below).

Pied-billed Grebe

The pied-billed grebe is listed as a state endangered species (CTDEEP, 2013b). Pied-billed grebes breed on freshwater to brackish seasonal and permanent ponds and require dense stands of deep water emergent vegetation (e.g. cattails) for nesting and cover that are situated close to open water for foraging (CTDEEP, 2013i; NYSDEC, 2013g).

Pied-billed grebes have been documented in Windham County (CTDEEP, 2013d). Algonquin's existing Pomfret M&R Station is located within this county; however, habitat for the pied-billed grebe does not occur near this site. The proposed station modifications would take place within the existing fence line of the Pomfret M&R Station site. Based on the absence of suitable habitat, the Project would not affect the pied-billed grebe.

Savannah Sparrow

The savannah sparrow is listed as a state species of special concern (CTDEEP, 2013b). Savannah sparrows breed in open areas with low vegetation (Cornell Lab of Ornithology, 2013). Savannah sparrows have been documented in Windham County (CTDEEP, 2013d) where Algonquin's existing Pomfret M&R Station is located. While potential habitat for the savannah sparrow occurs near this site, the proposed station modifications would take place within the existing fence line of the Pomfret M&R Station site and land disturbance would be minimal. We have concluded the Project would not affect this species. However, since suitable habitat for this species occurs near the Project, we are recommending that Algonquin continue to consult with the CTDEEP to ensure agency concerns for state-listed species, including the savannah sparrow, are met and addressed as needed in Algonquin's conservation plan for the Project (see below).

Red Bat

The red bat is listed as a state species of special concern (CTDEEP, 2013b). Red bats are typically forest dwellers, and generally prefer a deciduous forest biome. During the day it roosts in trees, often roosting in dense foliage or occasionally moss (CTDEEP, 2013j; University of Connecticut, 2013).

Red bats have been documented in Windham County (CTDEEP, 2013d) where Algonquin's existing Pomfret M&R Station is located. While potential habitat for the red bat occurs near this site, the proposed station modifications would take place within the existing fence line of the Pomfret M&R Station site and land disturbance would be minimal. We have concluded the Project would not affect this species. However, since suitable habitat for this species occurs near the Project, we are recommending that Algonquin continue to consult with the CTDEEP to ensure agency concerns for state-listed species, including the red bat, are met and addressed as needed in Algonquin's conservation plan for the Project (see below).

Eastern Cougar

The eastern cougar is listed as a state species of special concern and is presumed to be extirpated from Connecticut (CTDEEP, 2013b, 2013d). Eastern cougars utilize a wide range of habitats including tidal marshes, deserts, mountainous terrain and deciduous, coniferous, and tropical forests (NYSDEC, 2013f).

Given that eastern cougars are presumed extirpated from the state, the Project would not affect this species. Should an unexpected eastern cougar be observed during construction of the AIM Project facilities in Connecticut, Algonquin would notify the CTDEEP and ensure the animal not be disturbed by construction activity.

Eastern Box Turtle

The eastern box turtle is listed as a special concern species in Connecticut (CTDEEP, 2013b, 2013e). This terrestrial turtle is found in a variety of habitats, including woodlands, field edges, thickets, marshes, bogs, and stream banks, but typically prefer well-drained forest bottomlands and open deciduous forests. They will use wetland areas at various times during the season. Eastern box turtles overwinter in low-lying wooded wetlands where they burrow into the forest floor to hibernate.

The CTDEEP recommended that work be conducted in box turtle habitat during the winter dormancy period of October through March (CTDEEP, 2013d). If this timetable cannot be met, and work must be conducted when box turtles are active, the following conservation measures have been provided by the CTDEEP for those sites that are determined to provide habitat for box turtles (CTDEEP, 2013d):

- silt fencing should be installed around the work area prior to construction;
- after silt fencing is installed and prior to construction, a sweep of the work area should be conducted to look for turtles;
- workers should be apprised of the possible presence of turtles, and provided a description of the species;
- any turtles that are discovered should be moved, unharmed, to an area immediately outside of the fenced area, and positioned in the same direction that it was walking;
- no vehicles or heavy machinery should be parked in any turtle habitat;
- work conducted during early morning and evening hours should occur with special care not to harm basking or foraging individuals; and
- all silt fencing should be removed after work is completed and soils are stable so that reptile and amphibian movement between uplands and wetlands is not restricted.

The CTDEEP identified the eastern box turtle as having the potential to occur along the Line-36A Loop Extension, the existing Cromwell Compressor Station, the existing Middletown M&R Station, and the North Haven M&R Station (CTDEEP, 2013d).

The North Haven M&R Station property in New Haven, Connecticut consists of a paved yard and gravel lot surrounded by a chain link fence. The station is bordered on the north side by a forested wetland community. The proposed upgrades to the facility and the temporary workspace would all occur within the existing fenced metering station. No impacts on box turtles are expected at this site.

The Middletown M&R Station property in Middlesex, Connecticut is maintained as a mowed lawn, with a gravel pad inside a high chain link fence surrounding the existing facility. The station is bordered on the southern side by a deciduous upland forest community. No wetlands were found within 100 feet of the metering station property. The proposed upgrades to this facility are to occur within the existing fenced metering station, with ATWS situated on the surrounding lawn to be used for equipment staging and vehicle parking.

Algonquin's proposed construction schedule for the Middletown M&R Station extends through the box turtles active period from April to October 2015. To mitigate for box turtles, the entire work area would be surrounded by a silt fence to act as a turtle exclusion barrier. The area inside the fence would be searched by a qualified biologist to locate any turtles present; if any are found, they would be moved to the forested upland area south of the station. Contractors would be appraised of the turtle's possible presence, and any turtles discovered inside the established silt fence we be relocated outside the barrier. Upon completion of the M&R station upgrades, the fence would be removed and the area returned to its original condition.

The Line-36A Loop Extension is a 2-mile-long segment of existing pipeline right-of-way that crosses four wetland communities. These wetlands, and their adjacent uplands, have the potential to provide suitable habitat for eastern box turtles. In addition, the existing Cromwell Compressor Station site is located along the eastern end of the Cromwell Line-36A Loop and shares the same upland and wetland communities as the pipeline segment right-of-way.

Algonquin's proposed construction schedule for these Cromwell facilities extends through the box turtles active period from April to October 2015. Due to the linear nature of the Line 36-A Loop Extension, and constant advancement of crews down the pipeline right-of-way, turtle exclusion barriers are not practical in this application. To minimize possible impacts on box turtles at these facilities, Algonquin would retain the services of a qualified biologist to survey the work sites for box turtles prior to when active construction was to occur, with particular emphasis on clearing and grading activities. The biologist would inspect the workspace staging areas and any open pipeline trenches to locate box turtles. The biologist would also clear access roads before heavy machinery was moved down the right-of-way, and would relocate any turtles to areas outside the workspace. Construction staff working at these facilities would be provided with a description and photos of the species, along with contact numbers to call if a box turtle was encountered. The Cromwell Compressor Station would be surrounded by a turtle exclusion fence, and this area would be inspected each day by the qualified biologist to relocate any box turtles discovered.

Since Algonquin would be implementing mitigation measures to avoid or minimize impacts on the eastern box turtle, we have concluded that the Project would not significantly affect this species. However, since all mitigation measures presented by the CTDEEP cannot be implemented for all Project components where the box turtle has the potential to occur, we are recommending that Algonquin continue to consult with the CTDEEP to ensure agency concerns for state-listed species, including this species, are met and addressed as needed in Algonquin's conservation plan for the Project (see below).

<u>Eastern Hognose Snake</u>

The eastern hognose snake is listed as a state species of special concern (CTDEEP, 2013b). The eastern hognose snake's center of distribution in Connecticut is the extensive glacial sand and gravel deposits that span the central portions of the eastern and western hills (CTDEEP, 2013l). According to the CTDEEP, the eastern hognose snake has the potential to occur along the E-1 System Lateral Take-up and Relay segment in New London County (CTDEEP, 2013d).

To minimize possible impacts on eastern hognose snakes along the E-1 System Lateral Take-up and Relay segment, Algonquin would retain the services of a qualified biologist to conduct surveys of the Project area during clearing and grading activities, and conduct periodic inspections of the work area after the clearing and grading construction phases. Additionally, construction staff working at this facility would be provided with a description and photos of the species, along with contact numbers to call if a hognose snake was encountered.

Since Algonquin would be implementing mitigation measures to avoid or minimize impacts on the eastern hognose snake, we have concluded that the Project would not significantly affect this species. However, since suitable habitat for the species occurs near the Project, and the activity associated with the E-1 System Lateral Take-up and Relay could potentially destroy eastern hog-nosed snakes in the work area, we are recommending that Algonquin continue to consult with the CTDEEP to ensure agency concerns for state-listed species, including this species, are met and addressed as needed in Algonquin's conservation plan for the Project (see below).

Ground Beetle

The ground beetle (*Scaphinotus viduus*) is listed as a state species of special concern. It occurs in older growth mature floodplain forests where it is most often found under rocks, logs, leaf piles, and other decaying organic debris.

According to the CTDEEP, ground beetles have the potential to occur along the Line-36A Loop Extension segment and near the existing Cromwell Compressor Station and existing Middletown M&R Station located in Middlesex County (CTDEEP, 2013d). Because older growth mature floodplain forests would not be affected during the construction or modification of the facilities listed above, we have concluded that the Project would not affect this species. However, Algonquin indicated that additional information would be provided in the conservation plan being prepared for the CTDEEP. As such, we are recommending that Algonquin continue to consult with the CTDEEP to ensure agency concerns for state-listed species, including the ground beetle, are met and addressed as needed in Algonquin's conservation plan for the Project (see below).

Pine Barrens Tiger Beetle

The Pine Barrens tiger beetle is listed as a state species of special concern (CTDEEP, 2013b) that occupies sparsely vegetated blowouts and sand plains of dry-xeric, loose shifting sand. Pine Barrens tiger beetle has the potential to occur along the Line-36A Loop Extension in Middlesex County (CTDEEP, 2013d). While no Pine Barrens or similar habitats occur near this pipeline segment, an old sand quarry is located adjacent to the westernmost 2,500 feet of pipeline corridor, and could provide suitable habitat for this species. Since potentially suitable habitat for the species occurs near the Project area and the Project may affect this species, we are recommending that Algonquin continue to consult with the CTDEEP to ensure agency concerns for state-listed species, including the Pine Barrens tiger beetle, are met and addressed as needed in Algonquin's conservation plan for the Project (see below).

Jefferson Salamander "Complex"

Jefferson salamander "complex" is listed as a state species of special concern (CTDEEP, 2013b). It occurs west of the Connecticut River where it is localized in the upland areas of Litchfield County and northern Fairfield County. This salamander is very sensitive to habitat disturbance and fragmentation and is undergoing a range-wide decline. It breeds in vernal pools and requires extensive tracts of forest surrounding these pools to survive. Populations in Fairfield, New Haven, and Hartford Counties have been severely reduced and stressed by habitat fragmentation (CTDEEP, 2013m).

Jefferson salamander "complex" has the potential to occur along the Southeast to MLV 19 Take-up and Relay segment and near the existing West Danbury M&R Station site in Fairfield County (CTDEEP, 2013d). No impacts on Jefferson salamander "complex" or its habitat are anticipated as a result of the proposed modification work that would take place within the existing fence line of the West

Danbury M&R Station site. Algonquin conducted vernal pool surveys in April 2013 and identified one vernal pool along the Southeast to MLV 19 Take-up and Relay segment. This feature is on the edge of the temporary workspace and would not be disturbed during construction.

We have concluded that the AIM Project would not significantly affect the Jefferson salamander "complex" or its habitat because the Project would not disturb breeding habitat for this species along the Southeast to MLV 19 Take-up and Relay segment and no suitable habitat is present within the fenced existing West Danbury M&R Station site in Fairfield Middlesex County. However, because a vernal pool has been identified near the proposed temporary workspace and these salamanders may travel between vernal pools and adjacent forested areas, we are recommending that Algonquin continue to consult with the CTDEEP to ensure agency concerns for state-listed species, including the Jefferson salamander "complex," are met and addressed as needed in Algonquin's conservation plan for the Project (see below).

State-listed Plant Species in Connecticut

The CTDEEP identified eight plant species of concern with the potential to occur within the area of impact of four separate proposed Project facilities (CTDEEP, 2013d). These four facilities and the potential rare plant species can be grouped into three distinct areas: the Cromwell facilities (consisting of the Cromwell Compressor Station and associated Line-36A Loop Extension), the Southeast to MLV-19 Take-up and Relay, and the E-1 System lateral Take-up and Relay.

Six state-listed species could potentially be found within the area that would be impacted by the Cromwell facilities: climbing fern, Collin's sedge, field paspalum, twinflower, three-leaved false Solomon's seal, and yellow-fringed orchid (CTDEEP, 2013d). All six of these species display readily identifiable flowers or fruiting bodies during the month of July. In order to determine whether any of these six species are present, Algonquin will conduct botanical surveys of the Cromwell facilities during June 2014 using a qualified botanist. The surveys will target both upland and wetland areas within the identified project facilities. The results of the survey will be presented to the CTDEEP to be used to develop mitigation strategies to address the presence (if any) of the six identified within the Project area.

The Southeast to MLV-19 Take-up and Relay segment is known to harbor the hard-stemmed bulrush (CTDEEP, 2013d). This is a wetland species that produces readily identifiable fruiting bodies during the months of June through August (Pennsylvania Natural Heritage Program [PNHP], 2013a). Algonquin will utilize a qualified botanist to conduct a survey at the height of the fruiting period in June 2014, targeting the wetland habitats that have been identified for this project facility. The results of the survey will be presented to the CTDEEP to be used to develop mitigation strategies to address the presence (if any) of the hard-stemmed bulrush within the Project area.

The E-1 System Lateral Take-up and Relay segment is known to harbor threadfoot (CTDEEP 2013b). Threadfoot is a riparian species that is found in fast moving streams, rivers, and along rocky shorelines. Threadfoot is most identifiable during low water events when it is fruiting or flowering. Algonquin will utilize a qualified botanist to conduct a survey at the height of the fruiting and flowering periods in late July of 2014, targeting the riparian wetland habitats and waterbodies that have been identified for this project facility. The results of the survey will be presented to the CTDEEP to be used to develop mitigation strategies to address the presence (if any) of the threadfoot within the Project area.

Species-specific information regarding each of the eight state-listed plant species is listed below:

Climbing Fern

Climbing fern is listed as a state species of special concern (CTDEEP, 2013b). It is an evergreen, ivy-like plant that sprawls over the ground or climbs clockwise short distances up shrubs and low herbs. Climbing fern grows in moist pine-oak-maple woodlands with an open understory, in moist thickets, and along stream margins. Regenerating woodlands and right-of-way corridors also provide habitat for this species (MDFW, 2013a).

Collins' Sedge

Collins' Sedge is listed as a state species of special concern and is presumed to be extirpated (CTDEEP, 2013b). It is a perennial grass-like plant that is most recognizable when fruiting in summer (PNHP, 2013b). The species grows in sphagnum moss in acidic swamps and wet woods, often where conifers are a prominent part of the canopy (PNHP, 2013b).

Field Paspalum

Field Paspalum is listed as a state endangered species (CTDEEP, 2013b; NYNHP, 2013c). It is a perennial grass growing from short rhizomes. Fruit is present from Late July through September (NYNHP, 2013g). Field Paspalum is found in damp meadows, fields, mowed roadsides, mowed grounds, and lawns (NYNHP, 2013g).

Hard-stemmed Bulrush

Hard-stemmed bulrush is listed as a state threatened species (CTDEEP, 2013b). It is an erect grass-like perennial that grows from a spreading rhizome: the firm, rounded stems can reach a height of 10 feet or more within a single growing season. The flower can be found in spikelets that are held in small, branched clusters and fruiting from June to August. Hard-stemmed bulrush grows in wetlands and in the shallow water along the edges of lakes or ponds (PNHP, 2013a).

Three-leaved False Solomon's Seal

Three-leaved false Solomon's seal is a state listed threatened species (CTDEEP, 2013b). It is an herbaceous plant, with alternate, obolong-lanceolate leaves and flowers that display six white petals (USDA, 2013a). The flower cluster is a terminal panicle of 20 to 80 small white flowers which appear in July through August, and then develop into red or white berries dotted with purple (Washington State University, 2014). It is found in cool bogs and wetlands with peat soils.

Threadfoot

Threadfoot is listed as a state species of special concern (CTDEEP, 2013f). It is an olive-green, aquatic plant of firm texture that grows in streams and rivers while attached to rocks. It resembles seaweed, alga, or moss and attaches to rocks by fleshy disks. The stems are often branched and the leaves are very narrow and divided into numerous linear lobes. The flowers are small, not showy, and scattered along the stems. Flowers and/or fruits are present from mid-June through early October. Threadfoot grows submerged, to seasonally exposed, on cobbles and bedrock substrate in fast flowing, relatively large streams or rivers. Since this species often grows submerged in rapids and fast moving water it can be difficult to spot. Therefore, the best time to survey for this species is between mid-June and early October and when water levels are low (NYNHP 2013f).

Twinflower

Twinflower is listed as a state endangered species (CTDEEP, 2013b). Twinflower is a small, herbaceous species with basal leaves characterized by a pair of small pink nodding flowers at the top of a slender, hairy stem. The pink to white bell-like flowers are nodding and are born in pairs on short, thin Y-shaped stalks, seldom exceeding six inches in height, hence the common name "twinflower." Throughout its range twinflower is commonly found under moderate deciduous canopy in either moist soil or average moisture conditions (USFS, 2014). In Connecticut, it inhabits cool wetlands and swamps (USDA, 2013b).

Yellow Fringed Orchid

Yellow fringed orchid is listed as a state threatened species (CTDEEP, 2013b). It is a relatively stout, robust orchid with leafy shoots and basal leaves that terminate with a long, pointed tip. The stem is terminated by a densely flowered raceme of strikingly orange to yellow-orange flowers, each flower with an unlobed, prominently fringed lower lip. Yellow fringed orchid blooms primarily from late July through August (Washington State University, 2014, Michigan Natural Features Inventory 2009). It inhabits open mats of sphagnum bogs where its associates include pitcher plant, beak rush, cranberry, sedges, larch and other plants of acid peat bogs. This orchid also occurs in damp sandy meadows or in acid soils adjacent to marshes (Michigan Natural Features Inventory, 2009).

Summary and Conclusion for State-listed Species in Connecticut

Based on the information provided by Algonquin to date, we conclude that the Project would have no effect on the American bittern, pied-billed grebe, savanna sparrow, red bat, eastern cougar, and ground beetle; would not have a significant effect on the American kestrel, eastern box turtle, eastern hognose snake, and Jefferson salamander "complex"; and may affect the Pine Barrens tiger beetle. However, additional information and consultation with the CTDEEP is needed for eight of these species (savannah sparrow, red bat, ground beetle, American kestrel, eastern box turtle, eastern hognose snake, Jefferson salamander "complex," and Pine Barrens tiger beetle) and Algonquin is still working on its overall conservation plan for state-listed species in Connecticut. In addition, suitable habitat for multiple state-listed plant species occurs near several Project facilities, but surveys and consultations for state-listed plant species in Connecticut have not been completed. Therefore, **we recommend that:**

- **<u>Prior to construction in Connecticut,</u> Algonquin should file with the Secretary all survey results for state-listed species in Connecticut, the conservation plan being developed in consultation with the CTDEEP, and documentation of correspondence from the CTDEEP regarding the conservation plan.**

4.7.5.3 Rhode Island

Algonquin consulted with the RIDEM/RINHP to determine if any state-listed species are known to occur near Algonquin's Burrillville Compressor Station site (Jordan, 2013). No known records of occurrence of state-protected species were identified. Therefore, the Project would not affect state-listed species or habitats in Rhode Island.

4.7.5.4 Massachusetts

Algonquin consulted with the MDFW/MNHESP to determine if any state-listed species are known to occur along Algonquin's proposed West Roxbury Lateral or its existing and proposed M&R stations in Middlesex, Norfolk, Bristol, Plymouth and Suffolk Counties (MDFW, 2013b; French, 2013). No known occurrences of state-listed species were reported by MDFW and MNHESP for the Project areas in Massachusetts. Therefore, the Project would not affect state-listed species or habitats in Massachusetts.

4.8 LAND USE, RECREATION, SPECIAL INTEREST AREAS, AND VISUAL RESOURCES

4.8.1 Land Use

The AIM Project would consist of 37.6 miles of replacement, loop extension, and new natural gas pipeline that would cross three counties in the State of New York, four counties in the State of Connecticut, and two counties in the Commonwealth of Massachusetts; and new aboveground facilities and modifications to existing aboveground facilities in three counties in New York, six counties in Connecticut, one county in the State of Rhode Island, and five counties in Massachusetts. Of the 37.6 miles of pipeline, 20.1 miles would replace existing 26-inch-diameter mainline pipeline with 42-inch-diameter pipeline, 2.0 miles would extend an existing loop pipeline with 36-inch-diameter pipeline, 9.1 miles would replace existing 6-inch-diameter pipeline with 16-inch-diameter pipeline, 1.3 miles of new 12-inch-diameter pipeline would loop an existing pipeline, and 5.1 miles would consist of installation of new 16-inch and 24-inch-diameter lateral pipelines (see table 2.1.1-1). In addition to the installation of replacement, loop extension, or new pipeline, about 0.7 mile of Algonquin's existing 26-inch-diameter Southwest to MLV 19 pipeline would be abandoned in place. The proposed Project would also include modifications to 6 existing compressor stations, modifications to 24 existing M&R stations, construction of 3 new M&R stations, removal of one existing M&R station, construction of pig launcher and receiver facilities, construction of 1 new MLV, and modifications to 5 existing MLVs sites (see table 2.1.2-1).

4.8.1.1 Environmental Setting

Six general land use types would be affected by the AIM Project, which include open land, agricultural, forest/woodland, industrial/commercial, residential, and open water. Table 4.8.1-1 summarizes the acreage of each land use type that would be affected by construction and operation of the Project. The definitions of each land use type are as follows:

- 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;
- Agricultural – includes active hayfields and cultivated lands;
- Forest/woodland – includes mixed oak forest and forested wetlands;
- Industrial/commercial – includes manufacturing or industrial plants, paved areas, landfills, mines, quarries, electric power or natural gas utility facilities, developed areas, roads, railroads and railroad yards, and commercial or retail facilities;
- Residential – 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; and
- Open water – includes all waterbody crossings, unless the waterbody is not visible on aerial photography (in which case it is incorporated into the surrounding land use).

TABLE 4.8.1-1

Land Use Types and Acres Impacted by Construction and Operation of the AIM Project [a]

		Open Land		Agricultural		Forest/Woodland		Industrial/ Commercial		Residential		Open Water		Total	
Facility	County, State	Total Const.	New Perm.	Total Const.	New Perm.	Total Const.	New Perm.	Total Const.	New Perm.	Total Const.	New Perm.	Total Const.	New Perm.	Total Const.	New Perm.
PIPELINE FACILITIES [b,c]															
Replacement Pipeline															
Haverstraw to Stony Point Take-up and Relay	Rockland, NY	17.8	0.0	0.0	0.0	15.3	0.0	3.8	0.0	8.5	0.0	0.1	0.0	45.5	0.0
Stony Point to Yorktown Take-up and Relay	Rockland, NY	17.1	0.1	0.0	0.0	15.6	2.9	3.5	0.4	5.3	0.1	0.0	0.4	41.5	3.9
	Westchester, NY	39.1	0.3	1.6	0.0	55.1	8.6	14.9	1.0	13.5	0.1	0.1	0.4	124.3	10.4
Southeast to MLV 19 Take-up and Relay	Putnam, NY	0.9	0.0	0.0	0.0	0.4	0.0	3.9	0.0	0.0	0.0	0.0	0.0	5.2	0.0
	Fairfield, CT	21.1	0.0	0.0	0.0	17.6	0.0	9.7	0.0	8.4	0.0	0.0	0.0	56.8	0.0
E-1 System Lateral Take-up and Relay	New London, CT	45.2	4.4	13.0	0.9	34.3	2.9	2.0	0.1	0.2	0.0	0.2	0.0	94.9	8.3
Loop Extension															
Line-36A Loop Extension	Middlesex, CT	4.0	0.6	8.1	1.9	6.5	3.0	0.9	0.2	1.0	0.4	0.0	0.0	20.5	6.1
	Hartford, CT	0.5	0.0	0.6	0.1	1.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.5
E-1 System Lateral Loop Extension	New London, CT	3.4	0.4	0.0	0.0	9.5	2.6	0.7	0.0	0.6	0.2	0.0	0.0	14.2	3.2
New Pipeline															
West Roxbury Lateral	Norfolk, MA	5.0	1.5	0.0	0.0	1.6	1.0	20.9	2.6	4.3	0.0	0.1	0.0	31.9	5.1
	Suffolk, MA	0.0	0.0	0.0	0.0	2.1	0.0	2.5	0.0	9.9	0.0	0.0	0.0	14.5	0.0
Pipeline Facilities Subtotal		**154.1**	**7.3**	**23.3**	**2.9**	**159.5**	**21.4**	**62.8**	**4.3**	**51.7**	**0.8**	**0.5**	**0.8**	**451.9**	**37.5**

TABLE 4.8.1-1 (cont'd)

Land Use Types and Acres Impacted by Construction and Operation of the AIM Project [a]

		Open Land		Agricultural		Forest/Woodland		Industrial/ Commercial		Residential		Open Water		Total	
Facility	County, State	Total Const.	New Perm.	Total Const.	New Perm.	Total Const.	New Perm.	Total Const.	New Perm.	Total Const.	New Perm.	Total Const.	New Perm.	Total Const.	New Perm.
ABOVEGROUND FACILITIES															
Existing Compressor Stations															
Stony Point Compressor Station	Rockland, NY	1.0	0.0	0.0	0.0	7.6	0.9	11.7	0.7	0.0	0.0	0.0	0.0	20.3	1.6
Southeast Compressor Station	Putnam, NY	0.2	0.0	0.0	0.0	5.1	0.0	10.6	0.0	0.0	0.0	0.0	0.0	15.9	0.0
Oxford Compressor Station	New Haven, CT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cromwell Compressor Station	Middlesex, CT	0.2	0.0	0.0	0.0	3.2	1.7	11.5	0.2	0.0	0.0	0.0	0.0	14.9	1.9
Chaplin Compressor Station	Windham, CT	1.6	0.0	0.0	0.0	3.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0	11.7	0.0
Burrillville Compressor Station	Providence, RI	0.2	0.0	0.0	0.0	5.9	0.0	10.6	0.0	0.0	0.0	0.0	0.0	16.7	0.0
Compressor Stations Subtotal		3.2	0.0	0.0	0.0	24.8	2.6	51.5	0.9	0.0	0.0	0.0	0.0	79.5	3.5
Existing M&R Station Modifications															
Stony Point M&R Station [d]	Rockland, NY	0.6	0.0	0.0	0.0	0.8	0.0	0.7	0.0	0.0	0.0	0.1	0.0	2.2 [d]	0.0
Peekskill M&R Station [d]	Westchester, NY	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.7	0.0	0.0	0.0	2.1 [d]	0.0
Cortlandt M&R Station [d]	Westchester, NY	1.2	0.0	0.0	0.0	1.4	0.0	0.2	0.0	1.0	0.0	0.0	0.0	3.8 [d]	0.0
West Danbury M&R Station [e]	Fairfield, CT	1.2	0.0	0.0	0.0	1.3	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.3 [e]	0.0
Southbury M&R Station	New Haven, CT	0.1	0.0	0.0	0.0	0.3	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.6	0.0
Waterbury M&R Station	New Haven, CT	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.4	0.0
North Haven M&R Station	New Haven, CT	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.5	0.0
Guilford M&R Station	New Haven, CT	0.0	0.0	0.0	0.0	0.1	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.5	0.0

TABLE 4.8.1-1 (cont'd)

Land Use Types and Acres Impacted by Construction and Operation of the AIM Project [a]

		Open Land		Agricultural		Forest/Woodland		Industrial/ Commercial		Residential		Open Water		Total	
Facility	County, State	Total Const.	New Perm.	Total Const.	New Perm.	Total Const.	New Perm.	Total Const.	New Perm.	Total Const.	New Perm.	Total Const.	New Perm.	Total Const.	New Perm.
Farmington M&R Station	Hartford, CT	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.4	0.0
Glastonbury M&R Station	Hartford, CT	0.0	0.0	0.0	0.0	0.4	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.8	0.0
Middletown M&R Station	Middlesex, CT	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.5	0.0
Salem Pike M&R Station	New London, CT	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.0
Montville M&R Station [d]	New London, CT	0.0	0.0	0.0	0.0	0.6	0.0	0.6	0.0	0.0	0.0	0.0	0.0	1.2 [d]	0.0
Willimantic M&R Station	Windham, CT	0.0	0.0	0.0	0.0	0.7	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.9	0.5
Pomfret M&R Station	Windham, CT	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.4	0.0
Putnam M&R Station	Windham, CT	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.3	0.0
North Fall River M&R Station [f]	Bristol, MA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 [f]	0.0
New Bedford M&R Station	Bristol, MA	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	1.8	0.0
Middleborough M&R Station	Plymouth, MA	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.6	0.0
Brockton M&R Station	Plymouth, MA	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.6	0.0
Norwood M&R Station	Norfolk, MA	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.8	0.0
Needham M&R Station	Norfolk, MA	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.4	0.0
Wellesley M&R Station	Norfolk, MA	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.5	0.0
Mystic M&R Station	Middlesex, MA	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.7	0.0
Existing M&R Stations Subtotal		0.3	0.0	0.0	0.0	1.7	0.5	9.2	0.0	0.0	0.0	0.0	0.0	11.2	0.5

TABLE 4.8.1-1 (cont'd)

Land Use Types and Acres Impacted by Construction and Operation of the AIM Project [a]

Facility	County, State	Open Land		Agricultural		Forest/Woodland		Industrial/ Commercial		Residential		Open Water		Total	
		Total Const.	New Perm.	Total Const.	New Perm.	Total Const.	New Perm.	Total Const.	New Perm.	Total Const.	New Perm.	Total Const.	New Perm.	Total Const.	New Perm.
New M&R Stations															
Oakland Heights M&R Station [g]	New London, CT	0.8	0.0	0.0	0.0	1.6	1.4	0.0	0.0	0.0	0.0	0.0	0.0	2.4	1.4
Assonet M&R Station	Bristol, MA	0.3	0.1	0.0	0.0	0.7	0.1	0.5	0.0	0.0	0.0	0.0	0.0	1.5	0.2
West Roxbury M&R Station [d]	Suffolk, MA	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0 [d]	1.0
New M&R Stations Subtotal		1.1	0.1	0.0	0.0	2.3	2.5	0.5	0.0	0.0	0.0	0.0	0.0	3.9	2.6
Existing M&R Station Removal															
Greenville M&R Station [g]	New London, CT	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0
Aboveground Facility Subtotal		**4.8**	**0.1**	**0.0**	**0.0**	**28.8**	**5.6**	**61.3**	**0.9**	**0.0**	**0.0**	**0.0**	**0.0**	**94.9**	**6.6**
PIPE AND CONTRACTOR WARE YARDS		**4.2**	**0.0**	**0.0**	**0.0**	**9.6**	**0.0**	**29.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**43.6**	**0.0**
ACCESS ROADS		**0.9**	**0.9**	**0.0**	**0.0**	**1.0**	**1.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**1.9**	**1.9**
PROJECT TOTAL		**164.0**	**8.3**	**23.3**	**2.9**	**198.9**	**28.0**	**153.9**	**5.2**	**51.7**	**0.8**	**0.5**	**0.8**	**592.3**	**46.0**

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a The subtotals and totals shown in this table may not equal the sums of the addends due to rounding.

b The acreage shown for the land affected during construction includes all construction workspace, including the existing permanent right-of-way and includes the new land area that would be permanently affected during operation.

c The acreage shown for the land affected during operation includes only the new permanent right-of-way, not Algonquin's existing permanent easement.

d The temporary workspace shown for each of these M&R stations would be within the overall workspace area for pipeline facilities; therefore, these areas are not included in subtotal and total calculations.

e A portion of the temporary workspace at the West Danbury M&R Station would fall within the overall temporary workspace area for pipeline facilities; only the portion outside the overall pipeline workspace (0.3 acre) is included in subtotal and total calculations.

f The workspace that would be required at the North Fall River M&R Station would fall within the workspace for the new Assonet M&R Station; therefore, it is not listed here.

g The acres of land affected during construction at these facilities includes staging areas located a short distance away from the actual M&R station site.

Construction of the Project would impact a total of about 592.3 acres. About 76 percent of this acreage would be utilized for the pipeline facilities, including the construction right-of-way (64 percent) and ATWS (12 percent). The remaining acreage impacted during construction would be associated with aboveground facilities (16 percent), pipe and contractor ware yards (7 percent), and access roads (less than 1 percent). The primary land use types impacted during construction would be forest/woodland (34 percent), open land (28 percent), industrial/commercial land (26 percent), and residential land (9 percent). Agricultural land and open water would make up the remaining 3 percent of land types impacted during construction of the proposed Project.

Following construction, about 46.0 acres of new land outside of Algonquin's existing permanent right-of-way would be permanently encumbered by operation of the Project. About 82 percent of this acreage would be for the new pipeline right-of-way, 14 percent for aboveground facilities, and 4 percent for new permanent access roads. The primary land use types that would be permanently encumbered would be forest/woodland (61 percent), open land (18 percent), industrial/commercial land (11 percent), and agricultural land (6 percent). Open water and residential land would make up the remaining 4 percent of permanent impacts.

Forest/woodland affected by the Project would consist mainly of mixed oak forest and consists of both wetland and upland areas. Algonquin would minimize forest land impacts by locating Project facilities and work areas within existing rights-of-way and on open land wherever possible. Following construction activities, forest/woodland cleared outside of the permanent right-of-way would be allowed to regenerate to preconstruction conditions, but impacts on forest resources within these areas would last for several years. Forest/woodland falling within the new maintained permanent right-of-way would be permanently converted to a non-forested condition.

Open land could be temporarily impacted during Project construction by removal of vegetation and disturbance of soils. Impacts on open land would be temporary and short term, and would be minimized by the implementation of the E&SCP and by restoring open land areas to preconstruction conditions. Since 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 and commercial land uses could be temporarily impacted during Project construction by increased dust from exposed soils, construction noise, and traffic congestion. 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 leaving either a dirt surface or 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 usually return later to complete final paving, at which time the road surface is considered permanently restored to pre-existing conditions. Crossing of private driveways would be coordinated 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 can be made across the trench should the need arise. Additional discussion of traffic-related impacts is provided in section 4.9.5.

Agricultural land uses could be temporarily impacted during Project construction by removal of vegetation, disturbance of soils, and increased dust from exposed soils. Agricultural land in the Project area consists of feed and hay corn not considered specialty crops. Following construction, all impacted agricultural land would be restored to preconstruction conditions to the extent possible, in accordance with Algonquin's E&SCP, and with any specific requirements identified by landowners or state or federal agencies with appropriate jurisdiction. Algonquin would acquire 2.9 acres of agricultural land as new permanent right-of-way, but operation of the proposed pipeline would not affect the continuing use of these areas for agricultural activities after construction is complete.

Effects of construction on agricultural land would be minor and short term. Algonquin would maintain landowner access to fields, storage areas, structures, and other agricultural facilities during construction and would maintain irrigation and drainage systems that cross the right-of-way to the extent practicable. Landowners would be compensated for crop losses and other damages caused by construction activities. Algonquin's landowner-compensation program would address temporary loss of productivity in affected areas after construction.

4.8.1.2 Pipeline Facilities

The proposed replacement, loop, and lateral pipeline would consist of 37.6 miles of multi-diameter pipe. Of this amount, about 26.3 miles (70 percent) would consist of replacement of existing pipeline and about 11.3 miles (30 percent) would consist of new pipeline loops and one new lateral.

The predominant land use that would be crossed by the pipelines is open land (55 percent) followed by forest/woodland (14 percent), residential (14 percent), industrial/commercial (9 percent), agricultural (6 percent), and open water (2 percent). Of the 37.6 miles of proposed pipeline, about 93 percent of would be within or adjacent to existing rights-of-way, consisting of pipeline rights-of-way currently occupied by Algonquin, public roadways, railways, and/or other utility rights-of-way. Land use-related impacts associated with the Project would include the disturbance of existing uses within the right-of-way during construction and retention of an expanded or new permanent right-of-way for operation of the pipeline.

The replacement portions of the Project pipeline facilities would cross 29.2 miles of land, consisting of 65 percent open land, 13 percent forest/woodland, 11 percent residential, 5 percent agricultural, 3 percent industrial/commercial, and 3 percent open water. The loop extension portions of the Project pipeline facilities would cross 3.3 miles of land, consisting of 40 percent open land, 33 percent forest/woodland, 21 percent agricultural, and 6 percent residential. The new pipeline portion of the Project pipeline facilities would cross 5.1 miles of land, consisting of 49 percent industrial/commercial, 39 percent residential, 6 percent open land, and 6 percent forest/woodland.

For the replacement portions of the Project, Algonquin would generally use a 100-foot-wide construction right-of-way. This 100-foot right-of-way width would not include special crossing areas such as wetlands and waterbodies, residential areas, and agricultural areas where other construction right-of-way widths are proposed. The construction right-of-way would include the use of the existing 75-foot-wide permanent right-of-way to the extent practicable, as well as additional workspace. There are three exceptions to this proposed right-of-way use:

- For the portion of the Stony Point to Yorktown Take-up and Relay segment crossing the Blue Mountain Reservation in the Town of Cortlandt, New York, Algonquin would utilize an existing 75-foot-wide maintenance easement, and the replacement pipeline would be installed within an existing 6-foot-wide permanent easement.
- For the portion of the Stony Point to Yorktown Take-up and Relay segment associated with the HDD crossing of the Hudson River, Algonquin would utilize a 75-foot-wide construction right-of-way and a 50-foot-wide permanent right-of-way where the route deviates from the existing right-of-way on land. Within the Hudson River itself, there would be no construction right-of-way with the use of HDD, but a new 10-foot-wide permanent right-of-way would be established across the river.

- For the E-1 System Lateral Take-up and Relay segment, Algonquin would use a 75-foot-wide construction right-of-way (including the existing 50-foot-wide permanent easement to the extent practicable), and would obtain an additional 10 feet of new permanent right-of-way along some portions.

For the Line-36A Loop Extension portion of the Project, Algonquin would use a 85-foot-wide construction right-of-way (including the use of the existing 75-foot-wide permanent right-of-way to the extent practicable, and an additional 10 to 35 feet of temporary workspace). Algonquin also would obtain an additional 20 to 30 feet of new permanent right-of-way. For the E-1 System Lateral Loop Extension portion of the Project, Algonquin would use a 75-foot-wide construction right-of-way (including the use of the existing 30-foot-wide permanent right-of-way, an additional 25 feet of temporary workspace, and an additional 20 feet of new permanent right-of-way).

For the new pipeline portion of the Project, the construction right-of-way would vary between 15 feet and 75 feet in width, depending on location. The permanent right-of-way would be 50 feet wide, where available.

In addition to the construction right-of-way, various ATWSs would be used for construction. As discussed in section 2.2.1.5, Algonquin identified several areas where it believes site-specific conditions require the use of ATWS outside the proposed construction right-of-way. Table C-1 in appendix C lists the locations of these ATWSs and their dimensions. Table C-1 also lists the acreage of impact and the justifications for the use of additional workspace.

In addition to the installation of replacement, loop extension, or new pipeline described above, about 0.7 mile of Algonquin's existing 26-inch-diameter Southwest to MLV 19 pipeline would be abandoned in place along the Interstate 84/Still River HDD segment. This activity would not impact any additional land.

4.8.1.3 Aboveground Facilities

Construction at the 28 M&R stations, 6 compressor stations, and various MLV and launcher/receiver sites in New York, Connecticut, Rhode Island, and Massachusetts would disturb a total of about 94.9 acres of land. Of this total, about 6.6 acres would be permanently retained for operation of the aboveground facilities. Table 4.8.1-1 above summarizes the land requirements and land use for the aboveground facilities associated with the Project. The primary land uses that would be affected by these facilities are industrial/commercial (65 percent) and forest/woodland (30 percent). Open land would make up the remaining 5 percent.

Compressor Station Modifications

Algonquin proposes to modify six existing compressor stations to add an additional 81,620 hp to its pipeline system as part of the Project. The compressor station modifications would impact a total of about 79.5 acres of land during construction. Of the 79.5 acres, about 3.5 acres (4 percent) would consist of new land that would be permanently affected by operation of the modified compressor stations within the existing station property owned by Algonquin.

AIM Project modifications at the Stony Point Compressor Station in Rockland County, New York would impact a total of about 20.3 acres of land, consisting of 58 percent industrial/commercial land, 37 percent forest/woodland, and 5 percent open land. Of the 20.3 acres, about 1.6 acres of new land would be permanently affected by operation of the modified facility (56 percent forest/woodland and 44 percent industrial land). Outside the permanently affected area, construction impacts would be temporary and short term, except on forested land where impacts would be long term. The area surrounding the station property is predominantly forested, with some residential land nearby.

Modifications at the Southeast Compressor Station in Putnam County, New York would impact a total of about 15.9 acres of land, consisting of 67 percent industrial/commercial land, 32 percent forest/woodland, and 1 percent open land. No new land would be permanently impacted by operation of the modified compressor station. Construction impacts would be temporary and short term, except on forested land where impacts would be long term. The area surrounding the station property is predominantly forested.

At the Oxford Compressor Station in New Haven County, Connecticut modifications would be conducted entirely inside the existing compressor building. Therefore, construction and operation of the Project would not impact any land.

AIM Project modifications at the Cromwell Compressor Station in Middlesex County, Connecticut would impact a total of about 14.9 acres of land, consisting of 77 percent industrial/commercial land, 22 percent forest/woodland, and 1 percent open land. Of the 14.9 acres, about 1.9 acres of new land would be permanently affected by operation of the modified compressor station (89 percent forest/woodland and 11 percent industrial/commercial land). Outside the permanently affected area, construction impacts would be temporary and short term, with the exception of forested land where impacts would be long term. The area surrounding the station property is predominantly forested, with some industrial/commercial and agricultural land nearby.

Modifications at the Chaplin Compressor Station in Windham County, Connecticut would impact a total of about 11.7 acres of land, consisting of 61 percent industrial/commercial land, 25 percent forest/woodland, and 14 percent open land. No new land would be permanently impacted by operation of the modified compressor station. Construction impacts would be temporary and short term, except on forested land where impacts would be long term. The area surrounding the station property is predominantly forested.

At the Burrillville Compressor Station in Providence County, Rhode Island modifications would impact a total of about 16.7 acres of land, consisting of 64 percent industrial/commercial land, 35 percent forest/woodland, and 1 percent open land. No new land would be permanently impacted by operation of the modified compressor station. Construction impacts would be temporary and short term, except on forested land where impacts would be long term. The area surrounding the station property is predominantly forested, with some residential land nearby.

New and Modified M&R Stations

Algonquin proposes to modify 24 existing M&R stations in New York, Connecticut, and Massachusetts to accept the new gas flows associated with the AIM Project. Modifications at 21 of the 24 existing stations are minor in nature and would take place within the existing fenced facilities. The remaining three M&R stations (Guilford, Glastonbury, and Willimantic M&R Stations) would require complete reconstruction because the existing station piping and metering equipment, and in the case of the Willimantic M&R Station, the existing station site, are significantly undersized to accommodate the increase in the projected flow rate. The M&R station modifications would temporarily impact a total of about 11.2 acres of land. Of the 11.2 acres, about 0.5 acre (4 percent) would consist of new land that would be permanently affected by operation of the modified Willimantic M&R Station. None of the other 23 modified M&R stations would permanently impact new land during operation.

Algonquin proposes to construct three new M&R stations to accept the new gas flows associated with the AIM Project. Construction of the three new M&R stations would temporarily impact a total of about 3.9 acres of land. Of the 3.9 acres, about 2.6 acres (67 percent) would consist of new land that would be permanently affected by operation of the new M&R stations.

Algonquin also proposes to decommission and remove one M&R station in New London County, Connecticut. The Greenville M&R Station would be removed and replaced by the new Oakland Heights M&R Station once that station has been constructed and is in service. Removal of the Greenville M&R Station would temporarily impact about 0.3 acre of land, and would not permanently impact any new land.

Land impacts for M&R station construction activities are summarized below by state. See table 4.8.1-1 for impacts at individual stations.

- In New York, there would be no additional impacts from M&R station activities. The temporary workspaces at M&R stations in New York would fall entirely within the workspace for pipeline facilities, and there would be no new permanent land impacts.

- In Connecticut, M&R station activities would temporarily impact about 8.5 acres of land, consisting of 47 percent industrial/commercial, 39 percent forest/woodland, and 14 percent open land. Of the 8.5 acres, 1.9 acres (22 percent) would be permanently impacted by operation of the Willimantic M&R Station and the new Oakland Heights M&R Station. Outside the permanently affected area, construction impacts would be temporary and short term, except on forested land where impacts would be long term.

- In Massachusetts, M&R station activities would temporarily impact about 6.9 acres of land, consisting of 84 percent industrial/commercial, 10 percent forest/woodland, and 6 percent open land. Of the 6.9 acres, 1.2 acres (17 percent) would be permanently impacted by operation of the new Assonet and West Roxbury M&R Stations. Outside the permanently affected area, construction impacts would be temporary and short term, except on forested land where impacts would be long term.

Other Aboveground Facilities

As part of the AIM Project, Algonquin would also modify three existing MLV sites and five existing launcher/receiver sites, construct five new launcher/receiver sites, construct new cross over piping at two locations, and construct one new MLV (see table 2.1.2-1). Modification and construction activities for these facilities would take place within the Algonquin's proposed permanent right-of-way and construction work areas for pipeline facilities; therefore, these additional aboveground facilities would not impact any additional land.

4.8.1.4 Pipe and Contractor Ware Yards

Algonquin proposes to use four pipe and contractor ware yards during construction of the AIM Project facilities. Of the four yards, two would be located in New York and two would be located in Connecticut. These yards would impact about 43.6 acres of land, consisting of 68 percent industrial/commercial land, 22 percent forest/woodland, and 10 percent open land (see table 4.8.1-1). These impacts would be temporary, except on forested land, which would experience a long-term impact due to clearing. The pipe and contractor ware yards would not permanently impact any new land.

4.8.1.5 Access Roads

In addition to the existing access available by the use of public roads, Algonquin has identified a total of 35 access roads for use on the AIM Project (15 in New York, 16 in Connecticut, and 4 in Massachusetts). These 35 access roads would include 27 TARs and 8 PARs. With one exception, the access roads are comprised of existing gravel roads, unimproved dirt roads, paved and gravel driveways, private industrial and commercial roads, paved parking lots, and golf course roads. The exception is a new PAR to be constructed for the Assonet M&R Station.

The one new PAR to be constructed for the new Assonet M&R Station would run from the existing North Fall River M&R Station to the Assonet M&R Station. This new PAR would disturb less than 0.1 acre (0.03 acre) of land. The area impacted by this new PAR would fall entirely within the new permanent pipeline right-of-way; therefore, it is not included in the 1.9-acre total of impacts associated with access roads.

For all other temporary and permanent access, Algonquin would use existing roads. However, of these existing roads, six TARs and one PAR would require minor upgrades and/or widening (by about 10 feet) for use during pipeline construction. These upgrades would result in about 1.9 acres of new permanent land disturbance, consisting of 53 percent forest/woodland and 47 percent open land (see table 4.8.1-1).

See table 2.2.4-1 for the locations, lengths, and acres of impact for all individual TARs and PARs associated with the AIM Project.

4.8.2 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, temporary access roads, contractor ware yards), or permanent, granting the operator the right to operate and maintain the facilities once constructed.

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

An easement agreement between a company and a landowner typically specifies compensation for losses resulting from construction, including 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 its easement and maintain the 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.

4.8.3 Existing Residences, Commercial and Industrial Facilities, and Planned Developments

4.8.3.1 Existing Residences and Commercial and Industrial Facilities

Table H-1 in appendix H lists residences and other structures located within 50 feet of the construction work areas associated with the AIM Project (i.e., construction right-of-way, ATWS, and pipe and contractor ware yards) by milepost, and indicates the type of structure and its distance from the proposed Project work areas. Based on field surveys and aerial photography, Algonquin's proposed construction work areas would be located within 50 feet of 337 residential structures (i.e., houses and apartment buildings) and 95 non-residential structures (i.e., commercial or industrial facilities, sheds, garages).

The residential structures within 50 feet of the construction work areas would experience effects of Project construction and operation. In general, as distance from the construction work area increases, the impacts on residences decrease. In residential areas, the two most significant impacts associated with construction and operation of a pipeline are temporary disturbances during construction and 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 from transporting workers, equipment, and materials to 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 to 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 in such a way as to ensure that access to residential homes and businesses is maintained at all times. 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 utilities, and by hand digging. In the event of a disruption of service, immediate steps would be taken to restore service such as calling the service provider and keeping repair clamps on site in case a residential water or sewer system is encountered.

Algonquin would implement the following general measures to minimize construction-related impacts on all residences and other structures located within 50 feet of the construction right-of-way:

- install safety fence at the edge of the construction right-of-way for a distance of 100 feet on either side of a residence;
- attempt to preserve mature trees, vegetative screens, and landscaping within the construction work area to the extent possible;
- backfill the trench as soon as the pipe is laid or place temporary steel plates or timber mats over the trench; and
- complete final cleanup (including final grading) and installation of permanent erosion control measures within 10 days after the trench is backfilled.

For the residences within 50 feet of the construction workspace, Algonquin has developed Residential Construction Plans to inform affected landowners of proposed measures to minimize disruption and to maintain access to the residences (see appendix H). The plans include a dimensioned drawing depicting the residence relative to the pipeline construction; workspace boundaries; the proposed right-of-way; and nearby residences, structures, roads, and miscellaneous features (e.g., other utilities, playgrounds, etc.). An overall note sheet that describes the general measures that would be implemented in residential properties (e.g., landowner notification prior to construction, installation of safety fencing, etc.), potential construction techniques to be used, workspace restrictions, anticipated construction schedule, and safety considerations is also included. Algonquin provided its Residential Construction Plans to property owners for review and comment in March 2014. To-date, Algonquin has received feedback from landowners on several of the plans. We also encourage the owners of each of these residences to provide us comments prior to the end of the draft EIS comment period on the plan specific to their property.

We have reviewed the Residential Construction Plans and do not find them acceptable. The note sheet provides information on the overall suite of measures to be implemented in all residential areas, but does not indicate which measures would be site-specifically implemented at each individual residence, including appropriate measures to minimize traffic-related effects. In addition, as indicated in table H-1 in appendix H, numerous residences would be located within 10 feet of the proposed construction work area. There is an increased potential for construction of the Project to disrupt these residences. Where these residences are currently within 10 feet of Algonquin's existing right-of-way, the Residential Construction Plans do not adequately address the ability to further reduce the construction work area to maintain a greater than 10 foot separation.

Many of the residences identified within 50 feet of the construction work area (including those within 10 feet) are located along the West Roxbury Lateral. We recognize that all activities within 50 feet of residences along the West Roxbury Lateral would be associated with in-street construction; therefore, no residential land would be affected. However, Algonquin developed and provided the Residential Construction Plans to property owners with residences within 50 feet in this area to inform them about the proximity of the work to their houses and measures that would be taken to minimize impacts (e.g., installation of safety fencing).

To ensure that the Residential Construction Plans address comments received, provide more site-specific notes, address those residences within 10 feet of the construction work area, and allow property owners adequate opportunity for input regarding construction activity so close to their residence, **we recommend that:**

- **<u>Prior to the end of the draft EIS comment period</u>, Algonquin should file revised Residential Construction Plans that:**

  a. **incorporate additional site-specific details for each individual plan, including appropriate measures to minimize traffic-related effects; and**

  b. **for all residences located within 10 feet of the construction work area in New York and Connecticut, Algonquin should revise the construction work area to be greater than 10 feet from residences or provide site-specific justification for the use of the construction workspace within 10 feet of the the residence.**

  <u>Prior to construction of the AIM Project</u>, Algonquin should file with the Secretary, for review and written approval of the Director of the OEP, a revised set of Residential Construction Plans that incorporate and address the comments 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 not easily removed.

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

We conclude that implementation of Algonquin's construction methods for working in proximity to residences and other structures and site-specific Residential Construction Plans would 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, Algonquin's Environmental Complaint Resolution Procedure Plan would promote resolution of landowner issues.

4.8.3.2 Planned Developments

Algonquin contacted landowners and local officials in the municipalities that would be affected by the AIM Project to identify planned residential, commercial, or industrial developments within 0.25 mile of the proposed facilities. Planned developments identified within 0.25 mile of the AIM Project are described and listed in table 4.8.3-1. A discussion of cumulative impacts associated with the proposed Project and these developments is provided in section 4.13.

Several of the planned developments, although located within 0.25 mile of the AIM Project, would not be crossed by any Project facilities (see table 4.8.3-1). Planned construction dates are not currently available for any of these developments. Since the AIM Project would not cross any of these developments, Project activities would not cause any direct conflicts or preclude the development of these projects. If a planned development's construction period overlaps with AIM Project construction, indirect impacts such as noise from construction activities, dust resulting from soil work, and traffic congestion would occur on a temporary basis. In the event of overlapping construction periods, Algonquin would continue to coordinate with the developer and permitting authorities to identify any potential conflicts associated with construction of the Project. Planned developments that would be crossed by the Project and may experience impacts are discussed in more detail below.

Carlton Park, Jessup Valley, Jessup Valley North, and Stony Ridge Estates Residential Developments

The proposed Project would cross portions of property associated with each of these four planned residential developments from about MPs 1.8 to 2.0 along the Haverstraw to Stony Point Take-up and Relay segment. This area is currently undeveloped forest land, and is surrounded by existing residential subdivisions. Lots in the Carlton Park and Stony Ridge Estates developments have been subdivided, but have not yet been sold, and no planned construction dates are currently available as they are pending sale of the lots. In the Jessup Valley and Jessup Valley North developments, the developer has applied for re-subdivision of the lots; planned construction dates are not currently available.

TABLE 4.8.3-1

Planned Residential and Commercial Developments Within 0.25 Mile of the AIM Project

Facility/County, State/ Municipality	Begin MP	End MP	Distance Crossed (feet)[a]	Distance and Direction from Nearest Point Along Construction Work Area	Planned Development, Description, Timing
PIPELINE FACILITIES					
Haverstraw to Stony Point Take-up and Relay					
Rockland County, NY					
Haverstraw	0.0	1.0	NA	At MP 0.6, site(s) are located east/ southeast from the work area approx. 250 feet.	Highgate Estates FM# 3727 – Residential development/ subdivision with empty lots for sale; no current construction. Construction date pursuant to the sale of the lots.
Stony Point	1.8	1.8	5 and 200	At MP 1.8, site(s) are located northwest from the work area approx. 0 to 400 feet.	Carlton Park FM #7742 – Residential development/subdivision. Construction date pursuant to the sale of the lot(s).
Stony Point	1.8	1.8	88 and 306	At MP 1.8, site(s) are located southeast from the work area approx. 0 to 300 feet.	Jessup Valley North FM #7991 – Residential development/subdivision; no current construction. Developer has applied for re-subdivision of lots; construction date unavailable.
Stony Point	1.8	1.8	20 and 100	At MP 1.8, site(s) are located southeast from the work area approx. 0 to 300 feet.	Jessup Valley FM # 7574 – Residential development/ subdivision; no current construction. Developer has applied for re-subdivision of lots into "Jessup Ridge."
Stony Point	1.8	2.0	875	At MP 2.0, site is bisected by the work area.	Stony Ridge Estates FM #7378 – Residential development/subdivision; no current construction. Construction date pursuant to the sale of the lots.
Stony Point to Yorktown Take-up and Relay					
Stony Point	3.0	3.0	NA	At MP 3.0, site is located southerly from the work area approx. 150 feet.	Tax ID 14.04 -1-12 – Historic designated schoolhouse; owned by the Town of Stony Point. Construction/renovation intermittent pending funding.
Stony Point	3.1	3.1	100	At MP 3.1, the AIM pipeline crosses the railroad tracks for 100 feet.	CSX – Approval for track rehabilitation and replacement has been received by CSX but no construction dates have been set.
Stony Point	3.3	3.5	unknown	Somewhere between MPs 3.3 and 3.5 within the Hudson River bed.	Champlain Hudson Power Express Project - A proposed project by Transmission Developers, Inc. that would include a high voltage direct current line (running from Quebec to Astoria) within the bed of the Hudson River. Permits are currently being sought for the Project, with a final EIS expected in 2014. The proposed project would cross the AIM Project pipeline route; the exact location has not yet been determined. Construction dates have not yet been set as various federal and state permits are pending.

TABLE 4.8.3-1 (cont'd)

Planned Residential and Commercial Developments Within 0.25 Mile of the AIM Project

Facility/County, State/ Municipality	Begin MP	End MP	Distance Crossed (feet)[a]	Distance and Direction from Nearest Point Along Construction Work Area	Planned Development, Description, Timing
Westchester County, NY					
City of Peekskill	5.3	5.3	NA	At MP 5.3, site is located along railroad on Tract No. W-136; #WE-02550 in a northerly direction from the work area by approx. 250 feet.	Waste Transfer Facility – Per Mr. John Lynch of the City of Peekskill Planning Dept., a Waste Transfer Facility is planned by Kmmkm, Ldt. Once the facility is completed, waste would be downloaded from trucks to railcars. Owner has yet to commence construction of the said Transfer facility. It has been approved by the Planning Board of the City of Peekskill. No construction date has been filed; pending further permitting and approvals.
Cortlandt	7.6	7.6	NA	At MP 7.6, the site is located south of Tract #WE-03010 from the work area by approx. 350 feet.	Planned Subdivision – Per Asst. Dir. Of Code Enforcement for the Town of Cortlandt, Mr. Ken Hoch, a subdivision has been planned but the owner has failed to qualify to have it approved. No construction date available; pending subdivision approval.
Cortlandt	5.0	5.0	NA	0.1 mile west from MP 5.0.	West Point Transmission Project – West Point Partners (WPP) is proposing to construct a new transmission line from Leeds Substation in Athens to a substation located in Buchanan (Westchester County). The cable would be buried in the Hudson River for 74 miles and would then make landfall in the Hamlet of Verplanck, where it would be buried underground for about 1.5 miles before interconnecting with the existing Buchanan North Substation in the Village of Buchanan. WPP also proposes to construct a converter station that would occupy about 3.8 acres on a 105-acre parcel owned by Con Edison in the Hamlet of Verplanck located in the Town of Cortlandt. WPP has filed applications with the New York State Public Service Commission and USACE.
Cortlandt	9.8	9.8	NA	At MP 9.8, the site is located south of Tract #WE-04430 from the work area by approx. 0.25 mile.	Three-lot Subdivision – Per Asst. Dir. Of Code Enforcement for the Town of Cortlandt, Mr. Ken Hoch, a small three-lot subdivision has been approved by the Planning Board. No construction date has been filed.
Southeast to MLV 19 Take-up and Relay					
Fairfield County, CT					
City of Danbury	1.8	1.8	600	At MP 1.8, work area bisects northerly portion of the site.	Prindle Lane Center – Proposed new office building, restaurant, and hotel. No construction date has been filed.
E-1 System Lateral Take-up and Relay					
New London County, CT					
Lebanon	3.0	3.0	NA	At MP 3.0, site is located northerly from the work area approx. 25 feet.	Agricultural Field Reclamation/Pond Construction – Four- phase reclamation and pond construction on James Grover property. Construction is pending approval and permit from the USACE.
Franklin	7.0	7.5	2,400	Work area crosses the site.	Franklin Hills Estates and Country Club – Country Club and Golf Course/Houses. Clearing activities began January 2014.

TABLE 4.8.3-1 (cont'd)

Planned Residential and Commercial Developments Within 0.25 Mile of the AIM Project

Facility/County, State/ Municipality	Begin MP	End MP	Distance Crossed (feet)[a]	Distance and Direction from Nearest Point Along Construction Work Area	Planned Development, Description, Timing
Franklin	8.1	8.2	625	Work area crosses the parcel; the nearest proposed structure on the parcel is located southwesterly from the work area approx. 400 feet at MP 8.2.	395/2 Flex Center 6,600 sq. ft. multi-use commercial building – The construction of a multi-purpose commercial building and related site improvements on condominium Unit 2 of subject parcel. Construction dates not yet filed.
E-1 System Lateral Loop Extension					
New London County, CT					
Montville	1.0	1.0	20	At MP 1.0, site crosses the work area.	Access Easement/Driveway – Improvement of existing driveway for access to Cochegan Rock for the Mohegan Tribe of Indians of Connecticut. The driveway easement has been defined but no date has been set for construction.
West Roxbury Lateral					
Norfolk County, MA					
Dedham	2.6	2.6	NA	At MP 2.6, the bridge is approx. 60 feet west of the work area at nearest.	Harris Street Bridge Expansion – Massachusetts Department of Transportation (MDOT). MDOT has plans to expand the Boston Providence Turnpike's bridge over Harris Street. In consultation with MDOT, Algonquin incorporated a route variation to avoid conflicts with the bridge expansion.
Suffolk County, MA					
West Roxbury, Boston	3.6	3.6	NA	At MP 3.6, site is located easterly from the work area approx. 300 feet.	New 3-story Residential Development – To be located at 5165 Washington Street on the north side of the street, approx. 300 east of the intersection of Washington & Grove Street/300 east of MP 3.6. Proposal calls for the construction of a 27,000 square foot building comprised of 20 residential units in a 3-story structure and 32 parking spaces. Status: Board approved as of September 5, 2013. Construction date not yet available.
ABOVEGROUND FACILITIES					
Guilford Metering and Regulating (M&R) Station					
New Haven County, CT					
Guilford	NA	NA	NA	500 feet southwest of work area.	Residential Units – Planned Revision, 2614 Boston Post Road. Township approved. No construction date has been filed.
Guilford	NA	NA	NA	240 feet southeast of work area.	Retail Store with Apartments Above – Planned Revision, 2496 Boston Post Road. Township approved. No construction date has been filed.
Guilford	NA	NA	NA	808 feet southeast of work area.	Retail – 2450 Boston Post Road. Planned retail store with 12 apartments to the rear of the building. Township approved. No construction date has been filed.

TABLE 4.8.3-1 (cont'd)

Planned Residential and Commercial Developments Within 0.25 Mile of the AIM Project

Facility/County, State/ Municipality	Begin MP	End MP	Distance Crossed (feet)[a]	Distance and Direction from Nearest Point Along Construction Work Area	Planned Development, Description, Timing
Guilford	NA	NA	NA	535 feet east of work area.	Retail – 2455 Boston Post Road. Planned retail with nine condo units and an office building on the side. Township approved. No construction date has been filed.
Assonet M&R Station					
Bristol County, MA					
Freetown	NA	NA	NA	Abuts the property line on the east side.	New Massachusetts Bay Transportation Authority Station – A proposed Massachusetts Bay Transportation Authority Station to be located at 181 South Main Street in Freetown in immediate proximity to the Assonet M&R Station on parcels 233-023, 233-025, and 233-024. On September 16, 2013, the USACE released the final Environmental Impact Report with generally favorable findings. No construction date has been filed.
Freetown	NA	NA	NA	0.25 mile southwest of the meter station.	Interstate Waste Technology Co. Operating Facility – A high temperature gasifier facility to be located about 0.25 mile southwest of the Assonet M&R Station in Freetown. Interstate Waste Technology Co. proposes manufacturing alternative fuels (methanol, etc.) from salt, copper alloy, and other like materials. They have held an informal meeting with the planning board, although no formal application has been submitted as of September 27, 2013 and no public hearing has been held. The site is located in on parcel ID 233-030 on a site known locally as the Churchill & Banks parcel. Planning is still in early stages of development and permitting and no construction date has been filed.

[a] Where distance crossed is NA (not applicable), the Project would not cross the planned development but would be located within 0.25 mile.

Lots on which residential construction could occur are located throughout the area, between 0 and 400 feet from the proposed Project workspace. Although construction dates are not known, if construction were to overlap, conflicts with residential development on these lots could occur on a temporary basis. However, no permanent impacts would occur because Algonquin would construct the replacement pipeline adjacent to its existing pipelines and within its existing permanent right-of-way, which already precludes the placement of structures over the right-of-way in this area. Algonquin would continue to coordinate with the developers and permitting authorities to identify and address any potential construction-related conflicts.

CSX Railroad Track Replacement

The proposed Project would cross a railroad track owned by CSX Corporation at MP 3.2 along the Stony Point to Yorktown Take-up and Relay segment. The crossing would be about 100 feet in length. CSX has received approval to rehabilitate and replace this segment of railroad track, but no construction date has been set. Algonquin proposes to bore this railroad crossing, which would avoid direct impacts on the track and surrounding right-of-way. Therefore, the AIM Project would not preclude or conflict with CSX's ability to complete its proposed work. If construction of both projects were to overlap, indirect impacts such as increased traffic and noise from construction equipment and dust resulting from soil work would occur on a temporary basis. Algonquin would continue to coordinate with CSX and applicable authorities during the permitting of this crossing to identify and address any potential construction-related impacts.

Champlain Hudson Power Express Project

The Champlain Hudson Power Express Project, a proposed electric transmission project by Transmission Developers, Inc., would include a high-voltage direct-current line within the bed of the Hudson River. The alignment of Algonquin's proposed HDD of the Hudson River would cross this proposed transmission line at some point, although the exact alignment of the transmission line has not yet been determined. The DOE is scheduled to release a final EIS on the Champlain Hudson Project in 2014, and Transmission Developers, Inc. expects to construct the project between 2014 and 2017 but various federal and state permits are still pending. Although construction of both projects could overlap, Algonquin would avoid any in-water work as the proposed HDD would be staged from either side of the river and would place the pipeline far below the river bed. Therefore, the AIM Project would not directly preclude or conflict with the installation of the transmission line. However, indirect impacts such as increased traffic and noise from construction equipment would occur on a temporary basis if construction schedules were to overlap. Algonquin would coordinate with Transmission Developers, Inc. and permitting authorities to identify and address any potential construction-related impacts.

West Point Transmission Project

The West Point Transmission Project is a proposed 1,000 MW underwater power cable proposed by West Point Partners (WPP) to bring untapped power from northern and western New York State to the New York City area. The proposed route begins in Athens, New York, and the cable would be buried below the bottom of the Hudson River for a distance of about 74 miles before making landfall in the Hamlet of Verplanck, New York. The cable would then be buried underground for about 1.5 miles before interconnecting with existing transmission facilities at the Buchanan North Substation in the Village of Buchanan, New York. WPP also proposes to construct a converter station that would occupy about 3.8 acres on a 105-acre parcel owned by Con Edison in the Hamlet of Verplanck. WPP has filed applications with the USACE and the New York State Public Service Commission (NYSPSC).

The proposed route of the AIM Project's Stony Point to Yorktown Take-up and Relay segment also crosses the Hudson River onto the same Con Edison parcel in the Hamlet of Verplanck. The West Point Transmission Project would be about 530 feet west of the AIM Project, at the closest point. WPP's anticipated project schedule, as filed with the NYSPSC in June 2013, indicates that the landfall transition would be constructed between August 2014 and October 2014 (i.e. prior to construction of the proposed AIM Project), and that construction of its converter station would take place sometime between March 2014 and March 2016, which could overlap with Algonquin's proposed HDD activities in 2015. However, based on its consultations with WPP, Algonquin has indicated that construction of the two projects on the Con Edison parcel would not overlap, with AIM Project construction on the parcel completed in 2015, and WPP's construction on the parcel beginning after that point. Should construction of the two projects overlap due to changes in construction schedules, the parcel is large enough to accommodate both projects.

We have received several comments expressing safety concerns about potential interactions between Algonquin's proposed pipeline facilities and the WPP transmission line. A discussion of these safety concerns is provided in section 4.12.3.

Prindle Lane Center

The Prindle Lane Center is a proposed office building, restaurant, and hotel in the City of Danbury, Connecticut. The AIM Project would cross this property for about 600 feet at MP 1.8 along the Southeast to MLV 19 Take-up and Relay segment. No construction date is currently available for the Prindle Lane Center. It is possible that AIM Project construction could conflict with construction of these facilities. Although construction dates are not known, if construction were to overlap, conflicts with development at this site could occur on a temporary basis. However, Algonquin would construct the replacement pipeline adjacent to its existing pipelines and within its existing permanent right-of-way, which already precludes the placement of structures over the right-of-way in this area. Therefore, there would be no new permanent impacts on this development. Algonquin would continue to coordinate with the developers and permitting authorities to identify and address any potential construction-related impacts.

Franklin Hills Estates and Country Club

Franklin Hills Estates and Country Club is a development that includes a golf course, country club, and houses. Clearing activities for construction began in January 2014. The AIM Project would cross this property for about 2,400 feet from MPs 7.0 and 7.5 along the E-1 System Lateral Take-up and Relay segment. A projected completion date is not available for the estates and country club. Depending on the completion date, conflicts between the two projects could occur during construction. However, Algonquin would construct the replacement pipeline adjacent to its existing pipelines and within its existing permanent right-of-way, which already precludes the placement of structures over the right-of-way in this area. Therefore, there would be no new permanent impacts on this area. Algonquin would continue to coordinate with the developers and permitting authorities to identify and address any potential construction-related impacts.

395/2 Flex Center Commercial Development

The 395/2 Flex Center commercial development is a proposed multi-use commercial building in Franklin, Connecticut. The property is currently undeveloped and forested. The AIM Project would cross this property for about 625 feet from MPs 8.1 to 8.2 along the E-1 System Lateral Take-up and Relay segment. The nearest proposed structure associated with the commercial development would be about 400 feet from the AIM Project workspace. A proposed construction date for the commercial development has not yet been filed. Although construction dates are not known, if construction were to overlap, conflicts with development on this property could occur on a temporary basis. However, Algonquin would construct the replacement pipeline adjacent to its existing pipelines and within its existing permanent right-of-way, which already precludes the placement of structures over the right-of-way in this area. Therefore, there would be no new permanent impacts on this development. Algonquin would continue to coordinate with the developers and permitting authorities to identify and address any potential construction-related conflicts.

Cochegan Rock Access Driveway

The Mohegan Tribe of Indians plans to improve an existing driveway for access to Cochegan Rock, a sacred site owned by the tribe in Montville, Connecticut. The surrounding area is undeveloped and forested. The AIM Project would cross this driveway easement at about MP 1.0 on the E-1 System Lateral Loop Extension. No date has been set for construction. Although construction dates are not known, if construction were to overlap, conflicts with improvements to the existing driveway could occur on a temporary basis. However, there would be no new permanent impacts because the pipeline would be installed beneath the driveway and the driveway could continue to be used following installation of the pipeline. Algonquin would continue to coordinate with the tribe and permitting authorities to identify and address any potential construction-related conflicts.

4.8.4 Coastal Zone Management

In 1972, Congress passed the 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 will be conducted in a manner consistent with the program." In order to participate in the CZMP, a state is required to prepare a program management plan for approval by the NOAA, Office of Coast and Management (OCRM). Once the OCRM 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.

Portions of the AIM Project are subject to a federal Coastal Zone Consistency Review because it would: 1) involve activities within the coastal zones of New York and Massachusetts; and 2) require several federal permits and approvals (see table 1.5-1). The Project would not be located within the coastal zones of Connecticut or Rhode Island. New York and Massachusetts have approved CZMPs administered by the NYSDOS and the MAEOEEA, respectively. A description of each state's program, the applicable Project activities, and information provided by Algonquin regarding consistency of the Project with state policies is provided below.

4.8.4.1 New York

The NYSDOS, through the Division of Coastal Resources (DCR), is the lead agency responsible for administering the State's Waterfront Revitalization and Coastal Resources Act, Section 919, as approved by NOAA in 1982. This act provides the NYSDOS with the authority to establish a coastal management program, develop coastal policies, define the coastal boundaries, and establish state consistency requirements. The New York Coastal Management Program requires actions within the coastal zone to be consistent with the state's coastal area policies or a state-approved Local Waterfront Revitalization Program (LWRP). A LWRP is a refinement of the state's coastal policies, developed jointly by the state and a municipality.

The Stony Point to Yorktown Take-up and Relay segment crosses the coastal zone management area associated with the Hudson River in the Town of Stony Point and in the City of Peekskill. Both the Town of Stony Point and the City of Peekskill have approved LWRPs from the NYSDOS that refines and supplements the State's Coastal Management Program. The Town of Stony Point's LWRP was approved in 1994 and the City of Peekskill's LWRP was approved in 2004 (Town of Stony Point, 1994; City of Peekskill, 2004).

Algonquin plans to cross the Hudson River using the HDD method to avoid impacts on aquatic resources and potential impacts on critical environmental areas (CEA). Algonquin filed its consistency assessment application with the NYSDOS on February 27, 2014. In its application, Algonquin described how the AIM Project would be consistent with each of the applicable state coastal policies, as well as with the applicable additional policies of the Stony Point and Peekskill LWRPs. However, concurrence from the NYSDOS has not yet been received. Therefore, **we recommend that:**

- **<u>Prior to construction of the Stony Point to Yorktown Take-up and Relay segment,</u> Algonquin should file documentation of concurrence from the NYSDOS that the Hudson River crossing is consistent with the New York coastal policies, including the Stony Point and Peekskill LWRPs.**

4.8.4.2 Massachusetts

The Massachusetts Office of Coastal Zone Management (MACZM), within the MAEOEEA, 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, 2014).

The proposed new Assonet M&R Station would be located within the Massachusetts coastal zone. However, on February 6, 2014, MACZM determined that due to the limited nature of the work at this site, the Project falls below the threshold requiring federal consistency review.

4.8.5 Public Land, Recreation, and Other 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 P-1 in appendix P.

During pipeline construction within 0.25 mile of the areas identified in P-1 in appendix P, impacts associated with increased traffic, noise, and dust, as well as impacts on visual resources, could occur; however, these impacts would be temporary and limited to the time of construction. Visual impacts on recreation and special interest areas within 0.25 mile of existing aboveground facilities where modifications would occur would be similar to those already experienced. The new West Roxbury M&R

Station would be located on a property identified as an Urban Wilds & Natural Area by City of Boston's Open Space Plan 2008-2014 and identified as "Centre Marsh." However, the property has been identified as "lost," which is defined as "Wilds that have been so obliterated or so altered that any small pieces that are left clearly do not do what the original Wilds did for their neighborhood or for the City" (BNAN, 1990). Therefore, construction and operation of this new facility would not result in significant impacts on this area.

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.

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 Algonquin's E&SCP. Traffic-related impacts would be minimized through implementation of the measures in Algonquin's traffic management plans (see section 4.9.5). 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. To control fugitive dust during construction, Algonquin would apply water or other commercially available dust control agents on unpaved areas subject to frequent vehicle traffic. In addition, we have recommended that Algonquin develop and implement a Dust Control Plan that specifies the mitigation measures to be used for dust abatement (see section 4.11.1).

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 required to restore the woody vegetation to its preconstruction condition. Further, forest land within the new permanent right-of-way would experience permanent impacts because it would be precluded from being 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 P-1 in appendix P. We do not believe the Project would result in significant impacts on these areas. Areas requiring additional site-specific considerations are discussed in detail below by state.

4.8.5.1 New York

Harriman State Park

Harriman State Park is the second largest park in the New York State Parks system, located in Rockland and Orange Counties and managed by the PIPC. The park, at 46,613 acres, holds 31 lakes and ponds; over 200 miles of trails; and a number of recreation areas for camping, swimming, and hiking (New York State Parks, 2013). On its northeastern edge, Harriman State Park borders the 5,000-acre Bear Mountain State Park as well as the United States Military Academy's 16,000-acre forest reserve. Additionally, 18.8 miles of the Appalachian Trail are within the park.

The Project pipeline facilities would cross Harriman State Park in two locations in Rockland County, on the existing right-of-way from about MPs 0.0 to 0.3 in the Town of Haverstraw along the Haverstraw to Stony Point Take-up and Relay segment, and from about MPs 2.5 to 2.6 in the Town of Stony Point (Hamlet of Tomkins Cove) along the Stony Point to Yorktown Take-up and Relay segment. A total of about 4.5 acres of temporary construction workspace would be required for the construction of the pipeline facilities crossing Harriman State Park. Of this, 2.5 acres would consist of existing permanent right-of-way. Algonquin met with the Executive Director of the PIPC on January 8, 2014, and determined that the land use where the pipeline would cross the park is passive recreation with no active trails or public facilities.

No new permanent right-of-way would be added in Harriman State Park; therefore, any impacts would be temporary and limited to the construction period. Although temporary, impacts as a result of tree clearing would be long term. Construction would take place during the summer months of 2016, when recreational use of the park would be at a peak. However, no active public facilities are located in the Project area so there would be no direct impacts on recreational use of the park during construction. Any interaction with the public during construction would be mitigated with appropriate monitoring, use of safety devices, and signage. As part of its easement negotiations, Algonquin has agreed to complete a tree inventory and utilize erosion and sediment control procedures during construction. We have also recommended that Algonquin provide us with any additional avoidance and mitigation measures developed in consultation with NYSOPRHP and PIPC (see section 4.6.1.5).

Cheesecote Mountain Town Park

Cheesecote Mountain Town Park is owned by the Town of Haverstraw and contains 217 acres of land and a 6-acre pond (Cheesecote Reservoir). The park is open to the general public daily from April 1 through October 31st (Town of Haverstraw, 2014). The construction right-of-way associated with the Haverstraw to Stony Point Take-up and Relay segment of the Project would be located on town-owned property on Cheesecote Mountain, but would be about 0.4 mile west of the town park itself. The park is accessed from Willow Grove Road in the Town of Haverstraw, about 0.5 mile from the construction right-of-way. The portion of town property that would be crossed by the Project is not a designated public recreational area, and is not used for recreational or access purposes. Therefore, although Project construction would occur during the park’s open season in 2016, construction would not have an impact park use or access. Temporary visual impacts associated with construction would be consistent with the existing visual character of the area, because an existing overhead transmission line occupies the same area as the Project right-of-way.

Letchworth Village Cemetery

The Letchworth Village Cemetery is located in the Town of Haverstraw and owned by the State of New York and has been previously determined eligible for listing in the NRHP by the New York SHPO. The Project would cross a portion of open area within the cemetery on existing right-of-way at approximate MP 0.8 along the Haverstraw to Stony Point Take-up and Relay segment.

The AIM Project would not have any permanent impacts on land use within the cemetery because the replacement pipeline would be located within Algonquin’s existing permanent right-of-way, which already crosses the cemetery property. During the construction period, visits to the historic cemetery would be temporarily impacted by construction noise and dust. Letchworth Village Cemetery has been determined eligible for the NRHP. The boundaries for this resource will be delineated and avoided (see section 4.10.1). Algonquin must file documentation that it has completed NHPA section 106 consultation with the New York SHPO before construction could begin (see section 4.10.5).

Camp Bullowa

Camp Bullowa is a private facility owned by the Hudson Valley Council of the Boy Scouts of America. The camp consists of about 300 acres of fields and trails that serve local youth through Boy Scout programs. Activities within the camp include a shooting sports area and fishing and boating on Lake Boyce (Hudson Valley Council, 2010). The camp is available for use year-round by Boy Scout units and outside groups.

The Stony Point to Yorktown Take-up and Relay segment of the Project would cross Camp Bullowa on existing right-of-way for a distance of about 0.6 mile, from MPs 0.7 to 1.3. The entrance to the camp is located off Franck Road, immediately adjacent to the existing right-of-way. The portion of the camp that would be crossed by the Project is about 200 feet north of the camp recreation area, and is also occupied by an existing high-tension power line.

Project construction would occur during the summer of 2016; therefore it is likely that the camp could be in use during construction. Temporary construction noise, dust, and traffic would be the primary impacts associated with construction within Camp Bullowa. Impacts on the camp would be mitigated with appropriate monitoring, safety devices, and signage. Algonquin has committed to continue coordinating with the Hudson Valley Council of the Boy Scouts to address any specific concerns and ensure the safety of all scouting members at the camp.

Simpson Memorial Church

Simpson Memorial Church, Inc. is a property in the Hamlet of Tompkins Cove with land use classified as Institutional Quasi Public (Rockland County Planning Department, 2013). The Stony Point to Yorktown Take-up and Relay segment of the Project would cross this property between MPs 2.8 and 3.0. A new easement would be required for this crossing.

The crossing of the church property would be located entirely along a wooded area. There is no church structure in this area, and the area is not used for church or recreational functions. Therefore, there would be no direct impact on public use of the property. Temporary noise, dust, and traffic impacts would occur during construction, but these impacts would be minimized by screening from the surrounding wooded area in addition to the general measures identified above.

Washington-Rochambeau National Historic Trail (New York Portion)

The Washington-Rochambeau National Historic Trail (NHT) is managed by the National Park Service (NPS) and covers over 680 miles of land and water used by General Washington and General Rochambeau during the siege of Yorktown in the War of Independence. This trail crosses major rivers, metropolitan areas, state parks, and rural and suburban communities from Virginia to Massachusetts. The NHT also follows many roads that have been in existence since the 18th century (NPS, 2014a).

In New York, the Project would cross the NHT at one location in Stony Point and three locations in Cortlandt. The points crossed are all on existing paved public roadways that have been designated as part of the NHT: Route 9W/202-N. Liberty Drive (MP 3.0), Broadway Street (MP 4.8), Route 9A (MP 5.8), and Route 9 (MP 5.9). Algonquin has consulted with the NPS, and the NPS indicated that they do not have any concerns regarding the proposed Project. Algonquin also met with the New York State Department of Transportation (NYSDOT) on April 17, 2014, and NYSDOT personnel indicated that they do not foresee any conflict with the NHT or any need for additional mitigation measures, since the NHT is along paved roads and the Project would not alter the existing road use. Because the NHT is co-located with modern paved roads at these points, the Project would not have any impact on the recreational use or aesthetic character of the NHT.

St. Patrick's Church

St. Patrick's Church is located in the Hamlet of Verplanck with land use classified as Institutional Quasi Public (Westchester County, 2009). The Stony Point to Yorktown Take-up and Relay segment of would cross this property at MP 4.1. A new easement would be required for this crossing as it is in the portion of this pipeline segment that deviates from Algonquin's existing right-of-way. In addition, the ATWS associated with the pullback area of the Hudson River HDD would be located on the property.

The workspace associated with the Project would be located on the church's paved parking lot. Therefore, construction of the Project would restrict parking and could interfere with access to the church. Temporary noise and dust impacts would also occur during construction. After construction, the parking lot would be returned to its prior use; therefore, there would be no permanent impacts associated with the new easement. However, without mitigation, construction could result in significant adverse impacts. Algonquin should coordinate with St. Patrick's Church to avoid construction activities during church services, and minimize disruption to other uses of the church facility. To ensure that impacts on the church are minimized and reduced to less than significant levels, **we recommend that:**

- **<u>Prior to the end of the draft EIS comment period</u>, Algonquin should file with the Secretary a site-specific construction plan for St. Patrick's Church. The plan should be developed in consultation with the church leadership and include:**

  a. details on the location of church facilities relative to the proposed construction activities;

  b. a description of the construction activities that would occur at the site;

  c. the timing of construction activities (i.e., days of the week and hours of the day);

  d. specific measures that would be implemented to minimize conflicts with parishioners; and

  e. **documentation of consultation with St. Patrick's Church officials.**

Indian Point Energy Center

The IPEC is a nuclear powered generating facility owned by Entergy in the Village of Buchanan, New York. Algonquin's existing pipeline right-of-way crosses through the IPEC property on the east side of the Hudson River Crossing. The Stony Point to Yorktown Take-up and Relay segment of the Project would be located south of the existing right-of-way but would still include construction right-of-way within the IPEC facility property, and the east side of Algonquin's proposed HDD crossing of the Hudson River would include a staging area located on the IPEC property. The Project would cross the IPEC property for a total of 2,159 feet from about MPs 4.4 to 4.9. The Project would require about 2.4 acres of new permanent easement on the IPEC property, along with 1.9 acres of temporary workspace. The IPEC lands that would be crossed by the Project are located over 1,600 feet from the power plant structures, with other road, parking, and industrial/commercial land uses in between.

We received a comment from the New York State Attorney General's Office stating that Algonquin's pipeline is near a potential location for a closed-cycle cooling system for Indian Point Unit 3, and citing concerns that the pipeline could impede the construction of such a cooling system. This concern refers to Algonquin's existing pipelines on the IPEC property, immediately south of the IPEC security barrier. The proposed route would be located about 0.5 mile south of the IPEC security barrier, and would not impact construction of a closed-cycle cooling tower. Algonquin stated that Entergy, during consultation on May 16, 2014, has agreed that the proposed southern route for the AIM pipeline would not interfere with future plans to construct closed-cycle cooling towers.

We also received several comments expressing safety concerns about the proximity of the AIM Project facilities to the IPEC nuclear facilities. Algonquin is engaged in ongoing consultation with IPEC regarding the proposed AIM Project. The proposed AIM Project alignment within the IPEC property would be located outside the facility's primary security zone. Algonquin would coordinate all construction activities at this site with Entergy's IPEC site manager. See section 4.12.3 for additional discussion of safety-related concerns associated with the IPEC facility.

Buchanan-Verplanck Elementary School

The Buchanan-Verplanck Elementary School is a public elementary school serving about 300 students in Westchester County. The Stony Point to Yorktown Take-up and Relay segment of the AIM Project would be located adjacent to the back portion of the school property between MPs 4.9 and 5.0. The Project construction right-of-way and workspace would be located about 450 feet away from the school facility itself at its closest point. The area between the school and the proposed Project workspace is wooded.

The majority of Project construction adjacent to the school property would take place during the summer of 2016; therefore, school would not be in session and no significant adverse impacts would occur. However, some construction activity could overlap with the beginning or end of the school year. The intervening wooded land would provide a visual buffer to construction activities, but construction noise and dust could still cause a temporary disturbance to the school's operation. Therefore, **we recommend that:**

- **<u>Prior to the end of the draft EIS comment period</u>, Algonquin should file with the Secretary a site-specific construction plan for the Buchanan-Verplanck Elementary School. The plan should be developed in consultation with the school management and include:**

  a. details on the location of school facilities relative to the proposed construction activities;

  b. a description of the construction activities that would occur adjacent to the site;

  c. the timing of construction activities (i.e., months of the year, days of the week, and hours of the day);

  d. specific measures that would be implemented to minimize conflicts and impacts on the school and its students; and

  e. documentation of consultation with Buchanan-Verplanck Elementary School officials.

Village Park (Village of Buchanan)

This Village Park, owned by the Town of Cortlandt Manor – Village of Buchanan, is a municipal park about 43 acres in size. According to the County of Westchester Department of Planning, the land use within the park is classified as open space designated for municipal and park purposes (Westchester County, 2014a). The Stony Point to Yorktown Take-up and Relay segment of the Project would cross the park at about MP 5.1.

The Project would cross this park for about 313 feet along a wooded area at the back of the property. This area is about 165 feet from the portion of the property used for public recreation. Construction activities would be completed within a few months between March and October 2015, which coincides with the recreation season. The intervening woodland would provide a visual buffer during project construction; however, temporary construction noise and dust impacts could still occur. A new easement would be required for construction and operation of the pipeline as it falls within the portion of this segment that deviates from Algonquin's existing right-of-way. However, the right-of-way would not preclude use of the park. Algonquin has committed to coordinating with the Town of Cortlandt (the landowner for the Village Park) regarding the proposed crossing of this park.

Blue Mountain Reservation

The Blue Mountain Reservation is a 1,538-acre park located in the Town of Cortlandt, New York, and managed by Westchester County. The reservation is characterized by steep topography, rugged terrain, and the wide presence of exposed bedrock. The reservation offers trails for hiking and biking, including the two peaks of Blue Mountain and Mt. Spitzenberg (Westchester County, 2014b). The Stony Point to Yorktown Take-up and Relay segment of the AIM Project would cross the Blue Mountain Reservation from about MPs 6.7 to 8.1 and again between MPs 8.4 and 8.5.

The new 42-inch-diameter pipeline would replace the existing 26-inch diameter pipeline within a 6-foot-wide permanent easement granted in 1952 by the Westchester County Park Commission and the Westchester County Board of Supervisors. That easement also provides for a 75-foot-wide maintenance easement. Upon completion of construction, Algonquin would file and record as-built drawings with the county. A total of about 18.8 acres of temporary construction workspace would be required within the Blue Mountain Reservation for construction of the AIM Project. Of that amount, 1.1 acres would be within existing permanent right-of-way. No new permanent right-of-way would be added within the reservation, and no new easement would be required. The AIM Project would require ATWS within the Blue Mountain Reservation for up to a 6-month period; the process for approval of this ATWS would be defined by Westchester County.

Construction noise, dust, tree clearing, and traffic would temporarily impact the Blue Mountain Reservation during Project construction. Surrounding woodland would largely screen visual impacts on recreational/aesthetic use of the reservation. After construction, all impacted areas within the Reservation would be returned to their preexisting use, and although long-term temporary impacts would occur as a result of tree clearing, no permanent impacts would occur.

We received comments regarding the need to minimize construction impacts and protect the recreational use and aesthetic character of the park. On January 28, 2014, Algonquin met with Westchester County officials to address specific issues related to construction of the pipeline through the reservation and continued operation of Algonquin's facilities, and to request approval for additional workspace from the county. As mitigation for crossing the reservation, Algonquin would pay rent to Westchester County for its ATWS, and would pay compensation for trees removed along the right-of-way.

New York City Catskill Aqueduct

The New York City Catskill Aqueduct channels New York City's water supply system from the Catskill/Delaware Watersheds. The Stony Point to Yorktown Take-up and Relay segment of the AIM Project would cross the Catskill Aqueduct at approximate MP 10.3 on Croton Avenue near the Cortlandt M&R Station. The NYCDEP manages this aqueduct.

As currently proposed, the 26-inch-diameter pipeline and casing pipe that crosses the aqueduct would be removed and the 42-inch-diameter pipeline would be installed within a new casing pipe above the aqueduct. As with the existing pipeline, the new pipeline would be located above the aqueduct and would rest on concrete pads to provide adequate separation and protection for the aqueduct pipe. Algonquin continues to consult with the NYCDEP regarding this crossing. Algonquin is currently evaluating an alternative that would relocate this segment 50 feet to the south of the existing 26-inch pipeline. This modification would place the new 42-inch pipeline at the edge of Algonquin's existing right-of-way and would require additional permanent easement and temporary construction workspace (see section 3.5.4). As discussed in section 4.3.2, we are recommending that Algonquin provide a site-specific crossing plan developed in consultation with the NYCDEP prior to the end of the draft EIS comment period.

Sylvan Glen Park Preserve (Granite Knolls Park West)

The Sylvan Glen Park Preserve is a park located on the west side of Stony Street in the Town of Yorktown. The preserve is the site of a former quarry that supplied honey-colored granite for the approaches to the George Washington and Whitestone bridges. The reserve contains 5.0 miles of trails used for hiking and dog walking and is open year-round. Old cables, discarded slabs of granite, and an explosive shed are a few of the remnants along the trails in the reserve (New York-New Jersey Trail Conference, 2014).

The Stony Point to Yorktown Take-up and Relay segment of the Project crosses parcels within the Sylvan Glen Park Preserve (also referred to by commentors as Granite Knolls West) terminating at the west side of Stony Street. The crossings would occur on existing right-of-way for a total distance of about 1.2 miles, from about MPs 11.0 to 11.8 (with a short separation where the pipeline leaves the park property) and MPs 11.9 to 12.3. A new launcher/receiver and pressure regulating facility would be constructed and operated at MP 12.3 on a parcel within Sylvan Glen Park Preserve. In addition, Algonquin proposes to use 15.0 acres in Sylvan Glen Park Preserve as a pipe and contractor ware yard (Yorktown Yard).

In 1952, Loyola Seminary granted Algonquin a 50-foot-wide permanent easement for a pipeline and appurtenant facilities under and upon the land in what is now the Sylvan Glen Park Preserve. The Town of Yorktown acquired the Loyola Seminary property in 1981 for park purposes. The conversion to a park use did not extinguish Algonquin's existing easement. The AIM Project replacement pipeline would be installed within the existing permanent easement. The new launcher/receiver and pressure regulator facility would require about 0.5 acre of new permanent easement. ATWS and the Yorktown Yard would cover a larger area but existing for no more than 10 months.

The Town of Yorktown identified two hiking trails (High Quarry and Turtle Pond trails) that it wished to remain open during Project construction, and a historic lime kiln that it expects the New York SHPO would want maintained rather than demolished. We also received a scoping comment expressing concern about damage to this kiln. Phase II archaeological evaluation is in progress for this site (see section 4.10.1).

Construction activities, noise, and dust would impact recreational use of this area. Algonquin would place timber mats over the High Quarry and Turtle Pond trails, as requested by the town, in order to keep them open during construction. Algonquin would mitigate construction impacts by installing safety fencing around excavations left overnight, installing signage, and watering regularly to control fugitive dust. After the construction period, Algonquin would return the construction area to its preexisting use; however, 0.5 acre of land would be permanently impacted by the new easement for the launcher/receiver and pressure regulator facility. Algonquin must file documentation that it has completed NHPA section 106 consultation with the New York SHPO before construction could begin (see section 4.10.5).

New York Critical Environmental Areas

In New York State, local agencies may designate specific geographic areas within their boundaries as CEAs. State agencies may also designate geographic areas they own, manage, or regulate. To be designated as a CEA, an area must have an exceptional or unique character with respect to one or more of the following:

- a benefit or threat to human health;
- a natural setting (e.g., fish and wildlife habitat, forest and vegetation, open space and areas of important aesthetic or scenic quality);
- agricultural, social, cultural, historic, archaeological, recreational, or educational values; or
- an inherent ecological, geological, or hydrological sensitivity to change that may be adversely affected by any change.

Algonquin identified two CEAs that would be crossed by the AIM Project (NYSDEC, 2014b):

- Hudson River CEA: The Stony Point to Yorktown Take-up and Relay segment in Westchester County would cross the Hudson River from MPs 3.2 to 3.9. This area is designated as a CEA. The Project would cross the Hudson River using the HDD method to avoid impacts on the CEA. Specifically, the crossing would be south of the Hudson River Mile 44-56 habitat, and avoid the Iona Island and Haverstraw Bay Significant Coastal Fish and Wildlife Habitats located to the north and south, respectively. The Project would also avoid the Hudson Highlands State Park Preserve, which lies within the coastal zone north of the Project. Therefore, no impacts on these areas would occur.
- County and State Park Lands CEA: The Stony Point to Yorktown Take-up and Relay segment of the Project would cross this CEA from MPs 6.7 to 8.1 and again from MPs 8.4 to 8.5. This CEA area is associated with the Blue Mountain Reservation (see the discussion of the Blue Mountain Reservation above).

State of New York Parkland Alienation

In New York, the Public Trust Doctrine requires state legislative approval when there is a "substantial intrusion on parkland for non-park purposes, regardless of whether there has been an outright conveyance of title and regardless of whether the parkland is ultimately to be restored" (Friends of Van Cortlandt Park v. City of New York, 2001). Therefore, municipalities proposing to permit a non-park use on parkland must seek approval from the New York State Legislature, a process called "alienation of parkland." New York courts, nonetheless, have recognized that there are de minimis exceptions to the Public Trust Doctrine that have a time and area component. In particular, minor uses of parkland for non-park purposes that do not interfere with public use do not require legislative approval (Hand v. Hospital for Special Surgery, 2012; Roosevelt Island Residents Assoc. v. Roosevelt Island Operation Corp., 2005). In addition, construction projects of less than 1 year generally do not constitute alienations, particularly when park uses can continue to go on around the construction (Hand v. Hospital for Special Surgery, 2012; Powell v. City of New York, 2011).

As discussed above, the AIM Project would cross the Blue Mountain Reservation, the Sylvan Glen Park Preserve, Cheesecote Mountain, and a Village Park in the Village of Buchanan. With regard to state parks or other lands owned by New York State agencies, such as the crossing in Harriman State Park, Rockland County, alienation is not triggered. New York State's parkland law authorizes state agencies to approve easements and licenses in parkland for utilities serving a public purpose (N.Y. Parks & Hist. Pres. L. §13.06).

The AIM Project replacement pipeline would be located underground and thus would not permanently affect the use of the surface land for park purposes in the parks that would be crossed by the Project. The construction period within each individual park would be less than 1 year. Each state or local park management agency would decide whether to seek alienation for the proposed activities on their lands.

4.8.5.2 Connecticut

Ridgewood Country Club

Ridgewood Country Club is a private 18-hole golf course located on Franklin Street just north of Interstate 84 in the City of Danbury (Ridgewood Country Club, 2013). The club is owned by Ridgewood County Club, Inc. and offers golf, recreational (tennis and swimming), and dining memberships. A pro golf shop is also located on-site as well as a banquet, patio, garden room, and grill room. The club's season is May through September with June, July, and August being the most active months for the club. The Southeast to MLV 19 Take-up and Relay segment of the Project would border the northeastern side of the Ridgewood Country Club property and cross a small portion of it on existing right-of-way at the northern tip between Franklin Street Extension (MP 3.9) and Kohanza Street (MP 4.2). The portion of the Club property that would be crossed includes part of the golf course.

In October 2013, Algonquin met with the General Manager of the club to discuss the proposed Project and any concerns the club may have. In a letter to the Commission dated October 24, 2013, the club requested that Algonquin schedule the proposed work between October 2015 and April 2016 because this is their off-season and would cause the least interruption. Algonquin has agreed to this timeframe. Therefore, there would be no significant impacts on the Ridgewood Country Club, as temporary construction impacts would be restricted to the club's off-season and there would be no new permanent easement.

Trumbull Cemetery

The Trumbull Cemetery is located in the Town of Lebanon and managed by the Town of Lebanon Historical Society Museum and Visitor Center. It contains many historic headstones and notable graves, including Revolutionary War Governor John Trumbull and William Williams, a signer of the Declaration of Independence (Town of Lebanon, 2014). The E-1 System Lateral Take-up and Relay segment of the AIM Project would be adjacent to the cemetery property for about 400 feet at MP 1.9.

This cemetery is listed in the Connecticut State Register of Historic Places and would be avoided (see section 4.10.1).

Aspinall Recreation Complex and Lebanon Elementary School

The Aspinall Recreation Complex is located in the Town of Lebanon. The Town of Lebanon acquired the 51-acre Aspinall property in 1977 and developed it for recreation in the early 1980s. The property is managed by the Lebanon Recreation Commission and is the major non-school recreational facility in the town. It is located adjacent to Lebanon Elementary School and includes ball fields, tennis courts, and a pavilion (Town of Lebanon, 2013). The E-1 System Lateral Take-up and Relay segment of the AIM Project would cross this property on existing right-of-way from about MPs 2.0 to 2.2.

The portion of the property that would be crossed by the Project is forested and is not developed for recreational use. The crossing would be entirely located within a wetland; mitigation would be conducted in accordance with Algonquin's E&SCP. The adjacent Lebanon Elementary School is actually located closer to the right-of-way than any of the recreational facilities on the Aspinall Complex property. The Project workspace would be about 750 feet northeast of the school (at its closest point). The intervening land is heavily forested, and would provide screening from visual, noise, and dust impacts during Project construction. The shared entrance to the school and the recreation complex would be over 1,150 feet from the access point to the Project workspace along Exeter Road; therefore, construction traffic would not interfere with access to the facilities.

Senator Thomas J. Dodd Memorial Stadium

Dodd Stadium is a minor league baseball stadium located in and owned by the City of Norwich. It is affiliated with the Detroit Tigers Minor League Baseball team. The stadium opened in 1995 and is primarily used for baseball, with a seating capacity of 6,270. It is most active during the baseball season (June through September) and closed during the winter. The E-1 System Lateral Take-up and Relay segment of the Project would cross the outskirts of the stadium property on existing right-of-way for a total of about 1,489 feet (from about MPs 8.7 to 8.9 and MPs 8.9 to 9.0).

The Project crosses a forested area southwest of the stadium and its associated parking lot. The Project workspace would be about 40 feet from the rear (outfield) edge of the stadium structure, at its closest point. The Project would not interfere with use of the stadium, since it would not cross any developed stadium facilities. However, construction would occur between April and October 2015 (i.e., spring, summer, and early fall), which is the high use period for the stadium. Temporary noise, dust, and visual impacts would be mitigated by a strip of forest left intact as a buffer between the Project area and the stadium. Algonquin would also regularly water the construction area to control dust, and would install safety fencing and signage. Project traffic would not impact access to the stadium because the road that provides stadium access, Stott Avenue, would not be utilized by construction vehicles. Although Algonquin's existing permanent right-of-way would be expanded to accommodate the replacement pipeline along this segment, operation of the pipeline facilities would not create any new restrictions or conflicts with use of the stadium. However, to ensure that impacts on the stadium during construction are minimized, **we recommend that:**

- **<u>Prior to the end of the draft EIS comment period</u>, Algonquin should file with the Secretary a mitigation plan for Dodd Stadium. The plan should be developed in consultation with the stadium ownership and include:**

  a. details on the timing of construction relative to scheduled games;

b. **specific measures that would be implemented to minimize conflicts with the stadium, particularly when games are in progress; and**

c. **documentation of consultation with the stadium ownership.**

Watrous Park

Watrous Park is located on a 75.1-acre property owned by the Town of Cromwell, which also houses Cromwell Middle School (Cromwell Recreation Department, 2011). Watrous Park is located on a portion of the property behind the school, accessed from Geer Street. Facilities include a pavilion, volleyball courts, tennis courts, basketball courts, a playground, walking trails, softball fields, and a skate park. The park is open daily from 7:00 a.m. to 10:00 p.m. during the summer months and 7:00 a.m. to sunset the rest of year. The Line-36A Loop Extension would cross this property on existing right-of-way from about MPs 0.5 to 0.8.

The construction workspace would be located over 100 feet away from park recreational fields at its closest point, and more than 0.25 mile from the middle school, which shares the property. Because construction would occur primarily during the summer months, users of the nearest park baseball field could experience temporary noise and dust impacts during construction. However, the Project would be located in a forested area that would provide screening to minimize these impacts and avoid visual impacts. Project traffic would not impact access to Watrous Park or Cromwell Middle School, because Geer Street, the main access, would not be utilized by construction traffic. The Project would not have any new permanent impacts on the park.

Cromwell Fire District Property

Managed by the Town of Cromwell, the Cromwell Fire District is a Special Act District created by the Legislature of the State of Connecticut. The District maintains and services the water distribution, pumping, and treatment facilities that service the Town of Cromwell as well as providing fire protection and ambulance service (Cromwell Fire District, 2013). The Line-36A Loop Extension would cross a property owned by the Cromwell Fire District on existing right-of-way from about MPs 1.1 to 1.2. This 7.6-acre property is used for potable public water wells and is occupied by a pump house.

Algonquin has met with representatives of the Cromwell Fire District to determine the location of public water supply wells on the property and to discuss the protection of aboveground supply valves within the proposed Project workspace. Algonquin has committed to continue coordinating with the Fire District to ensure the protection of well valves on the property. Project construction and operation would not impact the function of this facility.

Mohegan Tribe of Indians Property

This property owned by the Mohegan Tribe of Indians is located in the Town of Montville. The E-1 System Lateral Loop would cross the property on existing right-of-way for a total of about 279 feet (at approximate MP 1.1). This land is held in trust by the Mohegan Tribal Nation and is not classified as Sovereign land.

The portion of the property that would be crossed by the Project is forested and undeveloped. Algonquin would expand its existing 30-foot-wide permanent easement by an additional 20 feet to accommodate the new 12-inch diameter pipeline. Algonquin met with representatives of the Mohegan Tribe regarding the proposed Project in June 2013. According to Algonquin, the representatives did not express any concerns about the Project. The expanded permanent easement would permanently impact about 0.1 acre of forest/woodland on the property. Impacts on areas outside the new permanent easement would be temporary, and these areas would be allowed to return to their preconstruction condition. Algonquin has committed to continuing discussions with the tribe to discuss the additional permanent easement and temporary workspaces that would be needed for the Project.

State Protected Open Space (Proposed Bike Trail)

The State of Connecticut has proposed a new bike trail about 120 feet (at nearest) to the east of the existing Farmington M&R Station. Algonquin has reduced its proposed workspace to avoid conflict with the construction of the bike trail. The Town of Farmington has agreed to install a driveway apron to provide access for Algonquin across the bike trail. Therefore, there would be no impact on the development of this trail.

Quinebaug and Shetucket Rivers Valley National Heritage Corridor

The Quinebaug and Shetucket Rivers Valley National Heritage Corridor is located in northeastern Connecticut and portions of Massachusetts. It is an area known for its rural character with rolling hills, farmland, and classic New England scenery. The corridor contains some of the largest unbroken forests in southern New England. In 1994, Congress designated the Quinebaug and Shetucket Rivers Valley as a national heritage corridor to recognize the valley's unique natural and historical qualities and because it is one of the last remaining stretches of green in the Boston to Washington, D.C. heavily urbanized corridor (NPS, 2014b; Connecticut General Assembly, 2000). In 1999, Congress enlarged the corridor to include Quinebaug and Shetucket River Valley towns in both Massachusetts and Connecticut, now numbering 35 in all. The corridor is spread over 695,000 acres. The valley encompasses two scenic rivers, 80 ponds and lakes, more than 130 miles of hiking trails, and habitat for several different species of animals. The region has some 43 historic towns, 118 historic sites, and museums and several neighborhoods that preserve historic structures. Walking and hiking are two of the most popular recreation activities in the park.

Although the corridor is a federally designated national heritage corridor, the federal government does not own or manage any of the associated lands. The NPS indicated that the Last Green Valley, a local non-profit stewardship organization, should be contacted for all comments and questions regarding the corridor. Algonquin contacted The Last Green Valley to provide Project materials in April 2014, and The Last Green Valley is currently reviewing the Project.

In Connecticut, the proposed Project facilities would be located within several municipalities that are included in this corridor, including the City of Norwich, the Town of Chaplin, the Town of Pomfret, the Town of Putnam, and the Town of Windham, where aboveground facilities would located. The facilities would all be located on private land, and with the exception of the new Oakland Heights M&R Station, they are all preexisting facilities. Modifications at the existing facilities would be consistent with the existing visual character and would not impact the aesthetic character of the corridor. Operation of the new Oakland Heights M&R Station would newly encumber about 1.4 acres of forest/woodland within the corridor, resulting in a minor, but permanent, impact on the visual character at that location. None of the Project facilities would be located in any portions of the corridor designated for public recreational use; therefore, construction and operation of the Project would not impact recreational use of the corridor.

4.8.5.3 Massachusetts

Norfolk Golf Club

The Norfolk Golf Club is a private, nine-hole golf club. The West Roxbury Lateral would cross the Norfolk Golf Club property, including a portion of the golf course, between East Street and Canton Street from about MPs 0.0 to 0.2. Since the West Roxbury Lateral would be constructed primarily during the summer months, the Project would temporarily restrict use of the portion of the golf course crossed during the construction period. After the construction period, the property would be restored to its preexisting use and no permanent impacts would occur. Algonquin consulted with the club and incorporated a minor route variation at the club's request (see table 3.5.2-1), and is currently evaluating an appropriate construction schedule to minimize impacts on use of the club. With an appropriate construction schedule, impacts on this area would not be significant. Therefore, **we recommend that:**

- **<u>Prior to the end of the draft EIS comment period</u>, Algonquin should file with the Secretary the proposed construction schedule for the Norfolk Golf Club that would minimize impacts on use of the club, any other measures developed in consultation with the club owners to minimize impacts on the golf course during construction, and documentation of consultation with the club owners.**

Gonzalez Field

Gonzalez Field is a public athletic field located in the Town of Dedham at the intersection of High Street and East Street, adjacent to the Boston-Providence Highway (Dedham Youth Soccer Association, 2014). This field is owned by the Town of Dedham and is also home to the Dedham Youth Soccer Association. The West Roxbury Lateral would traverse the center of Gonzalez Field from about MPs 2.4 to 2.6.

The proposed pipeline crosses between two soccer fields located on the property, and would also cross the associated parking lot. Construction of the Project, especially during the summer months, would therefore disrupt recreational use as well as access and parking. After the construction period, the property would be restored to its preexisting use and no permanent impacts would occur. Algonquin has discussed potential impacts on the field with Town officials, and the Town Board of Parks and Recreation has granted permission for Algonquin to conduct geotechnical, environmental, and cultural resource investigations within the field. Algonquin has committed to continue consultation with the Board to minimize impacts and discuss possible mitigation requirements. Without mitigation, adverse impacts on this area could be significant. Therefore, to ensure that impacts on Gonzalez Field are minimized, **we recommend that:**

- **<u>Prior to the end of the draft EIS comment period</u>, Algonquin should file with the Secretary a site-specific construction plan Gonzalez Field. The plan should be developed in consultation with the Town of Dedham and include:**

  a. details on the location of recreational and associated facilities relative to the proposed construction activities;

  b. a description of the construction activities that would occur at the site;

  c. the timing of construction activities (i.e., months of the year, days of the week, and hours of the day);

d. **a description of the construction methods that would be used;**

e. **specific measures that would be implemented to minimize conflicts and impacts on the field and its access and parking lot; and**

f. **documentation of consultation with the Town of Dedham.**

Washington-Rochambeau National Historic Trail (Massachusetts Portion)

The Washington-Rochambeau NHT is described above (see section 4.8.5.1). In the Town of Dedham, the proposed West Roxbury Lateral would be co-located with the NHT along Washington Street from the Dedham Mall northeast to Grove Street (MPs 3.0 to 3.7).

As noted above, the NPS has indicated that they do not have any concerns regarding the proposed Project and the NHT. Algonquin has also consulted with the Town of Dedham Department of Public Works (DPW) to discuss specific construction procedures along Washington Street; the DPW indicated that no additional mitigation related to the NHT would be required. Because the NHT is collocated with a modern paved road, the Project would not have any impact on the recreational use or aesthetic character of the NHT.

Mother Brook Reservation

The Mother Brook Reservation contains the riparian corridor surrounding Mother Brook, a historic hand-dug canal. Managed by the Massachusetts Department of Conservation and Recreation (MADCR), the Mother Brook Reservation's corridor totals 3.7 miles in length and encompasses a total area of about 47.7 acres. Of this amount, 1.8 miles (15.1 acres) are located in the Town of Dedham. Originally built in 1639 to divert water from the Charles River to the Neponset River to create hydropower potential for mills, the brook is now used as part of a flood-control system that diverts water from the Charles River to the Neponset River (Mother Brook Arts and Community Center, 2014). Based on a taking made in 1958 for the limited purpose of flood control, the MADCR holds several permanent easements along Mother Brook along the proposed AIM Project alignment which permit the MADCR to access private property "… for the purpose of dredging and otherwise improving Mother Brook so as to relieve flood conditions and improve the water quality thereof and to construct, reconstruct and repair such dams and gates as may be required…" (MADCR, 2008). These easements do not allow public access, and the underlying fee interest remains with private landowners.

The West Roxbury Lateral would cross the Mother Brook Reservation, and Mother Brook itself, off Washington Street between Eastbrook Road and Post Lane in Dedham (MP 3.1). Algonquin incorporated a minor route variation in this area (see table 3.5.2-1). Algonquin would install the crossing of Mother Brook using a dry crossing method. After construction, the stream would be restored to preconstruction elevation contours. Because the MADCR's easement in this area does not allow public access, construction and operation of the Project would not impact any public use of the Mother Brook Reservation. Operation of the Project would not impact the MADCR's ability to access the reservation and perform flood control activities.

Brookdale Cemetery

Brookdale Cemetery is a non-denominational municipal cemetery located off Washington Street in the Town of Dedham (Town of Dedham, undated). The West Roxbury Lateral would traverse the property boundary along East Street from about MPs 2.8 to 3.1.

The Project would be collocated with East Street in this area, and its operation would not have any impact on the cemetery. During the construction period, pipeline construction along East Street would be visible and audible from the northwestern portion of the cemetery. The cemetery's main entrance is located on Brookdale Avenue, over 1,000 feet from any Project workspaces, but Project construction could disrupt access to the cemetery for short amounts of time through a secondary entrance gate on East Street. However, these impacts would be temporary and minor.

Mary Draper Playground

The Mary Draper Playground is set back from Washington Street in the West Roxbury section of Boston, and contains a pool, playgrounds, a basketball court, and ball fields (West Roxbury Patch, 2014). The facilities are open year-round. The West Roxbury Lateral would be adjacent to the playground's entrance from Washington Street near MP 3.6.

The Project would be collocated with Washington Street in this area, and its operation would not have any impact on the playground. The playground field is set back about 300 feet from the Washington Street entrance and is screened by several large residential structures; therefore, Project construction along Washington Street would not have any significant visual or noise impact on users of the playground. However, Project construction could temporarily disrupt access to the playground from Washington Street. This disruption would be short in duration, and would not significantly impact access to the playground as another entrance is located on Stimson Street.

Centre Marsh

The proposed West Roxbury M&R Station is located on a property identified as an Urban Wilds & Natural Area by City of Boston's Open Space Plan 2008-2014 (City of Boston, 2008). This property is listed as "Centre Marsh" (BNAN, 1990). However, the property has been identified as "lost," which is defined as "Wilds that have been so obliterated or so altered that any small pieces that are left clearly do not do what the original Wilds did for their neighborhood or for the City" (BNAN, 1990). The City of Boston's Open Space Plan 2008-2014, Section 9, Seven-Year Action Plan did not include this site among the plan's many goals and objectives of evaluating, protecting, or enhancing open space. Algonquin purchased this private property in 2013 for the proposed West Roxbury M&R Station.

Construction and operation of the West Roxbury M&R Station would permanently convert about 1.0 acre of forest/woodland on this property to industrial use. A strip of woodland would be left intact along Grove Street to mitigate the visual impact of the new M&R station. Because the property has already long been classified as "lost," construction of the new M&R station would not have any impact on its use or development as an urban wild.

West Roxbury Quarry Urban Wild

A ring of undeveloped property identified as Urban Wild by the BNAN surrounds the West Roxbury Crushed Stone Quarry (BNAN, 1990). The quarry is an active, private facility owned by West Roxbury Crushed Stone Company. The West Roxbury Lateral, along Grove Street from about MPs 4.0 to 4.5, would be adjacent to the urban wild property.

The Project would be adjacent to the narrow southwestern portion of the ring of urban wild property. The majority of the urban wild acreage is located in the northeastern portion of the ring, on the opposite side of the active quarry. The Project would have no direct impact on the urban wild lands. During the construction period, temporary visual and noise impacts on recreational users of the urban wild could occur but would be minor relative to the existing character of the area, due to the presence of the active quarry, the dense existing residential development in the area, and the fact that only a small, narrow portion of the urban wild is adjacent to the Project area.

We received several comments expressing concern about conflicts between the Project and operations at the quarry. This is discussed in more detail in section 4.1.4.

Roxbury Latin School

The Roxbury Latin School is an independent boys' private day school in the West Roxbury section of Boston, serving about 300 boys in grades seven through twelve (about 100 from the City of Boston, with the remainder commuting from several surrounding parishes and towns through provided bus service). The school is open year-round, hosting several programs during the summer for students. The school's academic and athletic facilities total about 120 acres. The West Roxbury Lateral would be located about 15 feet from the boundary of the school property along Centre Street and St. Theresa Avenue from about MPs 5.0 to 5.1.

The school's academic facilities are located about 800 feet southeast of the proposed West Roxbury Lateral at its closest point. The portion of the school property adjacent to the Project serves as a baseball field. The Project would not have any permanent impact on the school itself. However, users of the baseball field may experience temporary noise and visual impacts during the construction period, although a row of trees at the edge of the field would provide a partial buffer. Overall, the impacts would be temporary and minor.

St. Theresa of Avila School and Parish

The St. Theresa of Avila School is a private Catholic school in the West Roxbury section of Boston serving 300 to 400 students age three to eighth grade commuting to the school from several surrounding parishes and towns. The St. Theresa of Avila Parish is located adjacent to the school and faces Centre Street. The West Roxbury Lateral terminates at an interconnection with National Grid's facilities on St. Theresa Avenue (approximate MP 5.1), adjacent to the school and parish property.

The Project would not have any permanent impact on the school or parish. However, the Project construction area would be located within 20 feet of the church building, and the church would experience temporary noise and visual impacts during the construction period. Traffic to the church and school could also be temporarily impeded during construction. Representatives of St. Theresa's expressed concern about the location of the interconnection on St. Theresa Avenue and about potential traffic impacts in particular. Algonquin has initiated discussions with National Grid regarding the possibility of an alternative interconnection location that would not require the use of St. Theresa Avenue. If the interconnection is not relocated, adverse impacts in this area could be significant. Therefore, **we recommend that:**

- **<u>Prior to the end of the draft EIS comment period</u>, Algonquin should file with the Secretary the results of consultations with National Grid and details of any route variations agreed upon in order to relocate the interconnection from St. Theresa Avenue to avoid or minimize impacts on St. Theresa of Avila School and Parish. If the pipeline is not relocated, then Algonquin should file with the Secretary a site-specific construction plan for St. Theresa of Avila School and Parish. The plan should be developed with the parish leadership and include:**

  a. details on the location of the school and parish facilities relative to the proposed construction activities;

b. **a description of the construction activities that would occur at the site;**

c. **the timing of construction activities (i.e., days of the week and hours of the day);**

d. **specific measures that would be implemented to minimize conflicts with the school and parish; and**

e. **documentation of consultation with the parish leadership.**

State of Massachusetts Article 97 Land

Massachusetts Article 97, approved in 1972 as an amendment to the state constitution, requires that public lands acquired for natural resource purposes not be converted to other uses without consideration of a feasible alternative and replacement with equivalent natural resource land. Algonquin has conducted an initial review of possible Article 97 lands crossed by the West Roxbury Lateral.

A review suggests that Gonzales Field in the Town of Dedham (see above) may be subject to Article 97. Discussions between Algonquin and the Town of Dedham concerning the Town's ownership interest and the Project's impact on the field are ongoing and we have recommended that Algonquin develop a site-specific plan for crossing this area.

Similarly, a review suggests that the Mother Brook Reservation in the Town of Dedham (see above) may be subject to Article 97; however, the status of this area with regard to Article 97 is currently undetermined because title remains with private landowners. Discussions between Algonquin and the MADCR will occur as soon as the title review is completed.

4.8.6 Hazardous Waste Sites and Polychlorinated Biphenyls

4.8.6.1 Hazardous Waste Sites and Landfills

Algonquin contracted with EDR to prepare a corridor database search for the AIM Project and identified 23 sites within 500 feet of the Project, on an individual basis, with potential and/or actual sources of contamination. Several of these sites have the potential to impact soils or groundwater at Project facilities. Section 4.2.1.5 provides summaries of these sites as they pertain to soils, and table 4.3.1-2 provides a summary of these sites as they pertain to groundwater.

To-date, Algonquin has determined that field sampling would be required at two locations. The first location is along the E-1 System Lateral Take-up and Relay segment near MP 8.6 (Collins and Jewel site) and the other is along the West Roxbury Lateral Pipeline near MP 2.2. The CTDEEP also identified a concern about encountering contamination at a third site near the Lightolier property (also near MP 8.6 along the E-1 System Lateral Take-up and Relay). We have recommended that Algonquin develop a Field Sampling Plan prior to sampling for contamination at these and any other sites identified prior to construction (see section 4.2.2.6).

Algonquin would implement the protocols in its Unexpected Contamination Encounter Procedures if contamination is encountered during construction. We find these procedures to be acceptable. In general, if unanticipated contamination is encountered or suspected during construction, all construction work in the immediate vicinity would be stopped until an appropriate course of action is determined (see section 4.2.2.6). We have reviewed the Unexpected Contamination Encounter Procedures and find it acceptable.

4.8.6.2 Polychlorinated Biphenyls

PCBs are a blend of chemical compounds that were used in a variety of industrial applications until their commercial manufacture was banned by the EPA in 1979. Before then, PCBs were introduced into many natural gas transmission lines in the United States through the use of PCB-containing lubricants at compressor station sites and in other operation and maintenance activities. Since 1981, the EPA has worked with pipeline operators to identify and remove PCBs from the nation's natural gas transmission systems.

The Algonquin pipeline system is PCB regulated due to PCB concentrations greater than 50 ppm in recovered pipeline liquids. Based on historical sampling at the existing facilities, concentrations of PCBs could range from Non-Detect to less than 500 ppm.

Algonquin's removal of any existing piping or equipment that has been in contact with natural gas would be completed in accordance with the EPA's PCB rules and regulations (40 CFR 761). Algonquin's handling of PCB contaminated pipeline and materials would be performed in accordance with federal and state standard operating procedures (SOP).

Algonquin has developed a SOP for removing, storing, sampling, and disposing of pipe and equipment removed from gas service. "Material removed from gas service" refers to all material that has been in contact with gas flow prior to combustion. Examples of materials that have been in gas service include pipe, valves, separators, meter tubes, and fabricated assemblies. The process of removing pipe and equipment from gas service includes:

1. pigging the pipeline to remove any liquids prior to exhuming the pipe for removal;
2. additional inspection for liquids during pipe or equipment removal; and
3. cutting and removal of the pipe into sections for handling and transportation.

Liquids may be removed using pigging, draining valves, and equipment and purging methods. Pigging is required prior to removal of pipe and equipment except when pipe or equipment cannot be pigged due to size or configuration. Purging of the line using nitrogen or air may be used to further evacuate the pipeline. Additional inspection of pipe for liquids is conducted during removal of the pipe at low points and water crossings. Any residual liquids found during the inspection process are removed. All liquids removed from the pipeline system are handled in accordance with company SOPs and in compliance with federal requirements.

Pipe and equipment would be cut into sections no longer than 40 feet in length and secured with end caps for transportation. Pipe and equipment removed from gas service would be transferred from the right-of-way to a storage facility within 48 hours of removal. Wipe sampling of pipe and equipment would be completed prior to disposal in order to determine proper disposal. Results of wipe sampling would be used to classify the pipe and equipment as unrestricted (less than or equal to 10 micrograms [µg] per 100 square centimeters [cm^2]), conditional (greater than 10 and less than 100 µg per 100 cm^2), or restricted (greater than or equal to 100 µg per cm^2). There are no special storage requirements for "unrestricted" material. This material may be sold at Algonquin's discretion. Algonquin would decontaminate or dispose of "Conditional" and "restricted" material at a Toxic Substances Control Act landfill in accordance with all applicable federal and state regulations.

4.8.7 Visual Resources

4.8.7.1 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. The majority of the proposed pipeline facilities (about 93 percent) would be installed within or adjacent to existing pipeline, roadway, railway, and/or other utility rights-of-way. 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 landform changes that introduce contrasts in visual scale, spatial characteristics, form, line, color, or texture.

Visual impacts would be greatest where a pipeline route parallels or crosses roads and the pipeline right-of-way may be seen by passing motorists, from residences where vegetation used for visual screening or for ornamental value is removed, and where the pipeline is routed through 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 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 would be prevented from re-establishing on the permanent right-of-way.

The area crossed by the pipeline facilities is a highly fragmented landscape, comprising mostly a mixture of open land, residential areas, forest/woodland, industrial/commercial development, and agricultural land. Additionally, as discussed above, about 93 percent of the proposed pipeline routes would be located 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 crossings, where impacts on visual resources between the HDD entry and exit holes would be avoided.

After construction, all disturbed areas would be restored and returned to preconstruction conditions in compliance with federal, state, and local permits; landowner agreements; and Algonquin's easement requirements, with the exception of aboveground facility sites.

4.8.7.2 Aboveground Facilities

The modified and new aboveground facilities associated with the AIM 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 line for some facilities. Therefore, after the completion of construction, these aboveground facilities would be consistent with the existing visual landscape.

New aboveground facilities for the AIM Project would include three new M&R stations.

The proposed Assonet M&R Station would be located adjacent to Algonquin's existing North Fall River M&R Station, within the same property line on industrial land. Construction of the new Assonet M&R Station would permanently impact an additional 0.1 acre of forest/woodland and an additional 0.1 acre of open land, but this would not significantly alter the visual character of the property because the station would be adjacent to the existing North Fall River M&R Station.

The proposed West Roxbury M&R Station would be sited on a wooded property located across the street from an active rock quarry. It would be bounded by residential properties to the north, south, and west. Algonquin would maintain an existing wooded buffer along the entire western portion of the property as well as portions on the north and south sides of the site. Due to this buffer, no significant visual impacts on the surrounding area would be likely from construction at this site.

The proposed Oakland Heights M&R Station would be located adjacent to the Oakland Heights residential community. To provide visual screening, Algonquin would maintain a 30- to 50-foot buffer of existing vegetation from the edge of the property line to the M&R station. This vegetative buffer would be left undisturbed by construction with the exception of the station access road. Due to this buffer, no significant visual impacts would be likely from construction and operation of this station.

In addition, the existing Willimantic M&R Station would be rebuilt on an adjacent new parcel of land. Algonquin has adjusted the proposed workspace for construction of the proposed rebuild of the station to keep an existing 25-foot-wide vegetative buffer intact between the new facility and South Road. By implementing this mitigation measure, no significant visual impacts would be likely from construction and operation of this station.

4.8.7.3 Pipe and Contractor Ware 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.

4.8.7.4 Access Roads

Algonquin proposes to use 27 roads for temporary access to the Project facilities during construction and 8 roads for permanent access to the Project facilities during operation. With one exception, the access roads are comprised of existing gravel roads, unimproved dirt roads, paved and gravel driveways, private industrial and commercial roads, paved parking lots, and golf course roads. Seven of these existing roads would require minor improvements, but this would not have a significant impact on visual resources. After construction, the TARs would be returned to preconstruction conditions unless another arrangement is mutually agreed upon with the landowner.

In addition, one new PAR would be constructed running from Algonquin's existing North Fall River M&R Station to the proposed Assonet M&R Station. The existing station and proposed station would be located adjacent to each other within Algonquin's existing property line. Because this new PAR would be located within the existing industrial property, it would be consistent with existing land use and would not result in significant visual impacts.

4.9 SOCIOECONOMICS

The socioeconomic conditions and impacts associated with construction and operation of the pipeline facilities, M&R stations, and existing compressor stations in New York, Connecticut, Rhode Island, and Massachusetts are discussed below. The proposed pipeline facilities would be constructed in New York, Connecticut, and Massachusetts. Work at the existing Burrillville Compressor Station in Providence County, Rhode Island does not constitute a new, significant aboveground facility that could result in socioeconomic impacts; therefore, the potential impacts on existing socioeconomic conditions in Rhode Island are not evaluated in this section. The AIM Project includes about 37.6 miles of replacement, loop, lateral, and new natural gas pipeline facilities that would cross three counties in New York, four counties in Connecticut, and two counties in Massachusetts.

The six compressor stations to be modified resulting in the addition of 81,620 hp would be located in Rockland and Putnam Counties, New York; Middlesex and Windham Counties, Connecticut; and Providence County, Rhode Island; however, because the work at these stations would require minimal site disturbance within Algonquin's station property lines and a limited construction workforce, the potential impacts on existing socioeconomic conditions at these existing stations are not evaluated further in this section. Likewise, the AIM Project would include modifications to 24 existing M&R stations in New York, Connecticut, and Massachusetts, but because these modifications would occur within or directly adjacent to existing Algonquin M&R stations, they do not constitute significant aboveground facilities and thus the potential impacts on existing socioeconomic conditions are not evaluated further at these stations. Additionally, three new M&R stations would be constructed in New London, Connecticut and Bristol and Suffolk Counties, Massachusetts; and the removal of one M&R station in New London Connecticut.

The socioeconomic impact area analyzed encompasses an estimated maximum distance of 20 miles for workers to travel each way to and from the construction sites within the following counties:

- Rockland County, New York;
- Westchester County, New York;
- Putnam County, New York;
- Fairfield County, Connecticut;
- Middlesex County, Connecticut;
- Hartford County, Connecticut;
- New London County, Connecticut;
- Norfolk County, Massachusetts;
- Suffolk County, Massachusetts; and
- Bristol County, Massachusetts

Approximately 93 percent of the 37.6 miles of pipeline facilities would be within or adjacent to existing rights-of-way, consisting of Algonquin's pipeline rights-of-way, public roadways, railways, and/or other utility rights-of-way. 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.

4.9.1 Population and Employment

Table 4.9.1-1 provides a summary of selected demographic and socioeconomic conditions for the communities that would be affected by the AIM Project in New York, Connecticut, and Massachusetts. The major occupations throughout the Project area are in education, health, and social services; professional, scientific, management, administrative, and waste management; retail; manufacturing; finance and insurance; and real estate and rental and leasing.

The population of the potentially affected counties in New York from Project construction range from approximately 99,710 to 949,113 (U.S. Census Bureau, 2010a). One metropolitan area[3], the New York–Jersey City–White Plains Metropolitan Division, is located within the Project area, which includes all of Rockland and Westchester Counties. The AIM Project pipeline would pass through two communities in Rockland County (the Town of Haverstraw [including the Village of Pomona] and the Town of Stony Point [including the Hamlet of Tomkins Cove]) and four communities in Westchester County (the Town of Cortlandt [including the Hamlet of Verplanck and the Village of Buchanan], the City of Peekskill, and the Town of Yorktown). Population densities vary from approximately 433 to 2,205 people per square mile (U.S. Census Bureau, 2010a), and the county-level civilian workforces range from 65.6 to 68.4 percent (U.S. Census Bureau, 2012). Based on 2011 data, the per capita incomes in Rockland, Putnam, and Westchester Counties are about $3,187, $7,950, and $16,510 higher, respectively, than the state average of $31,796. Unemployment rates within the potentially affected New York counties range from 5.7 to 6.2 percent (based on July 2013 for county data and August 2013 for state data).

In Connecticut, the populations in the potentially affected counties from Project construction range from approximately 165,676 to 916,829 (U.S. Census Bureau, 2010a). Three metropolitan areas are located within the Project Area: the Norwich-New London-Westerly Metro Area, the Hartford-West Hartford-East Hartford Metro Areas, and the Bridgeport-Stamford-Norwalk Metro Area. Population densities vary from approximately 412 to 1,467 people per square mile (U.S. Census Bureau, 2010a), and the county-level civilian workforces range from 65.3 to 68.8 percent (U.S. Census Bureau, 2012). Based on 2011 data, the per capita incomes in Middlesex and Fairfield Counties are about $1,720 and $11,295 higher, respectively, than the state average of $37,627. However, per capita incomes in New London and Hartford Counties are between $4,149 and $3,636 less than the Connecticut state average. Unemployment rates within the potentially affected Connecticut counties range from 7.0 to 8.8 percent (based on July 2013 for county data and August 2013 for state data).

For the Commonwealth of Massachusetts, the populations in potentially affected counties from Project construction range from approximately 548,285 to 722,023 (U.S. Census Bureau, 2010a). One metropolitan area, the Boston-Cambridge-Quincy Metro Area is located within the Project area. It includes the Town of Westwood, the Town of Dedham, and the neighborhood of West Roxbury (City of Boston), where the AIM Project pipeline facilities are proposed to be located. Population densities vary from approximately 991 to 12,416 people per square mile (U.S. Census Bureau, 2010a), and the county-level civilian workforces range from 67.6 to 69.0 percent (U.S. Census Bureau, 2012). Based on 2011 data, the per capita income for Norfolk County is about $8,634 higher than the state average of $35,051. However, per capita incomes in Bristol and Suffolk Counties are between $6,369 and $3,017 less than the Massachusetts state average. Unemployment rates within the potentially affected Massachusetts counties range from 6.2 to 9.7 percent (based on July 2013 for county data and August 2013 for state data).

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[3] A metropolitan or metro area contains a core urban area of 50,000 or more in population, and a micro area contains an urban core of at least 10,000 (but less than 50,000) population. Each metro or micro area consists of one or more counties and includes the counties containing the core urban area, as well as any adjacent counties that have a high degree of social and economic integration (as measured by commuting to work) with the urban core (U.S. Census Bureau, 2013b, available online at http://www.census.gov/population/metro/).

TABLE 4.9.1-1

Existing Economic Conditions by Geographic Area for the AIM Project

State/County	Population (2010) [a]	Population Density (Persons/sq. mile) [a]	Per Capita Income [b]	Unemployment Rate July 2013/ August 2013 [c]	Civilian Workforce (percent) [b]	Top Three Industries [b]
New York	19,378,102	401.9	$31,796	7.6	63.6	E, P, R
Rockland County	311,687	1,795.9	$34,983	6.0	65.6	E, P, R
Putnam County	99,710	432.9	$39,746	5.7	68.4	E, P, R
Westchester County	949,113	2,204.7	$48,306	6.2	65.7	E, P, F
Connecticut	3,574,097	738.1	$37,627	8.1	67.9	E, M, R
Fairfield County	916,829	1,467.2	$48,922	7.5	68.1	E, P, F
Middlesex County	165,676	448.6	$39,347	7.0	68.8	E, M, P
Hartford County	894,014	1,216.2	$33,991	8.8	67.6	E, F, M
New London County	274,055	412.2	$33,478	8.4	65.3	E, A, M
Commonwealth of Massachusetts	6,547,629	839.4	$35,051	7.2	67.7	E, P, R
Norfolk County	670,850	1,693.6	$43,685	6.2	68.3	E, P, F
Suffolk County	722,023	12,415.7	$32,034	7.6	69.0	E, P, A
Bristol County	548,285	991.3	$28,682	9.7	67.6	E, R, M

Sources:

[a] U.S. Census Bureau, 2010a. Available online at http://factfinder2.census.gov/faces/nav/jsf/pages/community_facts.xhtml#none.

[b] U.S. Census Bureau, 2013a. U.S. Census Bureau, 2007-2011 American Community Survey 5-Year Estimates. Available online at http://factfinder2.census.gov/faces/nav/jsf/pages/community_facts.xhtml.

[c] Bureau of Labor Statistics, 2013. Available online at http://www.bls.gov/web/laus/laumstrk.htm (August 2013 is for state data while July 2013 is for county data).

Industries:

A – Arts, entertainment, and recreation, and accommodation and food services

E – Educational services, and health care and social assistance

F – Finance and insurance, and real estate and rental and leasing

M – Manufacturing

P – Professional, scientific, and management, and administrative and waste management services

R – Retail trade

Construction of the AIM Project would temporarily increase the population in the general vicinity of the Project. Table 4.9.1-2 lists the size of the estimated construction workforce for the AIM Project. The highest concentration of workers for the Project would occur from the spring of 2015 and continue until August of 2016. Workforce numbers during this period would range from a low of about 10 workers to a high of about 899 workers and includes preparation and start-up efforts for construction of the pipeline, as well as peak construction at the three new M&R station sites. Peak construction workforce is expected to total about 2,693 workers across all Project components (see table 4.9.1-2). Once the pipeline and the M&R stations are completed, the workforce numbers would decrease substantially. Construction at each Project location would last approximately 1 to 12 months. The number of personnel required at each proposed activity location would vary greatly, depending on the activity (i.e., HDD crossings, etc.). If a larger than anticipated percentage of non-local workers is required to meet peak workforce requirements, sufficient workers should be available in the labor pool in the surrounding counties and states.

TABLE 4.9.1-2

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

Facility	Length (miles)	Year	Average Workforce	Peak Workforce
PIPELINE FACILITIES				
Replacement Pipeline				
Mainline Take-up and Relay [a]	20.1	2016	124	899
Hudson River HDD [b]	2.1	2015	15	178
Interstate 84/Still River HDD	0.7	2015	17	86
E-1 System Lateral Take-up and Relay	9.1	2015	18	158
Loop Extension				
Line-36A Loop Extension	2.0	2015	12	201
E-1 System Lateral Loop Extension	1.3	2015	66	133
New Pipeline				
West Roxbury Lateral	5.1	2015/2016	15	162
ABOVEGROUND FACILITIES				
Existing Compressor Station Modifications				
Stony Point Compressor Station [c]	NA	2016	5	76
Southeast Compressor Station	NA	2016	11	76
Oxford Compressor Stations	NA	2016	4	14
Cromwell Compressor Station	NA	2015	12	76
Chaplin Compressor Station	NA	2015	5	38
Burrillville Compressor Station	NA	2015	8	76
Existing M&R Station Modifications				
Stony Point M&R Station	NA	2016	0	0
Peekskill M&R Station	NA	2015	3	13
Cortlandt M&R Station	NA	2016	5	10
West Danbury M&R Station	NA	2016	2	11
Southbury M&R Station	NA	2015	3	11
Waterbury M&R Station	NA	2016	10	10
North Haven M&R Station	NA	2016	10	10
Guilford M&R Station	NA	2015	1	10
Farmington M&R Station	NA	2016	1	11
Glastonbury M&R Station	NA	2015	4	11
Middletown M&R Station	NA	2015	5	10
Salem Pike M&R Station	NA	2015	1	11
Montville M&R Station	NA	2015	2	10
Willimantic M&R Station	NA	2015	1	12
Pomfret M&R Station	NA	2016	6	11
Putnam M&R Station	NA	2016	6	11
North Fall River M&R Station	NA	2016	3	11
New Bedford M&R Station	NA	2016	5	10
Middleborough M&R Station	NA	2015	1	11
Brockton M&R Station	NA	2015	4	13
Norwood M&R Station	NA	2015	5	10
Needham M&R Station	NA	2016	6	11
Wellesley M&R Station	NA	2015	6	11
Mystic M&R Station	NA	2015	6	11

TABLE 4.9.1-2 (cont'd)

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

Facility	Length (miles)	Year	Average Workforce	Peak Workforce
New M&R Stations				
Oakland Heights M&R Station	NA	2016	4	11
Assonet M&R Station	NA	2015	4	11
West Roxbury M&R Station	NA	2016	4	11
Existing M&R Station Removal				
Greenville M&R Station	NA	2016	1	10
TOTALS			**421**	**2,693**

[a] Includes the Haverstraw to Stony Point, Stony Point to Yorktown, and Southeast to MLV 19 Take-up and Relay segments.
[b] Includes the 0.7-mile HDD and the surrounding areas not adjacent to Algonquin's existing right-of-way.
[c] Construction workforce is shown in the mainline take-up and relay.

Algonquin anticipates hiring a substantial number of local construction workers with the requisite experience for the installation of the natural gas facilities. These local hires would include surveyors, welders, equipment operators, and general laborers. About 15 to 76 percent of the construction workers are expected to be local hires depending on the facility. The local supply of construction workers needed for the AIM Project would be derived from workers employed in the construction industry in the affected counties of New York, Connecticut, and Massachusetts including those employed in the large metro areas identified earlier. As shown in table 4.9.1-3, the New-York-Jersey City-White Plains Metro Area has the highest population and potential workforce of 19,567,410 people. The Norwich–New London Metro Area, with a potential workforce of only 274,055 people, is also well above the maximum number of workers needed for the Project. Construction personnel that may be hired from outside these areas include supervisory personnel and inspectors. These individuals are anticipated to temporarily relocate to the Project vicinity during construction.

TABLE 4.9.1-3

Population Changes for the Five Metro Areas Within the Vicinity of the AIM Project

	Population		
Metro Area	April 1, 2000	April 1, 2010	Percent Change
New York-Jersey City–White Plains, NY	18,944,519	19,567,410	+3.3
Norwich-New London, CT	259,088	274,055	+5.8
Hartford-West Hartford-East Hartford, CT	1,148,618	1,212,381	+5.6
Bridgeport-Stamford-Norwalk, CT	882,566	916,829	+3.9
Boston-Cambridge-Quincy, MA	4,391,344	4,552,402	+3.7

Source:
U.S. Census. 2010b. February 2013 Delineations BL. Available online at http://www.bls.gov/eag/eag.ma_boston_nd.htm.

Project-area population impacts would be temporary and proportionally small. The total population change would equal the total number of non-local construction workers plus any family members accompanying them. Given the brief construction period and in our experience, most non-local workers would not be expected to 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. A brief decrease in the unemployment rate could occur as a result of hiring local workers for construction and increased demands on the local economy. Algonquin would add three full-time permanent workers for operation of the proposed and modified facilities. This small number would have a negligible impact on the population and employment in the project area.

4.9.2 Housing

Housing statistics for the counties affected by the Project are presented in table 4.9.2-1. In 2012, the number of vacant housing units across the 10 potentially affected counties in New York, Connecticut, and Massachusetts ranged from a high of 27,762 units in Suffolk County, Massachusetts to a low of 3,075 vacant units in Westchester County, New York. Rental vacancy rates in these same counties varied from 7.8 percent in Fairfield County to 4.1 percent in Westchester County.

TABLE 4.9.2-1

Housing Statistics by County in the Vicinity of the AIM Project

State, County	Vacant Housing Units [a]	Rental Vacancy Rate (percent) [a]	Number of Hotels/Motels [b]	Number of Campgrounds/ Recreational Vehicle Parks [c, d]
New York				
Rockland County	5,286	5.3	40	29
Putnam County	23,845	5.3	99	8
Westchester County	3,075	4.1	14	0
Total	32,206	4.9	153	37
Connecticut				
Fairfield County	27,734	7.8	155	1
Middlesex County	7,682	5.5	45	17 [a]
Hartford County	24,842	7.3	178	1
New London County	13,451	6.0	159	16
Total	73,709	6.9	537	35
Massachusetts				
Norfolk County	13,399	4.9	105	2
Suffolk County	27,762	5.2	308	1
Bristol County	19,489	6.5	95	1
Total	60,650	5.5	508	4

a U.S. Census Bureau, 2013a. Available online at http://factfinder2.census.gov/faces/nav/jsf/pages/community_facts.xhtml.
b Hotels and Motels. 2013. Available online athttp://www.hotelmotels.info/.
c Yellow Pages. 2013. Available online at http://www.yellowpages.com.
Visit Connecticut. 2013. Available online at http://www.ctvisit.com/.
MADCR, 2013. Available online at http://www.mass.gov/eea/agencies/dcr/massparks/recreational-activities/massparks-camping-info-generic.html.
Recreational Vehicle Clubs and Campgrounds. 2013. Available online at http://www.rv-clubs.us/.
d Some campgrounds and/or parks contained over 100 sites available for lodging purposes.

Temporary housing availability varies geographically within the counties near the proposed Project facilities. Temporary housing is available in the form of daily, weekly, or monthly rentals in hotels and motels.

In addition to vacant housing, there are about 1,200 hotels/motels and 76 campgrounds/recreational vehicle parks in the Project area. Connecticut has the highest number of hotels/motels and campgrounds/recreational vehicle parks at a combined total of 572 compared to New York with a combined total of 190. Suffolk County in Massachusetts has the highest number of hotels/motels of 308 compared to Westchester County in New York with a low of 14.

Construction of the AIM Project could temporarily decrease the availability of housing in the Project area; however, the Project could have a short-term positive impact on the area's rental industry through increased demand and higher rates of occupancy. Thus, no significant impacts on the local housing market are expected. Assuming that the local construction workers do not require housing, a range of between 592 and 2,096 housing units[4] for non-local workers may be required during peak construction activities. Given the vacancy rates (4.1 percent to 7.8 percent) and the high number of vacant housing units in the counties that would be affected by the Project (32,206 in New York, 73,709 in Connecticut, and 60,650 in the Commonwealth of Massachusetts), construction crews should not encounter difficulty in finding temporary housing. In addition, we conclude that the three new operational workers would not have a significant impact on housing availability in the area.

4.9.3 Public Services

A wide range of public services and facilities are also offered in the AIM Project area. Services and facilities include hospitals, full-service law enforcement, career and volunteer fire departments, and schools. Sheriffs also serve each county, except those in Connecticut, which are served by State Marshals and Judicial Marshals. Table 4.9.3-1 provides an overview of select public services available in the vicinity of the Project area.

Based on the number of police (186) and fire stations (677), public schools (1,639), and hospitals (57), there appears to be adequate public service infrastructure in the vicinity of the AIM Project to accommodate the temporary needs of the non-local construction workers and their families.

In the event of an on-the-job accident, Algonquin's 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. Short-term, temporary impacts on certain other public services are possible, which would 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 4.9.5.

Table 4.9.3-2 provides the names of schools within 0.25 mile of the Project pipeline right-of-way. Based on the number and size of these schools, there appears to be adequate education infrastructure in the vicinity of the Project to accommodate any temporary educational needs for the number of non-local construction workers and their families.

In summary, there are ample public services available in the area to meet the needs of the AIM Project. Therefore, we do not believe any long-term impacts would result from construction of the Project.

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[4] As provided in section 4.9.1, the peak construction workforce is expected to total about 2,693 workers of which between 15 and 76 percent are expected to be local hires or between 85 and 24 percent of non-local workers.

TABLE 4.9.3-1

Public Service Infrastructure for the AIM Project

State, County	Number of Fire Stations (by active firefighter type) [a]	Number of Police Departments [b]	Number of Public Schools [c]	Number of Hospitals [d, e, f]	Number of Hospital Beds [d, e, f, g]
New York					
Rockland County	46 (0 career/ 1,944 volunteer)	10	70	4	1,018
Putnam County	129 (1,276 career/4,290 volunteer)	44	263	15	4,601
Westchester County	20 (0 career/ 904 volunteer)	6	22	1	298
Connecticut [h]					
Fairfield County	97 (1,211 career/ 1,527 volunteer)	24	252	6	4,558
Middlesex County	29 (104 career/864 volunteer)	7	60	1	230
Hartford County	125 (1,069 career/1,580 volunteer)	27	342	8	2,649
New London County	61 (369 career/ 1,330 volunteer)	13	105	2	425
Commonwealth of Massachusetts					
Norfolk County	61 (1,257 career/ 6 volunteer)	30	190	4	600
Suffolk County	45 (1,817 career/ 0 volunteer)	5 [i]	190	12	4,099
Bristol County	64 (941 career/ 124 volunteer)	20	145	4	1,310

Sources:

a U.S. Fire Administration (FEMA). 2013. Available online at http://apps.usfa.fema.gov/census/display.cfm.

b USACops. 2013. Available online at http://www.usacops.com/.
National Sheriffs' Association. 2013. Available online at http://sheriffs.org/iframepage/americas-sheriffs.
CT State Marshal System. 2013. Available online at http://das.ct.gov/cr1.aspx?page=107.
CT Judicial Marshals. 2013. Available online at http://ibpolocal731.org/.
CT State Troopers. 2013. Available online at http://www.ct.gov/despp/lib/despp/dsp/csp_troops_2012_20120816.pdf.

c Public School Review. 2013. Available online at http://www.publicschoolreview.com/.

d NYSDOH. 2013b. Available online at http://hospitals.nyhealth.gov/.

e American Hospital Directory. 2013a. Available online at http://www.ahd.com/states/hospital_CT.html.

f American Hospital Directory. 2013b. Available online at http://www.ahd.com/states/hospital_MA.html.

g Hospitals do not include rehabilitation, long-term, and psychiatric hospitals.

h Includes Resident State Trooper districts. Resident Troopers are regular members of the state police that are assigned specifically to that one town who provide the bulk of the police administrative tasks, such as supervision of part-time town officers, if any.

i The City of Boston has one police department serving as the headquarters, however broken up in neighborhood areas are 12 individual police districts serving these neighborhoods.

TABLE 4.9.3-2

Public Schools Within 0.5 Mile of the Pipeline Right-of-Way for the AIM Project[a]

State/County/School	Milepost Location	Location in Relation to Right-of-Way	Number of Students
New York			
Westchester County			
Verplanck Elementary	5.0	500 feet south	351
Connecticut			
Fairfield County			
Western Connecticut State University	2.8	400 to 900 feet south	6,025
Danbury High School	4.4	1,440 feet north	2,898
Middlesex County			
Cromwell Middle School	0.8	1,700 feet south	475
New London County			
Lebanon Elementary	2.0	1,000 feet southwest	482
Massachusetts			
Norfolk County			
Dedham Day School	1.7	1,800 feet west	267
Ursuline Academy	1.9	2,300 feet northwest	390
Dedham High School	2.5	2,100 feet southeast	802
Dedham Middle School	2.5	1,500 feet southeast	643
Suffolk County			
Ohrenberger School	3.7	1,900 feet east	642
Beethoven School	3.9	300 feet east	261
Joyce Kilmer School	4.5	200 feet northwest	430
Catholic Memorial School	5.0	1,400 feet west	747
Roxbury Latin	5.1	15 to 800 feet southeast	299
St. Theresa of Avila Elementary School	5.1	100 to 115 feet southeast	435

[a] Public School Review. 2014. Available online at http://www.publicschoolreview.com/; Western Connecticut State University statistics, available online at https://www.wcsu.edu/president/facts-figures.asp.

We received comments about the safety of installing a high-pressure pipeline in urban or developed setting in close proximity to facilities such as schools and hospitals. As further discussed in section 4.12.1, Algonquin would construct, operate, maintain, and inspect the proposed facilities to meet or exceed PHMSA's safety requirements.

4.9.4 Public Utilities and Related Infrastructure

The pipeline would cross a number of buried utilities and would be constructed within roadways that include existing buried utilities such as sewer and water lines within the road easement. Prior to construction, Algonquin would identify and locate existing utility lines and other sensitive resources identified in easement agreements or by federal and state agencies to prevent accidental damage during construction. Algonquin's contractors would contact the "Call Before You Dig" or "One Call" system, or state or local utility operators, to verify and mark all utilities along the Project workspace areas to minimize the potential for damage to other buried facilities in the area. If there is a question as to the location of a utility, such as a water, cable, gas, or sewer line, Algonquin would verify the vertical and horizontal location of the existing infrastructure using field instrumentation and test pits prior to installation of the pipeline. Where the proposed pipeline crosses under an existing utility line, the utility line would be temporarily supported as required. After the pipeline is installed, the backfill would be compacted properly to prevent settling. If concerns are raised regarding utility damage, a post-construction inspection would also be performed to clarify damages. Algonquin would be responsible for the repair/replacement of any damaged existing sewer or water infrastructure to the satisfaction of the city/utility owner and to ensure the impacts on residences or businesses as a result of any such damage are minimized. Algonquin would comply with appropriate federal, state, and local requirements intended to protect existing utilities that are crossed by the pipeline. These measures would minimize potential impacts on water, sewer, and other utilities. Specific details regarding individual crossings would be provided by Algonquin to the appropriate municipal permitting agencies prior to construction.

We received comments regarding the potential effect of Project construction on subsurface systems. A subsurface drain or drainage is any artificial system of pipes or conduits designed to intercept, collect, and convey excess soil moisture to a suitable outlet. These may include clay and concrete tile, vitrified sewer tile, corrugated plastic tubing, and stone drains. Following construction, Algonquin would repair and/or replace any damaged subsurface drainage systems that were affected during Project implementation.

No impacts on existing utilities and related infrastructure are anticipated during operation of the proposed facilities and only short-term, temporary impacts would result from construction activities.

4.9.5 Transportation and Traffic

The local road and highway system in the vicinity of the proposed Project facilities is readily accessible by interstate highways, U.S. highways, state highways, secondary state highways, county roads, and private roads. The Project may temporarily impact transportation and traffic during construction across and within roadways and railroads and due to increased vehicle traffic associated with the commuting of the construction workforce to the Project area and the movement of construction vehicles and delivery of equipment and materials to the construction work area. However, no long-term impacts are anticipated.

To the extent feasible, existing public and private road crossings along the AIM Project routes would be used as the primary means of accessing rights-of-ways. In addition to the existing access available by the use of public roads, Algonquin would use 35 existing roads for temporary or permanent access during Project construction. Of this total, 15 access roads would be in New York, 16 access roads in Connecticut, and four access roads in Massachusetts (see section 2.2.4).

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. For instance, in New York, the Project area is serviced by several lines and stops along the Metro North Railroad system (Metropolitan Transportation Authority, 2013). In Connecticut, there are 50 rail stations providing easy access to the Project area (CTrides, 2013a) and 8 state-owned bus divisions serving different areas of the state (Connecticut Transit [CTtransit], 2013b). In Massachusetts, the Massachusetts Bay Transit Authority commuter rail system provides over 20 transit lines with direct access to the Project area (Massachusetts Bay Transit Authority, 2013). The Project area also provides convenient (free) park and ride areas in numerous areas along the major expressway and highway systems for commuters.

Table F-1 in appendix F provides the milepost as well as the crossing method for each of the road and railroad crossings associated with the Project. In addition to road and railroad crossings, portions of the West Roxbury Lateral in Massachusetts would be installed within roadways using in-street construction methods. Road and railroad crossings and in-street construction are discussed in more detail below.

4.9.5.1 Roadway and Railroad Crossings

The AIM Project would require 108 public road crossings and 5 railroad crossings (see table F-1 in appendix F). The crossings would be accomplished using one of several possible methods. Railroads would be bored or crossed using the HDD method and roads would either be bored, cased, hammered, or open-cut. A summary of each of these crossing techniques is provided in section 2.3.1. The use of boring and hammering techniques would avoid road and rail surface impacts, but the use of the open-cut crossing method would not. Road crossing permits would be obtained from applicable federal, state, and local agencies. These permits would dictate the specific requirements for the day-to-day construction activities at each crossing, and the restoration and repair of the areas after construction.

The open-cut crossing method would primarily be used to cross driveways, parking lots, and roads with low traffic densities. The first step for an open-cut crossing would be to install traffic control devices. Traffic would be detoured around the open trench during the installation process. The pipeline crossing would be installed one lane at a time and, as the pipe is installed, successive lanes would alternately be taken out of service until the crossing is completed. Another option that may be used would be to temporarily close a portion of the road and detour traffic around the work area onto an adjacent roadway.

In response to public scoping comments, Algonquin retained traffic management consultants to provide traffic engineering consulting services in support of the AIM Project facilities, particularly in Massachusetts and New York. Algonquin has committed to consulting with each municipality along the Project to address potential traffic-related impacts associated with constructing the Project. Algonquin has also prepared separate traffic management plans for the West Roxbury Lateral and pipeline segments in New York (see appendix G). The traffic management plan for the West Roxbury Lateral is discussed in section 4.9.5.2.

The *Traffic Management Plan for the New York Pipeline Segments* includes a summary of roadways where Project construction would take place and information regarding general traffic management strategies. The locations and crossing methods of the proposed pipeline installations in New York are summarized in table F-1 in appendix F. . All of the roads to be crossed during construction are paved.

The general traffic management plans for the roadways affected by pipeline construction in New York are provided in appendix G. These detailed plans contain temporary traffic control (TTC) devices for:

- short-[5] or intermediate-term[6] stationary lane closures on two-lane, two-way roadways (TTC no. 1);
- short- or intermediate-term single lane closures for an undivided, multi-lane highway (TTC no. 2);
- double interior lane closures for a multi-lane highway (TTC no. 3);
- short- or intermediate-term sidewalk detour on a two-lane, two-way roadway (TTC no. 4);
- road closure with off-site detour on two-lane, two-way roadways (TTC no. 5); and
- work beyond the shoulder at a construction entrance (TTC no. 6).

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5 Short-term stationary closure: daytime work that occupies a location for more than 1 hour within a single daylight period (NYSDOT, 2014).

6 Intermediate-term stationary closure: work that occupies a location more than one daylight period up to 3 consecutive days, or nighttime work lasting more than 1 hour (NYSDOT, 2014).

The TTC typical detail(s) to be implemented for the crossing of a proposed roadway are also specified and provided in appendix G.

We have reviewed the *Traffic Management Plan for the New York Pipeline Segments* and find it to be acceptable; however, several of the road crossings listed in the plan were identified as needing further site-specific details (i.e., Zachary Taylor Street, Gate Hill Road (Highway 210), Bleakley Avenue, Route 9A, Montrose Station Road, Maple Avenue, and Cordwood Road). Therefore, **we recommend that**:

- **<u>Prior to construction in New York</u>, Algonquin should file with the Secretary, for review and written approval of the Director of OEP, a revised Traffic Management Plan for the New York pipeline segments that includes the site-specific details for the crossings of Zachary Taylor Street, Gate Hill Road (Highway 210), Bleakley Avenue, Route 9A, Montrose Station Road, Maple Avenue, and Cordwood Road.**

4.9.5.2 In-street Construction

In addition to road crossings, portions of the West Roxbury Lateral would be constructed within or along existing roadways. A detailed description of the in-street construction method is provided in section 2.3.1.2. In-street construction would affect traffic in the Project area and could also effect on-street parking and use of sidewalks adjacent to the roadway. In response to comments during the public scoping meetings from the FERC, MAEFSB, landowners, and other stakeholders, Algonquin has committed to consulting with each municipality along the Project to address potential traffic-related impacts associated with constructing the Project and would need to obtain road opening permits from the City of Boston and the Town of Dedham before conducting work in these roadways. Algonquin has also prepared a separate traffic management plan for the West Roxbury Lateral (see appendix G).

The *Updated Traffic Management Assessment and Plans for the West Roxbury Lateral* includes the following information to help assess the potential impacts of the Project along this pipeline segment:

- current level-of-service (LOS) and projected change in LOS during construction;
- duration of construction, time of year, number of days per week, and time of day for each segment;
- the severity and duration of potential traffic and business interruptions or delays at different times of the year and at different times of the day during peak periods and hours;
- turning movement counts at key intersections for peak commuting hours and peak shopping hours;
- location of lane closures, including the parking lane, and other available parking areas during site-specific closures; and
- the specific mitigation measures to be implemented to alleviate traffic congestion in these areas during construction.

The plan includes detailed traffic counts at key locations along the Project corridor where construction would occur, as well as existing traffic conditions and general traffic management strategies. It also includes measures to address motor vehicles, including parking, and considerations for pedestrians, bicycles, and construction workers.

Because some of the preliminary traffic count data for this area was outdated, Algonquin hired a traffic engineering consultant to conduct Automatic Traffic Recorder counts for a 72-hour period along the following study area roadways in May 2014:

- Elm Street Dedham – between Providence Highway and Legacy Place driveway;
- Providence Highway Dedham – between Legacy Boulevard signal and Best Buy/Star signal;
- East Street Dedham – north of High Street;
- High Street Dedham – east of East Street;
- Washington Street Dedham – between Lower East Street and Oak Street;
- Grove Street West Roxbury – south of Centre Street; and
- Centre Street West Roxbury – south of Spring Street.

The data gathered was used to evaluate the LOS for these key study area roadways and intersections under existing conditions and during construction of the pipeline lateral over the course of a typical weekday and on Saturday as presented in table 4.9.5-1. Additionally, manual turning movement counts were also collected during the same timeframe at key signalized study area intersections where traffic flow may be affected by some temporary travel lane closures during construction. The results of the capacity analysis at signalized intersections under existing conditions and during Project construction are presented in table 4.9.5-2.

TABLE 4.9.5-1

Observed Traffic Counts at Key Locations Along the AIM Project Corridor in Massachusetts

	Weekday	Hourly Traffic Range			Commuter Hours		Saturday	Hourly Traffic Range		
Location	Daily	Low	High	Average	a.m. Peak	p.m. Peak	Daily	Low	High	Average
Dedham										
Elm Street (eastbound)	6,309	146	640	390	284	640	7,736	120	696	517
Elm Street (westbound)	8,636	240	698	545	500	661	10,768	181	950	687
Total	**14,945**	**386**	**1,301**	**936**	**784**	**1,301**	**18,504**	**301**	**1,603**	**1,204**
Providence Highway (northbound)	24,178	1,294	1,735	1,545	1,634	1,735	25,667	646	1,993	1,633
Providence Highway (southbound)	22,542	558	1,790	1,377	1,098	1,789	23,669	579	1,925	1,548
Total	**46,720**	**1,992**	**3,524**	**2,921**	**2,732**	**3,524**	**49,336**	**1,225**	**3,826**	**3,181**
East Street	1,981	67	161	124	141	161	2,298	38	208	152
High Street	16,181	796	1,362	1,101	1,221	1,362	14,522	465	1,089	954
Washington Street (northbound)	11,358	513	802	692	661	795	11,976	250	926	704
Washington Street (southbound)	9,827	431	766	628	576	766	10,698	388	817	702
Total	**21,185**	**944**	**1,561**	**1,320**	**1,237**	**1,561**	**22,674**	**638**	**1,687**	**1,405**
West Roxbury										
Grove Street	8,569	402	724	597	682	724	7,266	229	589	478
Centre Street	7,282	331	637	513	577	637	6,219	190	506	400

TABLE 4.9.5-2

Signalized Intersection Capacity Analysis for Key Intersections Within the AIM Project Area in Massachusetts

Intersection	2014 Existing				2015 Construction			
	V/C [a]	Delay [b]	LOS[c]	95th % Queue (feet)	V/C	Delay	LOS	95th % Queue (feet)
HIGH STREET AT EAST STREET/HIGH STREET								
Weekday AM								
Harris Street EB LTR	0.39	35.6	D	50	0.20	19.81	B	68
High Street WB L	0.94	44.4	D	371 [d]	NA	NA	NA	NA
High Street WB TR	0.37	16.7	B	137	1.13	95.2	F	757 [d]
High Street NB LT	0.05	10.8	B	31	0.07	16.8	B	35
High Street NB RT	0.20	2.7	A	14	0.20	10.1	B	38
East Street SB LTR	0.03	10.7	B	21	0.06	16.5	B	25
Overall	**0.53**	**25.7**	**C**		**0.75**	**63.6**	**E**	
Weekday Midday								
Harris Street EB LTR	0.51	28.2	C	80	0.47	20.5	C	151
High Street WB L	0.84	31.6	C	194 [d]	NA	NA	NA	NA
High Street WB TR	0.27	15.9	B	81	1.18	120.3	F	441 [d]
High Street NB LT	0.06	8.4	A	28	0.07	11.4	B	30
High Street NB RT	0.20	4.3	A	16	0.20	8.9	A	23
East Street SB LTR	0.02	8.1	A	8	0.02	11.0	B	9
Overall	**0.46**	**19.3**	**B**		**0.68**	**61.9**	**E**	
Weekday PM								
Harris Street EB LTR	0.71	32.8	C	106	0.71	27.1	C	266 [d]
High Street WB L	0.89	33.5	C	296 [d]	NA	NA	NA	NA
High Street WB TR	0.22	12.5	B	77	1.62	311.0	F	486 [d]
High Street NB LT	0.07	11.1	B	33	0.07	11.4	B	33
High Street NB RT	0.35	5.0	A	21	0.34	9.3	A	28
East Street SB LTR	0.06	11.1	B	21	0.06	11.3	B	21
Overall	**0.61**	**19.6**	**B**		**0.96**	**127.5**	**F**	
SPRING STREET AT CENTRE STREET/TEMPLE STREET								
Weekday AM								
Spring Street EB LTR	0.58	19.8	B	229	0.46	22.7	B	277
Spring Street WB L	0.47	10.6	B	82	0.42	13.5	B	89
Spring Street WB TR	0.43	9.9	A	180	0.39	13.2	A	205
Centre Street NB LT	0.31	29.9	C	78	1.11	126.9	C	643 [d]
Centre Street NB R	0.79	34.5	C	182 [d]	NA	NA	NA	NA
Temple Street SB LTR	0.32	29.9	C	86	0.48	64.9	C	152
Overall	**0.67**	**18.7**	**B**		**0.68**	**40.9**	**B**	
Weekday Midday								
Spring Street EB LTR	0.58	20.8	C	220 [d]	0.58	20.8	C	220 [d]
Spring Street WB L	0.46	11.3	B	106 [d]	0.46	11.3	B	106 [d]
Spring Street WB TR	0.35	10.4	B	146	0.35	10.4	B	146
Centre Street NB LT	0.11	22.0	C	35	0.53	29.4	C	126
Centre Street NB R	0.30	17.7	B	40	NA	NA	NA	NA
Temple Street SB LTR	0.19	22.9	C	51	0.20	23.0	C	51
Overall	**0.47**	**15.9**	**B**		**0.55**	**17.1**	**B**	

TABLE 4.9.5-2 (cont'd)

Signalized Intersection Capacity Analysis for Key Intersections Within the AIM Project Area in Massachusetts

	2014 Existing				2015 Construction			
Intersection	V/C [a]	Delay [b]	LOS [c]	95th % Queue (feet)	V/C	Delay	LOS	95th % Queue (feet)
Weekday PM								
Spring Street EB LTR	0.56	21.6	C	261	0.57	19.4	B	229
Spring Street WB L	0.70	14.9	B	211 [d]	0.47	10.6	B	82
Spring Street WB TR	0.37	8.6	A	191	0.43	9.9	A	180
Centre Street NB LT	0.35	37.1	D	66	1.49	268.5	F	453 [d]
Centre Street NB R	0.38	23.4	C	66	NA	NA	NA	NA
Temple Street SB LTR	0.63	43.8	D	166	0.38	31.4	C	88
Overall	**0.67**	**18.6**	**B**		**0.82**	**64.5**	**E**	

a Volume-to-capacity ratio.

b Average delay per vehicle in seconds.

c LOS standards for highways and streets and at signalized intersections: A=free flow, <10 seconds; B=reasonably free flow, 10 to 20 seconds; C=stable flow, at or near free flow, 20 to 35 seconds; D=approaching unstable flow, 35 to 55 seconds; E=unstable flow, operating at capacity, 55 to 80 seconds; F=forced or breakdown flow, >80 seconds.

d 95th percentile volume exceeds capacity, queue may be longer.

Notes: EB = Eastbound; WB = Westbound; NB – Northbound; SB = Southbound; L = Left; T = Through; R = Right; NA = Not Applicable

The recently gathered Automatic Traffic Recorder counts indicate that traffic flow within this study area remains relatively constant throughout the day. For the purposes of this Project, construction hours are expected to be a 12-hour day from 7:00 a.m. to 7:00 p.m. when allowable by traffic conditions and as permitted by the various agencies and municipalities having control over the affected roadways. Any work that is to occur during peak traffic hours (7:00 to 9:00 a.m. and 4:00 to 6:00 p.m.) would be coordinated in advance with the MDOT, Westwood, Dedham and/or West Roxbury. To prevent unnecessary delays to the motoring public during Project construction, Algonquin would implement the following measures:

- Reducing the existing roadway cross-sections by no more than one lane on multi-lane roadways during regular working hours. The majority of the study area would be accomplished using this traffic set-up.
- The East Street (Westwood) crossing is expected to occur via underground boring so no traffic management would be required along this roadway.
- Work in the vicinity of the Providence Highway/Elm Street intersection would occur during evening hours to minimize disruption to traffic flow.
- Traffic control devices would be placed to allow for access and egress from the West Roxbury Crushed Stone quarry.
- For those areas where sidewalks would need to be closed on a temporary basis, a proposed pedestrian bypass would be provided within the standard details of the traffic management plans. Pedestrian access would be maintained on the same side of the roadway and temporary wheelchair ramps would be provided to ramp the pedestrians from the existing sidewalk to the roadway. The pedestrians would be separated from the travel lanes by drums. If the width is not sufficient to accommodate traffic and pedestrian activity, then pedestrians would be directed to cross to the sidewalk on the opposite side of the street or at the closest adjacent intersection.

- Safe and ready means of ingress and egress to all stores and shops; public, private, and professional offices; and any other businesses or residences in the Project area, both day and night, shall be provided for the project duration.

- Bicyclists currently share the road within the Project study area because there are not separate bicycle facilities currently in place, so bicycles would be accommodated within normal vehicular traffic.

- Algonquin would limit the number of construction workers in this area to alleviate the shortage of available on-street parking on Grove Street.

As shown in table 4.9.5-2, High Street's intersection with East Street and Harris Street currently operates acceptably under peak-hour conditions and during a typical weekday midday period. However, the required lane closures at this intersection would result in significant adverse impacts on traffic operations during the course of construction, especially during the weekday peak afternoon rush hour. Therefore, Algonquin would construct during off-peak daytime hours to minimize these significant adverse impacts. This would not eliminate all traffic-related impacts, but would reduce the impacts at this location. Similarly, traffic generally operates acceptably at the Spring Street/Centre Street intersection in West Roxbury throughout the day. With the planned pipeline construction route, the northbound Centre Street right-turn lane would need to be blocked off temporarily. To avoid excessive delays at this location, Algonquin would schedule work in the vicinity of this intersection prior to the late afternoon commuter peak period.

We received specific comments regarding traffic access impacts and congestion during construction of the West Roxbury Lateral. National Amusements operates a theatre that is part of the 550,000-square-foot Legacy Place shopping center at Elm Street and Route 1 in Dedham and is concerned that the businesses at Legacy Place would be adversely affected by nearby roadway construction, traffic congestion, and access restrictions during construction of the AIM Project. Algonquin met with the management of the Legacy Place shopping center on January 27, 2014, and then again on March 11, 2014. The following general construction conditions were agreed upon between Algonquin and Legacy Place:

- Pipeline installation at Legacy Place's Elm Street driveway would be by trenchless construction, with no disturbance of the road surface or interference with traffic flow.

- Pipeline installation across Legacy Boulevard to the east of Providence Highway likely would be by open trench construction, provided that: (a) all work would take place between the hours of 12:00 a.m. and 8:00 a.m.; and (b) at least one paved lane for each turning movement would be maintained at all times.

- Pipeline installation across the southerly Legacy Place driveway at Providence Highway (between LL Bean and P.F. Chang's China Bistro restaurant) likely would be by trenchless construction, provided that agreement is reached on a sufficient staging area to be used for this work. Algonquin may also present an open trench construction option for this driveway that would include the same time restriction and access condition as noted above between the hours of 12:00 a.m. and 8:00 a.m.

- Algonquin and Legacy Place management would meet again within approximately 1 month after the completion of associated geotechnical survey work to go over the design details and construction methods for the above driveway crossings, the site-specific traffic and access management plan for Legacy Place, and related matters.

We conclude that impacts on traffic during construction along the West Roxbury Lateral would result in localized, unavoidable significant adverse impacts, particularly at the High Street intersection with East Street and Harris Street. However, with the implementation of Algonquin's *Updated Traffic Management Assessment and Plans for the West Roxbury Lateral*, including the measures described above, impacts resulting from in-street construction would be minimized to the extent possible and would be reduced to less than significant levels at all other locations along the West Roxbury Lateral.

4.9.6 Project-related Traffic

In addition to the direct temporary impacts associated with road crossings and in-street construction, the daily commuting of the construction workforce to the Project area could result in short-term impacts on traffic during Project construction. It is estimated that a maximum of 2,693 workers would be working on the proposed pipeline facilities at any one time. These workers would commute typically 6 days a week to and from the construction work area between 7:00 a.m. and 7:00 p.m., resulting in increased traffic in the Project area at specific times. To minimize traffic congestion, Algonquin would encourage construction workers to share rides or use mass transit to the construction work area. Contractors may also provide buses to move workers from common parking areas to the construction work area. Algonquin would also schedule construction work within roadways and specific crossings to avoid commuter traffic and school buses to the greatest extent practical. Additionally, Algonquin has developed site-specific traffic management plans that would be implemented along the Project corridor (see appendix G). We find the general traffic management principles depicted on these to be acceptable and agree that they would help to minimize any disruptions to traffic operations in the Project area.

In addition to the construction workforce, the delivery of construction equipment and materials to the construction work area could temporarily congest existing transportation networks at specific locations. Several construction-related trips would be made each day (to and from the job site) on each spread. This level of traffic would remain consistent throughout the construction period and would typically occur during the early morning hours and evening hours. The route vehicles would take after leaving the construction work area would vary, depending on the location of construction activity. Therefore, materials and equipment could be hauled long distances, resulting in longer drive time.

The local public roads in the vicinity of the Project are mostly paved or gravel roads. Construction of the Project could result in short-term impacts along some roads and highways due to the movement and delivery of equipment and materials. Existing public and private road crossings along the proposed pipeline route would be used as the primary means of accessing the right-of-way to the extent feasible. Algonquin propose to use 27 temporary access roads and eight permanent access roads along the pipeline route. Table 2.2.4-1 identifies the locations of new and existing roads associated with the AIM Project.

Although Algonquin would be using existing roads for temporary and permanent access, seven of these roads would require minor upgrades, so they can be used during pipeline construction. Algonquin would also need to construct new permanent access road from the existing North Fall River M&R Station to the new Assonet M&R Station. No improvements would be made to the 28 other temporary and permanent access. Following construction, these roads would be used to access the right-of-way for ongoing operations and maintenance, but these activities would not significantly increase the use of the access roads or the surrounding public roads.

As described in the revised traffic management plan for the West Roxbury Lateral, roadway capacity in certain areas would be impacted on a temporary basis. One-lane closures would be utilized when crossing two lanes or more in a single direction. If a lane needs to be closed at intersections, the work would be conducted during off-peak hours so that traffic flows are not constrained at the study area intersections. Therefore, we find the revised plan for the West Roxbury Lateral to be acceptable and conclude that the traffic measures and practices to be implemented during Project construction would maintain appropriate traffic flow and access to abutting residents and businesses at key locations along the Project corridor in the Towns of Dedham and West Roxbury, Massachusetts.

4.9.7 Displacement of Residences and Businesses

One residence, located near MP 10.7 along the Stony Point to Yorktown Take-up and Relay segment, would be displaced as a result of construction and operation of the AIM Project. The residence was constructed in 1959 within Algonquin's right-of-way. In order to replace the 26-inch-diameter pipeline with a 42-inch-diameter pipeline, while maintaining the same separation distance of 15 feet from the adjacent 30-inch-diameter loop line, the edge of the 42-inch-diameter replacement pipeline would be installed in close proximity to the residence. According to Algonquin, it would not be possible to remove the existing pipeline and excavate the ditch for the 42-inch-diameter pipeline without damage to the residence due to the size of equipment required to complete these tasks. Consequently, Algonquin's right-of-way agent approached the owners and determined that they were willing to sell the property. A purchase and sale agreement has been agreed to by attorneys for both the buyer and the seller.

No businesses would be displaced by the Project. However, impacts on businesses could occur during in-street construction along the West Roxbury Lateral. For example, Legacy Place shopping center has expressed concern that construction of the Project in the roadways adjacent to the shopping center would result in significant impacts on the businesses and stores within the center. To address these issues, Algonquin has developed a Traffic Management Plan for the West Roxbury Lateral to allow for continued access to businesses and stores during construction, including the Legacy Place shopping center (see section 4.9.5.2).

4.9.8 Property Values

We received some 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. Algonquin would acquire easements for both the temporary (construction) and permanent rights-of-way where applicable. With the exception of the West Roxbury Lateral, most of the remaining pipeline segments would be installed within Algonquin's existing right-of-way. Further, the majority of the AIM project pipeline segments are a replacement of existing pipeline in the same location and would not be encumbered by a new pipeline easement. Also, the majority of the West Roxbury Lateral would be located within streets or public property and, therefore, would not require a pipeline easement on individual properties. Most of the aboveground facilities would be modified within an existing facility owned by Algonquin. Algonquin would compensate the landowners for any new easements, the temporary loss of land use, and any damages. In addition, affected landowners who believe that their property values have been negatively impacted could appeal to the local tax agency for reappraisal and potential reduction of taxes. The AIM Project would not negatively impact property values outside of the pipeline rights-of-way or aboveground facility boundaries.

Regarding the potential for insurance premium adjustments associated with pipeline proximity, insurance advisors consulted on other natural gas projects reviewed by the FERC indicated that pipeline infrastructure does not affect homeowner insurance rates (FERC, 2008). As such, we find that homeowners' insurance rates are unlikely to change due to construction and operation of the proposed Project.

4.9.9 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. Table 4.9.9-1 provides the estimated payroll associated with construction of the AIM Project. Payroll taxes would also be collected from the workers employed on the Project. Algonquin anticipates that the total payroll for the Project would be approximately $264,316,027 during the construction phase. Construction payroll would be about $11,075,046 in Rhode Island, $127,228,136 in New York, $89,663,796 in Connecticut, and $36,349,049 in Massachusetts (see table 4.9.9-1).

TABLE 4.9.9-1

Socioeconomic Impact Resulting from Construction and Operation of the AIM Project

State		Construction (Estimated Construction Payroll)	Operation (Estimated Annual Ad Valorem Tax)
New York		$127,228,136	$20,070,000
Connecticut		$89,663,796	$5,770,000
Massachusetts		$36,349,049	$2,360,000[a]
Rhode Island		$11,075,046	$970,000
	Total	$264,316,027	$29,170,000

[a] Includes the annual property taxes for the Town of West Roxbury.

Algonquin estimates 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. These and other items required for construction would be purchased, as available, from vendors within Rockland, Westchester, and Putnam Counties, New York; Fairfield, Middlesex, Hartford, and New London Counties, Connecticut; and Norfolk, Suffolk, and Bristol Counties, Massachusetts.

Construction of the AIM 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 Algonquin over the life of the AIM Project (see table 4.9.9-1).

The Project is not expected to have any long-term negative economic impact. 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 pre-construction property uses would be allowed. The primary long-term impact of the pipeline would be 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. Business owners would be compensated for this encumbrance, if applicable.

We received several comments regarding the potential effect of the Project on home heating costs. Research shows that natural gas prices are a function of market supply and demand. The strength of the economy greatly influences natural gas markets. During periods of economic growth, the increased demand for goods and services from the commercial and industrial sectors generates an increase in natural gas demand. The increased demand can lead to increased production and higher prices. Declining or weak economic growth tends to have the opposite effect. During cold months, residential, and commercial end users consume natural gas for heating, which places upward pressure on prices as demand increases. Because of limited alternatives for natural gas consumption or production in the near term, even small changes in supply or demand over a short period can result in large price movements that bring supply and demand back into balance. Thus, increases in supply tend to result in lower prices, whereas decreases in supply tend to increase prices (DOE/EIA, 2012).

4.9.10 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 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 will 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 will 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. Algonquin met with many different stakeholders during the initial development of the route, including local residents and affected landowners. These efforts involved a number of open houses with the affected communities and local authorities. Algonquin also established, and is maintaining, a Project website to share Project information with the public.

The applicant also used the FERC's pre-filing process (see section 1.4). 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 several of Algonquin's open houses and hosted several scoping meetings to receive input from the public about the Project. The scoping meetings were held in the Town of Cortlandt, New York; Danbury, Connecticut; Norwich, Connecticut; and the Town of Dedham, Massachusetts. FERC staff also participated in site visits to all the proposed pipeline segments. Interested parties have had, and will 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 EIS, and the opportunity to submit written comments about the Project to the FERC. Outreach with Indian tribes is described in section 4.10.1. Stakeholders will have the opportunity to review this draft EIS, participate in public meetings, and provide comments directly to the FERC staff in person or in writing.

4.9.10.1 Demographic and Economic Data

Environmental Justice Areas or Communities are defined by the EPA 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 environmental justice communities potentially crossed by the Project's pipeline facilities were identified using available 2010 census block group statistics regarding ethnicity, median income, and poverty levels. Table 4.9.10-1 provides demographic statistics for the states and counties that would be affected by the Project. Table 4.9.10-2 provides an overview of the general economic status of these states and the counties.

TABLE 4.9.10-1

Demographic Statistics for Counties Crossed by Project Facilities in New York, Connecticut, and Massachusetts for the AIM Project

State/County	Total Population	White (percent)	African American (percent)	Native American and Alaskan Native (percent)	Asian (percent)	Native Hawaiian & Pacific Islander (percent)	Other Race (percent)	Hispanic or Latino Origin (percent)	Total Minority [a] (percent)
New York	**19,378,102**	**65.7**	**15.9**	**0.6**	**7.3**	**0.0**	**7.4**	**17.6**	**41.7**
Rockland	311,687	73.2	11.9	0.3	6.2	0.0	5.8	15.7	34.7
Westchester	949,113	68.1	14.6	0.4	5.4	0.0	8.3	21.8	42.6
Putnam	99,710	90.7	2.4	0.2	1.9	0.0	2.8	11.7	17.1
Connecticut	**3,574,097**	**77.6**	**10.1**	**0.3**	**3.8**	**0.0**	**5.6**	**13.4**	**28.8**
Fairfield	916,829	74.8	10.8	0.3	4.6	0.0	6.8	16.9	33.8
Middlesex	165,676	89.2	4.7	0.2	2.6	0.0	1.3	4.7	13.6
Hartford	894,014	72.4	13.3	0.3	4.2	0.0	7.1	15.3	33.9
New London	274,055	82.2	5.8	0.9	4.2	0.1	3.2	8.5	21.7
Massachusetts	**6,547,629**	**80.4**	**6.6**	**0.3**	**5.3**	**0.0**	**5.6**	**9.6**	**23.9**
Norfolk	670,850	82.3	5.7	0.2	8.6	0.0	1.3	3.3	19.6
Suffolk	722,023	56.0	21.6	0.4	8.2	0.0	9.7	19.9	51.9

Source: U.S. Census Bureau, 2010b. Available online at http://www.census.gov/2010census/popmap/.
[a] U.S. Census Bureau, 2013a. Available online at http://factfinder2.census.gov/faces/nam/jsf/pages/community_facts.xhtml ("minority" refers to people who reported their ethnicity and race as something other than non-Hispanic White).

TABLE 4.9.10-2

Economic Statistics for Counties Crossed by Project Facilities in New York, Connecticut, and Massachusetts for the AIM Project

State/County	Median Household Income (2008 to 2012)	Persons Below Poverty (2008 to 2012) (percent)
New York	**$57,683**	**14.9**
Rockland	$86,020	12.8
Westchester	$81,093	9.3
Putnam	$95,259	5.8
Connecticut	**$69,519**	**10.0**
Fairfield	$82,614	8.8
Middlesex	$76,659	5.9
Hartford	$64,752	11.5
New London	$68,310	8.1
Massachusetts	**$66,658**	**11**
Norfolk	$84,087	6.5
Suffolk	$52,700	20.7

Source: 2008–2012 American Community Survey 5-Year Estimates

New York

In New York, environmental justice communities are defined according to the following thresholds: communities where 23.6 percent or more of the individuals within a given census block are living below the poverty line as low-income populations; and/or communities where minorities comprise more than 51.1 percent of the population within a given census block. The use of a 51.1 percent threshold to identify minority populations is within the parameters identified in the EPA Region 2 Interim Environmental Justice Policy, which applies to permits issued by that region, including those in New York. The interim guidance suggests that the minority threshold should be 51.5 percent in urban areas of New York State. The NYSDEC issued guidance for conducting environmental justice analyses for New York State Environmental Quality Review. This guidance establishes a minority community threshold as being equal to or greater than 51.1 percent in an urban area; therefore, this is what was used for this analysis.

None of the counties affected by the Project in New York have minority populations greater than the general EPA guideline of 50 percent; therefore, they are also under the EPA Region 2 guidance of 51.5 percent and the NYSDEC guidance of 51.1 percent. However, two census block groups crossed by the Project in Westchester County do have minority [7] populations greater than these thresholds:

- Census Tract 141, Block Group 4 (Town of Cortlandt, including Buchanan) with a minority population of 57.3 percent; and

- Census Tract 141, Block Group 3 (City of Peekskill) with a minority population of 53.9 percent.

The Stony Point to Yorktown Take-up and Relay segment would cross these two block groups for about 940 feet out of the total segment length of 12.3 miles (8.8 miles of which is in Westchester County). The crossings would occur on either side of where the pipeline crosses Route 9A (near MP 5.8) and would not be located through neighborhoods. FERC staff participated in a site visit to this and the other pipeline segments in New York and also conducted a public scoping meeting in the Town of Cortlandt. The proposed pipeline in this area would replace an existing pipeline within the same right-of-way. None of the census blocks crossed have 23.6 percent or more of the individuals within it living below the poverty line.

Connecticut

None of the counties or census blocks crossed in Connecticut have minority populations greater than the general EPA guideline of 50 percent. However, the State of Connecticut has additional guidelines on what constitutes an environmental justice community, which are defined as:

- a U.S. census block group, as determined in accordance with the most recent U.S. census, for which 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; or

- a distressed municipality (Connecticut Environmental Justice Policy, 2012a,b).

[7] Minority refers to people who reported their ethnicity and race as something other than non-Hispanic White by itself in the decennial census.

The pipeline facilities would not cross any of the 2012 Connecticut Department of Economic and Community Development's List of Distressed Municipalities (Connecticut Department of Economic and Community Development, 2012); however, a portion of the Southeast to MLV 19 Take-up and Relay segment in Danbury (about 1.4 miles or about 30 percent of the total segment length) would be located in a defined census block group (Census Tract 2108, Block Group 3) with 30 percent or more of the population living below 200 percent of the federal poverty level. This census block group is regulated under section 22a–20a of the Connecticut General Statutes (CGS). According to this section of the CGS, the pipeline itself does not qualify as an "affecting facility" under the environmental justice policies of the CTDEEP, as defined. Therefore, Algonquin would not be subject to the requirements for a certificate of environmental compatibility and public need from the Connecticut Siting Council and so filed a petition for a declaratory ruling seeking a "finding of no jurisdiction" from the Connecticut Siting Council for the AIM Project, due to the FERC's federal jurisdiction. The petition was approved on November 7, 2013. Furthermore, the proposed pipeline in this area would replace an existing pipeline within the same right-of-way.

Massachusetts

Suffolk County is the only county crossed in Massachusetts with a minority population greater than the general EPA guideline of 50 percent. However, none of the census blocks crossed by the West Roxbury Lateral within Suffolk County have minority populations greater than 50 percent. Similar to the State of Connecticut, MAEOEEA has established an Environmental Justice Policy (MAEOEEA, 2002) to help address the disproportionate share of environmental burdens experienced by lower-income people and communities of color who, at the same time, often lack environmental assets in their neighborhoods. According to the MAEOEEA, environmental justice populations are those segments of the population defined as neighborhoods (U.S. Census Bureau census block groups) that meet one or more of the following criteria:

- the 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.

According to the 2010 U.S. Census data, 11.4 percent of the Town of Dedham's population in Norfolk County is located in environmental justice block groups that meet the 25 percent minority criteria listed above. Of the 2.9 miles of the West Roxbury Lateral in Dedham, about 1.4 or 47 percent would cross through a portion of one of these groups. In Suffolk County, the Project would pass through environmental justice block groups in West Roxbury that meet two of the above four criteria (25 percent minority, below the 65 percent of the median income, or a combination of the two). All 1.7 miles (100 percent) of the AIM Project pipeline in West Roxbury would cross through these groups and/or traverse along the outer edges of these groups.

In support of the environmental justice populations, the Environmental Justice Policy identifies a number of specific services to be provided to environmental justice populations by the Secretary of the energy and environmental affairs agencies and other related state agencies, including greater public participation and outreach. To date, Algonquin has reached out to the public through various forums, particularly landowners, local community groups, and public officials, to inform them about the Project and has also prepared a Public and Agency Participation Plan for the AIM Project. In addition, FERC conducted a site visit with EPA staff along the entire pipeline route and also hosted a public scoping meeting in Dedham.

4.9.10.2 Impact Analysis

The construction and operation of the proposed facilities would affect a mix of racial/ethnic and socioeconomic areas in the Project areas as a whole. To minimize overall impacts, Algonquin would collocate the majority of its proposed Project facilities with existing linear and facility infrastructure. In addition, not all impacts identified in this EIS are considered to affect minority or low-income populations. The primary adverse impacts on the environmental justice communities associated with the construction of the AIM Project would be the temporary increases in dust, noise, and traffic from Project construction. These impacts would occur along the entire pipeline route and in areas with a variety of socioeconomic backgrounds.

As part of the Project, Algonquin would implement a series of measures to minimize such impacts (see sections 4.9.5, 4.11.1, and 4.11.2). 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, the noise control measures that would be implemented by Algonquin during Project construction and operation would ensure that noise attributable to the new aboveground facilities would be either less than 55 decibels on the A-weighted scale (dBA) day-night sound level (L_{dn}) at nearby noise-sensitive areas (NSA), or where the noise currently attributable to a particular station is greater than 55 dBA L_{dn}, the noise attributable to the station modifications would cause no perceptible change to station noise levels. Algonquin has also developed traffic management plans for New York and the West Roxbury Lateral to minimize impacts during construction. In addition, the roads crossed within the identified New York census block groups would be bored, so impacts on traffic would be avoided.

Based on the identified estimated emissions from operation of the proposed Project facilities and review of the modeling analysis, the Project would result in continued compliance with the national ambient air quality standards (NAAQS), which are protective of human health, including children, the elderly, and sensitive populations (see section 4.11.1). 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 AIM Project would also bring economic benefits to the region via added tax revenues and jobs associated with construction and operation of the pipeline facilities in these and other areas along the right-of-way.

Therefore, the AIM Project would not result in any disproportionately high or adverse environmental and human health impacts on minority or low-income communities, or Indian tribes.

4.10 CULTURAL RESOURCES

Section 106 of the NHPA (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 NRHP and to provide the ACHP an opportunity to comment on the undertaking. Algonquin, as a non-federal party, is assisting the 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).

Algonquin 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. Algonquin then conducted field surveys for aboveground properties and archaeological sites.

4.10.1 Cultural Resources Consultations

On September 13, 2013, the FERC sent copies of the NOI for this Project to a wide range of stakeholders, including the ACHP, the NPS, Historic Preservation Field Services Bureau of the NYSOPRHP, the Connecticut State Historic Preservation Office of the Department of Economic and Community Development, the Rhode Island Historical Preservation & Heritage Commission, the Massachusetts Historical Commission, 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 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.

In addition to the FERC's notification process, Algonquin or its consultant, Public Archaeology Laboratory (PAL), separately contacted the SHPOs and tribes that might attach cultural or religious significance to cultural resources in the Project area.

4.10.1.1 State Historic Preservation Offices

Table 4.10.1-1 summarizes communications with the SHPOs. PAL contacted the New York, Connecticut, Rhode Island, and Massachusetts SHPOs to provide them information regarding the Project and to request comments on May 17, 2013, and provided each SHPO with technical proposals for conducting identification surveys in each state on May 23, 2013. The New York SHPO provided comments on the technical proposal on July 19, 2013; the Connecticut SHPO responded on September 19, 2013; the Rhode Island SHPO responded November 1, 2013; and the Massachusetts SHPO indicated by telephone that it would not be commenting until formal application materials are submitted.

On October 25, 2013, PAL provided each SHPO with technical memoranda describing the initial identification survey results and requesting comments. The New York SHPO responded with comments on December 2, 2013, while the other SHPOs have not commented at this time. On February 24, 2014, PAL submitted identification survey technical reports to each SHPO. The New York SHPO provided comments on March 28, 2014; the Connecticut SHPO provided comments on April 8, 2014; the Rhode Island SHPO provided comments on March 5, 2014; and the Massachusetts SHPO provided comments on March 10, 2014. Details on specific comments/concurrence for archaeological sites and historic architectural properties are found in section 4.10.2. Where the respective SHPO has concurred with specific findings and recommendations below, we also concur.

TABLE 4.10.1-1

Algonquin and State Historic Preservation Office Correspondence for the AIM Project

Date	Sender	Recipient	Correspondence
New York			
May 17, 2013	Gregory Dubell, PAL	Ruth Pierpont, NY SHPO	Letter introducing Project and initiating consultation.
May 23, 2013	Gregory Dubell, PAL	Ruth Pierpont, NY SHPO	Letter with technical proposal for archaeological survey.
July 19, 2013	Brian Yates, NY SHPO	Gregory Dubell, PAL	Response to technical proposal.
August 2, 2013	Gregory Dubell, PAL	Ruth Pierpont, NY SHPO	Letter with copy of meeting notes from July 17, 2013 meeting.
August 12, 2013	Gregory Dubell, PAL	Ruth Pierpont, NY SHPO	Letter containing draft copies of Resource Reports 1 and 10.
October 25, 2013	Gregory Dubell, PAL	Ruth Pierpont, NY SHPO	Letter requesting review of technical memoranda and unanticipated discovery plan (UDP).
December 2, 2013	Brian Yates, NY SHPO	Gregory Dubell, PAL	Letter with review comments on documents submitted on October 25, 2013.
December 3, 2013	Gregory Dubell, PAL	Ruth Pierpont, NY SHPO	Letter providing Resource Reports 1–12.
December 11, 2013	Brian Yates, NY SHPO	Gregory Dubell, PAL	Letter providing comments on Resource Report 4.
January 13, 2014	Gregory Dubell, PAL	Brian Yates, NY SHPO	Email requesting further survey work following previously reviewed methods.
February 24, 2014	Gregory Dubell, PAL	Ruth Pierpont, NY SHPO	Letter requesting review of technical reports and revised UDP.
March 4, 2014	Gregory Dubell, PAL	Ruth Pierpont, NY SHPO	Letter providing Resource Reports 1–12.
March 28, 2014	Brian Yates, NY SHPO	Gregory Dubell, PAL	Letter with review comments on technical reports.
April 18, 2014	Gregory Dubell, PAL	Ruth Pierpont, NY SHPO	Letter with proposal to perform Phase II site evaluations.
Connecticut			
May 17, 2013	Gregory Dubell, PAL	Stacey Vairo, CT SHPO	Letter introducing Project and initiating consultation.
May 23, 2013	Gregory Dubell, PAL	Stacey Vairo, CT SHPO	Letter with technical proposal for archaeological survey.
July 29, 2013	Gregory Dubell, PAL	Stacey Vairo, CT SHPO	Letter with addendum to technical proposal for archaeological survey.
August 12, 2013	Gregory Dubell, PAL	Stacey Vairo, CT SHPO	Letter containing draft copies of Resource Reports 1 and 10.
September 16, 2013	Stacey Vairo, CT SHPO	Gregory Dubell, PAL	Letter commenting on archaeological survey proposal.
October 25, 2013	Gregory Dubell, PAL	Stacey Vairo, CT SHPO	Letter requesting review of technical memoranda and UDP.
December 3, 2013	Gregory Dubell, PAL	Stacey Vairo, CT SHPO	Letter providing Resource Reports 1–12.
January 13, 2014	Gregory Dubell, PAL	Stacey Vairo, CT SHPO	Email requesting further survey work following previously reviewed methods.
February 24, 2014	Gregory Dubell, PAL	Stacey Vairo, CT SHPO	Letter requesting review of technical reports.
March 4, 2014	Gregory Dubell, PAL	Stacey Vairo, CT SHPO	Letter providing Resource Reports 1–12.
April 8, 2014	Stacey Vairo	Mike Tyrrell, Algonquin	Letter with review comments on technical reports.
April 8, 2014	Stacey Vairo	Gregory Dubell, PAL	Letter requesting technical edits to the technical reports.
April 9, 2014	Gregory Dubell, PAL	Stacey Vairo, CT SHPO	Letter with proposal to perform Phase II site evaluations.
April 16, 2014	Stacey Vairo, CT SHPO	Mike Tyrrell, Algonquin	Letter providing comments on Phase II site evaluation proposal.
June 3, 2014	Gregory Dubell, PAL	Stacey Vairo, CT SHPO	Letter providing progress memo on Phase II site evaluations and additional Phase I survey.

TABLE 4.10.1-1 (cont'd)

Algonquin and State Historic Preservation Office Correspondence for the AIM Project

Date	Sender	Recipient	Correspondence
June 4, 2014	Catherine Labadia, CT SHPO	Gregory Dubell, PAL	Email acknowledging phone call regarding progress memo.
June 6, 2014	Gregory Dubell, PAL	Stacey Vairo, CT SHPO	Letter providing phone notes from call with CT SHPO on June 4, 2014.
Rhode Island			
May 17, 2013	Gregory Dubell, PAL	Edward Sanderson, RI SHPO	Letter introducing project and initiating consultation.
May 23, 2013	Gregory Dubell, PAL	Edward Sanderson, RI SHPO	Letter with technical proposal for archaeological survey.
August 12, 2013	Gregory Dubell, PAL	Edward Sanderson, RI SHPO	Letter containing draft copies of Resource Reports 1 and 10.
October 25, 2013	Gregory Dubell, PAL	Edward Sanderson, RI SHPO	Letter requesting review of technical memoranda and UDP.
November 1, 2013	Charlotte Taylor, RI SHPO	Gregory Dubell, PAL	Letter providing permit for archaeological survey.
December 3, 2013	Gregory Dubell, PAL	Edward Sanderson, RI SHPO	Letter providing Resource Reports 1–12.
February 24, 2014	Gregory Dubell, PAL	Edward Sanderson, RI SHPO	Letter requesting review of technical reports and information on historic architectural properties.
March 4, 2014	Gregory Dubell, PAL	Edward Sanderson, RI SHPO	Letter providing Resource Reports 1–12.
March 5, 2014	Edward Sanderson, RI SHPO	Gregory Dubell, PAL	Letter commenting on technical reports.
March 5, 2014	Edward Sanderson, RI SHPO	Gregory Dubell, PAL	Letter commenting on UDP.
April 1, 2014	Edward Sanderson, RI SHPO	Gregory Dubell, PAL	Letter providing review of historic architectural survey findings.
April 8, 2014	Gregory Dubell, PAL	Edward Sanderson, RI SHPO	Letter with application for permit to conduct Phase II site evaluation.
Massachusetts			
May 17, 2013	Gregory Dubell, PAL	Brona Simon, MA SHPO	Letter introducing project and initiating consultation.
May 23, 2013	Gregory Dubell, PAL	Brona Simon, MA SHPO	Letter with technical proposal for archaeological survey.
August 12, 2013	Gregory Dubell, PAL	Brona Simon, MA SHPO	Letter containing draft copies of Resource Reports 1 and 10.
October 25, 2013	Gregory Dubell, PAL	Brona Simon, MA SHPO	Letter requesting review of technical memoranda and UDP.
December 3, 2013	Gregory Dubell, PAL	Brona Simon, MA SHPO	Letter providing Resource Reports 1–12.
January 27, 2014	Gregory Dubell, PAL	Brona Simon, MA SHPO	Letter containing phone notes from call with MA SHPO on October 25, 2013.
February 24, 2014	Gregory Dubell, PAL	Brona Simon, MA SHPO	Letter requesting review of technical reports and revised UDP.
March 4, 2014	Gregory Dubell, PAL	Brona Simon, MA SHPO	Letter providing Resource Reports 1–12.
March 10, 2014	Brona Simon, MA SHPO	Kimberly Bose, FERC	Letter commenting on technical reports, memorandum, and UDP.
March 10, 2014	Brona Simon, MA SHPO	Deborah Cox, PAL	Letter commenting on technical reports, memorandum, and UDP.
March 24, 2014	Gregory Dubell, PAL	Brona Simon, MA SHPO	Letter with copies of reports.

4.10.1.2 Consultation Parties

Between May 2013 and February 2014, Algonquin consulted with several governmental organizations, non-governmental organizations, non-federally recognized tribes, and municipal historic preservation commissions in New York and Massachusetts to provide them an opportunity to comment on the proposed Project. These consulting parties included:

- Ramapough Conservancy;
- Massachusetts Board of Underwater Archaeological Resources;
- Massachusetts Department of Conservation and Recreation;
- Boston Landmarks Commission;
- Brockton Historical Commission;
- Dedham Historical Commission;
- Freetown Historical Commission;
- Middleborough Historical Commission;
- Medford Historical Commission;
- Needham Historical Commission;
- New Bedford Historical Commission;
- Norwood Historical Commission;
- Wellesley Historical Commission;
- Westwood Historical Commission;
- Eastern Pequot Tribal Nation;
- Golden Hill Tribe of the Paugussett Indian Nation;
- Ramapough Lenape Indian Nation;
- Schaghticoke Tribal Nation;
- Connecticut Indian Affairs Council; and
- Massachusetts Commission on Indian Affairs.

The Boston Landmarks Commission commented on the archaeological overview survey methodology. Algonquin provided the archaeological overview survey and historic architectural properties overview/identification survey technical reports to the relevant Massachusetts consulting parties for review. No comments have been received to date from the remaining consulting parties.

4.10.1.3 Federally Recognized Indian Tribes Consultations

On May 17, 2013, Algonquin wrote to nine federally recognized Indian tribes (the Delaware Nation of Oklahoma, Delaware Tribe of Indians, Mashantucket (Western) Pequot Tribal Nation, Mashpee Wampanoag Indian Tribe, Mohegan Indian Tribe, Narragansett Indian Tribe, Saint Regis Mohawk Tribe, Stockbridge-Munsee Community Band of Mohican Indians, and Wampanoag Tribe of Gay Head (Aquinnah)) to provide an opportunity to identify any concerns about properties of traditional religious or cultural significance that may be affected by this undertaking.

On September 13, 2013, the FERC sent copies of the NOI to all tribes with a known interest in the area. In addition, on November 25, 2013, the FERC wrote letters to the federally recognized tribes to request their comments on the proposed Project. An email was sent to each of these tribes on February 4, 2014, to ensure that the tribes had received copies of the cultural resources studies for the Project and to seek comments. In response to these emails, three tribes (Mohegan Indian Tribe, Wampanoag Tribe of Gay Head (Aquinnah), and Mashantucket (Western) Pequot Tribal Nation) requested to meet with the FERC. On March 12, 2014, the FERC met with these three tribes as well as the Narragansett Indian Tribe to discuss their concerns about the Project. Beginning April 3, 2014 (and ongoing), the FERC hosted regular (mostly weekly) conference calls with these four tribes, Algonquin, and Algonquin's cultural resources consultant (PAL) to discuss schedule and coordination for pending cultural resources field investigations. When calls could not be scheduled, Algonquin representatives provided the parties weekly updates via email on upcoming and planned field work, as well as a summary of work completed the prior week.

The Delaware Nation of Oklahoma responded that they would like to be apprised of changes in the expansion or inadvertent discoveries. The Delaware Tribe of Indians responded that there are no religious or culturally significant sites in the Project area and they defer comments to the SHPOs; in addition, the tribe stated that it wishes to continue as a consulting party. The Mashantucket (Western) Pequot Tribal Nation reviewed the survey reports and wished to continue receiving information regarding the Project. The Mohegan Indian Tribe sent a representative to accompany the archaeological field crew for a portion of the Project in Connecticut and identified areas of interest that may need further consideration. The Narragansett Indian Tribe expressed an interest in the Project and were going to send a representative to accompany the archaeological field crew in Rhode Island. Stockbridge–Munsee Community Band of Mohican Indians responded that they are not aware of any cultural sites but wished to continue receiving information regarding the Project. The Wampanoag Tribe of Gay Head (Aquinnah) responded that they wished to continue to be consulted during Project planning activities and accompanied an archaeological field crew during a portion of the identification fieldwork and identified areas of interest. The Mashpee Wampanoag Tribe responded that, because of known archaeological sites in the Project area, the tribe would require periodic visits by tribal monitors during ground-disturbing activities and requested at least a 14-day notice prior to the start of construction as well as contact information for the construction contractor/project manager. No response has been received from the Saint Regis Mohawk Tribe. Table Q-1 in appendix Q provides a summary of consultations with federally recognized tribes.

4.10.2 Results of Cultural Resources Surveys

Algonquin surveyed a 200-foot-wide corridor for archaeological sites. The pipeline construction workspace, ATWS, and permanent right-of-way would be contained within this surveyed corridor. Surveys for historic architectural properties were conducted in a 300-foot-wide area that extended 150 feet on either side of the pipeline centerline. For aboveground facilities (compressor stations and M&R stations), the survey area included properties within view of the constructed facility. The APE for access roads would be defined based on the width needed to make the roads usable for construction, and the APE for contractor yards would include the footprint of those yards. Table 4.10.2-1 provides a summary of cultural resource investigations and work that is pending for each state.

4.10.2.1 New York

Pipeline Facilities

In New York, regarding the identification survey coverage, the Haverstraw to Stony Point Take-up and Relay segment has received 83 percent coverage for archaeology, the Stony Point to Yorktown Take-up and Relay segment has received 99 percent coverage for archaeology, and the Southeast to MLV 19 Take-up and Relay segment has had 100 percent survey for archaeology. Each segment has received 100 percent identification survey coverage for historic architecture. A report presenting the results of this survey work was submitted to the SHPO on February 24, 2014. The findings for each segment are summarized below.

TABLE 4.10.2-1

Cultural Resources Investigations for the AIM Project

State/Type of Investigation	Report of Investigation	Percent Surveyed	Acreage remaining
New York			
Phase I archaeological identification survey for pipeline corridors	Nichole Gillis et al. (February 2014). *Archaeological Overview and Identification Survey, Algonquin Incremental Market (AIM) Project: Haverstraw T&R, Stony Point T&R, and Southeast T&R, Buchanan, Cortlandt, Haverstraw, Peekskill, Southeast, Stony Point, and Yorktown, New York*	95.7	16.6
Phase I archaeological identification survey for M&R and compressor stations	Joseph N. Waller, Jr., and Jennifer Ort (February 2014). *Algonquin Incremental Market (AIM) Project: Archaeological Overview and Identification Surveys, New York Metering & Regulating and Compressor Stations, Cortlandt, Peekskill, Southeast, and Stony Point, New York*	<100	[a]
Phase I architectural identification survey for all facilities	Kathleen M. Miller et al. (February 2014). *Historic Architectural Properties Overview and Identification Survey, Algonquin Incremental Market (AIM) Project: Haverstraw T&R, Stony Point T&R, and Southeast T&R, and M&R and Compressor Stations, Buchanan, Cortland, Haverstraw, Peekskill, Southeast, Stony Point, Tompkins Cove, Verplanck, and Yorktown, New York*	100	0
Remaining investigations			
Phase I archaeological identification survey for the Southeast Compressor Station	Pending	NA	NA
Phase II site evaluation of eight sites	Pending	NA	NA
Connecticut			
Phase I archaeological identification survey for pipeline corridors	Nichole Gillis et al. (February 2014). *Archaeological Overview and Identification Survey, Algonquin Incremental Market (AIM) Project: Southeast T&R, Cromwell Loop Extension, E-1 System T&R, and E -1 System Loop, Cromwell, Danbury, Franklin, Lebanon, Montville, Norwich, and Rocky Hill, Connecticut*	91.3	35.6
Phase I archaeological identification survey for M&R and compressor stations	Joseph N. Waller, Jr. (February 2014). *Algonquin Incremental Market (AIM) Project: Archaeological Overview and Identification Surveys, Connecticut Metering & Regulating and Compressor Stations, Berlin, Chaplin, Cromwell, Danbury, Farmington, Glastonbury, Guilford, Middletown, Montville, North Haven, Norwich, Plainville, Pomfret, Putnam, Southbury, Waterbury, Windham, Connecticut*	65	0.4
Phase I architectural identification survey for all facilities	Kathleen M. Miller et al. (February 2014). *Historic Architectural Properties Overview and Identification Survey, Algonquin Incremental Market (AIM) Project: Southeast T&R, Cromwell Loop Extension, E-1 System T&R, and E-1 System Loop, and M&R and Compressor Stations, Cromwell, Chaplin, Danbury, Farmington, Franklin, Glastonbury, Greenville, Guilford, Lebanon, Middletown, Montville, North Haven, Norwich, Pomfret, Putnam, Rocky Hill, Southbury, Waterbury, and Windham, Connecticut*	100	0
Remaining investigations			
Phase I archaeological identification survey for Line 36A (Cromwell) Loop Extension, E-1 System T&R, and Greenville M&R Station	Pending	NA	NA
Phase II site evaluation of 17 sites	Pending	NA	NA

TABLE 4.10.2-1 (cont'd) **Cultural Resources Investigations for the AIM Project**			
State/Type of Investigation	Report of Investigation	Percent Surveyed	Acreage remaining
Rhode Island			
Phase I archaeological identification survey for compressor station	Joseph N. Waller, Jr. (February 2014). *Algonquin Incremental Market (AIM) Project: Archaeological Identification (Phase I[c]) Survey, Burrillville Compressor Station, Burrillville, Rhode Island*	100	0
Phase I archaeological identification survey for compressor station	Letter report to RI SHPO (February 24, 2014)	100	0
Remaining investigations			
Phase II site evaluation of RI 2568	Pending	NA	NA
Massachusetts			
Phase I archaeological overview survey for pipeline corridor	Jennifer Banister and Suzanne Cherau. (February 2014). *Archaeological Overview (Reconnaissance) Survey, Algonquin Incremental Market (AIM) Project: West Roxbury Lateral, Boston (West Roxbury), Dedham, and Westwood, Massachusetts*	<100	[b]
Phase I archaeological overview survey for M&R stations	Joseph N. Waller, Jr. (February 2014). *Archaeological Overview (Reconnaissance) Survey, Algonquin Incremental Market (AIM) Project: Metering & Regulating Stations, Boston, Brockton, Freetown, Middleborough, Medford, Needham, New Bedford, Norwood, and Wellesley, Massachusetts*	<100	[c]
Phase I architectural identification survey for all facilities	Kathleen M. Miller et al. (February 2014). *Historic Architectural Properties Overview and Identification Survey, Algonquin Incremental Market (AIM) Project: West Roxbury Lateral and M&R and Compressor Stations, Boston (West Roxbury), Brockton, Dedham, Freetown, Medford, Middleborough, Needham, New Bedford, Norwood, Wellesley, and Westwood, Massachusetts*	100	0
Remaining investigations			
Phase I archaeological identification survey, West Roxbury Lateral and West Roxbury M&R station	Pending	NA	NA
Phase I identification survey of West Roxbury Lateral and West Roxbury M&R station	Pending	NA	NA

[a] A portion of the Southeast Compressor Station has not been surveyed; exact acreage is unknown at this time.
[b] The overview report recommended identification survey along portions of the West Roxbury Lateral; that work is pending and exact remaining acreage is unknown.
[c] The overview report recommended identification survey along portions of the West Roxbury M&R station; that work is pending and exact remaining acreage is unknown.
NA = Not applicable

Haverstraw to Stony Point Take-up and Relay

Three archaeological sites (two pre-contact, one dating to the Archaic period but also containing post-contact artifacts, the other undetermined; and one post-contact cemetery) were identified along the Haverstraw to Stony Point Take-up and Relay survey corridor. Two of the sites are recommended potentially eligible for the NRHP and are recommended for further testing. The New York SHPO agreed with the recommendations in a letter dated March 28, 2014. Site evaluation would be undertaken at these two sites to evaluate their eligibility for the NRHP. The remaining site, Letchworth Village Cemetery, has been determined eligible for the NRHP (New York SHPO unique site number [USN] 08702.000274). The boundaries for this resource would be delineated and avoided. In addition, eight stone walls were recorded within the Haverstraw to Stony Point Take-up and Relay survey corridor. These walls have been interpreted as former property boundaries, and where avoidance is not possible, documentation and restoration would be undertaken.

Eight aboveground historic resources were identified in the APE associated with the Haverstraw to Stony Point Take-up and Relay segment. Four of these are residences and considered not eligible for the NRHP. Two resources, Harriman State Park (NY-A; New York SHPO USN 08702.000044 – USN 08702.000176) and Letchworth Village Cemetery (NY-2), have been determined eligible for the NRHP. The remaining two resources, Palisades Interstate Parkway (NY-6; New York SHPO USN 08702.000179) and Stony Point District School, No. 4 (NY-7; New York SHPO USN 08705.000083) are listed in the NRHP. The assessment indicates that the AIM Project would have no effect on the significance of the Palisades Interstate Parkway, Stony Point District School No. 4, or Harriman State Park. The New York SHPO agreed with the recommendations in a letter dated March 28, 2014. Effects to Letchworth Village Cemetery have yet to be determined pending an archaeological boundary delineation.

Stony Point to Yorktown Take-up and Relay

Fourteen archaeological sites were identified along the Stony Point to Yorktown Take-up and Relay survey corridor, half of which are pre-contact sites (one dating to the Archaic period, the others undetermined) and half post-contact, ranging from the mid-19th to mid-20th centuries. Seven of the sites have been recommended not eligible for the NRHP. Seven of the sites are recommended potentially eligible for the NRHP and would require further testing. Avoidance has been recommended in one case. In addition, 48 stone walls were recorded within the Stony Point to Yorktown Take-up and Relay survey corridor. These walls have been interpreted as former property boundaries and, where avoidance is not possible, documentation and restoration is recommended. The New York SHPO agreed with the recommendations in a letter dated March 28, 2014. Site evaluation would be conducted at the seven sites recommended eligible for the NRHP to evaluate their NRHP eligibility. A comment was received about a lime kiln site within Sylvan Glen Park. The archaeological survey identified a portion of this site within the Project area, and it is one of the sites to be evaluated.

Twenty-seven aboveground historic resources were identified in the APE associated with the Stony Point to Yorktown Take-up and Relay segment. Of those, 26 are recommended not eligible for the NRHP. The remaining resource, the Fresh Air Association House of St. John the Divine (NY-C), is recommended potentially eligible for the NRHP. While the Project has no potential to impact standing structures associated with the Fresh Air Association House of St. John Divine Complex, archaeological remains that might contribute to the significance of the property are located within the impact area of the pipeline. The examination of this resource for potentially significant archaeological remains would be included in the evaluation noted above. The New York SHPO agreed with the recommendations in a letter dated March 28, 2014.

Southeast to MLV 19 Take-up and Relay

No archaeological resources were identified along the Southeast to MLV 19 Take-up and Relay survey corridor and no further testing was recommended. However, three stone walls were recorded. These walls have been interpreted as former property boundaries and, where avoidance is not possible, documentation and restoration is recommended. No historic resources were identified in the APE. The New York SHPO agreed with the recommendations in a letter dated March 28, 2014.

Aboveground Facilities

There are two compressor stations (Southeast and Stony Point Compressor Stations) and three M&R station modifications (Cortlandt, Peekskill, and Stony Point M&R Stations) associated with the Project in New York. Most of these facilities were reviewed and determined to have low potential for intact archaeological resources and no identification surveys were undertaken there. Archaeological field surveys were conducted for the Southeast Compressor Station, Stony Point Compressor Station, and the Cortlandt M&R Station. All facilities also were surveyed for historic architectural properties with the Project's APE. The other aboveground facilities in New York (MLVs, launcher/receivers, cross over piping) would be modified or constructed within the proposed pipeline rights-of-way and are, therefore, included in the discussion of pipeline facilities. A summary of the survey findings for each facility is presented below.

<u>Southeast Compressor Station</u>

No archaeological resources were identified in the proposed Southeast Compressor Station site, and no historic resources were identified in the APE. No further studies were recommended. The New York SHPO agreed with the recommendations in a letter dated March 28, 2014.

<u>Stony Point Compressor Station</u>

No archaeological resources were identified in the proposed Stony Point Compressor Station site, and no historic resources were identified in the APE. No further studies were recommended. The New York SHPO agreed with the recommendations in a letter dated March 28, 2014.

<u>Stony Point M&R Station</u>

One historic resource was identified in the APE: the NRHP-listed Stony Point District School, No. 4 (NY-7; New York SHPO USN 08705.000083). The assessment indicates the Project would have no effect on the significance of the resource. No further studies were recommended. The New York SHPO agreed with the recommendations in a letter dated March 28, 2014.

<u>Peekskill M&R Station</u>

Four historic resources, all of which were considered not eligible for the NRHP, were identified in the APE. No further studies were recommended. The New York SHPO agreed with the recommendations in a letter dated March 28, 2014.

<u>Cortlandt M&R Station</u>

No archaeological resources were identified in the proposed Cortlandt M&R Station site, and no historic resources were identified in the APE. No further studies were recommended. The New York SHPO agreed with the recommendations in a letter dated March 28, 2014.

4.10.2.2 Connecticut

Pipeline Facilities

In Connecticut, regarding the identification survey coverage, the Southeast to MLV 19 Take-up and Relay has received 100 percent coverage for both archaeology and historic architecture. The E-1 System Lateral Take-up and Relay segment has received 93 percent coverage for archaeology and 100 percent coverage for historic architecture. The Line-36A Loop Extension has received 59 percent coverage for archaeology and 100 percent coverage for historic architecture. The E-1 System Lateral Loop has received 100 percent identification survey coverage for both archaeology and historic architecture. The findings for each segment are summarized below.

<u>Southeast to MLV 19 Take-up and Relay</u>

The archaeological survey of this Project facility in Connecticut identified a single archaeological site, dating to the early 19th century. The site was recommended not eligible for the NRHP and no further work was recommended. In addition, 36 stone walls were recorded within the Southeast to MLV 19 Take-up and Relay survey corridor. These walls have been interpreted as former property boundaries and, where avoidance is not possible, documentation and restoration is recommended. A survey for historic architectural properties located 13 resources that were 50 years old or older within the Project's APE. Only one of these resources, a residence and barn in Danbury, is recommended eligible for the NRHP. However, the Project would have no effect on this resource. The Connecticut SHPO agreed with the recommendations in a letter dated April 8, 2014.

<u>Line-36A Loop Extension</u>

The archaeological survey of this Project facility identified a single pre-contact archaeological site. The site was recommended not eligible for the NRHP and no further work was recommended. A survey for historic architectural properties located four resources that were 50 years old or older within the Project's APE; all four were recommended not eligible for the NRHP and no further work was recommended. The Connecticut SHPO agreed with the recommendations in a letter dated April 8, 2014.

<u>E-1 System Lateral Take-up and Relay</u>

A total of 18 archaeological sites, dating from the pre-contact period (one Early Archaic, one Middle Archaic, five Late Archaic, and nine undefined) and post-contact period (a mill site dating to the early 18th century and a domestic site likely dating from the mid-18th to 19th centuries), as well as a single cemetery were identified during the archaeological survey of the E-1 System Lateral Take-up and Relay segment. The cemetery, Trumbull Cemetery, which has grave markers from about 1700 to 1850, is already listed on the State Register of Historic Places and would be avoided. Sixteen sites are recommended for evaluation to determine their eligibility for the NRHP, and the sites would be investigated to make that determination. The remaining two sites are recommended not eligible for the NRHP and no further work is recommended. In addition, 28 stone walls were recorded within the E-1 System Lateral Take-up and Relay survey corridor. These walls have been interpreted as former property boundaries and, where avoidance is not possible, documentation and restoration would be undertaken. The Connecticut SHPO agreed with the recommendations in a letter dated April 8, 2014. Site evaluation investigations are pending for the 16 sites.

A survey for historic architectural properties found 13 additional properties within the Project's APE, 3 of which are recommended eligible for the NRHP: Jonathan Metcalf House in Lebanon (Statewide Historic Resource Inventory No. 71-5); a residence on Trumbull Highway in Lebanon (Statewide Historic Resource Inventory No. 71-125; 113); and a residence and barn in Franklin. The Project would have no effect on these resources. The Connecticut SHPO considers seven of the remaining 10 architectural properties that were recommended not eligible as potentially eligible for the NRHP, but agreed that there would be no adverse effect on potentially eligible resources in a letter dated April 8, 2014.

<u>E-1 System Lateral Loop Extension</u>

A single archaeological site, a pre-contact site of unknown temporal association, was identified on the E-1 System Lateral Loop Extension. The site was recommended for evaluation to determine its NRHP eligibility. The Connecticut SHPO agreed with the recommendation of additional testing of this site in a letter dated April 8, 2014. Site evaluation of the site is pending. In addition, nine stone walls were recorded within the E-1 System Lateral Loop survey corridor. These walls have been interpreted as former property boundaries and, where avoidance is not possible, documentation and restoration is recommended. Seven historic architectural properties were identified within the APE, but none are recommended eligible for the NRHP. The Connecticut SHPO considers four of these architectural properties potentially eligible for the NRHP, but agreed that there would be no adverse effect on potentially eligible resources in a letter dated April 8, 2014.

Aboveground Facilities

There are 18 aboveground facilities located in Connecticut. Work at the Oxford Compressor Station would consist of modifications within the existing compressor building and would not require any temporary workspace; therefore, it is not included in this discussion. Eleven of the facilities (West Danbury M&R Station, Waterbury M&R Station, North Haven M&R Station, Farmington M&R Station, Glastonbury M&R Station, Greenville M&R Station, Middletown M&R Station, Salem Pike M&R Station, Montville M&R Station, Pomfret M&R Station, and Putnam M&R Station) were reviewed and determined to have low potential for intact archaeological resources. No identification surveys were conducted. The Connecticut SHPO agreed with this approach in a letter dated April 8, 2014. Field investigations for archaeological sites were carried out at the remaining facility locations where there was sensitivity for containing intact archaeological sites. All facilities also were surveyed for historic architectural properties within the Project's APE. A summary of the findings for each facility is presented below.

<u>Cromwell Compressor Station</u>

An archaeological survey of this station identified no sites that were eligible for the NRHP, and no further archaeological work was recommended. Four historic architectural properties were identified within the APE, but none are considered eligible for the NRHP. The Connecticut SHPO agreed with the recommendations in a letter dated April 8, 2014.

<u>Chaplin Compressor Station</u>

An archaeological survey of this station identified no sites that were eligible for the NRHP, and no further archaeological work was recommended. The Connecticut SHPO agreed with the recommendations in a letter dated April 8, 2014.

Oakland Heights M&R Station

One archaeological site was identified during the field investigations at this new station site, an undetermined pre-contact site. This site has been recommended not eligible for the NRHP and no further archaeological work was recommended. The Connecticut SHPO agreed with the recommendations in a letter dated April 8, 2014.

Southbury M&R Station

An archaeological survey of this station identified no sites that were eligible for the NRHP, and no further archaeological work was recommended. The Connecticut SHPO agreed with the recommendations in a letter dated April 8, 2014.

Waterbury M&R Station

The survey for historic architectural properties identified five resources within the APE. None of these resources was recommended eligible for the NRHP. No further studies were recommended. The Connecticut SHPO agreed with the recommendations in a letter dated April 8, 2014.

North Haven M&R Station

The survey for historic architectural properties identified two resources within the APE. Neither of these resources was recommended eligible for the NRHP. No further studies were recommended. The Connecticut SHPO agreed with Algonquin’s recommendations in a letter dated April 8, 2014.

Guilford M&R Station

An archaeological survey of this station identified no sites that were eligible for the NRHP, and no further archaeological work was recommended. The Connecticut SHPO agreed with the recommendations in a letter dated April 8, 2014.

Glastonbury M&R Station

The survey for historic architectural properties identified six resources within the APE and none of these resources was recommended eligible for the NRHP. No further studies were recommended. The Connecticut SHPO responded that one resource, CT-38, may be eligible for the NRHP, but concluded that no historic architectural properties would be affected in a letter dated April 8, 2014.

Greenville M&R Station

An archaeological survey and architectural survey of this station is pending.

Middletown M&R Station

The survey for historic architectural properties identified one resource within the APE; however, this resource was not recommended eligible for the NRHP. No further studies were recommended. The Connecticut SHPO agreed with the recommendation in a letter dated April 8, 2014.

Salem Pike M&R Station

The survey for historic architectural properties identified three resources within the APE. None of these resources were recommended eligible for the NRHP, and no further studies were recommended. The Connecticut SHPO agreed with the recommendations in a letter dated April 8, 2014.

Willimantic M&R Station

An archaeological survey of this station identified no sites that are eligible for the NRHP. The survey for historic architectural properties identified three resources within the APE. None of these resources were recommended eligible for the NRHP, and no further work was recommended. The Connecticut SHPO responded that one resource, CT-65, may be eligible for the NRHP, but concluded that no historic properties would be affected in a letter dated April 8, 2014.

Pomfret M&R Station

The survey for historic architectural properties identified one resource within the APE; however, this resource was not recommended eligible for the NRHP. No further work was recommended. The Connecticut SHPO responded that this resource, CT-47, may be eligible for the NRHP, but concluded that no historic properties would be affected in a letter dated April 8, 2014.

Putnam M&R Station

The survey for historic architectural properties identified seven resources within the APE. None of these resources were recommended eligible for the NRHP, and no further studies were recommended. The Connecticut SHPO responded that three resources (CT-48, CT-52, and CT-53) may be eligible for the NRHP, but concluded that no historic properties would be affected in a letter dated April 8, 2014.

4.10.2.3 Rhode Island

Algonquin conducted an archaeological survey of the Burrillville Compressor Station and identified two archaeological sites, both pre-contact sites of unknown temporal affiliation. One of the sites, the Algonquin Lane Site (RI 2568), may be eligible for the NRHP and requires evaluation of its eligibility; the second site was not recommended eligible for the NRHP. The Rhode Island SHPO agreed with this recommendation in a letter dated March 5, 2014. A plan for site evaluation has been submitted and the work is pending. The survey for historic architectural properties identified two resources within the APE. Neither of these resources was recommended eligible for the NRHP. The Rhode Island SHPO agreed with this recommendation in a letter dated April 1, 2014.

4.10.2.4 Massachusetts

Pipeline Facilities

Many portions of the West Roxbury Lateral have low potential for containing significant archaeological sites due to prior disturbance. However, Algonquin has identified some locations that would require archaeological investigations.

The survey for architectural properties identified 259 resources within the APE of the West Roxbury Lateral. Only two of these resources are considered eligible for listing on the NRHP: St. Theresa of Avila Church Complex in West Roxbury and the Willow Street Area in Dedham. The Project would have no effect on these historic resources.

Aboveground Facilities

The Project would involve work at 10 M&R stations, including: Assonet M&R Station, West Roxbury M&R Station, North Fall River M&R Station, New Bedford M&R Station, Middleborough M&R Station, Brockton M&R Station, Norwood M&R Station, Needham M&R Station, Wellesley M&R Station, and Mystic M&R Station. Based on research on previously recorded sites and a walk-over reconnaissance of these stations, all except the West Roxbury M&R Station have little potential for the presence of significant archaeological sites and do not require additional studies. The Massachusetts SHPO agreed with the recommendations in a letter dated March 10, 2014. All facilities also were surveyed for historic architectural properties with the Project's APE. The other aboveground facilities in Massachusetts (MLVs and launcher/receivers) would be modified or constructed within the proposed pipeline right-of-way and are therefore included in the discussion of pipeline facilities. A summary of the findings at each facility is presented below.

<u>West Roxbury M&R Station</u>

An archaeological survey to determine if sites are present at the West Roxbury M&R Station was recommended. This work is currently pending. The survey for historic architectural properties identified 14 resources within the APE, five of which also were within the APE for the West Roxbury Lateral. None of these resources were recommended eligible for the NRHP.

<u>North Fall River M&R Station</u>

The survey for historic architectural properties identified one resource within the APE; however, this resource was not recommended eligible for the NRHP, and no further work was recommended.

<u>Brockton M&R Station</u>

The survey for historic architectural properties identified one resource within the APE; however, this resource was not recommended eligible for the NRHP, and no further work was recommended.

<u>Norwood M&R Station</u>

The survey for historic architectural properties identified three resources within the APE. None of these resources were recommended eligible for the NRHP, and no further work was recommended.

<u>Mystic M&R Station</u>

The survey for historic architectural properties identified three resources within the APE. None of these resources were recommended eligible for the NRHP, and no further work was recommended.

4.10.3 Outstanding Cultural Resource Investigations

Algonquin has yet to file some identification reports, evaluation reports, and SHPO comments for portions of the Project. A summary of this outstanding work is presented below (see also table 4.10.2-1). The Project also includes access roads and contractor yards, some of which may require identification surveys for cultural resources.

4.10.3.1 New York

Identification survey for archaeological sites remains for a portion of the Haverstraw to Stony Point Take-up and Relay as well as the Stony Point to Yorktown Take-up and Relay segments. Additionally, evaluation work is pending for two sites along the Haverstraw to Stony Point Take-up and Relay segment (Corral and Depressions Site and the Pound Swamp Site) and for seven sites on the Stony Point to Yorktown Take-up and Relay segment (Franck Road Site, St. John the Divine Fresh Air Home, Westchester Wetlands Site, Pleasantside Site, Little Stream Site, Furnace Brook Site, and Kiln Site). Additional remaining work includes Algonquin's assessment of possible impacts on the Letchworth Village Cemetery.

4.10.3.2 Connecticut

Identification survey is not complete for portions of the Line-36A Loop Extension, E-1 System Lateral Take-up and Relay, and the Greenville M&R Station. Evaluation work also is pending for 16 sites on the E-1 System Lateral Take-up and Relay (Elisha Brook Pre-Contact Site, Johnnycake Brook Site, Meetinghouse Hill Site, Susquetonscut Brook Mill Site, Susquetonscut Brook Post-Contact Site, Susquetonscut Brook Pre-Contact sites 1 through 9, 11, and 12), and the Raymond Hill Wetland Site on the E-1 System Lateral Loop Extension.

4.10.3.3 Rhode Island

Evaluation studies remain for one site located at the Burrillville Compressor Station, the Algonquin Lane Site.

4.10.3.4 Massachusetts

Evaluation studies remain for portions of the West Roxbury Lateral and the West Roxbury M&R Station.

4.10.4 Unanticipated Discoveries Procedures

Algonquin has prepared procedures to be used in the event any unanticipated historic properties or human remains are encountered during construction. The *Procedures Guiding the Discovery of Unanticipated Cultural Resources and Human Remains* provide for the notification of interested parties, including Indian tribes, in the event of any discovery. The Massachusetts, New York, and Rhode Island SHPOs agreed with the procedure's provisions and we find them acceptable as well. The Connecticut SHPO responded that the procedures should include the specific language of CGS section 10-388, which requires immediate notification of both the Chief Medical Examiner and State Archaeologist in the event human remains are encountered. Therefore, **we recommend that:**

- **<u>Prior to the end of the draft EIS comment period</u>, Algonquin should file with the Secretary a revised Procedures Guiding the Discovery of Unanticipated Cultural**

Resources and Human Remains that incorporates the Connecticut SHPO's comment to include specific language of CGS section 10-388.

4.10.5 General Impact and Mitigation

Construction and operation of the Project could affect historic properties. Direct effects could include destruction or damage to all, or a portion of, an archaeological site, or alteration or removal of a historic property. Indirect effects could include the introduction of visual, atmospheric, or audible elements that affect the setting or character of a historic property.

Compliance with section 106 of the NHPA has not been completed for the proposed Project. Cultural resources surveys of portions of the proposed Project and consultation with the SHPOs and other parties has not been completed. To date, nine archaeological sites located in New York, 17 sites in Connecticut, and one site in Rhode Island require additional testing to determine eligibility for listing on the NRHP. If FERC, in consultation with the New York, Connecticut, and Rhode Island SHPOs, determines that the sites are eligible and cannot be avoided, Algonquin would be required to prepare a treatment plan, in consultation with the appropriate parties, to mitigate adverse effects. The FERC would afford the ACHP an opportunity to comment in accordance with 36 CFR 800.6. Implementation of a treatment plan would occur only after Certification of the Project and receipt of written notification to proceed from the FERC.

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

- **Algonquin should not begin implementation of any treatment plans/measures (including archaeological data recovery); construction of facilities; or use of staging, storage, or temporary work areas and new or to-be-improved access roads until:**

  a. Algonquin files with the Secretary all remaining cultural resources survey and evaluation reports, any necessary treatment plans, and the New York, Connecticut, Rhode Island, and Massachusetts SHPOs' comments on the reports and plans;

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

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

4.11 AIR QUALITY AND NOISE

4.11.1 Air Quality

Air quality would be affected by construction and operation of the AIM 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 compressor units at five of the existing compressor stations. These would be the Stony Point and Southeast Compressor Stations in New York; the Cromwell and Chaplin Compressor Stations in Connecticut; and the Burrillville Compressor Station in Rhode Island. The modifications at the sixth compressor station, the Oxford Compressor Station in Connecticut, would involve the restaging of one existing compressor unit. This work would not result in impacts on air quality or noise. Therefore, the Oxford Compressor Station is not included in the analysis below. Three new M&R stations are also proposed to be added as part of the Project, including one in Connecticut and two in Massachusetts. The new M&R stations would include natural gas-fired heaters, which would be new sources of emissions during operation of the proposed Project.

4.11.1.1 Existing Air Quality

The Project area in southeastern New York and southwestern Connecticut has a climate that is characterized as continental. Winters are short and moderately cold lasting into mid-March. Summers are warm with periods of oppressive heat and humidity, while autumn is characterized by mild temperatures extending into November. Normal monthly precipitation, as recorded at the nearest measurement stations (Suffern, New York; Carmel, New York; and Danbury, Connecticut), ranges from a high of 5 inches during the month of July to a low of approximately 3 inches during the month of February. Airflow and weather systems that affect the area are primarily of continental origin.

The Project area in central and western Connecticut has a climate that is characterized as continental with hot summers and cold winters. Normal monthly precipitation, as recorded at the nearest measurement stations (Middletown and Thompson, Connecticut), ranges from a high of 5 inches during the month of October to a low of approximately 3 inches during the month of February. The primary airflow and weather systems that affect the area are either cold, dry air originating from sub-arctic North America or warm, moist air moving across the mid-continent from the Gulf of Mexico and sub-tropical waters of the Atlantic.

The Project area in Rhode Island has a climate that is characterized as humid continental. In general the winters are cold, but extreme temperatures are of short duration. The summers are comparatively cool, although there are some periods of hot weather, usually of short duration. Normal monthly precipitation, as recorded at the nearest measurement station (Foster, Rhode Island), ranges from a high of 5 inches during the month of March to a low of approximately 4 inches during the month of July. Winds are predominantly from the west and seasonal temperature differentiation is moderated by the proximity of Narragansett Bay and the Atlantic Ocean.

The Project area in eastern and southeastern Massachusetts has a climate that is characterized as humid continental. The climate in the region is characterized by frequent changes in the weather, large ranges in temperature, and considerable diversity from place to place. Normal monthly precipitation, as recorded at the nearest measurement station (New Bedford and Milton, Massachusetts), ranges from a high of 5 inches during the month of March to a low of approximately 4 inches during the month of May. The primary airflow and weather systems that affect the area are either cold, dry air originating from sub-arctic North America or warm, moist air moving across the mid-continent from the Gulf of Mexico and sub-tropical waters of the Atlantic, or cold air from the North Atlantic. Occasionally, cool, damp air from the North Atlantic results in Northeasters.

Ambient air quality is protected by federal and state air quality standards. The EPA established NAAQS 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.

There are two classifications of NAAQS, primary and secondary standards. EPA set limits under the primary standards to protect human health including sensitive populations such as children, the elderly, and asthmatics. EPA set secondary standard limits to protect public welfare from detriments such as reduced visibility and damage to crops, vegetation, animals, and buildings. The federal NAAQS are presented in table 4.11.1-1. The NYSDEC, CTDEEP, and MADEP all have adopted ambient air quality standards (AAQS) that differ in some respects from the current NAAQS. Table 4.11.1-2 summarizes the current AAQSs for New York, Connecticut, and Massachusetts (NYSDEC, 2014h; CTDEEP, 2014a; MADEP, 2014a). The RIDEM has adopted in full all of the NAAQS.

GHGs occur in the atmosphere both naturally and as a result of human activities, such as the burning of fossil fuels. These gases are the integral components of the atmosphere's greenhouse effect that warms the earth's surface and moderates day/night temperature variation. In general, the most abundant GHGs are water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and ozone. On December 7, 2009, the EPA defined air pollution to include the mix of six long-lived and directly emitted GHGs, finding that the presence of the following GHGs in the atmosphere may endanger public health and welfare through climate change: CO_2, CH_4, N_2O, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

As with any fossil fuel-fired project or activity, the Project would contribute GHG emissions. The primary GHGs that would be produced by the Project include CO_2, CH_4, and N_2O. 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 (Intergovernmental Panel on Climate Change, 2007). Thus, CO_2 has a GWP of 1, CH_4 has a GWP of 25, and N_2O has a GWP of 298.[8] To obtain the CO_2e quantity, the mass of the particular GHG is multiplied by the corresponding GWP. The CO_2e value for each of the GHG compounds is summed to obtain the total CO_2e GHG emissions. 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 4.11.1.3.

8 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 EPA has established for reporting of GHG emissions and air permitting requirements. This allows for a consistent comparison with these regulatory requirements.

TABLE 4.11.1-1

National Ambient Air Quality Standards

Pollutant	Averaging Period	Standards Primary	Standards Secondary
SO_2	1-hour [j,k]	75 ppb	--
	3-hour [b]	--	0.5 ppm 1300 µg/m^3
	Annual [a,k]	0.03 ppm 80 µg/m^3	--
	24-hour [b,k]	0.14 ppm 365 µg/m^3	--
PM_{10}	24-hour [d]	150 µg/m^3	150 µg/m^3
$PM_{2.5}$ (2012 Standard)	Annual [e,l]	12.0 µg/m^3	15.0 µg/m^3
$PM_{2.5}$ (2006 Standard)	24-hour [f]	35 µg/m^3	35 µg/m^3
$PM_{2.5}$ (1997 Standard)	Annual [e,l]	15.0 µg/m^3	15.0 µg/m^3
	24-hour [f]	65 µg/m^3	65 µg/m^3
NO_2	Annual [a]	0.053 ppm (53 ppb) 100 µg/m^3	0.053 ppm (53 ppb) 100 µg/m^3
	1-hour [c]	100 ppb 188 µg/m^3	--
CO	8-hour [b]	9 ppm 10,000 µg/m^3	--
	1-hour [b]	35 ppm 40,000 µg/m^3	--
Ozone (2008 Standard)	8-hour [g,h,i]	0.075 ppm	0.075 ppm
Ozone (1997 Standard)	8-hour [g,i]	0.08 ppm	0.08 ppm
Lead (Pb)	Rolling 3-month [a]	0.15 µg/m^3	0.15 µg/m^3

[a] Not to be exceeded.
[b] Not to be exceeded more than once per year.
[c] Compliance based on 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area.
[d] Not to be exceeded more than once per year on average over 3 years.
[e] Compliance based on 3-year average of weighted annual mean $PM_{2.5}$ concentrations at community-oriented monitors.
[f] Compliance based on 3-year average of 98th percentile of 24-hour concentrations at each population-oriented monitor within an area.
[g] Compliance based on 3-year average of fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area.
[h] The EPA is currently reconsidering the 8-hour ozone standard set in March 2008. However, the EPA has moved forward with implementing the 2008 standard until the reconsideration is finalized.
[i] The EPA proposed to revoke the 1997 8-hour ozone NAAQS in June 2013; until this action appears in the Federal Register as a final rule, the Project is still subject to requirements related to its maintenance status under the 1997 8-hour ozone NAAQS.
[j] Compliance based on 3-year average of 99th percentile of the daily maximum 1-hour average at each monitor within an area.
[k] The 24-hour and annual average primary standards for SO_2 remain in effect until one year after an area is designated for the 1-hour standard. Area designations in Ohio were finalized for the 1-hour standard on October 4, 2013.
[l] The 1997 annual $PM_{2.5}$ standard and associated implementation rules remain in in effect until 1 year after an area is designated for the 2013 annual $PM_{2.5}$ standard. Area designations have not yet been proposed for the 2013 standard.

Notes: ppm = parts per million by volume; ppb = parts per billion by volume; µg/m3 = micrograms per cubic meter

TABLE 4.11.1-2

State Ambient Air Quality Standards

Pollutant	Averaging Period	New York AAQS	Primary Connecticut AAQS	Secondary Connecticut AAQS	Primary Massachusetts AAQS	Secondary Massachusetts AAQS
SO_2	Annual [a,d]	0.03 ppm (80 µg/m^3)	0.03 ppm (80 µg/m^3)	--	0.03 ppm (80 µg/m^3)	--
	24-hour [b]	0.14 ppm (365 µg/m^3)	0.14 ppm (365 µg/m^3)	0.1 ppm (260 µg/m^3)	0.14 ppm (365 µg/m^3)	--
	24-hour [c]	0.10 ppm	--	--	--	--
	3-hour [b]	0.50 ppm (1,300 µg/m^3)	--	0.50 ppm (1,300 µg/m^3)	--	0.50 ppm (1,300 µg/m^3)
	3-hour [c]	0.25 ppm	--	--	--	--
Suspended Particulates	Annual [a]	45 µg/m^3 (Level 1 areas) 55 µg/m^3 (Level 2 areas) 65 µg/m^3 (Level 3 areas) 75 µg/m^3 (Level 4 areas)	--	--	--	--
	24-hour [b]	250 µg/m^3	--	--	--	--
PM_{10}	Annual [h]	--	50 µg/m^3	50 µg/m^3	50 µg/m^3	50 µg/m^3
	24-hour [i]	--	150 µg/m^3	150 µg/m^3	150 µg/m^3	150 µg/m^3
NO_2	Annual [a]	0.05 ppm (100 µg/m^3)	0.05 ppm (100 µg/m^3)	0.05 ppm (100 µg/m^3)	0.05 ppm (100 µg/m^3)	0.05 ppm (100 µg/m^3)
CO	8-hour [b]	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
	1-hour [b]	35 ppm (40 µg/m^3)	35 ppm (40 µg/m^3)	35 ppm (40 µg/m^3)	35 ppm (40 µg/m^3)	35 ppm (40 µg/m^3)
Ozone	8-hour [j]	--	0.08 ppm	0.08 ppm	--	--
	1-hour [i]	--	0.012 ppm	0.012 ppm	0.012 ppm (235 µg/m^3)	0.012 ppm (235 µg/m^3)
Photochemical Oxidants	1-hour [b]	0.08 ppm (160 µg/m^3)	--	--	--	--
Non-methane hydrocarbons	3-hour [b,e]	0.24 ppm (160 µg/m^3)	0.24 ppm (160 µg/m^3)	0.24 ppm (160 µg/m^3)	--	--
Total Fluorides	Growing season [f,g]	40 ppm	--	--	--	--
	60 days [f]	60 ppm	--	--	--	--
	30 days [f]	80 ppm	--	--	--	--
Gaseous Fluorides	1 month [f]	1.0 ppb (0.8 µg/m^3)	--	--	--	--
	1 week [f]	2.0 ppb (1.65 µg/m^3)	--	--	--	--
	24-hour [f]	3.5 ppb (2.85 µg/m^3)	--	--	--	--
	12-hour [f]	4.5 ppb (3.7 µg/m^3)	--	--	--	--
Beryllium	1 month [a]	0.01 µg/m^3	--	--	--	--

TABLE 4.11.1-2 (cont'd)

State Ambient Air Quality Standards

Pollutant	Averaging Period	New York AAQS	Primary Connecticut AAQS	Secondary Connecticut AAQS	Primary Massachusetts AAQS	Secondary Massachusetts AAQS
Hydrogen sulfide	1-hour [a]	0.01 ppm (14 µg/m^3)	--	--	--	--
Lead (Pb)	3-month/ Calendar Quarter [a]	--	1.5 µg/m^3	1.5 µg/m^3	1.5 µg/m^3	1.5 µg/m^3
Dioxin	Annual[a]		1.0 picograms/m^3	--	--	--
	8-hour [k]		7.0 picograms/m^3	--	--	--

a Not to be exceeded.
b Not to be exceeded more than once per year.
c Compliance based on 99th percentile value.
d Calculated as annual average of 24-hour concentrations.
e Applies during 6 to 9 a.m.
f Not to equal or exceed.
g Growing season not to exceed 6 continuous months.
h Standard attained when expected annual arithmetic mean is less than indicated value.
i Standard attained when expected days per calendar year exceeding value is less than or equal to 1.
j Compliance based on average of the annual fourth-highest daily maximum 8-hour average.
k Surrogate value that may be used for demonstrating compliance with primary standard for dioxin.

Notes: ppm = parts per million by volume; ppb = parts per billion by volume; µg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter.

Air quality control regions (AQCR) are areas established by EPA and local agencies, in accordance with section 107 of the CAA, for air quality planning purposes in which SIPs describe how 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. Areas are designated attainment, unclassifiable, nonattainment, or maintenance on a pollutant-by-pollutant basis. Attainment areas are in compliance (below) with the NAAQS and nonattainment areas not in compliance (exceed) with the NAAQS. Areas where no data are available are designated unclassifiable. 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.

The entire Project area is designated attainment or unclassifiable for SO_2, NO_2, PM_{10}, and lead. Table 4.11.1-3 identifies the counties designated as nonattainment and/or maintenance within the Project area for CO, ozone, and $PM_{2.5}$ (EPA, 2014a).

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 SIP, 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.

TABLE 4.11.1-3

Nonattainment and Maintenance Areas Within the Vicinity of the AIM Project

Project Component	Nonattainment/ Maintenance Pollutant	County	Air Quality Control Region	General Conformity Applicability Threshold (tons/year)
New York				
Pipeline – 6.8 miles Stony Point M&R Station Stony Point Compressor Station	$PM_{2.5}$ Maintenance	Rockland, NY	NY-NNJ-LI, NY-NJ-CT	$PM_{2.5}$ – 100 SO_2 – 100 NO_x – 100
	1997 Ozone – Moderate NA	Rockland, NY	NY-NNJ-LI, NY-NJ-CT	NO_x – 100 VOC – 50
	2008 Ozone – Marginal NA	Rockland, NY	NY-NNJ-LI, NY-NJ-CT	NO_x – 100 VOC – 50
Pipeline – 8.8 miles Hudson River HDD Peekskill and Cortlandt M&R Stations	$PM_{2.5}$ Maintenance	Westchester, NY	NY-NNJ-LI, NY-NJ-CT	$PM_{2.5}$ – 100 SO_2 – 100 NOx - 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
Pipeline – 0.1 mile Southeast Compressor Station Purge and Blowdown of Pipeline and Compressor Station	1997 Ozone – Moderate NA	Putnam, NY	Poughkeepsie, NY	NO_x – 100 VOC – 50
Connecticut				
Pipeline – 4.4 miles Still River HDD West Danbury M&R Station Pipeline – 1.8 miles	$PM_{2.5}$ Maintenance	Fairfield, CT	NY-NNJ-LI, NY-NJ-CT	$PM_{2.5}$ – 100 SO_2 – 100 NO_x - 100
	1997 Ozone – Moderate NA	Fairfield, CT	NY-NNJ-LI, NY-NJ-CT	NO_x – 100 VOC – 50
	2008 Ozone – Marginal NA	Fairfield, CT	NY-NNJ-LI, NY-NJ-CT	NO_x – 100 VOC – 50
	CO – Maintenance	Fairfield, CT	NY-NNJ-LI, NY-NJ-CT	CO – 100
Cromwell Compressor Station Middletown M&R Station	1997 Ozone – Moderate NA	Middlesex, CT	NY-NNJ-LI, NY-NJ-CT	NO_x – 100 VOC – 50
	2008 Ozone – Marginal NA	Middlesex, CT	NY-NNJ-LI, NY-NJ-CT	NO_x – 100 VOC – 50
	CO – Maintenance	Middlesex, CT	Hartford-New Britain-Middletown, CT	CO – 100
Southbury, North Haven, Waterbury, and Guilford M&R Stations	$PM_{2.5}$ 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
Pipeline – 10.4 miles Greenville, Salem Pike, Montville, and Oakland Heights M&R Stations	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
Pipeline – 0.2 mile Farmington and Glastonbury M&R Stations	1997 Ozone – Moderate NA	Hartford, CT	Greater Connecticut	NO_x – 100 VOC – 50
	2008 Ozone – Marginal NA	Hartford, CT	Greater Connecticut	NO_x – 100 VOC – 50
	CO – Maintenance	Hartford, CT	Hartford-New Britain-Middletown, CT	CO – 100

TABLE 4.11.1-3 (cont'd)

Nonattainment and Maintenance Areas Within the Vicinity of the AIM Project

Project Component	Nonattainment/ Maintenance Pollutant	County	Air Quality Control Region	General Conformity Applicability Threshold (tons/year)
Chaplin Compressor Station Willimantic, Pomfret, and Putnam M&R Stations	1997 Ozone – Moderate NA	Windham, CT	Greater Connecticut	NO_x – 100 VOC – 50
	2008 Ozone – Marginal NA	Windham, CT	Greater Connecticut	NO_x – 100 VOC – 50
Purge and Blowdown of Pipeline, Compressor Stations, and M&R Stations	1997 Ozone – Moderate NA	AQCR 042 Hartford-New Haven-Springfield Interstate	Greater Connecticut	NO_x – 100 VOC – 50
	2008 Ozone – Marginal NA	AQCR 042 Hartford-New Haven-Springfield Interstate	Greater Connecticut	NO_x – 100 VOC – 50
Rhode Island				
Burrillville Compressor Station Purge and Blowdown of Compressor Station	1997 Ozone – Moderate NA	Providence, RI	Providence (all of RI), RI	NO_x – 100 VOC – 50
Massachusetts				
Pipeline – 5.1 miles	1997 Ozone – Moderate NA	Norfolk and Suffolk, MA	Boston-Lawrence-Worcester (Eastern MA), MA	NO_x – 100 VOC – 50
	CO – Maintenance	Norfolk and Suffolk, MA	Boston, MA	CO – 100
Mystic, West Roxbury, Needham, Wellesley, and Norwood M&R Stations	1997 Ozone – Moderate NA	Norfolk, Suffolk, and Middlesex, MA	Boston-Lawrence-Worcester (Eastern MA), MA	NO_x – 100 VOC – 50
	CO – Maintenance	Norfolk, Suffolk, and Middlesex, MA	Boston, MA	CO – 100
New Bedford, Brockton, North Middleborough, North Fall River, and Assonet M&R Stations	1997 Ozone – Moderate NA	Bristol and Plymouth, MA	Boston-Lawrence-Worcester (Eastern MA), MA	NO_x – 100 VOC – 50
Gas Heaters at West Roxbury M&R Station	1997 Ozone – Moderate NA	Suffolk, MA	Boston-Lawrence-Worcester (Eastern MA), MA	NO_x – 100 VOC – 50
	CO – Maintenance	Suffolk, MA	Boston, MA	CO – 100
Purge and Blowdown of Pipeline and M&R Stations	1997 Ozone – Moderate NA	AQCR 119 Metropolitan Boston Intrastate	Boston-Lawrence-Worcester (Eastern MA), MA	NO_x – 100 VOC – 50
Multi-State Region				
Purge and Blowdown of Pipeline, Compressor Stations and M&R Stations	$PM_{2.5}$ Maintenance	AQCR 043 NJ-NY-CT Interstate	NY-NNJ-LI, NY-NJ-CT	$PM_{2.5}$ – 100 SO_2 – 100 NO_x – 100
	1997 Ozone – Moderate NA	AQCR 043 NJ-NY-CT Interstate	NY-NNJ-LI, NY-NJ-CT	NO_x – 100 VOC – 50
	2008 Ozone – Marginal NA	AQCR 043 NJ-NY-CT Interstate	NY-NNJ-LI, NY-NJ-CT	NO_x – 100 VOC – 50

Notes: NY = New York; NJ = New Jersey; CT = Connecticut; RI = Rhode Island; MA = Massachusetts; NA: nonattainment; NY-NNJ-LI = New York-North New Jersey-Long Island

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

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. To characterize the background air quality in the region surrounding the Project areas, data were obtained from representative air quality monitoring stations. A summary of monitoring data from the EPA AirData database for the 3-year period of 2010 through 2012 is provided in table 4.11.1-4 (EPA, 2014b).

4.11.1.2 Air Quality Regulatory Requirements

Federal Air Quality Regulations

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

Prevention of Significant Deterioration and Nonattainment New Source Review

Ambient air quality within the Project area is protected by the EPA's Prevention of Significant Deterioration (PSD) and Nonattainment New Source Review (NNSR) programs. The PSD regulations apply to new major stationary sources or major modifications to existing stationary sources located in attainment areas. The NNSR regulations apply to new or modified stationary sources located in nonattainment areas.

The PSD regulations (40 CFR 52.21) define a major source as any source listed under the named industrial source categories in the regulation that has the potential-to-emit (PTE) 100 tons per year (tpy) or more of any New Source Review (NSR) pollutant or any source not on the list of named categories that has a PTE of any NSR pollutant equal to or greater than 250 tpy. The Project would not include facilities or operations included on the list of named source categories to which the 100-tpy trigger applies.

Major modifications to existing major sources as defined in the PSD regulations would result in a significant emissions increase and a significant net emissions increase of a regulated NSR pollutant. They would include: a modification to an existing major source that results in a net emissions increase greater than the PSD significant emission rates specified in the regulations; or an existing minor source proposing a modification that is major by itself.

NO_x and VOCs are precursor pollutants to ozone; therefore, major NNSR thresholds are 25 tpy for NOx or VOC emissions, each. Similarly, SO_2 and NO_x are $PM_{2.5}$ precursors and therefore the NNSR threshold for $PM_{2.5}$ is 100 tpy of direct $PM_{2.5}$, SO_2, or NO_x emissions, each. Although major NNSR thresholds are established on a federal level, they may be implemented by state or local permitting authorities. As a result, the major NNSR thresholds vary by state and by location within a state.

GHGs are now a regulated NSR pollutant and under the EPA's GHG Tailoring Rule. The rule covers an estimated 70 percent of GHG emissions from stationary sources but does not apply to smaller sources such as apartment buildings and schools. Beginning on July 1, 2011, an existing industrial facility is subject to PSD review for GHGs if:

- it is already subject to PSD review for another NSR pollutant and would increase its GHG emissions by 75,000 tpy CO2e;
- the existing potential GHGs emissions are equal to or greater than 100,000 tpy CO2e and GHG emissions as a result of the Project would increase by 75,000 tpy CO2e or more; or
- the existing source is minor for PSD (including GHGs) and the modification alone would result in equal to or greater than 100,000 tpy CO2e.

TABLE 4.11.1-4

Ambient Air Quality Concentrations

Pollutant	Averaging Period	Monitoring Station Location	2010	2011	2012
Stony Point Compressor Station					
CO	1-hour[a]	Fairfield, CT	1.5 ppm	1.4 ppm	0.9 ppm
	8-hour[a]	Fairfield, CT	1.0 ppm	1.0 ppm	0.8 ppm
NO_2	1-hour[b]	Lackawanna, PA	43 ppb	45 ppb	36 ppb
$PM_{2.5}$	24-hour[b]	Orange, NY	27 µg/m^3	21 µg/m^3	20 µg/m^3
	Annual[c]	Orange, NY	8.1 µg/m^3	8.6 µg/m^3	7.8 µg/m^3
PM_{10}	24-hour[a]	New Haven, CT	34 µg/m^3	50 µg/m^3	37 µg/m^3
SO_2	1-hour[d]	Putnam, NY	10 ppb	11 ppb	6 ppb
	24-hour[a]	Putnam, NY	4 ppb	5 ppb	3 ppb
Ozone	1-hour[a]	Rockland, NY	0.101 ppm	0.086 ppm	0.100 ppm
	8-hour[e]	Rockland, NY	0.076 ppm	0.074 ppm	0.079 ppm
Southeast Compressor Station					
CO	1-hour[a]	Fairfield, CT	1.5 ppm	1.4 ppm	0.9 ppm
	8-hour[a]	Fairfield, CT	1.0 ppm	1.0 ppm	0.8 ppm
NO_2	1-hour[b]	Lackawanna, PA	43 ppb	45 ppb	36 ppb
$PM_{2.5}$	24-hour[b]	Fairfield, CT	26 µg/m^3	25 µg/m^3	22 µg/m^3
	Annual[c]	Fairfield, CT	9.1 µg/m^3	9.6 µg/m^3	8.4 µg/m^3
PM_{10}	24-hour[a]	New Haven, CT	34 µg/m^3	50 µg/m^3	37 µg/m^3
SO_2	1-hour[d]	Putnam, NY	10 ppb	11 ppb	6 ppb
	24-hour[a]	Putnam, NY	4 ppb	5 ppb	3 ppb
Ozone	1-hour[a]	Fairfield, CT	0.109 ppm	0.102 ppm	0.107 ppm
	8-hour[e]	Fairfield, CT	0.084 ppm	0.083 ppm	0.084 ppm
Cromwell Compressor Station					
CO	1-hour[a]	Hartford, CT	1.4 ppm	2.0 ppm	1.3 ppm
	8-hour[a]	Hartford, CT	1.2 ppm	1.3 ppm	1.0 ppm
NO_2	1-hour[b]	Hartford, CT	44 ppb	58 ppb	37 ppb
$PM_{2.5}$	24-hour[b]	Hartford, CT	24 µg/m^3	23 µg/m^3	20 µg/m^3
	Annual[c]	Hartford, CT	8.5 µg/m^3	9.3 µg/m^3	8.5 µg/m^3
PM_{10}	24-hour[a]	Hartford, CT	24 µg/m^3	24 µg/m^3	22 µg/m^3
SO_2	1-hour[d]	Hartford, CT	10 ppb	14 ppb	8 ppb
	24-hour[a]	Hartford, CT	6 ppb	8 ppb	4 ppb
Ozone	1-hour[a]	Middlesex, CT	0.100 ppm	0.114 ppm	0.103 ppm
	8-hour[e]	Middlesex, CT	0.081 ppm	0.080 ppm	0.081 ppm

TABLE 4.11.1-4 (cont'd)					
Ambient Air Quality Concentrations					
Pollutant	Averaging Period	Monitoring Station Location	2010	2011	2012
Chaplin Compressor Station					
CO	1-hour[a]	Hartford, CT	1.4 ppm	2.0 ppm	1.3 ppm
	8-hour[a]	Hartford, CT	1.2 ppm	1.3 ppm	1.0 ppm
NO_2	1-hour[b]	Hartford, CT	44 ppb	58 ppb	37 ppb
$PM_{2.5}$	24-hour[b]	Hartford, CT	24 µg/m^3	24 µg/m^3	18 µg/m^3
	Annual[c]	Hartford, CT	7.6 µg/m^3	8.9 µg/m^3	7.3 µg/m^3
PM_{10}	24-hour[a]	Hartford, CT	24 µg/m^3	24 µg/m^3	22 µg/m^3
SO_2	1-hour[d]	Hartford, CT	10 ppb	14 ppb	8 ppb
	24-hour[a]	Hartford, CT	6 ppb	8 ppb	4 ppb
Ozone	1-hour[a]	Tolland, CT	0.106 ppm	0.106 ppm	0.099 ppm
	8-hour[e]	Tolland, CT	0.079 ppm	0.068 ppm	0.083 ppm
Burrillville Compressor Station					
CO	1-hour[a]	Providence, RI	2.3 ppm	1.8 ppm	1.5 ppm
	8-hour[a]	Providence, RI	1.6 ppm	1.3 ppm	1.0 ppm
NO_2	1-hour[b]	Providence, RI	40 ppb	45 ppb	40 ppb
$PM_{2.5}$	24-hour[b]	Kent, RI	24 µg/m^3	15 µg/m^3	14 µg/m^3
	Annual[c]	Kent, RI	6.7 µg/m^3	6.3 µg/m^3	6.7 µg/m^3
PM_{10}	24-hour[a]	Kent, RI	26 µg/m^3	23 µg/m^3	20 µg/m^3
SO_2	1-hour[d]	Providence, RI	21 ppb	21 ppb	18 ppb
	24-hour[a]	Providence, RI	13 ppb	11 ppb	8 ppb
Ozone	1-hour[a]	Worchester, MA	0.083 ppm	0.103 ppm	0.080 ppm
	8-hour[e]	Worchester, MA	0.071 ppm	0.068 ppm	0.070 ppm

[a] 2nd high
[b] 98th percentile
[c] Mean
[d] 99th percentile
[e] 4th high

Notes: ppm = parts per million by volume; ppb = parts per billion by volume; µg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter.

The U.S. Supreme Court recently issued a ruling related to the EPA's GHG Tailoring Rule. It is not clear at this time the implication of this ruling on pending permit actions. The air permitting actions associated with the proposed Project have been presented based upon the previous interpretations of the GHG Tailoring Rule and would comply with all currently applicable federal and state rules.

Because of their attainment status, all Project facilities would potentially be subject to NNSR review for ozone precursor pollutants NO_x and VOCs. Facilities located in Rockland and Westchester Counties, New York would potentially be subject to NNSR for $PM_{2.5}$. Facilities located in Westchester County, New York; Fairfield, Hartford, Middlesex, and New Haven Counties, Connecticut; Norfolk, Suffolk, and Middlesex Counties, Massachusetts would potentially be subject to NNSR for CO. All other Project facilities and pollutants, including GHGs, would potentially be subject to PSD review. Each of the states in which Project facilities would be located have state-level programs that implement federal NNSR and PSD permitting, which are summarized below.

One additional factor considered in the PSD permit review process is the potential impacts on protected Class I areas. Certain lands were designated as Mandatory Federal Class I Areas as a part of the CAA Amendments of 1977. 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). Federal Class I Areas are protected against several types of pollution including criteria pollutant concentrations, visibility degradation, and acidic deposition. If a new major source or major modification is located within 62 miles (100 kilometers) of a Class I Area, the facility is required to notify the appropriate federal officials and assess the impacts of that project on the nearby Class I Area. For major sources that are located within 6.2 miles (10 kilometers) from a Class I area, ambient air pollutant impacts must be assessed for any project emission increases. The nearest Class I areas to the AIM Project are the Lye Brook Wilderness Area in Vermont and the Brigantine Wilderness Area in New Jersey (EPA, 2014c). The shortest distance between the Lye Brook Wilderness Area and the closest portion of the Project (the Cromwell Compressor Station) is approximately 100 miles. The shortest distance between the Brigantine Wilderness Area and the closest portion of the Project (the Stony Point Compressor Station) is approximately 119 miles. Therefore, an assessment of the impact on Class I areas is not required.

The NYSDEC administers its major NSR permitting program through 6 NYCRR 231. The New York SIP was updated in November 2010 to create a new state PSD program and to update the existing New York NNSR rules to include the 2002 federal NSR reform provisions. The Stony Point and Southeast Compressor Stations are existing major PSD sources located in New York. The facilities are also existing major NNSR sources. The proposed modifications to the Stony Point Compressor Station trigger PSD for GHG emissions and do not trigger NNSR review. An application for a significant modification to the Stony Point Compressor Station was submitted to the NYSDEC in February 2014. The proposed modifications to the Southeast Compressor Station do not trigger PSD or NNSR review.

The CTDEEP administers its NSR permitting program through Regulation of Connecticut State Agencies (RCSA) § 22a-174-3a. The Cromwell and Chaplin Compressor Stations are existing major PSD sources located in Connecticut. The facilities are also existing major NNSR sources. The proposed modifications to the Cromwell Compressor Station do not trigger NNSR review. Because Algonquin has chosen to accept a fuel use restriction, the proposed modifications also do not trigger PSD review. The proposed modifications to the Chaplin Compressor Station do not trigger PSD or NNSR review.

The RIDEM NSR permitting program is established in Air Pollution Control (APC) Regulation No. 9. The Burrillville Compressor Station is an existing major NNSR. Although the facility has existing GHG potential emissions greater than 100,000 tpy of CO_2e, in Rhode Island, a major source of GHGs is not considered a major PSD source if it is not also major for another PSD pollutant. Therefore, the Burrillville Compressor Station is not considered a major source under the PSD program. The proposed modifications to the Burrillville Compressor Station do not trigger NNSR review. Also, because Algonquin has chosen to accept a fuel use restriction for the new turbine, the proposed modifications also do not trigger PSD review.

Algonquin is also proposing to modify 24 existing M&R stations, remove one existing M&R station, and install three new M&R stations; however, Algonquin has not decided on the size of some of the emission generating units at the new and/or revised M&R stations. The modifications to five existing M&R stations located in Peekskill, New York (the Peekskill M&R Station); Cortlandt, New York (the

Cortlandt M&R Station); Guilford, Connecticut (the Guilford M&R Station); Windham, Connecticut (the Willimantic M&R Station); and New Bedford, Massachusetts (the New Bedford M&R Station) would include new or replacement natural gas-fired inlet gas heaters. The primary source of air emissions at the three new M&R stations proposed in Norwich, Connecticut (the Oakland Heights M&R Station); Freetown, Massachusetts (the Assonet M&R Station); and Boston, Massachusetts (the West Roxbury M&R Station) would be natural gas-fired inlet gas heaters. These gas heaters are expected to have rated maximum heat input capacities ranging from less than 1 million metric British thermal units per hour (MMBtu/hr) up to approximately 10 MMBtu/hr. Based upon the information provided by Algonquin, the potential emissions from the modified and new M&R stations would be significantly below NNSR and PSD permitting thresholds and would, therefore, not be subject to federal air permitting. Further details regarding the air permitting requirements associated with these modifications are included in the state permitting summary.

Title V Permitting

Title V of the CAA requires each state to develop an operating permit program. The operating permit program is implemented through Title 40 CFR Part 70, and the permits required by these regulations are often referred to as Part 70 permits. If a facility's PTE is equal to or greater than the criteria pollutant or hazardous air pollutants (HAP) thresholds, the facility is considered a "major source." The major source threshold level is 100 tpy for criteria pollutants, 10 tpy of any single HAP, or 25 tpy of all HAPs in aggregate.

The EPA also promulgated the Title V GHG Tailoring Rule, which established permitting thresholds for GHG emissions under the Title V program. Sources with an existing Title V permit or new sources obtaining a Title V permit for non-GHG pollutants are required to address GHGs. New sources and existing sources not previously subject to Title V that have a PTE equal to or greater than 100,000 tpy CO_2e would become subject to Title V requirements.

Algonquin's Stony Point and Southeast Compressor Stations in New York, Cromwell and Chaplin Compressor Stations in Connecticut, and Burrillville Compressor Station in Rhode Island have existing Title V permits, all of which are required to modify their Title V permit to incorporate the proposed modifications associated with the Project. Title V permit modifications for the Stony Point and Southeast Compressor Stations were submitted to the NYSDEC in February 2014. Air permit modifications for the Cromwell and Chaplin Compressor Stations were submitted to the CTDEEP in February and January 2014, respectively. Algonquin requested in the air permit modifications that the CTDEEP incorporate the proposed modifications into the existing Title V permit for these facilities during the next permit renewal process. An air permit modification for the Burrillville Compressor Station was provided to the RIDEM in February 2014, which included a request to modify the existing Title V permit to incorporate the proposed modifications.

As presented in section 4.11.1.2, the individual emissions from the proposed modified or new M&R stations are unlikely to trigger federal major source permitting. Although the exact equipment has not yet been selected for the proposed modified or new M&R stations, based upon maximum potential emission estimated provided by Algonquin, it is unlikely that any of the M&R stations would trigger Title V permitting.

New Source Performance Standards

The New Source Performance Standards (NSPS), codified in 40 CFR 60, apply to new, modified, or reconstructed stationary sources that meet or exceed specified applicability thresholds. The NSPS are divided into several subparts. Each subpart regulates a specific source type and size. The potentially applicable subparts are addressed below.

NSPS Subpart Dc applies to steam generating units, with a maximum design heat input capacity of greater than or equal to 10 MMBtu/hr but less than or equal to 100 MMBtu/hr for which construction, modification, or reconstruction is commenced after June 9, 1989. Algonquin has not completed the final design of its heaters. Therefore, it cannot be determined if there would be any subject steam generating units with a maximum design heat input capacity of greater than or equal to 10 MMBtu/hr installed at any of the proposed Project facilities. However, if any steam generating units with a maximum design heat input capacity greater than 10 MMBtu/hr are installed as part of the Project, they would be subject to Subpart Dc requirements. There are no emissions limitations that apply to natural gas-fired steam generating units subject to Subpart Dc. Applicable units are subject to reporting requirements (for notification of initial construction and initial startup) and recordkeeping requirements (for amount of fuel combusted).

NSPS Subpart JJJJ is applicable to owners and operators of new or existing stationary spark ignition internal combustion engines that commence construction, modification, or reconstruction after June 12, 2006. The Project includes new emergency generators greater than 25 hp at each of the five affected compressor stations. Therefore, requirements of Subpart JJJJ would apply to the proposed Project. There are NO_x and CO emission limits that would apply to the emergency generators and applicable units are potentially subject to fuel use, testing, monitoring, notification, reporting, and recordkeeping requirements.

NSPS Subpart KKKK applies to stationary combustion turbines with a heat input rate at peak load of 10 MMBtu/hr or greater that commenced construction, modification, or reconstruction after February 18, 2005. Subpart KKKK limits emissions of NO_x as well as the sulfur content of fuel that is combusted from subject units. The AIM Project involves the installation of new stationary combustion turbines at all five affected compressor stations. Therefore, the Project would trigger the emissions limitations as well as the monitoring, reporting, recordkeeping, and testing requirements under Subpart KKKK of Part 60.

NSPS Subpart OOOO applies to storage vessels that are located in the oil and natural gas production segment, natural gas processing segment, or natural gas transmission and storage segment that commenced construction, reconstruction, or modification after August 23, 2011, and have the potential to emit VOC emissions equal to or greater than 6 tpy, as determined in accordance with Part 60.5365(e). Natural gas transmission is defined as the pipelines used for the long distance transport of natural gas (excluding processing). The Project does not include the construction, reconstruction, or modification of any storage vessels. Therefore, the requirements of Subpart OOOO do not apply.

In summary, the Project is subject to NSPS Subpart JJJJ, Subpart KKKK, and potentially Subpart Dc requirements.

National Emission Standards for Hazardous Air Pollutants

National Emission Standards for Hazardous Air Pollutants (NESHAP) are codified in Title 40 CFR Parts 61 and 63 to regulate facilities that emit specific HAPs. Part 61 regulates only eight hazardous substances and specific industries: asbestos, benzene, beryllium, coke oven emissions, inorganic arsenic, mercury, radionuclides, and vinyl chlorides. The AIM Project would not emit these pollutants; therefore, the Part 61 requirements would not apply to the Project.

The 1990 CAA Amendments established a list of 189 HAPs, resulting in the promulgation of Part 63. Part 63, also known as the Maximum Achievable Control Technology standards, regulates HAP emissions specific source types located at major or area sources of HAPs. The 1990 CAA Amendments define a major source of HAPs as any source that has a PTE of 10 tpy for any single HAP or 25 tpy for all HAPs in aggregate. Area sources are stationary sources that do not exceed the thresholds for major source designation.

The existing Stony Point, Cromwell, and Burrillville Compressor Stations are major sources of HAPs, both because the facilities' HAP emissions are above the major source threshold of 10 tpy of any single HAP and 25 tpy of all HAPs in aggregate. The Cromwell and Burrillville Compressor Stations would remain major sources of HAP after the Project. Due to the abandonment of the four existing reciprocating engines, the Stony Point Compressor Station would become a minor source of HAPs following the Project; however, the NESHAPs currently applicable to this station would remain applicable following the change. The Southeast and Chaplin Compressor Station are currently not major sources for HAPs and would remain minor sources of HAPs after the Project. Below is a detailed discussion of the NESHAP regulations that are potentially applicable to the compressor stations. In addition to the source type-specific regulations, any source that is subject to a subpart of 40 CFR 63 is also subject to the general provision of NESHAP Subpart A, unless otherwise noted in the applicable subpart.

Subpart YYYY of Part 63 applies to stationary combustion turbines at major sources of HAPs. Emissions and operating limitations under Subpart YYYY apply to new and reconstructed stationary combustion turbines. Because the Stony Point, Cromwell, and Burrillville Compressor Stations are each existing major sources of HAPs with proposed new stationary combustion turbines, the Project would trigger the requirements under Subpart YYYY. However, on August 18, 2004 The D.C. Circuit Court issued a Stay of Implementation regarding this subpart. The EPA is evaluating the possibility of delisting gas-fired turbines from the rule. Currently, natural gas-fired turbines are only subject to the general permitting and Initial Notification requirements set forth in 40 CFR Part 63, Subpart A. Thus, there are no pollutants regulated under the current Subpart YYYY.

Subpart ZZZZ of Part 63 applies to existing, new, and reconstructed stationary reciprocating internal combustion engines depending on size, use, and whether the engine is located at a major or area source of HAPs. The Project includes new emergency generators rated greater than 500 hp at the Stony Point, Southeast, Cromwell, and Chaplin Compressor Stations and a new emergency generator rated less than 500 hp at the Burrillville Compressor Station. Because the Stony Point and Cromwell Compressor Stations are existing major sources of HAPs, the new emergency generator rated greater than 500 hp must meet the Initial Notification requirements set forth in 40 CFR Part 63, Subpart A, but are not subject to any other requirement of Subpart ZZZZ.

The Burrillville Compressor Station is also an existing major source of HAPs, however, the new emergency generator rated less than 500 hp must meet the requirements of Subpart ZZZZ by meeting the NSPS Subpart JJJJ. Similarly, a new emergency generator located at an area source of HAPs, such as those proposed for the Southeast and Chaplin Compressor Stations, must also meet the requirements of Subpart ZZZZ by meeting the NSPS Subpart JJJJ. The new emergency generators proposed for these facilities are subject to NSPS Subpart JJJJ; therefore the requirements of Subpart ZZZZ would be met.

Subpart DDDDD of Part 63 applies to certain new and existing boilers and process heaters at major HAP sources and regulates CO, hydrogen chloride, mercury, and total selected metals (arsenic, beryllium, cadmium, chromium, lead, manganese, nickel and selenium). The Stony Point, Cromwell, and Burrillville Compressor Stations are major HAP sources. The Project includes the installation of small natural gas-fired turbine compressor fuel gas heaters at the Stony Point, Cromwell, and Burrillville Compressor Stations. The new fuel gas heaters would be considered affected sources under Subpart DDDDD. Therefore, the Project would be subject to the requirements of Subpart DDDDD. Compliance with this subpart may include performance testing, fuel analyses, recordkeeping, and notification requirements.

Subpart JJJJJJ of Part 63 applies only to certain new and existing boilers at area sources, where a boiler is defined as "an enclosed device using controlled flame combustion in which water is heated to recover thermal energy in the form of steam and/or hot water." The rule does not apply to natural gas-fired boilers. The Southeast and Chaplin Compressor Stations are both area sources of HAP. Any new heating devices proposed as part of the AIM Project would be fired by natural gas, and therefore the Project is not expected to be subject to Subpart JJJJJJ requirements.

In summary, the Project is subject to Part 63 Subpart YYYY, Subpart ZZZZ, and Subpart DDDDD NESHAP requirements.

<u>Conformity of General Federal Actions</u>

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. According to section 176(c) of the CAA (Title 40 CFR Part 93 Subpart B), a federal agency cannot approve or support any activity that does not conform to an approved SIP. 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. With regard to the Project, the relevant general conformity pollutant thresholds are shown in table 4.11.1-3.

The thresholds in table 4.11.1-3 are based on the current air quality designations (e.g., serious nonattainment, moderate nonattainment, maintenance, etc.).

Operational emissions for the Project are presented in section 4.11.1.3. The operational emissions that would be permitted or otherwise covered by major or minor 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 4.11.1-5.

TABLE 4.11.1-5

Summary of Emissions Subject to General Conformity Review Associated with the AIM Project for 2015–2017

Designated Pollutant	Designated Area	Threshold (tpy)	Pollutant or Precursor	2015 Total Non-Exempt Emissions (tons) [a]	2016 Total Non-Exempt Emissions (tons)[a]	2017 Ongoing Operational Emissions (tons)
Ozone	New York – N. New Jersey – Long Island, NY-NJ-LI-CT	50	VOC	8.9	37.1	18.1
		100	NO_x	34.9	82.1	0.4
	Greater Connecticut	50	VOC	10.5	14.7	19.3
		100	NO_x	15.1	2.7	0.2
	Poughkeepsie, NY	50	VOC	0.3	1.5	<0.1
		100	NO_x	1.7	3.4	0.0
	Providence (all of RI), RI	50	VOC	0.5	0.0	0.0
		100	NO_x	3.0	0.0	0.0
	Boston-Lawrence-Worchester (E. Mass), MA	50	VOC	12.4	19.2	22.6
		100	NO_x	13.1	16.2	5.6
$PM_{2.5}$	New York – N. New Jersey – Long Island, NY-NJ-LI-CT	100	$PM_{2.5}$	2.2	9.4	0.2
		100	SO_2	<0.1	0.2	<0.1
		100	NO_x	23.0	82.1	0.4
CO	New York – N. New Jersey – Long Island, NY-NJ-LI-CT	100	CO	17.7	79.1	0.3
	Hartford-New Britain-Middletown, CT	100	CO	28.2	0.5	0.0
	New Haven-Meriden-Waterbury, CT	100	CO	1.1	1.2	0.2
	Boston, MA	100	CO	23.8	28.2	1.0

[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; RI = Rhode Island; MA = Massachusetts.

As shown in table 4.11.1-5, during all years of construction, emission estimates would not exceed general conformity applicability thresholds. Based upon this evaluation, a general conformity assessment is not required. It should be noted that should the schedule for construction change, or modifications to the Project result in emissions that would exceed the general conformity applicability threshold in one calendar year, FERC would be required to prepare a General Conformity Determination at that time.

Greenhouse Gas Emissions and the Mandatory Reporting Rule

The EPA's Mandatory Reporting of Greenhouse Gases Rule requires reporting of GHG emissions from suppliers of fossil fuels and facilities that emit greater than or equal to 25,000 metric tons of GHG (as CO_2e) per year. Although the rule does not apply to construction emissions, we have provided GHG construction emission estimates, as CO_2e, for accounting and disclosure purposes in table 4.11.1-6. Operational GHG emission estimates for the Project are presented, as CO_2e, in table 4.11.1-7. Based on the emission estimates presented, actual GHG emissions from operation of the modified compressor stations have the potential to exceed the 25,000 metric tpy reporting threshold for the Mandatory Reporting Rule. The Mandatory Reporting Rule does not require emission control devices and is strictly a reporting requirement for stationary sources based on actual emissions. If the actual emissions from any of the compressor stations 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 Part 217-3, and RCSA § 22a-174-19), and New York developed standards on diesel engine retrofitting in 6 NYCRR Part 248 on diesel engine retrofitting. These standards as they apply to Project activities are further described in section 4.11.1.3.

New York

The NYSDEC authorizes both construction and operation of emission sources under one permit. Facilities apply for and are issued minor facility registrations (for minor NSR sources) under 6 NYCRR Subpart 201-4 and state facility permits (for synthetic minor sources or minor NSR sources with emissions above certain thresholds) under 6 NYCRR Subpart 201-5. Emission sources or activities listed under 6 NYCRR Subpart 201-3 are exempt from the registration and permitting provisions of 6 NYCRR Subparts 201-4, 201-5, and 201-6.

Project activities involving air permitting associated with the Stony Point and Southeast Compressor Stations have been summarized under federal air permitting programs.

Project activities in New York also include modifications to the Peekskill, Cortlandt, and Stony Point M&R Stations. The modifications to the Peekskill and Cortlandt M&R Stations would include new natural gas-fired in-line gas heaters; however, because the maximum rated heat input capacity of the heaters are proposed to be less than 10 MMBtu/hr, Algonquin does not believe that a minor facility registration from NYSDEC would be required. The modifications to the Stony Point M&R Station require the connection of the existing station tap valve to the new 42-inch-diameter pipeline, and may require a minor facility registration. Because the design of the modifications to these M&R stations is not yet complete, we are not able to determine if state-level permits would be required for these activities. Therefore, **we recommend that:**

- **Prior to the end of the draft EIS comment period, Algonquin should provide an update regarding the air permitting requirements associated with the modifications to the M&R stations in New York, and, if applicable, provide copies of all permit applications or other permit registration documentation that has been filed with the NYSDEC.**

Connecticut

The CTDEEP has established state NSR permitting thresholds at RCSA § 22a-174-3a(a)(1) for new emission units and modifications to existing units of 15 tons or more per year of any individual air pollutant. The CTDEEP also has a permit-by-rule program to which the Project would be subject in RCSA § 22a-174-3b.

Project activities involving air permitting associated with the Cromwell and Chaplin Compressor Stations have been summarized under federal air permitting programs. The proposed replacement emergency generators for the Cromwell and Chaplin Compressor Stations would be operated under a permit-by-rule.

Project activities in Connecticut include modifications to 13 existing M&R stations, the installation of one new M&R station, and the removal of an existing M&R station. The proposed modifications to the 13 existing M&R stations range in scale from a complete station rebuild, to adding new in-line gas heaters, or adding or replacing a meter run. The proposed new Oakland Heights M&R Station would include an in-line gas heater. If any of the new in-line gas heaters or any other new emission unit would have potential emissions of 15 tons or more per year of any individual air pollutant, a state NSR permit would be required. Similarly, if any modifications to an existing emission unit result in an increase in potential emissions of any individual air pollutant from such unit by 15 tons or more per year, a state NSR permit would be required. Because the design of the new and/or modified M&R stations is not yet complete, we are not able to determine if state-level permits would be required for these activities. Therefore, **we recommend that:**

- **<u>Prior to the end of the draft EIS comment period</u>, Algonquin should provide an update regarding the air permitting requirements associated with the new and/or modified M&R stations in Connecticut, and, if applicable, provide copies of all permit applications or other permit registration documentation that has been filed with the CTDEEP.**

<u>Massachusetts</u>

The MADEP requires that any natural gas-fired fuel utilization equipment resulting in an increase in potential emissions of any single air contaminant equal to or greater than 1 tpy and with a rated maximum heat input capacity of greater than 10 MMBtu/hr and less than 40 MMBtu/hr obtain a Limited Plan Approval prior to construction. However, emissions from emission units installed in accordance with the Industry Performance Standards at 310 Code of CMR 7.26 are not included when calculating an increase in potential emissions for purposes of determining applicability under 310 CMR 7.02(4)(a)1 and 2. Any fuel utilization equipment with a rated maximum heat input capacity of less than 10 MMBtu/hr and utilizing natural gas is exempt from Massachusetts plan approval requirements.

Project activities in Massachusetts include two new proposed M&R stations and proposed modifications to eight existing M&R stations. The new Assonet and West Roxbury M&R Stations would include new in-line heaters. Modifications to eight existing M&R stations range from replacing existing natural gas-fired in-line gas heaters to adding a low flow meter. Some of the new or modified M&R stations may require a Limited Plan Approval. Because the design of the new and/or modified M&R stations is not yet complete, we are not able to determine if state-level permits would be required for these activities. Therefore, **we recommend that:**

- **<u>Prior to the end of the draft EIS comment period</u>, Algonquin should provide an update regarding the air permitting requirements associated with the new and/or modified M&R stations in Massachusetts and, if applicable, provide copies of all permit applications or other permit registration documentation that has been filed with the MADEP.**

4.11.1.3 Air Emission Impacts and Mitigation

Construction Emissions

Air emissions would be generated during construction of the new pipeline, replacement of existing pipeline, modifications at five existing compressor stations, construction of three new M&R stations, modifications at 24 existing M&R stations, and removal 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. Indirect emissions during construction of the Project would 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 4.11.1-6 presents the total direct and indirect estimated construction emissions for 2015 and 2016.

TABLE 4.11.1-6

Potential Construction Emissions (tons per year) for the AIM Project

Pollutant	2015 Direct Construction Emissions [a]	2016 Direct Construction Emissions [a]	2015 Indirect Construction Emissions [b]	2016 Indirect Construction Emissions [b]
NO_x	66.2	98.1	1.6	2.1
CO	116.6	155.2	11.1	14.8
SO_2	0.1	0.2	0.02	0.02
PM_{10}	59.6	43.1	0.05	0.06
$PM_{2.5}$	10.5 [c]	11.1 [c]	0.05 [c]	0.06 [c]
VOC	8.1	11.8	0.4	0.6
CO_2e	13,879	23,780	1,056	1,381
HAP (total)	0.4	0.7	0.2	0.2

[a] Direct emissions include fugitive dust emissions and non-road and on-road construction emissions.

[b] Indirect emissions include construction worker commuting emissions.

[c] A separate $PM_{2.5}$ emission estimate was not provided for non-road and on-road construction emissions or for construction worker commuting emissions. $PM_{2.5}$ emissions were conservatively assumed to be the same as PM_{10} emissions for non-road and on-road construction emissions.

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. Algonquin proposes 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.

While the measures described above would help control fugitive dust, we conclude that more detail is necessary because the Project crosses many roads and would be constructed near many residences and other structures. Specifically, more information regarding other mitigation measures for dust abatement in addition to spraying of water (e.g., reducing vehicle speeds where appropriate for travel on unpaved roads, using palliative in high erosion areas to control dust in residential areas and near road crossings, and training of Project personnel) is necessary. Therefore, **we recommend that:**

- **<u>Prior to the end of the draft EIS comment period</u>, Algonquin should file with the Secretary a Fugitive Dust Control Plan that specifies the precautions that Algonquin would take to minimize fugitive dust emissions from construction activities, including additional mitigation measures to control fugitive dust emissions of Total Suspended Particulates and particulate matter with an aerodynamic diameter less than or equal to 10 microns. The plan should clearly explain how Algonquin would implement measures, such as:**

  a. watering the construction workspace and access roads;

  b. providing measures to limit track-out onto the roads;

  c. identifying the speed limit that Algonquin would enforce on unsurfaced roads;

  d. covering open-bodied haul trucks, as appropriate;

  e. clarifying that the EI has the authority to determine if/when water or a palliative needs to be used for dust control; and

  f. clarifying the individuals with the authority to stop work if the contractor does not comply with dust control measures.

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. New York and Connecticut developed standards to limit emissions from diesel engines through idling restrictions (i.e., 6 NYCRR Part 217-3, and RCSA § 22a-174-19). In addition, some of the states that would be affected by the Project have developed standards (e.g., 6 NYCRR Part 248 on diesel engine retrofitting) for other methods of reducing diesel emissions, such as the use of low sulfur diesel and advanced pollution control technologies. Algonquin provided an estimate of construction-related emissions, which are presented in table 4.11.1-6 that includes diesel combustion emissions for the AIM Project.

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 Algonquin, along with our recommendations, air quality impacts from construction equipment would be temporary and should not result in a significant impact on regional air quality.

Operation Emissions

Modifications to the five compressor stations, modifications to five existing M&R stations, and three new M&R stations would be sources of air emissions during operation of the Project. One of the five compressor station modifications would require PSD review for GHG emissions, three of the five compressor station modifications would require new state-level or minor source NSR permits, and all five of the compressor station modifications would require revisions to the existing facility Title V operating permits. Tables 4.11.1-7 to 4.11.1-11 provide the potential emissions for the compressor station modifications.

TABLE 4.11.1-7

Potential Operational Emissions for the Stony Point Compressor Station Modifications (tons per year) for the AIM Project

	Emissions							
	NO_x	CO	VOC	SO_2	$PM_{10}/PM_{2.5}$	Formaldehyde	Total HAPs	CO_2e
Source	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy
Existing Station PTE	189	381	203	3.8	17	56	89	240,796
Two Proposed Compressor Units	38	50	5	4	8	0.3	1	135,994
Proposed Emergency Generator	1	1.9	0.9	<0.1	<0.1	0.4	0.5	433
Three Proposed Gas Heaters	1.5	2.2	0.5	<0.1	0.1	<0.1	0.1	1,791
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, Truck Loading)	0.0	0.0	-16	0.0	0.0	0.0	-1	-11,556
Total of Proposed Units	40.5	54.1	-9.2	4.0	8.1	0.7	0.6	126,662
Changes for Modified Compressor	-53	-76	-1	0.3	1	-1	-1	11,764
Changes for Units Proposed to be Removed	-82	-249	-118	-0.1	-10	-55	-79	-60,487
Total of Proposed Modifications	**-94.5**	**-270.9**	**-128.2**	**4.2**	**-0.9**	**-55.3**	**-79.4**	**77,939**
Proposed Modified Station PTE	94.5	110.1	74.8	8.0	16.1	0.7	9.6	318,735
NNSR/NESHAP/PSD Applicability Threshold	25	100	25	40	15 (PM_{10}) 10 ($PM_{2.5}$)	10	25	75,000

TABLE 4.11.1-8

Potential Operational Emissions for the Southeast Compressor Station Modifications (tons per year)for the AIM Project

	Emissions							
	NO_x	CO	VOC	SO_2	$PM_{10}/PM_{2.5}$	Formaldehyde	Total HAPs	CO_2e
Source	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy
Existing Station PTE	172	266	66	5	10	4	11	221,231
New Proposed Compressor Unit	12	21	2	1	2	0.1	0.4	44,511
Proposed Emergency Generator	1	1	1	<0.1	<0.1	0.3	0.3	288
Two Proposed Gas Heaters	1	1	0.4	<0.1	0.1	<0.1	0.1	1,190
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, Truck Loading)	0.0	0.0	8	0.0	0.0	0.0	1	4,745
Total of Proposed Units	14	23	11.8	1.0	2.1	0.4	1.8	50,734
Changes for Modified Compressor	-54	-70	-1	0.3	1	-1	-1	11,634
Total of Proposed Modifications	**-40**	**-47**	**10.8**	**1.3**	**3.1**	**-0.6**	**0.8**	**62,368**
Proposed Modified Station PTE	132	219	76.8	6.3	13.1	3.4	11.8	74,002
NNSR/NESHAP/PSD Applicability Threshold	40	100	40	40	15 (PM_{10}) 10 ($PM_{2.5}$)	10	25	75,000

TABLE 4.11.1-9

Potential Operational Emissions for the Cromwell Compressor Station Modifications (tons per year) for the AIM Project

	Emissions							
	NO_x	CO	VOC	SO_2	$PM_{10}/PM_{2.5}$	Formaldehyde	Total HAPs	CO_2e
Source	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy
Existing Station PTE	1,077	397.6	235.4	1.9	26.0	108	164	179,861
Proposed Compressor Unit	18.5	33.0	2.5	1.9	3.7	0.2	0.5	65,894
Proposed Emergency Generator	0.8	1.6	0.7	<0.1	<0.1	0.3	0.4	346
Proposed Gas Heater	0.5	0.7	0.2	<0.1	<0.1	<0.1	<0.1	597
Proposed Parts Washer	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0
New Fugitive Releases (Piping, Gas Releases)	0.0	0.0	8.5	0.0	0.0	0.0	0.8	4,744
Total of Proposed Modifications	**19.8**	**35.3**	**12.3**	**1.9**	**3.7**	**0.5**	**1.8**	**71,581**
Proposed Modified Station PTE	1,096.8	432.9	247.7	3.8	29.7	108.5	165.8	251,442
NNSR/NESHAP/PSD Applicability Threshold	25	100	25	40	15 (PM_{10}) 10 ($PM_{2.5}$)	10	25	75,000

TABLE 4.11.1-10

Potential Operational Emissions for the Chaplin Compressor Station Modifications (tons per year) for the AIM Project

	Emissions							
	NO_x	CO	VOC	SO_2	$PM_{10}/PM_{2.5}$	Formaldehyde	Total HAPs	CO_2e
Source	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy
Existing Station PTE	81.9	59.6	3.4	2.0	3.6	1.5	5.0	64,862
Proposed Compressor Unit	10.0	16.7	1.3	1.0	1.9	0.1	0.3	35,830
Proposed Emergency Generator	0.6	1.2	0.5	<0.1	<0.1	0.2	0.3	260
Proposed Gas Heater	0.5	0.7	0.2	<0.1	<0.1	<0.1	<0.1	597
Proposed Parts Washer	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0
New Fugitive Releases (Piping, Gas Releases)	0.0	0.0	8.5	0.0	0.0	0.0	0.8	4,744
Total of Proposed Modifications	**11.1**	**18.6**	**10.9**	**1.0**	**2.0**	**0.3**	**1.5**	**41,431**
Proposed Modified Station PTE	93.0	78.2	14.3	3.0	5.6	1.8	6.5	106,293
NNSR/NESHAP/PSD Applicability Threshold	25	100	25	40	15 (PM_{10}) 10 ($PM_{2.5}$)	10	25	75,000

TABLE 4.11.1-11

Potential Operational Emissions for the Burrillville Compressor Station Modifications (tons per year) for the AIM Project

	Emissions							
	NO_x	CO	VOC	SO_2	$PM_{10}/PM_{2.5}$	Formaldehyde	Total HAPs	CO_2e
Source	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy
Existing Station PTE	164.0	208.0	135	1.9	8.4	34.0	54.0	138,519
Proposed Compressor Unit	18.6	33.0	2.5	1.9	3.7	0.2	0.5	65,905
Proposed Emergency Generator	0.5	1.0	0.4	<0.1	<0.1	0.2	0.3	216
Proposed Gas Heater	0.5	0.7	0.2	<0.1	<0.1	<0.1	<0.1	597
Proposed Parts Washer	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0
New Fugitive Releases (Piping, Gas Releases)	0.0	0.0	8.5	0.0	0.0	0.0	0.8	4,744
Total of Proposed Modifications	**19.6**	**34.7**	**12.0**	**1.9**	**3.7**	**0.4**	**1.7**	**71,462**
Proposed Modified Station PTE	183.6	242.7	147	3.8	12.1	34.4	55.7	209,981
NNSR/NESHAP/PSD Applicability Threshold	25 tpy	250 tpy	25 tpy	250 tpy	250 tpy (PM_{10}) 250 tpy ($PM_{2.5}$)	10 tpy	25 tpy	75,000 tpy

As discussed in section 4.11.1.2, the proposed new and reconstructed M&R stations would not be subject to PSD review. However, because the scope of the changes to the M&R stations has not yet been defined, FERC staff is not able to assess if some state-level permits would be required for the proposed modifications. As such, FERC staff has provided recommendations for Algonquin to further assess the need for air permitting at the M&R stations once the scope of work is better defined, and to provide copies of any required air permit submittals prior to the end of the draft EIS comment period. However, Algonquin provided an estimate of representative potential emissions from new proposed combustion sources at M&R stations, which are presented in table 4.11.1-12.

TABLE 4.11.1-12

Potential Emissions from New Combustion Sources at M&R Stations for the AIM Project (tons per year)

M&R Station	CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$
New Bedford	8	5	1.5	<0.1	0.4	0.4
West Roxbury	1	0.5	0.2	<0.1	0.3	0.3
Assonet	0.1	0.1	<0.1	<0.1	<0.1	<0.1
Oakland Heights	0.1	0.1	<0.1	<0.1	<0.1	<0.1
Willimantic	0.1	0.1	<0.1	<0.1	<0.1	<0.1
Guilford	0.2	0.1	<0.1	<0.1	<0.1	<0.1
Peekskill	0.2	0.1	<0.1	<0.1	<0.1	<0.1
Cortlandt	0.1	0.1	<0.1	<0.1	<0.1	<0.1

We received comments regarding leakage or fugitive releases from the proposed facilities. Fugitive releases at each compressor station were included in the in tables 4.11.1-7 to 4.11.1-11. Non-combustion related emissions would also occur from the pipeline and at the proposed M&R stations during normal operation. These emissions would include fugitive VOC releases from storage vessels and truck loading operations, as well as fugitive natural gas releases from piping components. Table 4.11.1-13 provides an annual estimate of these emission sources.

TABLE 4.11.1-13

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

Pollutant	Fugitives & Non-Routine (M&R Stations)	Fugitives & Non-Routine (Pipeline)	Total
VOC	55.4	2.7	58.1
CO_2e	68,968	712	69,680

Due to modifications on existing equipment and/or removal of existing compressors, the potential emissions of most pollutants at the Stony Point and Southeast Compressor Stations would be reduced from their current potential levels. However, Algonquin completed screening-level air quality modeling for NO_2, $PM_{2.5}$, PM_{10}, CO, and SO_2 using the U.S. EPA's AERMOD model for the Stony Point and Southeast Compressor Station modifications, and using the U.S. EPA's AERSCREEN model for the Cromwell, Chaplin, and Burrillville Compressor Stations modifications to estimate the potential impacts on air quality as a result of the modifications. Table 4.11.1-14 summarizes the results of the modeling analyses.

The modeling analyses for all modeled pollutants at all five compressor stations showed that the Project, combined with background pollutant levels, would not contribute to a violation of the NAAQS. We reviewed the modeling analyses and agree with these conclusions.

TABLE 4.11.1-14

Summary of Predicted Air Quality Impacts for the AIM Project

Pollutant	Averaging Period	Background ($\mu g/m^3$)	Project Impact ($\mu g/m^3$)	Project Impact + Background ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	NAAQS Consumed by Background and Project Impact (percent)
Stony Point Compressor Station [a]						
NO_2	1-Hour	77.8	65.6	143.4	188	76.2
	Annual	18.1	5.6	23.7	100	23.7
$PM_{2.5}$	24-Hour	22.5	3.3	25.8	35	73.7
	Annual	8.2	0.5	8.7	12	72.5
PM_{10}	24-Hour	39.0	5.5	44.5	150	29.7
CO	1-Hour	1,150	488.2	1,638.2	40,000	4.1
	8-Hour	920	265.2	1,185.2	10,000	11.9
SO_2	1-Hour	23.6	10.1	33.7	196	17.2
	3-Hour	30.7	8.2	38.9	1,300	3.0
	24-Hour	13.1	3.1	16.2	365	4.4
	Annual	3.3	0.3	3.6	80	4.5
Southeast Compressor Station [a]						
NO_2	1-Hour	77.8	65.1	142.9	188	76.0
	Annual	18.1	6.8	24.9	100	24.9
$PM_{2.5}$	24-Hour	24.0	3.4	27.4	35	78.2
	Annual	9.0	0.5	9.5	12	79.2
PM_{10}	24-Hour	39.0	5.5	44.5	150	29.7
CO	1-Hour	1,150	348.9	1,498.9	40,000	3.7
	8-Hour	920	228.8	1,148.8	10,000	11.5
SO_2	1-Hour	23.6	6.2	29.8	196	15.2
	3-Hour	30.7	7.4	38.1	1,300	2.9
	24-Hour	13.1	3.4	16.5	365	4.5
	Annual	3.3	0.2	3.5	80	4.4
Cromwell Compressor Station [a]						
NO_2	1-Hour	87.1	54.3	141.4	188	75.2
	Annual	-	5.1	5.1	100	5.1
$PM_{2.5}$	24-Hour	22.3	2.0	24.3	35	69.4
	Annual	8.8	0.3	9.1	12	75.8
PM_{10}	24-Hour	23.3	2.0	25.3	150	16.9
CO	1-Hour	1,795.4	121.9	1,917.3	40,000	4.8
	8-Hour	1,337.0	109.7	1,446.7	10,000	14.5
SO_2	1-Hour	0.01	0.5	0.5	196	0.3
	3-Hour	0.007	0.5	0.5	1,300	<0.1
	24-Hour	-	0.3	0.3	365	0.1
	Annual	-	<0.1	<0.1	80	0.1
Chaplin Compressor Station [a]						
NO_2	1-Hour	87.1	72.5	159.6	188	84.9
	Annual	-	6.8	6.8	100	6.8
$PM_{2.5}$	24-Hour	22.0	3.4	25.4	35	72.6
	Annual	7.9	0.6	8.5	12	70.8
PM_{10}	24-Hour	23.3	3.4	26.7	150	17.8
CO	1-Hour	1,795.4	162.5	1,957.9	40,000	4.9
	8-Hour	1,337.0	146.3	1,483.3	10,000	14.8

TABLE 4.11.1-14 (cont'd) Summary of Predicted Air Quality Impacts for the AIM Project						
Pollutant	Averaging Period	Background ($\mu g/m^3$)	Project Impact ($\mu g/m^3$)	Project Impact + Background ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent of NAAQS Impact
SO_2	1-Hour	0.01	1.5	1.5	196	0.8
	3-Hour	0.007	1.5	1.5	1,300	0.1
	24-Hour	-	0.9	0.9	365	0.2
	Annual	-	0.2	0.2	80	0.2
Burrillville Compressor Station [a]						
NO_2	1-Hour	78.3	79.5	157.8	188	83.9
	Annual	-	7.4	7.4	100	7.4
$PM_{2.5}$	24-Hour	17.7	6.8	24.5	35	70.0
	Annual	6.6	1.1	7.7	12	64.2
PM_{10}	24-Hour	23.0	6.8	29.8	150	19.9
CO	1-Hour	2,139.2	175.2	2,314.4	40,000	5.8
	8-Hour	1,489.8	157.7	1,647.5	10,000	16.5
SO_2	1-Hour	0.02	4.6	4.6	196	2.4
	3-Hour	0.01	4.6	4.6	1,300	0.4
	24-Hour	-	2.8	2.8	365	0.8
	Annual	-	0.4	0.4	80	0.5

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

Notes: NY = New York; LI = Long Island; RI = Rhode Island; CT = Connecticut; MA = Massachusetts.

As shown in table 4.11.1-6, construction of the AIM Project would result in the generation of approximately 40,096 tons (36,374 metric tons) of GHG emissions, as measured in CO_2e. As shown in tables 4.11.1-7 to 4.11.1-11 and 4.11.1-13, operation of the modified compressor stations and non-routine and fugitive emissions from M&R stations and pipeline operation would result in a maximum of 1,030,133 tpy (934,521 metric tons) of GHG emissions, as measured in CO_2e, if operated at full capacity (i.e., 8,760 hours per year). Additional GHG emissions would be generated by the emission units proposed at the five modified M&R stations and three new M&R stations; however, these emissions have not yet been estimated and would be much less significant than the emissions associated with the new compression at the five new compressor stations. Although the GHG emissions appear large, the emissions are very small (0.4 percent) in comparison to the 2000 inventory of GHG emissions in the New England region of the United States of 224.01 metric tons of CO_2e (NSCAUM, 2004).

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 several comments concerning the risk of radon exposure associated with in-home burning of natural gas originating from the Marcellus shale. In particular, we received comments that natural gas from the Marcellus shale region contains radon at much higher concentrations than gas produced in the Gulf Coast region.

Radon is a naturally occurring radioactive gas that is odorless and tasteless. Radon can be entrained in fossil fuels including natural gas. Because radon is not destroyed by combustion, burning natural gas containing radon can increase the level of radon within a home (Agency for Toxic Substances and Disease Registry, 2010). While radon is inert, long-term (chronic) exposure to its decay products (progeny) can be carcinogenic (lung cancer), with increased risk to smokers. The EPA identifies that the average indoor radon level is 1.3 picocuries per liter (pCi/L) and recommends that indoor levels be less than 2-4 pCi/L. Also, Congress passed the Indoor Radon Abatement Act in 1988, which established the long-term goal that indoor air radon levels be equal or better than outdoor air radon levels. Outdoor radon levels average about 0.4 pCi/L.

In early 2012, a paper raised concern regarding radon levels in natural gas from the Marcellus shale (Resnikoff, 2012). This paper used theoretical calculations to identify that radon concentrations in Marcellus shale natural gas range between 36.9 and 2,576 pCi/L, with a resulting estimated concentrations in the home of 0.0187 to 0.482 pCi/L. However, a subsequent study by the USGS found that concentrations of radon in natural gas samples from the Marcellus shale and overlapping Devonian sandstones, as measured at the wellhead, ranged from 1 to 79 pCi/L and 7 to 65 pCi/L, respectively (Rowan and Kraemer, 2012). These results would be further diluted in household air, which was outside the scope of the study. In July 2012, a study used natural gas samples collected from Texas Eastern and Algonquin pipelines from the Marcellus shale gas fields (Anspaugh, 2012). The samples from this study presented measured radon concentrations in natural gas pipelines ranging from 16.9 to 44.1 pCi/L, with resulting in-home concentrations estimated at 0.0042 to 0.0109 pCi/L. These levels are less than the average indoor and outdoor radon levels.

We note that several factors limit the indoor exposure to radon from natural gas. Radon's half-life, defined as the time it takes for the element to decay to half its initial concentration, is relatively short (3.8 days). The time needed to gather, process, store, and deliver natural gas allows a portion of the entrained radon to decay, which decreases the amount of radon in the gas before it is used in a residence. Additionally, radon concentrations are reduced when a natural gas stream undergoes upstream processing to remove liquefied petroleum gas. Processing can remove an estimated 30 to 75 percent of the radon from natural gas (Johnson et al., 1973). Other research suggests that the cumulative decay of radon from wellhead to burner tip is around 60 percent (Gogolak, 1980). Also, radon exposure associated with the combustion of natural gas may be lower now due to the improved ventilation and increased energy efficiency of modern boilers, furnaces, and hot water heaters, as well as new building codes requiring venting of gas-fired stoves and ovens.

While the FERC has no regulatory authority to set, monitor, or respond to indoor radon levels, many local, state, and federal entities (e.g., the EPA) establish and enforce radon exposure standards for indoor air. Therefore, we find that the risk of exposure to radon is not significant.

4.11.2 Noise

Noise quality can be affected both during construction and operation of facilities. 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.

4.11.2.1 Existing Noise Levels

Algonquin provided ambient noise surveys and acoustical analyses for the five proposed compressor station modifications, the five existing M&R stations with significant proposed modifications, three new proposed M&R stations, and two new mainline regulators (MLR) that would have an NSA within 0.5 mile of the station.

Stony Point Compressor Station

The Stony Point Compressor Station is located in Rockland County, New York, approximately 2 miles west of Stony Point, New York. The station is located approximately 0.5 mile east of the Palisades Interstate Parkway. The most recent acoustical survey was completed for the Stony Point Compressor Station in 2006. There are several NSAs located in the vicinity, the closest of which are residences located generally west, east, and south of the compressor station site. The distance and direction from the closest existing or proposed compressor building to the NSAs are presented in table 4.11.2-1 and shown on figure 4.11.2-1. Although existing noise levels exceed our 55 dBA L_{dn} criterion at two NSAs, the four existing compressor units to be abandoned at this station were authorized prior to implementation of noise standards.

Southeast Compressor Station

The Southeast Compressor Station is located in Putnam County, New York, approximately 3 miles south-southeast of Brewster, New York. The Connecticut state line borders the station on the east side, and Interstate 84 borders the north property line of the station. The most recent acoustical survey was completed for the Southeast Compressor station in 2009. There are several NSAs located in the vicinity, which are located generally west, southwest, and southeast of the compressor station site and include residences and an apartment complex. The distance and direction from the closest existing or proposed compressor building to the NSAs are presented in table 4.11.2-1 and shown on figure 4.11.2-2.

Cromwell Compressor Station

The Cromwell Compressor Station is located in Middlesex County, Connecticut. The property for the station is primarily located in the Township of Cromwell, although there is a small section of the property that is in the Township of Rocky Hill. The property is heavily wooded, except for the station access road and station site. The most recent acoustical survey was completed for the Cromwell Compressor Station on January 23, 2014. Algonquin identified the only NSA as a residence located 850 feet west of the existing compressor building as presented in table 4.11.2-1 and shown on figure 4.11.2-3. However, we also note two additional residences, one of which is located approximately 920 feet southwest of the existing compressor building, and the second of which is located approximately 1,620 feet north-northwest of the proposed new compressor building. We have included these two NSAs in our analysis. Also, existing noise levels exceed our 55 dBA L_{dn} criterion at two NSAs; however, the majority of the existing compressor units at this station were authorized prior to implementation of noise standards.

Chaplin Compressor Station

The Chaplin Compressor Station is located in Windham County, Connecticut, approximately 2 miles northwest of the town of Chaplin. The property is heavily wooded, except for the station access road and station site. The most recent acoustical survey was completed for the Chaplin Compressor Station in 2007. The nearest NSAs are residences located along Tower Hill Road north and northeast of the station. The distance and direction to the nearest NSAs from the nearest existing or proposed compressor building are presented in table 4.11.2-1 and shown on figure 4.11.2-4.

Burrillville Compressor Station

The Burrillville Compressor Station is located in Providence County, Rhode Island, approximately 25 miles from the city of Providence. The property is heavily wooded, except for the station site. The land use in the surrounding area is primarily rural and recreational. The most recent acoustical survey was completed for the Burrillville Compressor Station in 2014. The nearest NSAs are both permanent and non-permanent (i.e., vacation) residences. Algonquin identified the distance and direction to two of the nearest NSAs (representing multiple residences) from the nearest existing or proposed compressor building, which are presented in table 4.11.2-1 and shown on figure 4.11.2-5. We also note a group of residences are located north of the existing compressor building, represented by the closest NSA at 3,320 feet from the facility, and a group of residences west of the proposed new compressor building, represented by the closest NSA at 3,610 feet from the facility. We have included these NSAs in our analysis. Also, existing noise levels exceed our 55 dBA L_{dn} criterion at one NSA; however, three of the five existing compressor units at this station were authorized prior to implementation of noise standards.

TABLE 4.11.2-1

Noise Levels at the Nearest Noise-Sensitive Areas to the Proposed Modified Compressor Stations for the AIM Project[a]

Location/Facility	Distance to NSA (feet)	Direction to NSA	Ambient Noise L_{dn} [b,c] (dBA)
NEW YORK			
Existing Stony Point Compressor Station			
NSA 1	650	West-southwest	62.9
NSA 2	700	West	63.0
NSA 3	800	South-southeast	49.9
NSA 4	1,000	East	49.6
Existing Southeast Compressor Station			
NSA 1	1,200	Northwest	66.0 (37.7) [d]
NSA 2	1,300	South-southwest	52.2 (36.9) [d]
NSA 3	2,200	Southeast	53.3 (31.4) [d]
CONNECTICUT			
Existing Cromwell Compressor Station			
NSA 1	850	West	60.6 (48.7) [d]
NSA 2	920	Southwest	60.6 (63.2) [d, e]
NSA 3	1,620	North-northwest	60.6 (58.2) [d, e]
Existing Chaplin Compressor Station			
NSA 1	1,350	North-northeast	48.0 (37.3) [d]
NSA 2	1,200	Northeast	46.7 (38.5) [d]
NSA 3	1,400	East-northeast	46.7 (36.0) [d]
RHODE ISLAND			
Existing Burrillville Compressor Station			
NSA 1	2,050	East-northeast	56.9
NSA 2	2,100	Northeast	52.4
NSA 3	3,320	North	52.4 [e]
NSA 4	3,610	West	45.0 [f]

NA – not available

[a] The modifications at the existing Oxford Compressor Station would only involve the restaging of an existing compressor unit. This activity would not result in additional operational noise.

[b] Current station levels based on noise surveys as described in table 4.11.2-1.

[c] Existing noise levels (L_{dn}) including the current compressor station operating at full load.

[d] The existing compressor station is not the dominant noise source influencing ambient sound levels. The sound contribution from the compressor station only is provided in parenthesis.

[e] Background noise levels were not measured because FERC staff added this NSA during the evaluation of the Project. Background noise levels were estimated using other NSAs in the area within similar proximity to major roadways and the compressor station.

[f] Background noise levels were not measured because FERC staff added this NSA during the evaluation of the Project. Because no similar NSAs for which background levels were measured were available, a background noise level was estimated based on typical rural noise levels included in the EPA's 1974 document *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*.

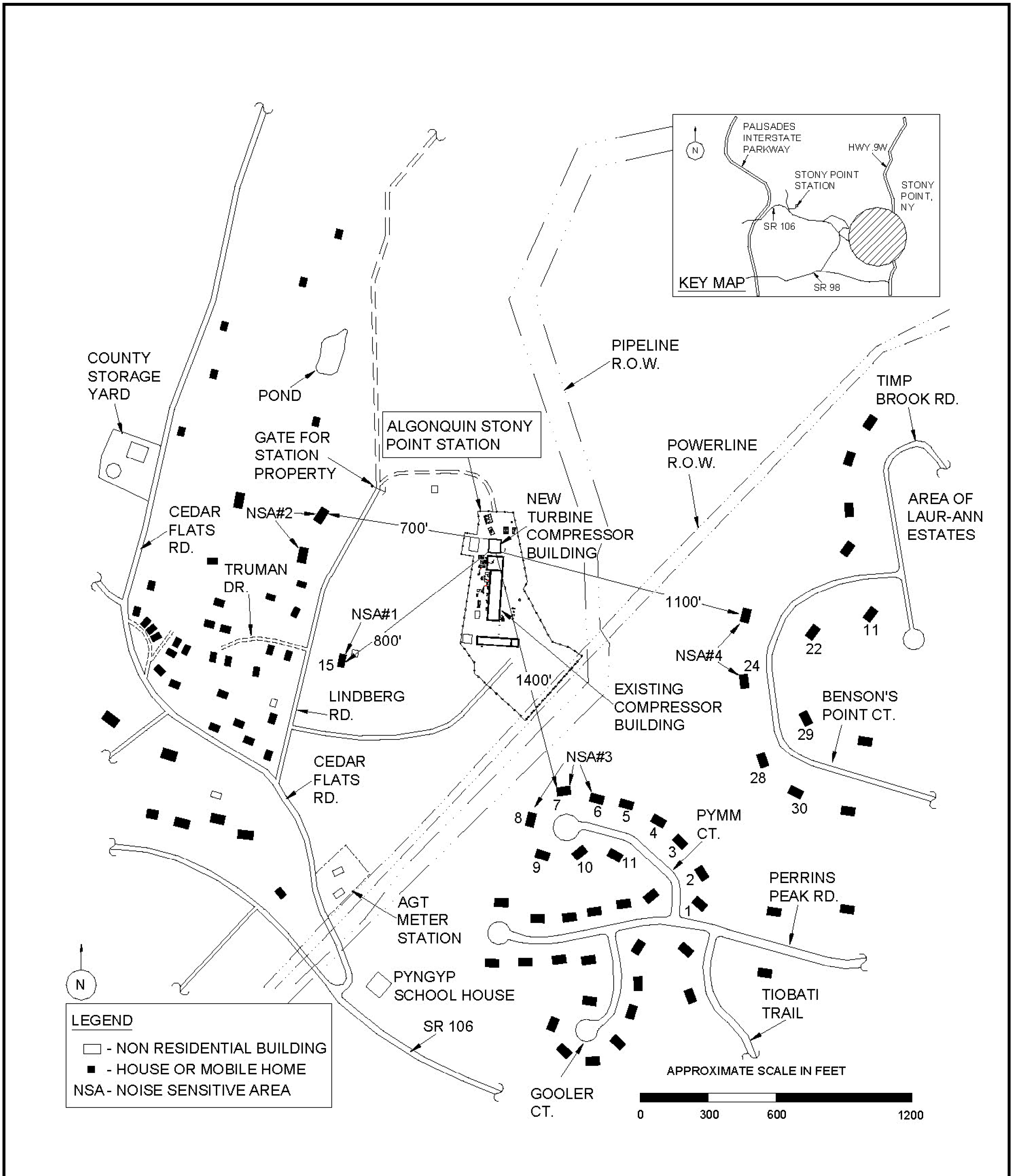

Figure 4.11.2-1

AIM Project

Existing Stony Point Compressor Station

Closest Noise-Sensitive Areas

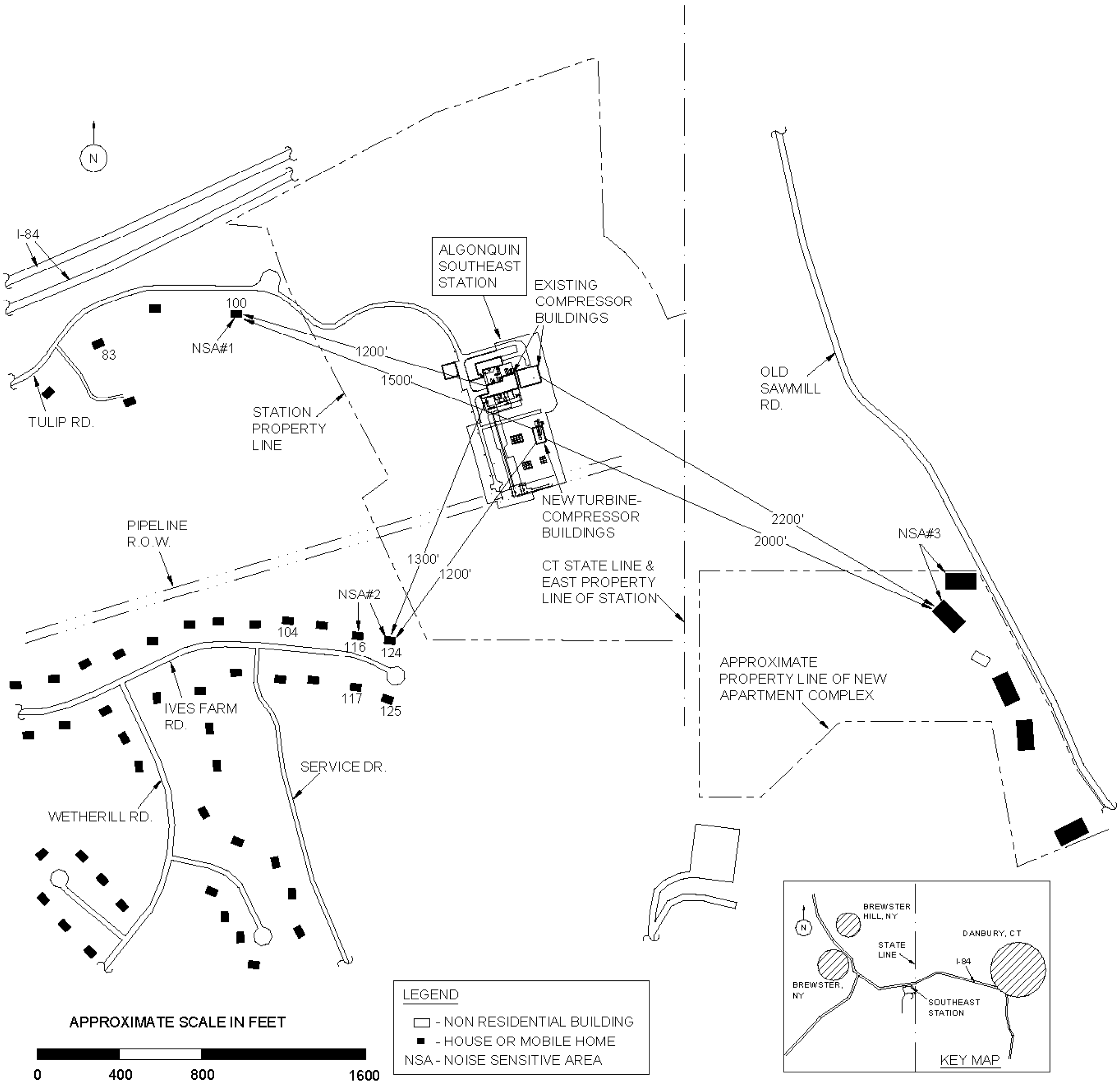

Figure 4.11.2-2
AIM Project
Existing Southeast Compressor Station
Closest Noise-Sensitive Areas

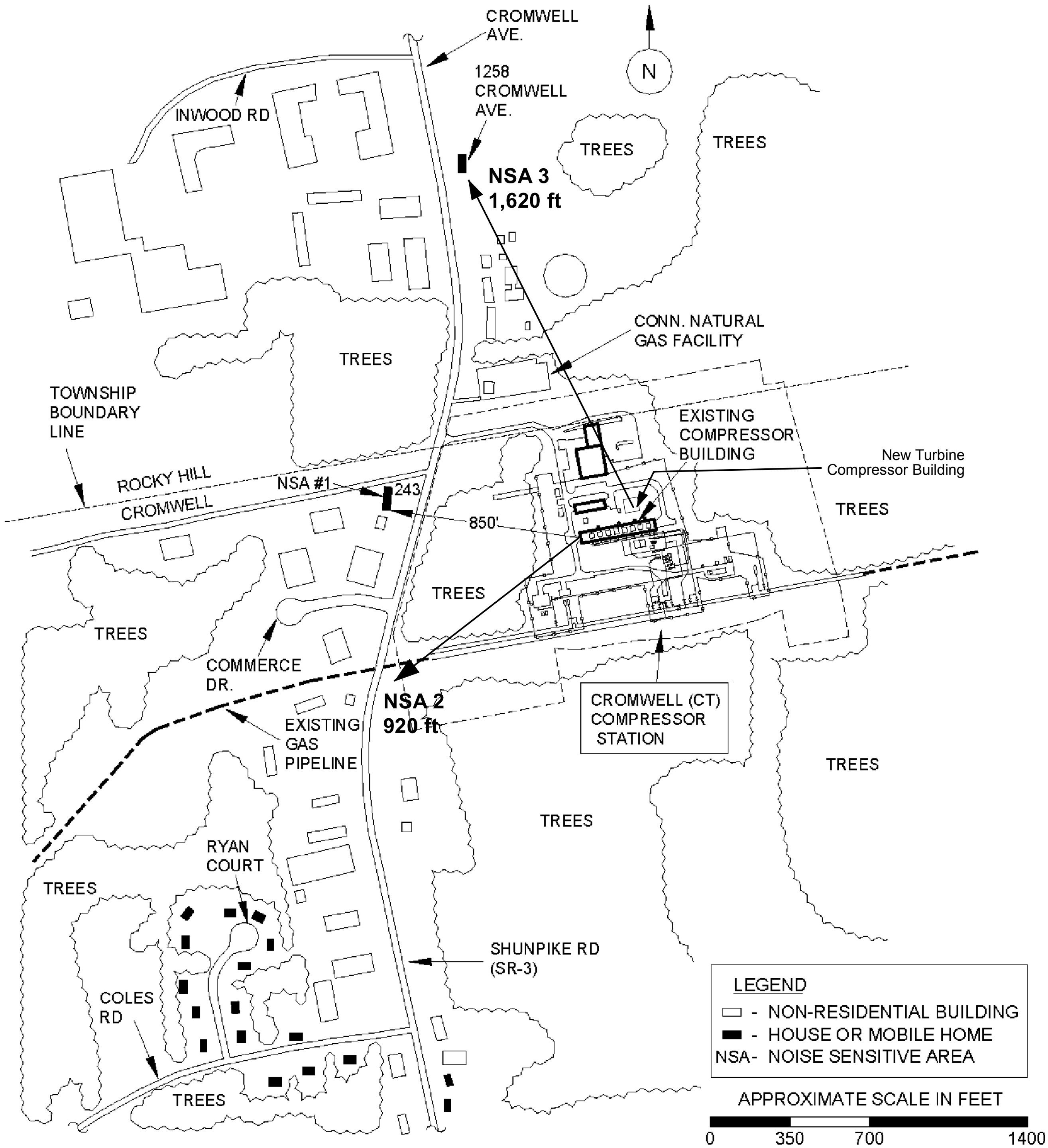

Figure 4.11.2-3
AIM Project
Existing Cromwell Compressor Station
Closest Noise-Sensitive Areas

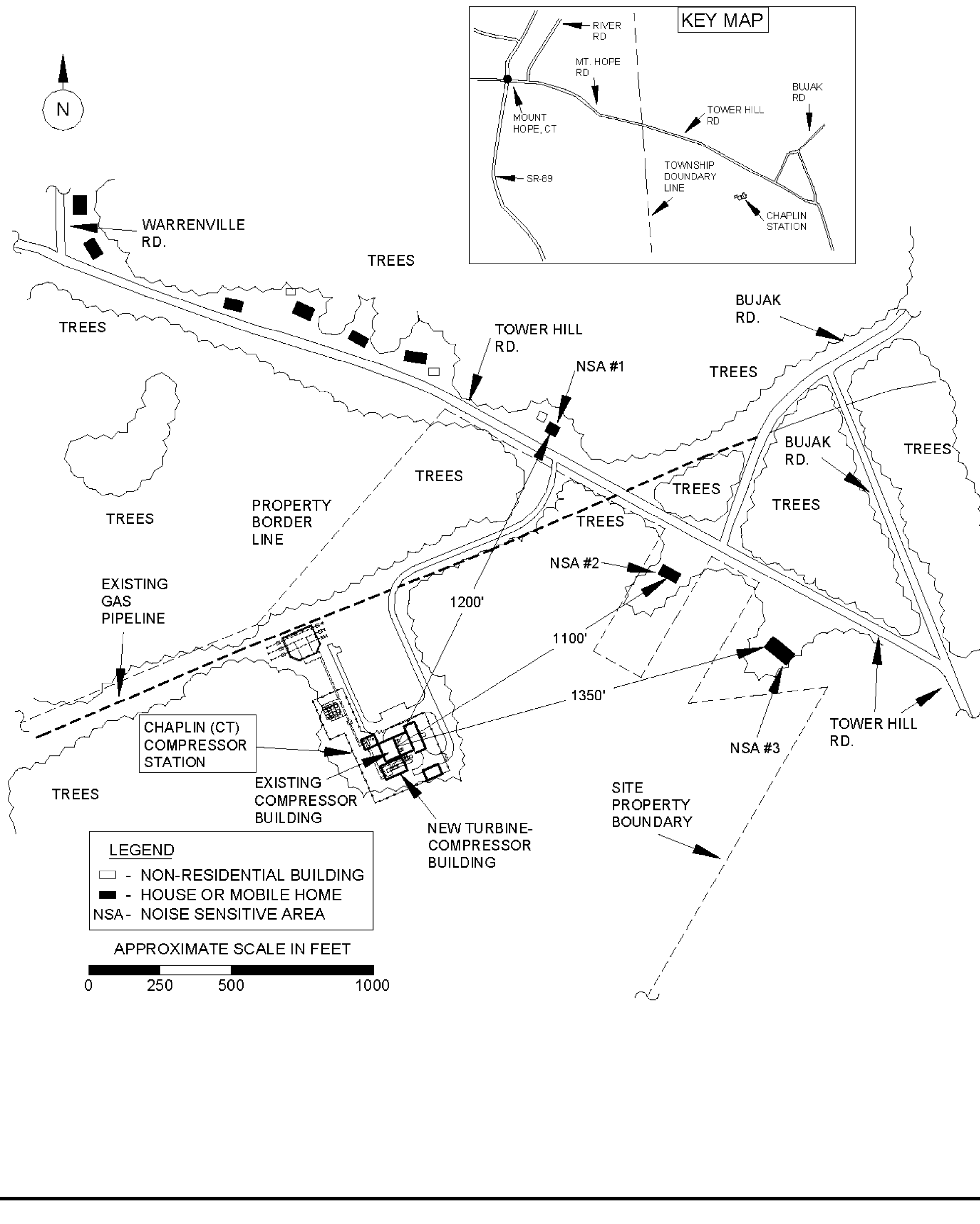

Figure 4.11.2-4
AIM Project
Existing Chaplin Compressor Station
Closest Noise-Sensitive Areas

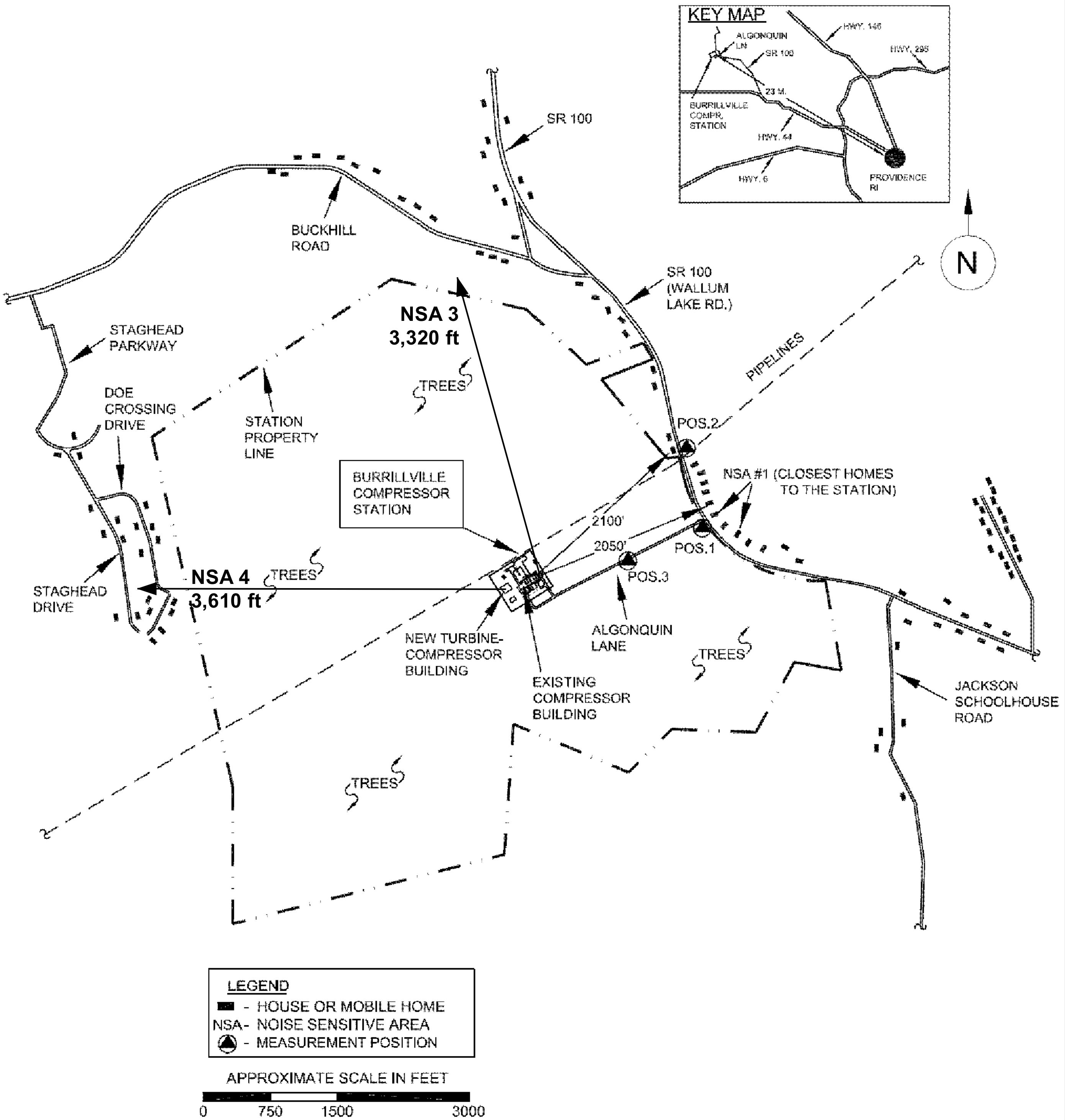

Figure 4.11.2-5
AIM Project
Existing Burrillville Compressor Station
Closest Noise-Sensitive Areas

M&R Stations and MLR Sites

The Project involves modification to two existing M&R stations in New York that involve major changes with the potential to generate additional noise. The Project also involves the addition of one proposed MLR in New York. The existing Peekskill M&R and Cortlandt M&R Stations are both located in Westchester County, New York. The proposed Stoney Street MLR would also be located in Westchester County, New York. Acoustical analyses were completed for the Peekskill and Cortlandt M&R Stations on March 27, 2014 and for the proposed Stoney Street MLR from November 13 to 14, 2013. The nearest NSA to the existing M&R stations and the proposed new MLR site are presented in table 4.11.2-2.

The Project involves modification to two existing M&R stations in Connecticut that involve major changes with the potential to generate additional noise. The Project also involves the addition of one proposed M&R station and one proposed MLR in Connecticut. The existing Willimantic M&R Station is located in Windham County, Connecticut. The existing Guilford M&R Station is located in New Haven County, Connecticut. The proposed new Oakland Heights M&R Station would be located in New London County, Connecticut. The proposed new Clapboard Ridge Road MLR would be located in Fairfield County, Connecticut. Acoustical surveys were completed for the existing Willimantic and Guilford M&R Stations, the proposed new Oakland Heights M&R Station, and the proposed new Clapboard Ridge Road MLR from November 13 to 14, 2013. The distance and direction to the nearest NSAs from each of these existing or proposed stations are presented in table 4.11.2-2.

In Massachusetts, the Project involves modification to one existing M&R stations that involves major changes with the potential to generate additional noise. The Project also involves the addition of two proposed M&R stations. The existing New Bedford M&R Station and the proposed new Assonet M&R Station would be located in Bristol County, Massachusetts. The proposed new West Roxbury M&R Station would be located in Suffolk County, Massachusetts. Acoustical surveys were completed for the proposed new Assonet and West Roxbury M&R Stations from November 13 to14, 2013. Due to the commercial/industrial nature of the existing New Bedford M&R Station and relative distance to the nearest NSAs, an acoustical survey was not completed for this station; however, an acoustical analysis was completed using estimated ambient sound levels. The distance and direction to the nearest NSAs from each of these proposed stations are presented in table 4.11.2-2.

4.11.2.2 Noise Regulatory Requirements

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 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.

The proposed modifications at 19 of the M&R stations associated with the Project, as well as the MLR sites located greater than 0.5 mile from nearby NSAs, would not change or affect noise conditions at nearby receptors; therefore, no further analysis of these facilities is required.

TABLE 4.11.2-2

Background Noise Levels at the Nearest NSAs to the Existing and Proposed M&R Stations and MLR Sites for the AIM Project

Location/Facility	Distance to NSA	Direction to NSA	Ambient L_{dn} [a]
NEW YORK			
Existing Peekskill M&R Station			
NSA 1	170 feet	Southeast	57.9 dBA [b]
Existing Cortlandt M&R Station			
NSA 1	90 feet	Northwest	58.7 dBA [b]
Proposed Stoney Street MLR			
NSA 1	275 feet	Northeast	47.5 dBA [c]
CONNECTICUT			
Existing Willimantic M&R Station			
NSA 1	90 feet	North	47.4 dBA [b]
Existing Guilford M&R Station			
NSA 1	350 feet	Northeast	49.8 dBA [b]
Proposed Oakland Heights M&R Station			
NSA 1	130 feet	North	50.5 dBA [c]
Proposed Clapboard Ridge Road MLR			
NSA 1	90 feet	North	49.2 dBA [c]
MASSACHUSETTS			
Existing New Bedford M&R Station			
NSA 1	2,200 feet	South	50.0 dBA [b]
Proposed Assonet M&R Station			
NSA 1	325 feet	South-Southeast	59.7 dBA [c]
Proposed West Roxbury M&R Station			
NSA 1	100 feet	Southwest	52.1 dBA [c]

[a] Ambient levels based on noise surveys as described in table 4.11.2-1.
[b] Ambient background noise level (L_{dn}) including the existing M&R station.
[c] Ambient background noise level (L_{dn}) of the proposed M&R station or MLR site.

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, 2014). Chapter 96 of the Town of Southeast Code entitled "Noise Ordinance of the Town of Southeast, New York" sets a maximum sound level in light industrial areas to 80 dBA during the day and 70 dBA at night (or impulsive sound is limited to 90 and 80 dBA during the day and night, respectively). Exceptions to these noise standards apply to construction activities occurring Monday through Friday, 7:00 a.m. to 8:00 p.m., and Saturday from 9:00 a.m. to 5:00 p.m. (Town of Southeast, 2014). Accordingly, the FERC noise standards establish more stringent noise requirements for Stony Point and Southeast Compressor Stations and thus impacts are discussed below based on the FERC standards.

Connecticut

Connecticut has established noise regulations that apply to the compressor stations, M&R stations, and MLR site. 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 4.11.2-3 summarizes the Noise Zone Standards that establish noise level requirements (CTDEEP, 2014b).

TABLE 4.11.2-3

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, M&R stations, and MLR site, 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.

The Town of Cromwell has established noise regulations in Chapter 168 of the town ordinances. Generally, industrial sites cannot exceed noise levels of 70 dBA to other industrial receptors, 66 dBA to other commercial receptors, or 61 dBA (daytime) or 51 dBA (nighttime) to residential receptors (Town of Cromwell, 2014). Noise generated during construction is exempt from these requirements during daytime hours. As the state code criteria described above is more conservative than the town ordinance, and the FERC standard is more stringent than the state standard, the noise analysis for the Cromwell Compressor Station is based on the FERC standard.

Rhode Island

Rhode Island does not have any state-level noise regulations, but allows each individual community to regulate noise through community by-laws. No local noise ordinances were identified that would be applicable to the Project.

Massachusetts

Massachusetts has established noise regulations (310 CMR 7.10). The MADEP 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 MADEP's noise regulation (310 CMR 7.10) if the source:

1. increases the broadband sound level by more than 10 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 decibels 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}) (MADEP, 2014b). 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 MADEP and site ambient sound surveys, the following summarizes the estimated noise criterion/guideline for Algonquin's new meter stations in Massachusetts:

- the noise attributable to the New Bedford M&R Station should be equal to or less than 50.0 dBA at the closest residential property lines or nearby residences;

- the noise attributable to the Assonet M&R Station should be equal to or less than 59.6 dBA at the closest residential property lines or nearby residences; and

- the noise attributable to the West Roxbury M&R Station should be equal to or less than 49.1 dBA at the property line of the station.

In general, the resulting noise criteria for the new meter stations in Massachusetts are considered to be approximately equal to the FERC sound requirement (i.e., L_{eq} of 48.6 dBA at nearby NSA) for the new West Roxbury M&R Station and higher than the FERC sound requirement for the existing New Bedford M&R Station and new Assonet M&R Station.

The City of Boston's Municipal Code (Chapter 16, Section 26) defines unreasonable or excessive noise as noise in excess of 50 dBA between the hours of 11:00 p.m. and 7:00 a.m. or in excess of 70 dBA at all other hours. As the state-level noise criteria are more stringent than the City of Boston's municipal code, the analyses described above are based on the state's standards.

4.11.2.3 Noise Level Impacts and Mitigation

Construction Noise

Noise would be generated during construction of the pipeline and during construction and operation of the 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.

One exception to this would be certain HDD activities, which are expected to continue into the nighttime hours. Because of this and 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 two locations (Hudson River crossing and Interstate 84/Still River crossing). The Hudson River and Interstate 84/Still River HDDs are anticipated to occur between March and October 2015, with an estimated duration of 5 and 7 months, respectively. Algonquin performed ambient noise surveys and acoustical assessments of the HDD sites within 0.5 mile of NSAs to determine background noise levels and the predicted noise levels at NSAs.

The results of 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 4.11.2-4. The acoustical assessments indicate that mitigation would be necessary at all proposed HDD 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.

TABLE 4.11.2-4

Noise Quality Analysis for the Horizontal Directional Drilling Sites Associated with the AIM Project

Planned HDD Site (Entry or Exit Point)	Distance and Direction of the Closest NSA to Site Center	Ambient L_{dn}	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 the Ambient Noise (dB)
Hudson River HDD [b]							
HDD (west entry site)	730 feet/west	45.9	60.3	7.2	53.1	53.8	7.9
HDD (east entry site)	630 feet/east-southeast	48.1	63.7	10.1	53.6	54.7	6.6
Interstate Highway 84/Still River HDD [b]							
HDD (south entry site)	450 feet/southeast	57.8	66.9	13.1	53.8	59.3	1.5
HDD (north entry site)	400 feet/east	55.2	68.1	14.6	53.5	57.4	2.2

[a] Noise levels listed are based on the use of noise mitigation to meet the sound criteria.

[b] Both HDDs would be completed using the intersect method, which employs drill rigs on both sides of the crossing. As such, both ends of the HDD are referred to as the entry side.

Note: dB = decibels, dBA = decibels on the A-weighted scale

Algonquin has committed to implementing the following noise mitigation measures at the HDD entrance and exit points:

- Hudson River HDD crossing (east and west sides)
  - use a "close-fit" partial enclosure for the hydraulic power unit (HPU) associated with the drilling rig (e.g., 16-foot barrier around the HPU);
  - partially enclose the unenclosed engines (e.g., high-pressure mud pump);
  - employ a "low-noise" generator for the mud/cleaning system (i.e., generator set designed with a factory-installed acoustical enclosure); and
  - employ a residential–grade exhaust silencer on all engines.
- Interstate 84/Still River HDD crossing (north and south sides)
  - employ a temporary noise barrier along the south side and east side of the South Side HDD site workspace (i.e., constructed of plywood panels or noise barrier blanket material (e.g., 16-foot high);
  - use a "close-fit" partial enclosure for the South Side HDD HPU associated with the drilling rig (e.g., 16-foot barrier around the HPU);
  - partially enclose the South Side HDD unenclosed engines (e.g., high-pressure mud pump) and the North Side HPU associated with the drilling rig;
  - use a "noise-reduction tent" over the HDD workspace (constructed of a heavy canvas material supported over steel trusses and lined with acoustical sound-absorptive/barrier material designed with a septum mass layer);
  - employ a "low-noise" generator for the mud/cleaning systems (i.e., generator set designed with a factory-installed acoustical enclosure); and
  - employ a residential–grade exhaust silencer on all engines.

We reviewed Algonquin's 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 areas surrounding the two proposed HDD crossings, **we recommend that:**

- **Algonquin file <u>in the weekly construction status reports</u> the following for the Hudson River and Interstate 84/Still River HDD sites:**

  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 decibels.**

Operational Noise

The modified compressor stations would generate noise on a continuous basis (i.e., 24 hours per day) once operating. Some noise would also be generated by the operation of modified M&R stations, the proposed new M&R Stations, and the proposed new MLRs. 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.

Algonquin completed an acoustical analysis to identify the estimated noise impacts at the nearest NSAs from the proposed changes at the five compressor stations. The results of these acoustical analyses are presented in table 4.11.2-5 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;
- adequate silencer for each turbine air intake system;
- low-noise lube oil cooler for each compressor unit; and/or
- low-noise gas cooler.

Although Algonquin evaluated the implementation of various mitigation measures at each compressor station, it is currently evaluating noise control measures needed at the existing compressor stations. We reviewed the compressor station noise analyses and agree that, if properly implemented, these noise control measures would ensure that noise attributable to the modified 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.

At the Stony Point Compressor Station, existing noise levels are above 55 dBA L_{dn} as a result of existing compressor station equipment that was installed prior to implementation of the FERC noise criterion. These four units would be abandoned as a result of this project, resulting only in facilities installed after the FERC noise criterion. This would result in noise levels below those projected by Algonquin, as all units would be required to comply with the FERC criterion. However, to ensure noise levels from the Stony Point Compressor Station are not significant, **we recommend that:**

- **Algonquin file a noise survey with the Secretary no later than 60 days after placing the authorized units at the Stony Point Compressor Station in service. If a full load condition noise survey of the entire station is not possible, Algonquin shall instead 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 all of the equipment at the Stony Point Compressor Station under interim or full horsepower load conditions exceeds an L_{dn} of 55 dBA at any nearby NSAs, Algonquin should file a report on what changes are needed and should install the additional noise controls to meet the level within 1 year of the in-service date. Algonquin should confirm compliance with the L_{dn} of 55 dBA requirement by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls.

TABLE 4.11.2-5

Noise Quality Analysis for the Compressor Stations Proposed to Be Modified for the AIM Project

Location/Facility	Distance and Direction to NSA	Current Station L_{dn} (dBA) [a]	L_{dn} Attributable to the Modifications (dBA)	Station 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 (WSW)	62.9	49.4	62.9	0.0
NSA 2	700 feet (W)	63.0	50.7	63.0	0.0
NSA 3	800 feet (SSE)	49.9	41.1	50.9	1.0
NSA 4	1,000 feet (E)	49.6	46.4	51.3	1.7
Existing Southeast Compressor Station					
NSA 1	1,200 (NW)	66.0	44.1	66.0	0.0
NSA 2	1,300 (SSW)	52.2	45.8	53.1	0.9
NSA 3	2,200 (SE)	53.3	40.7	53.5	0.2
CONNECTICUT					
Existing Cromwell Compressor Station					
NSA 1	850 feet (W)	48.7 [b]	45.0	50.3	0.6
NSA 2	920 feet (SW)	63.2 [b]	44.3	63.3	0.1
NSA 3	1,620 feet (NNW)	58.2 [b]	39.4	58.2	0.0
Existing Chaplin Compressor Station					
NSA 1	1,200 feet (NNE)	48.0	41.7	48.9	0.9
NSA 2	1,100 feet (NE)	46.7	42.8	48.2	1.5
NSA 3	1,350 feet (ENE)	46.7	41.3	47.8	1.1
RHODE ISLAND					
Existing Burrillville Compressor Station					
NSA 1	2,050 feet (ENE)	56.9	39.2	57.0 [c]	0.1
NSA 2	2,100 feet (NE)	52.4	39.2	52.6	0.2
NSA 3	3,320 feet (N)	52.4	35.0	52.5	0.1
NSA 4	3,610 feet (W)	45.0	34.3	45.4 [d]	0.4

[a] Stony Point Compressor Station noise assessment does not account for the removal of 4 older compressor units; therefore, the projected future noise levels are conservative.

[b] The existing compressor station is not the dominant noise source influencing ambient sound levels. The sound contribution from the compressor station only is provided.

Because existing noise levels are above 55 dBA L_{dn}, Algonquin is still completing the final compressor station designs, and to ensure that the noise control measures used are properly implemented at the Southeast, Cromwell, and Burrillville Compressor Stations, **we recommend that:**

- **Algonquin should file noise surveys with the Secretary no later than 60 days after placing the authorized units at the Southeast, Cromwell, and Burrillville 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 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 should file a report on what changes are needed and should install the additional noise controls to meet the level within 1 year of the in-service date. Algonquin should confirm compliance with the above requirement by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls.

Also, to ensure that the noise control measures still under final development are properly implemented at Chaplin Compressor Station, we recommend that:

- **Algonquin file a noise survey with the Secretary no later than 60 days after placing the authorized units at the Chaplin Compressor Station in service. If a full load condition noise survey of the entire station is not possible, Algonquin shall instead 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 all of the equipment at the Chaplin Compressor Station under interim or full horsepower load conditions exceeds an L_{dn} of 55 dBA at any nearby NSAs, Algonquin should file a report on what changes are needed and should install the additional noise controls to meet the level within 1 year of the in-service date. Algonquin should confirm compliance with the L_{dn} of 55 dBA requirement by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls.**

Algonquin also completed acoustical analyses on the modified M&R stations that would result in additional noise, the proposed new M&R stations, and the MLR sites that are within 0.5 mile of nearby NSAs and to determine what, if any, noise control measures would be needed to ensure compliance with federal and local noise ordinances. The results of these acoustical analyses are presented in table 4.11.2-6 and indicate that the noise resulting from the operation of these facilities would be in compliance with the applicable noise standards.

Algonquin has stated that they are currently evaluating noise control measures to be implemented at the proposed modified and new M&R stations and MLR sites. 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}. It is our experience that M&R stations and MLRs may 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 justify the need for post-construction noise surveys for several of the proposed modified and new M&R stations and MLR site 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 file noise surveys with the Secretary no later than 60 days after placing the Guilford, Willimantic, Oakland Heights, and West Roxbury M&R Stations and the proposed new Clapboard Ridge Road MLR in service. If the noise attributable to the operation of any M&R Station or MLR 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 within 1 year of the in-service date. Algonquin should confirm compliance with the above requirement by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls.

TABLE 4.11.2-6

Noise Quality Analysis for the Applicable M&R Stations and the MLR Sites for the AIM 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 Peekskill M&R Station					
NSA 1	170 feet (SE)	57.9	49.4	58.5	0.6
Existing Cortlandt M&R Station					
NSA 1	90 feet (NW)	58.7	53.0	59.7	1.0
Proposed Stoney Street MLR					
NSA 1	275 feet (NE)	47.5	47.3	50.4	2.9
CONNECTICUT					
Existing Willimantic M&R Station					
NSA 1	90 feet (N)	47.4	50.2	52.0	4.6
Existing Guilford M&R Station					
NSA 1	350 feet (NE)	49.8	39.7	50.2	0.4
Proposed Oakland Heights M&R Station					
NSA 1	130 feet (N)	50.5	46.4	51.9	1.4
Proposed Clapboard Ridge Road MLR					
NSA 1	90 feet (N)	49.2	50.5	52.9	3.7
MASSACHUSETTS					
Existing New Bedford M&R Station					
NSA 1	2,200 feet (S)	50.0	31.9	50.1	0.1
Proposed Assonet M&R Station					
NSA 1	325 feet (SSE)	59.7	41.7	59.8	0.1
Proposed West Roxbury M&R Station					
NSA 1	100 feet (SW)	52.1	48.5	53.7	1.6

[a] Current ambient levels based on noise surveys as described in table 4.11.2-1.

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 event, we do not believe that they will be a significant contributor to operational noise from the Project.

Based on the analyses conducted, mitigation measures proposed, and our additional recommendations, we believe that the Project would not result in significant noise impacts on residents, and the surrounding communities.

4.12 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.

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 within an enclosed space in the presence of an ignition source can explode. It is buoyant at atmospheric temperatures and disperses rapidly in air.

4.12.1 Safety Standards

PHMSA is mandated to provide pipeline safety under 49 USC 601. The OPS 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 AIM Project, New York and Connecticut are interstate agents that have been delegated authority to inspect interstate natural gas pipeline facilities. OPS federal inspectors perform inspections on interstate natural gas pipeline facilities in Massachusetts and Rhode Island.

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 the 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. The 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.

The 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 AIM 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.

We received comments regarding the siting of a high-pressure pipeline in urban or developed settings in close proximity to facilities such as schools, residential areas, and hospitals. 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 4.12.1-1.

TABLE 4.12.1-1

Area Classifications Along the AIM Project

Facility	County, State	Begin MP	End MP	Length (feet)	Class Location
Replacement Pipeline					
Haverstraw to Stony Point Take-up and Relay	Rockland, NY	0.0	1.7	9,186	3
		1.7	1.9	787	1
		1.9	3.3	7,334	3
Stony Point to Yorktown Take-up and Relay	Rockland, NY	0.0	0.9	4,800	3
		0.9	1.3	2,270	1
		1.3	3.2	9,988	3
		3.2	3.5	1,542	1
	Westchester, NY	3.5	3.9	1,983	1
		3.9	4.6	3,837	2
		4.6	4.7	244	3
		4.7	5.0	1,776	1
		5.0	6.8	9,567	3
		6.8	8.0	6,148	1
		8.0	10.9	15,335	3
		10.9	11.2	1,708	2
		11.2	12.3	5,755	1
Southeast to MLV 19 Take-up and Relay	Putnam, NY	0.0	0.1	792	1
	Fairfield, CT	0.1	0.9	4,105	3
		0.9	1.0	724	1
		1.0	2.6	8,205	3
		2.6	2.9	1,585	1
		2.9	4.5	8,354	3
E-1 System Lateral Take-up and Relay	New London, CT	0.0	0.5	2,579	2
		0.5	8.5	42,408	1
		8.5	8.9	2,123	3
		8.9	9.1	938	1
Loop Extension					
Line-36A Loop Extension	Middlesex, CT	0.0	0.7	3,586	1
		0.7	0.9	906	3
		0.9	1.0	1,034	1
		1.0	1.5	2,328	2
		1.5	1.8	1,372	1
	Hartford, CT	1.8	2.0	1,320	1
E-1 System Lateral Loop Extension	New London, CT	0.0	0.3	1,814	3
		0.3	1.2	4,412	1
		1.2	1.3	902	2
New Pipeline					
West Roxbury Lateral	Norfolk, MA	0.0	0.2	900	3
		0.2	0.4	1,300	4
		0.4	0.6	1,100	3
		0.6	1.2	19,600	4
		1.2	3.4	11,880	3
	Suffolk, MA	3.4	5.1	8,976	3

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, Algonquin 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 well 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 [9] is greater than 660 feet and there are 20 or more buildings intended for human occupancy within the potential impact circle [10]; 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.

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9 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 pipeline diameter in inches.

10 The potential impact circle is a circle of radius equal to the potential impact radius.

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 based on the relationship of the pipeline centerline to other nearby structures and identified sites. Table 4.12.1-2 lists the HCAs by milepost that would be crossed by the pipeline facilities.

TABLE 4.12.1-2

Location of High Consequence Areas Along the Pipeline Facilities for the AIM Project[a]

Facility	County, State	Begin MP	End MP	HCA Length (feet)
Replacement Pipeline				
Haverstraw to Stony Point Take-up and Relay	Rockland, NY	0.0	0.0	36
		0.0	0.1	725
		0.3	1.3	5,306
		2.2	2.8	3,398
Stony Point to Yorktown Take-up and Relay	Rockland, NY	0.3	1.2	4,633
		1.9	2.6	3,487
	Westchester, NY	3.8	4.3	2,701
		4.4	6.4	10,921
		8.0	8.6	2,650
		8.8	11.3	13,738
Southeast to MLV 19 Take-up and Relay	Fairfield, CT	0.1	1.0	4,641
		1.0	2.8	9,866
		3.0	3.4	1,817
		4.3	4.4	800
E-1 System Lateral Take-up and Relay	New London, CT	8.5	8.6	372
		8.6	8.7	438
		8.9	9.0	860
Loop Extension [b]				
Line-36A Loop Extension	Middlesex, CT	0.5	1.0	2,722
New Pipeline				
West Roxbury Lateral	Norfolk, MA	0.0	3.4	18,163
	Suffolk, MA	3.4	5.1	8,976

[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] No HCAs would be located along the E-1 System Lateral Loop.

The pipeline integrity management rule for HCAs requires inspection of the pipeline every 7 years. Algonquin has implemented a comprehensive integrity management program that meets, and in many cases exceeds, these regulations. While the pipeline integrity management regulations apply only to HCAs, Algonquin would continue to implement the same rigorous practices across its entire pipeline system. Key elements of Algonquin's integrity management program include data gathering, risk assessment, integrity assessments, response and remediation, and preventative and mitigative measures as described below.

Data Gathering – In order to properly identify integrity risks and potential consequences, data is gathered from a number of sources, including:

- original construction records;
- pipeline alignment sheet records;
- personnel interviews;
- quadrangle USGS maps;
- digital elevation models;
- historical data;
- database searches;
- leak and incident data/reports;
- operating characteristics;
- corrosion monitoring;
- cathodic protection surveys;
- subject matter experts;
- one-call notices; and
- aerial photography.

Risk Assessment – Each year Algonquin performs a detailed risk analysis for its entire pipeline system to identify potential integrity threats to the pipeline and potential consequences in the event of a pipeline failure. This risk analysis, which allows Algonquin to prioritize integrity management activities, such as integrity assessments and additional prevention measures. The risk assessment is performed by subject matter experts using modern risk management tools and techniques to assure the risk assessment process provides an accurate determination of pipeline risks.

Integrity Assessments – Integrity assessments are prioritized based on the risk assessment, and are conducted to find pipeline defects before they could become a threat. The integrity assessment method for each pipeline segment is selected based on the types of potential integrity threats applicable to that segment. The integrity assessment methods could include:

- In-Line Inspection – conducted using an internal inspection tool (commonly referred to as a "smart pig") that is capable of identifying and classifying pipe defects, including metal loss, dents, gouges, and other types of defects. The smart pig is inserted into the pipeline and is typically pushed by the flow of natural gas in the pipeline.

- Direct Assessment – an assessment method that uses a systematic approach to identify potential defects through data review, indirect assessments, and targeted hands-on inspections.

- Pressure Testing – an assessment method where the pipeline is filled with an inert substance, typically water, and is tested to a pressure that is well above the normal operating pressure to validate the strength of the pipe and identify any smaller defects before they become a threat.

Response and Remediation – Pipeline defects identified by the integrity assessments are scheduled for field investigation and repair, if required, in accordance with the integrity management regulations and industry standards and best practices. Algonquin schedules and conducts investigations and repairs for any potential defects that exceed specified thresholds. This is done regardless of whether or not the pipeline is located in a designated HCA.

Preventive and Mitigative Measures – Preventive measures include design specifications, selection of suitable construction materials, development and selection of welding procedures, pipe coatings, and cathodic protection systems. Additionally, manufacturing controls would be used to promote high-quality installation of the pipeline and to limit operating stress. During the installation phase, all welders and radiographic technicians performing work on the facilities would be required to take and pass a qualification test. Qualified oversight inspection staff would be used to monitor the installation of the facilities.

After construction and as required by PHMSA's regulations, the pipeline facilities would be marked at line-of-sight intervals and at crossings of roads, railroads, and other key points. The markers would indicate the presence of the pipeline and provide a telephone number where a company representative could be reached in the event of an emergency or before any excavation in the area of the pipeline by a third party. Algonquin participates in the "Call Before You Dig" and "One Call" programs and other related pre-excavation notification organizations in the states in which they operate. In addition, if there is excavation occurring near one of Algonquin's pipelines, operational personnel would be on site during excavation activities to ensure there is no risk of damage to 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 related to:

- erosion and wash-outs along the right-of-way;
- settling, undermining, or degradation of a 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 endanger the pipeline.

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 Algonquin's Emergency Plan (under Part 192.615) include:

- receiving, identifying, and classifying emergency events, such as gas leakage, fires, explosions, and natural disasters;
- establishing and maintaining communications with local fire, police, and public officials, and coordinating emergency response;
- employing an emergency system shutdown and safely restoring service;
- making personnel, equipment, tools, and materials available at the scene of an emergency; and
- protecting people first and then property, and making them safe from actual or potential hazards, including evacuating individuals and rerouting traffic as necessary to avoid any area that is deemed to be unsafe.

We received comments during public scoping regarding emergency response procedures and employee training at the Southeast and Stony Point Compressor Stations. Algonquin's Cromwell, Connecticut Area Office maintains the Emergency Response Plan for the Southeast Compressor Station, and the South Plainfield, New Jersey Area Office maintains the Emergency Response Plan for the Stony Point 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, Algonquin conducts periodic training sessions to review operating and emergency procedures with their operations staff.

Algonquin's 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. Algonquin's AIM 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 allow for a section of pipeline to be isolated from the rest of the system.

We received a comment concerning the potential for Algonquin's monitoring and data acquisition systems to be vulnerable to computer "worms," such as the Stuxnet Computer worm. Algonquin stated that its controls are tested on a continuous basis and that it has fully staffed Information Technology and Corporate Security groups dedicated to the protection and security of their pipeline control systems. Additionally, its staff is certified and trained through the Department of Homeland Security and works closely with local, state, and federal agencies reviewing and developing safeguards against cyber threats.

We also received comments regarding operational checks and leak detection. Algonquin's operating personnel would patrol the right-of-way along the new and existing pipeline facilities on a weekly basis. Algonquin 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. Algonquin would maintain a liaison with public authorities and local utilities in all locations along the pipeline system. A current list of those to be contacted would be maintained by the Transmission Area Managers at the South Plainfield (New Jersey), Cromwell (Connecticut), and Westwood (Massachusetts) Area Offices. Algonquin would provide the appropriate training to local emergency service personnel before the pipeline is placed in service.

We received several comments during the scoping period regarding the tax burden on local emergency services in the event of a pipeline incident. Algonquin would not necessarily compensate the municipalities for any public service assistance that might be required to respond to an incident; however, Algonquin would pay taxes (see section 4.9.8), which may be used to offset any required municipal expenses.

4.12.2 Pipeline Accident 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.[11]

During the 20-year period from 1994 through 2013, a total of 1,237 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. Table 4.12.2-1 provides a 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 constituting 48.2 percent of all significant incidents. The pipelines included in the data set in table 4.12.2-1 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.

TABLE 4.12.2-1

Natural Gas Transmission Pipeline Significant Incidents by Cause (1994–2013) [a]

Cause	Number of Incidents	Percentage
Corrosion	292	23.6
Excavation [b]	211	17.0
Pipeline Material, Weld or Equipment Failure	304	24.6
Natural Force Damage	142	11.5
Outside Forces [c]	74	6.0
Incorrect Operation	33	2.7
All Other Causes [d]	181	14.6
TOTAL	1,237	--

[a] All data gathered from PHMSA Significant Incident files, March 14, 2014 (http://primis.phmsa.dot.gov/comm/reports/safety/SigPSI.html).
[b] Includes third-party damage.
[c] Fire, explosion, vehicle damage, previous damage, intentional damage.
[d] Miscellaneous causes or unknown causes.

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 protection system,[12] required on all pipelines installed after July 1971, significantly reduces the corrosion rate compared to unprotected or partially protected pipe.

Outside force, excavation, and natural forces are the cause in 34.5 percent of significant pipeline incidents. These result from the encroachment of mechanical equipment such as bulldozers and

[11] $50,000 in 1984 dollars is approximately $115,000 as of March 2014 (CPI, Bureau of Labor Statistics, ftp://ftp.bls.gov/pub/special.requests/cpi/cpiai.txt, February 2014).

[12] 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.

backhoes; earth movements due to soil settlement, washouts, or geologic hazards; weather effects such as winds, storms, and thermal strains; and willful damage. Table 4.12.2-2 provides a breakdown of outside force incidents by cause.

TABLE 4.12.2-2

Outside Forces Incidents by Cause (1994–2013)[a]

Cause	Number of Incidents	Percent of all Incidents
Third-party excavation damage	176	14.2
Operator excavation damage	25	2.0
Unspecified equipment damage/Previous damage	10	0.8
Heavy Rain/Floods	72	5.8
Earth Movement	35	2.8
Lightning/Temperature/High Winds	21	1.7
Unspecified Natural Force	14	1.1
Vehicle (not engaged with excavation)	45	3.6
Fire/Explosion	8	0.6
Previous mechanical damage	5	0.4
Fishing or maritime activity	7	0.6
Intentional damage	1	0.1
Electrical arcing from other equipment/facility	1	0.1
Unspecified outside force	7	0.4
TOTAL	427	--

[a] Excavation, Outside Forces, and Natural Force Damage from table 4.12.2-1.

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 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 (*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 4.12.2-3. In addition, pipeline operator compliance and incident history is publically available on the PHMSA website at www.phmsa.dot.gov/pipeline.

TABLE 4.12.2-3

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

4.12.3 Impact on Public Safety

Algonquin would implement various public safety measures during construction in residential and commercial areas, including but not limited to:

- fencing the construction work area boundary to ensure equipment, materials, and spoil remain in the construction right-of-way and that the public is excluded from hazardous areas;
- ensuring piping is welded and installed as quickly as reasonably possible consistent with prudent pipeline construction practices to minimize the duration of construction within a neighborhood;
- backfilling the trench as soon as the pipe is laid or temporarily installing a steel plate over the open trench; and
- completing final cleanup and installation of permanent erosion control measures within 10 days after the trench is backfilled, weather conditions permitting.

Along the West Roxbury Lateral, the pipeline would primarily be placed within streets in the vicinity of residential and commercial areas. Algonquin would use the in-street construction method to install the pipeline within roadways (see section 2.3.1.2). The work area would be isolated from road and pedestrian traffic, and traffic controls would be used to allow traffic to bypass the work area. No trenches would be left open overnight. With the exception of the end of the pipe, which would be left exposed within the trench, the pipe trench would be backfilled at the end of the day, and the open trench containing the exposed ends of the pipe would be plated. The work would be accomplished so that emergency vehicles would be able to pass and homeowners would be able to access their driveways. Algonquin has developed an acceptable Traffic Management Plan for the West Roxbury Lateral as well as acceptable site-specific residential construction plans for residences within 50 feet of the construction right-of-way (see sections 4.9.5 and 4.8.3, respectively).

We received several comments regarding the proximity of the Project to high-voltage power lines. It is not uncommon for natural gas pipeline facilities to parallel existing utility rights-of-ways, including electric transmission rights-of-way. Algonquin would comply with all federal, state, and local regulations that apply to construction with regard to structures and underground utilities. Algonquin has conducted surveys and collected information on the location and size of existing power line structures within the proposed right-of-way corridors, tower footing locations and dimensions, and wire heights (lowest point between towers). Algonquin would design or modify its construction technique on the AIM Project with sufficient offsets to eliminate the risk of heavy construction equipment interfering with overhead high-voltage electric transmission lines during construction and operation. Where possible, Algonquin would offset its pipeline trench by 50 feet to avoid any potential damage to electric transmission towers; and in those areas that this offset could not be achieved, the construction technique would be modified. Algonquin would use a licensed blasting engineer and would follow a Project-specific Rock Removal Plan that includes blasting procedures (see section 4.1.6) to avoid damage to overhead electric transmission lines and structures from blasting.

To address potential effects on the pipeline from potential lighting strikes to nearby electric transmission towers**,** Algonquin would consult with an engineer that specializes in developing alternating current (AC) mitigation systems for pipeline utility companies. An AC mitigation system would be designed and installed to mitigate the steady state induced AC 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 have also received several comments expressing safety concerns about potential interactions between Algonquin's proposed pipeline facilities and the WPP transmission line. Algonquin and WPP have corresponded and met regarding the two projects, and plan to share design drawings. Algonquin has committed to conducting an alternating current/direct current (AC/DC) interference study and incorporating field surveys and comprehensive modeling to identify potential adverse effects on the pipeline from stray currents and from inductive, conductive, and coupling AC/DC effects from nearby AC/DC utilities. After completion of the study, mitigation requirements would be determined. Potential mitigation measures for AC/DC interference could include maximum separation distance, parallel/point mitigation utilizing anodes, potentially controlled impressed current cathodic protection systems, or other measures based on engineering judgment. WPP has committed to installing its cable in accordance with Algonquin's requirements at any point where it would cross the pipeline. Although we do not anticipate any significant issues, to ensure that safety concerns about potential interactions are adequately addressed, **we recommend that:**

- **<u>Prior to construction of the Stony Point to Yorktown Take-up and Relay segment</u>, Algonquin should file with the Secretary its final AC/DC interference study associated with the West Point Transmission Project, documentation of all consultations with WPP, and any additional mitigation measures to address safety-related issues.**

Additionally, we received scoping comments from individuals as well as Entergy concerning the safety of the Project and its proximity to the IPEC facility. Three existing pipelines (24-inch-diameter Northline, 30-inch-diameter L30B pipeline, and 24-inch-diameter Southline) currently cross the Hudson River within Algonquin's mainline right-of-way and are immediately adjacent to the IPEC-protected security barrier. For the Stony Point to Yorktown Take-up and Relay segment of the proposed Project, Algonquin has identified as its proposed route an alternate crossing location of the Hudson River that is located approximately 0.5 mile south of the three existing pipelines. While the proposed route would still cross a portion of IPEC land, it would be about 2,370 feet from the IPEC-protected security barrier around the main facility sites. Land uses between the proposed route and the IPEC-protected security barrier include commercial and industrial. Algonquin would work with Entergy on any requirements for the storage of construction equipment on these parcels when negotiating easements with Entergy and Con Edison for construction of the proposed pipeline. Algonquin has also shared its operation and maintenance procedures with Entergy and would continue to consult with Entergy regarding the use of Entergy-owned or leased land along the proposed route.

Entergy also commented about the potential impacts of the new 42-inch-diameter pipeline crossing the existing pipelines. To minimize potential impacts on the existing line, Algonquin would locate the existing pipeline using above-grade visual cues, electronic pipe locators, probing, and soft digging methods. Once the pipeline is located and identified, pipe stress calculations could be completed for equipment crossings and surface loads. If necessary, Algonquin would provide additional cover; install timber mats, steel plating, or temporary air bridging; utilize a combination of these; or avoid the crossing in order to minimize or avoid impacts on existing utilities. During construction, Algonquin would use soft digging methods to excavate utility lines. Excavator buckets without teeth or side cutters would be used, and lines could be shielded with rock shield or plywood. Utility lines would be supported from below or by a beam installed across the top of the trench. For highly sensitive lines, Algonquin would develop a site-specific work plan for working near the utility.

Entergy commented about concerns on the purging of gas from the existing 26-inch-diameter pipeline, Algonquin would not have any purging operations on IPEC property. Blowing down the existing 26-inch-diameter pipeline would occur either upstream or downstream of the IPEC facility. A written procedure for blow-down of the pipeline would be drafted in accordance with Algonquin's standard operation procedures.

Entergy also commented on blasting and HDD inadvertent releases with regard to the IPEC facility. The proposed route would not be located within or adjacent to the main IPEC facilities; therefore, no blasting would occur within or near the IPEC-secured zone. If blasting would be required along the proposed route, Algonquin would first consult with Entergy. Blasting would be conducted in accordance with Algonquin's Rock Removal Plan (see appendix E). The Hudson River HDD would be located about 0.5 mile south of the protected security barrier surrounding the IPEC facility. It is not anticipated that inadvertent releases of drilling fluids would affect IPEC property, and HDD construction equipment would not be located on or adjacent to the IPEC facility.

With regard to Entergy's comment regarding how Algonquin intends to prevent overpressure of the downstream pipeline when adding additional horsepower at existing compressor stations, overpressure protection controls are established at compressor stations on Algonquin's transmission lines. These controls have been in place for the 26- and 30-inch-diameter pipelines at the Stony Point Compressor Station. The new 42-inch-diameter pipeline segment would have the same overpressure protection measures to ensure safety of the pipeline. The pressure controls and overpressure devices are reliable and stringent, and the accuracy of set points is verified at periodic time intervals in accordance with PHMSA regulations. Maintenance records of the pressure controls and overpressure devices are audited by internal teams as well as PHMSA auditors to ensure compliance.

Given the distance from the IPEC generating facilities and the avoidance and mitigation measures described above, the proposed route should not pose any new safety hazards to the IPEC facility. Based on our consultation with NRC, Entergy is required to assess any new safety impacts on its facility and provide that analysis to the NRC. Algonquin has coordinated with Entergy to provide information about its proposed pipeline and Entergy is currently performing a Hazards Analysis. Therefore, to ensure that no new safety hazards would result from the AIM Project, **we recommend that:**

- **<u>Prior to the end of the draft EIS comment period</u>, Algonquin should file with the Secretary its final conclusions regarding any potential safety-related conflicts with the IPEC based on the Hazards Analysis performed by Entergy. If Entergy's Hazards Analysis is not yet complete, Algonquin should provide an update on its status and a schedule for anticipated completion. If, upon completion of the Hazards Analysis, additional mitigation measures are required to address safety-related issues or conflicts, prior to construction in the vicinity of the IPEC facility, Algonquin should file with the Secretary, for review and written approval by the Director of OEP, a site-specific construction and mitigation plan for the IPEC developed in consultation with Entergy.**

We received numerous comments from residents who were concerned about the consequences of an explosion of a larger, 42-inch-diameter pipeline. The majority of this Project involves replacement of existing pipeline. However, table 4.12.3-1 presents the existing and future potential impact radius for each pipeline segment. Although the transportation of natural gas via a pipeline involves some degree of risk to the public in the event of an accident and subsequent release of gas, it is also important to examine the probabilistic level of risks for pipeline-related events.

TABLE 4.12.3-1

Existing and Future Potential Impact Radius for the AIM Project

Facility	County, State	Begin MP	End MP	Existing PIR (feet)	Future PIR (feet)
Replacement Pipeline					
Haverstraw to Stony Point Take-up and Relay	Rockland, NY	0.0	3.3	465.7	844.9
Stony Point to Yorktown Take-up and Relay	Rockland, NY	0.0	2.6	465.7	844.9
	Rockland/Westchester, NY	2.6	5.5	NA	844.9
	Westchester, NY	5.5	12.3	465.7	844.9
Southeast to MLV 19 Take-up and Relay	Putnam, NY/Fairfield, CT	0.0	4.5	465.7	844.9
E-1 System Lateral Take-up and Relay	New London, CT	0.0	9.1	113.4	302.3
Loop Extension [b]					
Line-36A Loop Extension	Middlesex/Hartford, CT	0.0	2.0	NA	724.2
E-1 System Lateral Loop Extension	New London, Ct	0.0	1.3	NA	226.8
New Pipeline					
West Roxbury Lateral	Norfolk/Suffolk, MA	0.0	5.1	NA	302.3

Notes:
PIR = potential impact radius
NA = Not Applicable. New pipeline segments or loops do not have an existing potential impact radius.

The service incidents data summarized in table 4.12.2-1 include pipeline failures of all magnitudes with widely varying consequences. Table 4.12.3-2 presents the average annual injuries and fatalities that occurred on natural gas transmission lines for the 5 year period between 2009 and 2013. 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. Local distribution systems do not have large rights-of-way and pipeline markers common to the FERC-regulated natural gas transmission pipelines.

TABLE 4.12.3-2

Injuries and Fatalities – Natural Gas Transmission Pipelines

Year	Injuries	Fatalities
2009	11	0
2010 [a]	61	10
2011	1	0
2012	7	0
2013	2	0

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

The nationwide totals of accidental fatalities from various anthropogenic and natural hazards are listed in table 4.12.3-3 in order to provide a relative measure of the industry-wide safety of natural gas transmission pipelines. Direct comparisons between accident categories should be made cautiously, however, because individual exposures to hazards are not uniform among all categories. The data nonetheless indicate a low risk of death due to incidents involving natural gas transmission pipelines compared to the other categories. Furthermore, the fatality rate is much lower than the fatalities from natural hazards such as lightning, tornados, or floods.

TABLE 4.12.3-3

Nationwide Accidental Deaths [a]

Type of Accident	Annual Number of Deaths
All accidents	117,809
Motor Vehicle	45,343
Poisoning	23,618
Falls	19,656
Injury at work	5,113
Drowning	3,582
Fire, smoke inhalation, burns	3,197
Farming, fishing, and other forestry occupations [b]	279
Floods [c]	89
Lightning [c]	54
Tornado [c]	74
Natural gas distribution lines [d]	14
Natural gas transmission pipelines [d]	2

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

[b] Bureau of Labor Statistics, Census of Fatal Occupational Injuries, May 2, 2014, 10-year average (2003-2012). (http://www.bls.gov/iif/oshwc/cfoi/all_worker.pdf)

[c] NOAA National Weather Service, Office of Climate, Water and Weather Services, 30 year average (1983-2012) (http://www.weather.gov/om/hazstats.shtml).

[d] PHMSA, 2014. Significant Incidents Summary Statistics: 1994 – 2013, 20-year average (http://primis.phmsa.dot.gov/comm/reports/safety/PSI.html).

The available data show that natural gas transmission pipelines continue to be a safe, reliable means of energy transportation. From 1994 to 2013, there were an average of 62 significant incidents, 10 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 would replace 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 where lopping or a new pipeline is proposed, based on these numbers, we conclude that the proposed AIM Project would represent a slight increase in risk to the nearby public.

4.12.4 Terrorism

We received comments regarding concerns that the pipeline 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 Office 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 its website to ensure that sensitive information is not readily available.

Algonquin stated that through its parent company, Spectra, it would continue to participate in various activities in close collaboration with the Office of Homeland Security's Transportation Safety Administration (TSA) and key industry groups concerning security as part of the AIM Project. This would include:

- complying with the TSA's Pipeline Security Division's Security Guidelines;
- participating in monthly intelligence meetings with both the Department of Homeland Security's Intelligence Program and the TSA's Pipeline Security Division's monthly update conference calls;
- attending classified briefings with the 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 the FERC. The likelihood of future acts of terrorism or sabotage occurring at or along the AIM 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.

4.13 CUMULATIVE IMPACTS

In accordance with NEPA, we considered the cumulative impacts of the AIM Project and other projects or actions in the area. Cumulative impacts represent the incremental effects of the proposed action when added to other past, present, or reasonably foreseeable future projects. Although the individual impact of each separate project may be minor, the additive or synergistic effects of multiple projects could be significant. The direct and indirect impacts of the AIM Project are discussed in other sections of this EIS.

The purpose of this analysis is to identify and describe cumulative impacts that would potentially result from implementation of the AIM 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 AIM Project. In order to avoid unnecessary discussions of insignificant impacts and projects, and to adequately address and accomplish the purposes of this analysis, the cumulative impacts analysis for the AIM Project was conducted using the following guidelines:

- Another project must impact a resource category potentially affected by the proposed Project. These projects are located in the same general area that would be directly affected by construction of the proposed Project. More geographically distant projects are not assessed because their impact would generally be localized and, therefore, would not contribute significantly to cumulative impacts in the proposed AIM Project area. However, cumulative impacts on air quality and watersheds are considered on a broader, more regional basis.

- The distance into the past and future that other projects could cumulatively impact the area of the AIM Project is based on whether the impacts are short-term, long-term, or permanent. The majority of the impacts related to the AIM Project would occur during the construction phase. Algonquin proposes to place the AIM Project facilities into service by November 2016, and would seek approval to begin construction as soon as all necessary federal approvals can be obtained.

- Where a potential for cumulative impacts was indicated, those impacts were quantified to the extent practicable; however, in some cases, the potential impacts can only be described qualitatively (e.g. projects in the planning stages, contingent on economic conditions, availability of financing or the issuance of permits).

The criteria listed below define the AIM Project's region of influence, which is used in this cumulative impacts analysis to describe the general area for which the AIM Project could contribute to cumulative impacts. The region of influence varies depending on the resource being discussed. Specifically, for the various resources our conservative approach considered:

- Impacts on geology and soils, land use, residential areas, visual resources, cultural resources, and traffic by the AIM Project would be highly localized and, therefore, we evaluated other projects (e.g. residential development, small commercial development, small transportation projects) within 0.25 mile of the construction work areas for the AIM Project for cumulative impacts on these resources.

- The AIM Project pipeline segments are each less than 15 miles long and primarily utilize existing rights-of-way. Waterbody and wetland crossings, as well as impacts on groundwater, vegetation, and wildlife by the AIM Project would be localized and minimized. Therefore, we included cumulative impacts on these resources for other projects within the sub-watersheds crossed by the AIM Project.

- The AIM Project compressor stations would result in long-term impacts on air quality in various AQCRs. Therefore, other projects with the potential to result in long-term impacts on air quality (e.g. natural gas compressor stations or industrial facilities) within the AQCRs that would also be impacted by an AIM Project compressor station were considered.

- Long-term noise impacts from the AIM 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 AIM Project compressor stations.

The anticipated cumulative impacts of the AIM Project and these other actions are discussed below, as are pertinent mitigation measures. Table 4.13-1 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 AIM Project.

Other Known Projects

In addition to those projects identified in table 4.13-1, 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 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; and Dominion Gas Transmission's New Market Project in New York. However, none of these other projects would occur within the same region of influence as the AIM Project and are therefore not discussed further.

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 increased energy (Algonquin, 2014d). This planned expansion is referred to as the Atlantic Bridge Project and would involve work in New York, Connecticut, Rhode Island, and Massachusetts. Similar to the scope of the AIM Project, the planned facility modifications associated with the Atlantic Bridge Project would generally consist of replacing sections of existing pipeline with new larger diameter pipeline, installing pipeline adjacent to sections of existing pipeline, increasing compression at existing compressor stations, and modifying a number of existing meter stations to provide for increased deliveries. The specific details about the Atlantic Bridge Project are currently not developed and no applications have been filed. However, if this project were to move forward, it does appear that there would be facilities within the same region of influence as the AIM Project. Impacts associated with the Atlantic Bridge Project would be similar to those of the AIM Project (i.e., short term and localized during construction). Although the same region of influence would be affected, the temporal scale of the projects is different. The AIM Project would be constructed in 2015 and 2016. The earliest the Atlantic Bridge Project would be placed into service would be November 2017. If the Atlantic Bridge Project gets constructed, air emissions during operation of compressor stations would overlap with the operational air emissions of the AIM Project. However, compressor station modifications would need to go through the same permitting process as the AIM Project facilities. Because the Atlantic Bridge Project would not occur at the same time as the AIM Project, and because details are not know, it is not considered further in this analysis.

TABLE 4.13-1

Existing or Proposed Projects Evaluated for Potential Cumulative Impacts in Conjunction with the AIM Project

Facility/Project	Description	Status	Location Relative to AIM Project
REPLACEMENT PIPELINE			
Haverstraw to Stony Point Take-up and Relay			
Second Ramapo to Rock Tavern 345 kV Line Project	Establish a second 345-kV transmission line from Con Edison's Ramapo 345-kV substation to the CH Rock Tavern 345-kV substation along Con Edison's existing right-of-way, using existing transmission towers, in Orange and Rockland Counties, New York.	In-service summer 2016	6.5 miles from MP 0.0 on the Haverstraw to Stony Point Take-up and Relay
Tappan Zee Bridge/Interstate 287 Corridor Project	A project that would relieve congestion in the Interstation 287 corridor between Suffern and Port Chester, New York.	Unknown	6.7 miles from MP 0.0 on Haverstraw to Stony Point Take-up and Relay
State Bicycle Route 9/ Rockland Lake River Trail – Dunderburg Mountain Trailway Project	Reconstruction of a section of the State Bicycle Route 9/Dunderberg Mountain Greenway Trail in the towns of Stony Point and Clarkstown, New York.	Proposed construction 2015 to 2016	5.9 miles from MP 2.9 on the Haverstraw to Stony Point Take-up and Relay
Stony Point to Yorktown Take-up and Relay			
Champlain Hudson Power Express Project	A 335-mile-long, 1,000-megawatt, high-voltage, direct-current transmission system from the Canadian border to the New York City area. The high-voltage, direct-current cables will be buried within several waterbodies including the Hudson River and located in several towns including Stony Point and Haverstraw.	Proposed construction 2015 to 2017	Crosses Stony Point to Yorktown Take-up and Relay at MP 3.3
Haverstraw Water Supply Project	A water intake, intake pumping station, water treatment plant, and transmission and distribution mains to be located in the Town of Haverstraw. It will treat and deliver up to 7.5 million gallons per day of potable water for United Water New York Inc.'s Rockland County customers.	Proposed construction 2013	2.9 miles from MP 0.5 on the Stony Point to Yorktown Take-up and Relay
NRG Bowline Repowering Project	The Bowline Generating Station is located on the west bank of the Hudson River in West Haverstraw and will be repowered to modernize the State of New York's infrastructure.	Unknown	3.6 miles from MP 0.1 on the Stony Point to Yorktown Take-up and Relay
Boundless Energy NE, LLC proposed projects	Boundless Energy NE, LLC filed a Statement of Intent with the New York Public Service Commission for four distinct transmission projects to strengthen the state's electric power grid.	In-service dates 2016 to 2018	17.7 miles from MP 1.9 on the Stony Point to Yorktown Take-up and Relay
Indian Point Nuclear Power Plant Cooling Water Intake Structure Project	Potential modification of existing cooling systems.	Unknown	0.7 mile from MP 5.5 on the Stony Point to Yorktown Take-up and Relay
West Point Transmission Project	Proposed construction of a new transmission line from Leeds Substation in Athens, New York to a substation located in the Town of Cortlandt, New York. The line would be buried in the Hudson River for 74 miles. The proposed converter station would be constructed on 3.8 acres of a 105-acre parcel owned by Con Edison also in the Town of Cortlandt, New York.	Proposed construction 2016	Crosses the Stony Point to Yorktown Take-up and Relay in the vicinity of MP 3.9

TABLE 4.13-1 (cont'd)

Existing or Proposed Projects Evaluated for Potential Cumulative Impacts in Conjunction with the AIM Project

Facility/Project	Description	Status	Location Relative to AIM Project
U.S. Gypsum Company dredging activities	On-going maintenance dredging (about once every 5 years) for U.S. Gypsum Company's existing access channel on the Hudson River to remove an accumulation of silt and other materials (about 90,000 cubic yards).	Ongoing	3.0 miles from MP 0.5 on the Stony Point to Yorktown Take-up and Relay
Kmmkm, Ltd. Waste Transfer Facility Project	Construction of the new facility has been approved by the Planning Board of the City of Peekskill. Site is located along the railroad on Tract No. W-136; #WE-02550 and waste will be downloaded from trucks to railcars.	Unknown	1.7 miles from MP 5.9 on the Stony Point to Yorktown Take-up and Relay pipeline
Bear Mountain Parkway/Route 6 Interchange, Bridge Replacement Project	Reconstruction of the Bear Mountain State Parkway interchange with Route 6 in the Towns of Cortlandt and Peekskill, New York.	Proposed construction 2020 to 2021	0.9 mile from MP 9.8 on the Stony Point to Yorktown Take-up and Relay pipeline
East of Hudson Watershed Corporation stormwater and drainage facilities	Retrofit existing drainage systems and construct new facilities in Putnam and Westchester Counties, New York to reduce stormwater pollution (i.e., phosphorus) from state highways east of the Hudson River Watershed.	Proposed construction 2013 to 2015	Various locations
Southeast to MLV 19 Take-up and Relay			
Prindle Lane Center Project	Interstate Business Center, LLC proposes to build a new business center, restaurant, and hotel on Prindle Lane in Danbury, Connecticut.	Proposed hotel in-service winter 2014	0.2 mile from MP 1.6 on Southeast to MLV-19 Take-up and Relay
E-1 System Lateral Take-up and Relay			
Replacement of bridge No. 01915 carrying State Road 616 (Norwich Avenue) over Gillette Brook	Replacement of the bridge with a reinforced cast-in-place concrete slab supported by abutments over Gillette Brook in the Town of Lebanon, Connecticut.	Proposed construction 2013 to 2014	4.1 miles from MP 5.4 on the E-1 System Lateral Take-up and Relay
Replacement of bridge on State Road 616 over Bartlett Brook	Replacement of the bridge over Bartlett Brook between Roger Foot Road and Geer Road and additional road work in the Town of Lebanon, Connecticut.	Construction could be completed	5.2 miles from MP 4.7 on the E-1 System Lateral Take-up and Relay
LOOP EXTENSION			
E-1 System Lateral Loop Extension			
Pavement preservation project on I-395	Pavement preservation project on I-395 between Exit 79A (Route 2A) in New London County, Connecticut to improve the existing riding surface and extend the service life of the pavement.	Construction could be completed	0.5 mile from MP 0.2 on the E-1 System Lateral Loop Extension
NEW PIPELINE			
West Roxbury Lateral			
Canton-Dedham-Randolph Westwood Route 128 Reconstruction Project	About 5 miles of Interstate 95/93 (Route 128) roadway construction, beginning at Route 24 (Randolph) to the Massachusetts Bay Transportation Authority Franklin Rail Road Line bridge in Westwood, Massachusetts, just north of the East Street Rotary.	Construction could be completed	Crosses the West Roxbury Lateral between MPs 0.4 and 0.5
Dedham-Needham Route 128 Bridge Replacement Project	Replacement of Routes 109 and 135, Charles River, and Great Plain Avenue bridges and about 4 miles of Interstate 95/Route 128 roadway work in Norfolk County, Massachusetts.	Proposed construction 2010 to 2015	0.2 mile from MP 0.1 on the West Roxbury Lateral

TABLE 4.13-1 (cont'd)

Existing or Proposed Projects Evaluated for Potential Cumulative Impacts in Conjunction with the AIM Project

Facility/Project	Description	Status	Location Relative to AIM Project
5165 Washington Street Residential Development	Residential development in West Roxbury, Massachusetts that requires 29,700 square feet of land for a 27,000-square-foot building consisting of 20 residential units in a 3-story structure and 32 parking spaces.	Unknown	0.05 mile from MP 3.8 on the West Roxbury Lateral
Interstate 95/University Avenue Interchange Improvements	Massachusetts Department of Transportation plans to reconfigure the Interstate 95/Interstate 93 interchange at University Avenue.	Unknown	1.5 miles from MP 0.2 on the West Roxbury Lateral
West Roxbury YMCA	Construction of a new YMCA on 15 Bellevue Street in West Roxbury, Massachusetts and demolition of the former Federal Post Office at 1972 Centre Street and portions of the existing YMCA facility.	Proposed construction 2014	0.34 mile from MP 5.1 of the West Roxbury Lateral
Harris Street Bridge and Boston Providence Turnpike Expansion	Massachusetts Department of Transportation plans to expand the Harris Street Bridge and Boston Providence Turnpike.	Unknown	West Roxbury Lateral
West Roxbury Crushed Stone Quarry	An existing crushed stone quarry in West Roxbury, Massachusetts	In service	Adjacent to West Roxbury Lateral from MPs 4.2 to 4.4
EXISTING COMPRESSOR STATION MODIFICATIONS			
Interstate 684 Northbound to Interstate 84 Eastbound Ramp Improvement Project	Modify the ramp alignment and improve the signs associated with the connecting ramp between Northbound Interstate 684 and Eastbound Interstate 84 in the Town of Southeast, New York.	Proposed construction 2014 to 2015	2.8 miles from the Southeast Compressor Station
Replacement of Interstate 84 bridges over Dingle Ridge Road	The New York State Department of Transportation is replacing two bridges on Interstate 84 (eastbound and westbound) over Dingle Ridge Road in the Town of Southeast, New York.	Proposed construction start fall 2013/early 2014	0.8 mile from the Southeast Compressor Station
Pavement preservation on Route 9	Nighttime pavement preservation of Route 9 in four towns including Cromwell. The work consists of concrete joint replacement at various structures along a 7-mile stretch of Route 9.	Construction could be completed	0.9 mile from Cromwell Compressor Station

Sources:

Haverstraw Water Supply Project Draft Environmental Impact Statement. Available online at http://www.haverstrawwatersupplyproject.com/.

Harbors at Haverstraw. Available online at http://harborsathaverstraw.com/riverfront-community/.

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Boundless Energy NE, LLC - Statement of Intent: http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7BE9B50316-69E6-4FAD-BDC9-DAEA818E077D%7D.

Tappan Zee Bridge/I-287 Corridor Project. Available online at http://www.tzbsite.com/index.html.

New York State Department of Transportation. Available online at https://www.dot.ny.gov/index.

Connecticut Department of Transportation: http://www.ct.gov/dot/site/default.asp

Massachusetts Department of Transportation. Available online at https://www.massdot.state.ma.us/.

Boston Redevelop Authority. Available online at http://www.bostonredevelopmentauthority.org/Home.asp.

Marcellus Shale

We received numerous 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 AIM Project construction area, outside of the sub-watersheds crossed by the AIM Project facilities, and outside of the AQCRs for the AIM 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.

Growth-inducing Effects

The EPA requested that we identify any growth-inducing impacts from the AIM Project. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems (40 CFR 1508.8(b)). Typically, the growth-inducing potential of a project would be considered adverse if it fosters growth or a concentration of population above what is assumed in local and regional land use plans, or in projections made by regional planning authorities. Growth impacts could also occur if a project provides infrastructure or service capacity to accommodate growth levels beyond those permitted by local or regional plans and policies.

The Project area is already served by various natural gas transmission lines so the Project would not extend public service to areas currently unserved by natural gas transmission lines. In addition, economic activity is already taking place. The demand for energy and the proposed Project are a result of, rather than a precursor to, development in this region. Therefore, the Project would not result in adverse growth-inducing effects.

4.13.1 Geology and Soils

The facilities associated with the AIM Project are expected to have a direct but temporary impact on near-surface geology and soils. Clearing activities could expose the soil to erosive elements such as precipitation and wind. The potential for impacts due to erosion by water is minimal because less than 4 percent of the soils along the proposed Project pipeline segments would be susceptible to water erosion and are found entirely along the pipeline segments in Connecticut. Similarly, about 5 percent of AIM's Project facilities would disturb soils considered to be susceptible to wind erosion. About 8.1 miles of the soils along the proposed pipeline segments are considered prime farmland. Additionally, about 102.1 acres of soils within the proposed pipeline workspaces and 7.2 acres of the soils within the permanent rights-of-way are also considered prime farmland. Impacts on geological and soil resources would be minimized by implementation of Algonquin's E&SCP.

The effects on geology and soils 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 at the same time and place as the proposed facilities. The construction of some of the projects listed in table 4.13-1 would coincide with the schedule proposed for the AIM Project. Projects that require significant excavation or grading would also have temporary, direct impacts on near-surface geology and soils, although, like the AIM Project, the duration and effect of these projects would be minimized by the implementation of erosion control and restoration measures. Construction and restoration activities as well as operation and maintenance activities would be monitored throughout the process to ensure compliance. 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. Consequently, any potential cumulative effects on geological and soil resources would be minor.

Many scoping comments were received regarding the potential cumulative effect of blasting operations associated with the proposed Project and the existing West Roxbury Crushed Stone Quarry. Algonquin discussed with the owners of the quarry the anticipated schedule and logistics associated with constructing the West Roxbury Lateral and M&R station, as well as the long-term operations of these facilities. No direct conflicts were identified that would inhibit the construction of the Project or the continued day-to-day operation of the quarry. Further, blasting at the quarry is performed under a permit issued by the City of Boston Fire Department, which specifies a limit on the allowable blast-induced vibration magnitude (e.g., amplitude or peak particle velocity) at any abutting property of 1.0 inch per second. Similarly, if blasting is required for the Project, it would be conducted in accordance with Algonquin's Rock Removal Plan (see appendix E) as well as applicable state blasting codes and any local blasting requirements. All blasting activity would be performed by state-licensed professionals according to strict guidelines designed to control energy release. Proper safeguards would be taken to protect personnel and property in the area. Therefore, we do not anticipate any significant cumulative effects as a result of blasting in this area.

4.13.2 Waterbodies, Groundwater and Wetlands

Cumulative effects on surface water resources affected by the AIM Project would be limited to waterbodies that are affected by other projects located within the same major watershed. A total of 108 waterbody crossings would be required for the Project, including 42 perennial streams, 62 intermittent streams, 3 ephemeral streams, and one ponded area. Some of the projects listed in table 4.13-1 would be located within the same major watersheds crossed by the AIM Project, but none of these would likely involve direct in-stream impacts. The AIM Project would not involve the construction of permanent diversions or dams and, therefore, is expected to have only temporary impacts on surface water quality. 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 would be avoided or minimized by the use of Algonquin's E&SCP, BDP Plan for monitoring HDD activities, and SPCC Plan.

Cumulative effects on groundwater resources are expected to be limited to areas that are affected by other projects located near the AIM Project facilities. Groundwater impacts could include increased turbidity, reduced water levels, and contamination. 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 would be 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 specified in Algonquin's E&SCP and BDP Plan for monitoring HDD activities.

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. Algonquin estimates a need for a total of about 10,082,645 gallons of water to conduct the hydrostatic testing for the Project (9,610,245 gallons for pipeline testing and 472,400 gallons for aboveground facilities). Most of this water would be obtained from municipal sources, but some would be appropriated from the old

Verplanck Quarry Lake in New York. However, none of the projects listed in table 4.13-1 would be expected to use water from the Old Verplanck Quarry Lake at the same time or at all. Following testing of the pipeline, the water would be discharged into dewatering structures located in upland areas and within the construction work area in accordance with the AIM Project E&SCP and the hydrostatic testing BMPs provided by agencies. Therefore, long term impacts on surface water sources would not be anticipated as a result of hydrostatic testing activities, and we expect the cumulative impacts of the projects listed in table 4.13-1 on surface and groundwater resources to be minor.

There would be a temporary loss of some existing wetland features as a result of the construction and operation of the proposed AIM Project facilities and the other reasonably foreseeable projects in the States of New York and Connecticut as listed in table 4.13-1. No wetlands would be affected in Rhode Island or Massachusetts from construction or operation of Project facilities. The AIM Project would convert about 2.3 acres of PFO wetlands to non-forested wetlands during operation of the pipeline facilities. There would be no wetland impacts from proposed aboveground facilities, and the Project would not result in any permanent loss of wetlands. Algonquin would mitigate unavoidable construction-related impacts on wetlands 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 as well as compensatory mitigation. Although construction of the AIM 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 are expected to appropriately mitigate for impacts on wetland resources.

4.13.3 Vegetation, Wildlife and Habitat, and Aquatic Resources

Construction of the Project would temporarily impact about 362.9 acres of forested upland and open upland vegetation. The Project would result in the permanent impact on about 36.3 acres of vegetation, primarily forested upland. Right-of-way clearing and grading and other construction activities associated with the Project along with some of the other projects listed in table 4.13-1 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 plant species. These effects would be greatest where the other projects are constructed within the same timeframe and areas as the proposed AIM Project, and where the recovery time of the vegetation/habitat takes longer to restore to its pre-construction state.

Algonquin's proposal to locate the majority of its facilities within or adjacent to existing, previously disturbed rights-of-way (e.g., pipeline utility, road, etc.) would minimize the areas of previously undisturbed vegetation that would be affected, thereby reducing the additional cumulative effects on vegetation communities and wildlife habitats, including migratory birds. The potential for habitat fragmentation resulting from the Project would be further 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 Algonquin's E&SCP and other construction, restoration, and mitigation plans.

Construction of the AIM Project at the same time as other projects listed in table 4.13-1 could result in cumulative impacts on aquatic resources within the AIM Project area, including groundwater, surface water, and wetlands. Potential impacts on waterbodies within AIM's Project area include sedimentation and turbidity, destruction of stream cover, introduction of water pollutants, interruption of fish migration and spawning, and entrainment of fish. Potential impacts would be minimized due to the short duration of in-stream construction activities and implementation of Algonquin's E&SCP, SPCC

Plan, and site-specific crossing plans prepared in consultation with the FERC and other agencies. Twenty-eight of the waterbodies that would be crossed by the Project support fisheries of special concern. Eight waterbodies are waters with naturally occurring spawning populations of trout. One waterbody (the Hudson River) contains threatened and endangered species and anadromous fisheries. Algonquin would avoid impacting the special status species in the Hudson River by using the HDD crossing method. Should an inadvertent release of drilling fluid occur, Algonquin would implement the measures detailed in its BDP Plan for monitoring the HDD program. Collectively, these measures would reduce Project impacts on waterbodies and aquatic resources. If any of the other projects listed in table 4.13-1 would involve direct in-stream impacts on waterbodies, then they would be required to obtain permits from the USACE and appropriate state agencies, and consult with the EPA, the FWS, and NOAA Fisheries as applicable. These agencies would assess the potential for cumulative impacts from these projects and require measures to mitigate impacts on aquatic resources associated with these other projects. Therefore, the cumulative effects on aquatic resources would be minor.

A total of nine federally listed species, under the jurisdiction of either the FWS or NOAA Fisheries, are known to occur in the Project area. Through consultation with the state agencies, 29 state-listed threatened, endangered, or special concern species were identified as potentially occurring in the New York and Connecticut sections of the Project area. No state-listed species were identified as a concern for the Project in Rhode Island and Massachusetts. Cumulative impacts on these species could result if other reasonably foreseeable future projects listed in table 4.13-1 would affect these same species or their habitat. The AIM Project would have no effect on six of these species. Two of these species may be affected, but would not be adversely affected or jeopardize the continued existence of the species. Survey results are pending for the three remaining species. Algonquin would adhere to conservation measures to avoid, minimize, and mitigate impacts on any listed species affected by the Project. Furthermore, Algonquin is still working on its overall conservation plan for state-listed species in Connecticut. Conservation measures would likely be required as well for each of the other projects by the jurisdictional agencies to minimize potential impacts on federally and state-listed species. Overall, the conservation measures would be project-specific and would be expected to reduce impacts such that the projects would not adversely affect special status species or would not jeopardize the continued existence of a species or cause adverse modification of critical habitat.

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

Land Use

The AIM Project in combination with other foreseeable future projects listed in table 4.13-1 would result in temporary and permanent changes on current land uses. Construction of the Project would impact a total of about 592.3 acres. The primary land use types impacted during construction would be forest/woodland (34 percent), open land (28 percent), industrial/commercial land (26 percent), and residential land (9 percent). Agricultural land and open water would make up the remaining 3 percent of land types impacted during construction of the proposed Project. The majority of land use impacts associated with the AIM Project would be temporary, as most land uses would be allowed to revert to prior uses following construction. However, about 46.0 acres of new land outside of Algonquin's existing permanent right-of-way would be permanently encumbered by operation of the Project. The primary land use types that would be permanently encumbered would be forest/woodland (61 percent), open land (18 percent), industrial/commercial land (11 percent), and agricultural land (6 percent). Open water and residential land would make up the remaining 4 percent of permanent impacts. If the utility and commercial/residential development projects planned in the AIM Project area as listed in table 4.13-1 would also affect similar land uses, then cumulative impacts would result. However, compared to the other proposed projects the permanent change in land use from implementation of the AIM Project is relatively minor and would not represent a significant cumulative impact.

Recreation and Special Interest Areas

A number of recreational or areas of special interest would be affected by the AIM Project, and could result in cumulative impacts on recreational or special interest areas if the other foreseeable future projects listed in table 4.13-1 would affect the same area at the same time. 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 only several days to several weeks in any one area. These impacts would be minimized by implementing Algonquin's E&SCP. Following construction, most open land uses would be able 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 required to restore the woody vegetation to its preconstruction condition. Further, forest land within the new permanent right-of-way would experience permanent impacts because it would be precluded from being 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. However, we have concluded that construction impacts on several of the special interest areas crossed would be significant without additional mitigation. We are recommending that Algonquin provide site-specific plans for these crossings along with additional mitigation measures. In addition, some of the other projects listed in table 4.13-1 have or would cross federal, state, or local recreation and special interest areas. However, none appear to cross the same areas as those affected by the AIM Project. As a result, although the Project could have significant impacts on recreation and special interest areas, cumulative impacts on those same areas are not anticipated.

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 AIM Project would consist of modifications to existing structures. The modifications to the existing compressor stations would be conducted within or adjacent to Algonquin's existing station buildings and within the footprint of an existing commercial/industrial property. Construction of the new M&R stations, specifically the West Roxbury M&R Station and Oakland Heights M&R Station, would not result in significant visual impacts on the surrounding areas with implementation of site-specific mitigation measures such as maintaining vegetative buffers.

Of the projects listed in table 4.13-1, the proposed transportation and commercial/residential projects would have the greatest cumulative impact on visual resources in the Project area. The AIM Project facilities would add incrementally to this impact but the overall contribution would be relatively minor given that the majority of the AIM Project facilities would be buried (i.e., the pipeline) or adjacent to existing facilities of similar appearance (i.e., the aboveground facilities). Additionally, disturbed areas would be revegetated as appropriate after construction, thereby limiting permanent visual impacts to those 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, cumulative visual impacts would be minimal.

4.13.5 Socioeconomics

Present and reasonably foreseeable future projects and activities could cumulatively impact socioeconomic conditions in the AIM Project area. As described below, employment, housing, infrastructure, and public services could 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. Algonquin estimates that the AIM Project would temporarily employ up to 2,693 workers during the peak construction months, of which a peak of 649 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 3,750,965 people and an average unemployment rate of 7.3 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. Therefore, if these projects are built at the same time, the demand for workers could exceed the local supply of appropriately skilled labor. Three new permanent employees would be hired to operate the proposed AIM Project facilities; however, this small number of new permanent employees would not have a measurable impact on the economy or employment.

In addition to impacts on local employment, these projects would provide an increase in tax revenue for New York, Connecticut, Rhode Island, 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 4.9.8, the estimated payroll for the AIM Project would be about $264,316,027 during the construction phase and annual property taxes attributable to the Project are anticipated to be about $20,070,000 in New York, $5,770,000 in Connecticut, $970,000 in Rhode Island, and $2,360,000 in Massachusetts, which includes construction of the new West Roxbury Lateral. A net increase in payroll and tax revenues is likely to occur from the other projects listed in table 4.13-1. Cumulatively, these projects would have both short- and long-term beneficial impacts on state, county, and local economies.

Temporary Housing

Temporary housing would be required for construction workers who would be needed for the portion of the workforce not drawn from the local area. Given the current vacancy rates, the number of rental housing units in the area, and the number of hotel/motel rooms available in the cities and towns in the vicinity of the Project, construction workers should not encounter difficulty in finding temporary housing. If construction occurs concurrently with other projects, temporary housing would still be available but may be slightly more difficult to find and/or more expensive to secure. Regardless, these effects would be temporary, lasting only for the duration of construction, and there would be no long-term cumulative impact on housing from the proposed Project.

Public Services

The cumulative impact of the AIM Project and the other projects listed in table 4.13-1 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 would be temporary, occurring only for the duration of construction, 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 from implementation of the AIM Project would be anticipated on infrastructure and public services, we find no long 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 AIM Project. Traffic impacts associated with the AIM Project are expected along the new West Roxbury Lateral in Norfolk and Suffolk Counties, Massachusetts. Limited traffic impacts would occur at most other proposed railroad, highways, and major road crossings because these 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 AIM Project to cumulative traffic impacts would be temporary and short term. Workers associated with the AIM Project would generally commute to and from the pipeline right-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.). It is unlikely that other projects listed on table 4.13.1 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 AIM 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. Impacts associated with in-street construction would be minimized through implementation of 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.

Although construction details are not available for all projects listed in table 4.13-1, we know or assume that the Champlain Hudson Power Express Project, West Point Transmission Project, and U.S. Gypsum Company dredging activities, as well as several other possible projects, would involve work in the Hudson River. Some of these projects would likely involve increased barge traffic that would navigate the Hudson River and/or remain stationary within the river during construction of individual projects. The HDD method would involve staging construction equipment on land, thus the AIM Project is not expected to result in cumulative impacts on navigation in the Hudson River with the other projects listed in table 4.13-1. Nonetheless, it is expected that all projects will coordinate with the U.S. Coast Guard and USACE to ensure that there are no cumulative impacts on navigation within the Hudson River.

Overall, the AIM 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.

4.13.6 Cultural Resources

Past disturbances to cultural resources in the AIM Project area are typically related to accidental disturbances; intentional destruction or vandalism; lack of awareness of historical value; and construction and maintenance operations associated with existing roads, railroads, utility lines, and electrical transmission lines. The currently proposed projects listed in table 4.13-1 that are defined as federal actions would include mitigation measures designed 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. Non-federal actions would need to comply with any mitigation measures required by the affected states. Algonquin has developed Project-specific plans to address unanticipated discoveries of cultural resources and human remains in the event they are discovered during construction. Therefore, the proposed AIM 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.

Indian tribes in the Project area have expressed concern about the cumulative impacts on properties of traditional religious or cultural significance that may be affected by the various undertakings. For the AIM Project, we have engaged in frequent communications with the tribes who have expressed concern about the Project. Other agencies (e.g., USACE) also conduct tribal consultation for projects under their jurisdiction in order to identify and address any tribal concerns.

4.13.7 Air Quality and Noise

Construction of most of the reasonably foreseeable future projects and activities listed in table 4.13-1 would involve the use of heavy equipment that would generate emissions of air contaminants, fugitive dust, and noise. Construction and operation of the AIM Project would contribute cumulatively to air quality impacts. The combined impact of multiple construction projects occurring in the same airshed and timeframe as the AIM Project could temporarily add to the ongoing air impacts in the Project area. The entire AIM 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 4.11.1.1. 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 4.13-1 would not occur at the same time as construction of the AIM Project facilities or are located sufficiently far away as to not result in cumulative air impacts. In addition, Algonquin has consulted with WPP and it has identified that construction of the converter station associated with the West Point Transmission Project, located on the same parcel, would not occur at the same time. Therefore, simultaneous cumulative air impacts of the AIM Project and West Point Transmission Project would not occur.

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. Also, the air modeling presented in section 4.11.1 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 Algonquin, we do not anticipate that the construction and operation of the proposed Project facilities are expected to have a significant impact on air quality in the Project area or in the region itself. Furthermore, because the projects listed in table 4.13-1 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 AIM Project could contribute to cumulative noise impacts. The analysis in section 4.11.2.1 quantifies future noise levels, which include Project related noise and ambient noise levels. Noise impacts were analyzed by looking at NSAs nearest to the five proposed compressor station modifications, the five existing M&R stations with significant proposed modifications, the three new proposed M&R stations, the two new MLRs, 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 Hudson River crossing and Interstate 84/Still River crossing. Algonquin performed ambient noise surveys at the HDD sites, 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. We reviewed Algonquin's noise assessment and agree that the mitigation measures discussed in the assessment and committed to by Algonquin could result in noise levels in compliance with the FERC's noise criterion of 55 dBA L_{dn} at nearby NSAs. To ensure this level would not be exceeded, Algonquin would follow our recommendations outlined in section 4.11.2.3 of this EIS. 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 AIM Project. The AIM Project together with the other projects listed in table 4.13-1 would all produce noise during construction; however, this noise would be temporary in the vicinity of each of the proposed projects. Therefore, cumulative noise impacts associated with construction and operation would be unlikely.

4.13.8 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[13] 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;

[13] 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.

- 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 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 AIM 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 AIM Project are discussed in more detail in section 4.11.1. Emission of GHGs from the proposed Project 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).

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 MAEOEEA 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…." (MAEOEEA, 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.

Because fuel oil is widely used as an alternative to natural gas in the region in which the AIM Project would be located, we find that the Project would result in the displacement of some fuel oil use, thereby regionally offsetting some GHG emissions.

4.13.9 Reliability and Safety

Impact on reliability and public safety would be mitigated through the use of the PHMSA Minimum 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 addition, Algonquin's construction contractors would be required to comply with the OSHA Safety and Health Regulations for Construction in Title 29 CFR 1926. We received several comments about potential cumulative impacts relative to safety between the proposed Project as well as the IPEC facility and WPP's proposed West Point Transmission Line (see section 4.12.3). However, we do not anticipate any significant cumulative impacts on reliability or safety to occur.

4.13.10 Conclusion

Recently completed, ongoing, and planned projects in the AIM Project area were identified for inclusion in this cumulative impact analysis (refer to table 4.13-1). 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 would occur on wetland and forested and 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 AIM 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 AIM Project as a whole, minimal cumulative effects are anticipated when the impacts of the AIM Project are added to the identified ongoing projects in the immediate area.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 SUMMARY OF THE FERC STAFF'S ENVIRONMENTAL ANALYSIS

The conclusions and recommendations presented in this section are those of the FERC environmental staff. Our conclusions and recommendations were developed with input from the EPA, USACE, and PHMSA, as cooperating agencies. The federal cooperating agencies may adopt the EIS per 40 CFR 1506.13 if, after an independent review of the document, they conclude that their permitting requirements and/or regulatory responsibilities have been satisfied. However, these agencies would present their own conclusions and recommendations in their respective and applicable records of decision or determinations. Otherwise, they may elect to conduct their own supplemental environmental analysis, if necessary.

We determined that construction and operation of the AIM Project would result in adverse environmental impacts. Most of these environmental impacts would be temporary or short-term during construction and operation, but long-term and potentially permanent environmental impacts on vegetation and individual wildlife species would also occur as part of the Project. However, if the proposed Project is constructed and operated in accordance with applicable laws and regulations, the mitigating measures discussed in this EIS, and our recommendations, most of these adverse impacts would be reduced to less than significant levels. This determination is based on a review of the information provided by Algonquin and further developed from data requests; field investigations; scoping; literature research; alternatives analysis; and contacts with federal, state, and local agencies as well as Indian tribes and individual members of the public. As part of our review, we developed specific mitigation measures that we determined would appropriately and reasonably reduce the environmental impacts resulting from construction and operation of the Project. Therefore, we are recommending that our mitigation measures be attached as conditions to any authorization issued by the Commission. A summary of the anticipated impacts from the Project and our conclusions regarding impacts are provided below by resource area.

5.1.1 Geology and Paleontological Resources

Construction and operation of the Project would not materially alter the geologic conditions of the Project area. The effects would mostly be limited to construction activities within the right-of-way resulting from grading and trenching operations. Algonquin would minimize the impacts on surface geology by returning contours to preconstruction conditions to the maximum extent practicable. This may not be the case at the aboveground facilities, where grading and filling may be required to create a safe and stable land surface to support the facility. The Project would not cross any active or proposed mines, but the West Roxbury Crushed Stone Quarry is located adjacent to the West Roxbury Lateral and M&R Station in Massachusetts. No direct conflicts were identified that would inhibit the construction of the Project or the continued day-to-day operation of this quarry.

The potential for geologic hazards to significantly affect construction or operation of the proposed Project facilities is low. The Project would not be located in a region that represents a serious seismic risk to the proposed facilities. Although the Ramapo Fault has been linked to recent earthquake occurrence in the area, and field investigations identified potential faults at the Hudson River and Interstate 84/Still River HDDs, the design of the pipeline takes into consideration site-specific conditions, including earthquakes. The recorded magnitude of earthquakes in the Project area is relatively low and the ground vibration would not pose a problem for a modern welded-steel pipeline. The proposed Project facilities would also be located in an area considered to have a low incidence of landslides. Flash flooding has the potential to occur in streams within the Project area, particularly in areas of higher relief and narrower stream valleys in Connecticut; however, no such features are located along the Project route or in proximity to any of the aboveground facilities. We conclude that subsidence due to karst conditions is not anticipated to be a concern for the Project due to the minimal occurrence of calcareous bedrock crossed by the Project and because no mapped karst features have been identified in the Project area.

The pipeline segments would traverse about 7.2 miles of shallow bedrock that may require blasting. In order to minimize potential impacts from blasting, Algonquin would comply with all federal, state, and local regulations for blasting and has developed an acceptable Rock Removal Plan to be used during construction.

With implementation of Algonquin's E&SCP, Rock Removal Plan, and the additional mitigation measures discussed above, impacts on geological resources would be adequately minimized and would not be significant.

5.1.2 Soils

The Project would traverse a variety of soil types and conditions. Construction activities associated with the Project, such as clearing, grading, trenching, and backfilling, could adversely affect soil resources by causing erosion, compaction, and introducing excess rock or fill material to the surface. These effects could hinder restoration of the disturbed areas. Algonquin would implement the mitigation measures contained in its E&SCP to control erosion, enhance successful revegetation, and minimize any potential adverse impacts on soil resources. Contamination from spills or leaks of fuels, lubricants, and coolant from construction equipment could also adversely affect soils. The effects of such contamination are typically minor because of the low frequency and volumes of spills and leaks. In addition, Algonquin has developed an acceptable SPCC Plan that specifies cleanup procedures to minimize the potential for soil contamination from spills or leaks of fuel, lubricants, coolants, or solvents.

Various locations with potential and/or known sources of soil contamination were identified in the vicinity of the proposed Project facilities in New York, Connecticut, and Massachusetts. To-date, Algonquin has determined that field sampling would be required at two locations (one in Connecticut and one in Massachusetts). The CTDEEP also identified a concern at a third site. To ensure that contamination in the Project area is accurately identified, we are recommending that Algonquin file a Field Sampling Plan for the identification of potential contaminated sites that may be encountered during construction. Excavated contaminated material would be managed in compliance with Algonquin's acceptable Unexpected Contamination Encounter Procedures, which specifies measures to ensure that contaminated material is managed in accordance with state and federal regulations.

With implementation of Algonquin's E&SCP, SPCC Plan, Unexpected Contamination Encounter Procedures, and our additional recommended mitigation measure, we conclude that impacts on soil resources would be adequately minimized.

5.1.3 Water Resources

Groundwater resources in the Project area are composed of unconsolidated glacial deposits of sand and gravel underlain by consolidated bedrock aquifer systems. The majority of the Project facilities are not located within a designated SSA. However, the Haverstraw to Stony Point Take-up and Relay segment would cross about 0.6 mile of the Ramapo River Basin SSA in New York. The West Roxbury Lateral crosses a portion of the state-designated Charles River Basin aquifer in Massachusetts and the existing Wellesley M&R Station is also located within the Charles River Basin aquifer. Based on available information, 93 private domestic wells and a public well would be located within 150 feet of Algonquin's proposed construction work area. Two of the water supply wells would be located within the construction workspace.

Construction activities are not likely to significantly impact groundwater resources because the majority of construction would involve shallow, temporary, and localized excavation. These potential impacts would be avoided or minimized by the use of construction techniques described in Algonquin's E&SCP. The two domestic wells that would be located within the construction workspace would be protected by safety fencing during construction. Algonquin would contact any landowner with water supply wells within 150 feet of the construction workspace and offer to conduct pre- and post-construction monitoring of well yield and water quality. 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 would be provided, or the landowner would be fairly compensated for damages. We are recommending that Algonquin file a report that identifies whether any water supply wells were impacted during construction and how it resolved those impacts. Algonquin would also implement the measures in its SPCC Plan to minimize the potential for groundwater impacts associated with an inadvertent spill of hazardous materials.

Algonquin has indicated that there are two sites within the Project area (one in Connecticut and one in Massachusetts) where existing groundwater contamination could be encountered during construction. The CTDEEP has also identified a concern at a third site. These sites would be included in the Field Sampling Plan discussed above. We also received scoping comments related to existing groundwater contamination at the IPEC site. A hydrogeological analysis of groundwater movement at the site demonstrated that the proposed AIM Project facilities would not interact with radiologically contaminated groundwater at the IPEC site. Impacts associated with unexpected contaminated groundwater would be avoided or minimized by following the procedures outlined in Algonquin's Unexpected Contamination Encounter Procedures.

Algonquin conducted a review of each of the proposed HDD entry/exit locations and found no documented groundwater contamination. The only site where there was a record of historic contamination was at the former Mirant Lovett property in New York, where the entry hole for the HDD crossing on the west side of the Hudson River would be located. A Remedial Action Closeout Report was filed with the NYSDEC in 2008 demonstrating that a past fuel oil release at the site had been effectively remediated. Therefore, contamination is not expected to be encountered during HDD activities. We conclude that potential impacts on groundwater resources would be avoided, minimized, or mitigated.

The Project would cross 108 waterbodies, including 42 perennial streams, 62 intermittent streams, 3 ephemeral streams, and a ponded area. The Hudson River is also the only major waterbody (greater than 100 feet wide) crossed by the Project. No waterbodies would be impacted by the work at the existing and proposed aboveground facilities. Five waterbodies would be crossed by the existing access roads. None of the proposed crossings are designated as EFH, though the proposed Hudson River crossing is located north of a designated EFH area. Thirty-one of the Project waterbody crossings support fisheries of special concern and eight waterbodies are waters with naturally occurring spawning populations of trout. The Hudson River is the only waterbody within the Project area that contains threatened and endangered species and anadromous fisheries.

The Hudson River and Interstate 84/Still River Still River would be crossed using the HDD method. At both crossings, Algonquin anticipates using the intersect method to complete the pilot hole and has developed an acceptable BPD Plan that describes how the HDD operations would be monitored and measures that it would implement to minimize the potential for inadvertent returns and releases at these two locations. If an inadvertent release were to occur, the appropriate measures outlined in Algonquin's BDP Plan would be implemented to minimize any resulting impacts. Algonquin has indicated that additional investigation would be required to verify the existence, type, and depth of any existing bridge foundations where the Interstate 84/Still River HDD alignment would cross Ridgebury Road. Therefore, we are recommending that Algonquin provide a revised plan for the Interstate 84/Still River crossing if additional measures are needed to address any existing bridge foundations associated with the alignment across Ridgebury Road. Based on our assessment of the geotechnical conditions at the proposed HDD crossings, we conclude that with the implementation of our recommendation and the mitigation measures Algonquin proposes to employ, impacts associated with these crossings would be sufficiently avoided or mitigated.

Algonquin proposes to construct the remaining waterbody crossings using a dry construction technique (i.e., dam and pump, and/or flume) to minimize soil erosion and sedimentation downstream. Temporary construction-related impacts associated with the dry crossing method would be limited to short periods of increased turbidity before and after installation of the pipeline. Use of the measures identified in the E&SCP would minimize these potential short- and long-term impacts, including minimization of clearing of streamside vegetation, installation and maintenance of temporary and permanent erosion controls, and minimization of the duration of in-stream construction.

The Project has the potential to impact the watersheds that supply water to the New York City metropolitan area including the Croton, the Catskill, and the Delaware Water Supply Systems. The Croton Watershed would be crossed by the Stony Point to Yorktown Take-up and Relay segment between MPs 10.0 and 12.3 in the Town of Cortlandt and by the Southeast to MLV-19 Take-up and Relay segment between MPs 0.0 and 0.1 in the Town of Southeast. In addition, the proposed Stony Point to Yorktown Take-up and Relay segment crosses the Catskill Aqueduct near MP 10.3. As with the existing pipelines in the area, the new pipeline would be located above the Catskill Aqueduct on concrete pads to provide adequate separation and protection for the aqueduct pipe. Algonquin is also working with the NYCDEP to develop a SWPPP that addresses NYCDEP's requirements for constructing within a New York City watershed. Because Algonquin is still working with NYCDEP to develop a final crossing plan for the Catskill Aqueduct, we are recommending that Algonquin provide the site-specific crossing plan developed in consultation with the NYCDEP prior to the end of the draft EIS comment period.

NYSDEC was particularly concerned about trench dewatering and requested that Algonquin commit to isolating shorter portions of trench to reduce the volume of trench water that would need to be handled at one time. Because Algonquin's E&SCP does not make this specific commitment, we are recommending that Algonquin describe how it would minimize trench dewatering along Project facilities in New York.

There are nine streams with shallow bedrock that may require blasting during Project construction. Only two of these streams, Susquetonscut Brook and an Unnamed Tributary to Stony Brook, contain fisheries of special concern. Algonquin has committed to perform in-stream work in these streams during the appropriate timing windows for warmwater and coldwater fisheries. Also, in accordance with the FERC Procedures, Algonquin would need to file with the Secretary a schedule identifying when blasting would occur within each waterbody greater than 10 feet wide and within any designated coldwater fishery.

Pipeline construction activities affecting surface waters would be conducted in accordance with Algonquin's E&SCP; SPCC Plan; Unexpected Contamination Encounters Procedures; Rock Removal Plan; BDP Plan; and construction stormwater plans and permits, including the SWPPP being developed in consultation with the NYCDEP to address concerns about crossing New York City watersheds. We conclude that with these measures, along with our additional recommended mitigation measures, impacts on surface waters would be effectively minimized or mitigated, and would be largely temporary in duration.

Algonquin is proposing to use both surface water and municipal water sources for hydrostatic testing and municipal water for HDD operations. Algonquin estimates a need for a total of about 10,082,645 gallons of water to conduct the hydrostatic testing of pipeline segments and aboveground facilities. Of this total, about 9,610,245 gallons is required for testing pipeline segments and 472,400 gallons is required for testing aboveground facilities.

Impacts associated with the withdrawal and discharge of water would be effectively minimized by the implementation of the mitigation measures outlined in Algonquin's E&SCP and in accordance with all applicable permits. Algonquin is not proposing to use any chemicals for testing or for drying the pipeline following hydrostatic testing. Accidental spills during construction and operation would be prevented or adequately minimized through implementation of Algonquin's SPCC Plan. Based on the avoidance and minimization measures developed by Algonquin, we conclude that the Project would not have adverse impacts on groundwater or surface water resources due to hydrostatic testing activities.

5.1.4 Wetlands

Construction of the Project would temporarily impact 52.3 acres of wetlands, about 24.0 acres in New York and 28.3 in Connecticut. There would be no wetland impacts in Rhode Island or Massachusetts. Of the total wetland acreage, approximately 35.3 acres (67 percent) would involve herbaceous and shrub-scrub wetlands, and the remaining 17.0 acres (33 percent) would involve forested wetlands. About 2.3 acres of the forested wetlands would be permanently converted to non-forested wetlands during operation of the pipeline facilities. The remaining 14.7 acres of forested wetlands would eventually revert to preconstruction conditions following construction. No wetlands would be affected at any of the aboveground facility sites or access roads. In areas were wetlands are adjacent to an existing access road, construction crews would avoid the wetland. The Project would not result in any permanent loss of wetlands. In addition, two vernal pools would be located within the temporary construction area for the Project facilities in New York.

The construction right-of-way width in wetlands would generally be 75 feet wide, except in areas where additional width has been requested by Algonquin. Based on our review, we determined that these requests are justified. In accordance with the FERC Procedures, when wetlands are dry enough to support skids and pipe, the pipeline would be assembled in the wetlands. In these instances, Algonquin proposes to excavate the trench prior to the pipeline assembly. Excavating the trench prior to stringing and assembling the pipe segments in non-saturated wetlands is generally acceptable; however, Algonquin's blanket approval proposal for implementing this practice would not provide the site-specific justification required by our Procedures. Therefore, we are recommending that Algonquin provide site-specific information regarding the location of those wetlands it believes would meet the criterion of non-saturated conditions at the time of construction.

Construction and operation-related impacts on wetlands and vernal pools would be mitigated by implementing the wetland protection and restoration measures contained in Algonquin's E&SCP, Invasive Plant Species Control Plan, and any additional conditions of the wetland permits that could be issued by the USACE, NYSDEC, and CTDEEP. This includes Algonquin committing to provide compensatory mitigation for the permanent conversion of 0.8 acre of forested wetlands to a non-forested wetland type in New York and 1.5 acres of forested wetlands to a non-forested wetland type in Connecticut. Both USACE Districts have indicated what would be required, but final mitigation plans have not been developed. Therefore, we are recommending that Algonquin develop a final Compensatory Mitigation Plan in consultation with the USACE, the NYSDEC, and the CTDEEP. We are also recommending that Algonquin identify any additional avoidance or mitigation measures for the two vernal pools through the permit review process with the applicable agencies.

Based on the avoidance and minimization measures developed by Algonquin, as well as our recommendations, we conclude that impacts on most wetland resources would be minimal and would be temporary in duration. We further conclude that by Algonquin's implementation of a final, agency-approved Compensatory Mitigation Plan, it would further offset any adverse impacts on wetland functions that would result from the permanent conversion of PFO wetlands to a non-forested wetland type.

5.1.5 Vegetation

Impacts on vegetation from the proposed Project would range from short-term to permanent due to the varied amount of time required to reestablish certain community types, as well as the maintenance of grassy vegetation within the permanent right-of-way and the conversion of aboveground facility locations to non-vegetated areas. Construction of the proposed Project facilities would temporarily disturb about 362.9 acres of vegetation (164.0 acres of open land and 198.9 acres of forested vegetation) and permanently affect 36.3 acres (8.3 acres of open land and 28.0 acres of forested vegetation). The Project would also affect vegetation communities of special concern, including chestnut oak forests.

The greatest impact on vegetation would be on forested areas because of the time required for tree regrowth in all temporary workspace back to preconstruction condition. Algonquin would limit the amount of disturbance to chestnut oak forests, which are considered a significant natural community in New York, by utilizing the existing pipeline right-of-way during construction to the extent possible. Construction in forest lands would remove the tree canopy over the width of the construction right-of-way, which would change the structure and local setting of the forest area. The regrowth of trees in the temporary workspaces would take years and possibly decades. Moreover, the forest land on the permanent right-of-way would be permanently impacted by ongoing vegetation maintenance during operations, which would preclude the re-establishment of trees on the right-of-way. However, the Project would not contribute significantly to forest fragmentation. Much of the proposed pipeline routes are located along existing rights-of-way and in areas that are already developed and highly fragmented. As a result, the forested areas that are present are predominantly edge habitats that are unlikely to support forest interior species.

Multiple invasive species have been identified throughout the Project area. Algonquin would implement its Invasive Plant Species Control Plan to address the spread of invasive plants within the Project rights-of-way and control invasive populations that might prevent successful revegetation.

Following construction, all disturbed areas would be restored. The impact of the Project on open lands would be short term, as these areas would recover within one to two growing seasons. Construction of the proposed pipeline facilities would have a long-term effect on forested wetland and upland vegetation within the construction right-of-way. Maintenance activities would result in permanent conversion of some areas of existing upland forested vegetation to herbaceous or scrub-shrub vegetation. However, because Algonquin has routed the pipeline facilities to use existing utility rights-of-way and road corridors to the extent possible, impacts on forested vegetation would be minimized. We find that Project-specific minimization and mitigation measures, and mitigation measures described in Algonquin's E&SCP and Invasive Plant Species Control Plan would be sufficient to offset adverse impacts on vegetation in the Project area. Therefore, we have concluded that constructing and operating the pipeline facilities would not significantly affect existing vegetation populations.

5.1.6 Wildlife and Aquatic Resources

The Project could have both direct and indirect impacts on wildlife species and their habitats. Direct impacts of construction on wildlife include the displacement of wildlife from the right-of-way or work sites into adjacent areas and the potential mortality of some individuals. The cutting, clearing, and/or removal of existing vegetation within the construction work area could also affect wildlife by reducing the amount of available habitat for nesting, cover, and foraging. Indirect effects of construction could include lower reproductive success by disrupting courting, nesting, or breeding of some species, which could also result in a decrease in prey available for predators of these species. Some of these effects would be temporary, lasting only while construction is occurring, or short-term, lasting no more than a few years until the preconstruction habitat and vegetation type would be reestablished. Other impacts would be longer term such as the re-establishment of forested habitats, which could take decades. Algonquin proposed several measures to minimize or avoid impacts on wildlife and aquatic resources, including collocating the majority of pipeline facilities within or adjacent to existing rights-of-way to the maximum extent possible, using the HDD crossing method at the Hudson River crossing to avoid direct affects to aquatic habitats and adjacent riparian habitats, and treating all vernal pools as wetlands and protecting them through adherence to the measures outlined in Algonquin's E&SCP and any permit conditions developed through consultation with the applicable federal and state agencies.

Algonquin has routed the pipeline to minimize impacts on sensitive wildlife habitats, such as the Lower Hudson River IBA, Harriman State Park, and Blue Mountain Reservation. Algonquin continues to consult with the NYSOPRHP and PIPC to address impacts on Harriman State Park. Given that consultation with NYSOPRHP and PIPC is not complete, we are recommending that Algonquin provide a site-specific plan that includes any avoidance and mitigation measures developed for Harriman State Park through consultation with these agencies.

In an effort to minimize permanent effects on wildlife and to promote the rapid stabilization and revegetation of the disturbed areas, Algonquin would comply with its E&SCP to minimize disturbance to vegetation and provide for stabilization of affected areas to mitigate direct and indirect effects on wildlife. Revegetation would be completed in accordance with permit requirements and consultation with agency and non-agency stakeholders affected by the Project. In addition, maintenance clearing would not be conducted between April 15 and August 1 to avoid direct and indirect effects on wildlife during the nesting and breeding season (e.g., grassland birds). In wetland areas, trees located within 15 feet of either side of the pipeline that are greater than 15 feet in height may be selectively cut and removed from the right-of-way. However, trees and shrubs that become reestablished beyond 15 feet on either side of the pipeline in wetlands would not be disturbed. Algonquin would also retain a riparian strip within 25 feet of a stream as measured from the mean high water mark. This riparian area would be allowed to permanently revegetate with native woody plant species across the entire right-of-way, with exception of a 10-foot-wide corridor centered on the pipeline that would be maintained in an herbaceous state. In the riparian area, trees and shrubs greater than 15 feet in height may also be selectively cut within 15 feet on either side of the pipeline.

All waterbodies crossed by the pipeline are classified as warmwater or coldwater fisheries with the exception of the Hudson River and Dickey Brook, which support estuarine fisheries. In-stream pipeline construction across waterbodies could have both direct and indirect effects on aquatic species and their habitats, including increased sedimentation and turbidity, alteration or removal of aquatic habitat cover, stream bank erosion, impingement or entrainment of fish and other biota associated with the use of water pumps, downstream scouring, and the potential for fuel and chemical spills.

Algonquin would minimize the effects of its Project on aquatic resources through the use of dry crossing methods, construction timing windows, and restoration procedures. The HDD method would be used to cross the Hudson and Still Rivers. Use of the HDD method would avoid any in-stream impacts on these waterbodies. Algonquin would also implement the erosion and sedimentation control measures described in its E&SCP to contain materials within the construction work areas and minimize impacts on fisheries due to changes in water quality. 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 AIM Project E&SCP, would minimize the potential for erosion from the surrounding landscape.

Some limited blasting in waterbodies could be required along the AIM Project pipeline segments. Algonquin would mitigate the effects of blasting on fish species by having the blasting contractor use delays and stemming to dampen the shock wave. The nature of the material that would require blasting and the short duration of blasting activities would help minimize the amount of fine-grained material released to the aquatic habitat, which would also minimize blasting-related effects of fish. Algonquin would also implement the measures identified in its Rock Removal Plan.

Algonquin would ensure that hydrostatic test water appropriations and discharges would not result in a significant entrainment of fish, loss of habitat, or an adverse effect to water quality. Discharge would comply with regulatory permit conditions and be controlled to prevent scour and sedimentation, flooding, or the introduction of foreign or toxic substances into the aquatic system. Algonquin would minimize the potential for spills to impact aquatic resources by implementing the measures contained in its SPCC Plan.

Through consultation with NOAA Fisheries, we have determined that the only waterbody crossing where EFH species could potentially occur is the Hudson River. Given the proposed use of the HDD construction method, implementation of Algonquin’s proposed BDP Plan, and the fact that no water would be withdrawn from the Hudson River to support Project construction, we conclude that the Project would have no effect on EFH or managed species. We have also determined that the Project would have no effect on marine mammals protected under the Marine Mammal Protection Act because they are not anticipated to occur within the Project area of the Hudson River.

Given the impact avoidance, minimization, and mitigation measures proposed by Algonquin, we conclude that the Project would not result in substantial adverse impacts on wildlife and aquatic resources.

5.1.7 Special Status Species

To comply with Section 7 of the ESA, we consulted either directly or indirectly (through Algonquin’s informal consultation) with the FWS, NOAA Fisheries, and state resource agencies regarding the presence of federally listed, proposed for listing, or state-listed species in the Project area. NOAA Fisheries identified two federally listed threated or endangered species (Atlantic and shortnose surgeon) under their jurisdiction that are known to occur in the Hudson River within the Project area. The FWS identified seven federally listed threatened or endangered species (piping plover, roseate tern, Puritan tiger beetle, Indiana bat, bog turtle, northern red-bellied cooter, and small whorled pogonia), as well as one candidate species (New England cottontail) and one species proposed for listing as endangered (northern long-eared bat) that are known to occur in the Project area.

Based on these consultations, we determined that construction and operation of the AIM Project would have *no effect* on the shortnose sturgeon, Atlantic sturgeon, piping plover, roseate tern, Puritan tiger beetle, northern red-bellied cooter, and small whorled pogonia; *may affect, but would not likely adversely affect* the bog turtle; and would *not likely jeopardize the continued existence* of the New England cottontail. Surveys are pending for the Indiana and northern long-eared bats. We are recommending that the survey results for these species and any identified avoidance or mitigation measures developed in consultation with the FWS and appropriate state agencies be provided prior to the end of the draft EIS comment period.

NOAA Fisheries concurred with our determination for the Atlantic and shortnose sturgeon and consultation is complete. In compliance with section 7 of the ESA, FERC requests the FWS to consider the draft EIS, along with various survey reports prepared by Algonquin, as the draft BA for the AIM Project and requests FWS concurrence for the species with *no effect* determinations. The final EIS will include a revised BA to address the remaining species. To ensure compliance with the ESA, we are recommending that Algonquin not begin construction of the Project until the FERC staff receives comments from the FWS regarding the BA and consultation is complete.

The potential impact of the Project on migratory birds, including BCC-listed birds, would include the temporary and permanent loss of habitat associated with the removal of existing vegetation during construction. The Haverstraw to Stony Point Take-up and Relay segment would run adjacent to and across a section of the Harriman and Sterling Forests IBA in Rockland County, New York. About 15.3 acres of forested land would be affected by this segment. The Stony Point to Yorktown Take-up and Relay segment would involve 70.7 acres of tree clearing where it diverges from Algonquin's existing rights-of-way in Rockland and Westchester Counties, New York. The Project has been designed to minimize potential impacts on migratory birds and Algonquin would take other measures during Project construction and operation to limit migratory bird impacts. Algonquin would conduct surveys prior to clearing along the 5.1-mile West Roxbury Lateral in Massachusetts. Excluding the proposed West Roxbury Lateral, 94 percent of the proposed pipeline facilities are located within or adjacent existing pipeline corridors, and other utility rights-of-way. Thus, tree-clearing activities would be limited in scope and spread over the entire Project area. We find that these measures would minimize the effects of the Project on birds of conservation concern and other migratory birds. We are recommending that any updated consultations with the FWS regarding migratory birds, including any avoidance or mitigation measures, be provided prior to the end of the draft EIS comment period.

Bald eagles are known to occur in portions of Rockland and Westchester Counties in New York. The Lower Hudson River IBA located in these counties is an important wintering and breeding area for bald eagles in New York State, and the NYSDEC identified the area in and around the Hudson River as their main area of concern for the Project. Additionally, wintering roost locations occur in and around the proposed crossing location of the Stony Point to Yorktown Take-up and Relay including (but not strictly limited to) Bear Mountain, the Hudson River shoreline, Lake Meahagh, and Iona Island.

During the surveys conducted in March and April 2014, no bald eagle nests were observed within 0.5 mile of the Hudson River crossing area, and the closest active nest is located more than 6,000 feet south of the proposed crossing location. Algonquin had indicated that it is still consulting with the FWS and NYSDEC to discuss survey results, and develop and implement appropriate avoidance and mitigation measures, including timing restrictions, as necessary, to avoid impacts on bald eagles both nesting and wintering within the Project area. Given that consultation for bald eagles is not yet complete, we are recommending that Algonquin file any updated consultations with the FWS and NYSDEC prior to the end of the draft EIS comment period, including any avoidance or mitigation measures developed with these agencies.

In addition to the federally listed and proposed species, 29 state-listed threatened, endangered, or special concern species were identified as potentially occurring in the New York and Connecticut sections of the Project area. No state-listed species would be affected in Rhode Island or Massachusetts. According to NYSDEC, timber rattlesnakes (a state-listed threatened species) are known to occur within the Project area. Given that surveys for potential habitat and consultation regarding the timber rattlesnake are not complete, we are recommending that Algonquin provide the survey results for timber rattlesnake habitat, permit requirements, and avoidance or mitigation measures developed in consultation with the FWS and NYSDEC. Additionally, Algonquin is in the process of preparing a conservation plan that discusses each of the species identified by the CTDEEP, addresses potential impacts and, if necessary, avoidance, minimization, and mitigation measures. We are recommending that this plan be provided prior to construction.

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

Construction of the Project would affect about 592.3 acres. Approximately 76 percent of this acreage would be utilized for the pipeline facilities, including the construction right-of-way (64 percent) and ATWS (12 percent). Of the remaining acreage impacted, 16 percent would be associated with the aboveground facilities, 7 percent would be for the pipe and contractor ware yards, and less than 1 percent would be for access roads. The primary land use types impacted during construction would be forest/woodland (34 percent), open land (28 percent), industrial/commercial land (26 percent), and residential land (9 percent). Agricultural land and open water would make up the remaining 3 percent of land types impacted during construction of the proposed Project.

During operation, the permanent pipeline right-of-way, aboveground facilities, and permanent access roads would newly encumber about 46.0 acres of land. The primary land use types that would be permanently encumbered would be forest/woodland (61 percent), open land (18 percent), industrial/commercial (11 percent), and agricultural land (6 percent). Open water and residential land would make up the remaining 4 percent of permanent impacts. To facilitate pipeline inspection, operation, and maintenance, the entire permanent right-of-way in upland areas would be maintained in an herbaceous/scrub-shrub vegetated state. This maintained right-of-way would be mowed no more than once every 3 years, but a 10-foot-wide strip centered over the pipeline may be mowed annually to facilitate operational surveys.

Algonquin's proposed construction work areas would be located within 50 feet of 337 residential structures (i.e., houses and apartment buildings) and 95 non-residential structures (i.e., commercial or industrial facilities, sheds, garages). To address impacts on residences within 50 feet of construction work areas, Algonquin developed Residential Construction Plans to inform affected landowners of proposed measures to minimize disruption and to maintain access to the residences during construction. We have reviewed these plans and do not find them acceptable. We are recommending that Algonquin provide a revised set of Residential Construction Plans that incorporates and addresses any comments received from affected landowners and also incorporates additional measures to minimize effects prior to construction. Following construction, all residential areas would be restored to preconstruction conditions or as specified in written landowner agreements.

Several planned residential and commercial developments were identified within 0.25 mile of AIM Project facilities. However, most would not be crossed by any Project facilities and would not experience any direct effects. Algonquin would continue to coordinate with the developers and permitting authorities of the developments crossed to identify and address any potential construction-related indirect effects.

In general, Project impacts on recreational and special interest areas would be temporary and limited to the period of active construction, which typically lasts only several days to several weeks in any one area. These impacts would be minimized by implementing the measures in Algonquin's E&SCP, traffic management plans, our recommended Fugitive Dust Control Plan, as well as measures to ensure that noise is mitigated. Areas requiring additional site-specific considerations, such as Harriman State Park, Camp Bullowa, and Sylvan Glen Tower Reserve, would be mitigated with appropriate monitoring, use of safety devices, and signage. As mitigation for crossing the Blue Mountain Reservation, Algonquin would pay rent to Westchester County for its ATWS, and would pay compensation for trees removed along the right-of-way. Without mitigation, impacts on several other special interest areas crossed by the Project could be significant. Therefore, we are recommending that Algonquin develop site-specific measures to further minimize impacts on St. Patrick's Church in Verplanck, New York; the Buchanan-Verplanck Elementary School in New York; Dodd Stadium in Norwich, Connecticut; the Norfolk Golf Club in Westwood, Massachusetts; Gonzalez Field in Dedham, Massachusetts; and St. Theresa of Avila School in West Roxbury, Massachusetts. With implementation of the measures proposed by Algonquin and our additional recommendations, we conclude that impacts on these recreation and public interest areas would be adequately avoided and minimized.

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. The majority of the proposed pipeline facilities (approximately 93 percent) would be installed within or adjacent to existing pipeline, roadway, railway, and/or other utility rights-of-way. As a result, the visual resources along the majority of the Project have been previously affected by pipeline or other operations.

The new aboveground facilities associated with the AIM Project would be the most visible features and would result in long-term impacts on visual resources. Only minor, temporary construction disturbance would occur outside the existing fence line for the modified aboveground facilities. New aboveground facilities for the AIM Project would include three new M&R stations. With the exception of the West Roxbury M&R Station, the new M&R stations would be constructed adjacent to existing facilities so no new impacts on visual resources would occur. At the West Roxbury M&R Station, Algonquin would maintain an existing wooded buffer to minimize impact on visual resources in the area.

With adherence to Algonquin's proposed impact avoidance, minimization, and mitigation plans, and our recommendations, we conclude that overall impacts on land use and visual resources would be adequately minimized.

5.1.9 Socioeconomics

Construction of the AIM Project would not have a significant adverse impact on local populations, housing, employment, or the provision of community services. Secondary socioeconomic effects include increased sales and property tax revenue, job opportunities, income associated with local construction employment, increased vehicle traffic, and impacts on roads.

There would be temporary to short-term increases in traffic levels due to the commuting of the construction workforce to the area of the Project as well as the movement of construction vehicles and delivery of equipment and materials to the construction work area. To address traffic impacts related to road crossings and in-street construction in densely populated areas, Algonquin has prepared separate Traffic Management Plans for the West Roxbury Lateral and pipeline segments in New York. The plans include measures to address motor vehicles, including parking, and considerations for pedestrians, bicycles, and construction workers during construction. We have reviewed these plans and found them acceptable with the exception of a portion of the Traffic Management Plan for the New York pipeline segments. Several road crossings in New York were identified as needing further site-specific details; therefore, we are recommending that Algonquin provide a revised plan that includes the site-specific details for these crossings prior to construction. Impacts on traffic during construction along the West Roxbury Lateral would result in significant adverse impacts at one intersection. However, with the implementation of Algonquin's Traffic Management Plan for the West Roxbury Lateral, impacts resulting from in-street construction would be minimized to the extent possible and would be reduced to less than significant levels at all other locations along the West Roxbury Lateral.

We received some comments regarding the potential effect of the Project on property values. Algonquin would acquire easements for both the temporary (construction) and permanent rights-of-way where applicable. With the exception of the West Roxbury Lateral, most of the remaining pipeline segments would be installed within Algonquin's existing right-of-way and would replace existing pipeline. Algonquin would compensate the landowners for any new easements, the temporary loss of land use, and any damages. We conclude that the AIM Project would not negatively impact property values outside of the pipeline rights-of-way or aboveground facility boundaries.

The primary impacts on the Environmental Justice Communities in both Connecticut and Massachusetts associated with the construction of the AIM Project would be the temporary increases in noise, dust, and traffic from Project construction. These impacts would occur along the entire pipeline route and in areas with a variety of socioeconomic backgrounds. As part of the Project, Algonquin would implement a series of measures to minimize such impacts. Conversely, the AIM Project would bring economic benefits to the region via added tax revenues and jobs associated with construction and operation of the pipeline facilities in these and other areas along the right-of-way. Based on our research and analysis, there is no evidence that the Project would result in disproportionately high and adverse health or environmental effects on minority or low-income communities.

Construction of the Project would result in minor positive impacts due to increases in construction jobs, payroll taxes, purchases made by the workforce, and expenses associated with the acquisition of material goods and equipment. Operation of the Project would have a minor to moderate positive effect on the local governments' tax revenues due to the increase in property taxes that would be collected.

5.1.10 Cultural Resources

Algonquin 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. Algonquin then conducted field surveys for aboveground properties and archaeological sites. Algonquin identified a total of 42 archaeological sites within the Project's APE. Of these, 27 require additional testing to determine eligibility for listing on the NRHP; 13 are not eligible; 1 is eligible for listing but would be avoided by the Project; and 1 is listed on the NRHP but would also be avoided by the Project. In addition, 387 historic aboveground resources were identified within the APE, the majority of which (358) are not eligible for listing on the NRHP and no further work is recommended. Of the remaining resources, effects to one (Letchworth Village Cemetery) have yet to be determined and are pending additional investigation. The Project would not result in any adverse effects on the remaining identified historic aboveground resources.

We consulted with nine federally recognized Indian tribes to provide an opportunity to identify any concerns about properties of traditional religious or cultural significance that may be affected by this undertaking. Eight of the tribes have contacted FERC staff to express an interest in the Project, request additional information, request to be kept apprised of the Project, and/or to accompany the archaeological field crews. In addition, four tribes have been participating in regular conference calls hosted by FERC staff. Consultations with several other governmental organizations, non-governmental organizations, non-federally recognized tribes, and municipal historic preservation commissions in New York and Massachusetts were also conducted to provide them an opportunity to comment on the proposed Project.

Algonquin has prepared procedures to be used in the event any unanticipated historic properties or human remains are encountered during construction. The *Procedures Guiding the Discovery of Unanticipated Cultural Resources and Human Remains* provide for the notification of interested parties, including Indian tribes, in the event of any discovery. The Massachusetts, New York, and Rhode Island SHPOs agreed with the procedure's provisions. The Connecticut SHPO responded that the procedures should include the specific language of CGS section 10-388, which requires immediate notification of both the Chief Medical Examiner and State Archaeologist in the event human remains are encountered. Therefore, we are recommending that the procedures be revised to incorporate this language.

To ensure that our responsibilities under section 106 of the NHPA are met, we are recommending that Algonquin not begin construction until any additional required surveys are completed, remaining survey reports and treatment plans (if necessary) have been reviewed by the appropriate parties, and we provide written notifications to proceed.

5.1.11 Air Quality and Noise

Air quality impacts associated with construction of the Project would include emissions from fossil-fueled construction equipment and fugitive dust. Such air quality impacts would generally be temporary and localized, and are not expected to cause or contribute to a violation of applicable air quality standards. In addition, 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. While the measures would help control fugitive dust, we found that more detail is necessary because the Project crosses many roads and would be constructed near many residences and other structures. Therefore, we are recommending that Algonquin develop a Fugitive Dust Control Plan that specifies the precautions that it would take to minimize fugitive dust emissions from construction activities.

Modifications to the five compressor stations, modifications to five existing M&R stations, and three new M&R stations would be sources of air emissions during operation of the Project. The modifications at the sixth compressor station would not result in impacts on air quality. Non-combustion related emissions would also occur from the pipeline and at the proposed M&R stations during normal operation. Because the design of the modifications to several M&R stations is not yet complete, we are recommending that Algonquin provide an update regarding the air permitting requirements associated with the modifications to the M&R stations in New York, Connecticut, and Massachusetts.

Due to modifications on existing equipment and/or removal of existing compressors, the potential emissions of most pollutants at the Stony Point and Southeast Compressor Stations would be reduced from their current potential levels. Further, based on the identified estimated emissions from operation of the proposed Project facilities and review of the modeling analysis for all compressor stations, the Project compressor station modifications would result in continued compliance with the NAAQS, which are protective of human health, including children, the elderly, and sensitive populations. Therefore, with the mitigation measures proposed by Algonquin, we do not anticipate that construction and operation of the proposed Project facilities would have a significant impact on air quality in the Project area or in the region itself.

We received several comments concerning the risk of radon exposure associated with in-home burning of natural gas originating from the Marcellus shale. While the FERC has no regulatory authority to set, monitor, or respond to indoor radon levels, many local, state, and federal entities (e.g., the EPA) establish and enforce radon exposure standards for indoor air. Studies have demonstrated that levels of radon in interstate pipelines carrying gas from the Marcellus shale would be below average indoor and outdoor radon levels.

Noise would be generated during construction of the pipeline and aboveground facilities. 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 Hudson River and Interstate 84/Still River crossings. Ambient noise assessments performed at the HDD sites 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 of 55 dBA L_{dn} at the closest NSAs. We reviewed Algonquin's 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 areas surrounding the two proposed HDD crossings, we are recommending that Algonquin file the noise measurements at the nearest NSA to the HDD entry sites obtained at the start of drilling operations, any noise mitigation measures implemented at the start of drilling operations, and any additional mitigation measures implemented at the Hudson River and Interstate 84/Still River HDD sites in its weekly construction status reports.

The modified compressor stations would generate noise on a continuous basis (i.e., 24 hours per day) once operating. Some noise would also be generated by the operation of modified M&R stations, the proposed new M&R Stations, and the proposed new MLRs. Algonquin completed an acoustical analysis to identify the estimated noise impacts at the nearest NSAs from these facilities. We reviewed the compressor station noise analyses and agree that, if properly implemented, these noise control measures would ensure that noise attributable to the modified 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 existing station noise levels. Algonquin has stated that they are currently evaluating noise control measures to be implemented at the proposed modified and new M&R stations and MLR sites. To ensure that the actual noise levels produced at the aboveground facilities are not significant, we are recommending that Algonquin submit noise surveys and add noise mitigation until noise levels are below our acceptable thresholds.

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

5.1.12 Reliability and Safety

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

We received comments regarding the siting of the pipeline in close proximity to schools and residential areas; the consequences of an explosion of a larger, 42-inch diameter pipeline; and Algonquin's emergency response procedures. The majority of the Project would replace 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 AIM Project where looping or a new pipeline is proposed, we conclude that the Project would represent a slight increase in risk to the nearby public. Based on available data, natural gas transmission pipelines continue to be a safe, reliable means of energy transportation.

All applicable Algonquin personnel receive annual training on the Emergency Response Plans, and the area offices conduct emergency response exercises on an annual basis. In the event of an emergency, the Algonquin's 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 allow for a section of pipeline to be isolated from the rest of the system. Algonquin representatives would meet with the emergency services departments of the municipalities and counties along the proposed pipeline facilities on an ongoing basis as part of their liaison programs. Algonquin would provide these departments with emergency contact information and verbal, written, and mapping descriptions of the pipeline systems. This liaison program would identify the appropriate fire, police, and public officials and the responsibilities of each organization that may respond to a gas pipeline emergency, and coordinate mutual assistance in responding to emergencies.

We received several scoping comments concerning the safety of the Project and its proximity to the IPEC, a nuclear facility on the east bank of the Hudson River in Westchester County, New York. Given the distance of the proposed Project from the IPEC generating facilities and the avoidance and mitigation measures that would be implemented by Algonquin, the proposed route should not pose any new safety hazards to the IPEC facility. Based on our consultation with NRC, Entergy is required to assess any new safety impacts on its IPEC facility and provide that analysis to the NRC. Algonquin has coordinated with Entergy to provide information about its proposed pipeline, and Entergy is currently performing a Hazards Analysis. To ensure that no new safety hazards would result from the AIM Project, we are recommending that Algonquin file the final conclusions regarding any potential safety-related conflicts with the IPEC based on the Hazards Analysis performed by Entergy.

We also received several comments expressing safety concerns about potential interactions between Algonquin's proposed pipeline facilities and the WPP transmission line. Algonquin has committed to conducting an AC/DC interference study. To ensure that safety concerns about potential interactions are adequately addressed, we are recommending that Algonquin provide its AC/DC interference study associated with the West Point Transmission Project, documentation of all consultations with WPP, as well as any additional mitigation measures that may be required to address safety-related issues or conflicts identified in the study.

We conclude that Algonquin's implementation of the above measures would ensure public safety and the integrity of the proposed facilities.

5.1.13 Cumulative Impacts

Three types of projects (past, present, and reasonably foreseeable projects) could potentially contribute to a cumulative impact when considered with the proposed AIM Project. These projects include transmission projects; residential, commercial, or industrial developments; transportation projects; water and drainage systems; maintenance dredging; and reconstruction of trails and parkways. Projects and activities included in our cumulative impact analysis are located within the same counties and major watersheds that would be affected by the AIM Project.

We received numerous comments during scoping for the Project about cumulative impacts associated with development of natural gas reserves (including hydraulic fracturing) in the Marcellus shale region. Activities associated with Marcellus shale development would occur well over 10 miles from the AIM Project construction area, outside of the sub-basin watersheds crossed by the AIM Project facilities, and outside of the AQCRs for the AIM 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.

Impacts associated with the proposed Project in combination with the other projects in the AIM Project area would be relatively minor overall, and we included recommendations in the EIS to further reduce the environmental impacts associated with the AIM Project, as identified in section 5.2. Algonquin's proposal to locate the majority of its facilities within or adjacent to existing, previously disturbed rights-of-way (e.g., pipeline utility, road, etc.) would minimize the areas of previously undisturbed vegetation that would be affected, thereby reducing the additional cumulative effects on vegetation communities and wildlife habitats. Similarly, each of the other projects considered in our cumulative impacts analysis would have been designed to avoid or minimize impacts on sensitive environmental resources. Any adverse impacts on sensitive resources resulting from these projects would be avoided or effectively minimized or mitigated through project design, BMPs, and regulatory agency permitting. Therefore, we conclude that the cumulative impacts associated with the AIM Project would be effectively limited.

The Project area is already served by various natural gas transmission lines so the Project would not extend public service to areas currently unserved by natural gas transmission lines. In addition, economic activity is already taking place. The demand for energy and the proposed Project are a result of, rather than a precursor to, development in this region. Therefore, we do not expect the Project to result in adverse growth-inducing effects.

5.1.14 Alternatives

We evaluated the No Action Alternative, energy alternatives, system alternatives, facility design and siting alternatives, alternative compressor units, route alternatives and variations, and aboveground facility site alternatives.

The No Action Alternative would eliminate or delay the short and long-term environmental impacts identified in this EIS, but the objectives of the Project would not be met. Algonquin would be unable to supply an additional 342,000 Dth/d of natural gas to its existing mainline system; increase deliveries to the Project Shippers at existing delivery points in southern New England; or provide three new delivery points for the Project Shippers. We evaluated the use of alternative energy sources and the potential effects of energy conservation, but these measures similarly would not satisfy the objectives of the Project, provide an equivalent supply of energy, or meet the demands of the Project Shippers.

Our analysis of system alternatives included an evaluation of the existing Tennessee and Iroquois systems as well as the planned Connecticut Expansion and Northeast Energy Direct Projects. None of the existing, proposed, or planned natural gas pipelines reach the delivery points required by the Project Shippers in southern New England. To provide service to these delivery points, the existing and planned systems would need to be modified by constructing hundreds of miles of new pipeline, much of which would duplicate the existing Algonquin system. This would result in greater environmental impacts than the Project. For this reasons, none of the existing or planned pipelines provide an environmental advantage over the Project.

We evaluated Algonquin's proposed design for the Project to determine if any alternative designs would be feasible and environmentally preferable to the Project. We determined that alternative designs would result in operational inefficiencies associated with flow characteristics of natural gas within the system, and would shift, but not avoid, environmental impacts from one location to another. For these reasons, we concluded that alternative designs would not be practical or provide an environmental advantage over the Project.

We also considered the feasibility of electric-driven compressor units in lieu of gas-fired units at each of the existing compressor station sites. We concluded that use of electric-driven compressor units would result in additional environmental impacts during construction and operation due to the installation of non-jurisdictional facilities, such as electric transmission lines and substations. Although electric-driven units would result in lower operating emissions, Algonquin would be required to comply with its existing air permits for air emissions at each site. Therefore, electric-driven compressors would not be preferable to or provide a significant environmental advantage over the proposed Project.

We evaluated route alternatives for the Hudson River crossing of the Stony Point to Yorktown Take-up and Relay segment and for the West Roxbury Lateral; several minor route variations along different segments of the Project; and site alternatives for M&R stations at the new delivery points in Connecticut and Massachusetts. With the exception of the Catskill Aqueduct Variation on the Stony Point to Yorktown Take-up and Relay segment, we determined that none of the route or site alternatives would offer significant environmental advantages over the Project, and we eliminated them from further consideration. Environmental impacts associated with the proposed route and the Catskill Aqueduct Variation would be similar, but the route variation would affect more wetland and require more tree clearing. While either route would be acceptable, we concluded that the proposed pipeline would be preferable to the Catskill Aqueduct Route Variation.

5.2 FERC STAFF'S RECOMMENDED MITIGATION

If the Commission authorizes the AIM Project, we recommend that the following measures be included as specific conditions in the Commission's Order. We believe that these measures would further mitigate the environmental impact associated with construction and operation of the proposed Project.

1. Algonquin 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 EIS, unless modified by the Commission's Order. Algonquin 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 EIS, 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 Algonquin's 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. Algonquin 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 EIS, 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 onsite 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 onsite 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 AIM 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 on 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 Algonquin from other federal, state, or local permitting agencies concerning instances of noncompliance, and Algonquin's 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. **Prior to construction of the AIM Project**, Algonquin shall file with the Secretary, for review and written approval of the Director of OEP, a Field Sampling Plan for potential contaminated sites that could be encountered during construction. The Field Sampling Plan shall include the locations of all proposed sampling, the number of samples to be taken, how and where the

samples will be analyzed, the schedule for when the sampling would occur, and the process for providing the results to the applicable agencies. ***(Section 4.2.2.6)***

13. **Within 30 days of placing the AIM Project facilities in service**, Algonquin shall file with the Secretary a report discussing whether any water supply well complaints concerning well yield or quality were received and how each was resolved. ***(Section 4.3.1.7)***

14. **Prior to the end of the draft EIS comment period**, Algonquin shall file with the Secretary a site-specific crossing plan for the Catskill Aqueduct developed in consultation with the NYCDEP. At a minimum, the plan shall include the location of the proposed pipeline relative to the aqueduct, the proposed construction methods, the timing of construction, any mitigation measures that would be implemented to minimize impacts on the aqueduct, and documentation of consultation with the NYCDEP. ***(Section 4.3.2.1)***

15. **Prior to construction of the Interstate 84/Still River HDD**, Algonquin shall file with the Secretary, for review and written approval of the Director of the OEP, a revised site-specific plan for the crossing if additional measures are needed to address any existing bridge foundations associated with the alignment across Ridgebury Road. ***(Section 4.3.2.3)***

16. **Prior to the end of the draft EIS comment period**, Algonquin shall file with the Secretary additional details describing how it would minimize trench dewatering as recommended by the NYSDEC and file documentation of its consultations with the NYSDEC. ***(Section 4.3.2.6)***

17. **Prior to construction in the vicinity of the two vernal pools in New York**, Algonquin shall file with the Secretary, for review and written approval of the Director of the OEP, revised site-specific crossing plans incorporating any additional avoidance or mitigation measures for the two vernal pools as required through the permit review process with the applicable agencies. ***(Section 4.4.3.2)***

18. **Prior to the end of the draft EIS comment period**, Algonquin shall file with the Secretary site-specific information regarding the location of those wetlands it believes would meet the criterion of non-saturated conditions at the time of construction. ***(Section 4.4.4)***

19. **Prior to construction in New York and Connecticut**, Algonquin shall file with the Secretary the final Compensatory Mitigation Plan, developed in consultation with the USACE, the NYSDEC, and the CTDEEP and file documentation of consultation with these agencies regarding the Compensatory Mitigation Plan. ***(Section 4.4.5)***

20. **Prior to construction of the Haverstraw to Stony Point Take-up and Relay segment**, Algonquin shall file with the Secretary, for review and written approval of the Director of the OEP, a site-specific plan for the Harriman State Park, including any avoidance or mitigation measures developed with the NYSOPRHP and PIPC. ***(Section 4.6.1.5)***

21. Algonquin shall not begin construction of the AIM Project **<u>until</u>**:

    a. the FERC staff receives comments from the FWS regarding the BA;

    b. the FERC staff completes consultation with the FWS; and

    c. Algonquin has received written notification from the Director of OEP that construction or use of mitigation may begin. ***(Section 4.7.1)***

22. **Prior to the end of the draft EIS comment period**, Algonquin shall file with the Secretary all survey results for the Indiana and northern long-eared bats, any avoidance or mitigation measures developed in consultation with the FWS and state agencies, correspondence from the FWS and state agencies confirming the adequacy of the proposed measures, and a statement regarding Algonquin's intention to comply with the recommended measures. ***(Sections 4.7.1.2 and 4.7.1.3)***

23. **Prior to the end of the draft EIS comment period**, Algonquin shall file with the Secretary any updated consultations with the New York and New England Field Offices of the FWS regarding migratory birds, including any avoidance or mitigation measures developed with these field offices. ***(Section 4.7.2)***

24. **Prior to the end of the draft EIS comment period**, Algonquin shall file with the Secretary any updated consultations with the FWS and NYSDEC regarding bald eagles, including any avoidance or mitigation measures developed with these agencies. ***(Section 4.7.3)***

25. **Prior to construction in New York**, Algonquin shall file with the Secretary all survey results for timber rattlesnake habitat, permit requirements, and avoidance or mitigation measures developed in consultation with the FWS and NYSDEC, and documentation of its correspondence with these agencies regarding the proposed measures. ***(Section 4.7.5.1)***

26. **Prior to construction in Connecticut**, Algonquin shall file with the Secretary all survey results for state-listed species in Connecticut, the conservation plan being developed in consultation with the CTDEEP, and documentation of correspondence from the CTDEEP regarding the conservation plan. ***(Section 4.7.5.2)***

27. **Prior to the end of the draft EIS comment period,** Algonquin shall file revised Residential Construction Plans that:

    a. incorporate additional site-specific details for each individual plan, including appropriate measures to minimize traffic-related effects; and

    b. for all residences located within 10 feet of the construction work area in New York and Connecticut, Algonquin shall revise the construction work area to be greater than 10 feet from residences or provide site-specific justification for the use of the construction workspace within 10 feet of the residence.

    Prior to construction of the AIM Project, Algonquin shall file with the Secretary, for review and written approval of the Director of the OEP, a revised set of Residential Construction Plans that incorporate and address the comments received from affected landowners. ***(Section 4.8.3.1)***

28. **Prior to construction of the Stony Point to Yorktown Take-up and Relay segment**, Algonquin shall file documentation of concurrence from the NYSDOS that the Hudson River crossing is consistent with the New York coastal policies, including the Stony Point and Peekskill LWRPs. ***(Section 4.8.4.1)***

29. **Prior to the end of the draft EIS comment period**, Algonquin shall file with the Secretary a site-specific construction plan for St. Patrick's Church, the Buchanan-Verplanck Elementary School, Dodd Stadium, and Gonzalez Field. The plans shall be developed in consultation with the officials from each facility and include:

    a. details on the location of the facilities relative to the proposed construction activities;

b. a description of the construction activities that would occur adjacent to the site;

c. the timing of construction activities (i.e., months of the year, days of the week, and hours of the day);

d. details on the timing of construction relative to scheduled games (for Dodd Stadium);

e. a description of the construction methods that would be used (for Gonzalez Field);

f. specific measures that would be implemented to minimize conflicts and impacts on the users of these facilities (for Dodd Stadium, particularly when games are in progress); and

g. documentation of consultation with officials from each facility. ***(Sections 4.8.5.1, 4.8.5.2, and 4.8.5.3)***

30. **Prior to the end of the draft EIS comment period**, Algonquin shall file with the Secretary the proposed construction schedule for the Norfolk Golf Club that would minimize impacts on use of the club, any other measures developed in consultation with the club owners to minimize impacts on the golf course during construction, and documentation of consultation with the club owners. ***(Section 4.8.5.3)***

31. **Prior to the end of the draft EIS comment period**, Algonquin shall file with the Secretary the results of consultations with National Grid and details of any route variations agreed upon in order to relocate the interconnection from St. Theresa Avenue to avoid or minimize impacts on St. Theresa of Avila School and Parish. If the pipeline is not relocated, then Algonquin shall file with the Secretary a site-specific construction plan for St. Theresa of Avila School and Parish. The plan shall be developed with the parish leadership and include:

a. details on the location of the school and parish facilities relative to the proposed construction activities;

b. a description of the construction activities that would occur at the site;

c. the timing of construction activities (i.e., days of the week and hours of the day);

d. specific measures that would be implemented to minimize conflicts with the school and parish; and

e. documentation of consultation with the parish leadership. ***(Section 4.8.5.3)***

32. **Prior to construction in New York**, Algonquin shall file with the Secretary, for review and written approval of the Director of OEP, a revised Traffic Management Plan for the New York Pipeline Segments that includes the site-specific details for the crossings of Zachary Taylor Street, Gate Hill Road (Highway 210), Bleakley Avenue, Route 9A, Montrose Station Road, Maple Avenue, and Cordwood Road. ***(Section 4.9.5.1)***

33. **Prior to the end of the draft EIS comment period**, Algonquin shall file with the Secretary a revised Procedures Guiding the Discovery of Unanticipated Cultural Resources and Human Remains that incorporates the Connecticut SHPO's comment to include specific language of CGS section 10-388. ***(Section 4.10.4)***

34. Algonquin shall not begin implementation of any treatment plans/measures (including archaeological data recovery); construction of facilities; or use of staging, storage, or temporary work areas and new or to-be-improved access roads **until**:

    a. Algonquin files with the Secretary all remaining cultural resources survey and evaluation reports, any necessary treatment plans, and the New York, Connecticut, Rhode Island, and Massachusetts SHPO's comments on the reports and plans;

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

    c. the FERC staff reviews and the Director of OEP approves all cultural resources survey reports and plans, and notifies Algonquin in writing that treatment plans/mitigation measures may be implemented or 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 4.10.5)***

35. **Prior to the end of the draft EIS comment period,** Algonquin shall provide an update regarding the air permitting requirements associated with the new and/or modified M&R stations in New York, Connecticut, and Massachusetts and, if applicable, provide copies of all permit applications or other permit registration documentation that has been filed with the NYSDEC, CTDEEP, and MADEP, respectively. ***(Section 4.11.1.2)***

36. **Prior to the end of the draft EIS comment period**, Algonquin shall file with the Secretary a Fugitive Dust Control Plan that specifies the precautions that Algonquin would take to minimize fugitive dust emissions from construction activities, including additional mitigation measures to control fugitive dust emissions of Total Suspended Particulates and particulate matter with an aerodynamic diameter less than or equal to 10 microns. The plan shall clearly explain how Algonquin would implement measures, such as:

    a. watering the construction workspace and access roads;

    b. providing measures to limit track-out onto the roads;

    c. identifying the speed limit that Algonquin would enforce on unsurfaced roads;

    d. covering open-bodied haul trucks, as appropriate;

    e. clarifying that the EI has the authority to determine if/when water or a palliative needs to be used for dust control; and

    f. clarifying the individuals with the authority to stop work if the contractor does not comply with dust control measures. ***(Section 4.11.1.3)***

37. Algonquin shall file **in the weekly construction status reports** the following for the Hudson River and Interstate 84/Still River HDD sites:

    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 decibels. ***(Section 4.11.2.3)***

38. Algonquin shall file a noise survey with the Secretary **no later than 60 days** after placing the authorized units at the Stony Point and Chaplin Compressor Stations in service. If a full load condition noise survey of the entire station is not possible, Algonquin shall instead 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 all of the equipment at the compressor station under interim or full horsepower load conditions exceeds an L_{dn} of 55 dBA at any nearby NSAs, 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 L_{dn} of 55 dBA requirement by filing a second noise survey with the Secretary **no later than 60 days** after it installs the additional noise controls. ***(Section 4.11.2.3)***

39. Algonquin shall file noise surveys with the Secretary **no later than 60 days** after placing the authorized units at the Southeast, Cromwell, and Burrillville 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 4.11.2.3)***

40. Algonquin shall file noise surveys with the Secretary **no later than 60 days** after placing the Guilford, Willimantic, Oakland Heights, and West Roxbury M&R Stations and the proposed new Clapboard Ridge Road MLR in service. If the noise attributable to the operation of any M&R Station or MLR 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 4.11.2.3)***

41. **Prior to construction of the Stony Point to Yorktown Take-up and Relay segment**, Algonquin shall file with the Secretary its final AC/DC interference study associated with the West Point Transmission Project, documentation of all consultations with WPP, and any additional mitigation measures to address safety-related issues. ***(Section 4.12.3)***

42. **Prior to the end of the draft EIS comment period**, Algonquin shall file with the Secretary the final conclusions regarding any potential safety-related conflicts with the IPEC based on the Hazards Analysis performed by Entergy. If Entergy’s Hazards Analysis is not yet complete, Algonquin shall provide an update on its status and a schedule for anticipated completion. If, upon completion of the Hazards Analysis, additional mitigation measures are required to address safety-related issues or conflicts, **prior to construction in the vicinity of the IPEC facility**, Algonquin shall file with the Secretary, for review and written approval by the Director of OEP, a site-specific construction and mitigation plan for the IPEC developed in consultation with Entergy. ***(Section 4.12.3)***

APPENDIX A

DISTRIBUTION LIST

APPENDIX A
DISTRIBUTION LIST

Federal Government Agencies

Advisory Council on Historic Preservation, DC

Bureau of Oceans and International Environmental and Scientific Affairs, U.S. Department of State, Alexander Yuan, DC

Centers for Disease Control and Prevention, U.S. Department of Health and Human Services, George Chandler, GA

Committee on Energy and Natural Gas, U.S. Senate, DC

Council on Environmental Quality, Ellen Athas, DC

Council on Environmental Quality, Horst G. Greczmiel, DC

Department of Conservation and Recreation, Chris Delaney, MA

Division of Decision Support, Planning, and the National Environmental Policy Act, U.S. Department of the Interior, Bureau of Land Management, Marci Todd, DC

Division of Decision Support, Planning, and the National Environmental Policy Act, U.S. Department of the Interior, Bureau of Land Management, Kerry Rodgers, DC

Division of Emergency and Environmental Health Services, U.S. Department of Health and Human Services, National Center for Environmental Health, Sharunda Buchanan, GA

Energy and Natural Resources Committee Office, Senator Mary Landrieu, DC

Enforcement, Research and Special Programs Administration, Southwest Region, Houston Office, TX

Environment and Natural Resources Division, Natural Resources Section, U.S. Department of Justice, Beverly Li, DC

Environmental Planning and Compliance Branch, U.S. Department of the Interior, National Park Service, Patrick Walsh, CO

Environmental Planning Division, U.S. Department of Housing and Urban Development, James M. Potter, DC

Environmental Policy and Compliance, U.S. Department of the Interior, Vijai N. Rai, DC

Minerals Management Service, U.S. Department of the Interior, DC

National Forest System, U.S. Department of Agriculture, Forest Service, DC

National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northeast Regional Office, Mary Colligan, MA

National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Chris Boelke, MA

National Oceanic and Atmospheric Administration, National Marine Fisheries Service, U.S. Department of Commerce, Steve Leathery, MD

National Oceanic and Atmospheric Administration, Program Planning and Integration, U.S. Department of Commerce, Steve Kokkinakis, MD

National Park Service, David Clark, MA

Natural Gas STAR, Environmental Protection Agency, Jerome Blackman, DC

Natural Resources Management, U.S. Department of the Interior, Office of Environmental Policy and Compliance, David Sire, DC

Office of Enforcement and Compliance Assurance, U.S. Environmental Protection Agency, Cynthia Giles, DC

Office of Environmental Management, U.S. Department of Energy, Dave Huizenga, DC

Office of Facilities, Environmental and Cultural Resources, U.S. Department of Interior, Bureau of Indian Affairs, Marvin Keller, VA

Office of Federal Activities, U.S. Environmental Protection Agency, Cliff Rader, DC

Office of Federal Activities, U.S. Environmental Protection Agency, Susan E. Bromm, DC

Office of Habitat Protection, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, MD

Federal Government Agencies (cont'd)

Office of Operating and Environmental Standards, U.S. Coast Guard, DC

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

Office of the Deputy Assistant Secretary of the Army, Environmental Safety and Occupational Health, Leslie Gillespie-Marthaler, DC

Office of the Deputy Undersecretary of Defense, Installations and Environment, U.S. Department of Defense, Terry Bowers, DC

Office of the Deputy Undersecretary of Defense, Installations and Environment, DC

Office of the Deputy Undersecretary of Defense, Installations and Environment, Robert Uhich, DC

Office of the Secretary, U.S. Department of Commerce, DC

Operations Division (DAIM-ODO), Raven L. Howell, VA

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

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

Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, Jeffrey Wiese, DC

Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, Magdy El-Sibaie, DC

Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, Sherri Pappas, DC

Program Planning and Integration, National Oceanic and Atmospheric Administration, MD

Research and Special Programs Administration, U.S. Department of Transportation, Office of Pipeline Safety, DC

Research and Special Programs Administration, U.S. Department of Transportation, Office of Pipeline Safety, DC

Section of Environmental Analysis, U.S. Department of Transportation, Surface Transportation Board, Victoria Rutson, DC

Surface Transportation Board, Office of Environmental Analysis, Victoria Rutson, DC

U.S. Air Force, Steve Zanders, DC

U.S. Army Corps of Engineers, New England District, Regulatory Division, Cori Rose, MA

U.S. Army Corps of Engineers, New England District, Regulatory Division, Jennifer McCarthy, MA

U.S. Army Corps of Engineers, New York District, Regulatory Division, Jun Yan, P.E., NY

U.S. Army Corps of Engineers, New York District, Regulatory Division, Steve Ryba, NY

U.S. Army Corps of Engineers, Office of the Chief of Army Engineers, DC

U.S. Coast Guard, DC

U.S. Coast Guard, Robert Papp, DC

U.S. Customs and Border Protection, Department of Homeland Security, Christopher Oh, DC

U.S. Department of Agriculture, Forest Service, Ecosystem Management Coordination, Joe Carbone, DC

U.S. Department of Agriculture, Forest Service, DC

U.S. Department of Agriculture, Natural Resources Conservation Service, John Matt Harrington, DC

U.S. Department of Agriculture, Natural Resources Conservation Service, Barbara Miller, MA

U.S. Department of Agriculture, Natural Resources Conservation Service, Donald Pettit, NY

Federal Government Agencies (cont'd)

U.S. Department of Agriculture, Natural Resources Conservation Service, Lisa R. Coverdale, CT

U.S. Department of Agriculture, Natural Resources Conservation Service, R. Phou Vongkhamdy, RI

U.S. Department of Air Force, Basing and Units, U.S. Department of Defense, Jack Bush, DC

U.S. Department of Energy, John Anderson, DC

U.S. Department of Energy, Office of Environmental Compliance, DC

U.S. Department of Energy, Office of Intergovernmental Affairs, Carol M. Borgstrom, DC

U.S. Department of Health and Human Services, Edward Pfister, DC

U.S. Department of Homeland Security, U.S. Coast Guard, Ed Wandelt, DC

U.S. Department of Justice, Land and Natural Resources Division, DC

U.S. Department of Labor, Office of Regulatory Economics, DC

U.S. Department of State, John Matuszak, DC

U.S. Department of Transportation, DC

U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, Office of Pipeline Safety, Community Assistance/Technical Services, CO

U.S. Environmental Protection Agency, Judith Enck, NY

U.S. Environmental Protection Agency, Office of Federal Activities, Robert Hargrove, DC

U.S. Environmental Protection Agency, Region 2, Lingard Knutson, NY

U.S. Environmental Protection Agency, Region 1, Air Program Branch, Anne Arnold, MA

U.S. Environmental Protection Agency, Region 1, Office of Environmental Review, Timothy Timmerman, MA

U.S. Fish and Wildlife Service, David Stilwell, NY

U.S. Fish and Wildlife Service, Department of the Interior, Pat Carter, VA

U.S. Fish and Wildlife Service, New England Field Office, Tom Chapman, NH

U.S. Fish and Wildlife Service, New York Field Office, Robyn Niver, NY

U.S. Forest Service, Farm Service Agency, Matthew Ponish, DC

U.S. Geological Survey, Department of the Interior, Esther Eng, VA

U.S. Nuclear Regulatory Commission, Allison M. Macfarlane, DC

U.S. Nuclear Regulatory Commission, Douglas Pickett, MD

U.S. Nuclear Regulatory Commission, Region I, PA

Federal Senators and Representatives

U.S. House of Representatives, Community Liaison, Matthew Abdifar, CT

U.S. House of Representatives, Congressman David Cicilline, DC

U.S. House of Representatives, Congressman Jim Langevin, DC

U.S. House of Representatives, Congressman Joe Courtney, DC

U.S. House of Representatives, Congressman John Larson, DC

U.S. House of Representatives, Congressman Michael Michaud, DC

U.S. House of Representatives, Congressman, Jim Himes, DC

U.S. House of Representatives, Congresswoman Elizabeth Esty, DC

U.S. House of Representatives, Congresswoman Rosa DeLauro, DC

U.S. House of Representatives, Director of District Operations, Russell W. Griffin, CT

U.S. House of Representatives, District Director to Congressman Joe Courtney, Jenny Contois, CT

U.S. House of Representatives, District Office of Congresswoman Elizabeth Esty, Samantha Pillion, CT

Federal Senators and Representatives (cont'd)

U.S. House of Representatives, Office of Congressman John Larson, John Rossi, CT

U.S. House of Representatives, Office of Congressman Maloney, Director, Ed Brancati, NY

U.S. House of Representatives, Office of Congresswoman Nita M. Lowey, District Director, Patricia Keegan, NY

U.S. House of Representatives, Staff to Congressman David Cicilline, RI

U.S. Senate, Office of Senator Jack Reed, Legislative Assistant, Diana Bowen, DC

U.S. Senate, Senator Angus S. King, Jr., DC

U.S. Senate, Senator Charles Schumer, DC

U.S. Senate, Senator Chris Murphy, DC

U.S. Senate, Senator Jack Reed, DC

U.S. Senate, Senator Jeanne Shaheen, DC

U.S. Senate, Senator Kelly Ayotte, DC

U.S. Senate, Senator Kirsten Gillibrand, DC

U.S. Senate, Senator Richard Blumenthal, DC

U.S. Senate, Senator Sheldon Whitehouse, DC

U.S. Senate, Senator Susan Collins, DC

U.S. Senate, Staff to Senator Reed, RI

U.S. Senate, Staff to U.S. Senator Whitehouse, RI

State Senators and Representatives

Assembly District Connecticut 88, Assemblywoman Amy Paulin, NY

Connecticut House of Representatives, Representative Antonio Guerrera, CT

Connecticut House of Representatives, Representative Arthur O'Neill, CT

Connecticut House of Representatives, Representative Brian Becker, CT

Connecticut House of Representatives, Representative Brian Sear, CT

Connecticut House of Representatives, Representative Cathy Abercrombie, CT

Connecticut House of Representatives, Representative Christie Carpino, CT

Connecticut House of Representatives, Representative Claire Janowski, CT

Connecticut House of Representatives, Representative Dan Carter, CT

Connecticut House of Representatives, Representative Dave Yaccarino, CT

Connecticut House of Representatives, Representative David Arconti, CT

Connecticut House of Representatives, Representative David Labriola, CT

Connecticut House of Representatives, Representative Elizabeth Boukus, CT

Connecticut House of Representatives, Representative Emmett Riley, CT

Connecticut House of Representatives, Representative Geoff Luxenberg, CT

Connecticut House of Representatives, Representative Janice Giegler, CT

Connecticut House of Representatives, Representative Jason Rojas, CT

Connecticut House of Representatives, Representative Joseph Aresimowicz, CT

Connecticut House of Representatives, Representative Joseph Diminico, CT

Connecticut House of Representatives, Representative Joseph Serra, CT

Connecticut House of Representatives, Representative Kevin Ryan, CT

Connecticut House of Representatives, Representative Linda Orange, CT

Connecticut House of Representatives, Representative Matthew Lesser, CT

Connecticut House of Representatives, Representative Michael Demicco, CT

Connecticut House of Representatives, Representative Mike Alberts, CT

Connecticut House of Representatives, Representative Patricia Widlitz, CT

Connecticut House of Representatives, Representative Prasad Srinivasan, CT

Connecticut House of Representatives, Representative Richard Smith, CT

Connecticut House of Representatives, Representative Robert Godfrey, CT

Connecticut House of Representatives, Representative Terry Gerratana, CT

State Senators and Representatives (cont'd)

Connecticut House of Representatives, Representative Timothy Ackert, CT

Connecticut House of Representatives, Representative Timothy Larson, CT

Connecticut House of Representatives, Representative Vincent Candelora, CT

Connecticut House of Representatives, Senator Daniel Rovero, CT

Connecticut House of Representatives, Senator Susan Johnson, CT

Connecticut State Senate, Senator Anthony Guglielmo, CT

Connecticut State Senate, Senator Beth Bye, CT

Connecticut State Senate, Senator Catherine Osten, CT

Connecticut State Senate, Senator Dante Bartolomeo, CT

Connecticut State Senate, Senator Donald Williams, CT

Connecticut State Senate, Senator Edward Meyer, CT

Connecticut State Senate, Senator Jason Welch, CT

Connecticut State Senate, Senator Leonard Fasano, CT

Connecticut State Senate, Senator Michael McLachlan, CT

Connecticut State Senate, Senator Paul Doyle, CT

Connecticut State Senate, Senator Robert Kane, CT

Connecticut State Senate, Senator Steve Cassano, CT

Maine House of Representatives, House Majority Leader Seth A. Berry, ME

Maine House of Representatives, House Majority Whip Jeff M. McCabe, ME

Maine House of Representatives, Representative Barry Hobbins, ME

Massachusetts House of Representatives, Representative Edward F. Coppinger, MA

Massachusetts House of Representatives, Representative Paul McMurtry, MA

Massachusetts House of Representatives, Senator Michael F. Rush, MA

New York State Senate, Legislative Director Sarah Ritz, NY

New York State Senate, Senator Andrea Stewart-Cousins, NY

New York State Senate, Senator Bill Larkin, NY

New York State Senate, Senator George Latimer, NY

New York State Senate, Senator Greg Ball, NY

New York State Senate, Senator Terry Gipson, NY

New York State, District Representative and Grants Coordinator, Sara Levine, NY

Rhode Island House of Representatives, Representative Caleb Keable, RI

Rhode Island House of Representatives, Senator Paul Fogarty, RI

Senate of Maine, President of the Senate Justin L. Alfond, ME

Senate of Maine, Senate Majority Leader Troy Jackson, ME

Senate of Maine, Senator Anne M. Haskell, ME

Senate of Maine, Senator Michael D. Thibodeau, ME

Senate of Maine, Senator Roger Katz, ME

State of Maine, Governor Paul LePage, ME

State Government Agencies

Commonwealth of Massachusetts Department of Highways, MA

Commonwealth of Massachusetts, Charles River Reservation, Benjamin Mills Park, MA

Connecticut Attorney General's Office, George Jepsen, CT

Connecticut Attorney General's Office, Joseph Rubin, CT

Connecticut Attorney General's Office, Kimberly Massicotte, CT

Connecticut Attorney General's Office, Robert Clark, CT

State Government Agencies (cont'd)

Connecticut Department of Energy and Environmental Protection Engineering and Enforcement Section, Richard A. Pirolli, CT

Connecticut Attorney General's Office, Robert Snook, CT

Connecticut Department of Energy and Environmental Protection, Cheryl Chase, CT

Connecticut Department of Energy and Environmental Protection, Christopher Martin, CT

Connecticut Department of Energy and Environmental Protection, David Simpson, CT

Connecticut Department of Energy and Environmental Protection, Dawn McKay, CT

Connecticut Department of Energy and Environmental Protection, Daniel Esty, CT

Connecticut Department of Energy and Environmental Protection, Douglas Hoskins, CT

Connecticut Department of Energy and Environmental Protection, Fred Riese, CT

Connecticut Department of Energy and Environmental Protection, Gary Rose, CT

Connecticut Department of Energy and Environmental Protection, Jessie Stratton, CT

Connecticut Department of Energy and Environmental Protection, Lydia J. Howard, CT

Connecticut Department of Energy and Environmental Protection, Peter Aarrestad, CT

Connecticut Department of Energy and Environmental Protection, Richard Jacobson, CT

Connecticut Department of Energy and Environmental Protection, William Hyatt, CT

Connecticut Energy and Technology Committee, Clark Chapin, CT

Connecticut Energy and Technology Committee, Gary LeBeau, CT

Connecticut Energy and Technology Committee, Jonathan Steinberg, CT

Connecticut Energy and Technology Committee, Laura Hoydick, CT

Connecticut Energy and Technology Committee, Lonnie Reed, CT

Connecticut Energy and Technology Committee, Robert Duff, CT

Connecticut Governer's Office, Liz Donohue, CT

Connecticut Governer's Office, Paul Mounds, CT

Connecticut Office of the Consumer Counsel, Elin Swanson Katz, CT

Connecticut Office of the Consumer Counsel, Joseph Rosenthal, CT

Connecticut Office of the Consumer Counsel, Richard E. Sobolewski, CT

Connecticut Office of the State Archaeologist, Nicholas Bellantoni, CT

Connecticut Policy Aides for Energy, Chris Zavagnin, CT

Connecticut Policy Aides for Energy, Dave Steuber, CT

Connecticut Policy Aides for Energy, Jason Stark, CT

Connecticut Policy Aides for Energy, Jesse Hubbard, CT

Connecticut Public Utility Regulatory Authority, Arthur House, CT

Connecticut Public Utility Regulatory Authority, John Betkoski III, CT

Connecticut Public Utility Regulatory Authority, Michael Caron, CT

Connecticut Siting Council, Melanie Bachman, CT

Connecticut State Historic Preservation Office, Stacy Vairo, CT

Connecticut U.S. Senator Richard Blumenthal, Matthew LeBeau, CT

State Government Agencies (cont'd)

Connecticut U.S. Senator Richard Blumenthal, Rich Kehoe, CT

Massachusetts Department of Environmental Protection, Lealdon Langley, MA

Massachusetts Department of Environmental Protection, Rachel Freed, MA

Massachusetts Energy Facilities Siting Board, Andy Greene, MA

Massachusetts Energy Facilities Siting Board, Enid Kurnin, MA

Massachusetts Energy Facilities Siting Board, Robert Shea, MA

Massachusetts Executive Office of Energy and Environmental Affairs, Maeve Vallely-Bartlett, MA

Massachusetts Executive Office of Energy and Environmental Affairs, Richard K. Sullivan Jr., MA

Massachusetts Historical Commission, Brona Simon, MA

Natural Heritage and Endangered Species Program, Lauren Glorioso, MA

New York City Department of Environmental Protection, Gail Piranio, NY

New York City Department of Environmental Protection, Matt Gianetta, NY

New York City Department of Environmental Protection, Melissa Layman, NY

New York Public Service Commission, Gary Brown and Staff, NY

New York State Department of Public Service, Kathleen H. Burgess, NY

New York State Department of Environmental Conservation, Chris Hogan, NY

New York State Department of Environmental Conservation, David Gasper, NY

New York State Department of Environmental Conservation, Denny Escapata, NY

New York State Department of Environmental Conservation, Jack Nasca, NY

New York State Department of Environmental Conservation, John J. Ferguson, NY

New York State Department of Environmental Conservation, Joseph Martens, NY

New York State Department of Environmental Conservation, Karen Chytalo, NY

New York State Department of Environmental Conservation, Larry S. Eckhaus, NY

New York State Department of Environmental Conservation, Margarat Valis, NY

New York State Department of Environmental Conservation, Michael Higgins, NY

New York State Department of Environmental Conservation, Mike Cronin, NY

New York State Department of Environmental Conservation, Region 3, George Sweikert, NY

New York State Department of Environmental Conservation, Robert Sandford, NY

New York State Department of Environmental Conservation, Stephen Tomasik, NY

New York State Department of Environmental Conservation, Steve Yarrington, NY

New York State Department of Environmental Conservation, Tara Seoane, NY

New York State Department of Environmental Conservation, William Little, NY

New York State Department of Public Service, James Denn, NY

New York State Department of State, Matthew Maraglio, NY

New York State Historic Preservation Office, New York State Office of Parks, Brian Yates, NY

New York State Historic Preservation Office, New York State Office of Parks, Nancy Herter, NY

New York State Historic Preservation, Ruth Pierpont, NY

New York State Office of General Services, John Hernick, NY

New York State Office of Parks, Recreation and Historic Preservation, Jeff Meyers, Esq., NY

New York State Office of Parks, Recreation, and Historic Preservation, Tom Alworth, NY

New York State Office of the Attorney General, John J. Sipos, NY

<u>State Government Agencies (cont'd)</u>

New York State Office of the Attorney General, Philip Bein, NY

Putnam County Legislature, Sam Oliverio, NY

Rhode Island Coastal Resource Management Council, David Reis, RI

Rhode Island Department of Environmental Management, Aleida Whitney, RI

Rhode Island Department of Environmental Management, Chuck Horbert, RI

Rhode Island Department of Environmental Management, Doug McVay, RI

Rhode Island Department of Environmental Management, Eric Beck, RI

Rhode Island Department of Environmental Management, Janet Coit, RI

Rhode Island Department of Environmental Management, Mark Gibson, RI

Rhode Island Department of Environmental Management, Ronald Gagnon, RI

Rhode Island Department of Environmental Management, Terry Walsh, RI

Rhode Island Division of Planning and Development, Paul Jordan, RI

Rhode Island Governor's Office, Policy Analyst, Kate Brock, RI

Rhode Island Historic Preservation and Heritage Commission, Edward F. Sanderson, RI

Rhode Island Office of the Attorney General, Peter Kilmartin, RI

Robert Michalik, CT

State of Connecticut Forest Land Hop Brook, CT

State of Connecticut, Attn: James Lapan, CT

State of Connecticut, c/o Western Connecticut State University – Luigi Marcone, CT

State of Connecticut, CT

State of Connecticut, Office of Rights of Way, CT

State of Connecticut, State Director, Kenny Curran, CT

State of Rhode Island, RI

<u>Local Government Agencies</u>

Ashland Conservation Commission, Conservation Agent, Matthew Selby, MA

Ashland Historical Commission, Chair Julie Nardone, MA

Berlin Inland Wetland and Watercourse Commission, Wetlands Agent/Deputy Director of Public Works James P. Horbal, CT

Boston City Archaeologist, Joseph Bagley, MA

Boston Conservation Commission, West Roxbury Neighborhood Coordinator Christopher Tracy, MA

Chaplin Wetlands and Watercourses Commission, Wetlands Agent Joseph Theroux, CT

City of Boston by Foreclosure, MA

City of Boston, Councilor John Connelly, MA

City of Boston, Councilor Matt O'Malley, MA

City of Boston, Director of Energy Brad Swing, MA

City of Boston, Director of Environmental Energy Brian Swett, MA

City of Boston, Director of Neighborhood Services, Jay Walsh, MA

City of Boston, MA

City of Boston, Mayor Thomas Menino, MA

City of New Bedford, Board of Health, MA

City of New Bedford, Water Department., MA

City of New York City, Aqueduct Manager, Bureau of Water Supply, Attn: Mike Tyrell, NY

City of Norwich, Atty Michael Jewell, CT

City of Norwich, Department of Public Utilities, General Manager John Bilda, CT

City of Peekskill, Acting City Manager Brian Havranek, NY

City of Peekskill, Corporation Counsel Ed Dunphy, NY

City of Peekskill, Mayor Mary Foster, NY

City of Peekskill, Michael Welfi, NY

Local Government Agencies (cont'd)

County of Rockland, County Executive Edwin J. Day, NY

County of Westchester, Blue Mt. Res., Attn: David Delucia, NY

Cromwell Fire District, CT

Cromwell Inland Wetlands and Watercourse Agency, Zoning and Wetlands Compliance Officer Fred Curtin, CT

Danbury Inland Wetlands and Watercourse Agency, Senior Inspector Daniel L. Baroody, CT

Dedham Conservation Commission, Chairman Frederick Civian, MA

Dedham Department of Public Works, Joe Flanalan, MA

Dedham Historical Commission, MA

Everett Conservation Commission, MA

Everett Historical Commission, MA

Farmington Inland Wetlands and Watercourse Agency, Town Planner Jeffrey Ollendorf, CT

Franklin Inland Wetlands and Watercourse Agency, Wetlands Enforcement Officer Thomas E. Weber, CT

Freetown Conservation Commission, Kevin Desmarais, MA

Freetown Historical Commission, Chair Mary E. Rezendes-Brown, MA

Glastonbury Inland Wetlands and Watercourse Agency, Environmental Planner Tom Mocko, CT

Guilford Inland Wetlands Commission, Inland Wetlands Enforcement Officer Regina Reid, CT

Lebanon Inland Wetlands and Watercourses Commission, Town Planner Philip Chester, CT

Medford Conservation Commission, Environmental Agent Alicia Hunt, MA

Middleborough Conservation Commission, Conservation Agent Patricia J. Cassady, MA

Middletown Inland Wetlands and Watercourse Agency, Planning/Environmental Specialist Matt Dodge, CT

Montville Inland Wetlands Commission, Planner II Colleen Bezanson, CT

Needham Conservation Commission, Director of Conservation Patricia Barry, MA

Needham Historical Commission, MA

New Bedford Conservation Commission, Office of Environmental Stewardship, Director Michele Paul, MA

New Bedford Conservation Commission, Office of Environmental Stewardship, Conservation Agent Sarah Porter, MA

New Bedford Historical Commission, MA

New York City Department of Environmental Protection, Bureau of Legal Affairs, General Counsel John Rousakis, Esq., NY

New York City Department of Environmental Protection, Bureau of Water Supply, Assistant Commissioner David Warne, NY

New York City Department of Environmental Protection, Commissioner Emily Lloyd, NY

New York City Department of Environmental Protection, Cynthia Garcia, NY

New York City Department of Environmental Protection, Laurie Machung, NY

New York City Law Department, Corporation Counsel Zachary W. Carter, NY

North Haven Inland Wetlands Commission, Land Use Officer Alan Fredricksen, CT

Norwich Public Utilities, Chris LaRese, CT

Norwich Wetlands Watercourses and Conservation Commission, City Planner Mike Schaefer, CT

Norwood Conservation Commission, Conservation Agent Al Goetz, MA

Norwood Historical Commission, MA

Office of Planning and Community Development, Chair Ryan Hayward, MA

Oxford Conservation Commission and Inland Wetlands Agency, Inland Wetlands Enforcement Officer Andrew Ferrillo, Jr., CT

Local Government Agencies (cont'd)

Plainville Inland Wetland and Watercourse Agency, AICP, Director of Planning and Economic Development Mark S. DeVoe, CT

Plymouth Conservation Commission, Conservation Planner Richard Vacca, MA

Plymouth Historical Commission, MA

Pomfret Inland Wetland and Watercourse Agency, Clerk Lynn Krajewski, CT

Putnam Inland Wetlands and Conservation Commission, Zoning and Wetlands Agent Frederick E. Wojick, CT

Senator Lou DiPalma, RI

Southbury Inland Wetlands Commission, Inland Wetlands Enforcement Officer Mark Massoud, CT

Tiverton/Little Compton State Legislators, Representative Dennis Canario, RI

Town Administrator Jim Goncalo, RI

Town Manager Michael Wood, RI

Town of Berlin, Administrative Assistant to the Town Manager, Sheila Wagner, CT

Town of Berlin, Town Manager Denise M. McNair, CT

Town of Bethel, First Selectman Matt Knickerbocker, CT

Town of Bethel, Office Administrator Wendy Smith, CT

Town of Carmel, Town Engineer Ron Gainer, NY

Town of Chaplin, CT

Town of Chaplin, First Selectman William H. Rose IV, CT

Town of Chaplin, Selectman Irene J. Schein, CT

Town of Chaplin, Selectman John A. Smith, CT

Town of Cortlandt, Assemblywoman Sandra Galef, NY

Town of Cortlandt, Edward Vergano, NY

Town of Cortlandt, Jeffrey C. Coleman, NY

Town of Cortlandt, Supervisor Linda Puglisi, NY

Town of Cortlandt, Town Attorney Tom Wood, NY

Town of Cromwell Middle School, Attn: Matt A. Bisceglia, Superintendent, CT

Town of Cromwell, Board of Selectman Allan D. Spotts, CT

Town of Cromwell, CT

Town of Cromwell, First Selectman Mertie Terry, CT

Town of Cromwell, Senior Executive Assistant Re Matus, CT

Town of Cromwell, Town Planner Jon Harriman, CT

Town of Cromwell, Town Planner Stuart Popper, CT

Town of Danbury, City Engineer Farid Khouri, CT

Town of Danbury, Mayor Mark D. Boughton, CT

Town of Danbury, PU Foreman of Maintenance Transmission and Dist., Timothy Nolan, CT

Town of Danbury, Public Utilities Superintendent David Dey, CT

Town of Dedham (Recreation), Attn: Taissir Alani, MA

Town of Dedham Cemetery Department, MA

Town of Dedham, Interim Town Administrator Nancy Baker, MA

Town of Dedham, Public Works, Director Joe Flanagan, MA

Town of Dedham, Town Engineer Jason Mammone, MA

Town of Farmington, Administrative Assistant, Lee A. Beckwith, CT

Town of Farmington, CT, Administrative Assistant Deb Bull, CT

Town of Farmington, Town Manager Kathleen A. Eagen, CT

Town of Franklin, First Selectman Richard Matters, CT

Town of Franklin, Selectman Charles Grant, CT

Town of Franklin, Selectman Russell Beisiegel, CT

Town of Glastonbury, Executive Assistant to Town Manager, Yolanda Olenick, CT

Local Government Agencies (cont'd)

Town of Glastonbury, Town Manager Richard Johnson, CT

Town of Guildford, Administrative Assistant, Karen Quercia, CT

Town of Guildford, Administrative Assistant, Kristen Elliott, CT

Town of Guildford, First Selectman Joseph S. Mazza, CT

Town of Haverstraw, Assemblyman Kenneth Zebrowski, NY

Town of Haverstraw, Building Inspector Eugene Barnum, NY

Town of Haverstraw, NY

Town of Haverstraw, Supervisor Howard Phillips, NY

Town of Lebanon, Assistant to the First Selectman Patti Handy, CT

Town of Lebanon, CT

Town of Lebanon, First Selectman Joyce Okonuk, CT

Town of Lebanon, John Bendoraitis, CT

Town of Lebanon, Selectman Linda Finelli, CT

Town of Little Compton, Town Council President Robert Mushen, RI

Town of Manchester, Deputy Mayor Jay Moran, CT

Town of Manchester, Executive Assistant to the General Manager Donna Huot, CT

Town of Manchester, General Manager Scott Shanley, CT

Town of Manchester, Mayor Leo V. Diana, CT

Town of Manchester, Sr. Administrative Secretary Megan Campion, CT

Town of Manchester, Town Engineer Jeff Lamalva, CT

Town of Marlborough, Al Lanzetta, NY

Town of Middleborough, MA

Town of Middletown, Executive Assistant Linda DeSena, CT

Town of Middletown, Mayor Daniel Drew, CT

Town of Montville, Mayor Ronald McDaniel, CT

Town of North Haven, First Selectman Michael J. Freda, CT

Town of Norwich, City Manager Alan Bergren, CT

Town of Norwich, Mayor Deberey Hinchey, CT

Town of Ossining, Supervisor Susanne Donnelly, NY

Town of Ossining, Supervisor Warren J. Lucas, NY

Town of Oxford, Economic Development Director Andrew McGeever, CT

Town of Oxford, First Selectman George Temple, CT

Town of Oxford, Selectman David McKane, CT

Town of Oxford, Selectman Jeffrey Haney, CT

Town of Plainville, Executive Assistant Lisa Metayer, CT

Town of Plainville, Town Manager Robert E. Lee, CT

Town of Pomfret, First Selectman Maureen Nicholson, CT

Town of Pomona, Mayor Brett Yagel, NY

Town of Pomona, Village Attorney, NY

Town of Putnam, Mayor Peter Place, CT

Town of Rocky Hill, Dir. Highways and Engineering James Sollmi, CT

Town of Rocky Hill, Economic Development Director Ray Carpentino, CT

Town of Rocky Hill, Mayor Anthony LaRosa, CT

Town of Rocky Hill, Town Manager Barbara Gilbert, CT

Town of Somers, Police Chief Michael Driscoll, NY

Town of Somers, Supervisor Mary Beth Murphy, NY

Town of Southbury, Assistant to First Selectman Carol M. Hubert, CT

Town of Southbury, First Selectman Ed Edelson, CT

Town of Southbury, Office Manager Noreen Thompson, CT

Town of Southeast, NY

Town of Southeast, Supervisor Troy Hay, NY

Town of Southeast, Town Hall, NY

Town of Stony Point, Assemblyman James Skoufis, NY

Local Government Agencies (cont'd)

Town of Stony Point, Assemblyman Steve Katz, NY

Town of Stony Point, Councilman Jim McDonnell, NY

Town of Stony Point, Supervisor Geoffrey Finn, NY

Town of Tiverton, Town Planner Kate Michaud, RI

Town of Vernon, Mayor Ernie Eldridge, CT

Town of Vernon, Mayor George F. Apel, CT

Town of Vernon, Town Manager Neal Beets, CT

Town of Westwood, MA

Town of Westwood, Town Administrator Mike Jaillett, MA

Town of Yorktown, Attn: Michael Grace, NY

Town of Yorktown, Supervisor Michael Grace, NY

Towns of Haverstraw and Stony Point, Legislative Director Robert Nickol, NY

Vernon Inland Wetlands Commission, Inland Wetlands Enforcement Officer Craig Perry, CT

Village of Buchanan, Village Administrator, Clerk of Treasurer Kevin Hay, NY

Village of Ossining, Corporation Counsel Lori Lee Dickson, NY

Waltham Conservation Commission, Conservation Commission Staff Kim King, MA

Waltham Historical Commission, Chair Alex Greene, MA

Wellesley Historical Commission, Chair Helen Robertson, MA

Wellesley Natural Resources Commission, Assistant Natural Resources Commission Director Diane E. Torres, MA

Westchester County Board of Legislators, Peter B. Harckham, NY

Westchester County Department of Planning, NY

Weston Conservation Commission, Conservation Administrator Michele Grzenda, MA

Weston Historical Commission, Ann Swaine, MA

Westwood Conservation Commission, Karen Skinner Civian, MA

Westwood Historical Commission, Chairperson Peter Paravalos, MA

Windham Inland Wetlands and Watercourses Agency, Land Use Officer James Finger, CT

Native American Groups

Connecticut Indian Affairs Council, Edward Sarabia, CT

Delaware Nation of Oklahoma, Tamara Francis, OK

Delaware Nation, Corey Smith, OK

Delaware Tribe of Indians, Dr. Brice Obermeyer, KS

Eastern Pequot Tribal Nation, James Cunha, CT

Mashantucket Pequot Tribal Nation, Kathleen Knowles, CT

Mashpee Wampanoag Tribe, Ramona Peters, MA

Massachusetts Commission on Indian Affairs, John A. Peters, Jr., MA

Mohegan Indian Tribe, James Quinn, CT

Mohegan Tribe of Indians of CT, Attn: Philip M. Cahill, CPA, CT

Mohegan Tribe of Indians of CT, Charles F. Bunnell, CT

Mohegan Tribe of Indians of CT, Phiip M. Cahill, CT

Narragansett Indian Tribe, John B. Brown, III, RI

Ramapough Lenape Indian Nation, Judith J. Sullivan Jr., NJ

Schaghticoke Tribal Nation, CT

St. Regis Mohawk Tribe, Chief Randy Hart, NY

Stockbridge-Munsee Community Band of Mohican Indians, Sherry White, WI

Tribal Historic Preservation Officer, Arnold Printup, Jr., NY

Wampanoag Tribe of Gay Head (Aquinnah), Bettina M. Washington, MA

Libraries

Ashand Public Library, Paula Bonetti, MA
Berlin-Peck Memorial Library, Sara Munson, CT
Brewster Public Library, Maria Steinberg, NY
Brownell Library, Beth Ryan, RI
Chaplin Public Library, Geraldine Helmer, CT
Cora J. Belden Library, Mary Hogan, CT
Danbury Library, Michele Capozzella, CT
Dedham Public Library, Dr. Mary Ann Tricarico, MA
Farminton Library - Main, Jay Johnston, CT
Field Library, Sibyl Canaan, NY
Guilford Free Library, Sandy Ruoff, CT
Guilford H. Hathaway Library, Dorothy P. Stanley-Ballard, MA
Haverstraw Kings Daughters Public Library, Claudia Depkin, NY
Hendrick Hudson Free Library, Jill Davis, NY
Janet Carlson Calvert Library, Christine Schulz, CT
Jesse M. Smith Memorial Library, Sandra P. Mundy, RI
John C. Hart Memorial Library, Patricia Barresi, NY
Jonathan Trumbull Library, Julie Culp, CT
Medford Public Library, Brian Boutilier, MA
Middleboro Public Library, Danielle Bowker, MA
Morrill Memorial Library, Charlotte Canelli, MA
Needham Public Library, Ann MacFate Director, MA
New Bedford Free Public Library, Theresa Coish, MA
North Haven Memorial Library, Lois Baldinni, CT
Otis Library, Veronica Marshall, CT
Oxford Public Library, Dawn Higginson, CT
Parlin Memorial Library, Deborah Abraham, MA
Plainville Public Library, Peter Chase, CT
Plymouth Public Library, Dinah O'Brien, MA
Pomfret Public Library, Laurie Bell, CT
Putnam Public Library, Priscilla Colwell, CT
Raymond Library, Joanne Westkamper, CT
Rockville Public Library, Donna Enman, CT
Rose Memorial Library, Benjamin Reid, NY
Russell Library, Arthur Meyers, CT
Somers Public Library, Pat Miller, NY
Southbury Library, Shirley Thorson, CT
The Cromwell Belden Public Library, Eileen Branciforte, CT
Tiverton Public Library, Ann Grealish-Rust, RI
Waltham Public Library, Kate Tranquada, MA
Wellesley Free Library, Elise MacLennan, MA
Welles-Turner Memorial Library, Barbara Bailey, CT
West Roxbury - Branch of the Boston Public Library, Sheila G. Scott, MA
Weston Public Library, Susan W. Brennan, MA
Westwood Public Library, Thomas Viti, MA
Windham Free Library, Carol Santa Lucia, CT

Media

Ann Farrell, MA
Dedham Times, Scott Herald, MA
Everett Independent, Deborah Digregoriou, MA
Free Bird Times, Ashley Brown, MA
Hartford Courant, Jessica, CT
Heritage Villager, Terry Lieder, CT
Metro West Daily News, Ann Farrell, MA
New Haven Register, Rich Catanese, CT
Newport Daily News, AnnMarie Brisson, RI
Norwich Bulletin, Cindy, CT
Plainville Citizen/Berlin Citizen, Christine Nadau, CT
Putnam Town Crier, Linda Lemmon, CT
Sakonnet Times, Toni Mitchell, RI
Shoreline Times, Joe Urson, CT
Standard Times, Modesta Levesque, MA
The Call, Diane Ames, RI
The Chronicle, Jodi Green, CT
The Dolphin, Joe Urson, CT
The Journal News, Lateefah Simpson, NY
The Middletown Press, Michael Giannone, CT

Media (cont'd)

The News-Times, Yola Rowe Spinosa, CT
The Pomfret Times, Elizabeth Cartier, CT
The Somerville News, Bobbi Toner, MA
Voices, Ann Herr, CT
Waterburg Republican American, Lisa Noonan, CT

Companies and Organizations

199 Shunpike Road, LLC, NY
210 Route 32 LLC, Edwin R. Muenzner, CT
23 Washington St., LLC, Bruce Adler, NY
23 Washington St., LLC, Charles Diven, NY
395 Flex Center Condominium Association, Inc., Theodore Tylaska, CT
42 Gate Hill Road Corp., Larry Kigler, NY
515 Realty Trust, Linda M. Smith, MA
5192 Washington Street LLC/A Mass Co., MA
58 Dwight Street Real Estate Trust, Antonio Musto, MA
62-64 Dwight Street Realty Trust, Kathryn Pierce, MA
71 Summer St Realty Trust/Acton Management, Jen Laferriere, MA
909 Providence Highway Realty Trust, Teymour Jamali, MA
95 Mill Plain Road LLC, CT
Accufacts Inc., Richard B. Kuprewicz, WA
ADAR 15 Corporation, Burton Dorfman, NY
Adelman Family LP, CT
Agriventures Realty, Dave O'Leary, CT
Anns Place the Home of I Can Inc., CT
Arborio Brothers, LLC, CT
Archstone Legacy Place LP
Avery Oak Realty LLC, c/o Tax Department Walgreen Co., IL
Back O' Beyond Inc., NY
Bay State Gas Company, c/o Columbia Gas of Massachusetts, Attn: Paul Franciose, MA
Beachak Bros., Inc., NY
Belimo Air Controls (USA) Inc., CT
Ber-Giam Realty Trust, Attn: Jeffrey S. Berry et al., Trustee, MA
Better Future Project, Craig Altemose, MA
Bijal Hotel Limited Partnership, c/o Jiten Hotel Management Inc., MA
Board of Public Utility Commission, CT
Bonie Wood Realty Co., Attn: Ralph Boniello, NY
Boston Gas Co. DBA National Grid Property Tax Dept., Peter Nagle, MA
Boston Gas Company, MA
Boston Housing Authority/Mass Corp., MA
Boy Scouts of America, Attn: David Horton, NY
Branford East Partnership, CT
Brazos Automotive Properties, c/o Monro Muffler/Brake Re Tax, NY
Brian F. Cook Realty Corp., Attn: Brian Cook, NY
Briarwoods Farms, Inc., NY
Brockton Taunton Gas Co., c/o Columbia Gas of Massachusetts, Attn: Paul Franciose, MA
Brookfield Industrial Development Co., c/o Goodfellows-Ashmore Attn: Todd Payne, CT
Brothers Properties, LLC, CT
Building and Construction Trades Council of Westchester and Putnam Counties, Edward Doyle, NY
Burris Logistics, DE
Butternut Hill LLC, CT
C & M Realty Trust, MA
C&C Development, LLC, CT
C&G Holdings, LLC, CT
C&J Real Estate Partners LLC, CT
Caliber Home Loans, Inc., Philip Varghese, TX
Cam-CT Properties LLC, CT
Capitalism vs. the Climate, Dan Fischer, CT
Cappalex Realty Corporation, Attn: Alex Alverez, NY
Carol Rice Rev. Trust, FL
Cedar Brook Owners, LLC, NJ
Charter Realty Corporation, MA

Companies and Organizations (cont'd)

Cherry Realty Trust, Hugh T. Varden, Trustee, MA

Church of St. Patrick, NY

Citizens' Environmental Coalition, Barbara Warren, NY

Claremont Dedham LLC, c/o The Claremond Co. Inc., MA

Clean Air Council, Joseph Otis Minott, Esq., PA

Coles Brook Commerce Park Association, CT

Compass Property Management, Inc., CT

Competitive Power Ventures, Attn: Andy Basinet, MA

Con Edison Co. of New York, Attn: Jennifer Stahmer, NY

Con Edison Co. of New York, Attn: Laurie Silberfeld, NY

Conn Natural Gas Corp., CT

Conn-Cal Associates, LLC, Attn: Chuck Mandel, Manager, CT

Connecticut AFL-CIO, Lori J. Pelletier, CT

Connecticut Business and Industry Association, Eric J. Brown, CT

Connecticut Light and Power, Attn: Shawn Southworth, CT

Connecticut Natural Gas Corp., c/o Shared Services, ME

Connecticut Natural Gas Corporation, CT

Connecticut Natural Gas Corporation, John Rudiak, CT

Connecticut Radio Holding, LLC, CT

Connecticut Water Company, CT

ConocoPhillips Company, Benjamin J. Schoene, TX

ConocoPhillips Company, Stephanie D. Jones, TX

Conservation Law Foundation, Caitlin Peale, MA

Conservation Law Foundation, Jonathan Peress, MA

Conservation Law Foundation, Shanna Cleveland, MA

Consolidated Rail Corporation (CSX), Attn: Rick Snyder, FL

Constellation, Christopher Young, MD

Cortlandt Farm Mkt., Dominick Dinardo, Trust, NY

Cristaldi, T.S. and Cristaldi Realty Trust, Michelangelo, MA

Cromwell Concrette Products, Inc., Attn: Raymond Sibera, CT

Croton Watershed Clean Water Coalition, Inc., Marian Rose, NY

Cullen and Dykman LLP, Kenneth T. Maloney, DC

Cumberland Farms, Inc., MA

Cushman Farms, LP, Attn: Nate Cushman, CT

CwCwC, Inc., Marian H. Rose, PhD, NY

D & M Real Estate Trust, Douglas H McCarther et al., Trustee, MA

D & T Dinardo, Trust, NY

Dalco Realty Trust, MA

Damascus Citizens for Sustainability, Inc., Jeff Zimmerman, PA

Damour Family Reality, LLC, MA

Danbury Acquisition Corporation, c/o RR Donnelley and Sons – Tax, Attn: Thomas Moran, IL

Daughters of St. Paul, MA

David, T.S. and Verna M., David Realty Trust, Kenneth, MA

Dedham Real Estate Dev LLC, MA

Dedham Sportmens Center Inc., MA

Dedham Wholesale Tire, Dona Manfedi, MA

DeMaio Builders, Inc., NY

Deutsche Bank Nat Tr., CA

Deutsches Altenheim Inc., MA

Devaney Realty Trust, Francis H Devaney et ux Trustee, MA

Dime Bank, CT

DLT Family LPS/Mass LPS, MA

Easter Seals Capital Region and Eastern Connecticut, Inc., Attn: Diane Trotman, CT

Eastern New York Laborers' District Council, Frank J. Marchese, Jr., NY

Eastern New York Laborers' District Council, Samuel M. Fresina, NY

Companies and Organizations (cont'd)

EEC Plus LLC, NY

Ellen A. Brennan Family Irrevocable Trust, James J. Brennan, MA

Entergy Nuclear Indian – PT3 LLC, LL&F Service Corp, LA

Entergy Nuclear Indian Point, Attn: Steve Miller, LA

Entergy Services, Inc., Michael C. Griffen, DC

Entergy Services, Inc., William B. Glew, Jr., NY

Enterprises Shunpike, LLC, Attn: Mike Holcolb, CT

ESS PRISA, II, VA

Exelon Corporation, Christopher A. Wilson, DC

Exelon Corporation, Lisa Simpkins, MD

Extra Space Properties Thirty LLC, Attn: Zach Dickens, UT

Farrington Properties LLC, NY

Federal Realty Investment Trust, MD

Food and Water Watch, Alex Beauchamp, NY

Forest View Estates Homeowners Association, c/o Northeast Property Management Attn: Melanie Grimes, CT

Fossil Free Rhode Island, Lisa Petrie, RI

Fountainhead Parks, Inc., Nancylu Viviano, NJ

Fox Television Stations Inc., MA

Franklin Hills Estates and Country Club, LLC, Attn: Andrew D'Amato, CT

Freihofer Sales Company, Inc., NY

FWA, LLC, CT

Gardners Nurseries, Inc., Attn: Jack Gardner, CT

Genlyte Group, Inc., Attn: Ron Westgate, MA

GenOn Lovett, LLC, Attn: Brian McCabe, NJ

GenOn, Attn: Brian McCabe, NJ

Gera Danbury, LLC, c/o Matrix Realty Group Attn: Mike Brown, CT

Giuliante Machine Tool Inc., Marcelo Giuliante, NY

Gosia LLC, MA

Grassroots Environmental Education, Ellen Weininger, NY

Green Party of Rhode Island, Tony Affigne, RI

Greenlands II, LLC, NY

H. Rocks Stone Supply, LLC, CT

Harney Nominee Trust, John C. and Mary B. Harney, MA

Harvard Energy Advisory Committee, Eric Broadbent, MA

Hasson Holding, LLC, Attn: Jan, CT

Haverstraw Elks No. 577, Michael Bulter, NY

Hendrick Hudson Central School District 3, NY

Housatonic Railroad, Inc., Attn: Finance, Legal, Accounting and Real Estate, CT

HSBC Bank USA National Assoc., NY

Hughes Brothers, Inc., William Hughes, Jr., NJ

International Union of Operating Engineers Local 137, Jeffrey Loughlin, NY

International Union of Operating Engineers, Craig Metz, CT

International Union of Operating Engineers, Nate Brown, CT

Interstate Business Center LLC, Attn: Greg Steiner, CT

Jac-Ross Company, Attn: William and Nancy Knight, VA

Janemar LLC, MA

Jar Associates, Attn: Anthony Rizzo, CT

JJW Properties LLC, Attn: Josh Weeks, CT

John Ross Properties, LLC, CT

Just Cheryl, CT

Kettletown, LLC, c/o IBM Corp., CT

King Marine, Randy King, NY

Kleen Energy Systems, LLC, CT

Kmmkm Ltd., NY

Laborers' International Union of North America, Local 60, NY

Laborers Local 754 of Rockland County, NY, Stephen J. Reich, NY

Lafarge Corp., Attn: Craig Ferry, NY

Lamont – Doherty Earth Observatory, John Armbruster, NY

League of Women Voters of the Rivertowns, Emma Lou Sailors Louis, NY

League of Women Voters of Westchester Inc., Sharon Lindsay, NY

Companies and Organizations (cont'd)

League of Women Voters of Westchester Inc., Susan Schwarz, NY

Legacy Place LLC, c/o S.R. Weiner and Associates Inc., MA

Lepe Gas Inc., MA

Liberty Utilities, F. Chico DaFonte, NH

Lighthouse Realty, LLC, CT

Linear Retail Dedham No. 1 LLC, c/o Keypoint Partners LLC, Attn: Julie Qualy, MA

Linear Retail Dedham No. 2 LLC, Attn: Julie Qualy, MA

Lucy Dedham LLC, CVS Caremark No. 1531-01, RI

Madison Realty Trust, Richard B. Aronson, MA

Mahopac National Bank, NY

Maine House of Representatives, Mark W. Eves, ME

Mambeejambee Ltd., NY

Maritime Grille LLC, CT

Martins Irrevocable Trust, Doris F. and Richard L. Martins, MA

Mass Bay Trans Authority, MA

Mathworks, Paul Popinchalk, MA

Maydon, LLC, CT

McCarter and English, John P. Gregg, DC

McGirk Management Corp., Attn: Lisa Hall, NY

Medical Information Tech Inc., Attn: Ed Sulham, MA

Merrifield, LLC, CT

Meteora, LLC, Attn: Ari Thanos, NY

Metro–North Railroad Company, Maintenance of Way, Attn: Jim Hom, NY

Metropolitan District, CT

Middleborough Gas and Electric Dept., Jacqueline L. Crowley, MA

Midwest Associates LLC, MA

Morgan, Lewis and Bockius LLP, Charles A. Moore, TX

Morgan, Lewis and Bockius LLP, Sean P. Jamieson, DC

Mount Pleasant Bldg Association/Mass Corporation, MA

Mountain Glen @Warwick Corporation, Attn: Abe Goldberger, NY

Mountain Spring Associates, LLC, CT

MPM Enterprises, LLC, CT

National Amusements Inc., Patricia Reeser, MA

National Center for Disaster Preparedness, Irwin Redlener, NY

National Grid, David Lodemore, MA

National Grid, James Stanzione, NY

National Grid, John Allocca, NY

National Grid, John Stavrakos, MA

National Grid, Samara Jaffe, NY

Natural Resource Group, LLC, Jennifer Lee, OR

Natural Resource Group, LLC, Stu Buchanan, NY

New England Central Railroad, VT

New England Gas Co., C/O Property Tax Department, MA

New England States Committee on Electricity, Benjamin S. D'Antonio, MA

New Jersey Resources, Douglas Rudd, NJ

New Jersey Resources, William Scharfenberg, NJ

New York City Aqueduct Manager, NY

New York League of Conservation Voters, Marcia Bystryn, NY

New York State Laborers' Organizing Fund, John F. Hutchings, NY

New York United Water, Attn: Hetal Mistry, NJ

New York Waterway, Inc., Donald Liloia, NJ

Nichmatt Corporation, NY

NiSource Corporate Services, Deepak Raval, OH

Nixon Peabody LLP, Elizabeth W. Whittle, DC

NJR Energy Services Company, Ginger Richman, NJ

Norfolk Golf Club, Attn: Paul Smith or Joe Frazer, MA

Northeast Allied Holdings, Attn: David R. Letts, MA

Northeast Utilities Service Company, Andrew S. Katz, DC

Northeast Utilities Service Company, James G. Daly, MA

Companies and Organizations (cont'd)

Norwich Franklin, LLC, Attn: David Bell, Sr., Real Estate Manager, NJ

NS Norfolk Acquisition LLC, c/o Christopher Cwynar, MA

Nstar Electric Company, Property Tax Department, MA

Nstar Gas Company, MA

NYH2O, NY

Oaktree Capital Management LP/Sawmill Road Property LLC, Attn: Amy Johannes, NY

OCW Retail – Dedham LLC, c/o The Wilder Companies Ltd., MA

Ondo Grove Street LLC, Attn: Kathleen Doherty, Manager, MA

One Reserve Road LLC, c/o Scalzo Property Management, CT

Orbit Realty Trust, Attn: Bullens Donn Trustee, MA

Owen Motors Inc., Attn: Peter Owen, MA

Pace University, Dr. Frances Delahanty, NY

Palazesi and Shawmut Avenue Nominee Trust, L.J. Trs, MA

Palisades Interstate Park Comm., c/o James F. Hall, Executive Director, NY

Palisades Interstate Park Commission, Attn: James F. Hall, CT

Pearl Realty Associates LLC, c/o Largo Realty Inc., Attn: Sophia Saroglov, MA

Peekskill Seaplane Base, James Martin, NY

Pep Boys – Manny Moe and Jack of Delaware Inc., c/o Akerman LLP, Attn: George W. Powell, Jr., FL

Petruzziello Properties LLC, MA

Pfizer, Inc., James Turner, CT

Phoenix House Foundation Pilgrim State Psych Center, Attn: Shari Feld, NY

Pleasantside Pres. School and Co., c/o Marion Perry, Attn: Alan Perry, NY

PNC Bank National Assoc., UT

Prides Corner Farms Inc., CT

Prime Enterprises, LLC, Byron Beausoleil, Member, Attn: Frank Blanchard, CT

Prime Locations of Connecticut, LLC, PA

PSEG Energy Resources and Trade, Cara Lewis, NJ

PSEG Energy Resources and Trade, David Caffery, NJ

PSEG Energy Resources and Trade, Matthew Weissman, NJ

Putnam County Coalition to Preserve Open Space, Ann Fanizzi, NY

Putnam County Legislature, Diane Schonfeld, NY

Quantum of Cromwell, III, LLC, CT

R & R Realty Associates LLC, MA

R K Centers, Attn: David Baker, MA

R.O.W./Roberts and Thompson, RI

Rackemann, Sawyer and Brewster, Sanford Matathia, Esq., MA

RAR2 Jefferson at Dedham Station Massachusetts Inc., c/o Thomson Reuters Dept. 207, Laura Donahue, Regional Property Management, AZ

Rasmussen Family Realty Trust, Nary E. Rasmussen and Anne M. Waisanen, MA

Rescue One, LLC, CT

Reynolds Hills, Inc., c/o Noah Slutsky Attn: Attorney Nancy Vaan, NY

Rider Hill Realty, Attn: Abe Goldberger, NY

Ridgewood Country Club Inc., Fred Del Percio, CT

Riverkeeper, Misti Duvall, NY

Riverkeeper, NY

Riverkeeper, Philip Musegaas, NY

Riverkeeper, William Wegner, NY

Riverwalk Partners LLC, CT

Rochester Gas and Electric Corporation, Linda Dent, NY

Rocky Hill Development, LLC, CT

Rocky Hill Vault, Inc., CT

Rocky Mountain Pipeline Construction Association, LA

Route 6 Land LLC, CT

Royal Auto Tops, Inc., Attn. Paul J. Camuso, MA

S & S Freeman LLC, MA

Companies and Organizations (cont'd)

S.M. Lorusso and Sons Inc./Mass Corp., Attn: Tony Lorusso, MA

Saunders, T.S. and Linda H. and Five 230 Washington Street Trust, Joseph K., MA

Schiavo Enterprises, LLC, MA

Schiff Hardin LLP, Debra Ann Palmer, DC

Schiff Hardin LLP, Noy S. Davis, DC

Schnip Family, LLC, Attn: Gary Schnip, CT

Scotty C. Corp., c/o Action Metal, Co., Inc., NY

SDBDJB, LLC, Attn: Anthony Petrella, CT

Seven Spring Realty Trust, Dimitra Kaltsas, MA

Shawmut Associates LLC, MA

Sheehan Trusts, Dennis P., Margaret P., John P. and Maurice C. Jr. and Barbara E. Spurrell TC and Joanne P. O'Callaghan TC, MA

Shunpike Auto Wash, LLC, CT

Shunpike Business Center, LLC, CT

Shunpike Real Estate, LLC, CT

Shurgard Storage Centers, Inc., c/o Public Storage, Attn: Kevin Jones, Facility Manager, NJ

Sierra Club, Lower Hudson Group, Bill Meyer, NY

Simpson Memorial Church, Inc., NY

Sive, Paget and Riesel P.C., Daniel Riesel, NY

Sive, Paget and Riesel, P.C., Daniel Mach, NY

Smith Beaumont Properties, LLC, Attn: Richard F. Smith and Mary Ann Smith, CT

SMS Realty, LLC, CT

Southern Connecticut Gas Co., CT

SPARC, Sandra Kissam, NY

Specon IX LLC, Delaware LLC, Amerada Hess Facilities, Business Trust No. 1998-1, TX

Starmount Corp., c/o Jowdy and Jowdy, Attn: James Jowdy, Jr., CT

Stony Point Acquisitions, Attn: Patrick Magee, NY

Stop the Algonquin Pipeline Expansion, Susan Van Dolsen, NY

Subra Company, Wilma Subra, LA

Sylson, LLC, c/o Howard Finkelstein, NY

SYSCO Food Service of Connecticut, CT

Tabshey Development, LLC, CT

The Annie Barry Company Ltd., NJ

The Business Council of Westchester, John Ravitz, NY

The Cary Schmoeger Living Trust, NY

The Fort Lane Real Estate Trust and Carrie M. Crossland Trustee, MA

The Hills at Riverton, Attn: Association Officer, CT

The Hills of Rivington, Attn: Anthony Tedesco, NY

The Hughes Family Trust, NY

The Nelson Companies, Ltd, Emily A. Maitin, Esq., MA

The New 865 Realty Trust, Alan H. Okstein, MA

The New England Council, James T. Brett, MA

The Ryan McElroy Trust, NY

Three R S Construction Co., NY

Tolake Corporation, Attn: Gerry Gottus, NY

Toll CT III Limited Partnership, Attn: Keith Diorio, PA

TRC Solutions, Mike Tyrrell, MA

Trout Unlimited, Richard Boissonneault, NY

Trustees of One Allied Drive Realty Trust, Attn: Thomas M. Alperin, et al., MA

Trustees Roxbury Latin School/Mass Corp., MA

Twenty-One 35 Realty LLC, Lou Kfoury, MA

Two 093-2105 Centre Street Nominee Trust, Bessie K. Thomas, MA

United Water, New York, NJ

Unitil Service Corp., Robert S. Furino, NH

Vergason-Essex Trust, LLC, c/o Simon Konover Co. Attn: Brian Nicknair, CT

Verifier Capitol, Addi Aloya, FL

Vertical Associates Co., RI

Vincent C.E. Peterson Trust, Vincent C.E. Peterson, et al., MA

Vinci Real Property, LLC, CT

Viola County Line Realty, LLC, CT

Virgin Mary/St. Pakhomious Coptic Orthodox Church, NJ

Companies and Organizations (cont'd)

Virjen, LTD, NY

Walter Realty, Inc., c/o William Greene and Co. Attn: Heather Blassberg, NY

Westerly Marina, Inc., Arthur DeMarchis, NY

Westmill LLC, CT

Westville Estates Community Association Inc., Attn: Kathleen Burns, CT

WEW 712 Brook Street, LLC, c/o Winstanley Enterprises, LLC, MA

WF Bros LLC, c/o Nick and Gino Vona, CT

Whiting Avenue LLC, MA

Woodfield Acres, Inc., Attn: Martin Feldi, NY

WR XXII, LLC, Attn: Tim Connelly, IN

WS Development, c/o Beth Windbourne, MA

Wyndam Land Trust, Inc., CT

Yando Rocky Hill, Inc., c/o Holm and Drath, LLP, NY

Yankee Gas Services, c/o Mike Curtain, CT

York Hill Rap Rock Quarry, CT

Individuals

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Aaron Hramiak, CT

Abby Marsa, MA

Abraham and Antoinette Llauger, NY

Abraham P. Joseph, NY

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Alexander Yuzhakov, MA

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Angela Pascale, NY

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Angela Seavey, NY

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Angelo Cerreto, NY

Angelo Serracchia, MA

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Ann Fanizzi, NY

Ann Lewis, NY

Ann Marie Gibson, NY

Ann Modena, MA

Anna Cugliandro, NY

Anna N. McKoan, CT

Individuals (cont'd)

Anne Bass, NY
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Anne Marie Lorigan, MA
Anne Marie Volpe, NY
Anne Pearl, NY
Anne Scally, NY
Anne Sumers, M.D., NY
Anne Zaera, NY
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Antoinietta Piriz, NY
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Arlene Goodenough, NY
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Barbara Dziuba, CT
Barbara Grady, NY
Barbara H. Hopkins, MA
Barbara Kopple, NY
Barbara L. Taggart, MA
Barbara LaFemina, NY
Barbara Stanton and William P. Conley, TS and Patricia Conley Irrevocable Trust and Stanton Irrevocable Trust, MA
Barbara Stewart, NY
Barbara Thompson, NY
Barry Zuckerman, NY
Bashir Suba, NY
Bearnice Croft, NY
Beatrice and Louis Morris, NY
Beatriz Lulo, MA
Begin Family Revocable Trust, Arthur J. Begin, Jr. and Richard E. Begin, Trust., MA
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Benjamin and Minerva Abramson, NY
Benjamin Dasilva and Jean Cotra, CT

Individuals (cont'd)

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Bernard and Prudence Oseit Tutu, NY
Bernard and Stephanie Vaughey, NY
Bernard J. and Jeanette G. Defazio, CT
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Betty Lee Shalou, RI
Betty Smyth, NY
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Bob Kelleher, NY
Bonnie B. Doran, CT
Bradlee Sheldon, PA
Bradley and Diane Conklin, NY
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Brian and Julie Murphy, NY
Brian and Stacey Retallick, NY
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Brian M. Dunning, MA
Brian Shovlin and AnneMarie Needham Needham, NY
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Bruce and Kathryn Tracy, NY
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Bruck Habtemarian and Makeda Essayas, MA
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Burchenal Green, NY
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Candace M. Almeida, MA
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Carl Grimm, NY
Carlos and Maryann Ascencao, NY
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Carmelo Apollonio, NY
Carmine and Emdio Incretolli et al., MA
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Carmine, Joseph A., and Joseph C. Saetta, NY
Carol A. Nettis, Revocable Living Trust, CT
Carol Ackbarali, NY
Carol and Matthew M. Zugibe, NY
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Carol Keenan, NY
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Caroline DePalma, NY
Caroline M. Harrison, CT
Caroline Mock and Kimberly Bisset, MA
Carolyn Altieri, NY
Carolyn and Ron Timcoe, NY
Carolyn Barthel, MA
Carolyn Fielding, NY
Carolyn R. Griffiths, NY
Carrie Litos, NY
Cary DeBenedictis, NY
Caryn Ann and Robert J. Falesto, Jr., NY
Cassandra Roth, NY
Catherine and Karen Rago, NY
Catherine and Lane Farber Schmitz, NY
Catherine Creecy and George P. Providakes, MA
Catherine Marsh, NY
Catherine Monzillo, NY
Cathy Quaranta, NY
Cecilia A. Clancy, CT
Celistino Arias, NY
Cesare Pasquale, NY
Chandler S. Davis, CT
Chandresh and Hemlata Patel, NY
Chaouki F. and Zeinan Freiha, MA
Charles and Francine Lee, NY
Charles and Jenny Zhao, CT
Charles and Lisa Bruzzese, NY
Charles and Margaret Lent, NY
Charles and Paula Roberts, NY
Charles and Rose Marie Barry, NY
Charles and Terry Martinelli, NY
Charles Blumeling, III, NJ

Individuals (cont'd)

Charles D. and Gilselia F. Farias, MA
Charles E. and Yvon Hock, III, NY
Charles Grauer, NY
Charles L. and Jennifer Lee-Craig Craig, NY
Charles Martinelli and Terry and Bianca and Kenneth Reynolds, NY
Charles R. Jr. and Barbara Jean Keesler, NY
Charles W. Shur, CT
Charlie Hayes, NY
Chas and Frances Travis, NY
Cherita, Eva M., Debbie and Andrew Gonzales, MA
Cheryl and Chester Andrews, CT
Cheryl I. and James F. Gilmore, NY
Chi Lam, NY
Chiffriller Residence, NY
Chris and Karen Londergan, MA
Chris and Wayne Kocher, NY
Chris Oliver, NY
Chris Wethered, NY
Christina A. Collins and Stephen S. Aprille, MA
Christina Dakin, NY
Christina Furfaro, NY
Christina S. Ponsades and Luz P. Rone, NY
Christine and Kenneth Confrey, NY
Christine Knowlton, NY
Christine M. and Douglas R. Esposito, CT
Christine Markley, NY
Christine Metzger, NY
Christine Michel and Jean Commaire Michel, NY
Christine Muscolo, CA
Christine R. Ferron, CT
Christine Schuster, NY
Christofores Karistianos, TC, Despina and Antonios and Agiro Yanikas and Anthipi Papangelis, MA
Christopher A. and Susan A. Hermonot, CT
Christopher and April Skennion, NY
Christopher and Debra D'Andrea, NY
Christopher and Rochelle Morello, NY
Christopher B. and Lisa M. Buteux, NY
Christopher M. Niemiec, NY
Christopher R. and Stacey Sharpe, NY
Cindy L. Miller, MA
Claire Silvers, MA
Claire Zoller, NY
Claires S. and Nathaniel J. Rogers, CT
Clara and Edward Ferreyra, NY
Claudette and Jean-Claude Cadet, NY
Clement and Rhonda L. Thompson, Jr., NY
Cleofe Cuevas, NY
Clifford T. Silva, RI
Colleen and Brian Kelly, NY
Colleen C. Morrill, CT
Colleen Klimek, NY
Collin Rees, MA
Conchita and Evelyn Regacho, NY
Conrad Starsja, NY
Constance B. Doubleday and Chelsea Benson, CT
Cora Weis, NY
Cordis and Michael Macalpin, NY
Cornelius O'Callaghan, MA
Courtney O'Connor, MA
Craig and Jodi Caliciotti, NY
Craig and Michele Purpura, NY
Craig Schultz, NY
Craig Stevens, NY
Csaba Toth, NY
Cumanda Torres and Cesar Bermeo and Pam Torres, NY
Curtis B. Randall and Barbara B. Zillman, MA
Cynthia A. Rogers, CT
Cynthia Butler-Martin, NY
Cynthia D. Arons, CT
Cynthia J. Slotkin, NY
Cynthia Lee, NY
Cynthia Neff, NY
D. Correia, NY
Dahmein and Michele McFadden, NY
Dale and Stephen C. Dubina, CT
Dan and Christine Wu, MA
Dan Killeen, Estate of, CT
Dan Welsh, NY
Dana Dionizio, NY
Dana S. Jr. Evans, RI
Dani and Jonathan Glaser, NY
Daniel and Rayola Chelladurai, NY
Daniel and Susan Mahoney, NY
Daniel B. Collins, MA

Individuals (cont'd)

Daniel C. and Nancy J. Lourenco, MA
Daniel C. and Sheila E Anderson, CO
Daniel M. and Cynthia Barry, NY
Daniel Murphy, NY
Daniel N. Field, CT
Daniel P. Keating, NY
Daniel Stewart, NY
Daniel T. Keon, NY
Daniel V. and Karen A. Mancuso, NY
Daniella Bernal, NY
Danielle Mantei, NY
Danine Skelly, NY
Danny R. Warren, Trustee, MA
Darcy Ann Witenko, CT
Daria Gregg, NY
Darrell C. Byers, MA
Darrell Marriott, NY
Daryl Paxson, NY
Dave Buren, CT
David A. and Kathryn A. Cox, MA
David A. Trudeau, CT
David Abraham, NY
David and Cindy Postian, NY
David and Dorothy Diederich, NY
David and Dorothy Perez, NY
David and Gloria Weinshel, CT
David and Mary Rosario, CT
David and Nancy Kahn, CT
David and Patricia A. Martin, NY
David and Po Chu Alice Lee, NY
David and Stephany Fanning, CT
David and Veronica T. Oxton, NY
David B. Harris, RI
David Buchwald, NY
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David Dietrich, NY
David Doskow, NY
David Forrest, CT
David H. and Barbara C. Vaughan, CT
David Holstein, CT
David J. and Donnam Dimartino, MA
David Kantarges, MA
David Lewine, NY
David M. and Stephanie Renzi, NY
David McEvoy, NY
David McGuine, NY
David Morkal and Kathleen Williams, NY
David Schassler, NY
David Sherman, NY
David Thomas and Heather J. Gruwell, CT
Dawn and Matthew Norris, NY
Dawn Budde, NY
Dawn Russo, NY
Dean McBeth, NY
Deanna Rose, NY
Debbie Costello, NY
Debbie Juckett, NY
Deborah Kaufman, NY
Deborah Plunkett, NY
Debra A. Gagnon, CT
Debra Alvernes, RI
Debra and Robert W. Mcnamara, NY
Debra O'Connor, NY
Declan Plunkett, CT
Deidre and Donald Wood, NY
DelRoy Paisley, NY
Denise and Otto Staats, NY
Denise Diri, NY
Denise Ward, MA
Dennis and Kathryn A. Sherman, RI
Dennis Drinnon, NY
Dennis Gormley, NY
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Diana and Nelson Sanchez, NY
Diane and John Tangen, NY
Dianna M. Piccarini, MA
Dianne and Phillip Picciano, NY
Dick Nelson, NY
DiCola Residence, NY
Dinis and Maria Demedeiros, CT
Dino P. Ricafranca and Lori A. Cormier, CT
Dino Thomas, et al. and Thomas Triantos, TC, MA
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Djavid and Florim Raci, NY
Dmitriy Khazanov, MA
Dominic Caputo, NY
Dominic Jacaruso, NJ
Dominic W. Pezzementi, NY
Donald and Anne Singer, NY
Donald and Heather Spaulding, CT
Donald and Marie Dwyer, NY
Donald and Rosemary Emeigh, NY

Individuals (cont'd)

Donald Depew, NY
Donald Edwards, NY
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Donald J. Akikie, Marilyn Cox and Mary N. and West Roxbury Realty Trust, MA
Donald Jr. and Dina Kennedy, NY
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Donald T. Watkins and Jennifer J. Nisbet, CT
Donald Woodard, NY
Donald Zern, NY
Donna and Roland Dorcean, NY
Donna L. Tilles, MA
Donna Starr, MA
Donna Strobel, NY
Donna Turner, NY
Donna Wessell, NY
Doreen Rynne, MA
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Doris O. and Stephen J. Cole-Hatchard, NY
Doris Trapasso, NY
Dorothea and Kenneth Brunck, NY
Dorothy B. Morgan c/o Terry Morgan, PA
Dorothy Fielding, NY
Dorothy O'Connor, NY
Dorothy Thomas, NY
Dorothy Tonich, NY
Dorothy Williams, NY
Doug Ballard, NY
Douglas A. and Michelle J. Viohl Cole-Hatchard, NY
Douglas and Eileen M. Odell, NY
Douglas J. and Victoria Taggart, NY
Douglas Mead, NY
Douglas Slotolowicz, NY
Douglas Whitbeck, NH
Dr. Courtney Williams, NY
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Dr. Thayer and Joan Draper, NY
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Edith E. and Francis F. Araby et al., MA
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Edward and Cynthia Villa, NY
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Edward J. Reed, NY
Edward L. Duryea, NY
Edward M. and Clare Fried, NY
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Edward R. Lynch, NY
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Edward Stebenvole, NY
Edward Tandy, NY
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Eileen and Thomas La Rosa, NY
Eileen and Tom Fedele, NY
Eileen Charles, NY
Eileen Feely, NY
Eileen Millane, MA
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Elizabeth Moore, NY
Elizabeth Sanchez, NY
Elizabeth Tomic, NY
Ellen Cantarow, MA
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Elouise and John Koski, NY
Emily and Valerie Sweeney, NY
Eric and Michelle Gulak, NY
Eric G. and Catherine Johansen, NY
Eric Gearity, NY
Erica and Chad Mills, NY
Erika Schenker, NY

Individuals (cont'd)

Erin and James Trapasso, NY
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Ermanno and Patricia Munno, NY
Ernest G. and Aidinha B. Blaney, Jr., CT
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Eva Lupica, NY
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Fang Hong and Loujia Shi Mao, MA
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Fargo Hadayia, Ts., Jean T. and Hadbro 1997 Realty Trust, MA
Fargo Hadayia, Ts., Jean T. and Hadbro 1997 Realty Trust, MA
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Frances Hammond, NY
Frances Ludwig, MA
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Francesco Ward, NY
Francine Snyder, NY
Francine Wiese, NY
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Francois Youhanna, MA
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George and Jacquelyne Seidler, NY
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Individuals (cont'd)

George Coniglio, NY
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Gerald and Carmen Williams, NY
Gerald and Sondra Levine, NY
Geralyn and James Alva, NY
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Ghassan W. and Lena Samaha, MA
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Gilbert and Denine Dimola, NY
Gilbert and Lois Longin, NY
Gilberte Morello, NY
Gillen, NY
Gina and Davide Gomes, NY
Gina Saia, MA
Gino Bonomo, NY
Giovanni Carlo Mino, NY
Giuseppe and Barbara Paonessa, NY
Glenn and Linda Ellingsen, NY
Glenn Creeden, NY
Glenn Dewton and Susana Correa, NY
Gloria A. Dirusso, MA
Gloria and Joseph Zale, NY
Gloria P. Rodriguez et al. and Luis E. Montes, MA
Gough Residence, NY
Grace M. Charles, NY
Gregory and Barbara A. Schnuck, CT
Gregory and Laura Gaynor, NY
Gregory and Natalie Roy, CT
Gretchen Flintosh, NY
Gretchen Pingel, NY
Guillermo A. and Amelie Sanchez - Martinez, CT
Guiwa Lakkis, MA
Gulmira A. David, MA
Guy Carlo B. and Flordeliza L. Ramel, MA
Guy G. and Nicole Isidore, NY
H. Carosi, NY
H. Winkelmann, NY
H.J. Von Der Goltz, MA
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Harold B. Jr. and Eileen T. Peterson, NY
Harrison B. Jones and Michael P. Rooney, NY
Harry Davis, NY
Harry Eisenberg, NY
Harry Mah et al., Trustee Mah Family Trust, MA
Harry P. and Dilys B. McIntyre, Jr., CT
Harry T. and Lori Moser, NY
Heather Nicholls and Patrick McCaughey, NY
Hector N. and Daisy Rivera, CT
Hegarty Residence, NY
Helen and Cheyl Lopez Vozzella et al., MA
Helen and Richard Cisek, NY
Helen C. Best, MA
Helen Curran, NY
Helen M. Ewald, CT
Helen Madden, Trust IRR., NY
Helen Meurer, NY
Henry Vasel, CT
Henry Westmoreland, NY
Herbert Oringel, NY
Herman Kahrs, c/o Platzl Brauhaus, NY
Herrera and Leon Residence, NY
Hill Residence, NY
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Holly and Mike Eichler, NY
Holly M. Haight, NY
Homer and Joyce Ludlan-Smith Smith, NY
Hope Solomon, NY
Howard and Phyllis Stapleton, NY
Howard C. and Analiza T. Traub, III, MA
Hugh O'Halloran, NY
Ilia Jr. and Carolyn A. Diterichs, CT

Individuals (cont'd)

Irving J. Kulick, etal c/o Alice Kulick, NY

Irwin Gladstone, NY

Isabelle T. Farrington, Living Trust, NY

Ismael and Zenaida Perez, NY

Jackson W. Davis and Patricia C., FL

Jacob and Paula Vaug Miller, NY

Jacqueline and Omar Irhan, NY

Jacqueline Doherty, NY

Jacqueline Karaban, NY

Jaime Ferrari, NY

James and Joan Sloat, NY

James and Julie Tuite, MA

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James and Mary Lou Baryza, NY

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James and Rita Lippert, NY

James and Salvatrice D'Amore, NY

James Bacon, Esq., NY

James Dolan, NY

James E. and Robert McCaw, CT

James E. Eagens, NY

James E. Grover, CT

James F. and Marilyn B. Green et al., MA

James Forte and Denise Panza, CT

James Gilbert, NY

James H. DeLuca, NY

James H. Wigmore, MA

James Haller, NY

James J. and Patricia S. Ruppert, NY

James J. Sepinski, NY

James J. Yates, MA

James Johnson, NY

James L. Park, MA

James M. and Kathleen M. Grogan, MA

James M. Whitfield and Margaret Adams-Whitfield, MA

James Michael and Melinda J. Trimble, NY

James P. and Frances E. Surak, NY

James P. and Mary E. Leonard, NY

James Russell, NY

James Seirmarco, NY

James V. and Marguerite A. Veltidi, NY

James W. Currier, CT

James W. Quill, MA

Jami S. Pascale, NY

Jamie and Maria Loureiro, NY

Jan B. Kavana, NY

Jan Meliti, NY

Jan R. Dyckman, NY

Jane E. Moorhead, CA

Jane G. Warren c/o Michael Warren, NY

Jane Kelleher, NY

Janet Curry, NY

Janet Englund, NY

Janet Guerra, NY

Janet M. Croft, NY

Janet Podell, NY

Janet Wagner, NY

Janice Strassburg Living Trust, NY

Janis D. Lynick, CT

Jannette Barth, NY

Jannette M. Barth, NY

Jason B. Gould, NY

Jay Sulow, NY

Jean and Dennis McCool, NY

Jean C. and William Breining, NY

Jean L. and Marie Villard, MA

Jean M. Collender, NY

Jean M. Steward, MA

Jean Piucci, NY

Jean Walsh, NY

Jeanette C. Gould, NY

Jeanette H. Bjurback and Nicholas E. Lupinacci, CT

Jeanmarie Cooney, NY

Jeanne Elven, CT

Jeanne Hoffman c/o Holly Siegel, NY

Jeanne Hoffman c/o Lee Hoffman, Jr. Esq., NY

Jeanne M. Graham, MA

Jeff Yates, CT

Jefferson Simplice et al. and Therese Pierre, MA

Jeffery and Kimberly Burd, MA

Jeffrey and Marian Bischoff, NY

Jeffrey C. and Alane E. Jennings, CT

Jeffrey C. and Mary C. Campbell, NY

Jeffrey Coleman, NY

Jeffrey M. Canning, NY

Jeffrey S. Hernandez and Catherine Hernandez-Casey, NY

Jenean Eichenholtz, NY

Jenia Quinn, NY

Jennifer Brodzik, MA

Jennifer Colasacco, MA

Individuals (cont'd)

Jennifer Daddio, NY
Jennifer DeSiqueira, NY
Jennifer Lahey, NY
Jennifer Maxwell, NY
Jennifer Stadt, NJ
Jennifer Tait, NY
Jennifer Uniak-Grosso, NY
Jenny Lisak, PA
Jeremy Zifchock, NY
Jerome T. and Susan Rodriguez, NY
Jerrold Miles, NY
Jerry Ravnitsky, NY
Jessica M. Alba, CT
Jessica Van Dekker, NY
Jhonathan Diaz, NY
Jian M. Zheng, CT
Jie Tang and Xiadon Wang, CO
Jill Marino, NY
Jill Z. and George Harry Kuhn, CT
Jim Jelenek, NY
Jim Trapasso, NY
Jing Li and Tu Wei Tong, MA
Jirong and Rui-Ying Zhu te Bai, MA
Jo Ann L. Conklin, NY
Joan A. and Robert W. Ford, CT
Joan and August Weise, NY
Joan Blan, NY
Joan Franich, NY
Joan Juckett, NY
Joan M. Tr. Civitanova, CT
Joan Marie and Lawrence F. Perrone Leonardi, NY
Joan McIntyre, NY
Joan Raiselis, NY
Joan Sichterman, NY
Joan Vogt, NY
JoAnn Kramer, NY
Joanna and Patrick Harbolic, NY
Joanne Dickey, MA
Joanne Harbolic, NY
Joanne Leader, NY
Joanne Simonyan, NY
Joe and Edna Flick, NY
Joe Duraes, NY
Joe O'Neill, NY
Joe Velders, NY
Johanna M. Locoparra, NY
John A. and Christine J. Falkl, NY
John and Claudia Bahrs, NY
John and Janella Eccleston, NY
John and Joan Cito, NY
John and Kalliope Stratidis, CT
John and Margaret Sullivan, NY
John and Mary Andretta, NY
John and Patricia Fisher, NY
John and Rhoda Famodimu, NY
John B., John T., and Bernadette Scally, NY
John Bozzi, Esq., CT
John DeBenedictis, NY
John DeCrenza, NY
John Dunn, NY
John E and Gorizia M. Howard, MA
John E. Sweeney, NY
John F. Shine and Marnal R. Newman, Jr. Ts of JNMC Realty Trust, MA
John F. Walsh, Jr., MA
John H. Duesing and Susan J. Meyer Duesing, NY
John J. and Frances M. Garrish, CT
John J. and Louise B. Capuano, NY
John J. and Marilynn F. Gillotti Jr., CT
John J. and Mary C. Tattan, MA
John J. and Norah V. and Croke Realty Trust Croke, MA
John Kakridas, c/o Hale Barnard Bill Payer Services, MA
John Krysko, NY
John L. and Heather Conklin, NY
John L. Sweeney and Annette P., Estate, CT
John L., John L. Jr., and Florence Rich, NY
John Louis Parker, NY
John M. and Jane M. Price, MA
John Marafioti, NY
John O. Berg, CT
John O'Connor, NY
John P. and Janine M. Verrengia, NY
John P. Houlihan, NY
John Peterson, CT
John R. and Patricia T. Crowe, CT
John Romanik, FL
John Russo, Trustee, CT
John Spring, NY
John T. Neider, NY
John Tanner and Donna Livulpi, CT
John Van Ostrand, III, CT
John W. and Susan M. Friel, MA
John W. Shippie, MA
Jolene Lent, NY

Individuals (cont'd)

Jo-Marie Barrientos, NY
Jon Chen, CT
Jonathan Hall, MA
Jonathan Hyman, NY
Jonathan Magee, NY
Jonathan O. and Sandhya Katz, NY
Jose A. Amaya-Crux and Vilma Bonilla-Velasquez, MA
Jose A. Melendez and Elisa Flores, MA
Jose and Josephine Rosario, NY
Jose and Nilda Blanco, NY
Jose and Noemi Dejesus Aponte, NY
Jose Barajas, NY
Jose Maya and Thomas V. Plamkoottathil, MA
Joseph A. and Linda Parenti, NY
Joseph and Christin A. Kondash, II, CT
Joseph and Katherine Slocum, NY
Joseph and Maria A. Guidice, NY
Joseph and Maureen Emmert, NY
Joseph and Melanie B. Marcario, NY
Joseph and Vivian Erbetta, NY
Joseph B. and Donna M. Lyons, Jr. et al., MA
Joseph C. and M. Elizabeth Grace, MA
Joseph Cerreto, NY
Joseph D. and Theresa M. Ramaci, MA
Joseph D. Foley and Erin M. Hannon, MA
Joseph D. Ramaci, Jr., MA
Joseph G. and Joyce A. Buckley, et al., MA
Joseph G. and Rita C. Painchaud, NY
Joseph G. Ganame c/o Ganame Realty Trust, MA
Joseph G. Kirby, Ts, MA
Joseph Giarnella, NY
Joseph J. Harzbecker, Jr., MA
Joseph Kozlowski, NY
Joseph L. and Uwo Gwendolyn Brooks, Ts., MA
Joseph L. Goode, MA
Joseph M. and Cynthia A. Gillan Hickey et al., MA
Joseph M. Orlando and Sandra L. Stallings, CT
Joseph N. and Donna J. Coto, NY
Joseph P. and Arlene LeVasseur, Jr., CT
Joseph P. Costello, NY
Joseph P. Stanger, NY
Joseph Previtera, MA
Joseph S. Jr. Farah, CT
Joseph Wiese, NY
Josephine A. Papula, NY
Josephine Paolucci, AZ
Josephine Principessa, MA
Joyce A. Fisher, NY
Joyce Belden and Devon Chapin Chapin, CT
Juan Anthony Torres, Jr. and Rafaela Villar, NY
Juan Mejia, NY
Judith and Charles N. Beshwaty, MA
Judith Halper, MA
Judith O'Brien, NY
Judith Stein Coleman, NY
Judith Wells, NY
Julia J. Ungarino, NY
Julia M. Orourke, RI
Juliane Lasaponara, NY
Julianne and Michael Connolly, NY
Julie and Michael Aitchison, NY
Julie Asfendis, NY
June Pierce, NY
Justin A. Paoloni, RI
Kamalini Martin, NY
Karen and Richard Strang, NY
Karen Costa, NY
Karen DeMasi, NY
Karen Klubko Connors, CT
Karen Mansfield and Darla Addabbo, NY
Karen Patricia Welch, NY
Karen Pinsky, NY
Karen Riccardelli, NY
Karen Rudnicki, NY
Karen Wells, NY
Karina A. Vasilenko, MA
Katavolos Residence, NY
Katherine A. Phillips, MA
Katherine Bozzi, CT
Katherine Somers, NY
Katherine Stigdon, NY
Kathleen and Vincent J. Pentimone, NY
Kathleen Belluzzi, NY
Kathleen Bertoline, NY
Kathleen Farrey, NY
Kathleen Gillespie, Ts., MA
Kathleen Gillis, NY
Kathleen Gray, NY
Kathleen Kullberg, VA
Kathleen M. Michelsen, CT
Kathleen P. Martley, RI

<u>Individuals (cont'd)</u>

Kathleen Paulson, CT
Kathleen Reidy, CT
Kathleen Rumsey, NY
Kathy Asaro, NY
Katrina O. Veidins, MA
Katy Dunlap, NY
Kay and Frank McNabb, CT
Keith and Cynthia Cartnick, NY
Keith Brothels, CT
Keith D. and Kim Crawford, MA
Keith R. Goudreau, MA
Keith S. and Amanda L. Dawley, Jr., CT
Kelliann Daly, NY
Kellie Budde, NY
Kelly and Peter Kincaid, NY
Kelly Fa, NY
Kelly McKinley, NY
Kelly Wall, NY
Ken Harbolic, NY
Ken Spaeth, NY
Kenneth A. Sanzeni, CT
Kenneth and Liz Caines, MA
Kenneth and Lois Baisley, NY
Kenneth Lewis, NY
Kenneth M. and Christine Rudner, NY
Kenneth N. Salstrom, NY
Kenneth P. and Kristen P. Orzechowski, CT
Kenneth Quarato, NY
Kenny and Joselyn Phillips, NY
Kerry and Patrick McCarthy, NY
Kevin and Donna McCaffrey, NY
Kevin and Elise Hughes, CT
Kevin and Patricia Daley, NY
Kevin E. Jordan and Holly E. Ready, MA
Kevin J. and Joan M. Fagan, NY
Kevin J. Lawner, NY
Kevin R. Blakeslee, CT
Kevin S. and Traci Schultz-Brega Brega, NY
Kevin Schmoeger, NY
Kevin W. and Marjorie S. Callaghan, CT
Khalid El Hasnaoui, MA
Khamphanh and Sukpaseuth Phongsa, CT
Kim S. Conklin, NY
Kimberley and Russell J. Petro, NY
Kimberly and Erik Zern, NY
Kimberly E. Chusmir, CT
Kirsten J. Filosa, NY
Kirsten Sheppard, NY
Kit Kechejian, CT
Kristine E. Holloran, MA
Larry A. Weinberg, NY
Larry L. and Margaret L. Norfolk, CT
Larysa Dyrszka, NY
Laura Davin, NY
Laura Petrillo, NY
Laura Ravotti, NY
Laura Schindler, MA
Laurel Lyford, NY
Laurie R. Gibeau, RI
Lauro and Alicia Uruchima, NY
Lawrence and Donna Iazzetti, NY
Lawrence J., Helen C. and Lawrence Joseph Healy, MA
LeeAnn McCarthy, NY
Lenny and Amy Amodeo, NY
Lenore Smith, NY
Leo V. Sybertz, MA
Leon and Anna M. Wrobel, CT
Leon J. and Tammy L. Wrobel, CT
Leon Schindel, NY
Leonar Soto, MA
Leonard B. and Mary E. McMahon, MA
Leonard J. and Allison J. Manzella, Jr., NY
Leonard J. and Nancy Carpezzi, NY
Lesley and Annette Lowther, NY
Leslie M. Arzoomanian, NY
Leslie Sabato, NY
Leszek and Renata Omelanczuk, NY
Leticia H. Morales and Jose P. Daria, MA
Lewis and Barbara Uttaro, MA
Liam Hinchey and Richard Upton and DandB Realty Trust, MA
Lillian A. Stein, NY
Lillian Dyckman, NY
Lillian Joseph, MA
Linda A. Habib, MA
Linda A. Imperato, NY
Linda and John Petrusich, NY
Linda and Michael Breen, NY
Linda and Michael S. Peters, NY
Linda and Stephen Iametti, NY
Linda Everett, NY
Linda Griffin, NY

Individuals (cont'd)

Linda J. Slamin, MA
Linda McTernan, NY
Linda Skinner and William Dennis, NY
Linda, John, and Sean Hanley, NY
Lisa Hagen, NY
Lisa Hanney, NY
Lisa M. Flannino, NY
Lisa Moir, NY
Lisa Paonessa, NY
Lisa Silver, NY
Liz McCluskey, NY
Lois Ann Nelli, NY
Lois Kessler Attn: Michael J. Lorenz, Jr., NY
Lois Rinzivillo, NY
Lora Saltis, MA
Lorenzo Henderson, NY
Loretta Brown, NY
Lori and Paul Pyrch, NY
Lori Coogan, NY
Lori Krane, NY
Lori Perkins, MA
Lorraine DuBeau, NY
Lorraine Keegan, NY
Lorraine M. Furino, CT
Louis and Christine Pastina, NY
Louis and Josephine Cavaliere, NY
Louis and Sandra Klein, NY
Louis C. Balezos et al. and Constantinos E. Belezos, MA
Louis Falcone, MA
Louise and Wilma Maio, NY
Louise Paterno, NY
Luanne Glashoff, NY
Lucian and Lacy Spiteri, NY
Lucinda Manning, NY
Lucy C. Casey, NY
Lucy Durr, NY
Lucy Gray, MA
Luigi Falciano, NY
Luis A. Siguenza, NY
Luis Gonzalez, NY
Luis Orozco, NY
Lydia E. Hornedo, MA
Lyle Walker, RI
Lynda Habib and Paul Jamiol, MA
Lynda Karanikolas, NY
Lynn Mastroddi, NY
Lynne Montgomery, CT
Lyta Schreiber and Jose Banda, NY
M. Jill Davis, NY
M. Ruyack, NY
Mabel MacDonald, CT
Mailan Thong and Vichiravuth Kret, MA
Mansour Succar, MA
Mara Lepore, NY
Marc E. and Mary Ann Holyfield, CT
Marc H. and Debra L. Michalovsky, CT
Marc J. Wolf, CT
Marcia and Thomas Hintze, NY
Marcia Glantz, NY
Marco Pinque, NY
Marcy J. Segelman, MA
Margaret Amaral and Margaret Amaral Realty Trust, MA
Margaret and William B. Stanley, CT
Margaret Ann Zern, NY
Margaret Gonyon, NY
Margaret Hughes, NY
Margaret Karlik, NY
Margaret Keesler, NY
Margaret Q. Arborio, CT
Margery Schab, NY
Maria A. Rivera, MA
Maria Adriana Bello, CT
Maria and Rafael Rodriguez, NY
Maria Antonio, NY
Maria Blessing, NY
Maria D. Morrissey, NY
Maria Defatima Queiroz, CT
Maria Ellen Geraghty, MA
Maria Fernandez and Jude Rodriques, NY
Maria M. and Edward J. Rose, NY
Maria M. Del Torro, MA
Marian L. Martins, MA
Marianna Sherman, NY
Marianne F. and Thomas King, NY
Marianne F. Merritt, NY
Marianne Mcgovern and John J. Zugibe III, NY
Marie A. O'Neill and One-21 Grove St. Revocable Trust, MA
Marie Anstett, NY
Marilyn T. Gross, MA
Mario Franco Iacino, CT
Marjie Kemper, NY
Marjorie A. Grimm, NY
Mark A. and Dawn M. Fiore, RI
Mark and Eleonora Zak, MA
Mark and Maureen Hyatt, NY
Mark C. and Kimberly A. Fortune, MA
Mark E Begley, MA
Mark J. and Donna L. Dapice, CT

<u>Individuals (cont'd)</u>

Mark J. Donadio et al. and Anne Marie Mazzarella, MA
Mark S. and Karen Kaczmarczyk, CT
Mark S. and Lorraine M. Anderson, NY
Mark Sandeen, MA
Mark William Brink, NJ
Marlene McDermott, MA
Marlis Jacobowitz, Trustee, CT
Marsha M. Landsberg, NY
Marta and Gary Midelton Jemiola, NY
Martin Anaya, NY
Martin C. Smolin, NY
Mary A. Davis, Trust, NY
Mary A. Harakaly, CT
Mary and Steve Manfolk, NY
Mary and Yannick Lastennet, NY
Mary Ann Babinski, MA
Mary Beth Thomas, MA
Mary C. Morrison, NY
Mary Chopyack, NY
Mary Crowley, NY
Mary E. Macnair, lt and Patricia E. Hubbard, MA
Mary E. Suleske L/U and Mary Ann Ciezynski, CT
Mary Ellen Baker, NY
Mary G. Petersen, MA
Mary Gerhardt, NY
Mary Gesinger, NY
Mary Green, NY
Mary Hawkins, NY
Mary Jean Garofalo, CT
Mary Jean Schubert, NY
Mary K. Abdelahad, MA
Mary Lou Arfield, NY
Mary McGuire, NY
Mary Murray, NY
Mary Napurski, NY
Mary Naylor, NY
Mary Rose Fanning, MA
Mary Schwartz, NY
Mary, Richard, and Siobhainin Funchion, NY
Maryn Borne, MA
Mathew B. Freedman and Andrea Freedman, MA
Mattheos and Iosifina Tampassidis, MA
Matthew and Catherine Castellano, NY
Matthew and Christine Clayton, NY
Matthew Brian Cook, NY
Matthew C. Cahill and Tania E. Bracetti-Cahill, NY
Matthew Geider and Jennifer Pugliese, NY
Matthew J. and Andrea Taffner, NY
Matthew McGuire and Jessica L. Porter, MA
Matthew Ross, NY
Matthew, Claire, and Helen Feely, NY
Maude and Serge Edouard, NY
Maureen Bosworth, NY
Maureen Connaire, NY
Maureen J. and Rindini Family Trust Collins, MA
Maureen Kuney, NY
Maureen Mercer, NY
Maurice C. Sheehan, tc, MA
Maurice T. O'Brien, Tr., OH
Mauricio F. Monaco, NY
Megan Prokopiak, NY
Mel Olsson, CT
Melinda and Stephen Spataro, NY
Melissa Luo, MA
Merle and Norman Schoenfeld, NY
Michael A. and Jennifer L. Jones, CT
Michael A. Yaffe et al., Trustees Phyllis Yaffe Family IRR Trust, MA
Michael and Amy Howell Cippola, CT
Michael and Camille Cannon, NY
Michael and Dana D'armiento, NY
Michael and Dawn Walsh, MA
Michael and Deborah Pfeifer, NY
Michael and Eunice Carias, MA
Michael and Gertrud McEvoy, NY
Michael and Judith Jenkins, NY
Michael and Julie Anne Riggs, CT
Michael and Margaret Ellicott Sheehan, NY
Michael and Patricia Chirico, NY
Michael and Patricia Chirico, NY
Michael and Ray Pagano, NY
Michael and Roberta Bleakley, NY
Michael and Sally Hannon, NY
Michael and Sheila Moylan, MA

Individuals (cont'd)

Michael Brechlin, CT
Michael C. and Gorgonia C. Cruz, CT
Michael C. Bernstein, MA
Michael Carazza, NY
Michael Carriere, NY
Michael D. Diederich, Jr., NY
Michael DeBenedictis, NY
Michael F. and Maureen P. Weir, CT
Michael Gordineer, NY
Michael H. Marciano, CT
Michael H. Schwartz, NY
Michael J. and Roberta A. Whelan, MA
Michael J. Donohue, NY
Michael J. Ganci, CT
Michael J. Gill, Ts. and Oonagh E. and Grove Terrace Realty Tr., MA
Michael J. McCallion, NY
Michael J. Sr. and Patricia D. Coyne, NY
Michael Kempski and Dawn Pusey-Kempski, NY
Michael L. and Myla K. Specht, NY
Michael L. and Sonia Fuller, CT
Michael Moreira, NY
Michael P. and Barbara Leff, NY
Michael Patras and Michael Meena and Max AandM, NY
Michael Puccio, NY
Michael S. and Karen A. Dodge, CT
Michael Shea, NY
Michael Stapleton and Nicole J. Stern, MA
Michael W. and Gail P. Diluzo, CT
Michael Weiss, NY
Michael Ying Buckley, MA
Michele A. Daniels, MA
Michele Carlson, NY
Michele Haight, NY
Michele Marona, NY
Michelle Lineweber, CT
Michelle Sobocinski, NY
Miguel A. Julia-Vazquez and Jeanette Dees, CT
Miguel Gadea, NY
Mike Gordon, NY
Mila M. Guinto, MA
Monica A. and David J. Stringer, CT
Mr. and Mrs. David Tandy, NY
Mr. and Mrs. Jon Jacoby, NY
Mr. and Mrs. Joseph Giacomantonio, NY
Mr. and Mrs. Joseph P. Hooke, NY
Mr. and Mrs. M. Zulla, NY
Mr. and Mrs. V. Moscardelli, NY
Mrs. William Durr, NY
N. Murray, NY
Nafie and Philip Shelly, NY
Nalliska K. Malone, MA
Nancy Brown, NY
Nancy E. Reagan, CT
Nancy G. and William Knight, VA
Nancy J. Toussaint, CT
Nancy Jenerose Turrone, NY
Nancy Koutnik, NY
Nancy Trapasso, NY
Nancy Vann, NY
Nancy Whalen, NY
Natalie Friedman, NY
Natalie Tropiano, NY
Nathan Palmer, NY
Neil I. and Eva M. Seamon, MA
Nemr and Christiane B. Kiami, MA
Nenette Kress, NY
Neru and Salil Mehrotra, NY
Nexhmije and Fadil Maska, MA
Nicholas and Bonnye Mollicone, NY
Nicholas and Brigette Savona, NY
Nicholas and Laura Picariello, NY
Nicholas and Marie Nittoli, NY
Nicholas G. and Matina Langadousis, et al., MA
Nicole Lopen and Walter Ostrowski, NY
Niculita Constain, NY
Nieves Pousada, NY
Nigel L. and Pamela J. Desilva, MA
Nike and Vasilika Cobi, MA
Nikki Apostolou, NY
Nikolaos etux and Efstathia Christoulis, MA
Nina Johnson, NY
Nino and Norina Mariani, NY
Nisha Swinton, ME
Noda Aurea, MA
Noelle Hanks, NY
Nora and Lenard Conklin, NY
Nora Calix Kassab, MA
Nora Comolli, NY
Nora Lye Lee and Tony Sing Wong, MA
Nora Mulligan, NY

Individuals (cont'd)

Noreen T. and David Rothman, NY
Norine Keating, NY
Norma Jeanne Sporck, CT
Norma Kalil Osta, CT
Nuno M. Pires, NY
Oleg Klavcrov, MA
Olga Colon, NY
Olga Zavala, MA
Oliver N. and Chidinm Ogbonna, NY
Orlando Soto, NY
Ortiz Family, NY
Oscar and Germania Garzon, NY
Pamela Turner and Irrevocable O'Dell, NY
Pamela W. Clausen, NY
Patric J. and Melissa R. Lange etal, MA
Patrice and Thomas Keesler, NY
Patrice Gillespie, CT
Patricia and Bruno Campea, NY
Patricia and Fred Greco, CT
Patricia Hempel, et al., CT
Patricia Korn, NY
Patricia M. Duclos, NY
Patricia McDonald, Ts., MA
Patricia Ryan, NY
Patricia S. Monkman, MA
Patricia Singleton, NY
Patricia Teahan, MA
Patrick and Gloria Boyd, NY
Patrick and Irene Keenan, NY
Patrick and Joan Cathren, NY
Patrick and Kerry Mcarthy, NY
Patrick and Sandra M. Lynch, MA
Patrick Dowling and Gina Dilillo, NY
Patrick J. and Noralee K. Meehan, MA
Patrick J. Coughlin, MA
Patrick J. Cronan, MA
Patrick L. Sr. O'Mara, NY
Patrick Scanlon, NY
Patrick W. and Melissa A. Brunelle, RI
Patrick Walsh, NY
Patti Smith, NY
Paul A. and Catherine Marino, MA
Paul and Barbara Bateman, NY
Paul and Joanne Whelan, MA
Paul and Laura Campagna, NY
Paul and Nancy B. Carbone, CT
Paul Buckhout, NY
Paul Childs, NY
Paul E. and Ann T. Keon and Keon Realty Trust, MA
Paul E. and Lisa K. Kegler, CT
Paul Ellis, NY
Paul F. and Carol A. Plant, NY
Paul F. Dunn, Jr., MA
Paul Gaspar, NY
Paul H and Michelle E. Weir, MA
Paul J. and Lisa M. Smith, NY
Paul J. and Patrice A. Diroma, NY
Paul J. Glennon, MA
Paul J. Kennedy and Dawn McConville, MA
Paul J. Mcirney, III, MA
Paul Joseph Botchis, CT
Paul P. Cocci, Trustee C & C Realty Trust, MA
Paul P. Cocci, MA
Paul R. and Mary L. Bolduc, RI
Paul Weber, CT
Paula L. Clair, NY
Paulette D'Ambrosio, NY
Pauline and John J.T. Buco, RI
Pauline M. Hunt, NY
Pavli and Liljana Qorri, MA
Pedro and Margarita Laredo, MA
Perry Ferris, CT
Peter A. and Susan Andersen, NY
Peter and Jennifer Hyde, MA
Peter and Lauren Ruggiero, NY
Peter Bakis and Rockland Trust, MA
Peter C. and Rachel L. Hanson, CT
Peter Gorman, NY
Peter H. Callaway, NY
Peter J. and Erica L. Neu, MA
Peter J. Bell, NY
Peter J. Hillebrand, NY
Peter S. and Patricia E. Melville, MA
Peter Smigel, CT
Peter T. and Donna M. Towler, NY
Philena T. Bolden, NY
Philip and Barbara Boyle, NY
Philip and Elizabeth Boyle, Jr., NY

Individuals (cont'd)

Philip V. and Ann M. Barden, Ts. and Family Tr., MA
Phung P. and Hoa That Ton, CT
Phyllis and Richard Novohradsky, NY
Phyllis Difrancia, CT
Phyllis Lupi, NY
Piro and Sonja Pelari, MA
Preetam and Yadita Samnarain, NY
Priscilla Coughlin, NY
Quentin J. Hanrahan, NY
Radhika Hernandez, NY
Rafael and Laura Silva, NY
Raffaele Iamiceli, NY
Raj and Linda Kanojia, NY
Rajadevia A. Satchi, CT
Ralph and Lucille Marchitelli, NY
Ralph DeGroat, Sr., NY
Ralph Major, NY
Ralph Serpe, NY
Ralph Tharua, NY
Ramin Abrishamian, MA
Raul Villa and Digna Esperan Tacuri, NY
Ravi Buckredan, NY
Ray J. Norton, Jr., MA
Raygo and Dawanna Veneable, NY
Raymond A. Reber, NY
Raymond and Geraldine Campbell, NY
Raymond D. Bertrand, MA
Raymond Haas, NY
Rebecca Quigley, NY
Regina R. Keefe, NY
Regina Wooster, NY
Reid H. Gearhart and Tiziana Mohorovic, NY
Rene Bracken, NY
Renn M. Nunes and Brittany N. McKinnon, CT
Rev. Daniel O'Brien, Sr., NY
Reyna Lounsbury, MA
Richard A. and Cynthia J. Compton, Jr., CT
Richard and Barbara Martindale, NY
Richard and Diane Aro, NY
Richard and Frances Ruyack, NY
Richard and Jilia Tilger, NY
Richard and Lisa Urban, NY
Richard and Theresa Walsh, NY
Richard Becker, NY
Richard Boylan, NY
Richard D. and Emma L. Clarke, CT
Richard F., Ronald L., and Terry T. Bushka, CT
Richard G. and Helen Weingart, CT
Richard G. and Lianne M. Moses and Ler P. Realty Trust, MA
Richard Isaacson, NY
Richard J. Beaulieu, CT
Richard K. and Hope E. Wise, CT
Richard Knizeski, NY
Richard Lutkevich and Patrick and Sheila Walsh, NY
Richard Nelund, NY
Richard P. and Tulay Luciano, CT
Richard Perugini, NY
Richard Rowlands, NY
Richard Ruffini and Lillian Lumadue, MA
Richard S. and Terry Lynn Shaffer, III, CT
Richard Saraceno, NY
Rickey Lombardi, NY
Rita J. Robertine, NY
Rita Tsinzo, MA
Rob and Nicole Segnit, NY
Robby and Celia Teichman, NY
Robert A. and Andrea Kissel, NY
Robert Alonso, NY
Robert and Allison Isola, NY
Robert and Barbara Archambeault, CT
Robert and Donna Palazzo, NY
Robert and Ellen Buczkowski, NY
Robert and Erika Diaz Caputo, CT
Robert and Janet Sullivan, NY
Robert and Karin Miller, NY
Robert and Linda Burden, NY
Robert and Linda Fuerst, NY
Robert and Sandy Walsh, NY
Robert and Serafina Bates, NY
Robert and Susan Heiferman, NY
Robert Benedetto, NY
Robert C. Grimes, Jr., CT
Robert Codman and Bonnie Hanes, Jr., MA
Robert E. and Evelyn Hatcher, MA
Robert F. and Kathleen Dymes, NY
Robert F. and Lynn A. Morris, MA
Robert F. Curran, NY
Robert G. and Linda A. Kovacs, CT
Robert G. Capron, RI

Individuals (cont'd)

Robert H. Reissfelder, Jr., MA

Robert Ingenito, NY

Robert J. and Beverly Winoski, CT

Robert J. and Dolores Stein, NY

Robert J. and Patricia Maio, NY

Robert J. Lewis, NY

Robert J. Reardon, NY

Robert K. and Patricia Goethals, NY

Robert L. Mazza, et al. and Norbert C. Nyhan, Jr., MA

Robert Lynch, NY

Robert M. and Gloria Jackman, NY

Robert Mastroddi, NY

Robert McFadden, NY

Robert Moskowitz, CT

Robert N. Hudson, NY

Robert P. Deshiro etux and Mary Lou Deshiro, Life Estate, MA

Robert Pelaccio c/o Anya H. Wehlau, NY

Robert Raymond and Patricia Mary Thompson, NY

Robert S. Carter, etux and Louise A. te Louise A. te, MA

Robert Scott, NY

Robert Strumke, NY

Robert Thomas, CT

Robert Ukeiley, KY

Robert V. and Mary G. Cieri, CT

Robert Vera and Norma Velazquez, CT

Robert W. and Laurie Cusick, NY

Roberta Gaudinier, NY

Robin A. and Kathryn L. Chesmer, CT

Robin L. Gilman, CT

Rodney and Rena jt Oudan, et al., MA

Rodolfo and Marie Antoinette Franze, NY

Roger M. and Georgette E. Kiami, MA

Roger Olson, NY

Roger R. Van Horn, NY

Rogerio M. and Filomena V. Pereira, CT

Rolland Wayne and Noreen Eloise Clarno, CT

Romona Desire, MA

Romona Genao-Archibald and Mark Archibald, NY

Romualdo and Gian Altobelli, NY

Romulo Neira, CT

Ron Urban, NY

Ronald C. and Donna M. Geck, CT

Ronald D. Rosen, NY

Ronald J. and Barbara Anstett, NY

Ronald J. Fontaine, MA

Ronald Lapinsky, NY

Ronan V. and Margaret O'Brien, NY

Rosa Arias, MA

Rosa Goncalves, NY

Rosa Mitrione, NY

Rosa Varella, NY

Rosaria A. Gomez, MA

Rose Ann and John Billings, NY

Rose Cosentino, NY

Rose Mason, NY

Rosedale and Roland Duguesnay, CT

Rosemarie DeMasi, NY

Rosemarie Muscolo, NY

Rosemarie Novelli-Salyer, NY

Rosemary and Dennis Lasher, NY

Rosemary and Viggo Worum, NY

Rosemary True, NY

Rosmarie Fint, NY

Roth Residence, NY

Roy B. Fleming, CT

Rudolph F. and Joan L. Schwerdt, NY

Russell and Jane B. McNeil, Ts. and Washington Realty Trust, MA

Russell W. Wilson and Richard E. McGuinness, MA

Ruth Spaeth, NY

Ryan Black, MA

Ryan Patrick Arsenault, MA

Ryan W. and Patricia S. Hawthorne, CT

S. O'Reilly, NY

Saladino Residence, NY

Salvatore A. and Cynthia C. Branca, NY

Salvatore B. Chillemi, MA

Salvatore Bottiglieri, NY

Sam Kleiner, CT

Samantha Zide, MA

Samuel Osborne, Jr., NY

Samuel R. Piotrkowski c/o Petrowski Auctioneers Inc., CT

Sandra J. McNichols, MA

Sandra M. and Bernardo Rey, CT

Sandra M. Blakeslee, CT

Individuals (cont'd)

Santo S. Vinci, Sr., CT
Sarah D. and Stanley D. Gromm, NY
Sarah J. Schmidt Hirakis, CT
Sarita Eisenstark, NY
Savvas Iliades, Ts. and Dimitra Realty Trust, MA
Schembari Residence, NY
Scott Allison, NY
Scott Horton, NY
Scott M. and Amy J. Hingley, RI
Scott Moreau, NY
Seamus and Eileen Coughlan, NY
Sean M. Walsh, MA
Sean W. and Lisa M. Bucher, CT
Selina and Joseph Medoro, NY
Selya and Lawrence Stone, NY
Serge and Waleria Isabelle, CT
Seth and Gina Lipscher, NY
Seth and Jeannie Weinstein, NY
Seymour Adelman, CT
Shannon Boylan, RI
Shannon Quinn, NY
Sharon Bellas, NY
Sharon Bodenschatz, NY
Sharon Gilleo, NY
Sharon Murphy, NY
Sharon Paterno and Craig Perusini, NJ
Sharyn Kuss, NY
Shawn McGillicuddy, CT
Sheila and John Collins, NY
Sheila Bushkin-Bedient, NY
Sheldon and Teres Charles et ux, MA
Shelley Avellino, NY
Shelly R. Eaddy, NY
Sherri L. and Walter A. Porr, NY
Sherry Horowitz, NY
Silvia Estebanez, NY
Siobhan Rossi, NY
Smith Residence, NY
Son Van and Aparecida Nguyen Etux, MA
Sonda and Gerald Levine, NY
Sonia and Gueron Nava Aloya, FL
Sonia Fujimori and Scott Crowder, NY
Sonnia Carbone, NY
Sonya Lewis, NY
Stacey M. Kelliher, MA
Stacy Conklin Chalk, NY
Stanley and Barbara Jacobs, NY
Stephan W. Anstett, NY
Stephanie and J. Schembari, NY
Stephen A. Kelley and Seana M. Pitt, NY
Stephen and Anne Bingman, NY
Stephen and Jean A. Klubko, CT
Stephen Costa, NY
Stephen J. and Ann M. Cole-Hatchard, NY
Stephen J. and Mary Lou Zmijeski, CT
Stephen Kohlhase, CT
Stephen M. Davis, MA
Stephen V. and Angela J. Corozine, NY
Stephen Z. and Yang Yang Edmondson, CT
Steve Dohoney, CT
Steven A. Boucher, CT
Steven and Carol Russo, NY
Steven and Sue C. Singer, NY
Steven Bernstein, MA
Steven M. Stein, NY
Steven R. and Christi Araujo, NY
Steven R. and Marlene R. Dupre, RI
Steven W. and Dana Grossman, NY
Stuart H. Rickett, DDS, NY
Sujatha Dasari and Veera Indana, NY
Sullivan Residence, NY
Sung and Hye Ahn, NY
Suresh Packiriswamy, CT
Susan and Gerald Peet, NY
Susan Burke, NY
Susan Cuccinello, NY
Susan Dugaw, NY
Susan F. and Paul B. Matthews, NY
Susan Filgueras, NY
Susan Kikoler, NY
Susan McDonnell, NY
Susan Moriarty, MA
Susan Oelkers, NY
Susan Peckelis, NY
Susan Redlich, MA
Susan Schwarz, NY
Suzannah Glidden, NY
Tandy Residence, NY
Tasso Lambrou and Mihail Triantafillou, NY
Terence and Toni Ann Dwyer, NY
Teresa Guerriero, NY
Teresa J. and Lawrence S. Fagan, et al., MA

Individuals (cont'd)

Terrence R. and Rachel B. McGregor, MA
Terri Halliday, MA
Teymour and Cheri E. Jamal, MA
Theodore and Lynn Needlemen, NY
Theodore and Rosemary Perrin, NY
Theodore L. and Carol A. Schultz, NY
Theresa A Augustine, CT
Theresa DiBitetto, NY
Theresa Jessup, NY
Theresa Kardos, NY
Theresa M. Grady, MA
Theresa McHale, NY
Theresa Ryan, NY
Thimitri Paspates et al. and Frannie Phillips, MA
Thomas A. and Denise R. Mozzer, Sr., CT
Thomas and Christine Mingone, NY
Thomas and Gail Sinclair, NY
Thomas and Joyce See, NY
Thomas and Rachel McLaughlin, NY
Thomas and Rosemarie Oppedisano, NY
Thomas and Sharyn L. Duncan, MA
Thomas Careccia, NY
Thomas Fedele, NY
Thomas G. Christmas, NY
Thomas H. Von Den Benken, MA
Thomas J. and Ann Marie McCarthy, NY
Thomas J. and Eleanor M. Clancy, MA
Thomas J. Roberts, CT
Thomas J. Shakun and Pamela Cummings Shakun, CT
Thomas Joseph and Annemarie Carey, MA
Thomas L. Holmgren, Trustee, CT
Thomas Lorino, NY
Thomas M. Hopkins, NY
Thomas McCaffrey and Margaret A. Richmond, NY
Thomas Mobbs, NY
Thomas N. Connery, CT
Thomas Tramantano, NY
Thomas W. Gonzalez, NY
Timothy and Kelly Peach, NY
Timothy Bleakley, NY
Timothy C. and Catherine F O'Neill and One Bow Realty Trust, MA
Tina Rickett, NY
Todd Tieche, NY
Toni Ann and Thomas Fonte, NY
Towers Residence, NY
Tracey DeBenedictis, NY
Tracey M. Meikle and Richard I. Fancher, Jr., CT
Tracey Straub and Patricia Schaeffer-Straub, NY
Traci Schultz-Brega, NY
Tracy Pritchard, NY
Trend Residence, NY
Tsinzo Residence, MA
Tsvetoslav Glouzgal, CT
Una Curran, NY
Ursula Stiloski, NY
V.J. Brophy, NY
Vernon and Laura Geberth, NY
Vernon and Lisa Cole, NY
Veryl Stubbs, CT
Victor G. and Barbara F. Rickard, Sr., NY
Victor Handal, CT
Victor P. and Marie Zugibe, NY
Victor P. and Patricia Zugibe, NY
Victor P. Jr. Zugibe, NY
Victoria Goldberg, NY
Vincent and Anita T. Savastano, NY
Vincent and Marie Orlando, MA
Vincent Annuziata and Deborah Dibernardo, NY
Vincent D.and Rosemarie Fonti, NY
Vincent Dert and Monica Lee, NY
Vincent E. and Marie C. Letteri, NY
Vincent Furfaro, NY
Vincent Mastriani, Jr., CT
Vincent Tallerico, NY
Vincent Tropiano, NY
Vincent Xavier and Kimberly Freyre, NY
Virginia Hickey, MA
Virginia Rederer, NY
Virginia Tadcock, NY
Virginia W. Plume and Sur John G. Trippett, NC
Vivian Diaz and Richard Simo, NY
Vivian Krizan, CT
Vladimir Nebelitskiy, etux and Flora Nebelitskaya te, MA
Vreni Roduner, NY
Wade C.W. and Elizabeth E.W. Smith, CT

Individuals (cont'd)

Waldemar and Beata Dec, NY

Walter A. and Janet S. Postel, NY

Walter Daniels, NY

Walter Jensen, CT

Walter T. Jr. Laffin and Carol A. Markesich, CT

Warren A. Smith, NY

Warren Lindholm, NY

Warren Rosenberg, NY

Warren W. Church and Gerda C. Gofberg, CT

Wayne Calley, NY

Wei Liu, NY

Wendy Jo Haft, NY

Westley Artope and Clara M. Montague, NY

Whitson Family, NY

Wilbert and Laura Moy, MA

Willaim and Stefani Catenzaro, CT

William A. Perry, NY

William and Frances McClarnon, NY

William and Margaret Franks, NY

William and Nancy L. Strange, NY

William and Patricia Barnett, NY

William D. and Linda E. Rifkin, NY

William G McRoberts, NY

William H. and Rose M. Pierce, MA

William H. and Virginia S. Madden, NY

William Herbert and Donna L.Pfeiffer, CT

William J. and Lynn M. Bender, NY

William J. and Rosalie V. Egan, et al., MA

William J. Fleming and William F. Fleming Family Tr., MA

William J. Oliver, NY

William Mattison, CT

William McGuire, NY

William R. Turke, MA

William S. Sawicky, CT

William Tsang, MA

William V. and Katherina N. Taylor Brenner, NY

Willis D Kelo, CT

Wilson Cumbe, NJ

Wm. Peter and Nellie Dykstra, NY

Xavier Kollmeier, NY

Xiansi and Zhi Wan Xhao, MA

Xiaohui and Haoli Jin Zhang, MA

Yannis Mavropoulos, MA

Yolanda M. and John D. Edwards, CT

Yurij and Leslie Baransky, NY

Yuriy and Vorobeychik Khoroshchak, MA

Yvonne Wilson and Cynthia Easy, NY

Zhiping Chen, MA

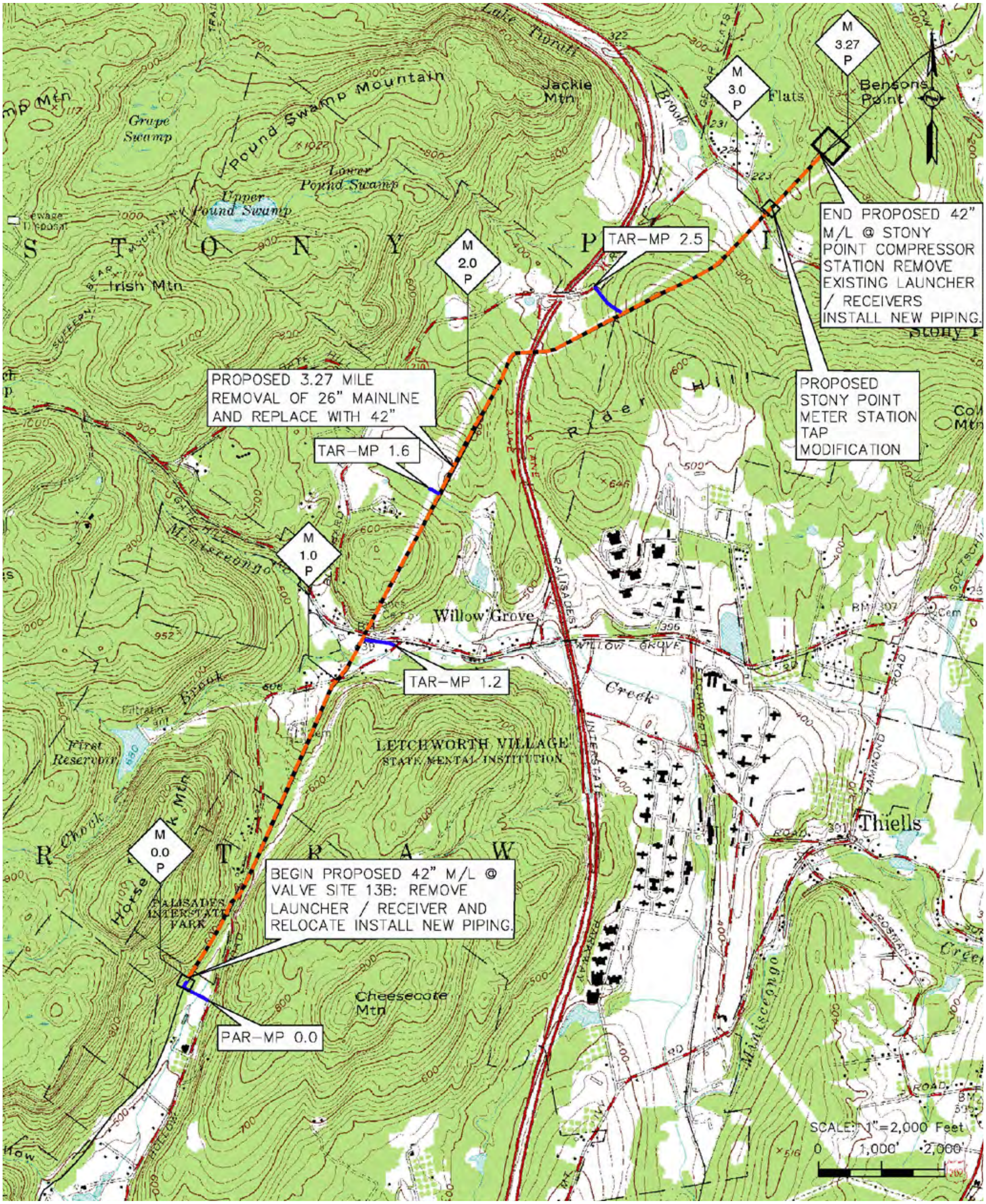
Ziyong Sun and Hongwu Zhang, MA

APPENDIX B

FACILITY LOCATION MAPS

- Haverstraw to Stony Point Take-up and Relay
- Stony Point to Yorktown Take-up and Relay
- Southeast to MLV 19 Take-up and Relay
- E-1 System Lateral Take-up and Relay
- Line-36A Loop Extension
- E-1 System Lateral Loop Extension
- West Roxbury Lateral
- Existing Compressor Stations
- New York M&R Stations
- Connecticut M&R Stations
- Massachusetts M&R Stations
- Pipe and Contractor Ware Yards

Haverstraw to Stony Point Take-up and Relay



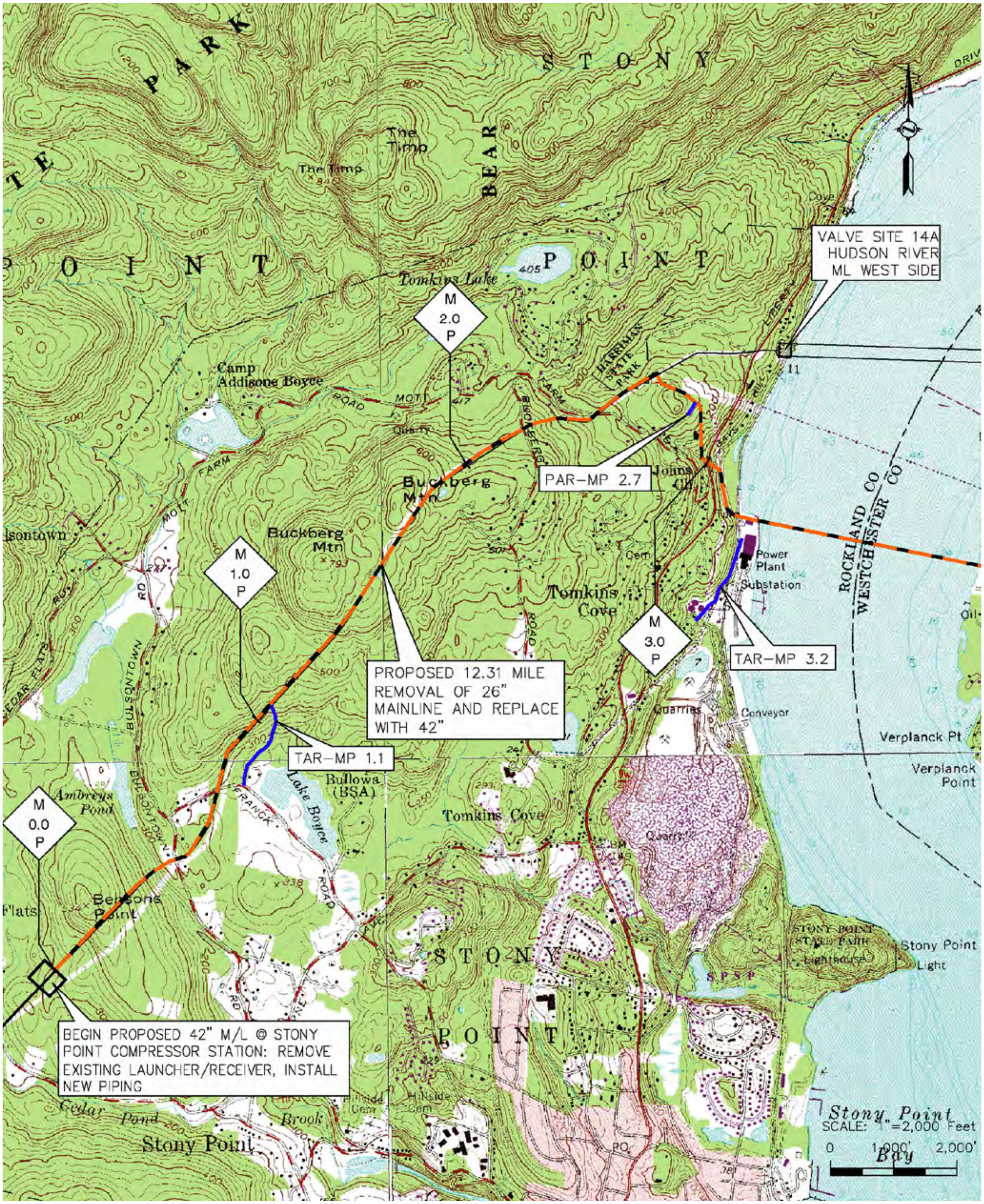
Appendix B

AIM Project

Facility Location Maps

Haverstraw to Stony Point Take-up and Relay

Stony Point to Yorktown Take-up and Relay



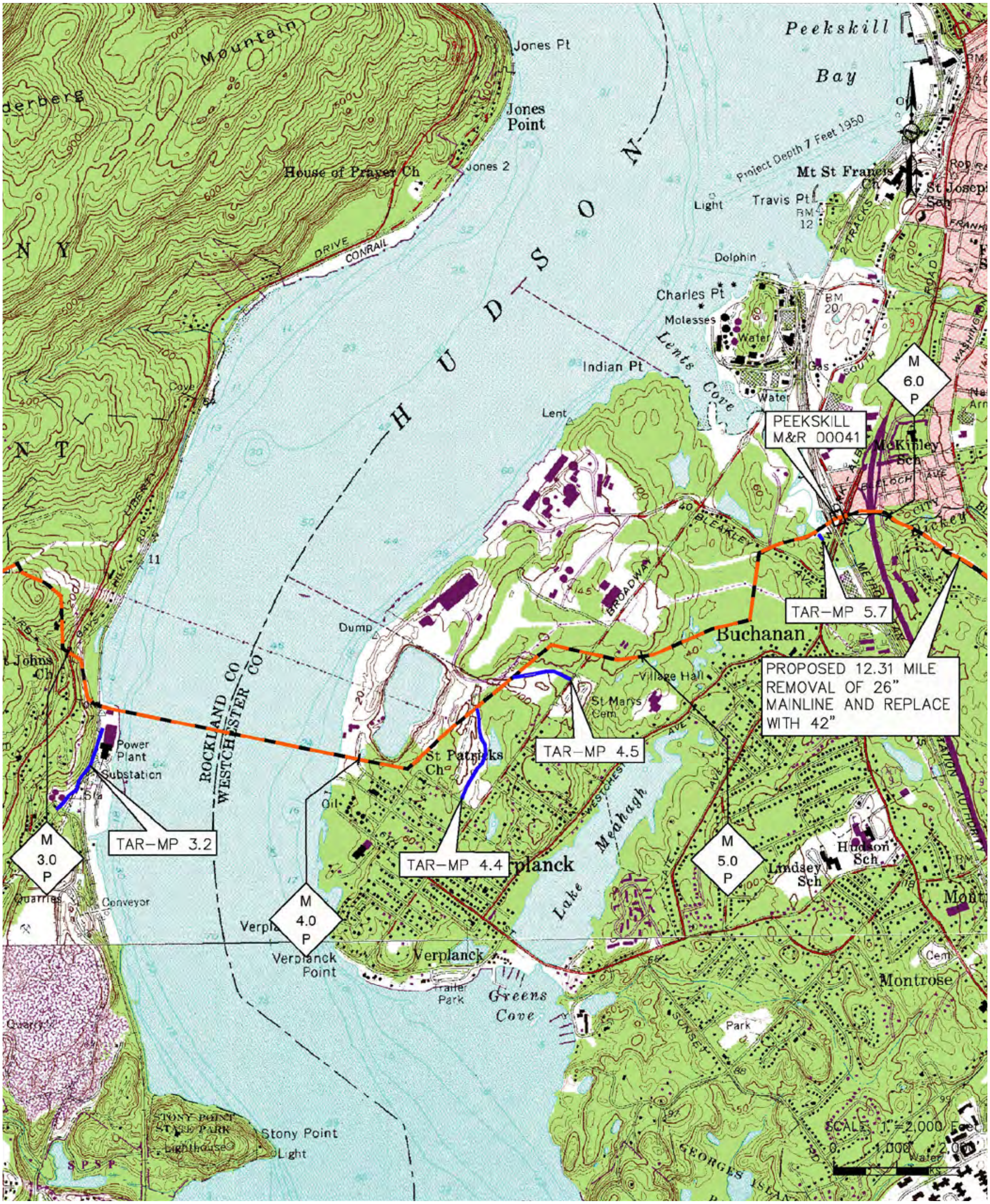
Appendix B

AIM Project

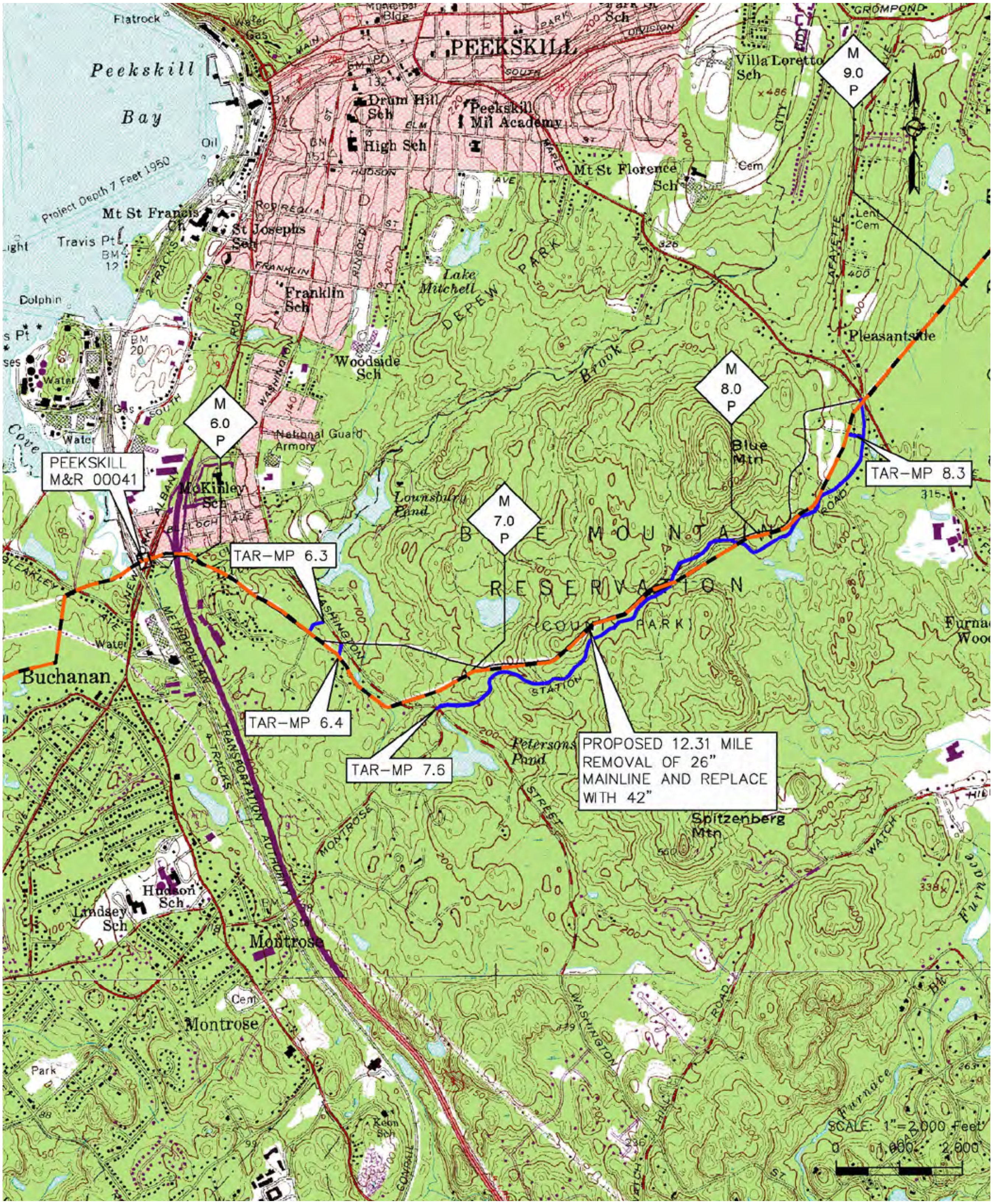
Facility Location Maps

Stony Point to Yorktown Take-up and Relay

Page 1 of 5



Appendix B
AIM Project
Facility Location Maps
Stony Point to Yorktown Take-up and Relay



Appendix B

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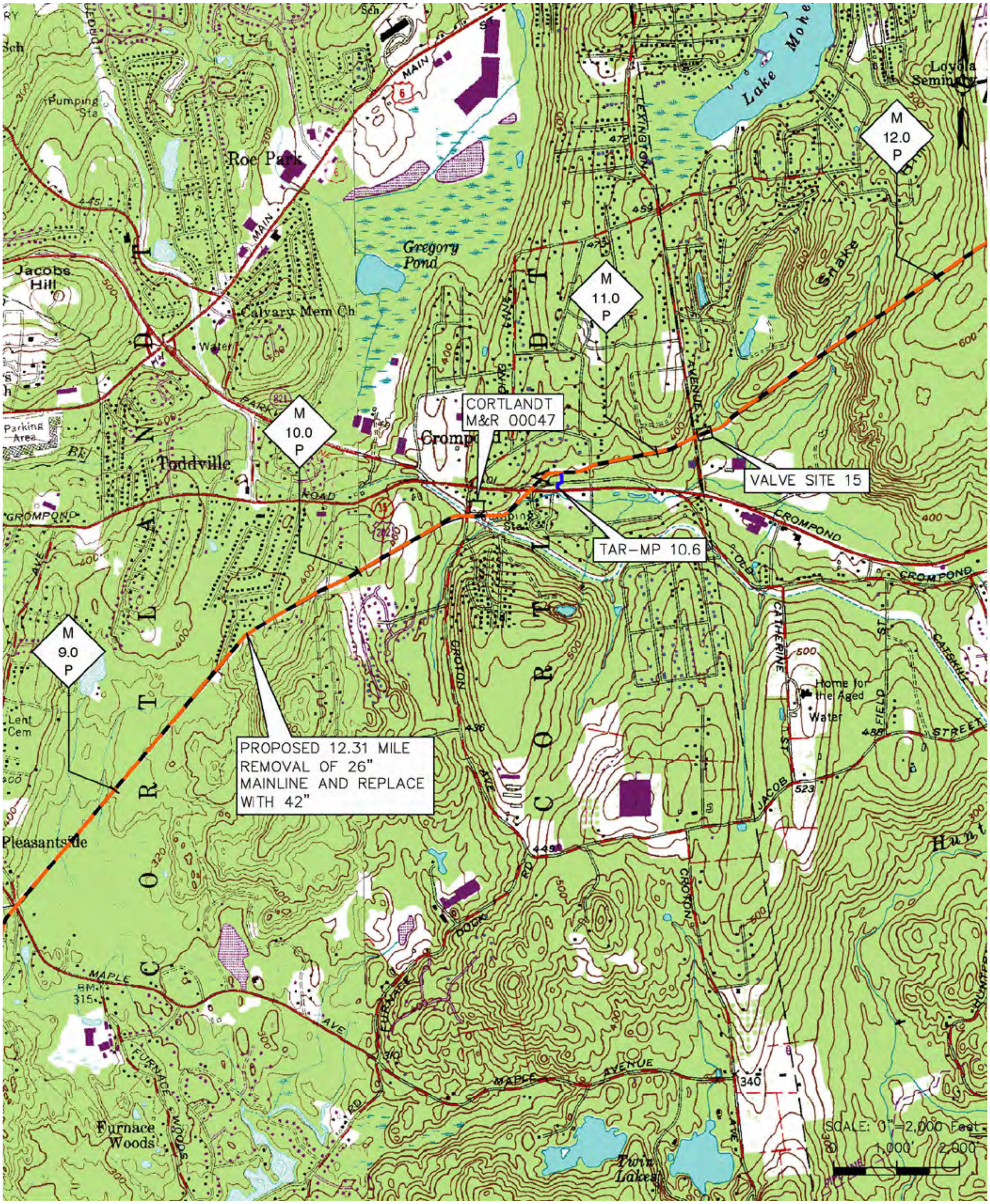
Facility Location Maps

Stony Point to Yorktown Take-up and Relay

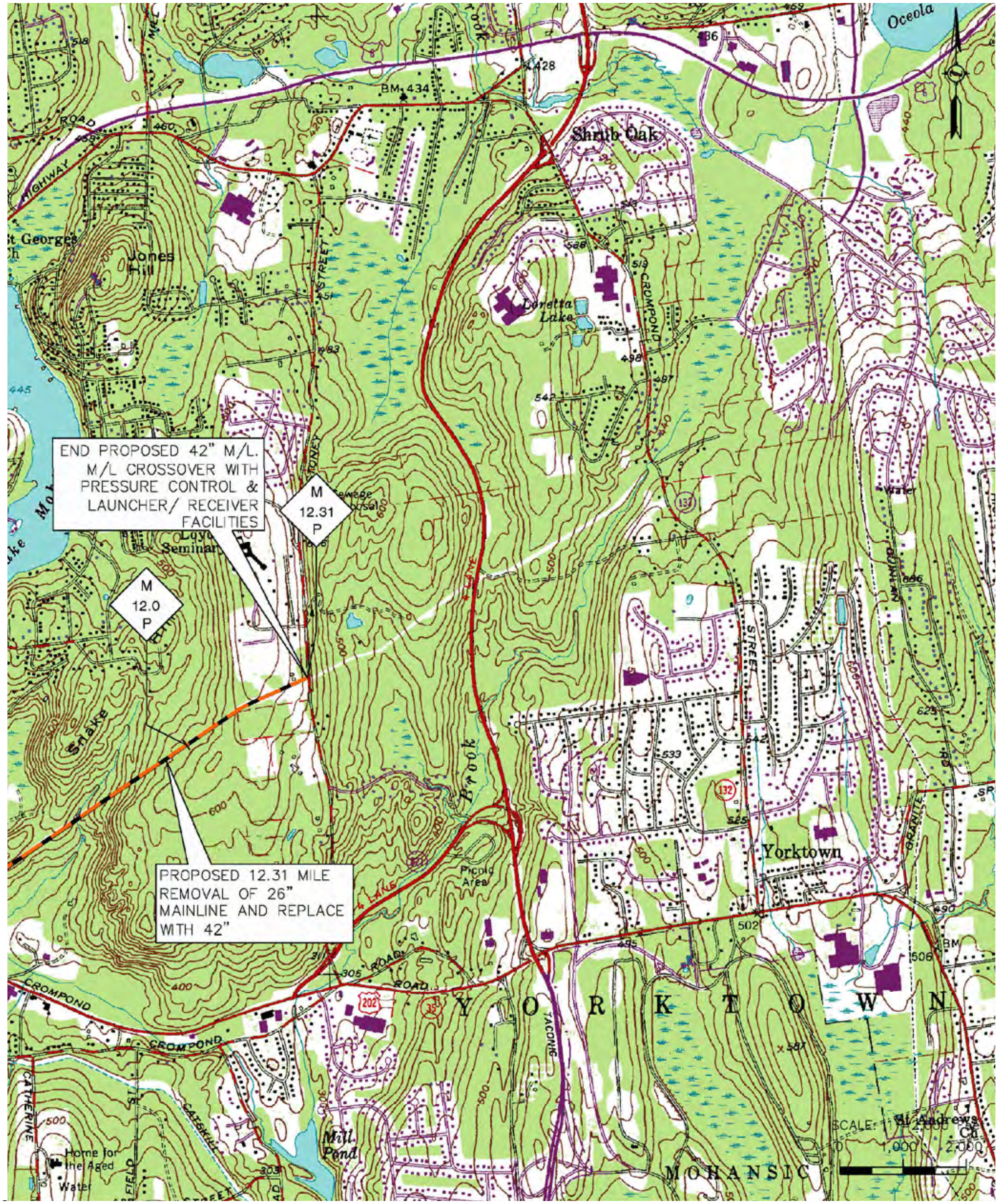


Appendix B

AIM Project

Facility Location Maps

Stony Point to Yorktown Take-up and Relay



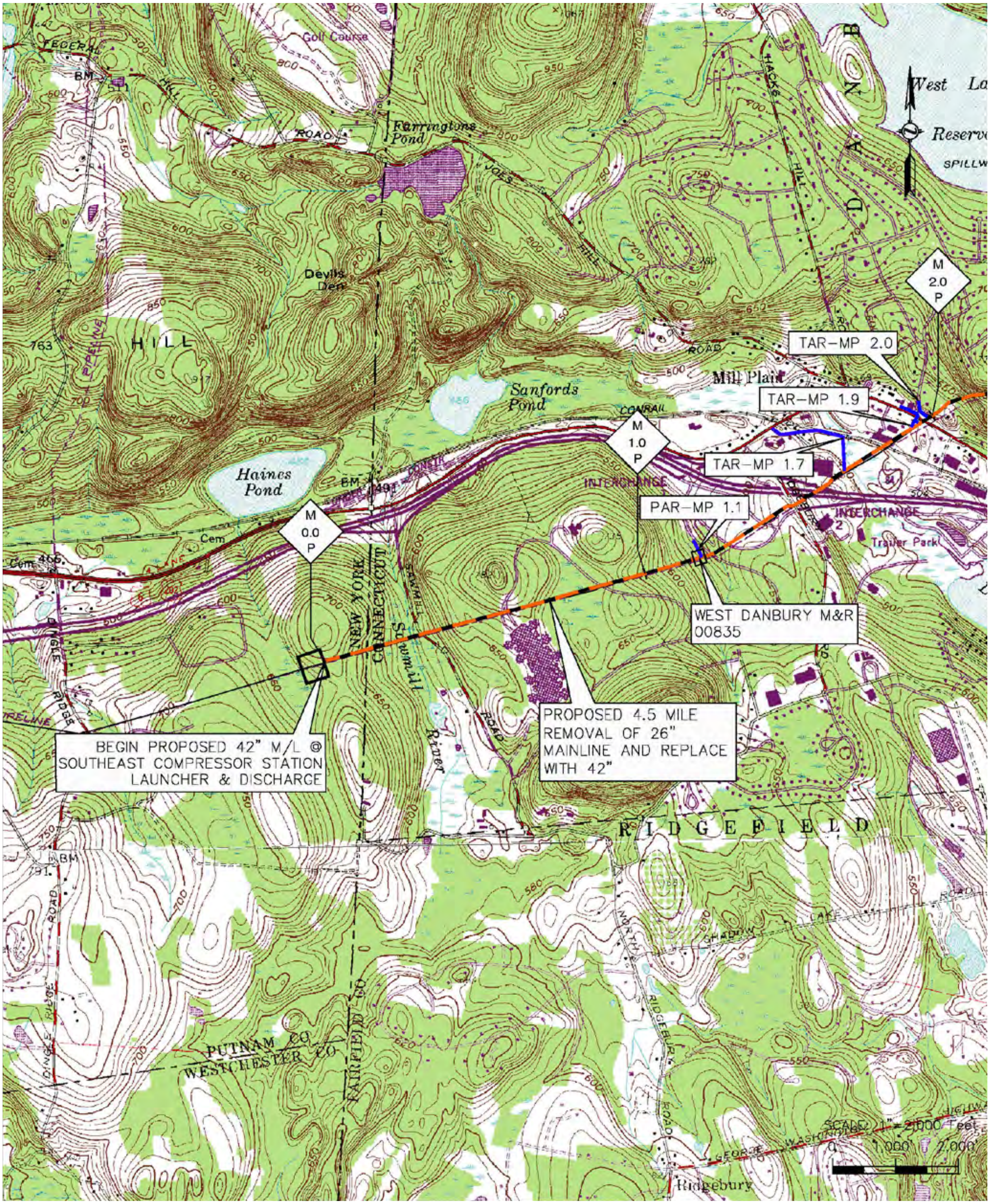
Appendix B

AIM Project

Facility Location Maps

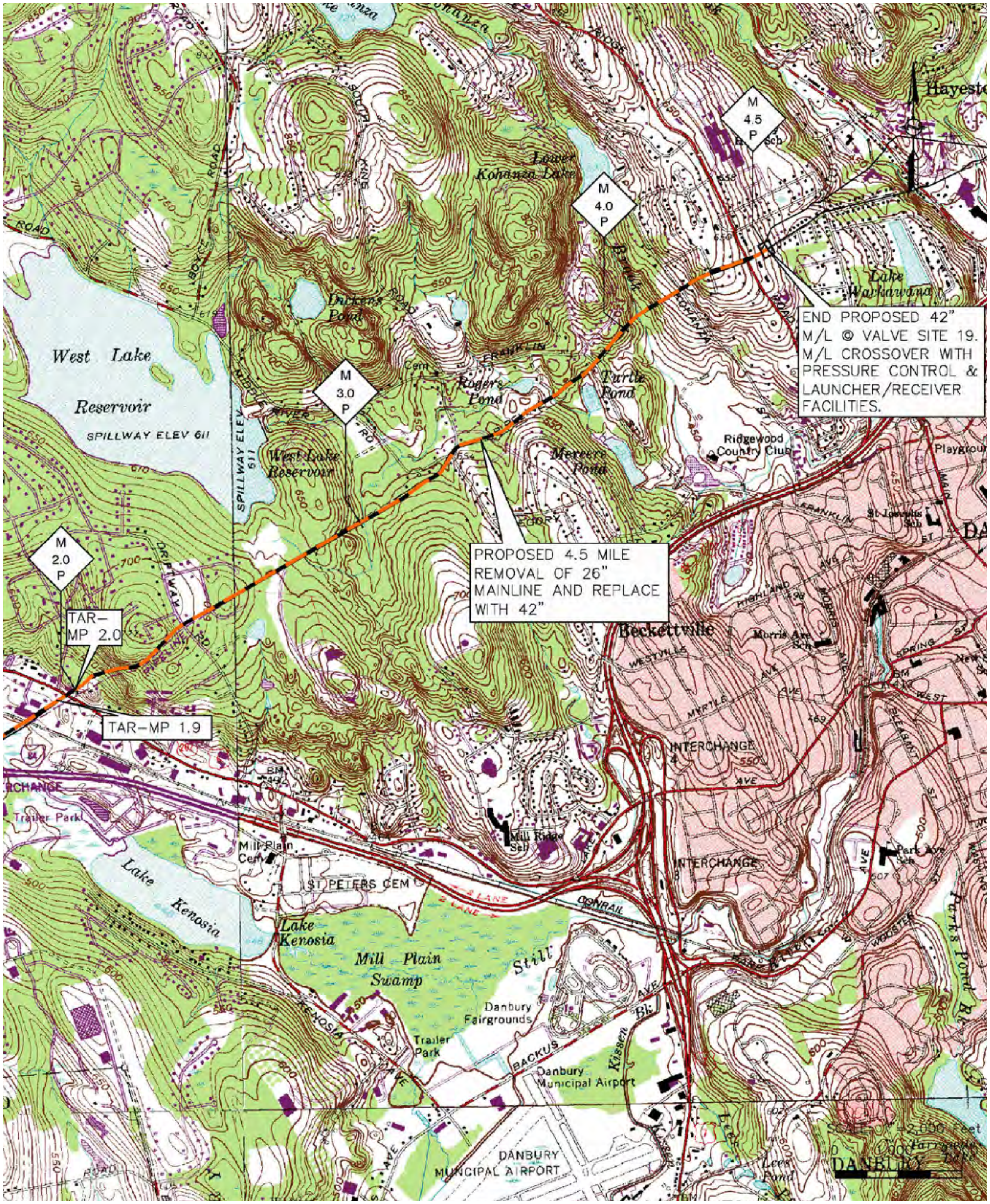
Stony Point to Yorktown Take-up and Relay

Southeast to MLV 19 Take-up and Relay



Appendix B
AIM Project
Facility Location Maps
Southeast to MLV 19 Take-up and Relay

Page 1 of 2



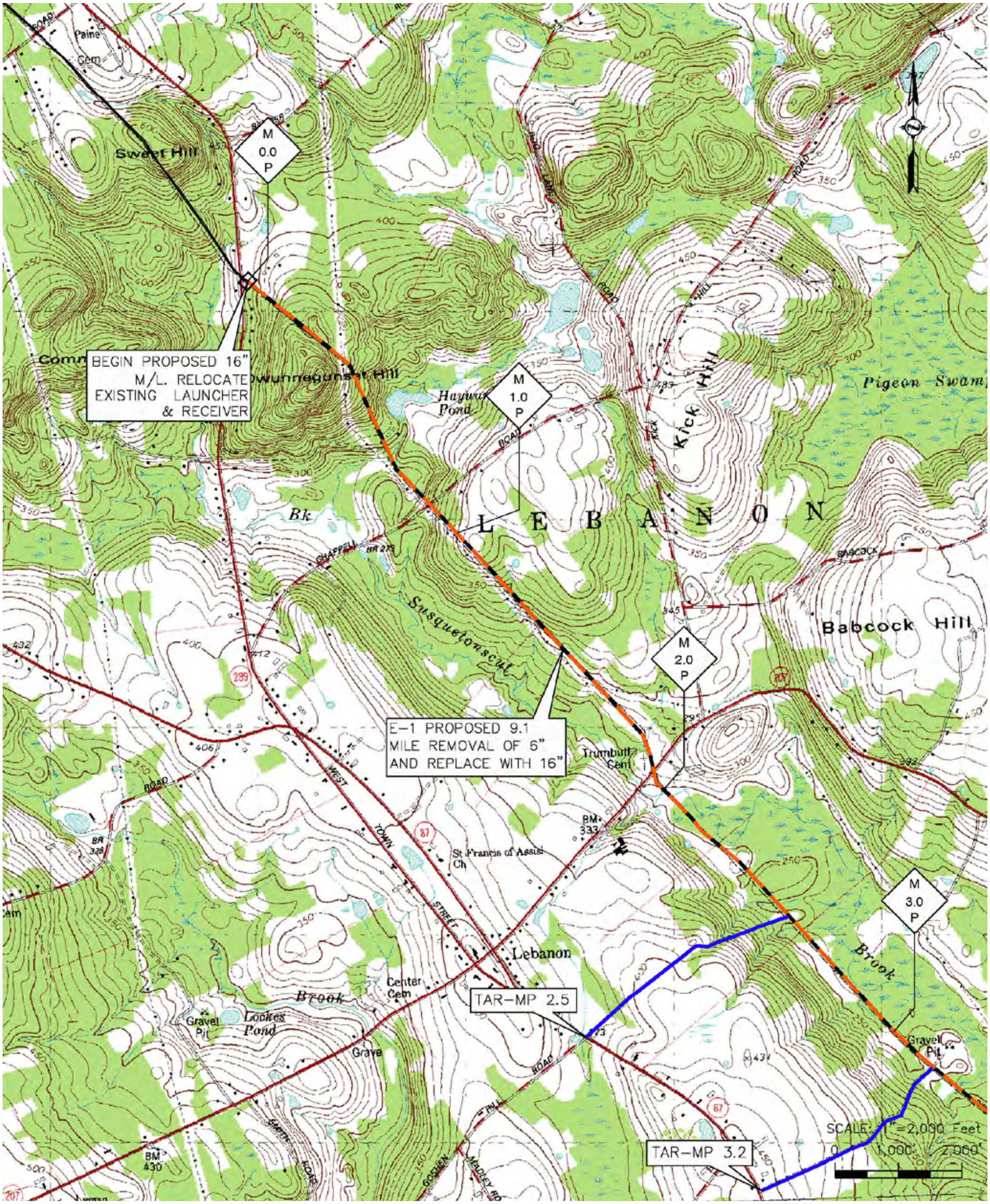
Appendix B

AIM Project

Facility Location Maps

Southeast to MLV 19 Take-up and Relay

E-1 System Lateral Take-up and Relay



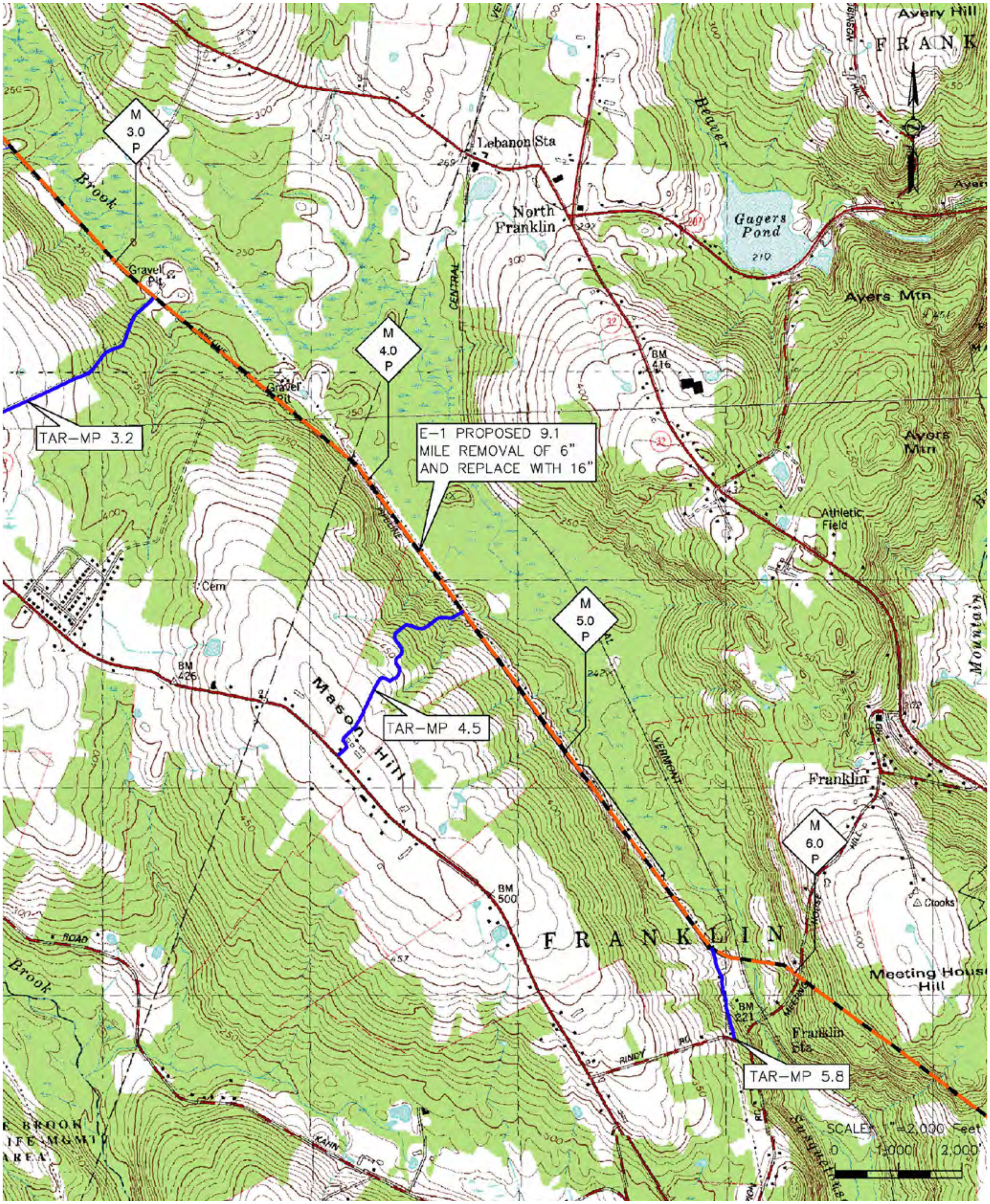
Appendix B

AIM Project

Facility Location Maps

E-1 System Lateral Take-up and Relay

Page 1 of 3



Appendix B

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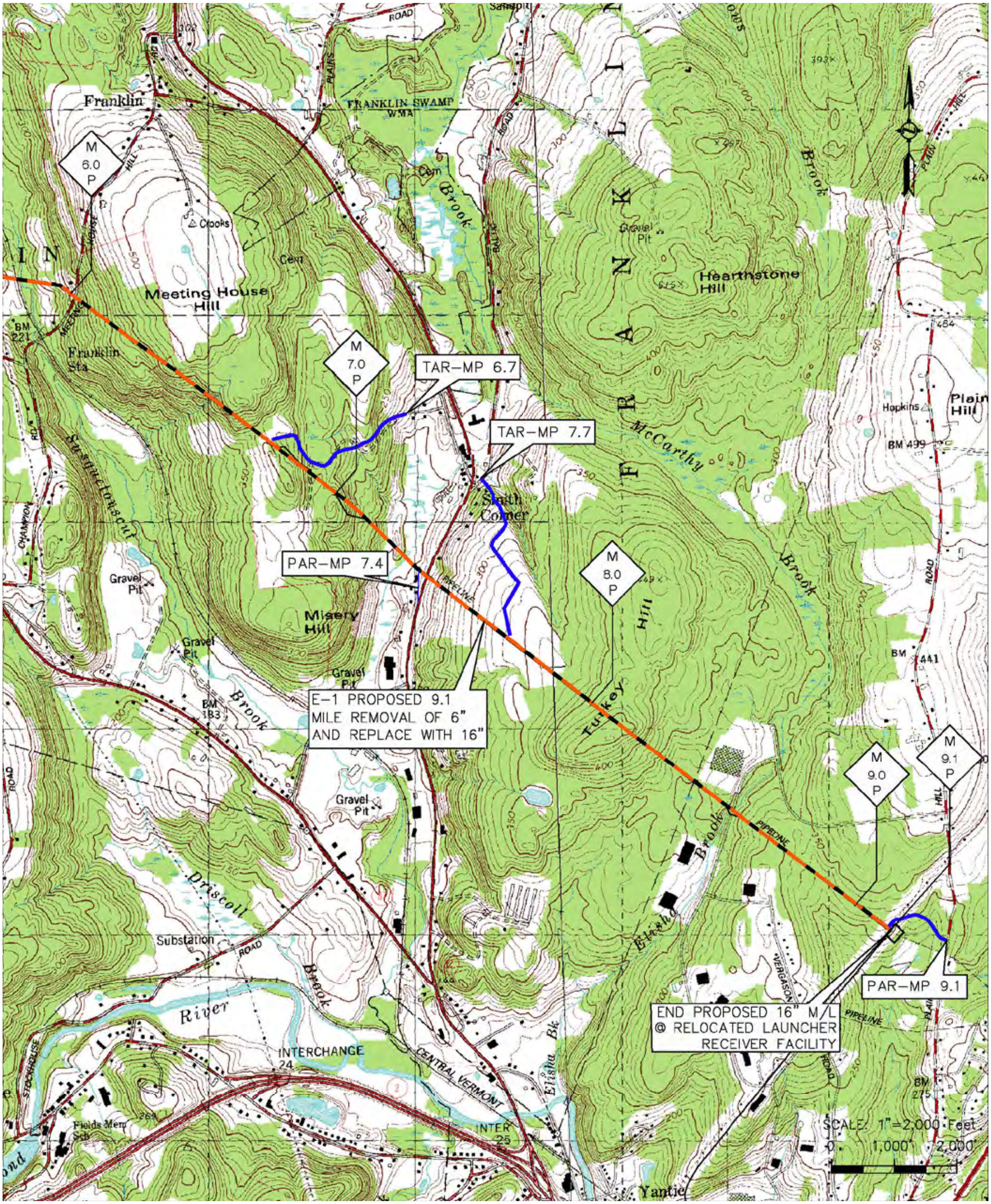
Facility Location Maps

E-1 System Lateral Take-up and Relay



Appendix B

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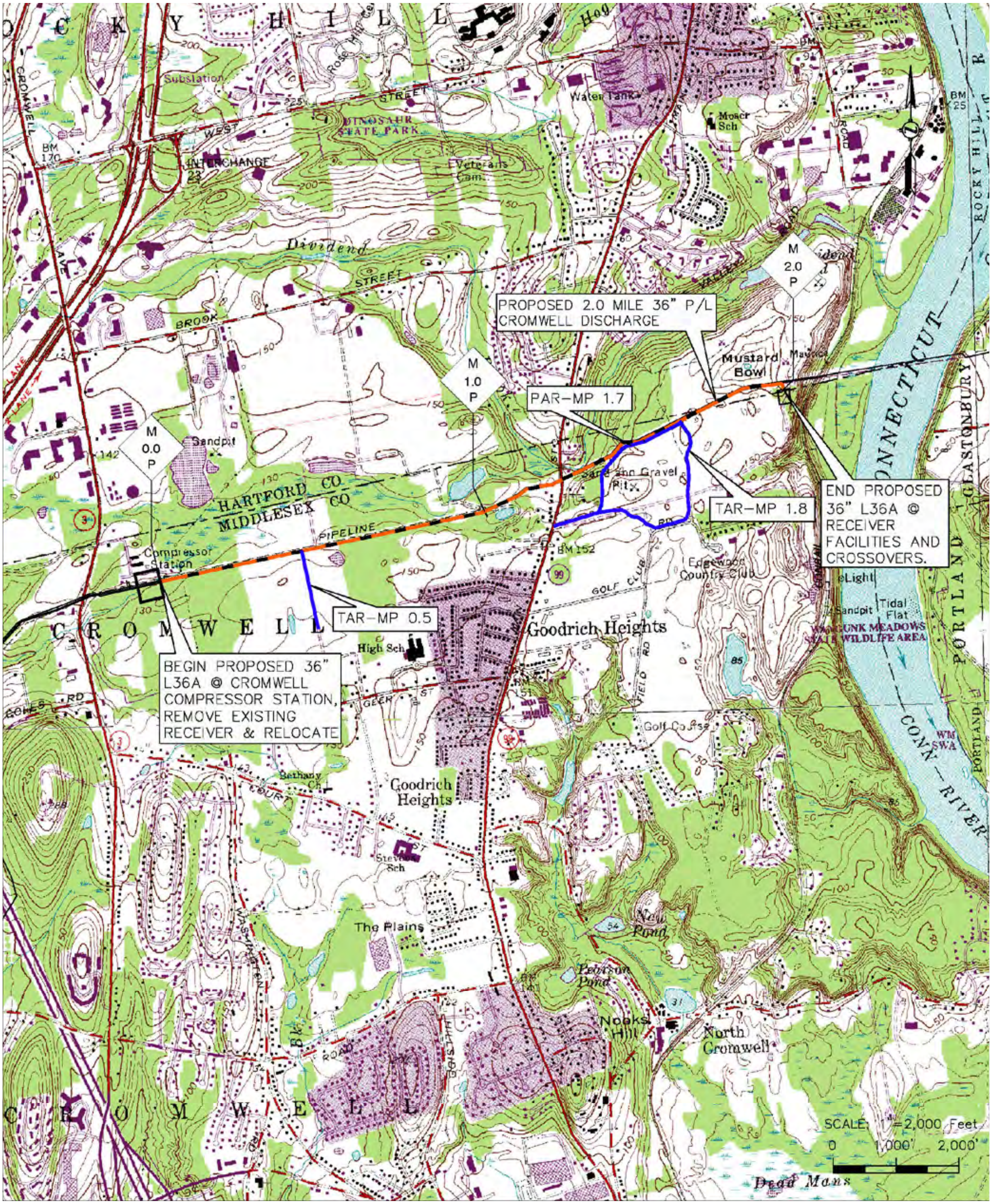
Facility Location Maps

E-1 System Lateral Take-up and Relay

Line-36A Loop Extension



Appendix B

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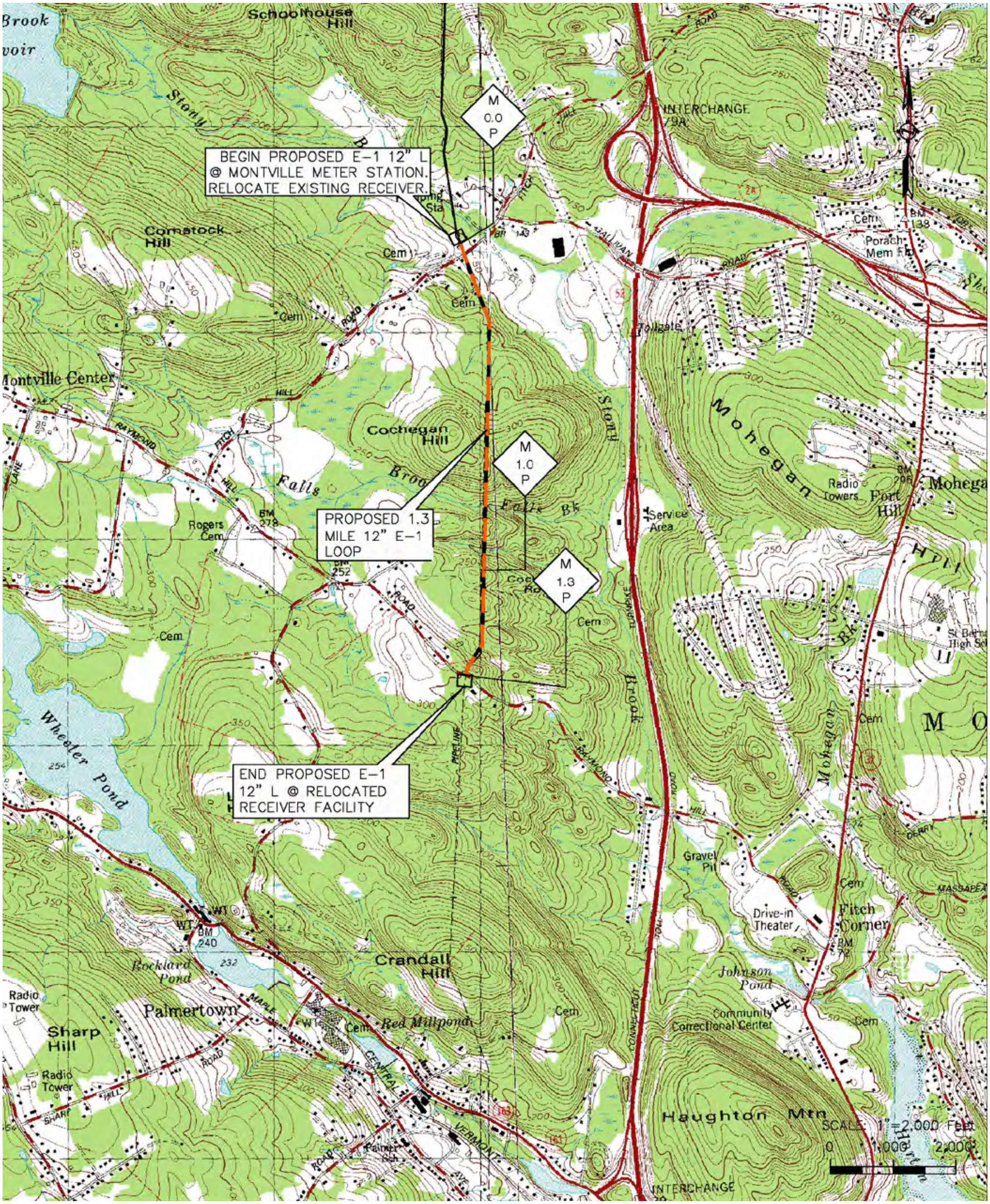
Facility Location Maps

Line-36-A Loop Extension

E-1 System Lateral Loop Extension



Appendix B

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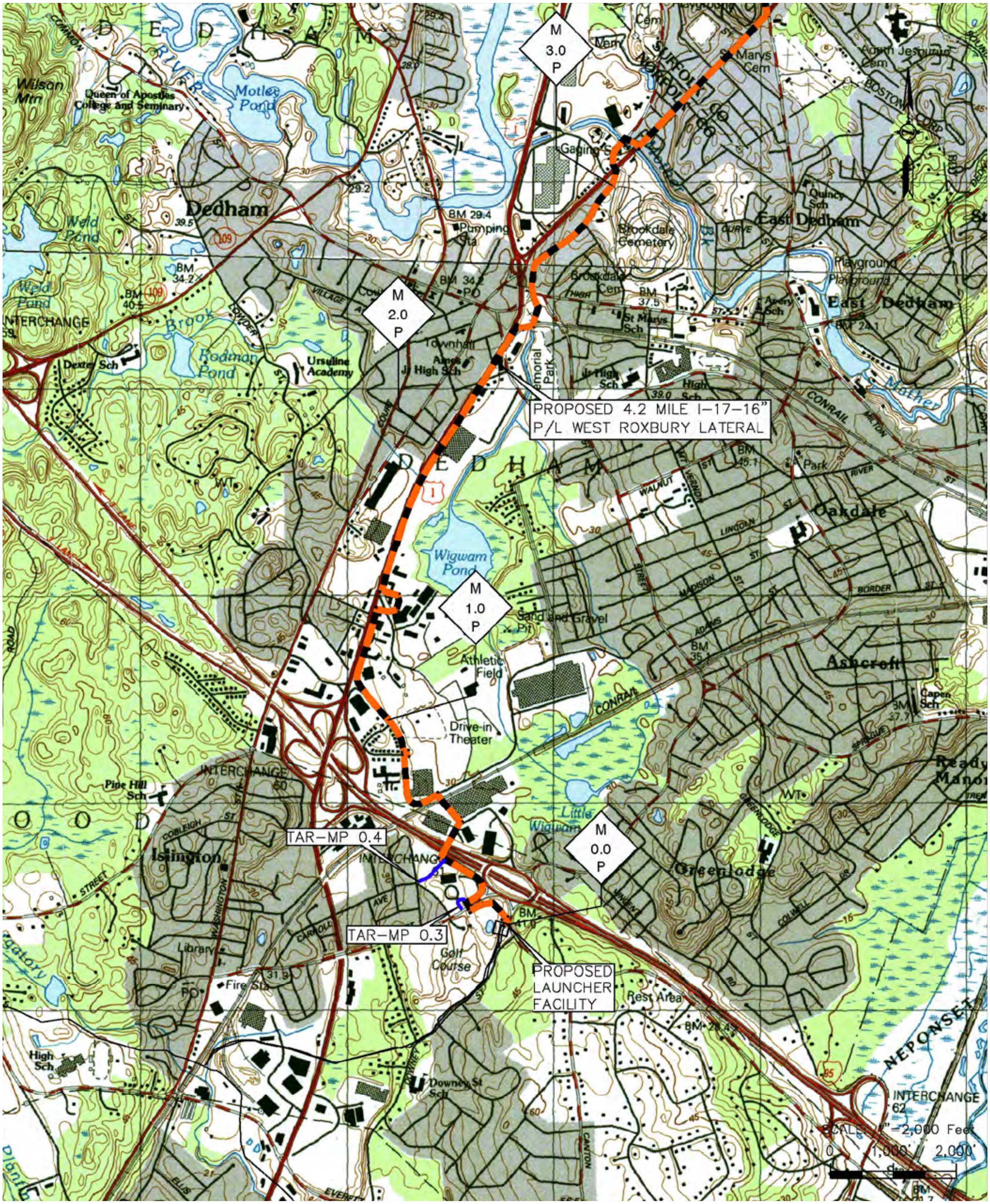
Facility Location Maps

E-1 System Lateral Loop Extension

West Roxbury Lateral



Appendix B

AIM Project

Facility Location Maps

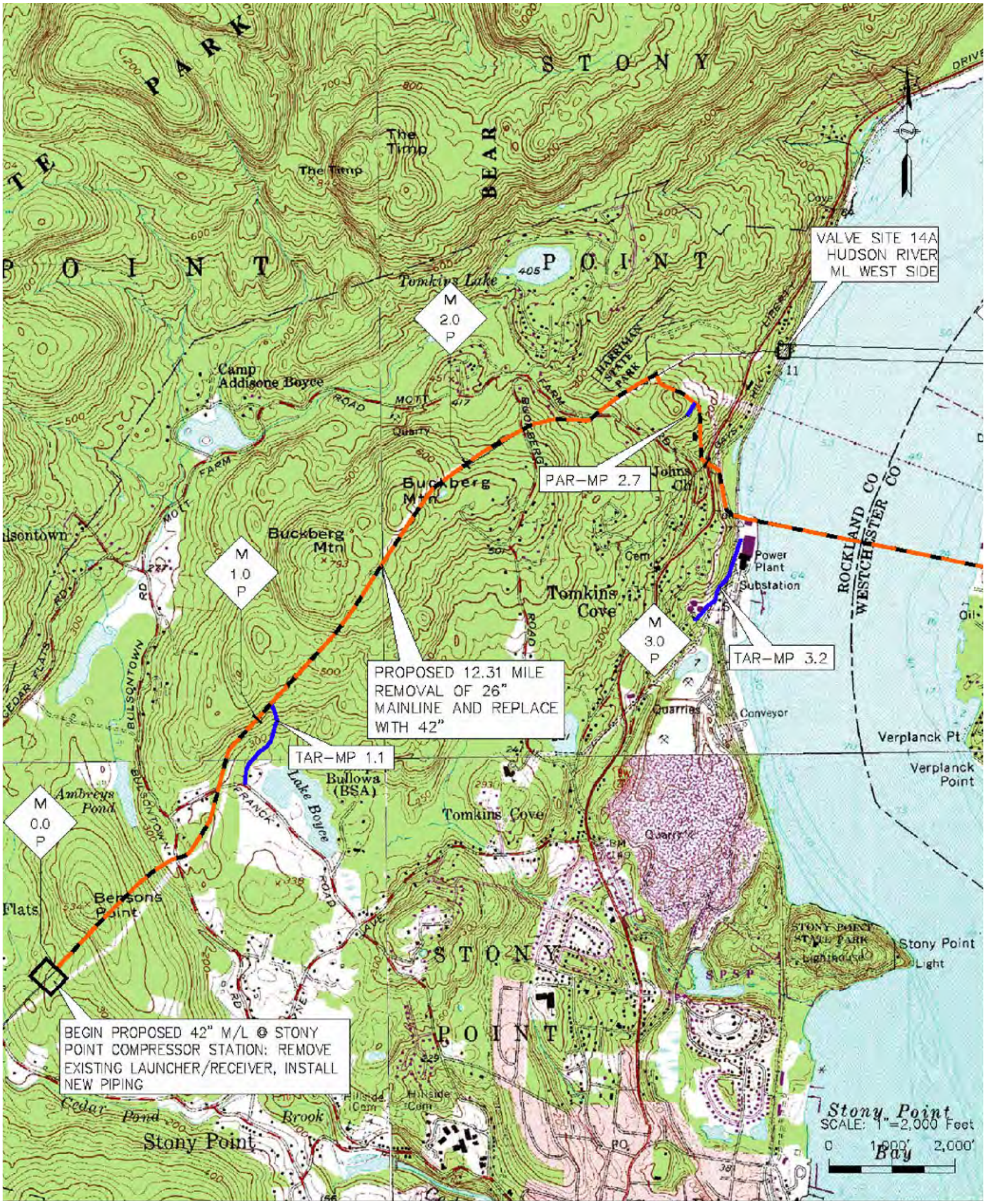
West Roxbury Lateral

Page 1 of 2

Appendix B
AIM Project
Facility Location Maps
West Roxbury Lateral

Page 2 of 2

Existing Compressor Stations



Appendix B

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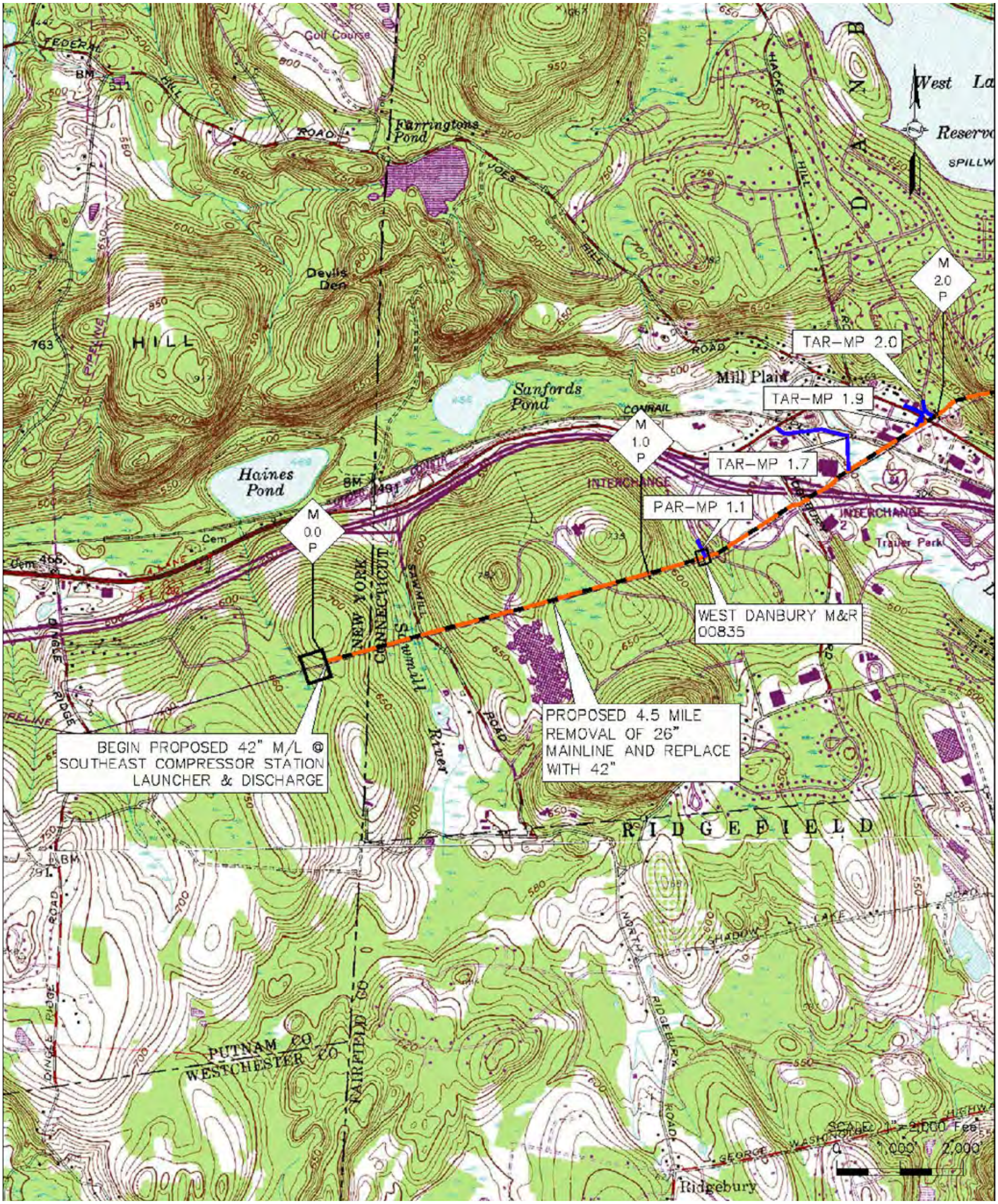
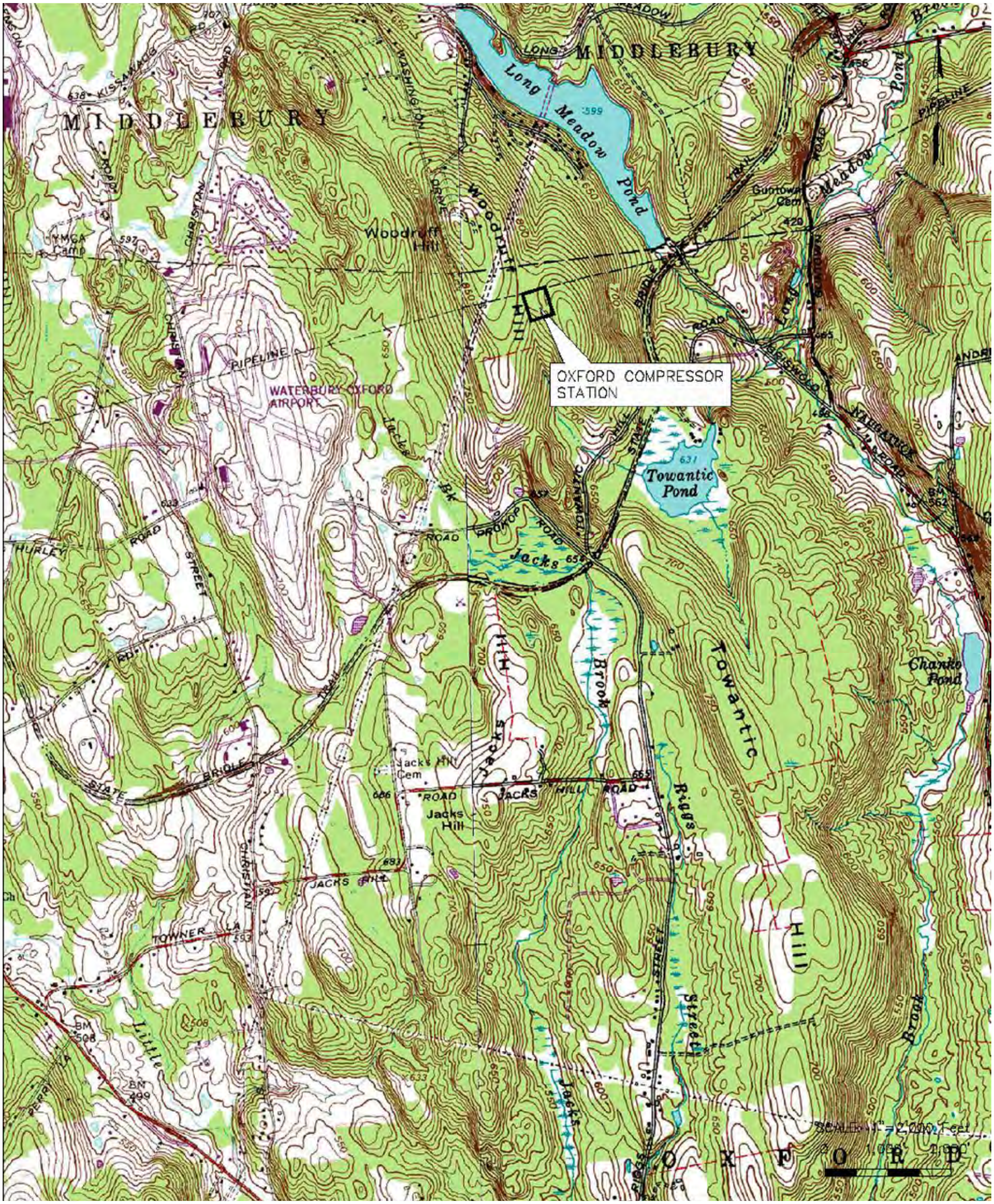
Facility Location Maps

Stony Point Compressor Station



Appendix B
AIM Project
Facility Location Maps
Southeast Compressor Station



Appendix B

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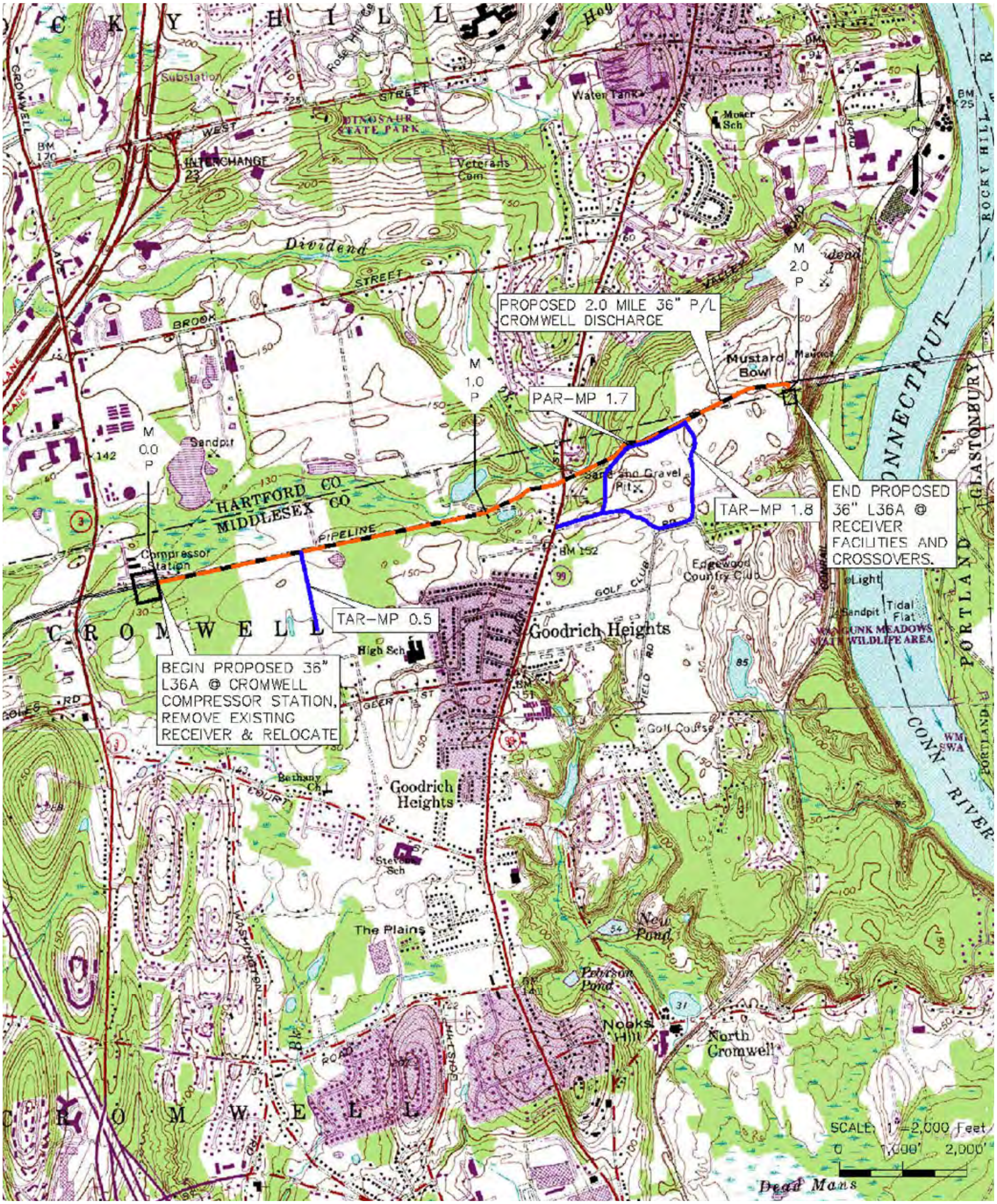
Facility Location Maps

Oxford Compressor Station



Appendix B

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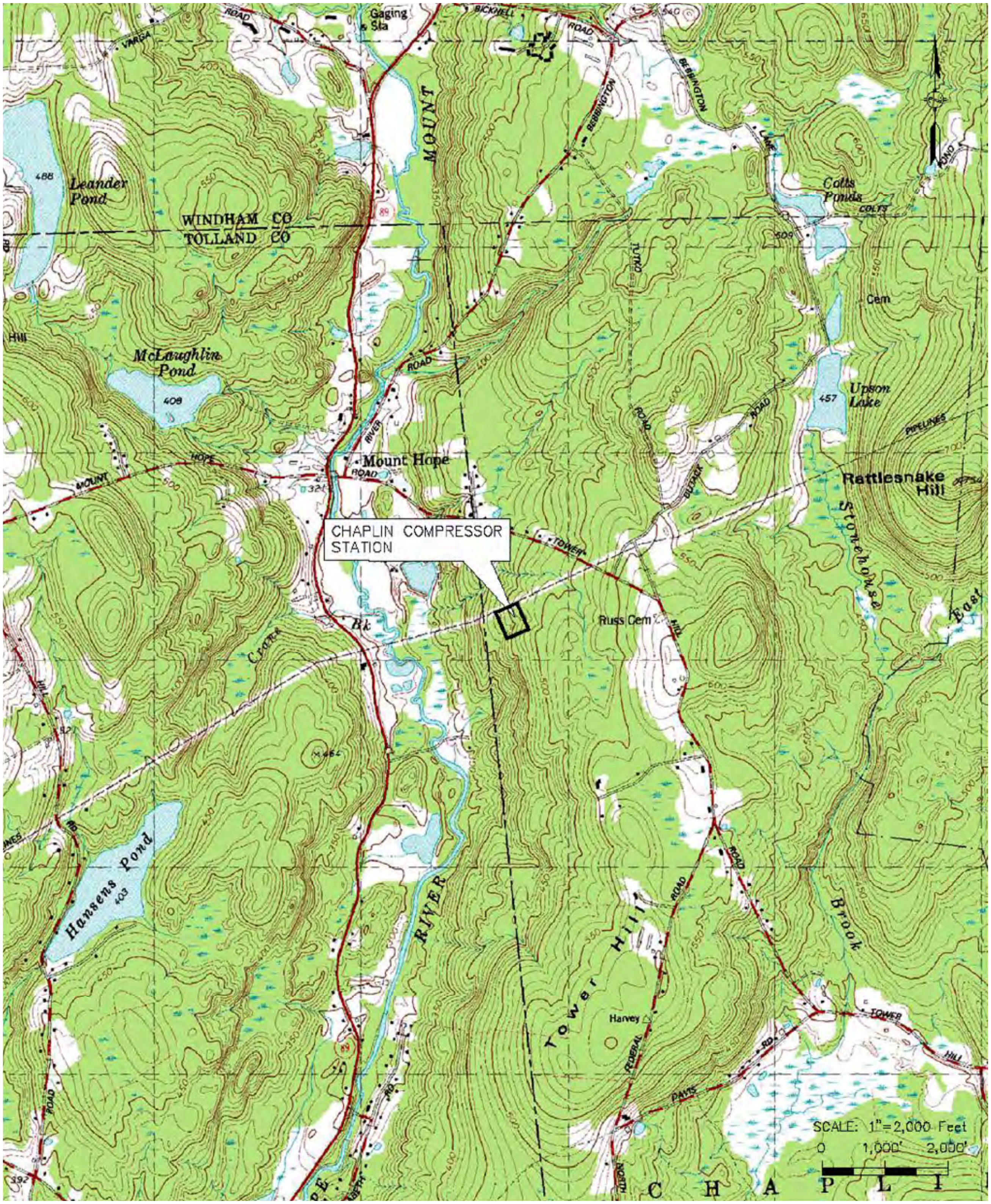
Facility Location Maps

Cromwell Compressor Station



Appendix B

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Facility Location Maps

Chaplin Compressor Station

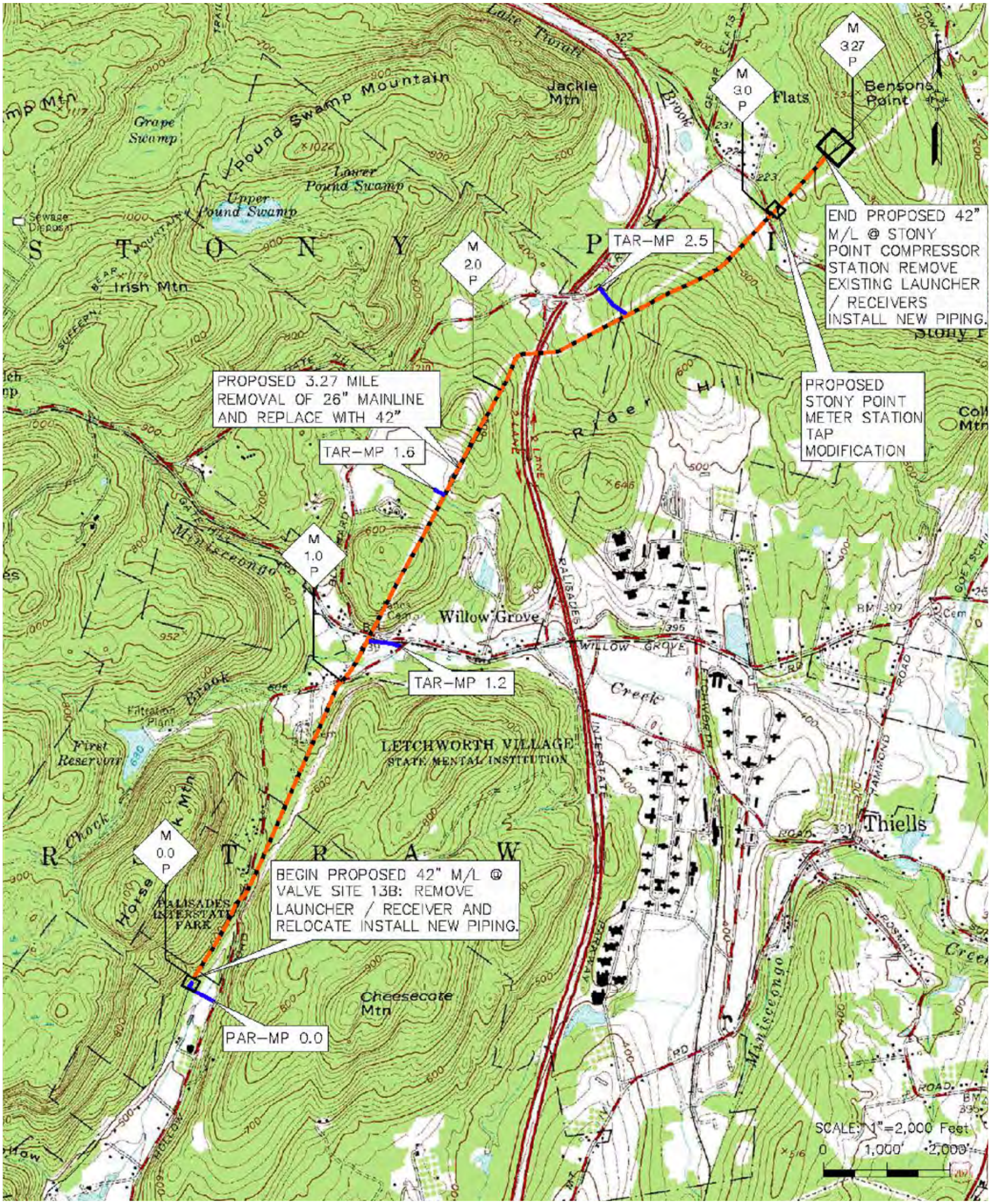
Appendix B

AIM Project

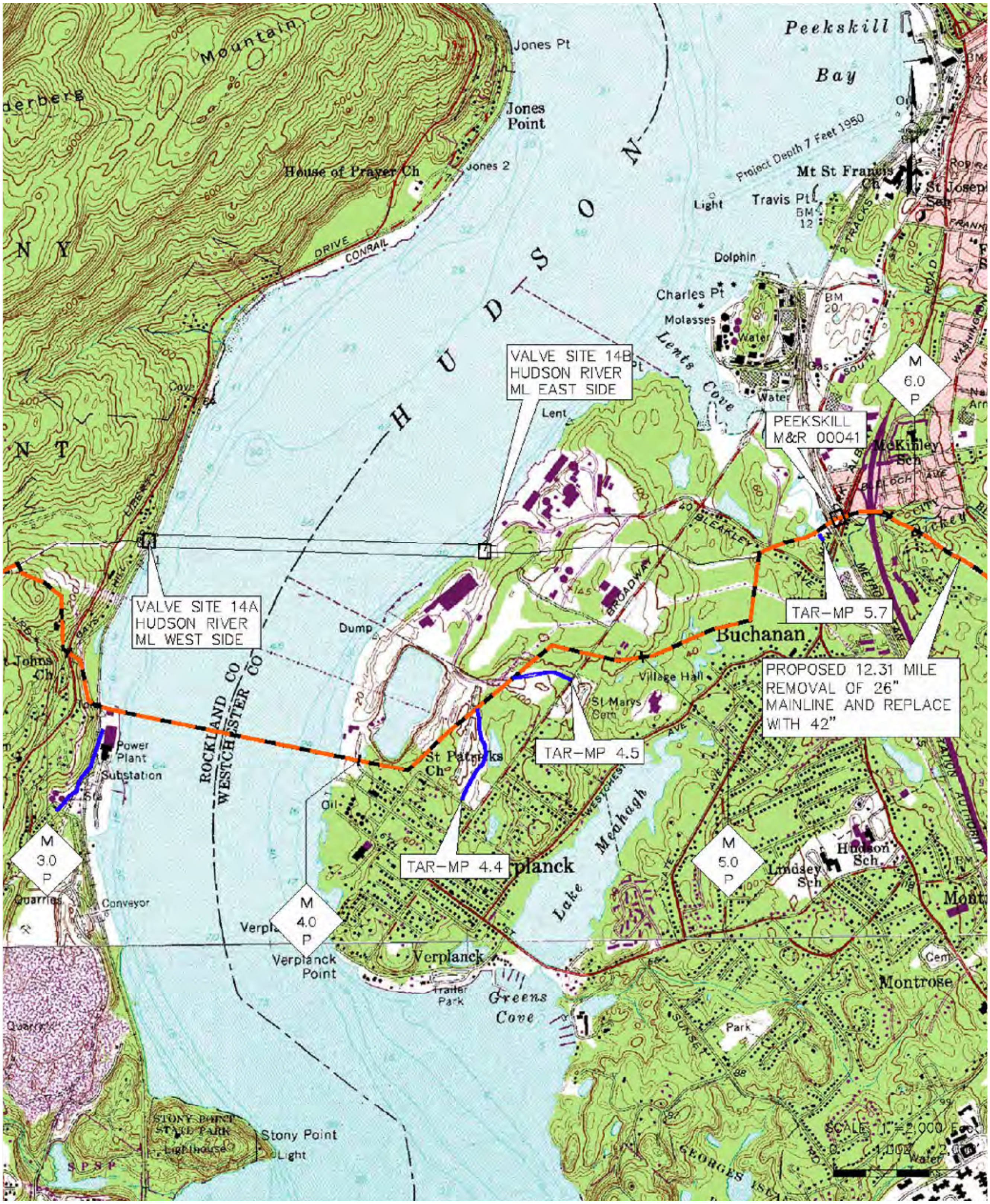
Facility Location Maps

Burrillville Compressor Station

New York M&R Stations



Appendix B
AIM Project
Facility Location Maps
Stony Point M&R Station



Appendix B

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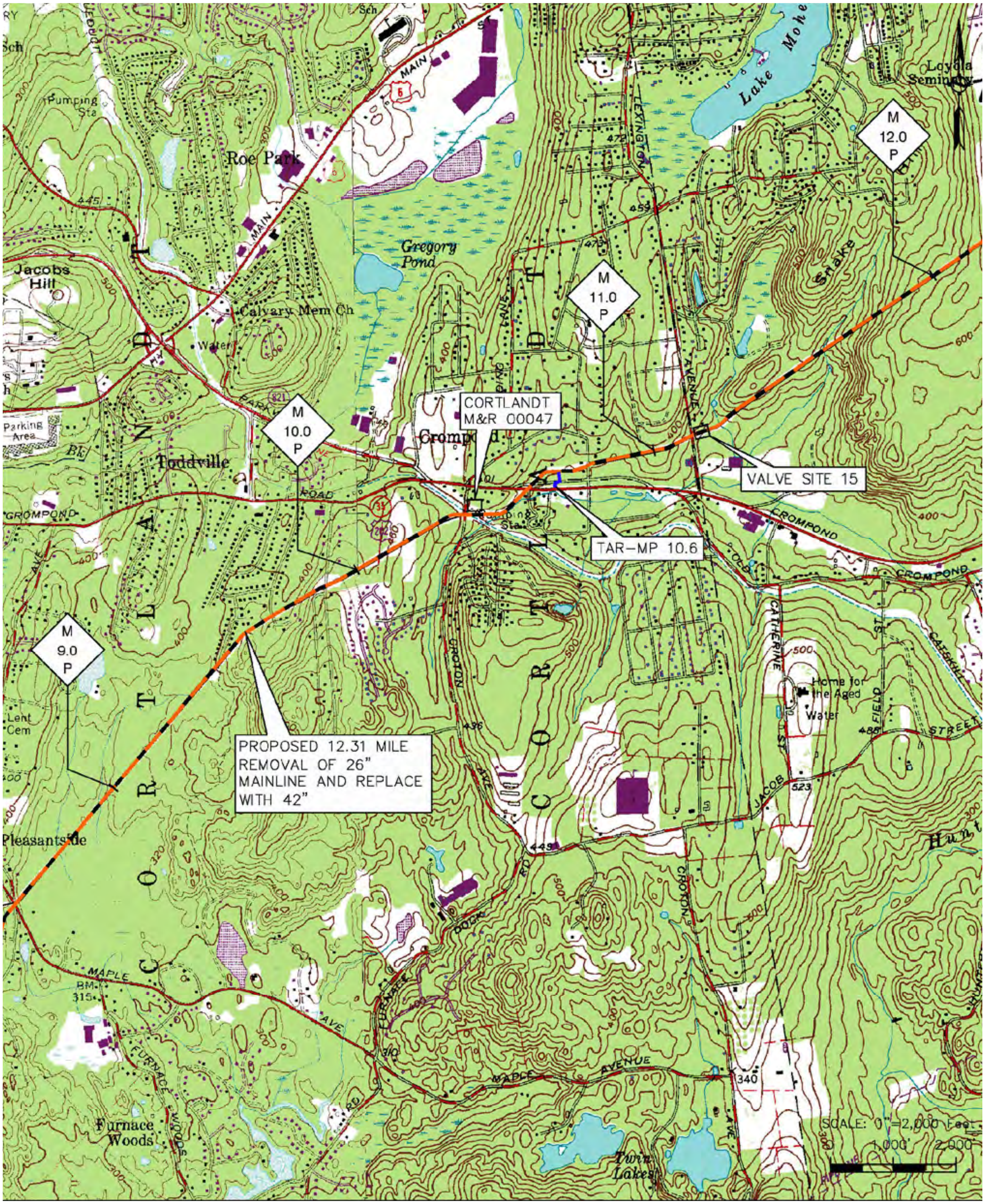
Facility Location Maps

Peekskill M&R Station



Appendix B

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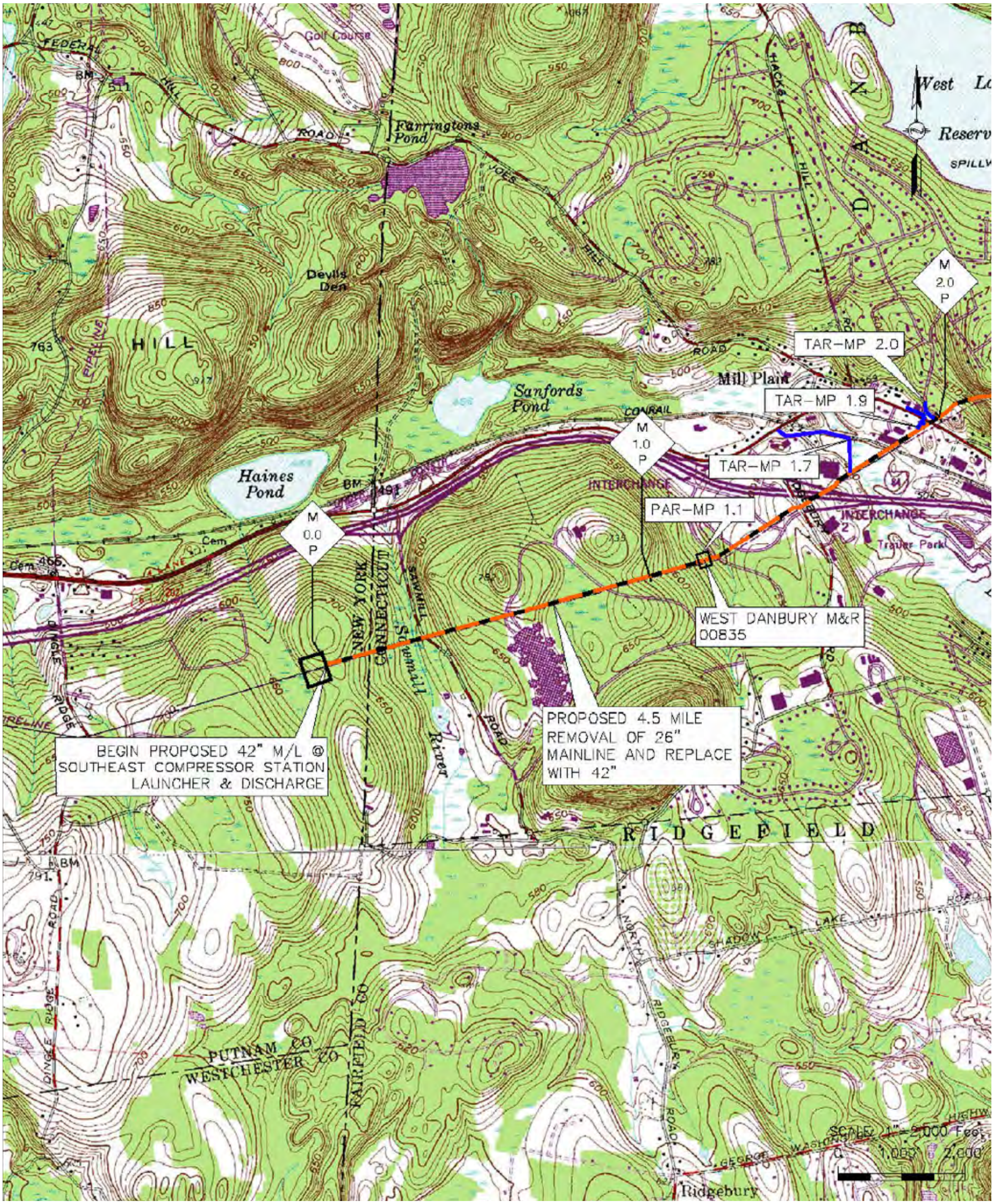
Facility Location Maps

Cortlandt M&R Station

Connecticut M&R Stations



Appendix B

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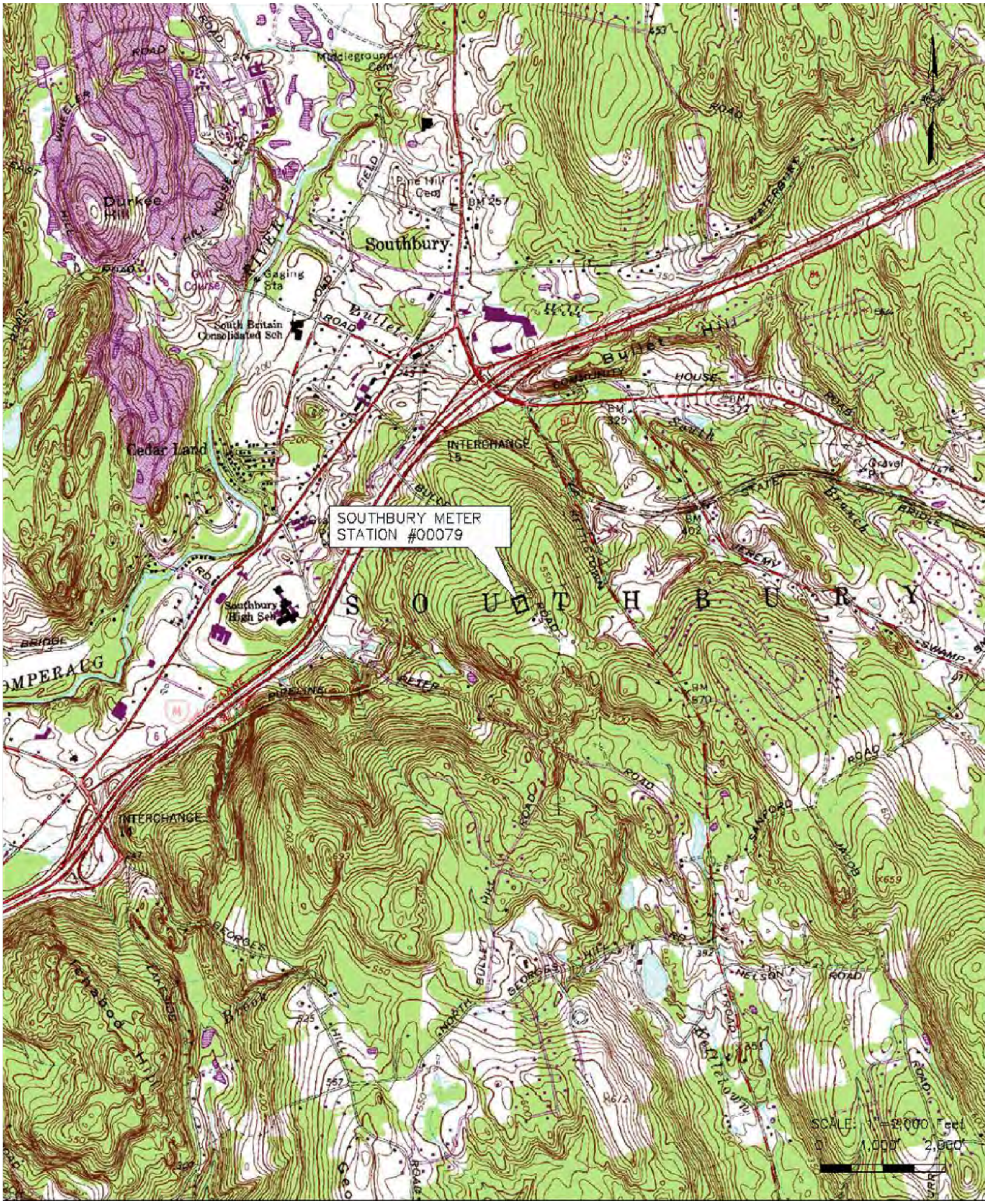
Facility Location Maps

West Danbury M&R Station



Appendix B

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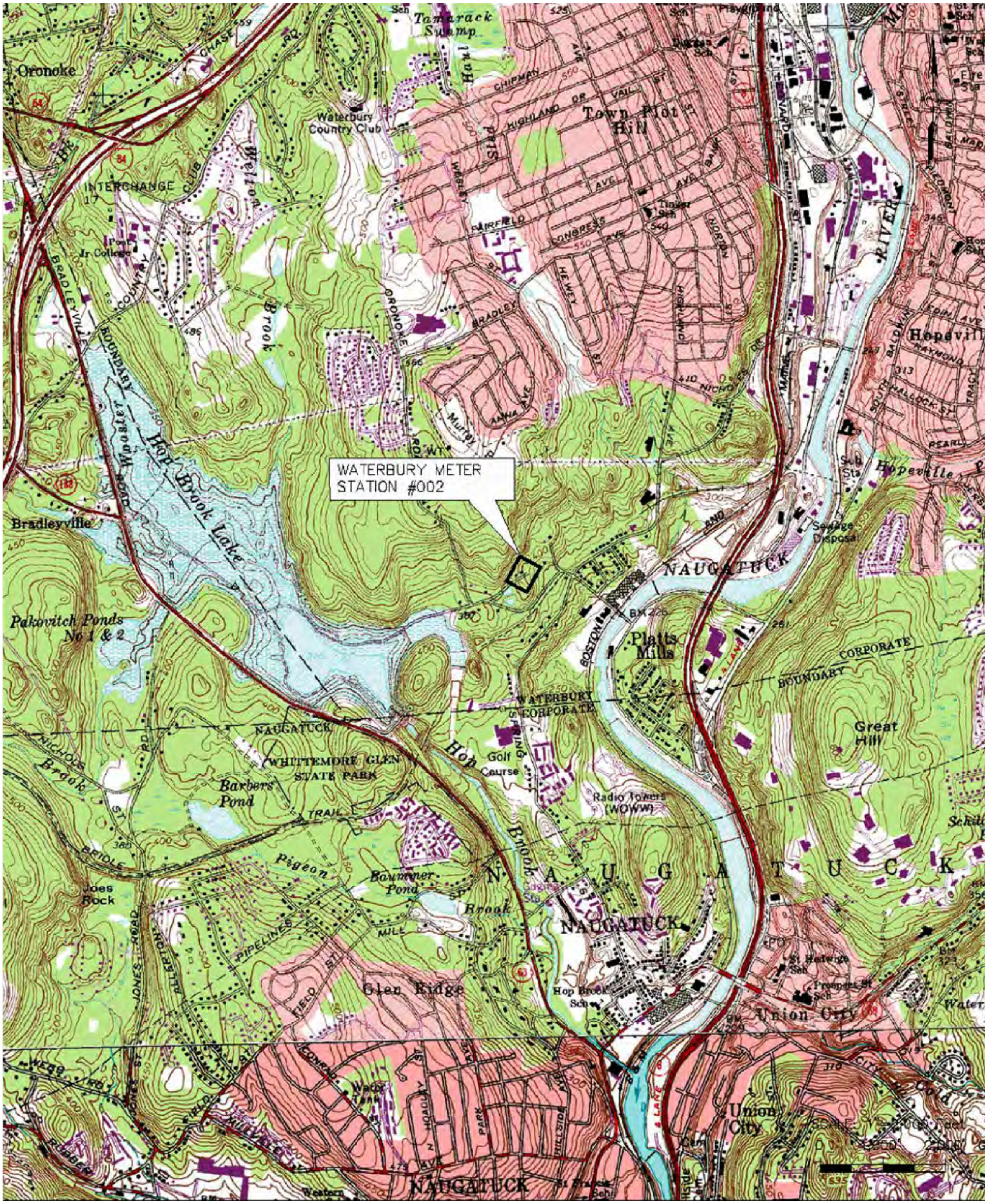
Facility Location Maps

Southbury M&R Station

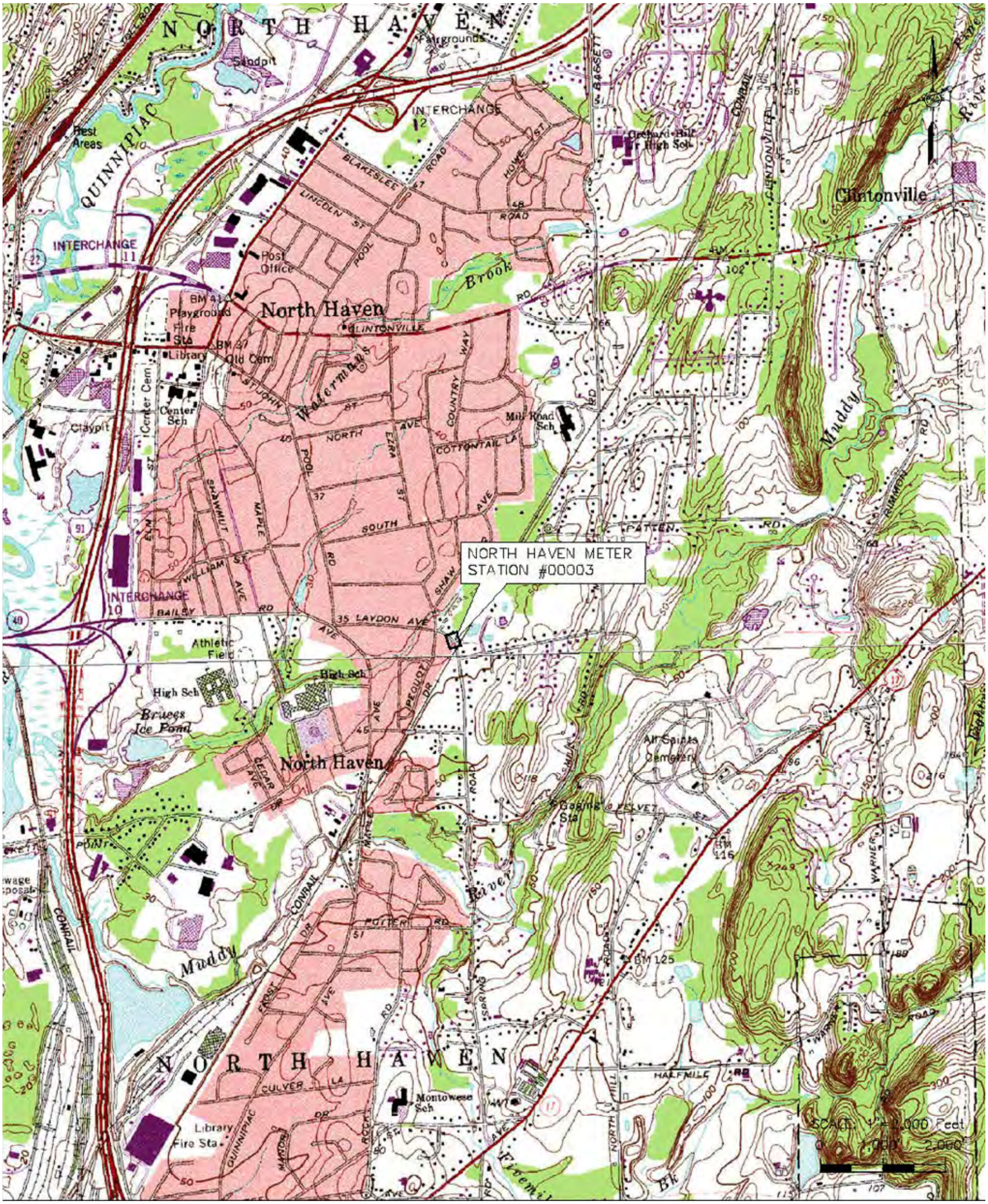


Appendix B

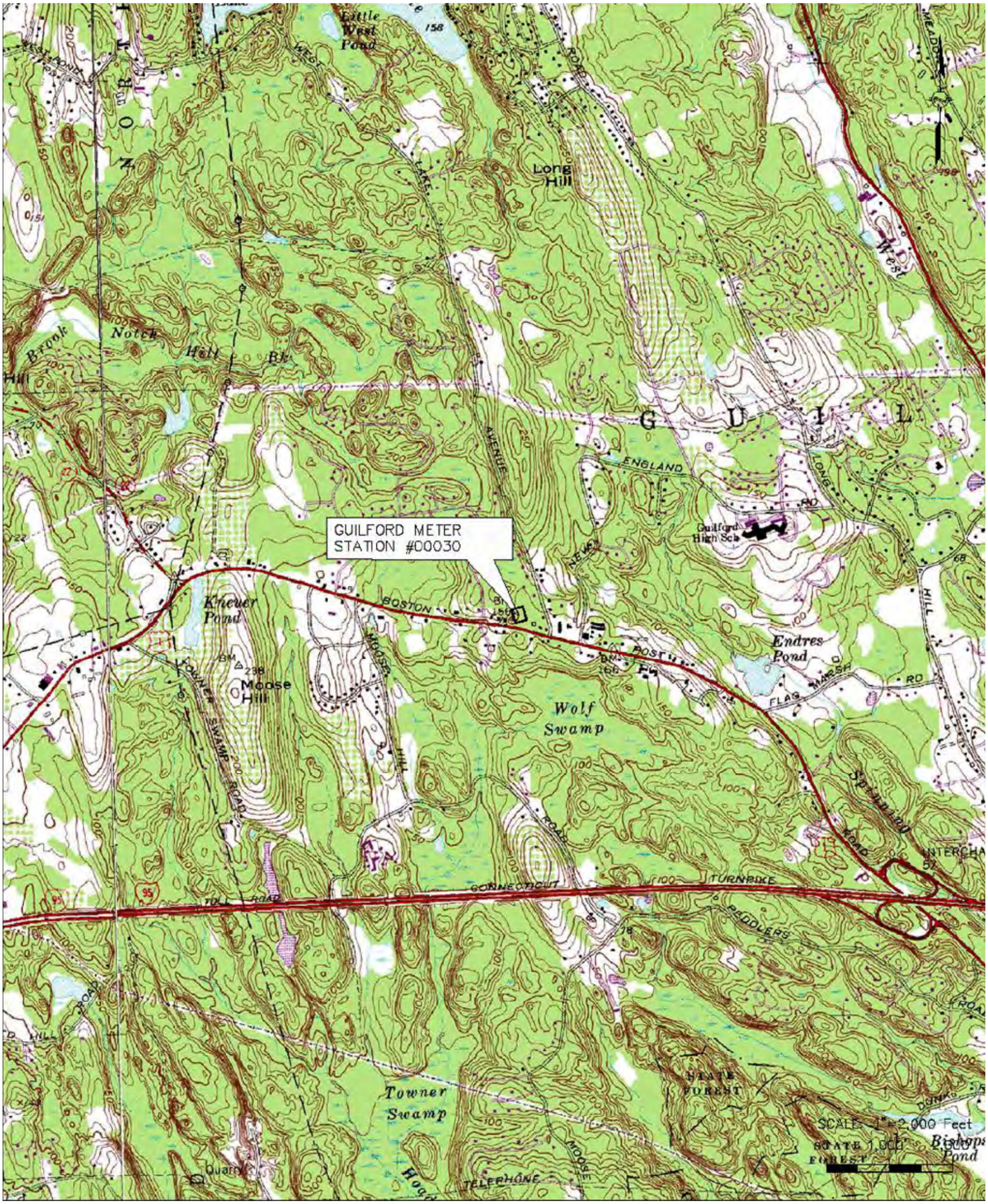
AIM Project

Facility Location Maps

Waterbury M&R Station



Appendix B
AIM Project
Facility Location Maps
North Haven M&R Station

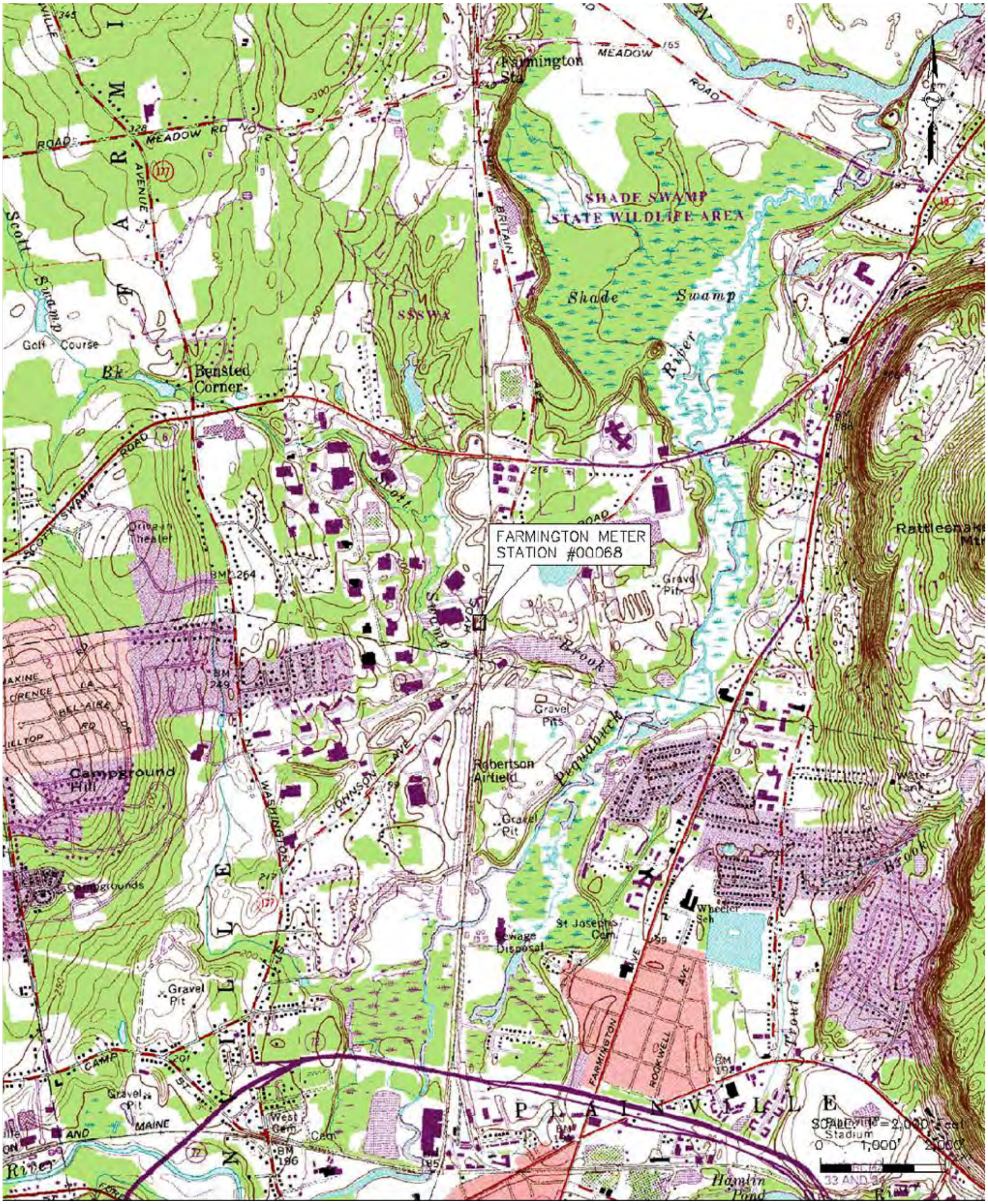


Appendix B

AIM Project

Facility Location Maps

Guilford M&R Station

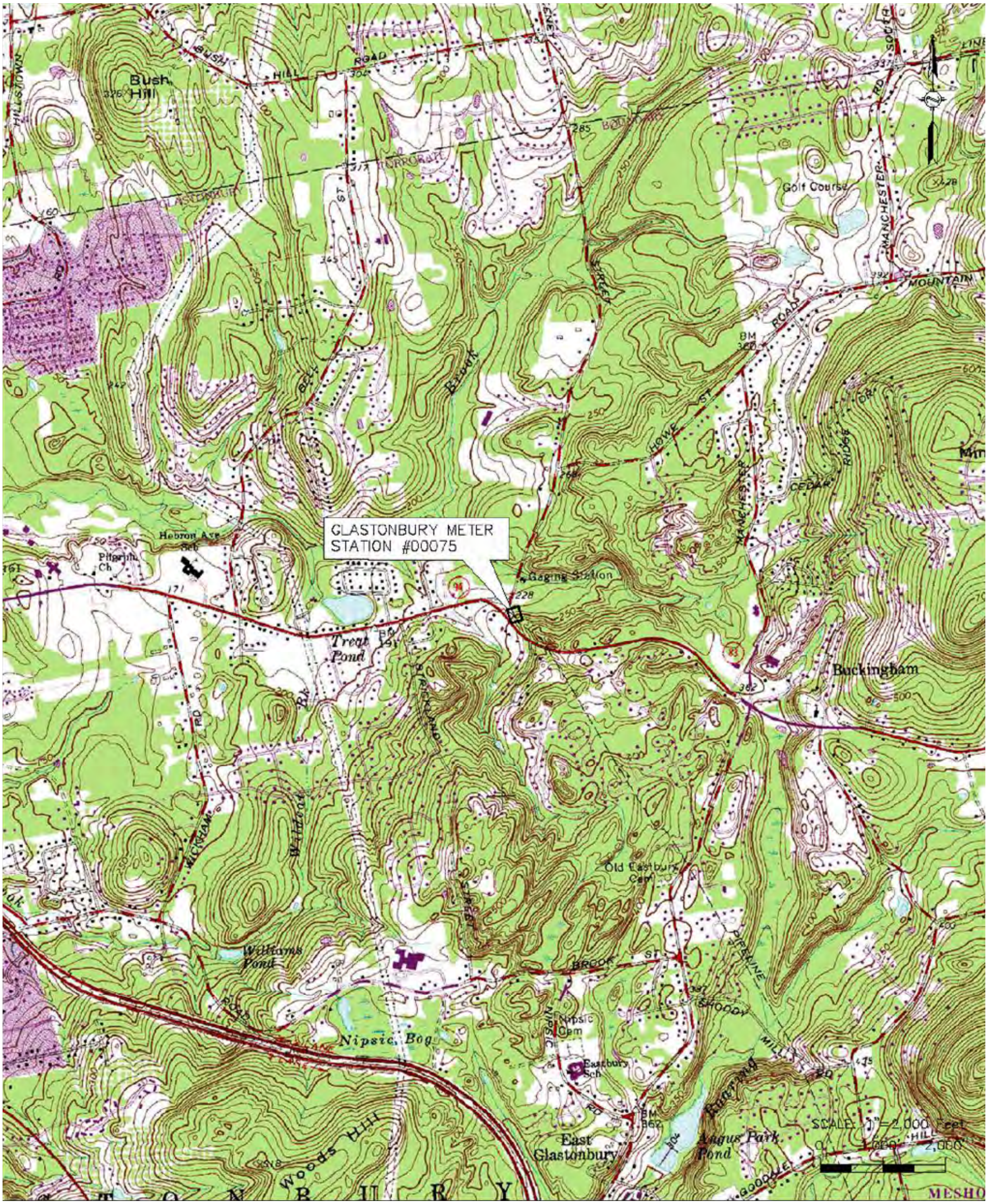


Appendix B

AIM Project

Facility Location Maps

Farmington M&R Station

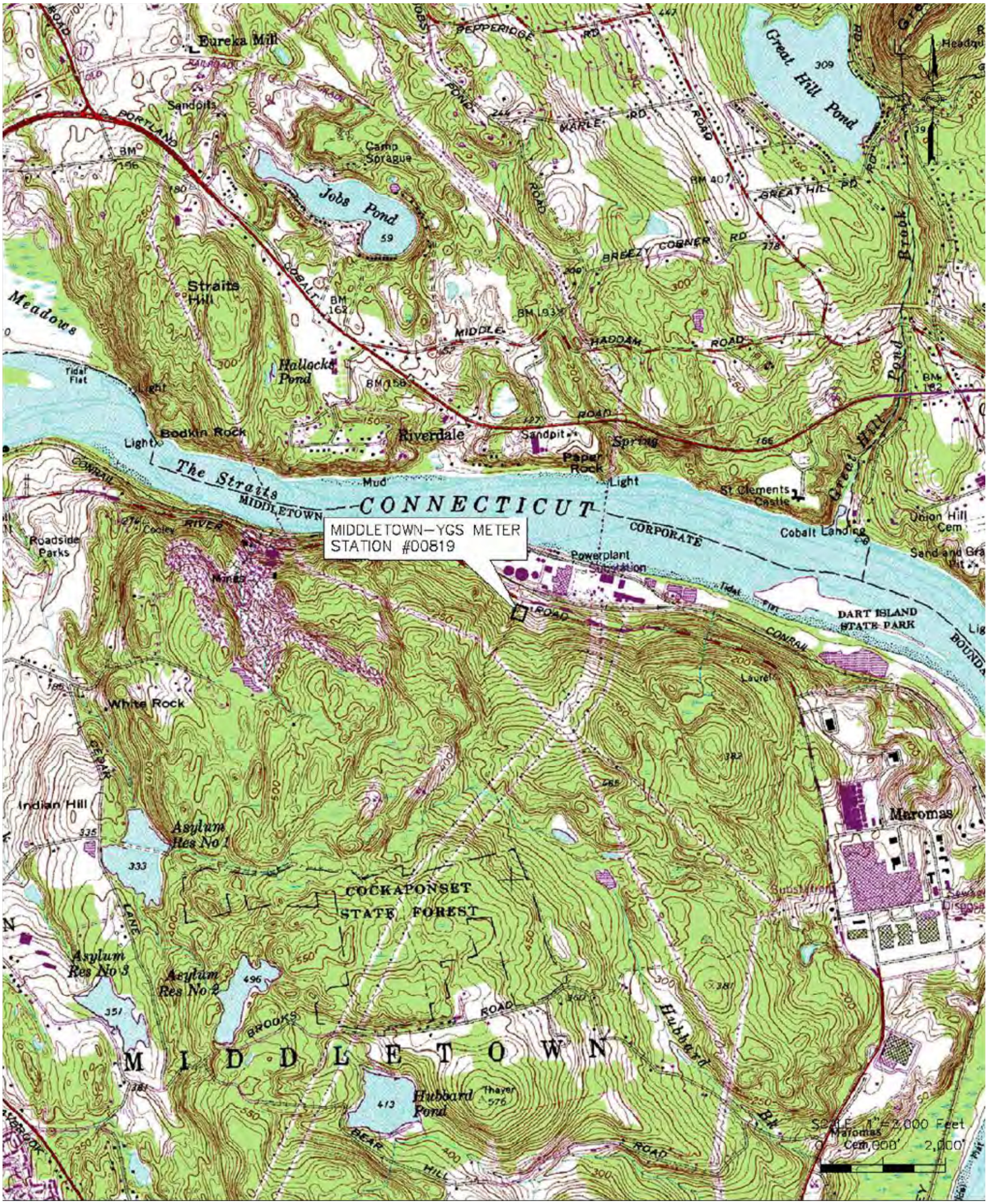


Appendix B

AIM Project

Facility Location Maps

Glastonbury M&R Station

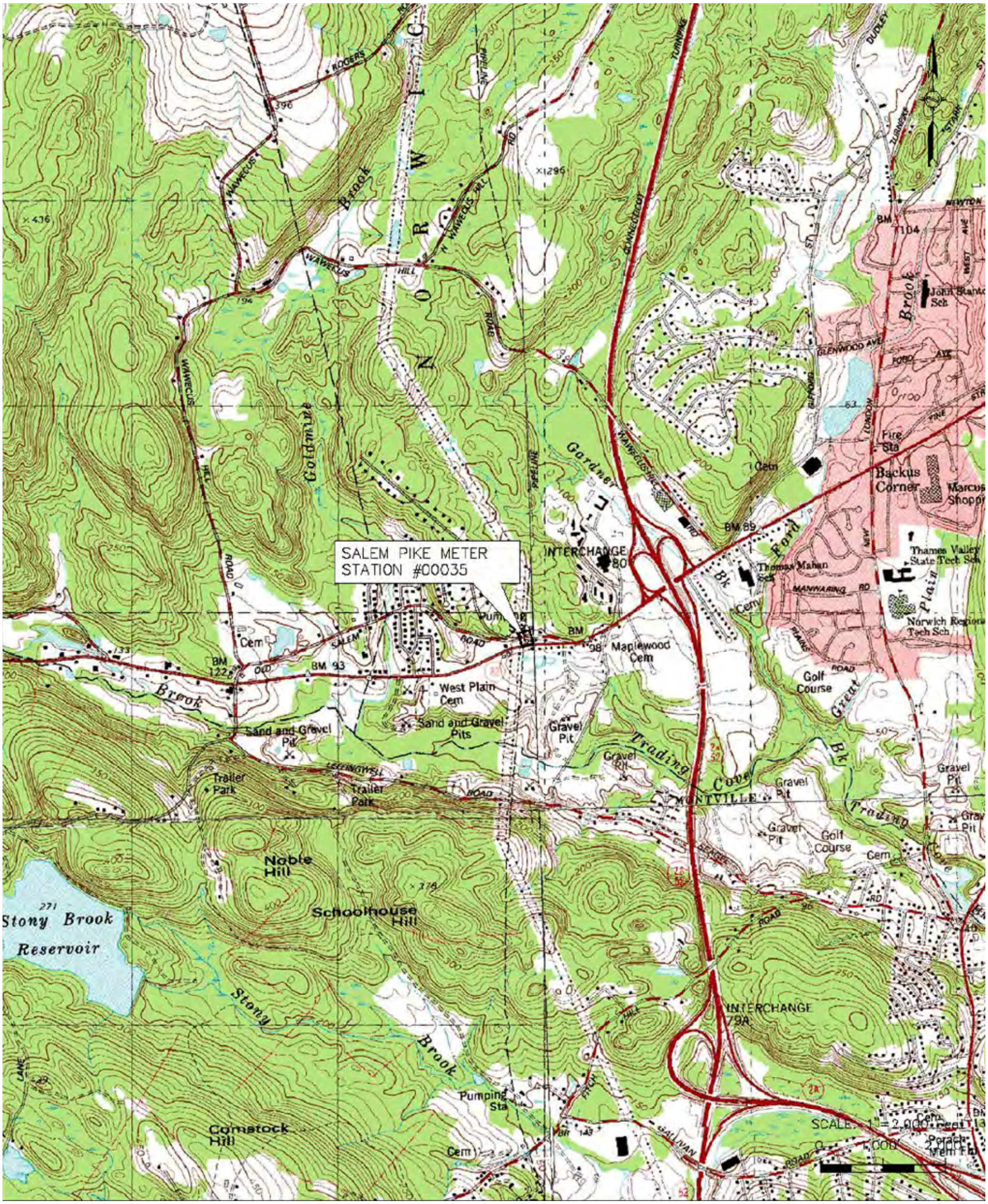


Appendix B

AIM Project

Facility Location Maps

Middletown M&R Station

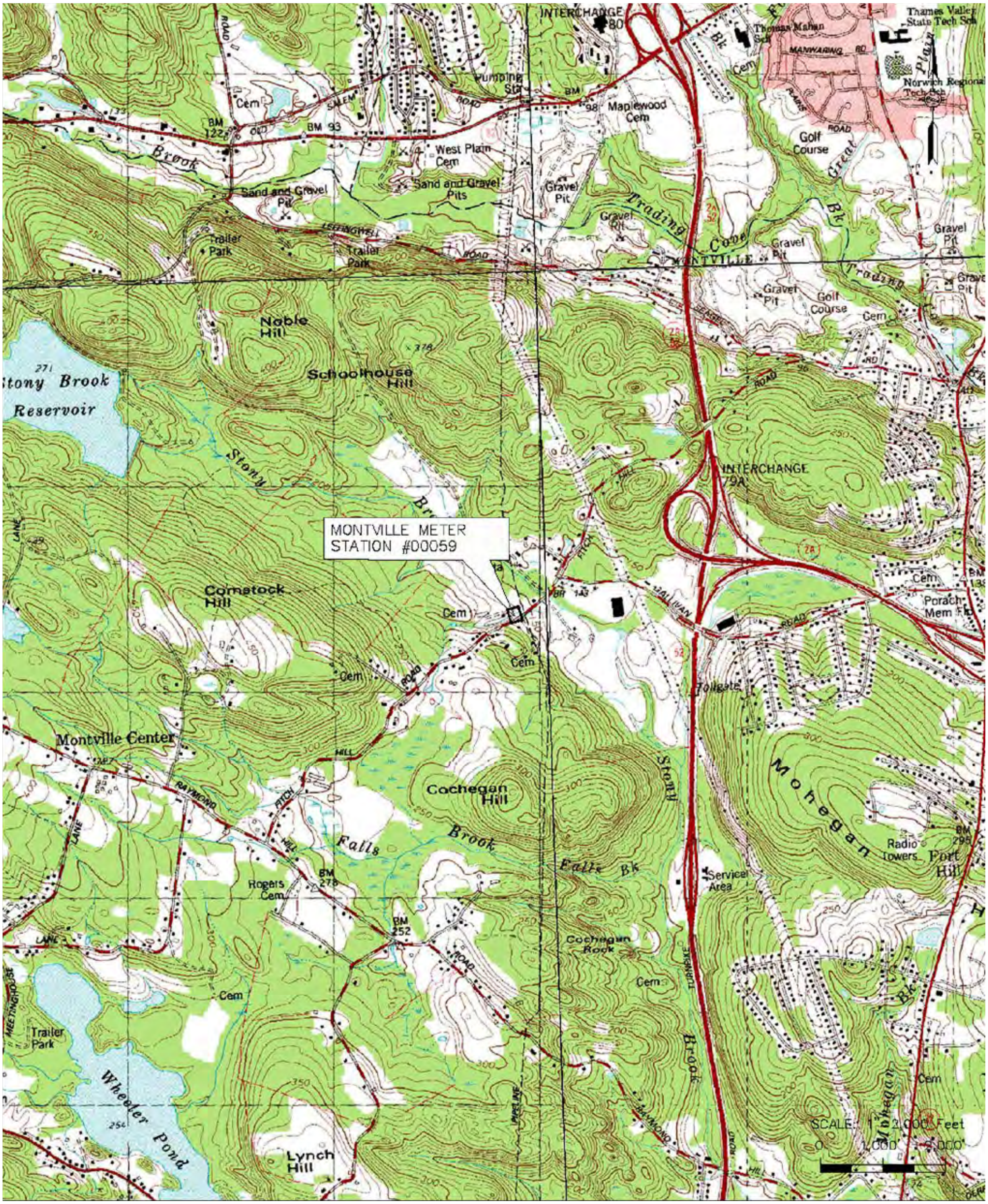


Appendix B

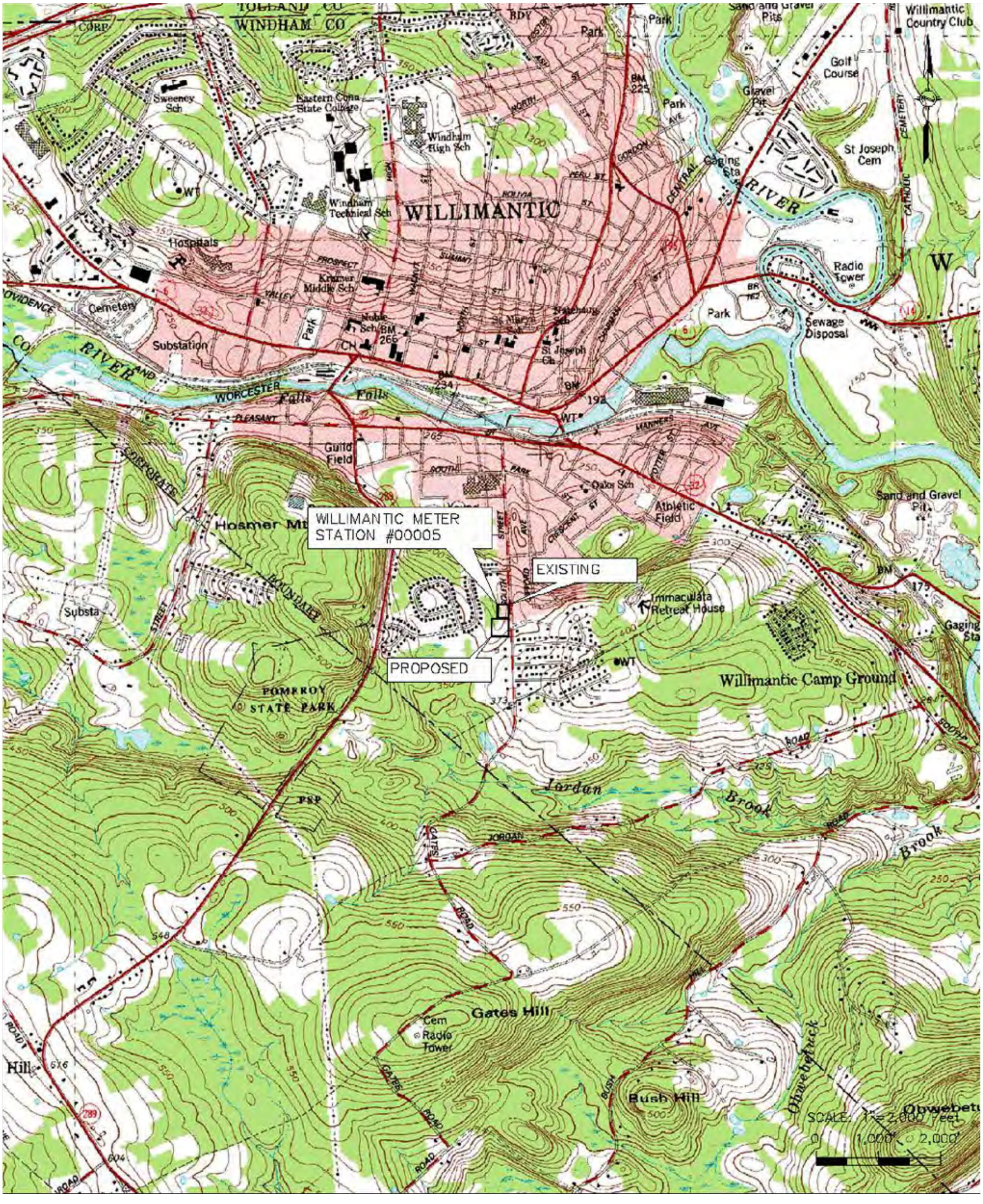
AIM Project

Facility Location Maps

Salem Pike M&R Station



Appendix B
AIM Project
Facility Location Maps
Montville M&R Station

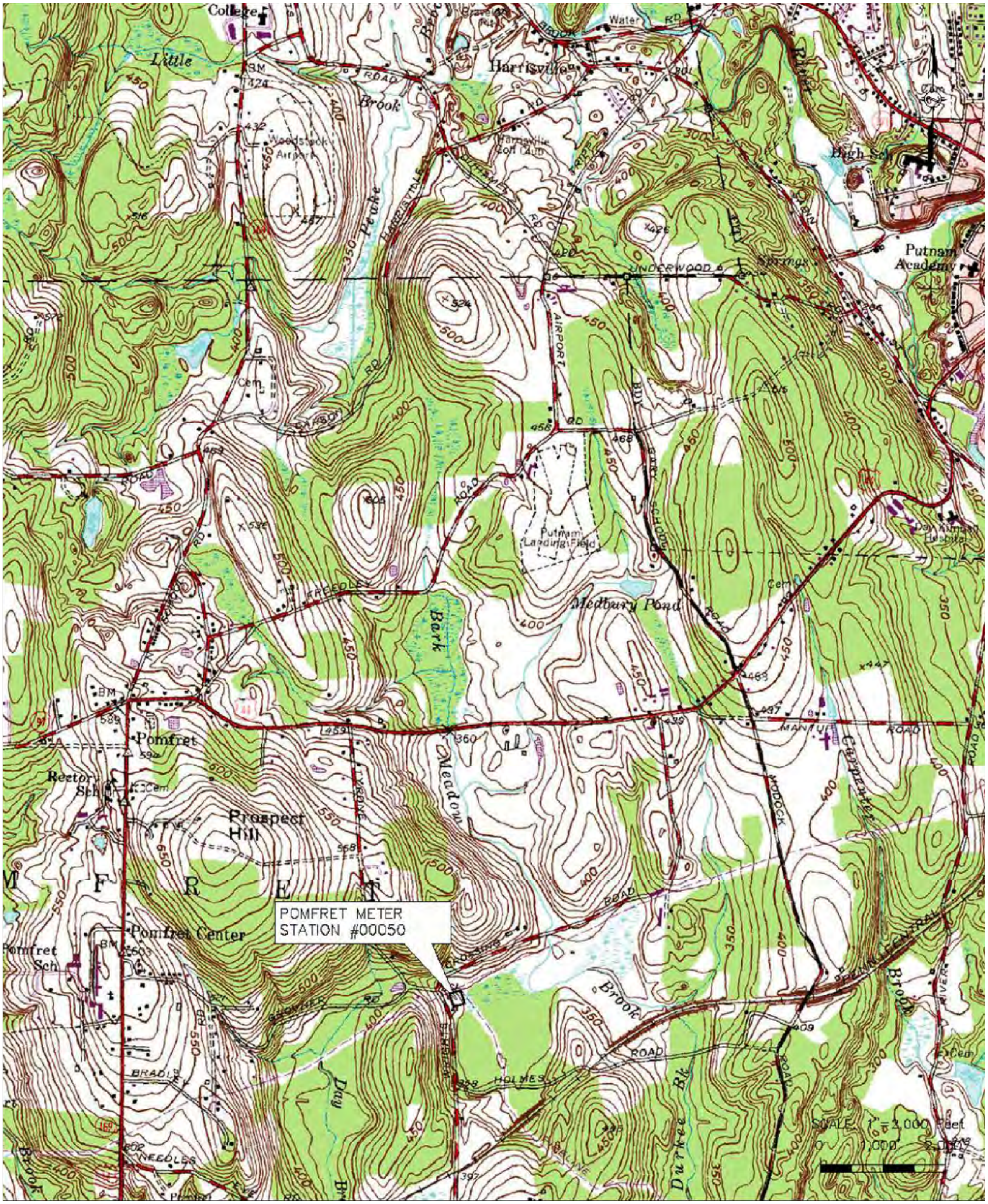


Appendix B

AIM Project

Facility Location Maps

Willimantic M&R Station

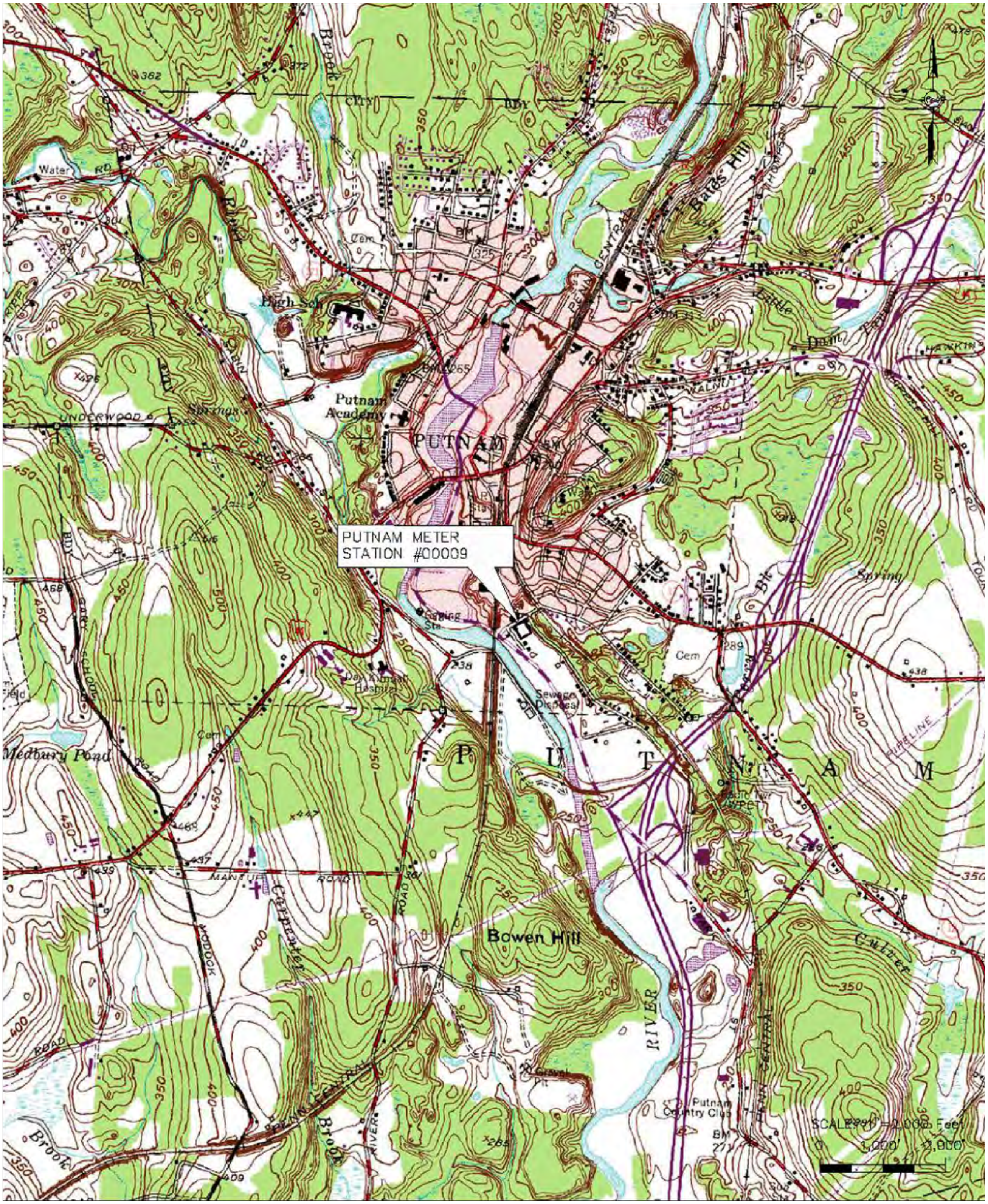


Appendix B

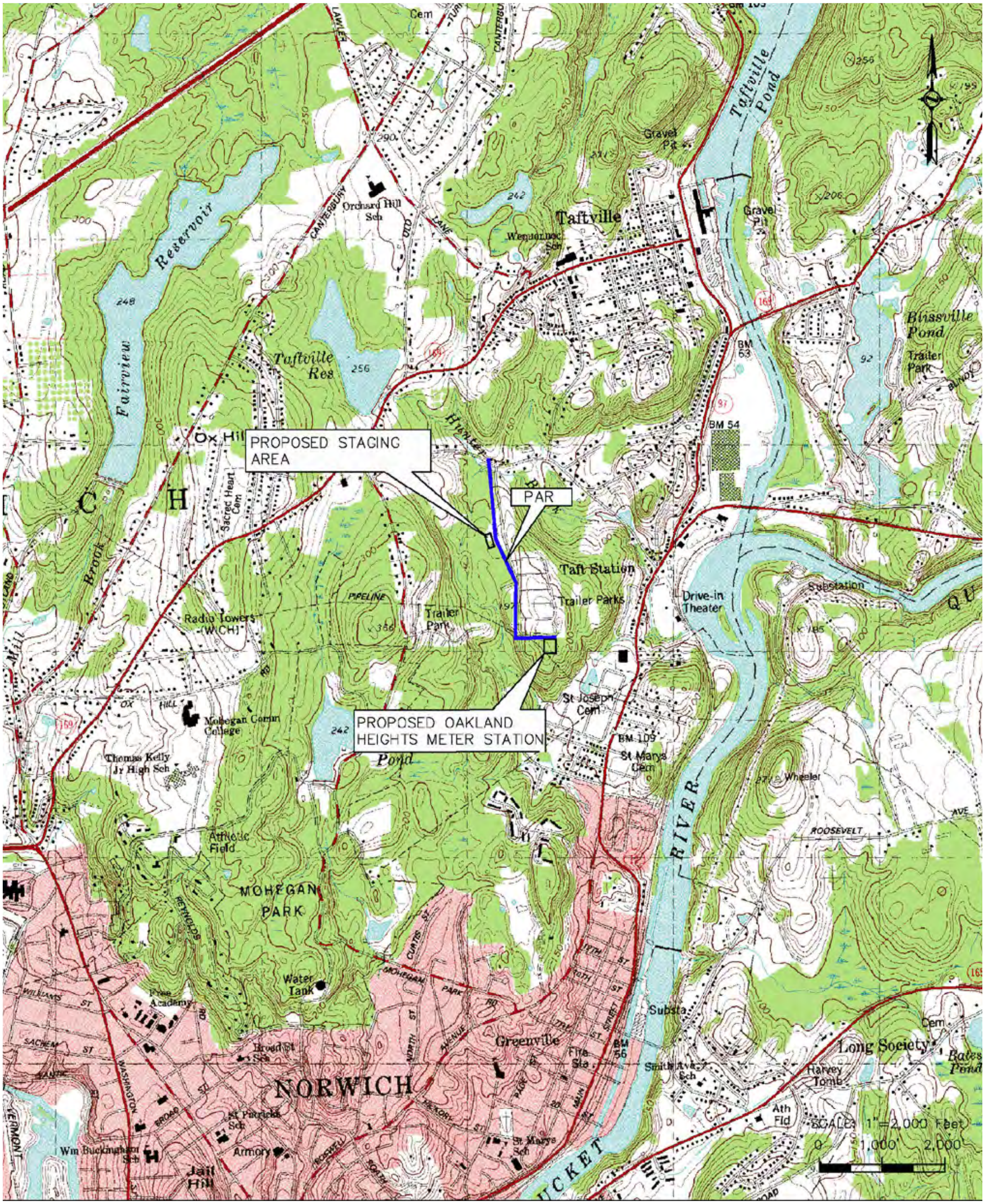
AIM Project

Facility Location Maps

Pomfret M&R Station



Appendix B
AIM Project
Facility Location Maps
Putnam M&R Station

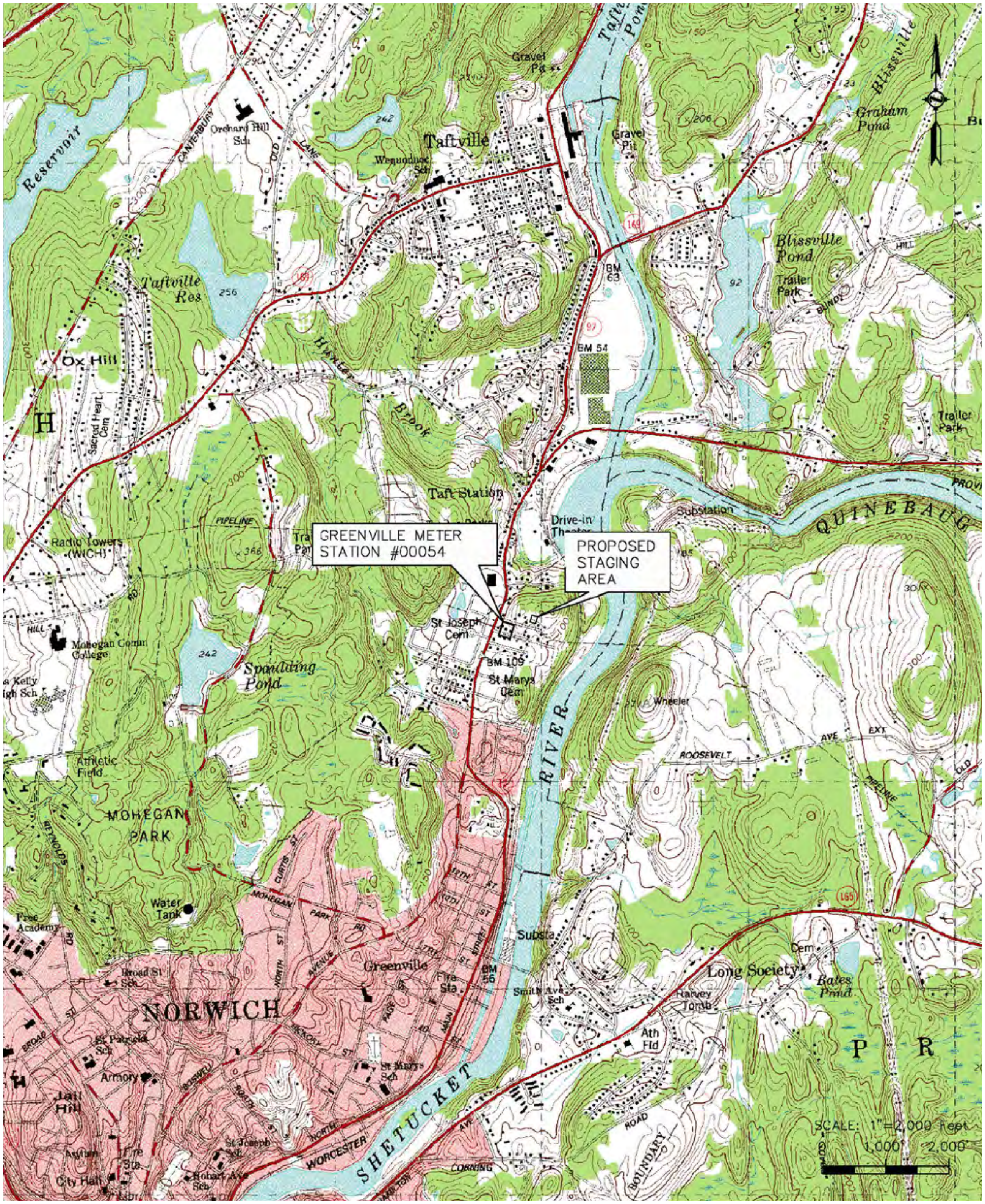


Appendix B

AIM Project

Facility Location Maps

Oakland Heights M&R Station



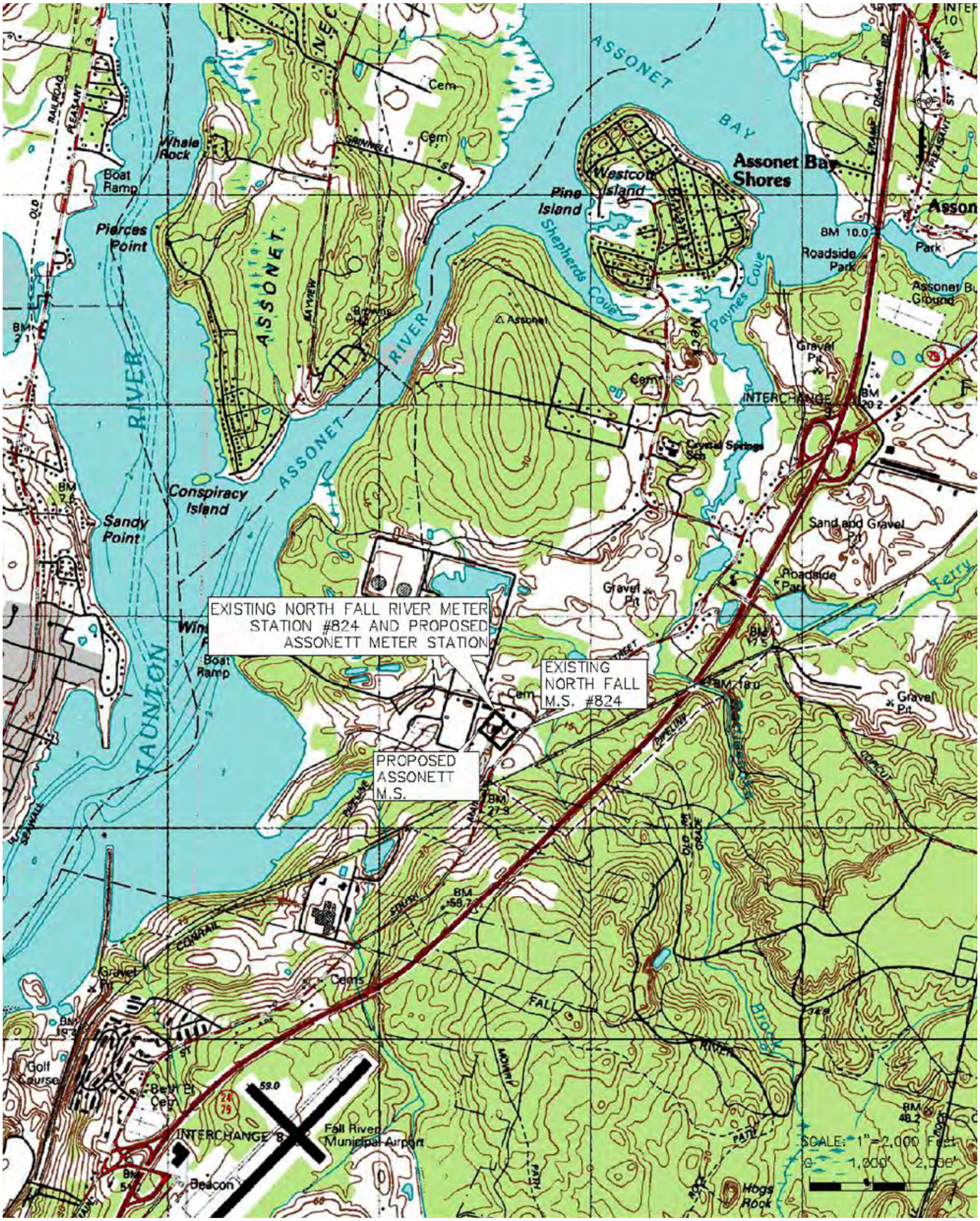
Appendix B

AIM Project

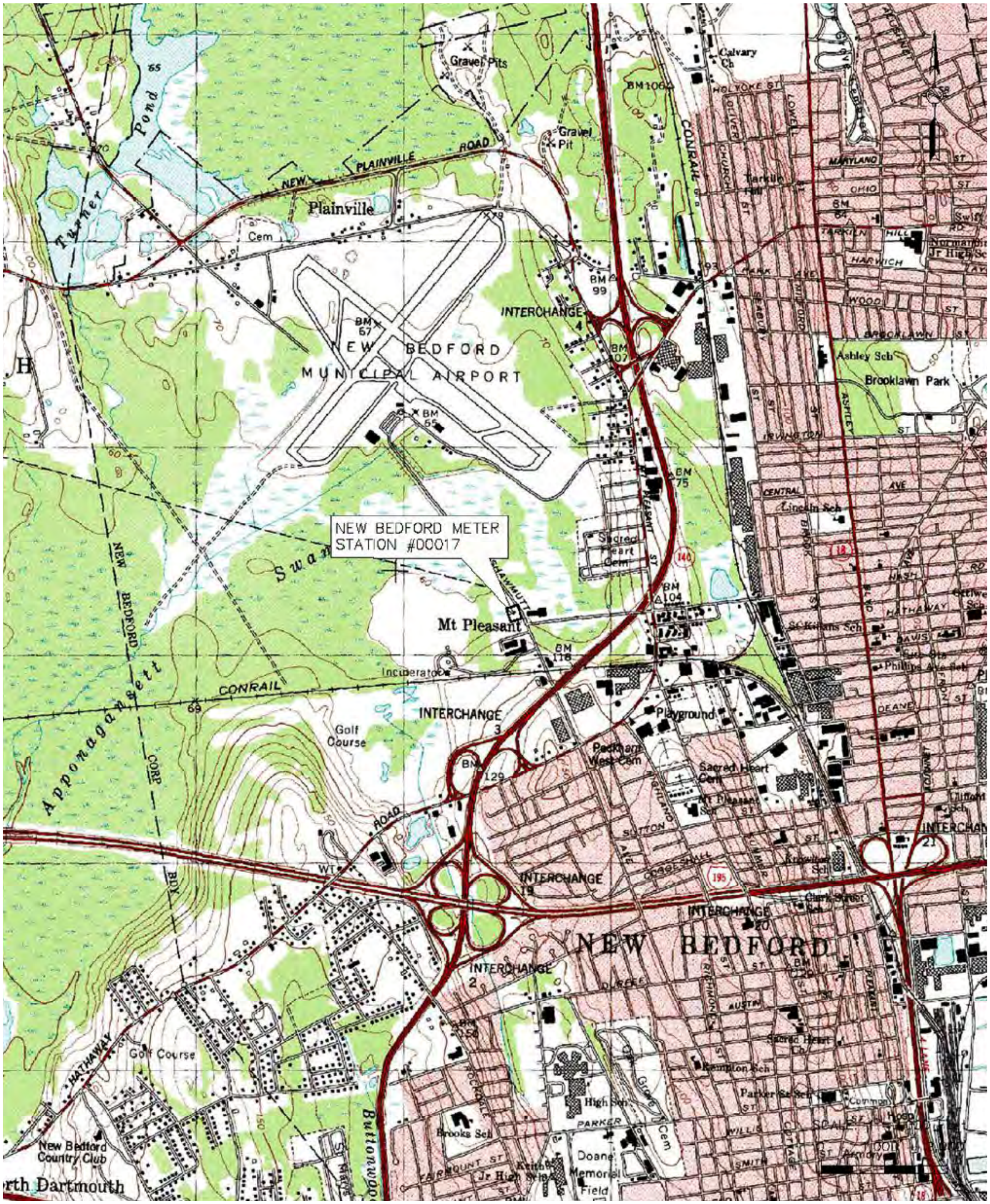
Facility Location Maps

Greenville M&R Station

Massachusetts M&R Stations



Appendix B
AIM Project
Facility Location Maps
North Fall River and Assonett M&R Stations

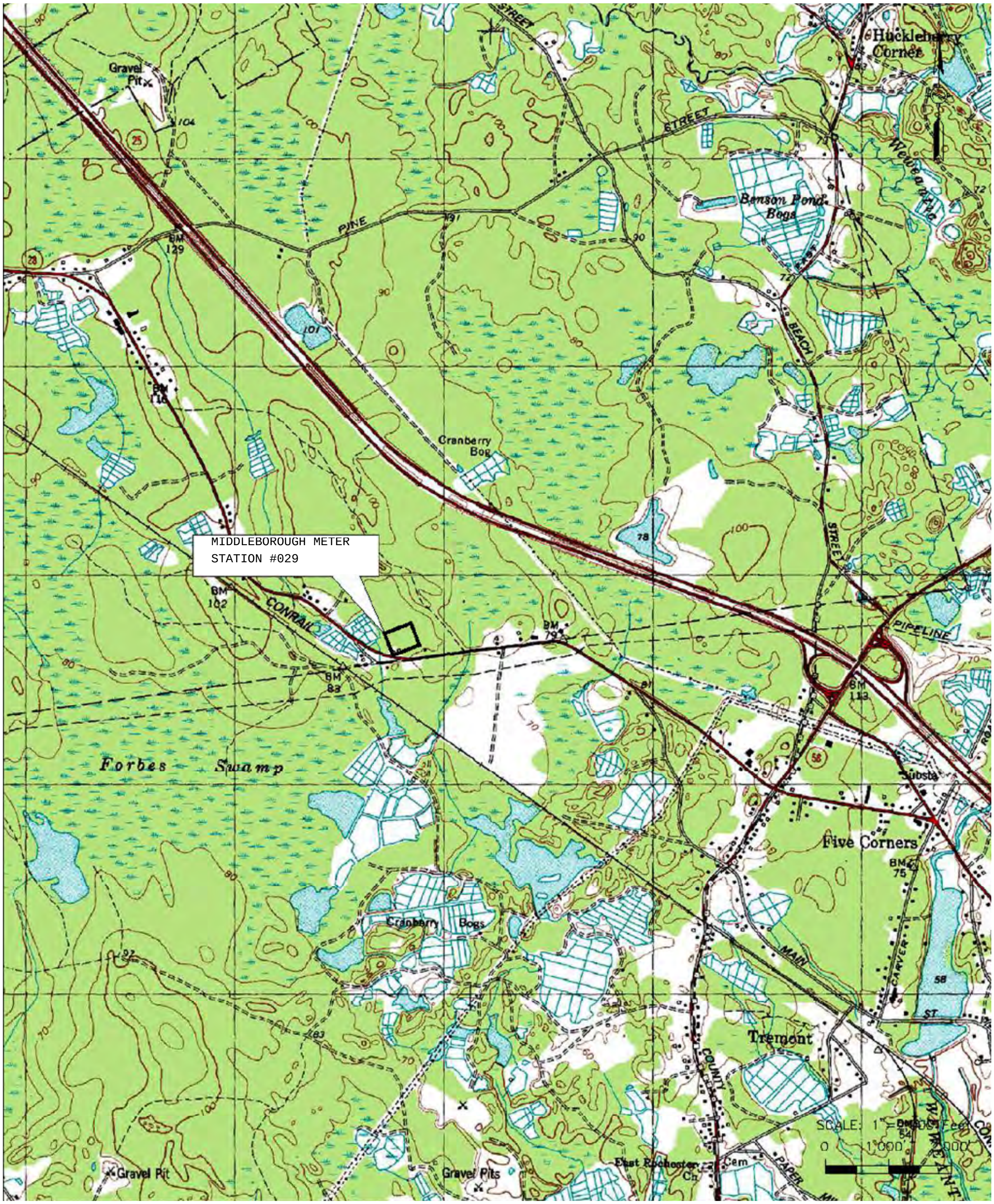


Appendix B

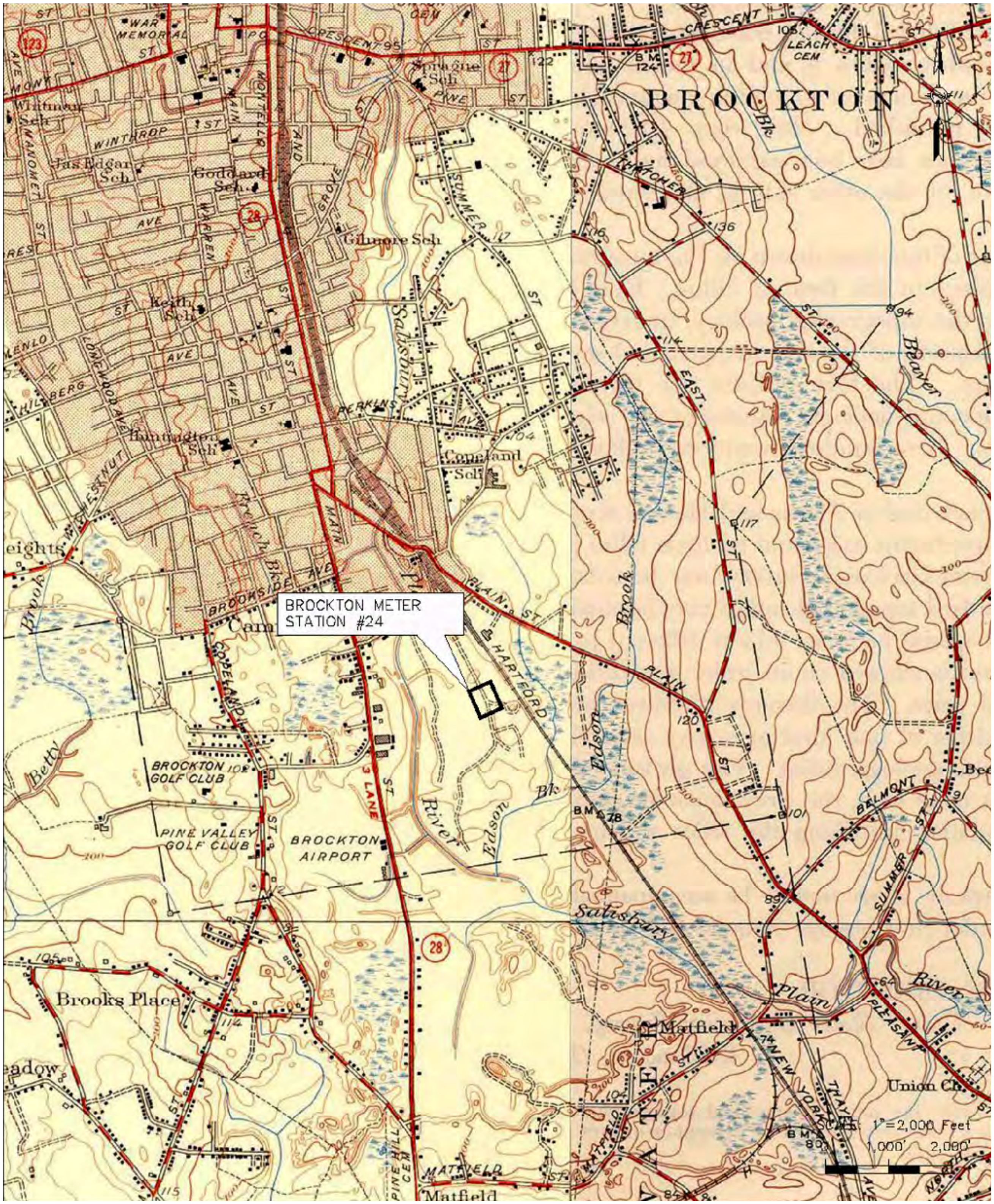
AIM Project

Facility Location Maps

New Bedford M&R Station



Appendix B
AIM Project
Facility Location Maps
Middleborough M&R Station

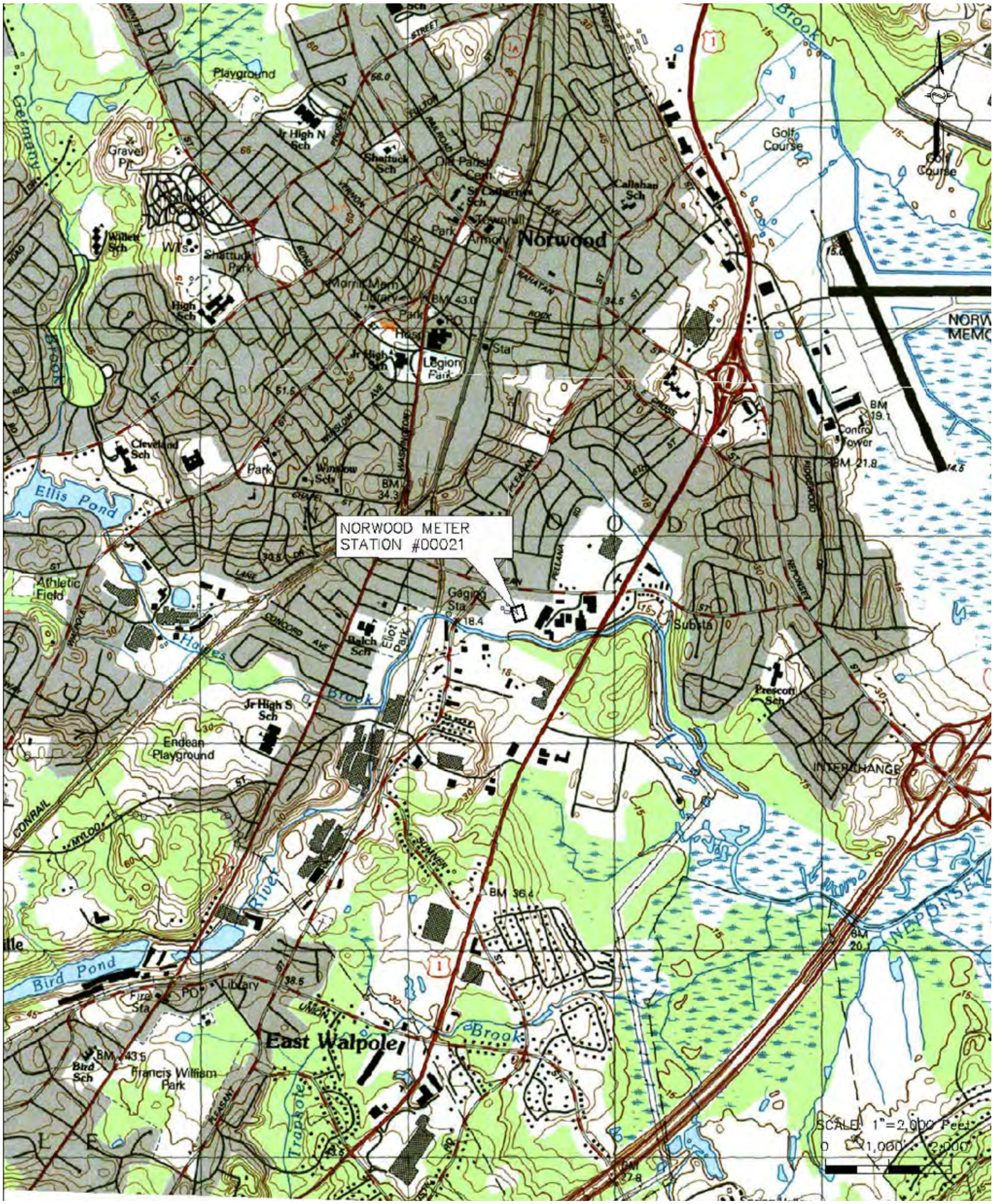


Appendix B

AIM Project

Facility Location Maps

Brockton M&R Station



Appendix B

AIM Project

Facility Location Maps

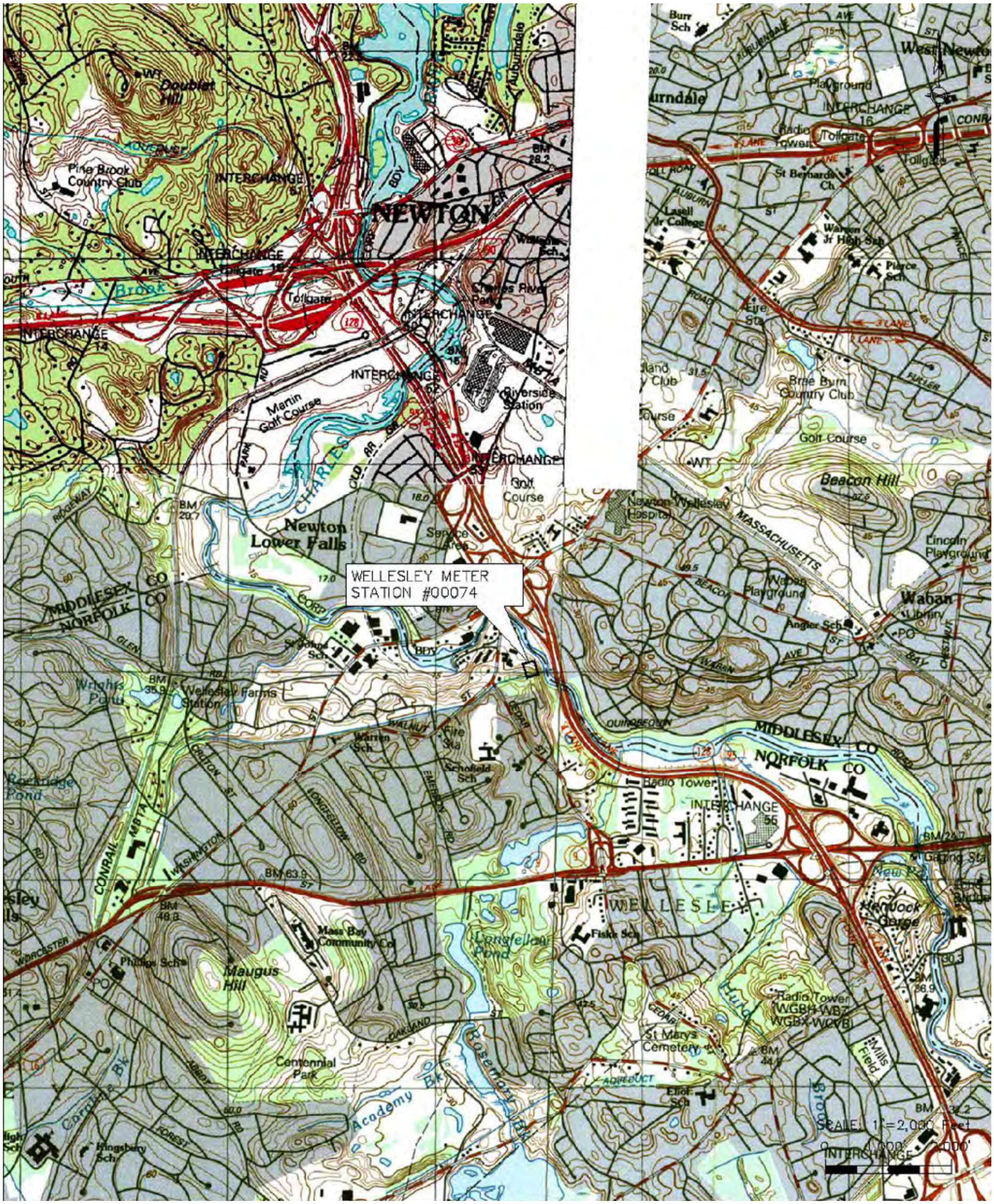
Norwood M&R Station

Appendix B

AIM Project

Facility Location Maps

Needham M&R Station



Appendix B

AIM Project

Facility Location Maps

Wellesley M&R Station

Appendix B

AIM Project

Facility Location Maps

Mystic M&R Station

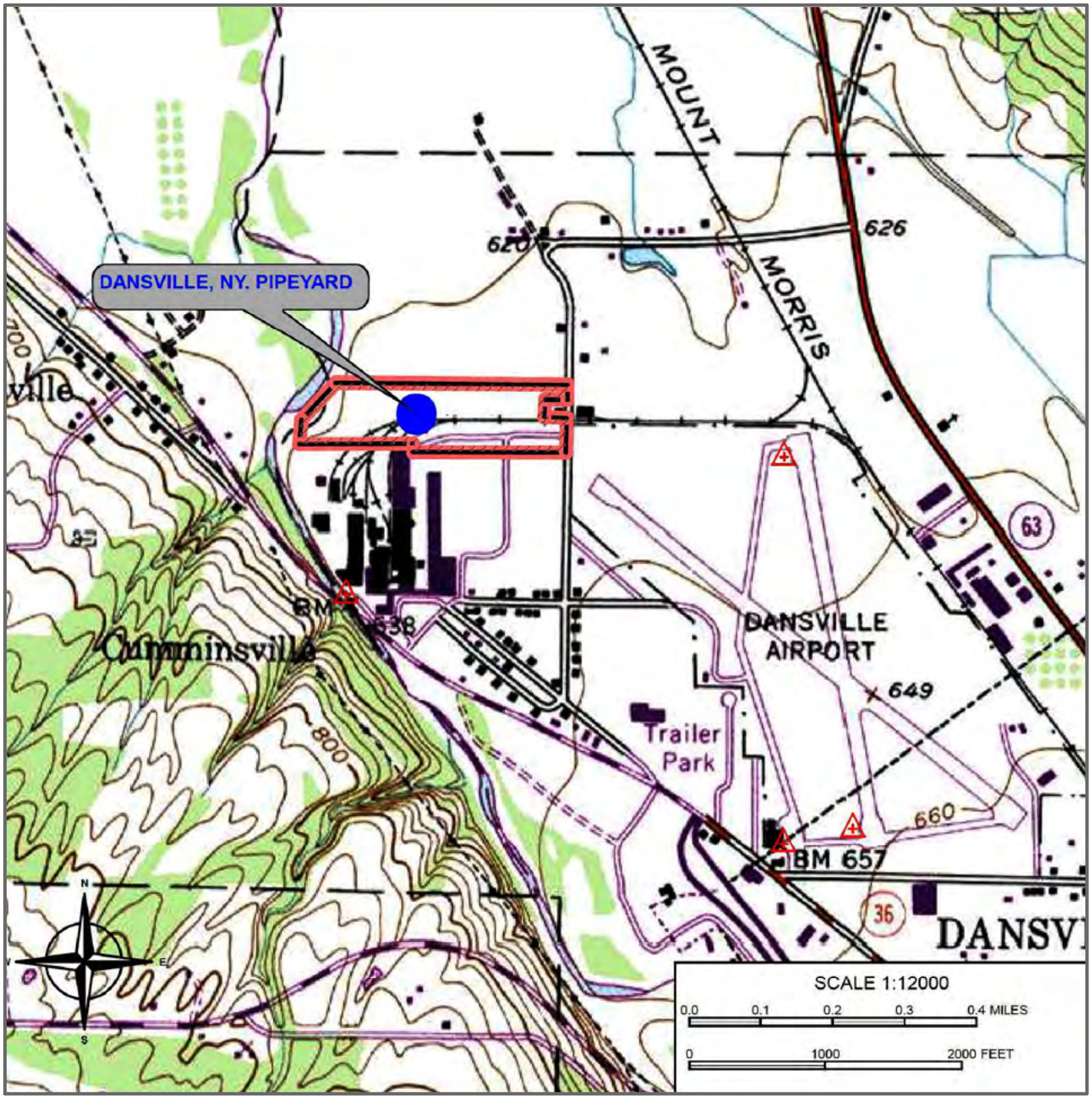
Appendix B

AIM Project

Facility Location Maps

West Roxbury M&R Station

Pipe and Contractor Ware Yards

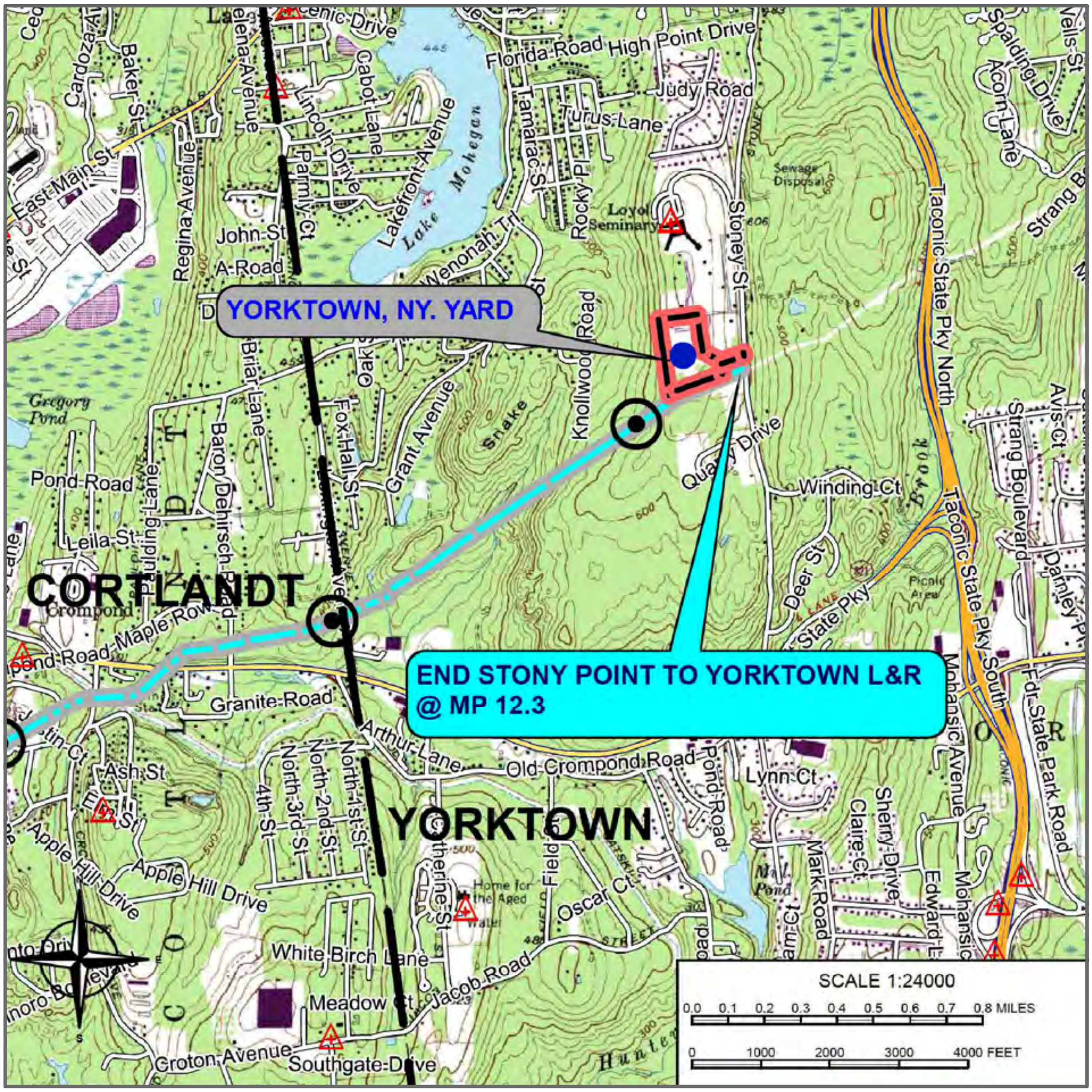


Appendix B

AIM Project

Facility Location Maps

Dansville Yard

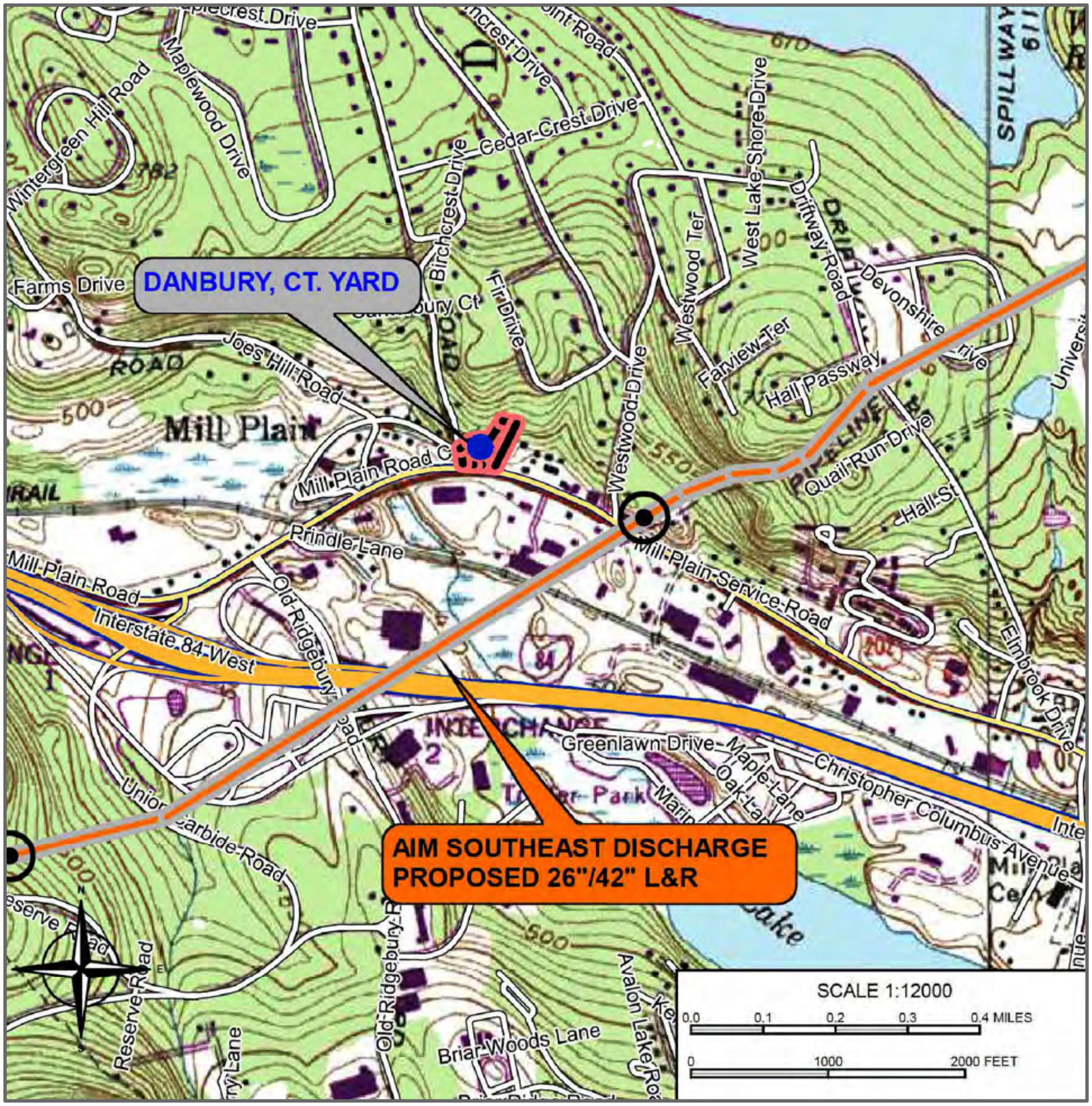


Appendix B

AIM Project

Facility Location Maps

Yorktown Yard

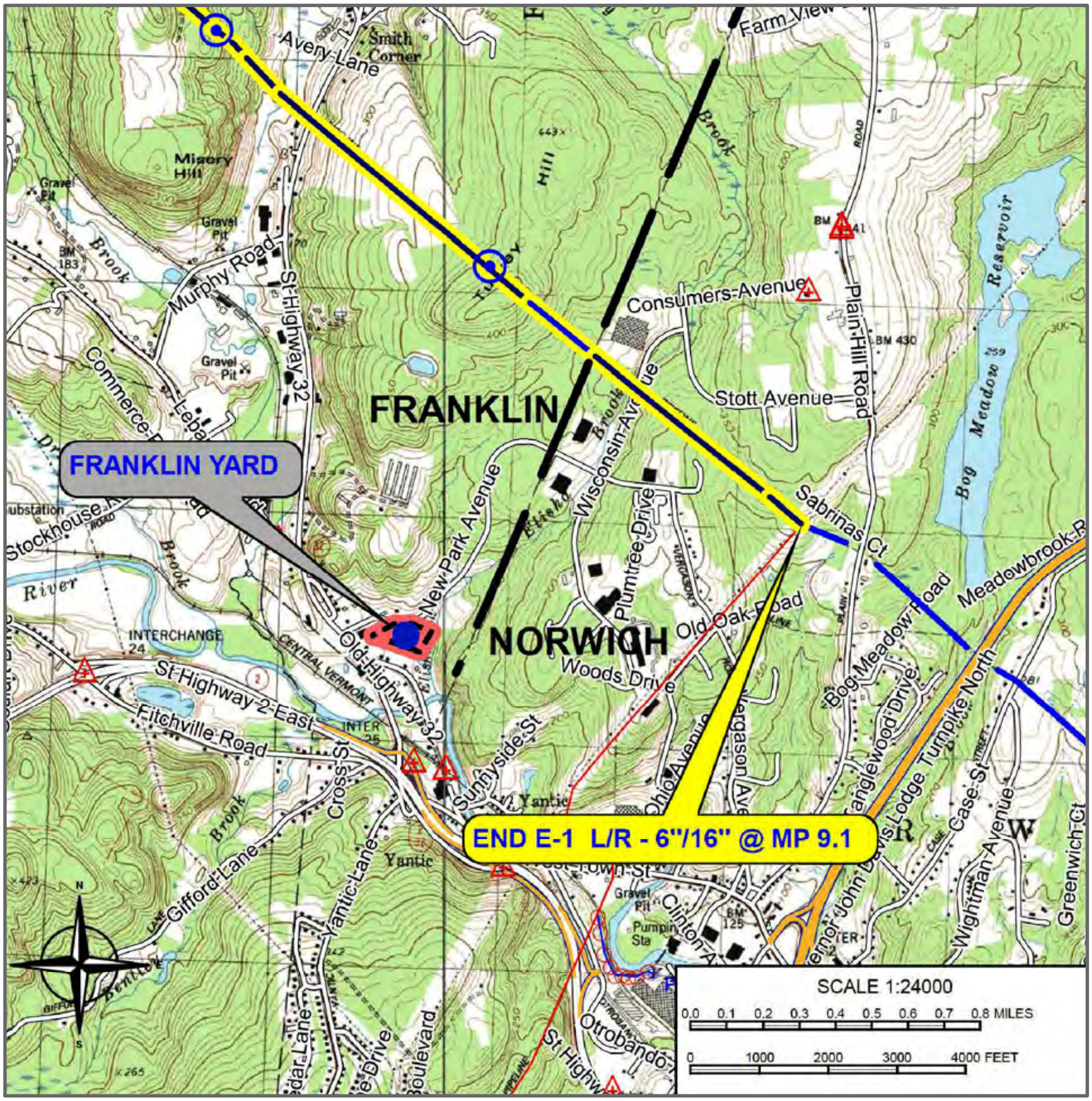


Appendix B

AIM Project

Facility Location Maps

Danbury Yard



Appendix B

AIM Project

Facility Location Maps

Franklin Yard

APPENDIX C

ADDITIONAL TEMPORARY WORKSPACE TABLE

TABLE C-1

Location of Additional Temporary Workspace Along the AIM Project Pipeline Facilities

Facility, County, State, Approximate Milepost	Side of Construction Work Area	Approximate Dimensions (feet) [a]	Acres	Existing Land Use [b]	Justification	Requires Variance	Wetland or Waterbody
Haverstraw to Stony Point Take-up and Relay							
Rockland County, NY							
0.0	Right	39 x 200	0.16	F, O	Valve site 13B	No	NA
0.0	Right	140 x 153	0.49	F, I, O	Valve site 13B	No	NA
0.3	Left	81 x 305	0.33	I, O R	Waterbody and road crossing	No	NA
0.6	Left	50 x 100	0.12	F	Wetland	No	NA
0.7	Left	50 x 415	0.47	F	Wetland	No	NA
0.9	Left	50 x 350	0.40	F	Wetland	No	NA
1.1	Left	65 x 450	0.49	F, I, R	Wetland/waterbody	Yes	B13-RLR-W3; B13-RLR-S3D; B13 RLR-S3I; B13-RLR-S3J
1.2	Left	30 x 450	0.33	F	Road crossing	No	NA
1.2	Left	55 x 180	0.23	F, I, R	Road crossing	No	NA
1.7	Left	30 x 1135	0.69	F, O, R	Wetland and stream crossing	No	NA
2.0	Right	10 x 135	0.03	F	Wetland	No	NA
2.2	Left	75 x 750	0.92	F, I, O, R	Road crossing (Palisades Interstate Parkway) and wetland	Yes	B13-RLR-S6
2.2	Right	40 x 450	0.37	F, I, O, R	Road crossing (Palisades Interstate Parkway) and wetland	No	NA
2.7	Right	20 x 760	0.37	O, R	Wetland	No	NA
3.0	Left	90 x 700	0.26	F, I, O, R	Highway 210 crossing and wetland	Yes	B13-RLR-W9; B13-RLR-W10; B13-RLR-S10A
3.0	Right	65 x 600	0.09	F, I, O, OW	Highway 210 crossing and wetland	Yes	B13-RLR-W10; B13-RLR-S10
Stony Point to Yorktown Take-up and Relay							
Rockland County, NY							
0.1	Left	35 x 200	0.16	F	Overhead transmission lines	No	NA
0.4	Left	35 x 100	0.08	F	Stream crossing	No	NA
0.4	Left	35 x 185	0.12	F, R	Stream crossing	Yes	A13-SPLR-S1
0.4	Right	90 x 160	0.18	I, R	Road crossing	No	NA
0.7	Right	70 x 125	0.10	R	Road crossing	No	NA
0.7	Left	80 x 125	0.18	F, I, R	Road crossing	No	NA
1.3	Left	25 x 100	0.06	F, O, R	Road crossing	No	NA
1.4	Right	50 x 120	0.13	F, I, R	Road crossing	No	NA
1.4	Left	50 x 125	0.12	F, I	Road crossing	No	NA
1.7	Right	50 x 280	0.28	F, I, O	Road crossing	No	NA

TABLE C-1 (cont'd)

Location of Additional Temporary Workspace Along the AIM Project Pipeline Facilities

Facility, County, State, Approximate Milepost	Side of Construction Work Area	Approximate Dimensions (feet) [a]	Acres	Existing Land Use [b]	Justification	Requires Variance	Wetland or Waterbody
2.5	Left	20 x 125	0.06	F, R	MLV cross over piping and launcher facility	No	NA
2.6	Left	30 x 100	0.07	F, O	MLV cross over piping and launcher facility	No	NA
3.0	Right	70 x 500	0.39	F, I	Road crossing	No	NA
3.1	Right	15 x 90	0.03	F, O	Wetland	No	NA
3.2	Right	320 x 225	1.81	I	HDD entry point	No	NA
3.2	Left	25 x 215	0.10	I	HDD entry point	No	NA
Westchester County, NY							NA
3.9	Left	190 x 460	2.27	F, I, OW	HDD exit point	No	NA
3.9	Right	185 x 555	2.39	F, I, OW	HDD exit point	No	NA
4.1	Right	1265 x 100	2.86	F	HDD pullback	No	NA
4.2	Left	245 x 370	2.12	F, I	Staging equipment for HDD work; overhead transmission lines	No	NA
4.5	Right	35 x 305	0.22	F, I	Wetlands and road crossing	No	NA
4.5	Right	705 x 510	6.38	F, I	Wetlands and road crossing	No	NA
4.8	Left	40 x 255	0.19	F, I	Wetlands and road crossing	No	NA
5.1	Right	20 x 100	0.05	F	Wetlands	No	NA
5.2	Right	20 x 195	0.10	F	Wetlands	No	NA
5.4	Right	35 x 100	0.08	F, O	Wetland	No	NA
5.5	Left	100 x 100	0.27	F, O	Road crossing	No	NA
5.5	Left	65 x 165	0.23	F, I, O	Road crossing	No	NA
5.6	Left	35 x 100	0.08	F	Wetland	Yes	B13-SPLR-W17
5.9	Right	20 x 330	0.15	I, O, R	Wetland and road crossings	Yes	B13-SPLR-W2
5.9	Left	255 x 300	0.56	F, R	Wetland	Yes	B13-SPLR-W2
5.9	Right	35 x 740	0.64	F, O	Wetland	Yes	B13-SPLR-W2; B13-SPLR-S2
6.0	Left	35 x 100	0.08	F	Wetland	No	NA
6.3	Left	35 x 100	0.08	F	Wetland	No	NA
6.4	Left	60 x 265	0.13	F	Road crossing	No	NA
6.7	Left	35 x 230	0.18	F, I, R	Road crossing	Yes	B13-SPLR-W7
6.8	Left	35 x 100	0.08	F	Wetland	No	NA
6.9	Left	35 x 100	.08	F	Wetland	No	NA
7.0	Right	95 x 460	0.45	F	Wetland	No	NA
7.4	Left	35 x 200	0.16	F, O	Wetland	Yes	B13-SPLR-W12
7.5	Left	35 x 100	0.09	F, O	Wetland	No	NA
7.6	Left	35 x 100	0.08	F, O	Wetland	No	NA
7.9	Left	35 x 525	0.41	F, O	Wetland	No	NA
8.2	Left	35 x 100	0.08	I	Wetland	No	NA
8.3	Left	35 x 100	0.08	I	Wetland	No	NA
8.3	Left	35 x 100	0.08	A, I	Wetland	No	NA
8.4	Left	35 x 100	0.08	F	Wetland	No	NA

TABLE C-1 (cont'd)

Location of Additional Temporary Workspace Along the AIM Project Pipeline Facilities

Facility, County, State, Approximate Milepost	Side of Construction Work Area	Approximate Dimensions (feet) [a]	Acres	Existing Land Use [b]	Justification	Requires Variance	Wetland or Waterbody
8.5	Left	50 x 150	0.15	F, I	Wetland and road crossing	Yes	A13-SPLR-W2
8.6	Left	50 x 100	0.11	F	Wetland	Yes	A13-SPLR-W2
8.8	Left	50 x 375	0.43	F	Wetland	Yes	A13-SPLR-W2; B13-SPLR-W18
8.9	Left	50 x 285	0.31	F	Wetland	No	NA
9.2	Right	90 x 165	0.18	F, I, R	Road crossing	No	NA
9.2	Left	30 x 160	0.11	F, I	Road crossing	Yes	A13-SPLR-W4
9.4	Right	45 x 180	0.13	I, R	Wetland and road crossing	No	NA
9.5	Right	50 x 100	0.11	F, R	Road crossing	No	NA
9.5	Right	50 x 100	0.11	F	Wetland	No	NA
9.6	Left	30 x 205	0.14	F, I, O, R	Wetland and road crossing	Yes	B13-SPLR-W43; B13-SPLR-W206
9.8	Right	30 x 170	0.06	F, I, R	Road crossing	No	NA
9.8	Right	105 x 255	0.39	R	Road crossing	No	NA
9.9	Left	155 x 280	0.47	F, I, R	Wetland	Yes	B13-SPLR-W20
10.1	Left	105 x 275	0.48	I, R	Road crossing	No	NA
10.2	Right	80 x 320	0.30	F, I, R	Road crossing	No	NA
10.3	Right	95 x 730	0.45	F, I, R	Wetland and road crossing	Yes	B13-SPLR-S21A; B13-SPLR-S21B
10.5	Right	80 x 130	0.07	I	Road crossing	No	
10.5	Left	30 x 220	0.15	F, I, O	Wetland and road crossing	Yes	B13-SPLR-W22
10.7	Left	65 x 155	0.11	F, O, R	Wetland and road crossing	Yes	B13-SPLR-W23
10.9	Left	35 x 100	0.08	F	Wetland	No	NA
11.0	Right	20 x 150	0.07	I, O	Wetland and road crossing	Yes	B13-SPLR-W41
11.1	Left	35 x 135	0.11	F, I	Road crossing	No	NA
11.1	Left	35 x 100	0.08	F	Wetland	No	NA
11.2	Left	35 x 100	0.09	F	Wetland	No	NA
11.5	Left	35 x 100	0.08	F	Wetland	No	NA
11.6	Left	35 x 100	0.08	F	Wetland	No	NA
11.7	Left	35 x 100	0.08	F	Wetland	No	NA
11.8	Left	35 x 100	0.08	F	Wetland	No	NA
12.0	Left	35 x 100	0.08	F	Wetland	No	NA
12.0	Left	35 x 100	0.08	F	Wetland	No	NA
12.3	Left	85 x 355	0.66	F, I	Road crossing	No	NA
12.3	Right	10 x 355	0.09	F, I, O	Road crossing	No	NA
Southeast to MLV-19 Take-up and Relay							
Fairfield County, CT							
0.4	Left	35 x 725	0.58	F, I	Road crossing(s)	Yes	B13-SELR-W8
0.6	Left	35 x 630	0.50	F, I	Wetland and road crossing	No	NA
0.7	Left	35 x 180	0.15	F	Wetland	No	NA
1.0	Right	50 x 560	0.60	F, I, O	Wetland and road crossing	No	NA

TABLE C-1 (cont'd)

Location of Additional Temporary Workspace Along the AIM Project Pipeline Facilities

Facility, County, State, Approximate Milepost	Side of Construction Work Area	Approximate Dimensions (feet) [a]	Acres	Existing Land Use [b]	Justification	Requires Variance	Wetland or Waterbody
1.1	Right	50 x 260	0.29	F	Wetland and road crossing	No	NA
1.4	Left	45 x 2050	1.53	F, I	Staging area for HDD entry point (I-84, Still River, Mill Plain Road)	No	NA
1.5	Right	175 x 1180	3.09	I, O	Staging area for HDD entry point (I-84, Still River, Mill Plain Road)	No	NA
1.9	Left	120 x 215	0.29	I	Staging area for HDD exit point (I-84, Still River, Mill Plain Road)	No	NA
1.9	Right	315 x 235	0.99	I	Staging area for HDD exit point (I-84, Still River, Mill Plain Road)	No	NA
2.0	Right	100 x 175	0.22	I	Road crossing	No	NA
2.1	Left	145 x 190	0.21	F	Wetland	No	NA
2.1	Right	335 x 190	0.22	F, I, O	Wetland	No	NA
2.4	Right	50 x 125	0.14	F, I, R	Road crossing	No	NA
2.4	Left	35 x 110	0.09	I, R	Road crossing	No	NA
2.6	Left	35 x 100	0.08	F	Wetland	No	NA
2.7	Left	50 x 140	0.13	F	Wetland	Yes	A13-SELR-W4
3.0	Left	60 x 260	0.30	F, I	Wetland	No	NA
3.2	Left	10 x 360	0.10	F, I, R	Wetland and road crossing	No	NA
3.3	Left	60 x 152	0.08	R	Wetland and road crossing	Yes	B13-SELR-S1
3.4	Left	45 x 90	0.08	R	Wetland and road crossing	No	NA
3.4	Right	35 x 305	0.20	F, O, R	Wetland and road crossing	No	NA
3.5	Right	30 x 160	0.10	F, I, O	Wetland and road crossing	No	NA
3.6	Left	10 x 490	0.11	F	Wetland	No	NA
3.9	Right	50 x 175	0.19	F, I	Wetland and road crossing	No	NA
4.3	Left	25 x 70	0.04	I, R	Road crossing	No	NA
4.5	Left	145 x 285	0.96	R	Valve site 19	No	NA
E-1 System Lateral Take-up and Relay							
New London County, CT							
0.0	Left	35 x 180	0.13	F, I	Wetland and road crossing	Yes	B13-ELR-W200
0.1	Left	50 x 100	0.11	F	Wetland	No	NA
0.6	Left	50 x 100	0.11	F	Waterbody	No	NA
0.7	Left	50 x 100	0.12	F	Waterbody/wetland	Yes	A13-ELR-W1; A13-ELR-S1
0.9	Left	50 x 300	0.35	F, I	Wetland and road crossing	No	NA
0.9	Right	25 x 220	0.13	F, I, O	Road crossing	No	NA

TABLE C-1 (cont'd)

Location of Additional Temporary Workspace Along the AIM Project Pipeline Facilities

Facility, County, State, Approximate Milepost	Side of Construction Work Area	Approximate Dimensions (feet) [a]	Acres	Existing Land Use [b]	Justification	Requires Variance	Wetland or Waterbody
1.2	Right	50 x 100	0.12	F	Waterbody	No	NA
1.2	Right	50 x 100	0.12	F	Waterbody	No	NA
1.8	Right	50 x 100	0.11	A, F	Wetland	No	NA
1.9	Left	50 x 330	0.38	A, I	Wetland and road crossing	No	NA
1.9	Right	75 x 145	0.09	A, I	Wetland and road crossing	Yes	A13-ELR-W2
2.3	Left	50 x 245	0.28	A	Wetland	No	NA
2.4	Left	50 x 100	0.11	A	Wetland	No	NA
2.4	Left	50 x 100	0.11	A	Wetland	No	NA
2.5	Left	50 x 200	0.23	A, F	Wetland	No	NA
2.6	Left	50 x 100	0.12	O	Wetland	No	NA
2.9	Left	50 x 100	0.12	F	Wetland	No	NA
3.1	Left	50 x 300	0.33	F, I	Wetland and road crossing	No	NA
3.3	Left	50 x 100	0.11	F	Wetland	No	NA
3.3	Left	50 x 100	0.12	F	Wetland	No	NA
3.4	Left	50 x 100	0.11	F	Wetland	No	NA
3.5	Left	50 x 100	0.12	A, F	Wetland	No	NA
3.7	Left	50 x 100	0.12	F	Waterbody	No	NA
3.8	Left	50 x 100	0.12	F	Waterbody	No	NA
4.1	Left	50 x 100	0.11	O	Wetland	No	NA
4.4	Left	50 x 100	0.11	O	Wetland	No	NA
4.5	Left	50 x 100	0.11	O	Wetland	No	NA
4.5	Left	50 x 100	0.11	O	Wetland	No	NA
4.7	Left	50 x 100	0.11	O	Waterbody	No	NA
4.7	Left	50 x 100	0.11	O	Waterbody	No	NA
4.8	Left	50 x 100	0.11	O	Waterbody	No	NA
4.8	Left	50 x 100	0.11	O	Waterbody	No	NA
4.9	Left	50 x 150	0.17	O	Waterbody/wetland	Yes	B13-ELR-S11
5.0	Left	50 x 100	0.11	O	Wetland	No	NA
5.0	Left	50 x 100	0.11	O	Waterbody	No	NA
5.1	Right	50 x 100	0.12	F, O	Waterbody	No	NA
5.1	Right	25 x 100	0.06	F	Spread move-around	No	NA
5.3	Right	50 x 100	0.11	F	Wetland/waterbody	No	NA
5.4	Left	25 x 100	0.05	O	Wetland	No	NA
5.6	Left	50 x 250	0.29	O	Wetland	No	NA
5.6	Left	50 x 100	0.11	O	Wetland	No	NA
5.7	Right	25 x 295	0.16	F, I, O	Wetland	No	NA
5.8	Left	50 x 100	0.12	F	Wetland/waterbody	No	NA
5.8	Left	50 x 50	0.07	F	Waterbody	Yes	B13-ELR-S5B
5.9	Left	50 x 100	0.11	F	Wetland	No	NA
6.0	Left	50 x 150	0.16	F	Road crossing	No	NA
6.1	Left	50 x 100	0.11	F	Wetland	No	NA
6.1	Left	35 x 100	0.08	F	Wetland	No	NA
6.3	Left	50 x 100	0.11	F	Wetland	No	NA
6.4	Left	50 x 100	0.11	F	Wetland	No	NA

TABLE C-1 (cont'd)

Location of Additional Temporary Workspace Along the AIM Project Pipeline Facilities

Facility, County, State, Approximate Milepost	Side of Construction Work Area	Approximate Dimensions (feet) [a]	Acres	Existing Land Use [b]	Justification	Requires Variance	Wetland or Waterbody
6.7	Left	50 x 130	0.14	F, O	Spread move-around	No	NA
6.7	Right	75 x 100	0.17	F	Spread move-around	No	NA
6.9	Left	25 x 145	0.08	F, O	Wetland	No	NA
6.9	Left	50 x 100	0.12	F	Wetland	No	NA
7.2	Left	50 x 150	0.17	F	Wetland	No	NA
7.3	Right	135 x 275	0.50	F, I	Wetland and road crossing	Yes	B13-ELR-W22
7.3	Left	175 x 350	1.16	F, I	Wetland and road crossing	Yes	B13-ELR-W22
7.4	Left	50 x 100	0.11	F	Wetland	No	NA
7.8	Left	50 x 100	0.11	A	Wetland	No	NA
7.9	Left	50 x 100	0.11	F	Wetland	No	NA
8.3	Left	50 x 100	0.11	F	Wetland	No	NA
8.4	Left	50 x 100	0.12	F, I	Wetland	No	NA
8.5	Left	50 x 150	0.16	F, I	Waterbody and road crossing	Yes	B13-ELR-S18
8.5	Right	150 x 155	0.24	F, I	Road crossing	Yes	B13-ELR-S18
8.6	Left	25 x 100	0.06	F	Spread move-around	No	NA
8.7	Left	50 x 100	0.11	F	Wetland	No	NA
8.8	Left	50 x 100	0.11	F	Wetland	No	NA
8.9	Left	50 x 100	0.11	F	Wetland/waterbody	Yes	B13-ELR-S24
9.0	Left	50 x 100	0.11	F	Waterbody	No	NA
9.1	Left	25 x 150	0.09	O	Valve assembly at a new launcher/ receiver facility	No	NA
9.1	Right	235 x 150	0.80	F, O	Valve assembly at a new launcher/ receiver facility	No	NA
Line-36A Loop Extension							
Middlesex County, CT							
0.1	Left	35 x 100	0.08	F	Wetland	No	NA
0.7	Left	35 x 100	0.08	F	Wetland	No	NA
0.9	Left	50 x 175	0.15	A	Wetland	No	NA
1.0	Left	35 x 80	0.04	A	Wetland	No	NA
1.1	Left	35 x 150	0.12	A	Wetland	No	NA
1.4	Left	30 x 85	0.04	F, R	Wetland	No	NA
1.4	Left	25 x 120	0.06	F	Wetland	No	NA
1.6	Right	95 x 200	0.28	A, I	Existing pipeline crossover	No	NA
1.7	Right	100 x 150	0.34	A, I	Existing pipeline crossover	No	NA
1.7	Right	25 x 100	0.06	A, I	Road crossing	No	NA

TABLE C-1 (cont'd)

Location of Additional Temporary Workspace Along the AIM Project Pipeline Facilities

Facility, County, State, Approximate Milepost	Side of Construction Work Area	Approximate Dimensions (feet) [a]	Acres	Existing Land Use [b]	Justification	Requires Variance	Wetland or Waterbody
E-1 System Lateral Loop Extension							
New London County, CT							
0.0	Left	25 x 130	0.07	F, I	Road crossing	No	NA
0.0	Right	105 x 295	0.66	F, I, R	Road crossing	No	NA
0.1	Left	25 x 100	0.06	F, O	Wetland/waterbody	No	NA
0.1	Left	25 x 100	0.06	F, O	Wetland	No	NA
0.2	Left	25 x 100	0.06	F	Wetland	No	NA
0.3	Left	25 x 100	0.06	F	Wetland	No	NA
0.5	Left	25 x 100	0.05	F	Wetland	No	NA
0.6	Right	55 x 155	0.16	F	Spread move-around	No	NA
0.6	Left	55 x 155	0.14	F, O	Spread move-around	No	NA
0.8	Right	25 x 100	0.06	F	Waterbody	No	NA
0.8	Right	25 x 100	0.06	F	Waterbody	No	NA
0.9	Right	25 x 100	0.06	F	Wetland	No	NA
1.0	Right	25 x 100	0.06	F	Wetland	No	NA
1.1	Right	25 x 100	0.06	F	Wetland	No	NA
1.2	Right	25 x 100	0.06	F	Wetland	No	NA
1.2	Left	25 x 140	0.07	F, O	Spread move-around	No	NA
1.3	Left	65 x 365	0.31	F, I	Road crossing	No	NA
West Roxbury Lateral							
Norfolk County, MA							
0.0	Right	75 x 145	0.20	F	New launcher/ receiver facilities	No	NA
0.0	Left	70 x 235	0.36	F, I, O, R	New launcher/ receiver facilities	No	NA
0.2	Left	30 x 115	0.24	I	New block valve	No	NA
0.2	Left	25 x 60	0.03	F, O	Road crossing	No	NA
0.4	Left	285 x 350	2.10	F, O	Staging for I-95 crossing	No	NA
0.5	Right	50 x 100	0.11	F, I	Staging for I-95 crossing	No	NA
0.6	Right	50 x 255	0.46	I	Railroad and road crossing	No	NA
0.9	Right	60 x 135	0.15	I	Existing utility lines	No	NA
1.1	Left	65 x 175	0.27	I	Existing utility lines	No	NA
1.2	Right	10 x 780	0.23	I	Existing utility lines	No	NA
1.4	Left	130 x 170	0.30	I	Existing utility lines	No	NA
1.5	Right	340 x 225	0.83	I	Existing utility lines	No	NA
1.8	Right	180 x 285	0.45	F, I	Wetland	No	NA
2.5	Right	170 x 100	0.30	I, O	Staging for road crossings and spread move-around	No	NA
2.6	Right	85 x 115	0.06	I, R	Road crossing	No	NA
2.6	Left	50 x 150	0.08	I, O, R	Road crossing	No	NA
3.0	Left	65 x 355	0.53	I, O	Road crossing	No	NA

TABLE C-1 (cont'd)

Location of Additional Temporary Workspace Along the AIM Project Pipeline Facilities

Facility, County, State, Approximate Milepost	Side of Construction Work Area	Approximate Dimensions (feet) [a]	Acres	Existing Land Use [b]	Justification	Requires Variance	Wetland or Waterbody
3.1	Right	65 x 120	0.09	I, O	Road crossing	No	NA
3.2	Left	60 x 85	0.06	R	Road crossing	No	NA
3.2	Right	25 x 90	0.04	R	Road crossing	No	NA
Suffolk County, MA							
3.8	Right	170 x 180	0.29	I, R	Road crossing	No	NA
5.1	Left	85 x 285	0.16	I, R	Road crossing	No	NA
5.1	Left	100 x 75	0.16	I, R	Staging for road crossings and spread move-around	No	NA

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

[b] A = Agricultural; F = Forest/woodland; I = Industrial/commercial; O = Open land; OW = Open water; R = Residential.

NA = Not Applicable

APPENDIX D

PROPOSED CONSTRUCTION TECHNIQUES BY MILEPOST TABLE

TABLE D-1

Proposed Construction Techniques by Milepost for the AIM Project

State, County, Municipality	Milepost Start	Milepost End	Length (Miles) [a]	Construction Method
NEW YORK				
Haverstraw to Stony Point Take-up and Relay				
Rockland County				
Haverstraw	0.00	0.36	0.36	Standard
	0.36	0.63	0.27	Drag
	0.63	1.0	0.37	Standard
	1.0	1.18	0.18	Drag
Stony Point	1.18	1.20	0.02	Drag
	1.20	1.61	0.41	Standard
	1.61	1.80	0.19	Drag
	1.80	1.90	0.10	Standard
	1.90	2.16	0.26	Drag
	2.16	2.20	0.04	Bore
	2.20	3.00	0.80	Drag
	3.00	3.27	0.27	Standard
Stony Point to Yorktown Take-up and Relay				
Rockland County				
Stony Point	0.00	0.36	0.36	Standard
	0.36	0.71	0.35	Drag
	0.71	1.29	0.58	Standard
	1.29	2.62	1.33	Drag
	2.62	3.14	0.52	Standard
	3.14	3.15	0.01	Bore
	3.15	3.19	0.04	Standard
	3.19	3.53	0.34	Hudson River HDD
Westchester County				
Cortlandt				
Verplanck	3.53	3.91	0.38	Hudson River HDD
Verplanck	3.91	4.60	0.69	Standard
Buchanan	4.60	4.77	0.17	Standard
Buchanan	4.77	4.78	0.01	Bore
Buchanan	4.78	5.48	0.70	Standard
Buchanan	5.48	5.71	0.23	Drag
Peekskill	5.71	5.72	0.01	Bore
Peekskill	5.72	5.74	0.02	Bore
Peekskill	5.74	5.81	0.07	Drag
Peekskill	5.81	5.84	0.03	Bore
	5.84	5.86	0.02	Bore
Peekskill	5.86	5.88	0.02	Bore
Peekskill	5.88	5.96	0.08	Drag
	5.96	6.34	0.39	Standard
	6.34	6.70	0.36	Drag
	6.70	8.08	1.38	Standard
	8.08	8.36	0.28	Drag
	8.36	8.94	0.58	Standard

TABLE D-1 (cont'd)

Proposed Construction Techniques by Milepost for the AIM Project

State, County, Municipality	Milepost Start	Milepost End	Length (Miles) [a]	Construction Method
	8.94	10.47	1.53	Drag
	10.47	10.50	0.03	Bore
	10.50	10.74	0.24	Drag
	10.74	11.02	0.28	Standard
Yorktown	11.02	11.16	0.14	Drag
	11.16	12.31	1.15	Standard
Southeast to MLV-19 Take-up and Relay				
Putnam County				
Southeast	0.00	0.13	0.13	Standard
CONNECTICUT				
Southeast to MLV-19 Take-up and Relay				
Fairfield County				
Danbury	0.13	1.23	1.10	Standard
	1.23	1.42	0.19	Drag
	1.42	2.07	0.65	Interstate 84 HDD
	2.07	4.47	2.40	Drag
Line-36A Loop Extension				
Middlesex County				
Cromwell	0.00	1.21	1.21	Standard
	1.21	1.34	0.13	Drag
	1.34	1.8	0.46	Standard
Hartford County				
Rocky Hill	1.8	2.00	0.2	Standard
E-1 System Lateral Take-up and Relay				
New London County				
Lebanon	0.00	1.84	1.84	Standard
	1.84	1.91	0.07	Drag
	1.91	1.92	0.01	Bore
	1.92	2.03	0.11	Drag
	2.03	3.90	1.87	Standard
Franklin	3.90	5.81	1.91	Standard
	5.81	5.82	0.01	Bore
	5.82	6.00	0.18	Standard
	6.00	6.01	0.01	Bore
	6.01	7.35	1.34	Standard
	7.35	7.36	0.01	Bore
	7.36	8.37	1.01	Standard
Norwich	8.37	9.11	0.74	Standard
E-1 System Lateral Loop Extension				
New London County				
Montville	0.00	0.02	0.02	Standard
	0.00	0.21	0.21	Drag
	0.21	1.32	1.11	Standard

TABLE D-1 (cont'd)

Proposed Construction Techniques by Milepost for the AIM Project

State, County, Municipality	Milepost Start	Milepost End	Length (Miles) [a]	Construction Method
MASSACHUSETTS				
West Roxbury Lateral				
Norfolk County				
Westwood	0.00	0.16	0.16	Drag
	0.16	0.18	0.02	Bore
	0.18	0.41	0.23	Drag
	0.41	0.47	0.06	Bore Interstate 95
Dedham	0.47	0.62	0.15	Drag
	0.62	0.64	0.02	Bore
	0.64	2.42	1.78	Drag / In-street
	2.42	2.54	0.12	Drag
	2.54	3.12	0.58	Drag / In-street
	3.12	3.14	0.02	Drag
	3.14	3.44	0.30	Drag / In-street
Suffolk County				
Boston				
West Roxbury	3.44	4.25	0.81	Drag / In-street
	4.25	4.36	0.11	Drag
	4.36	5.14	0.78	Drag / In-street

[a] Minor discrepancies in totals are due to rounding.

APPENDIX E

ROCK REMOVAL PLAN

Algonquin Gas Transmission, LLC

ALGONQUIN INCREMENTAL MARKET PROJECT

Rock Removal Plan

February 2014

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF APPENDICES

1.0 INTRODUCTION

This Rock Removal Plan ("Plan") describes the methods that will be implemented during construction of the Algonquin Gas Transmission, LLC ("Algonquin") Incremental Market Project ("AIM Project" or "Project").

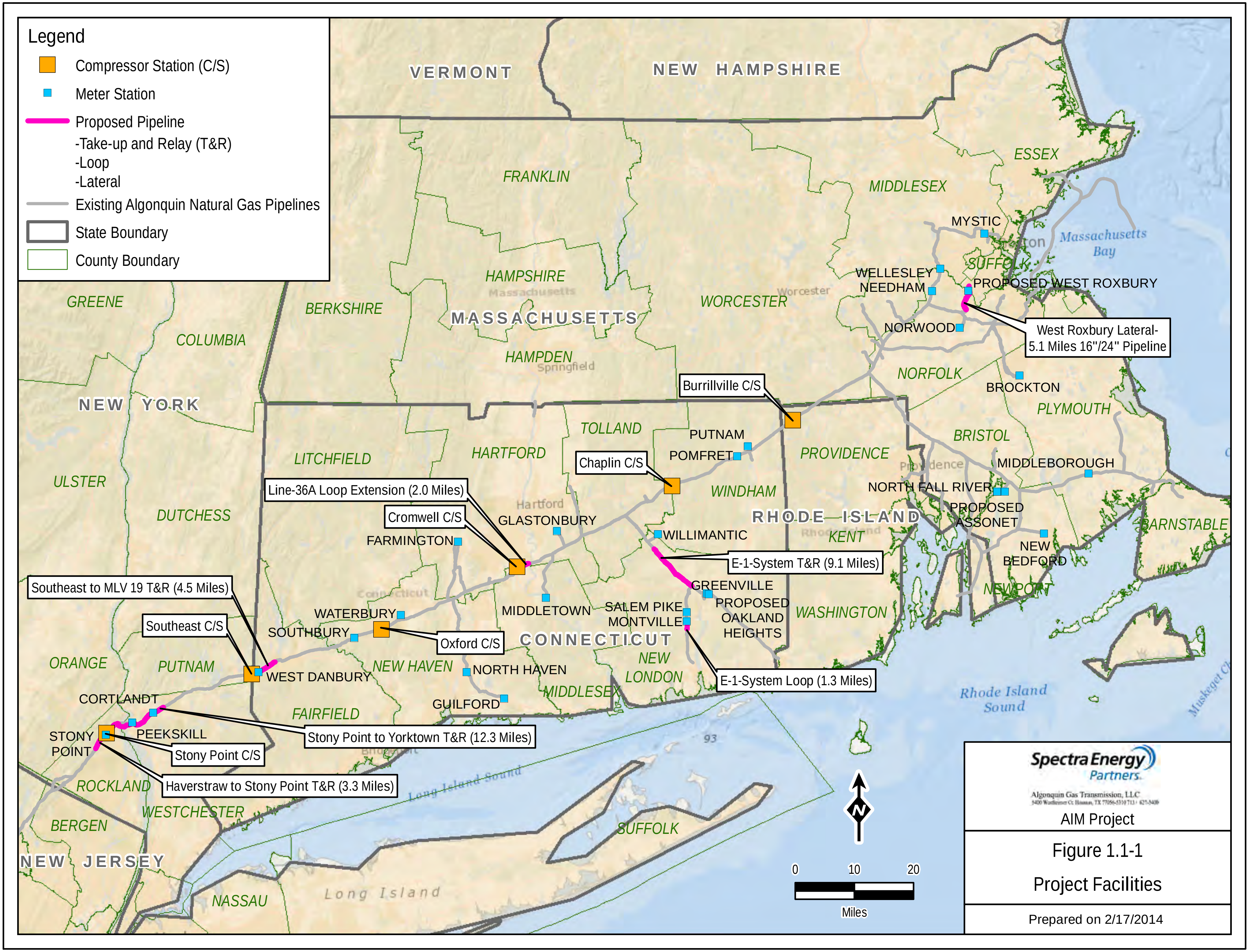
This Plan includes a brief description of the pipeline alignment, and overall physiological setting and bedrock geology in the vicinity of the Project. Information on shallow-to-bedrock soils and bedrock outcroppings is taken from the local published soil maps (and unpublished maps in progress) as acquired from the Natural Resources Conservation Service ("NRCS"). General bedrock type is also discussed. A map depicting the location of the AIM Project pipeline route is provided in Figure 1.1-1.

Information on the characteristics of the bedrock may be evaluated at least in a general sense, and applied towards an appropriate bedrock excavation method. The bedrock properties were developed using historical and observational data; Algonquin will continue this approach while assessing the pipeline route.

The hard and intact nature of the unweathered igneous bedrock (basalts and granites) and metamorphic bedrock (slates, phyllites, schists and quartzites) dictate what removal methods 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 AIM Project area rock type include:

- granitic rock is invariably resistant, except where weathered;
- granulitic (high temperature-high pressure metamorphic rock with gniessic 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.

These generalizations have been further grouped into two bedrock contact types: Lithic contact and Paralithic contact. The material below a lithic contact is either strongly cemented or the material is indurated and cannot be removed by conventional machinery. The materials below the Paralithic contact are partially weathered bedrock or weakly consolidated bedrock, such as sandstone, siltstone, or shale and is generally considered rippable by machinery. See the tabe in Appendix A which lists the surficial geology associated with areas with shallow-to-bedrock and bedrock outcroppings by mile post ("MP").


Legend
Compressor Station (C/S)
Meter Station
Proposed Pipeline
-Take-up and Relay (T&R)
-Loop
-Lateral
Existing Algonquin Natural Gas Pipelines
State Boundary
County Boundary
VERMONT
NEW HAMPSHIRE
MASSACHUSETTS
NEW YORK
CONNECTICUT
RHODE ISLAND
NEW JERSEY
FRANKLIN
ESSEX
MIDDLESEX
HAMPSHIRE
BERKSHIRE
WORCESTER
HAMPDEN
NORFOLK
SUFFOLK
PLYMOUTH
BRISTOL
BARNSTABLE
GREENE
COLUMBIA
ULSTER
DUTCHESS
ORANGE
PUTNAM
ROCKLAND
WESTCHESTER
BERGEN
NASSAU
SUFFOLK
LITCHFIELD
HARTFORD
TOLLAND
WINDHAM
NEW HAVEN
FAIRFIELD
MIDDLESEX
NEW LONDON
PROVIDENCE
KENT
WASHINGTON
NEWPORT
Massachusetts Bay
Rhode Island Sound
Long Island Sound
Long Island
MYSTIC
WELLESLEY
NEEDHAM
PROPOSED WEST ROXBURY
NORWOOD
West Roxbury Lateral-
5.1 Miles 16"/24" Pipeline
BROCKTON
Burrillville C/S
PUTNAM
POMFRET
Chaplin C/S
MIDDLEBOROUGH
NORTH FALL RIVER
PROPOSED
ASSONET
NEW
BEDFORD
Line-36A Loop Extension (2.0 Miles)
Cromwell C/S
GLASTONBURY
FARMINGTON
WILLIMANTIC
E-1-System T&R (9.1 Miles)
GREENVILLE
PROPOSED
OAKLAND
HEIGHTS
SALEM PIKE
MONTVILLE
MIDDLETOWN
Southeast to MLV 19 T&R (4.5 Miles)
Southeast C/S
WATERBURY
SOUTHBURY
Oxford C/S
WEST DANBURY
NORTH HAVEN
GUILFORD
E-1-System Loop (1.3 Miles)
CORTLANDT
PEEKSKILL
STONY
POINT
Stony Point to Yorktown T&R (12.3 Miles)
Stony Point C/S
Haverstraw to Stony Point T&R (3.3 Miles)
0
10
20
Miles
N
Spectra Energy
Partners
Algonquin Gas Transmission, LLC
AIM Project
Figure 1.1-1
Project Facilities
Prepared on 2/17/2014

2.0 PROJECT ALIGNMENT

The proposed Project consists of:

- Haverstraw to Stony Point Take-up & Relay - Take-up and relay 3.3 miles of 26-inch diameter pipeline with 42-inch diameter pipeline in Rockland County, New York upstream of Algonquin's existing Stony Point Compressor Station;
- Stony Point to Yorktown Take-up & Relay - Take-up and relay 9.4 miles of 26-inch diameter pipeline with 42-inch diameter pipeline and the installation of an approximately 2.9-mile section of new pipeline ROW that includes a 0.72-mile horizontal directional drill ("HDD") crossing of the Hudson River. This 12.3-mile segment is located in Rockland County, New York and Westchester County, New York downstream of Algonquin's existing Stony Point Compressor Station;
- Southeast to MLV 19 Take-up & Relay - Take-up and relay 4.5 miles of 26-inch diameter mainline pipeline with 42-inch diameter pipeline (including a new 0.7-mile long, 42-inch diameter HDD pipeline crossing of Interstate 84 and the Still River) located in Putnam County, New York and Fairfield County, Connecticut downstream of and between Algonquin's existing Southeast Compressor Station and mainline valve ("MLV") 19;
- Line-36A Loop Extension - Installation of 2.0 miles of 36-inch diameter pipeline loop extension in Middlesex County, Connecticut and Hartford County, Connecticut downstream of Algonquin's existing Cromwell Compressor Station;
- E-1 System Lateral Take-up & Relay - Take-up and relay 9.1 miles of 6-inch diameter pipeline with 16-inch diameter pipeline on Algonquin's existing E-1 System in New London County, Connecticut;
- E-1 System Lateral Loop - Installation of 1.3 miles of 12-inch diameter pipeline loop on Algonquin's existing E-1 System in New London County, Connecticut; and
- West Roxbury Lateral - Installation of 5.1 miles of new 16-inch diameter pipeline and 0.9 miles of new 24-inch diameter pipeline off of Algonquin's existing I-4 System in Norfolk and Suffolk Counties, Massachusetts.

There will also be a number of modifications to existing compressor stations and metering and regulating ("M&R") facilities, as well as installation of ancillary facilities for the pipeline which will consist of mainline valves and other appurtenant facilities.

3.0 GEOLOGIC SETTING

3.1 Physiography

The geology of the AIM Project area is very diverse, with complex arrays of folded and faulted metamorphic and igneous bedrock overlain by glacial deposits of varying thickness. Resource Report 6 provides additional information on geology.

Project facilities located in New York, Connecticut, and Rhode Island are within the New England Upland section of the New England province. This section is often described as a complex sequence of terrains, which are the result of land masses accreted to North America during the formation of Pangea and continental rifting during Pangea's separation. This resulted in mountainous areas with adjacent ranges having varied and distinct lithologies. These mountains were eroded and are now represented by the Ramapo Mountains in New York and the Bolton Range and Mohegan Range in Connecticut.

Project facilities in Massachusetts are located in the Coastal Lowland section of the New England province. The section was largely inundated by ocean water as the Laurentian ice sheet receded at the close of the Wisconsin glaciation. Erosion by wave action lowered the relief of these areas so that, once the land rebounded, the coastal areas had lower relief than areas further inland.

3.2 Topography

The pipeline route from Haverstraw to Stony Point traverses gentle slopes, hills of moderate relief (<200 feet), and slopes that are moderate. From Algonquin's existing Stony Point Compressor Station, the pipeline traverses moderate to steep relief and ascends and descends the moderate to steep slopes of Buckberg Mountain (approximately 450 feet of relief). It descends to the western shore of the Hudson River, comes ashore on the east bank of the Hudson River and continues along gentle to moderate slopes. In Connecticut, the pipeline segment traverses rolling hills with steep, moderate, and gentle slopes including a series of drumlins. In Massachusetts, the West Roxbury Lateral traverses gently sloping land along existing roadways. There is no pipeline proposed in Rhode Island.

3.3 Surficial Geology

Surficial geology of the AIM Project area is dominated by glacial till with discontinuous bedrock outcroppings, sand and gravel deposits, and fine grained deposits consisting of lacustrine and swamp sediments. Quaternary deposits can be broken out into three general categories, based on their depositional environment: deposits laid down by advancing ice sheets (moraines and most tills); glacial melt deposits (stratified deposits from glacial streams and lakes); and postglacial deposits (alluvium in existing floodplains and swamp deposits). Quaternary geologic materials may be categorized by their depositional environment (e.g., swamp), grain size (e.g., sand and gravel), formation type (e.g., moraine), or a combination of these (e.g., lacustrine sand).

The NRCS data collected for Resource Report 7 reveals that all soils with shallow-to-bedrock and bedrock outcroppings that are found within the AIM Project are glacial tills. See the table in Appendix A which lists the surficial geology associated with areas with shallow-to-bedrock and bedrock outcroppings by MP.

3.4 Subsurface Geology

Bedrock geology of the AIM Project area is dominated by igneous and metamorphic rocks with carbonate rock in limited areas. These rocks are characterized as having a lithic contact and will mostly require blasting for removal. A review of bedrock geology maps provided information regarding the nature of units expected in the Project area. Bedrock geology maps can be found in Appendix 6B of Resource Report 6.

New York

Hornblende Granite and Granite Gneiss (hg) - Middle Proterozoic age hornblende granite and granite gneiss with subordinate leucogranite.

Diorite with hornblende and/or biotite (Od) – Upper Ordovician age diorite with hornblende and/or biotite that is part of the Cortlandt and smaller mafic complexes.

Manhattan Formation (Undivided) (Om) – The Manhattan Formation is comprised of Ordovician pelitic schists, amphibolites and part of Trenton Group and Metamorphic Equivalents up to 8,000 feet (2,400 meters). The unit is mapped under Om in digital mapping but can be subdivided into Cambrian eugeosynclinal rocks (Omb, Omc, and Omd). Subunit Omd is comprised of sillimanite-garnet-muscovite-biotite-plagioclase-quartz gneiss. Subunit Omc is comprised of sillimanite-garnet-muscovite-biotite-quartz-plagioclase schistose gneiss, sillimanite nodules, and local quartz-rich layers. Subunit Omb is comprised of a discontinuous unit of amphibolite and schist.

Biotite augite norite (Oban) – Upper Ordovician norite that is part of the Cortlandt and smaller mafic complexes.

Hornblende norite (Ohn) – Upper Ordovician norite that is part of the Cortlandt and smaller mafic complexes. The hornblende is poikilitic.

Olivine pyroxenite (Opx) – Upper Ordovician pyroxenite with poikilitic hornblende that is part of the Cortlandt and smaller mafic complexes. A secondary rock type is peridotite.

Muscovite-biotite granodiorite (Dpgd) – Upper Devonian age muscovite-biotite granodiorite that is part of the Peekskill Pluton.

Muscovite-biotite granite (Dpgr) – Upper Devonian granite that is part of the Peekskill Pluton.

Connecticut

Gneiss of Highlands massifs (Yg) – Proterozoic age gneiss with secondary amphibolite and schist that was part of the proto-North American terrane. It may include a mixture of rock types when they aren’t mapped separately, including pink granitic gneiss (Ygr), Augen gneiss (Yga), layered gneiss (Ygn), Hornblende gneiss and amphibolite (Ygh), and rusty mica schist and gneiss (Ygs).

Hornblende gneiss and amphibolite (Ygh) – Proterozoic age hornblende gneiss and amphibolite that is dark gray to mottled, fine- to medium-grained, massive to foliated amphibolite and gneiss, composed of hornblende and plagioclase with biotite and minor quartz. This formation is often interlayered with banded felsic gneiss and locally contains calc-silicate rock or diopsidic calcite marble.

Pink granitic gneiss (Ygr) – Proterozoic granitic gneiss that is light pink to gray in color, medium to coarse texture, foliated but generally massive or poorly layered granitic gneiss having quartz, microline, oligoclase, and either biotite or muscovite (or both), with amphibole or epidote occurring locally.

Waterford Group (Zw) – Light to dark, generally medium grained gneiss, composed of plagioclase, quartz, and biotite, with hornblende in some layers and microcline in others. There are layers of amphibolite. The Waterford group is Proterozoic in age and part of the Avalonian Terrane and the Avalonian Anticlinorium.

Waterford Group, Stony Creek Granite Gneiss, and Narragansett Pier Granite (undifferentiated) (Zw+Zsc+Pn) – Proterozoic gneiss and granitic gneiss intruded by Permian age gneiss with considerable pegmatite formations.

Plainfield Formation (Zp) – Comprised of several rock types: Intelayered light gray, thin-bedded quartzite, in places with feldspar, mica, graphite, or pyrite; light to medium gray gneiss composed of quartz, oligoclase, and biotite; medium to dark gray schist composed of quartz, oligoclase, biotite, sillimanite, and garnet; dark gray or green gneiss composed of plagioclase, quartz, biotite, and hornblende; and amphibolite, diopsite-bearing quartzite, and calc-silicate rock. The Plainfield Formation is Proterozoic in age and part of the Avalonian Terrane and the Avalonian Anticlinorium.

Hope Valley Alaskite Gneiss (Zsh) – Light pink to gray, medium- to coarse-grained, locally porphyritic, variably lineated and foliated alaskitic gneiss, composed of microcline, quartz, albite or oligoclase, and minor magnetite, and locally biotite and muscovite. The Hope Valley Alaskite Gneiss is Proterozoic in age and part of the Avalonian Terrane, the Avalonian Anticlinorium, and the Sterling Plutonic.

Potter Hill Granite Gneiss (Zsph) – Light pink to gray (weathering tan) fine- to medium-grained, rarely porphyritic, well-foliated granitic gneiss composed of microcline, quartz, oligoclase (or albite), biotite, and magnetite, minor muscovite and local garnet. The Potter Hill Granite Gneiss is Proterozoic in age and part of the Avalonian Terrane and the Avalonian Anticlinorium.

Stockbridge Marble (OCs) – Lower Ordovician and Cambrian age white to gray, massive to layered marble, generally dolomitic but containing calcite marble in the upper part, locally interlayered with schist or phyllite and with calcareous siltstone or sandstone. The Stockbridge Marble represents the carbonate shelf of the Proto-North American terrane.

Basal marble member of Walloomsac Schist (Owm) – Middle Ordovician dark-gray to white, massive to layered schistose or phyllitic calcite-phlogopite marble.

Brimfield Schist (Obr?) – Upper (possibly) and middle Ordivician gray colored (weathering to rust), medium to coarse-grained, interlayered schist and gneiss, composed of oligoclase, quartz, potassium feldspar, and biotite, commonly with garnet, sillimanite, graphite, and pyrrhotite. Potassium feldspar often occurs as augen (“eyes”) 1-3 cm across. Minor layers and lenses include hornblende- and pyroxene-bearing gneiss, amphibolite, and calc-silicate rock.

Yantic Member of Tatnic Hill Formation (Otay) – Upper and Middle Ordovician age medium to dark gray, fine- to medium-grained schist, composed of quartz, oligoclase, biotite, and muscovite, some layers with garnet, staurolite, and kyanite or garnet and sillimanite, local epidote, or potassium feldspar and some layers of rusty-weathering graphititc, pyrrhotitic, two-mica schist.

Tatnic Hill Formation (Ota) – Medium to dark gray, medium-grained gneiss or schist composed of quartz, andesine, biotite, garnet, and sillimanite (locally kyanite, muscovite, or potassium feldspar) that is interlayered with graphitic pyrrhotitic two-mica schist, amphibolite, and calc-silicate rock.

Hebron Gneiss (SOh) – Silurian and Ordivician interlayered dark-gray colored, medium to coarse-grained schist, composed of andesine, quartz, biotite, and local potassium feldspar and greenish-grey, fine to medium-grained calc-silicate rock, composed of labradorite, quartz, biotite, anctinolite, hornblende, and diopside, with local scapolite. There are local lenses of graphitic two-mica schist. The Hebron Gneiss is part of the Iapetus (Oceanic) Terrane and the Merrimack Synclinorium.

Lebanon Gabbro (Dl) – Devonian age, dark, speckled, massive (but locally sheared) gabbro, composed of hornblende, labradorite, and opaques. Some rock bodies contain biotite and quartz, and some smaller bodies are almost pure hornblende with local augite. The Lebanon Gabbro is part of the Iapetus (Oceanic) Terrane and the Merrimack Synclinorium.

Dioritic phase of Lebanon Gabbro (Dld) – Devnoian age white to black, streaked, medium-grained, foliated or sheared mafic gneiss, composed of plagioclase, biotite, quartz, and often hornblende.

Maromas Granite Gneiss (Dm) – Light-gray to buff colored, medium- to fine-grained granitic gneiss, composed of quartz and microcline with minor plagioclase and biotite. Pegmatite bodies are common in the vicinity.

Scotland Schist (DSs) – Devonian or Silurian age silvery (with local rust coloration), fine- to medium-grained schist containing quartz, muscovite, biotite, staurolite, and oligoclase (locally with kyanite or sillimanite) and interlayered with quartz-oligoclase-biotite schist and granofels and quartzite, typically near the base and on the west side of the formation. The Scotland Schist is part of the Iapetus (Oceanic) Terrane and the Merrimack Synclinorium.

Quartzite unit in Scotland Schist (DSsq) – Devonian or Silurian quartzite, generally micaceous, interlayered with mica schist.

Portland Arkose (Jp) – Lower Jurassic age reddish-brown to maroon colored micaceous arkose and siltsone and red to black fissile silty shale. On the east it grades into coarse conglomerate.

New Haven Arkose (TRnh) – Red, pink, and gray colored coarse-grained poorly sorted and indurated arkose, with conglomerate locally, that is interbedded with brick-red micaceous, locally shaly siltstone and fine-grained feldspathic clayey sandstone.

Massachusetts

Dedham Granite (Zdgr) – Proterozoic, light grayish-pink to greenish-gray, equigranular to slightly porphyritic, variably altered granite with secondary diorite and quartz monzonite.

Granite of the Fall River pluton (Zfgr) – Proterozoic age light-gray, medium-grained, biotite granite, partially mafic-poor.

Gneiss and schist near New Bedford (Zgs) – Proterozoic age hornblende and biotite schist and gneiss, amphibolite.

Westwood Granite (Zwgr) – Proterozoic age light gray to pinkish gray, fine to medium grained granite.

Granite, gneiss, and schist, undivided (Zgg) –Plutonic and metamorphic rocks that are probably Proterozoic in age.

Cambridge Argillite (PzZc) – Proterozoic to early Paleozoic age gray argillite to minor quartzite with some sandstone and conglomerate.

Roxbury Conglomerate (PzZr) – Proterozoic to early Paleozoic age conglomerate, sandstone, siltstone, argillite, and metaphyre.

Wamsutta Formation (Pw) – Middle to Lower Pennsylvanian age, red to pink colored, well-sorted conglomerate, greywacke, sandstone, and shale.

Rhode Island Formation (Pr) – Upper and Middle Pennsylvanian age gray sandstone, graywacke, shale, and conglomerate and black shale. Also contains minor meta-anthracite beds.

3.5 Soil Hazards

The characteristics of the major soil types, vegetative cover, and slope are important factors in determining the potential for soil hazards. With regards to rock removal, there are areas identified along the AIM Project that are prone to introduction of rocks into topsoil during excavation and backfilling. Other issues of potential soil hazards include areas along the pipeline route that are prone to severe erosion, are designated as prime farmland, hydric, prone to compaction, and soils with poor or very poor revegetation potential. These soil hazards are further discussed in Section 7.3 of Resource Report 7.

Soils with shallow-to-bedrock soils and bedrock outcroppings are shown by pipeline segment and MP in Appendix A. Soil descriptions of each soil type can be cross referenced by the Soil Map Unit in Resource Report 7.

4.0 ROCK REMOVAL CONSIDERATIONS

This 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 above ground facilities. Refer to the table in Appendix A which identifies areas of the pipeline route where bedrock is expected within sixty inches of natural grade by MP. Construction within these areas may encounter solid rock while excavating or grading.

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 utilized 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 bull dozer mounted rock ripping attachment, or rock teeth on an excavator bucket. If alternative methods are considered, such as 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, state, and local 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 as pre/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, as well as others. These additional factors are inclusive of, but are 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.

5.0 ROCK REMOVAL METHODS

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.

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.

Provided below is a general overview of each method.

5.1 Excavation

During normal trenching activities, the contractor will be using 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 excavator or a ripping attachment on a bull dozer.

When ripping of the rock is not practical or possible, other means of rock fragmentation are necessary as described below.

5.2 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, they 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 their installation. Proper 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.

5.3 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.

These drilling machines are integral in creating a hole within rock for blasting, as they are both 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, the approach still has several limitations. It increases the number 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. As with other mechanical methods, proper fragmentation of the rock cannot be guaranteed.

5.4 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.

6.0 BLASTING PLAN

6.1 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 local or state ordinances 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 taken on this 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.
- Sampling of wells or springs will consist of turbidity and bacteriological analysis (total coliform).

The results will be summarized in a condition report that will include photographs and be completed prior to the commencement of blasting.

6.2 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, State, and Local procedures and 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 closest adjacent facilities by seismographs.

6.3 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, or as required by federal, state, or local ordinances, 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. 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. Like pre-blast inspection, post-blast sampling of wells or springs 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 corrective action.

6.4 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, stream flow 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, after removing the blast rock, additional blasting is required, 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 Algonquin's E&SCP.

6.5 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 also 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.

6.5.1 Pre-requisites for Use of Explosives

Prior to the use of any explosives, the contractor shall submit a blasting procedure and receive Algonquin approval. The blasting procedure shall take into account adjacent pipelines and specific requirements outlined in the Contract Documents and shall include 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 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.
- Obtain Algonquin approval and provide a notice of 72 hours prior to detonation of any explosives.
- Obtain approval from Algonquin 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% of the trench rock to less than 6 in (150 mm) in diameter.
- All delay connectors used shall have a delay interval of at least seventeen milliseconds.
- There are to be no loaded holes left overnight, and the site is 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.
- Copies of any seismographic data

6.5.2 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 ("USBOM") on cratering in granite, and refined based on a 2004 failure investigation. Other blasting limitations based upon extensive research by the Pipeline Research Committee International ("PRCI"), blasting consultants, and the USBOM regarding blasting adjacent to pipelines is also included in the Spectra Energy blasting criteria.

6.5.3 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.

6.5.4 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.

APPENDIX A

SHALLOW BEDROCK LOCATIONS ALONG THE AIM PIPELINE FACILITIES

Areas With Bedrock Less than 60 inches Below Grade by MP							
Bedrock Contact Type	**Overburden Material**	**Range of Slope (%) a/**	**Soil Map Unit**	**Beginning Milepost**	**Ending Milepost**	**Approximate Crossing Length (ft) b/**	**Depth - Bedrock (inches) g/**
NEW YORK							
Haverstraw to Stony Point Take-up and Relay							
Lithic	Till	15-30	CkD	1.19	1.49	1597.81	0
Lithic	Till	15-25	CoD	1.49	1.57	423.35	20
Stony Point to Yorktown Take-up and Relay							
Lithic	Till	15-25	CoD	0.31	0.36	279.84	0
Lithic	Till	15-25	CkD	0.36	0.41	269.28	0
Lithic	Till	8-15	CkC	0.41	0.51	522.72	0
Lithic	Till	15-25	CkD	0.72	1.29	3041.28	0
Lithic	Till	25-45	HlF	1.29	1.36	359.04	20
Lithic	Till	15-25	CkD	1.36	2.12	3970.56	0
Lithic	Till	15-25	CkD	2.79	3.14	1832.16	0
Lithic	-	0-45	Pv	4.06	4.13	390.72	0
Lithic	-	0-45	Pv	4.17	4.47	1610.40	0
Lithic	Till	15-25	CuD	4.87	4.92	279.84	20
Lithic	Till	15-25	CuD	5.44	5.52	464.64	20
Lithic	Till	15-25	CuD	5.64	5.65	89.76	20
Lithic	Till	15-25	CuD	5.98	5.98	10.56	20
Lithic	Till	8-15	CtC	6.32	6.41	469.92	0
Lithic	Till	15-25	CuD	6.41	6.48	327.36	20
Lithic	Till	15-25	CuD	6.50	6.56	332.64	20
Lithic	Till	15-25	CuD	6.72	6.74	142.56	20
Lithic	Till	15-25	CuD	6.79	6.82	153.12	20
Lithic	Till	15-25	CuD	6.99	7.01	84.48	20
Lithic	Till	8-15	CtC	7.01	7.10	448.80	20
Lithic	Till	15-25	CuD	7.10	7.31	1135.20	20
Lithic	Till	8-15	CtC	7.31	7.35	221.76	20
Lithic	Till	15-25	CuD	7.49	7.53	211.20	20
Lithic	Till	8-15	CtC	7.56	7.65	443.52	20
Lithic	Till	15-25	CuD	8.05	8.12	374.88	20
Lithic	Till	8-15	CtC	8.12	8.13	36.96	20
Lithic	Till	8-15	CtC	8.38	8.43	258.72	20
Southeast to MLV 19 Take-Up & Relay							
Lithic	Till	8-15	SgC	0.00	0.02	124.71	0

Areas With Bedrock Less than 60 inches Below Grade by MP							
Bedrock Contact Type	Overburden Material	Range of Slope (%) a/	Soil Map Unit	Beginning Milepost	Ending Milepost	Approximate Crossing Length (ft) b/	Depth - Bedrock (inches) g/
CONNECTICUT							
Southeast to MLV 19 Take-Up & Relay							
Lithic	Ablation till	15-45	73E	0.34	0.36	98.59	24
Lithic	Ablation till	15-25	73E	0.38	0.41	187.92	24
Lithic	Ablation till	15-25	73E	2.01	2.04	147.56	24
Lithic	Ablation till	15-45	73E	2.10	2.20	493.86	24
Lithic	Ablation till	15-45	73E	2.23	2.27	240.41	24
Lithic	Till	15-45	60D	2.31	2.38	358.28	20
Lithic	Till	15-45	60D	2.96	3.00	208.58	20
Lithic	Ablation till	15-45	75E	3.76	3.81	260.95	0
Lithic	Ablation till	15-45	73E	4.27	4.30	199.72	24
E-1 System Lateral Take-up & Relay							
Lithic	Ablation till	15-45	73E	0.47	0.51	237.36	24
Lithic	Till	15-25	60D	1.12	1.25	674.62	20
Lithic	Ablation till	15-45	75E	5.04	5.25	1,115.62	0
Lithic	Till	15-25	60D	5.77	5.78	58.57	20
Lithic	Ablation till	3-15	75C	6.20	6.21	72.84	15
Lithic	Ablation till	15-45	75E	6.21	6.33	604.85	0
Lithic	Ablation till	3-15	75C	6.33	6.40	369.84	15
Lithic	Ablation till	15-45	75E	6.40	6.43	148.77	0
Lithic	Ablation till	3-15	75C	6.43	6.48	266.02	15
Lithic	Ablation till	15-45	75E	6.48	6.57	468.02	0
Lithic	Ablation till	3-15	75C	6.57	6.59	139.14	15
Lithic	Ablation till	15-45	75E	6.59	6.66	384.06	0
Lithic	Ablation till	15-45	73E	6.82	6.86	242.16	24
Lithic	Ablation till	15-45	73E	6.92	6.95	134.46	24
Lithic	Ablation till	15-45	73E	6.98	7.06	405.85	24
Lithic	Ablation till	15-45	75E	8.12	8.17	303.27	0
Lithic	Ablation till	15-45	73E	8.23	8.27	221.70	24
Lithic	Ablation till	3-15	75C	8.27	8.28	39.24	15
Lithic	Ablation till	15-45	73E	8.52	8.55	180.29	24

Areas With Bedrock Less than 60 inches Below Grade by MP							
Bedrock Contact Type	**Overburden Material**	**Range of Slope (%) a/**	**Soil Map Unit**	**Beginning Milepost**	**Ending Milepost**	**Approximate Crossing Length (ft) b/**	**Depth - Bedrock (inches) g/**
E-1 System Loop							
Lithic	Ablation Till	15-45	75E	0.61	0.70	475.20	0
Lithic	Ablation Till	15-45	73E	0.70	0.77	332.64	24
Lithic	Ablation Till	15-45	75E	0.81	0.84	147.84	0
Lithic	Ablation Till	3-15	75C	0.84	0.88	211.2	15
Lithic	Ablation Till	15-45	75E	0.88	0.99	601.92	0
Lithic	Ablation Till	3-15	75C	0.99	1.03	195.36	15
Lithic	Ablation Till	15-45	75E	1.03	1.06	163.68	0
Lithic	Ablation Till	3-15	75C	1.06	1.17	570.24	15
Lithic	Ablation Till	3-15	75C	1.19	1.24	285.12	15
Lithic	Ablation Till	15-45	75E	1.24	1.31	380.16	0
MASSACHUSETTS							
West Roxbury Pipeline Lateral							
Lithic	Ablation till	3-15	104C	3.84	4.24	2,120.64	20
Lithic	-	0-45	601	4.24	4.27	119.37	0
Lithic	Ablation till	3-15	104C	4.27	4.37	549.20	20
Lithic	-	0-45	601	4.37	4.40	180.82	0
Lithic	Ablation till	3-15	104C	4.40	4.49	442.32	20
Lithic	Ablation till	3-15	630C	4.49	4.73	1,268.16	20
Lithic	Ablation till	3-15	104C	4.73	4.98	1,351.51	20
Lithic	Ablation till	3-15	630C	4.98	5.06	389.26	20

a/ For soil map units including areas of Udorthents and Urban Land, NRCS data did not specify a slope range. A slope range of 0 to 8 % was assigned to these developed areas.

b/ Soil crossing lengths were simplified by rounding to the nearest whole number. The crossing lengths may differ slightly from actual lengths due to rounding. No soil data is provided between MP 2.62 and MP 4.94 as the route across the Hudson River has not been determined at this time.

c/ Water erosion potential was determined by averaging the K factor values of horizons of each soil type. Based on the average K factor, each soil type was grouped into a water erosion class of “Low”, “Moderate”, and “High”. Refer to Section 7.3.1.1.

d/ WEGs were obtained from the NRCS Soil Data Mart. WEGs range from one to eight, with one being the highest potential for wind erosion, and eight the lowest. Refer to Section 7.3.1.2.

e/ “Urban Land” and “Udorthents” map units do not have a NRCS designated hydric soil status. These map units were considered to be non-hydric soils. Map units comprised of complexes of hydric and non-hydric soil types were considered to be partially hydric.

f/ Compaction potential was determined by drainage class. High compaction potential includes very poorly drained and poorly drained soils, moderate compaction potential includes somewhat poorly drained to moderately well drained soils, and low compaction potential includes well drained soils.

g/ Depth to bedrock is not defined by the NRCS for the “Pavement and Buildings” map unit. A depth to bedrock of >60” was assigned, which is consistent with NRCS designations for other natural and fill soils in the AIM Project area.

h/ The ability of soils within the AIM Project area to support successful revegetation were determined by evaluating range of slope, erosion potential, drainage class, and presence of fill materials. Refer to Section 7.3.5.

i/ Drainage class abbreviations are as follows: VPD, very poorly drained; PD, poorly drained; MWD, moderately well drained; WD, well drained; ED, excessively drained.

APPENDIX F

PUBLIC ROADS AND RAILROADS CROSSING TABLE

APPENDIX F

TABLE F-1

Public Roads and Railroads Crossed by the AIM Project

Facility, County, State, Milepost	Roadway	Road Surface	Municipality	Proposed Construction Method
Haverstraw to Stony Point Take-up and Relay				
Rockland County, NY				
0.30	Call Hollow Road	Paved	Haverstraw	Open cut
0.49	Wolf Road	Paved	Haverstraw	Open cut
1.02	Call Hollow Road	Paved	Haverstraw	Open cut
1.18	Willow Grove Road	Paved	Stony Point	Open cut
1.54	Irish Mountain Court	Paved	Stony Point	Open cut
2.17	Palisades Interstate Parkway (inbound and outbound)	Paved	Stony Point	Bore
2.26	Pierce Drive	Paved	Stony Point	Open cut
2.39	Zachary Taylor Street/Pierce Drive intersection	Paved	Stony Point	Open cut
2.46	Pyngyp Road	Paved	Stony Point	Open cut
2.97	Gate Hill Road (Highway 210)	Paved	Stony Point	Open cut
3.00	Cedar Flats Road	Paved	Stony Point	Open cut
Stony Point to Yorktown Take-up and Relay				
Rockland County, NY				
0.44	Bulson Town Road (Route 65)	Paved	Stony Point	Open cut
0.70	Franck Road	Paved	Stony Point	Open cut
1.38	Soluri Lane	Paved	Stony Point	Open cut
1.64	Soluri Lane	Paved	Stony Point	Open cut
2.14	Route 53/Buck Berg Mountain Road	Paved	Stony Point	Open cut
2.38	Mott Farm Road (Route 118)	Paved	Stony Point	Open cut
2.95	Highway 9W (N. Liberty Drive)	Paved	Stony Point	Open cut
2.97	West Shore Drive	Paved	Stony Point	Open cut
3.14	Railroad	Railroad	Stony Point	Bore
Westchester County, NY				
3.94	9th Street	Paved	Cortlandt	Open cut
4.50	Lafarge Entrance Road	Paved	Cortlandt	Open cut
4.77	Broadway Street	Paved	Cortlandt	Bore
5.52	Bleakley Avenue	Paved	Cortlandt	Open cut
5.71	Metro North Railroad	Railroad	Cortlandt	Bore
5.76	Route 9A	Paved	Cortlandt	Open cut
5.83	Beloch Avenue (entrance extension to Route 9 from Route 9A)	Paved	Cortlandt	Bore
5.84	Briarcliff Peekskill Parkway (Route 9) (inbound and outbound)	Paved	Cortlandt	Bore
5.87	Reynolds Hills	Paved	Cortlandt	Bore
6.31	Pine Lane	Paved	Cortlandt	Open cut
6.42	Boulder Drive	Paved	Cortlandt	Open cut
6.68	Washington Street	Paved	Cortlandt	Open cut
8.43	Montrose Station Road	Paved	Cortlandt	Open cut
8.43	Maple Avenue	Paved	Cortlandt	Open cut
9.05	Benjamin Lane	Paved	Cortlandt	Open cut
9.21	Dimond Avenue	Paved	Cortlandt	Open cut

TABLE F-1 (cont'd)

Public Roads and Railroads Crossed by the AIM Project

Facility, County, State, Milepost	Roadway	Road Surface	Municipality	Proposed Construction Method
9.39	Cordwood Road	Paved	Cortlandt	Open cut
9.61	Forest Avenue	Paved	Cortlandt	Open cut
9.79	Rick Lane	Paved	Cortlandt	Open cut
10.01	Justin Court	Paved	Cortlandt	Open cut
10.17	Peachtree Drive	Paved	Cortlandt	Open cut
10.27	Croton Avenue	Paved	Cortlandt	Open cut
10.49	Crompond Road (Route 35 & 202)	Paved	Cortlandt	Bore
10.69	Baron De Hirsh Road	Paved	Cortlandt	Open cut
11.02	Lexington Avenue	Paved	Cortlandt	Open cut
Southeast to MLV-19 Take-up and Relay				
Fairfield County, CT				
0.31	Sawmill Road	Paved	Danbury	Open cut
0.41	Reserve Road	Paved	Danbury	Open cut
0.58	Matrix Corp. Road	Paved	Danbury	Open cut
0.88	Reserve Road	Paved	Danbury	Open cut
1.21	Union Carbide Road	Paved	Danbury	Open cut
1.27	Service Road	Paved	Danbury	Open cut
1.52	Old Ridgebury Road (Overpass)	Paved	Danbury	HDD inclusive
1.57	Interstate 84 (2A-2B) inbound and outbound	Paved	Danbury	HDD inclusive
1.84	Housatonic Railroad	Railroad	Danbury	HDD inclusive
1.98	Mill Plain Road (Route 202 & 6)	Paved	Danbury	HDD inclusive
2.40	Driftway Road	Paved	Danbury	Open cut
2.76	University Boulevard	Paved	Danbury	Open cut
3.21	Chelsea Drive	Paved	Danbury	Open cut
3.35	Middle River Road/Filmore Avenue/Westville Road intersection	Paved	Danbury	Open cut
3.47	Topfield Road	Paved	Danbury	Open cut
3.86	Franklin Street Extension	Paved	Danbury	Open cut
4.21	Kohanza Street	Paved	Danbury	Open cut
4.31	Overlook Terrace	Paved	Danbury	Open cut
4.42	Clapboard Ridge Road (Route 39)	Paved	Danbury	Open cut
E-1 System Lateral Take-up and Relay				
New London County, CT				
0.86	Chappell Road	Paved	Lebanon	Open cut
1.92	Exeter Road (Route 207)	Paved	Lebanon	Bore
5.81	Railroad	Railroad	Franklin	Bore
6.01	Meeting House Hill Road	Paved	Franklin	Bore
7.36	Windham Turnpike (Route 32)	Paved	Franklin	Bore
8.52	Wisconsin Avenue	Paved	Norwich	Open cut
Line-36A Loop Extension				
Middlesex County, CT				
1.24	Maine Street (State Route 99)	Paved	Cromwell	Open cut
E-1 System Lateral Loop Extension				
New London County, CT				
0.02	Fitch Hill Road	Paved	Montville	Open cut

TABLE F-1 (cont'd)

Public Roads and Railroads Crossed by the AIM Project

Facility, County, State, Milepost	Roadway	Road Surface	Municipality	Proposed Construction Method
West Roxbury Lateral [a]				
Norfolk County, MA				
0.17	East Street	Paved	Dedham	Bore
0.45	Route 1 & Interstate 95/Route 128 (inbound and outbound)	Paved	Dedham	Bore
0.53	Allied Drive (and through large parking lot)	Paved	Dedham	Open cut
0.62	Railroad	Railroad	Dedham	Bore
0.63–0.87	In and along Rustcraft Road/Elm Street	Paved	Dedham	In-road
0.88	Robinwood Road (along Rustcraft Road/Elm Street)	Paved	Dedham	In-road
0.89–1.16	In and along Elm Street	Paved	Dedham	In-road
1.17–1.37	In Providence Highway	Paved	Dedham	In-road
1.37–1.52	In several parking lots and access roads alongside Providence Highway	Paved	Dedham	In-road
1.40	Legacy Boulevard	Paved	Dedham	In-road
1.52–2.42	In Providence Highway	Paved	Dedham	In-road
2.23	Jade Lane (along Providence Highway)	Paved	Dedham	In-road
2.35	Eastern Avenue (along Providence Highway)	Paved	Dedham	In-road
2.57	Harris Street/High Street and parking lot	Paved	Dedham	Open-Cut
2.59–3.01	In and along East Street	Paved	Dedham	In-road
3.05	Washington Street	Paved	Dedham	Open-Cut
3.06–3.13	In and along Eastbrook Road	Paved	Dedham	In-road
3.14–3.20	In and along Post Lane/Lower East Street	Paved	Dedham	In-road
3.20–3.44	In and along Washington Street	Paved	Dedham	In-road
3.31	Sumner Street (along Washington Street)	Paved	Dedham	In-road
3.35	Willis Street (along Washington Street)	Paved	Dedham	In-road
Suffolk County, MA				
3.44–3.76	In and along Washington Street	Paved	West Roxbury, Boston	In-road
3.52	Tobin Road (along Washington Street)	Paved	West Roxbury, Boston	In-road
3.66	Stimson Street (along Washington Street)	Paved	West Roxbury, Boston	In-road
3.76–4.36	In and along Grove Street	Paved	West Roxbury, Boston	In-road
3.93	Freeman Avenue (along Grove Street)	Paved	West Roxbury, Boston	In-road
3.96	Birch Road (along Grove Street)	Paved	West Roxbury, Boston	In-road
4.01	Altair Road (along Grove Street)	Paved	West Roxbury, Boston	In-road
4.19	Grove Terrace (along Grove Street)	Paved	West Roxbury, Boston	In-road
4.36–5.11	In and along Centre Street	Paved	West Roxbury, Boston	In-road
4.49	Glenhaven Road (along Centre Street)	Paved	West Roxbury, Boston	In-road

TABLE F-1 (cont'd)

Public Roads and Railroads Crossed by the AIM Project

Facility, County, State, Milepost	Roadway	Road Surface	Municipality	Proposed Construction Method
4.55	Baker Street/Centre Lane (along Centre Street)	Paved	West Roxbury, Boston	In-road
4.62	Wedgemere Road (along Centre Street)	Paved	West Roxbury, Boston	In-road
4.66	Woodbrier Road (along Centre Street)	Paved	West Roxbury, Boston	In-road
4.70	Bronx Road/Centre Terrace (along Centre Street)	Paved	West Roxbury, Boston	In-road
4.73	Acacia Road (along Centre Street)	Paved	West Roxbury, Boston	In-road
4.82	Cass Street (along Centre Street)	Paved	West Roxbury, Boston	In-road
4.93	Autumn Street (along Centre Street)	Paved	West Roxbury, Boston	In-road
4.99	Alaric Street (along Centre Street)	Paved	West Roxbury, Boston	In-road
5.07–5.11	In and along Spring Street	Paved	West Roxbury, Boston	In-road
5.11–5.14	In and along St. Theresa Avenue	Paved	West Roxbury, Boston	In-road

[a] The majority of the West Roxbury Lateral would be co-located along Providence Highway, Washington Street, Grove Street, Centre Street, and East Street.

APPENDIX G

TRAFFIC MANAGEMENT PLANS

Traffic Management Plan
New York Pipeline Segments

Algonquin Gas Transmission, LLC

ALGONQUIN INCREMENTAL MARKET PROJECT

Traffic Management Plan
New York Pipeline Segments

May 2014

TABLE OF CONTENTS

LIST OF ATTACHMENTS

1.0 INTRODUCTION

Algonquin Gas Transmission, LLC ("Algonquin"), an indirect, wholly-owned subsidiary of Spectra Energy Partners, LP, is seeking authorization from the Federal Energy Regulatory Commission ("FERC" or "Commission") pursuant to Section 7(c) of the Natural Gas Act[1] ("NGA") to construct, install, own, operate, and maintain the Algonquin Incremental Market Project ("AIM Project" or "Project") which will involve expansion of its existing pipeline systems located in New York, Connecticut, Rhode Island and Massachusetts.

In New York, Algonquin will take-up and relay approximately 3.3-miles of mainline pipeline located upstream (southwest) of the existing Stony Point Compressor Station in Rockland County, New York (*Haverstraw to Stony Point Take-up & Relay*). The installation of the new 42-inch pipeline will begin at the existing Algonquin Mainline Valve Site ("MLV") 13B (MP 0.0) located west of Call Hollow Road in the Town of Haverstraw and end at the Stony Point Compressor Station located northeast of Cedar Flats Road in the Town of Stony Point (MP 3.3).

Downstream (northeast) of the Stony Point Compressor Station, Algonquin will construct approximately 12.3 miles of 42-inch diameter mainline pipeline in the Towns of Stony Point and Cortlandt (including the Hamlet of Verplanck and the Village of Buchanan), the City of Peekskill, and the Town of Yorktown (*Stony Point to Yorktown Take-up & Relay*). This pipeline section includes two segments of take-up and relay pipeline construction and one section of pipeline construction within a new permanent ROW across the Hudson River.

In response to comments from the FERC, landowners and other stakeholders, Algonquin has retained Hatch Mott MacDonald, NY LLC. ("HMM") to provide traffic engineering consulting services in support of the proposed Project facilities in New York. Algonquin is committed to working with each municipality along the Project limits to address potential transportation-related impacts associated with constructing the proposed pipeline. This document includes a summary of roadways where the construction will take place and information regarding general traffic management strategies. Based on the research conducted to date, this report summarizes the currently proposed construction schedule, hours of operation, and provides representative traffic management plans that will be implemented during construction.

[1] 15 U.S.C. § 717f(c) (2006).

2.0 PROJECT DESCRIPTION

The projected in-service date of the AIM Project is November 2016. Construction of the Project pipeline facilities, new M&R stations, and modifications to the Algonquin's existing compressor stations and M&R stations is expected to occur over a 1½ year period to accommodate multiple work locations and the need for scheduled system outages for the numerous tie-ins along the existing system. The work is scheduled to start in the 1st Quarter of 2015 and be completed by October 2016.

Table 2-1 provides a preliminary construction schedule.

TABLE 2-1

Preliminary Construction Schedule for AIM Project Facilities in New York

Facilities	Start	Finish	Length (miles)
PIPELINE FACILITIES			
Mainline Take-up & Relay a/	March 2016	Oct. 2016	12.8
Horizontal Directional Drill/New Pipe b/			
Hudson River	March 2015	Oct. 2015	2.9
ABOVEGROUND FACILITIES			
Existing Compressor Station Modifications			
Stony Point c/	March 2016	Oct. 2016	N/A
Southeast c/	March 2016	Oct. 2016	N/A
Existing M&R Station Modifications			
Stony Point M&R Station	April 2016	Oct. 2016	N/A
Peekskill M&R Station	April 2015	Oct. 2015	N/A
Cortlandt M&R Station	April 2016	Oct. 2016	N/A

Notes:
a/ Certain complex pipeline crossings (e.g., road, streams, railroads) may be constructed during the April – October 2015 construction season. Winter clearing in Nov. 2015 – Feb. 2016 may be necessary to address time of year restrictions.
b/ The length shown for the Hudson River HDD is also included in the total length shown for the mainline take-up and relay.
c/ Civil site work at these two compressor stations will begin in the April – October 2015 time frame.

To expedite the completion of the Project, weekday working hours between 7 AM and 7 PM are desirable. However, Algonquin recognizes that these hours may not be possible for all portions of the Project due to traffic management in consideration of abutting residential and commercial properties, and that night working hours may be required. The exact timeframe for the completion of the Project is dependent on weather conditions, extent of restricted work hours and other factors. For construction planning purposes, the Project is being viewed in eighteen distinct sections. To minimize the duration of construction, work may occur simultaneously in multiple areas as three dedicated construction crews are expected to be working on the Project. For each portion of the Project involving work in public roadways traffic management plans will be required to help ensure general public safety and to maintain appropriate traffic flow. In addition to measures to address motor vehicles, considerations also will be made for pedestrians, bicycles, and construction workers. As such, Algonquin will continue to work closely with the various municipalities and public agencies involved, as well as residential and commercial stakeholders that may be affected by the Project.

3.0 REPRESENTATIVE TRAFFIC MANAGEMENT PLANS

General traffic management plans have been developed and included as part of this TMP. The plans were developed following standards contained in the Manual on Uniform Traffic Control Devices (MUTCD)[2], New York State Supplement to the Manual on Uniform Traffic Control Devices, and the New York State Work Zone Traffic Control Standard Details. While not all of the affected roadways are under New York State Department of Transportation ("NYSDOT") jurisdiction, NYSDOT's "Work Zone Traffic Control Standard Details" also were applied to local and residential roadways. These resulting plans are expected to be implemented for the majority of the work areas. The following tables provide a summary of where the attached traffic management plans are applied at each road crossing along the project.

A meeting with the NYSDOT was held on April 14, 2014 to discuss the locations and crossing methods of the proposed AIM Pipeline installations across NYSDOT jurisdictional roadways. The purpose of the meeting was to introduce the AIM Project, discuss pipeline crossing methods, required geotechnical boring work, and license vs. easement options pertaining to pipeline occupation at the road crossings.

The TMP's outlined in this document are being provided to each of the affected municipalities crossed by the proposed AIM Project and will be part of continuing communications.

Table 1: New York Roadways Affected by Construction (Haverstraw to Stony Point)

	MP	Road Name	Road Surface	Proposed Crossing Method	County	Municipality	Typical Detail #
Mainline Take up and Relay (Haverstraw to Stony Point)	0.3	Call Hollow Rd.	Paved	Open Cut	Rockland	Haverstraw	TTC DETAILS #1 AND #6
	0.49	Wolf Rd.	Paved	Open Cut	Rockland	Haverstraw	TTC DETAILS #1 AND #6
	1.02	Call Hollow Rd.	Paved	Open Cut	Rockland	Haverstraw	TTC DETAILS #1 AND #6
	1.18	Willow Grove Rd.	Paved	Open Cut	Rockland	Stony Point	TTC DETAILS #1 AND #6
	2.26	Pierce Dr.	Paved	Open Cut	Rockland	Stony Point	TTC DETAILS #5 AND #6
	2.39	Zachary Taylor St.	Paved	Open Cut	Rockland	Stony Point	SITE SPECIFIC DETAIL REQUIRED - MODIFICATION OF TTC DETAILS #1 AND #6
	2.46	Pyngyp Rd.	Paved	Open Cut	Rockland	Stony Point	TTC DETAILS #1 AND #6
	2.97	Gate Hill Rd. (HWY .210)	Paved	Open Cut	Rockland	Stony Point	SITE SPECIFIC DETAIL REQUIRED - MODIFICATION OF TTC DETAILS #1 AND #6
	3	Cedar Flats Rd.	Paved	Open Cut	Rockland	Stony Point	TTC DETAILS #1 AND #6

[2] U.S. Department of Transportation Federal Highway Administration, Manual on Uniform Traffic Control Devices, 2009 Edition; Washington DC, December 2009.

Table 2: New York Roadways Affected by Construction (Stony Point to Yorktown)

	MP	Road Name	Road Surface	Proposed Crossing Method	County	Municipality	Typical Detail #
Mainline Take up and Relay (Stony Point to Yorktown)	0.44	Bulson Town Rd. (Rte. 65)	Paved	Open Cut	Rockland	Stony Point	TTC DETAILS #1 AND #6
	0.7	Franck Rd.	Paved	Open Cut	Rockland	Stony Point	TTC DETAILS #1 AND #6
	1.38	Soluri Ln.	Paved	Open Cut	Rockland	Stony Point	TTC DETAILS #5 AND #6
	1.64	Soluri Ln.	Paved	Open Cut	Rockland	Stony Point	TTC DETAILS #5 AND #6
	2.14	Rte. 53/Buck Berg Mountain Rd.	Paved	Open Cut	Rockland	Stony Point	TTC DETAILS #1 AND #6
	2.38	Mott Farm Rd. (Rte. 118)	Paved	Open Cut	Rockland	Stony Point	TTC DETAILS #1 AND #6
	2.95	Highway 9	Paved	Open Cut	Rockland	Stony Point	TTC DETAILS #1 AND #6
	2.97	West Shore Dr.	Paved	Open Cut	Rockland	Stony Point	TTC DETAILS #1 AND #6
	4.5	Lafarge Entrance Rd.	Paved	Open Cut	Westchester	Cortlandt	TTC DETAILS #1 AND #6
	4.77	Broadway	Paved	Bore	Westchester	Cortlandt	TTC DETAIL # 6
	5.52	Bleakley Ave.	Paved	Open Cut	Westchester	Cortlandt	SITE SPECIFIC DETAIL REQUIRED - MODIFICATION OF TTC DETAILS #1, # 4 AND #6
	5.76	Rte. 9A	Paved	Open Cut	Westchester	Cortlandt	SITE SPECIFIC DETAIL REQUIRED - MODIFICATION OF TTC DETAILS #2, #3, #4 AND #6
	5.87	Reynolds Hills	Paved	Bore	Westchester	Cortlandt	TTC DETAIL # 6
	6.31	Pine Ln.	Paved	Open Cut	Westchester	Cortlandt	TTC DETAILS #1 AND #6
	6.42	Boulder Dr.	Paved	Open Cut	Westchester	Cortlandt	TTC DETAILS #1 AND #6
	6.68	Washington St.	Paved	Open Cut	Westchester	Cortlandt	TTC DETAILS #1 AND #6
	8.43	Montrose Station Rd.	Paved	Open Cut	Westchester	Cortlandt	SITE SPECIFIC DETAIL REQUIRED - MODIFICATION OF TTC DETAILS #1 AND #6
	8.43	Maple Ave.	Paved	Open Cut	Westchester	Cortlandt	SITE SPECIFIC DETAIL REQUIRED - MODIFICATION OF TTC DETAILS #1 AND #6
	9.05	Benjamin Ln.	Paved	Open Cut	Westchester	Cortlandt	TTC DETAILS #5 AND #6
	9.21	Dimond Ave.	Paved	Open Cut	Westchester	Cortlandt	TTC DETAILS #5 AND #6

	MP	Road Name	Road Surface	Proposed Crossing Method	County	Municipality	Typical Detail #
	9.39	Cordwood Rd.	Paved	Open Cut	Westchester	Cortlandt	SITE SPECIFIC DETAIL REQUIRED - MODIFICATION OF TTC DETAILS #1 AND #6
	9.61	Forest Ave.	Paved	Open Cut	Westchester	Cortlandt	TTC DETAILS #1 AND #6
	9.79	Rick Ln.	Paved	Open Cut	Westchester	Cortlandt	TTC DETAILS #1 AND #6
	10	Justin Ct.	Paved	Open Cut	Westchester	Cortlandt	TTC DETAILS #1 AND #6
	10.2	Peachtree Dr.	Paved	Open Cut	Westchester	Cortlandt	TTC DETAILS #1 AND #6
	10.3	Croton Ave.	Paved	Open Cut	Westchester	Cortlandt	TTC DETAILS #1 AND #6
	10.49	Crompond Rd. (Rt. 35 & 202)	Paved	Bore	Westchester	Cortlandt	TTC DETAIL # 6
	10.7	Baron De Hirsh Rd	Paved	Open Cut	Westchester	Cortlandt	TTC DETAILS #1 AND #6
	11	Lexington Ave.	Paved	Open Cut	Westchester	Cortlandt	TTC DETAILS #1 AND #6
	12.31	Stoney St.	Paved	N/A	Westchester	Cortlandt	TTC DETAIL # 6

ATTACHMENTS

TRAFFIC MANAGEMENT PLANS

G-15

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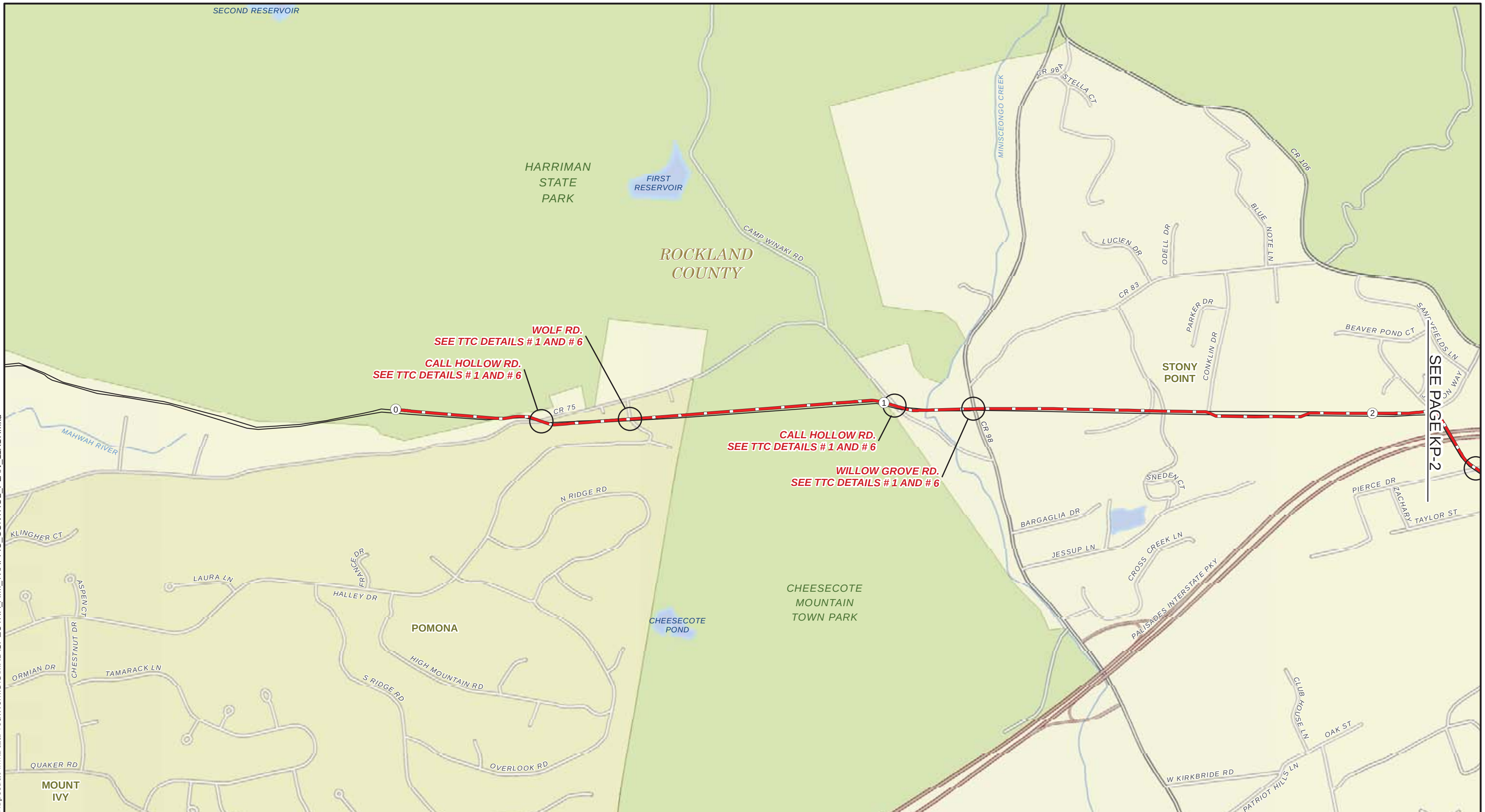

- MILE POST
- EXISTING ALGONQUIN COMPRESSOR STATION
- TEMPORARY TRAFFIC CONTROL DETAIL AREA
- PROPOSED PIPELINE CENTERLINE HANOVER / STONY POINT
- EXISTING ALGONQUIN GAS TRANSMISSION PIPELINE
- MAJOR HIGHWAY
- HIGHWAY
- LOCAL ROAD
- RAILROAD
- STREAM / RIVER
- PARK / FOREST
- WATERBODY
- CITY AREA
- COUNTY BOUNDARY

SPECTRA ENERGY
ALGONQUIN INCREMENTAL MARKET (AIM)
HANOVER AND STONY POINT LIFT AND RELAY TEMPORARY TRAFFIC CONTROL OVERVIEW

ROCKLAND COUNTY, NEW YORK

1,000 500 0 1,000 2,000 FEET

ABSOLUTE SCALE: 1:12,000

REFERENCE SCALE: 1 IN = 1,000 FT

Spectra Energy Partners
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310 713.627.5400

Hatch Mott MacDonald
150 Lower Westfield Rd.
Holyoke, MA 01040
Ph: (413) 535-0135 Fax: (413) 535-0136

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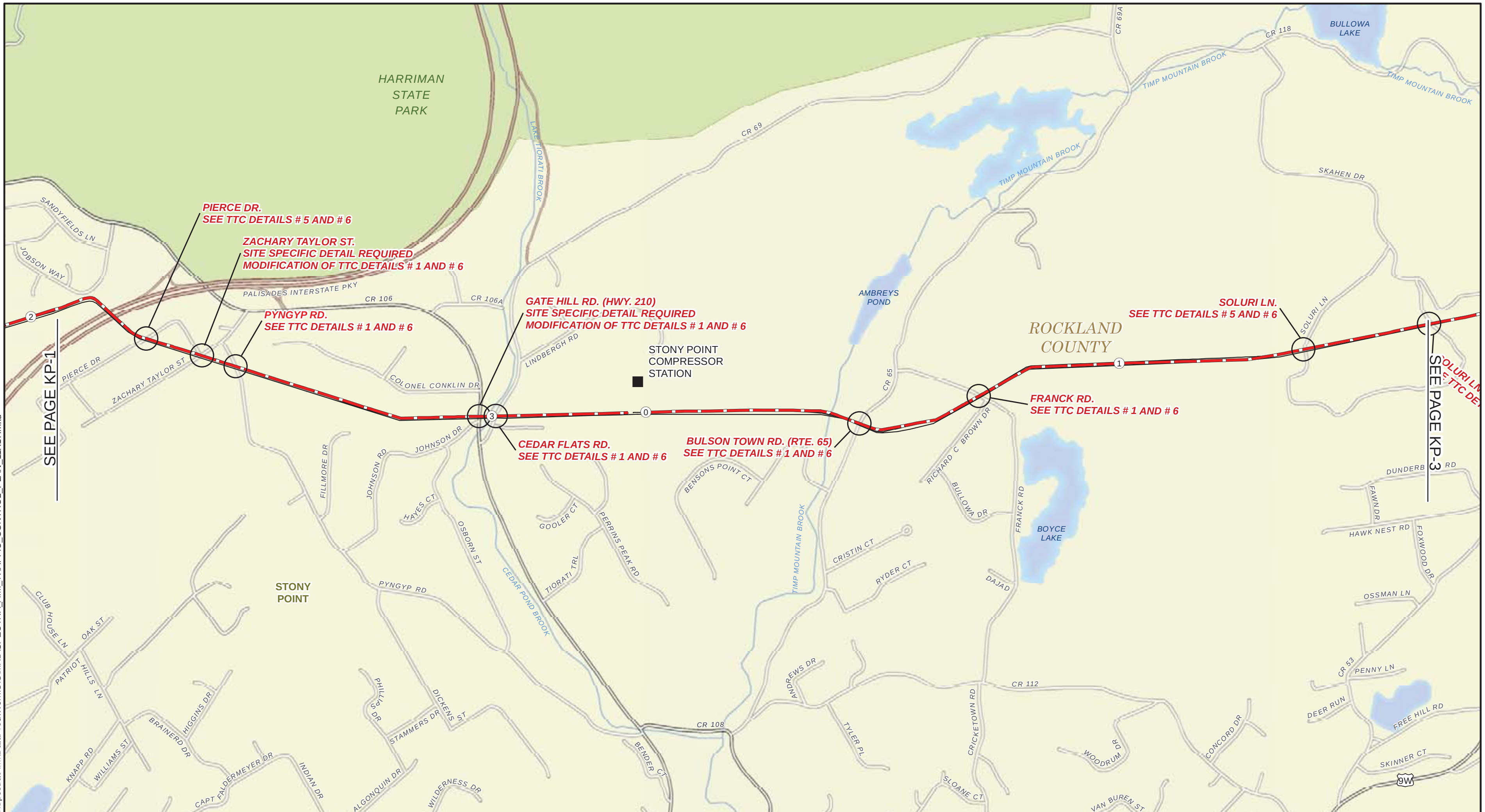

① MILE POST	MAJOR HIGHWAY
■ EXISTING ALGONQUIN COMPRESSOR STATION	HIGHWAY
○ TEMPORARY TRAFFIC CONTROL DETAIL AREA	LOCAL ROAD
PROPOSED PIPELINE CENTERLINE HANOVER / STONY POINT	RAILROAD
EXISTING ALGONQUIN GAS TRANSMISSION PIPELINE	STREAM / RIVER
PARK / FOREST	WATERBODY
CITY AREA	COUNTY BOUNDARY

SPECTRA ENERGY
ALGONQUIN INCREMENTAL MARKET (AIM)

HANOVER AND STONY POINT LIFT AND RELAY TEMPORARY TRAFFIC CONTROL OVERVIEW

ROCKLAND COUNTY, NEW YORK

1,000 500 0 1,000 2,000 FEET

N E S W

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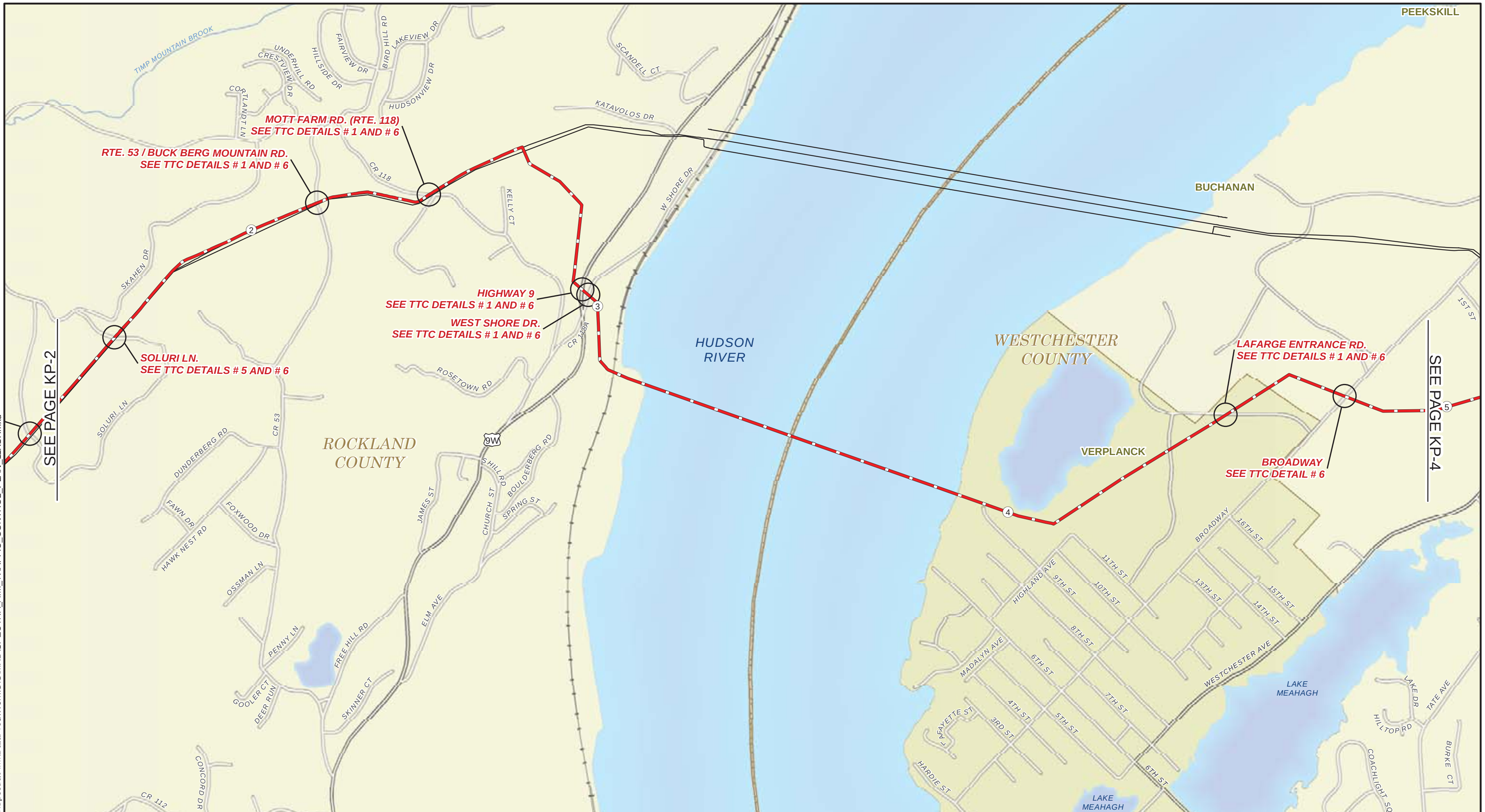

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① MILE POST	MAJOR HIGHWAY
■ EXISTING ALGONQUIN COMPRESSOR STATION	HIGHWAY
○ TEMPORARY TRAFFIC CONTROL DETAIL AREA	LOCAL ROAD
PROPOSED PIPELINE CENTERLINE HANOVER / STONY POINT	RAILROAD
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PARK / FOREST	WATERBODY
CITY AREA	COUNTY BOUNDARY

SPECTRA ENERGY
ALGONQUIN INCREMENTAL MARKET (AIM)

HANOVER AND STONY POINT LIFT AND RELAY TEMPORARY TRAFFIC CONTROL OVERVIEW

ROCKLAND & WESTCHESTER COUNTIES, NEW YORK

1,000 500 0 1,000 2,000 FEET

N W E S

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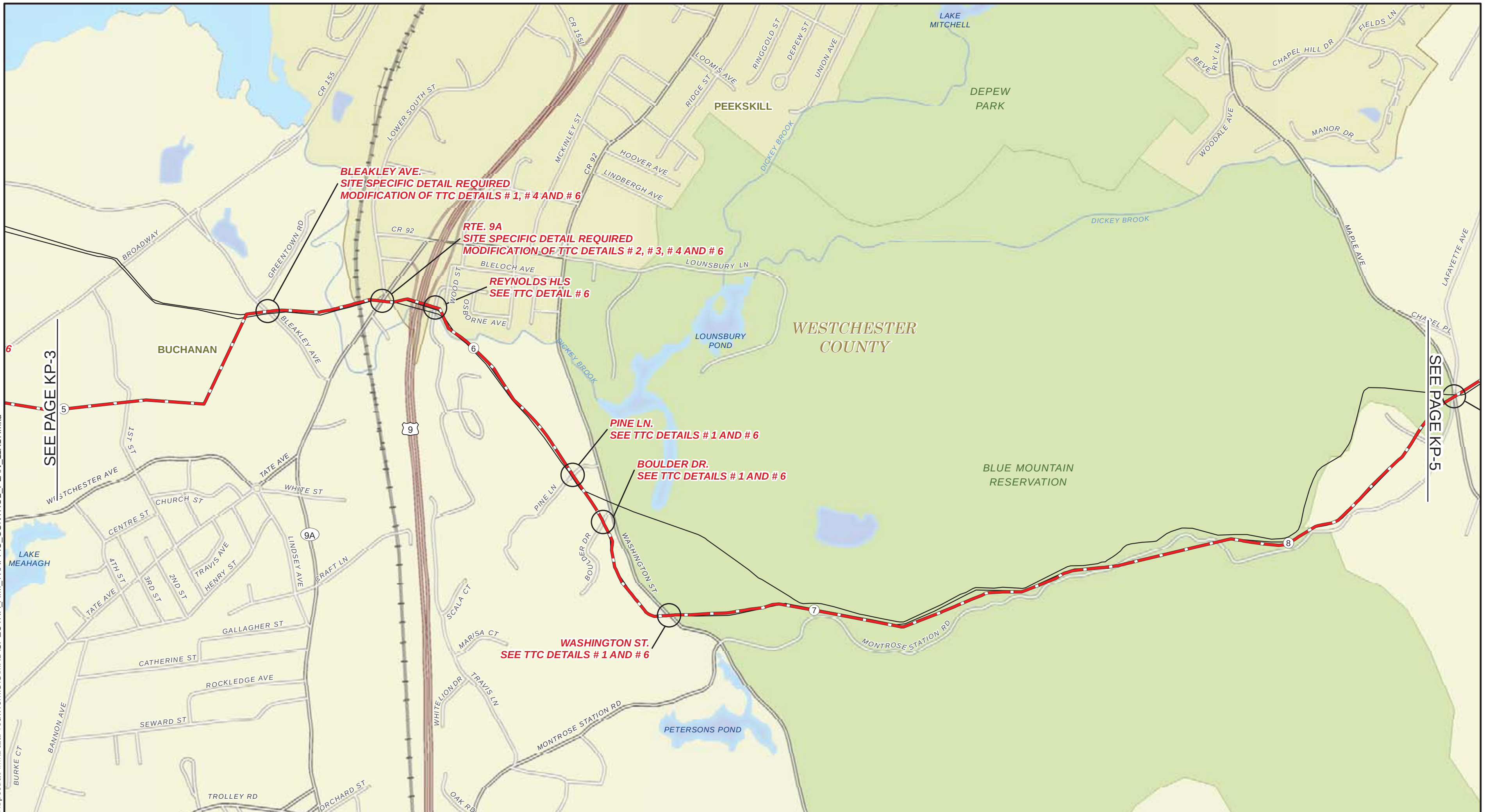

①	MILE POST
■	EXISTING ALGONQUIN COMPRESSOR STATION
○	TEMPORARY TRAFFIC CONTROL DETAIL AREA
	PROPOSED PIPELINE CENTERLINE HANOVER / STONY POINT
	EXISTING ALGONQUIN GAS TRANSMISSION PIPELINE
	MAJOR HIGHWAY
	HIGHWAY
	LOCAL ROAD
	RAILROAD
	STREAM / RIVER
	PARK / FOREST
	WATERBODY
	CITY AREA
	COUNTY BOUNDARY

SPECTRA ENERGY
ALGONQUIN INCREMENTAL MARKET (AIM)

HANOVER AND STONY POINT LIFT AND RELAY
TEMPORARY TRAFFIC CONTROL OVERVIEW

WESTCHESTER COUNTY, NEW YORK

1,000 500 0 1,000 2,000 FEET

N W E S

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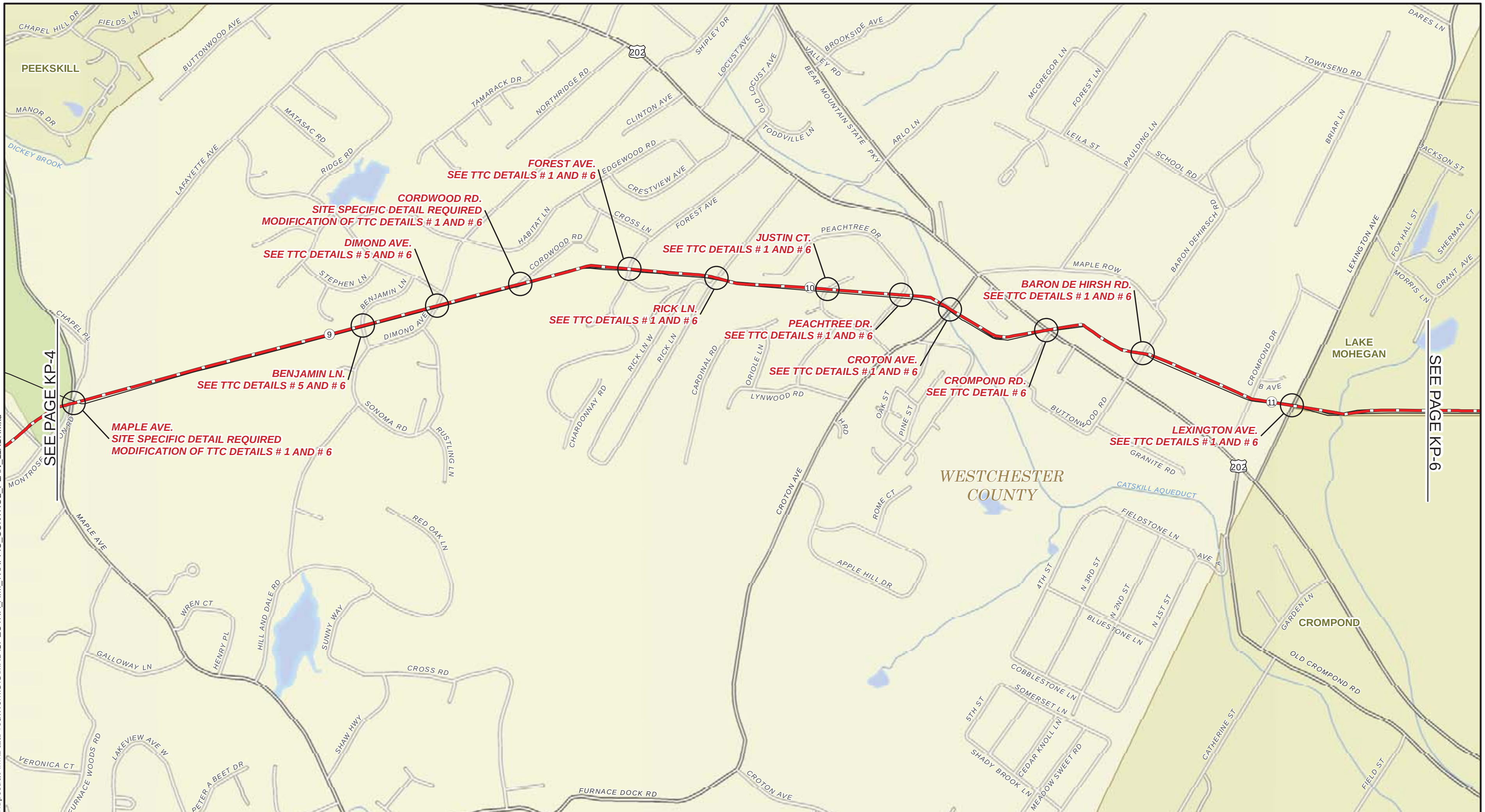

① MILE POST	MAJOR HIGHWAY	PARK / FOREST
EXISTING ALGONQUIN COMPRESSOR STATION	HIGHWAY	WATERBODY
TEMPORARY TRAFFIC CONTROL DETAIL AREA	LOCAL ROAD	CITY AREA
PROPOSED PIPELINE CENTERLINE HANOVER / STONY POINT	RAILROAD	COUNTY BOUNDARY
EXISTING ALGONQUIN GAS TRANSMISSION PIPELINE	STREAM / RIVER	

SPECTRA ENERGY
ALGONQUIN INCREMENTAL MARKET (AIM)
HANOVER AND STONY POINT LIFT AND RELAY TEMPORARY TRAFFIC CONTROL OVERVIEW

WESTCHESTER COUNTY, NEW YORK

1,000 500 0 1,000 2,000 FEET

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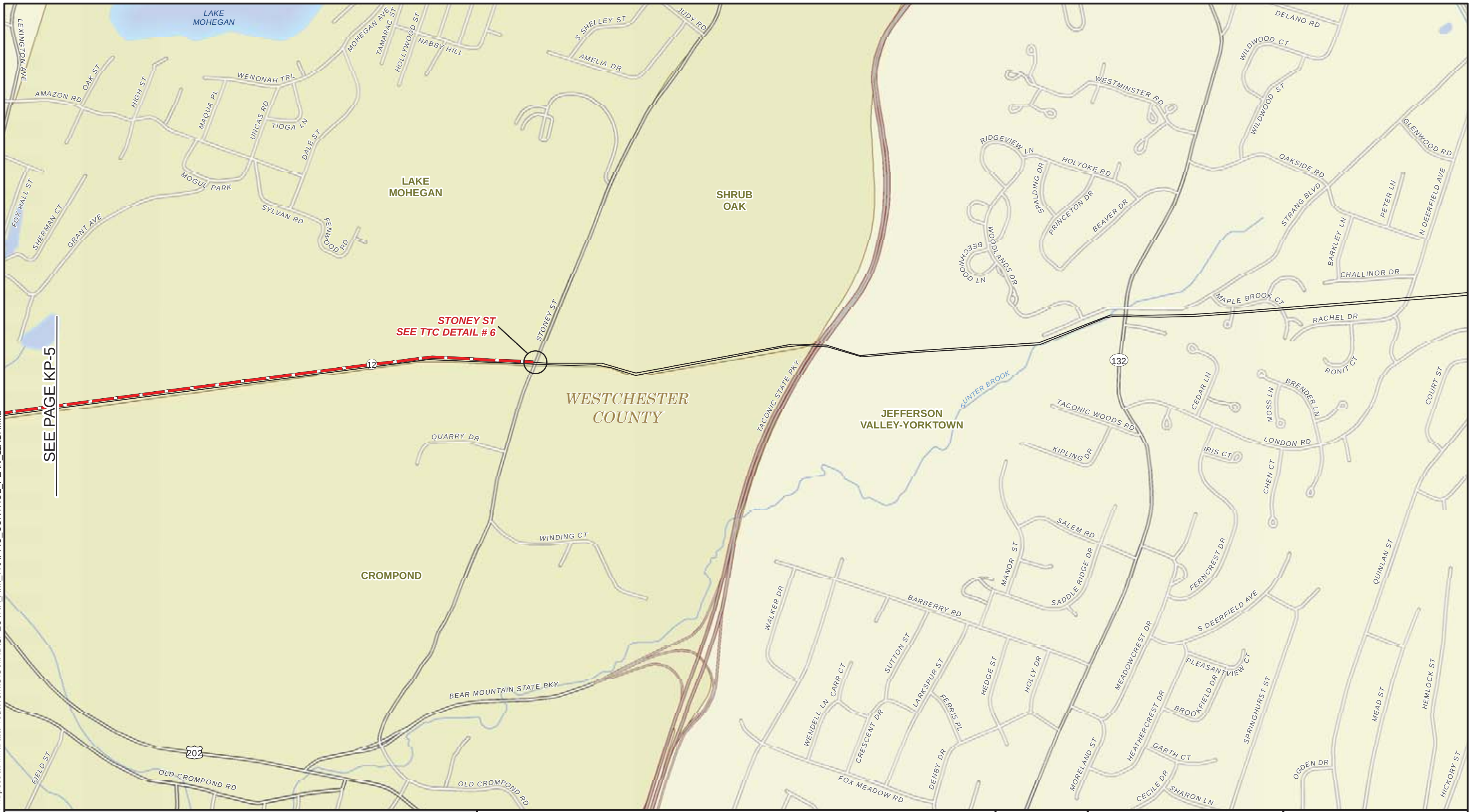

(1) MILE POST	MAJOR HIGHWAY	PARK / FOREST
EXISTING ALGONQUIN COMPRESSOR STATION	HIGHWAY	WATERBODY
TEMPORARY TRAFFIC CONTROL DETAIL AREA	LOCAL ROAD	CITY AREA
PROPOSED PIPELINE CENTERLINE HANOVER / STONY POINT	RAILROAD	COUNTY BOUNDARY
EXISTING ALGONQUIN GAS TRANSMISSION PIPELINE	STREAM / RIVER	

SPECTRA ENERGY
ALGONQUIN INCREMENTAL MARKET (AIM)

HANOVER AND STONY POINT LIFT AND RELAY
TEMPORARY TRAFFIC CONTROL OVERVIEW

WESTCHESTER COUNTY, NEW YORK

FEET 1,000 500 0 1,000 2,000

ABSOLUTE SCALE: 1:12,000

REFERENCE SCALE: 1 IN = 1,000 FT

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TABLE NY1-A BARRIER VEHICLE USE REQUIREMENTS (LONG TERM, INTERMEDIATE TERM, AND SHORT TERM STATIONARY CLOSURES)					
CLOSURE TYPE	EXPOSURE CONDITION [1]	USE REQUIREMENTS [4,5]			
		FREEWAY	NON-FREEWAY (PRECONSTRUCTION POSTED SPEED LIMIT)		
			w 45 MPH	35-40 MPH	
LANE CLOSURE	WORKERS ON FOOT OR IN VEHICLES EXPOSED TO TRAFFIC	REQUIRED [3]	REQUIRED [3]	REQUIRED [3]	
	NON-TRAVERSABLE HAZARD (IE. EQUIPMENT, MATERIALS, EXCAVATION) ONLY NO WORKERS EXPOSED	REQUIRED [3]	REQUIRED [3]	OPTIONAL [2]	
SHOULDER CLOSURE	WORKERS ON FOOT OR IN VEHICLES EXPOSED TO TRAFFIC	REQUIRED [3]	REQUIRED [3]	OPTIONAL [2]	
	NON-TRAVERSABLE HAZARD (IE. EQUIPMENT, MATERIALS, EXCAVATION) ONLY NO WORKERS EXPOSED	REQUIRED [3]	OPTIONAL [2]	OPTIONAL [2]	

THE EXPOSURE CONDITIONS DESCRIBED IN TABLE NY1-A ASSUMES THERE IS NO POSITIVE PROTECTION (TEMPORARY TRAFFIC BARRIER) PRESENT. WHERE WORKERS OR HAZARDS ARE PROTECTED BY A TEMPORARY TRAFFIC BARRIER, BARRIER VEHICLES ARE NOT REQUIRED.

WHERE THE REQUIREMENT IS "OPTIONAL", EITHER A BARRIER VEHICLE OR THE STANDARD LONGITUDINAL BUFFER SPACE (TABLE 6C-2) SHALL BE PROVIDED.

REQUIREMENTS SHALL INCLUDE PROVIDING A SEPARATE BARRIER VEHICLE FOR EACH CLOSED LANE AND EACH CLOSED PAVED SHOULDER 8' OR GREATER IN WIDTH. IF THE WORK SPACE MOVES WITHIN THE STATIONARY CLOSURE, THE BARRIER VEHICLE SHALL BE REPOSITIONED ACCORDINGLY. BARRIER VEHICLES PROTECTING NON-TRANSVERSABLE HAZARDS SHALL REMAIN IN PLACE DURING BOTH WORKING AND NON-WORKING HOURS UNTIL THE HAZARD NO LONGER EXISTS. EXCEPTIONS TO THESE REQUIREMENTS MAY BE MADE, AS APPROVED BY THE REGIONAL DIRECTOR OR HIS/HER DESIGNEE WHERE BARRIER VEHICLE PLACEMENT WOULD BE INEFFECTIVE OR WOULD INTERFERE WITH THE SAFE OPERATION OF TRAFFIC.

BARRIER VEHICLES ARE NOT REQUIRED FOR MILLING AND/OR PAVING OPERATIONS, BUT THE STANDARD LONGITUDINAL BUFFER SPACE (TABLE 6C-2) SHALL BE PROVIDED.

BARRIER VEHICLES ARE NOT REQUIRED FOR FLAGGING OPERATIONS, BUT THE STANDARD LONGITUDINAL BUFFER SPACE (TABLE6C-2) SHALL BE PROVIDED.

TABLE NY2-A PLACEMENT DISTANCE FOR BARRIER VEHICLES				
PRECONSTRUCTION POSTED SPEED LIMIT (MPH)	PLACEMENT DISTANCE (FT.)			
	BARRIER VEHICLES*			
	(18000 LBS.)		(24000 LBS.)	
	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
> 55	100 FT.	200 FT.	100 FT.	200 FT.
45 - 55	100 FT.	200 FT.	85 FT.	165 FT.
< 45	85 FT.	165 FT.	50 FT.	100 FT.

* AS DEFINED IN NYSDOT STANDARD SPECIFICATION 619:

BARRIER VEHICLE - VEHICLE USED FOR STATIONARY SHOULDER CLOSURES, LANE CLOSURES, AND OTHER STATIONARY WORK ZONES.

MINIMUM DISTANCE SHOWN REFLECTS THE ACTUAL ROLL AHEAD DISTANCE FROM MANUFACTURER.

TABLE 6H-4 FORMULAS FOR DETERMINING TAPER LENGTHS

SPEED LIMIT (S) (MPH)	TAPER LENGTH (L) (FT.)
(40 MPH) OR LESS	$L = WS^2/60$
(45 MPH) OR MORE	$L = WS$

L = TAPER LENGTH
W = WIDTH OF OFFSET (FT.)
S = PRECONSTRUCTION POSTED SPEED LIMIT (MPH)

STANDARD TAPER LENGTHS

LATERAL SHIFT OF TRAFFIC FLOW PATH	TEMPORARY TRAFFIC CONTROL ZONE POSTED SPEED LIMIT									
	(25 MPH)	(30 MPH)	(35 MPH)	(40 MPH)	(45 MPH)	(50 MPH)	(55 MPH)	(60 MPH)	(65 MPH)	(70 MPH)
4	45	60	85	110	180	200	220	240	260	280
5	55	75	105	135	225	250	275	300	325	350
6	65	90	125	160	270	300	330	360	390	420
7	75	105	145	190	315	350	385	420	455	490
8	85	120	165	215	360	400	440	480	520	560
9	95	135	185	240	405	450	495	540	585	630
10	105	150	205	270	450	500	550	600	650	700
11	115	165	225	295	495	550	605	660	715	770
12	125	180	245	320	540	600	660	720	780	840

TABLE NY6H-3 ADVANCE WARNING SIGN SPACING					
ROAD TYPE	DISTANCE BETWEEN SIGNS			SIGN LEGEND	
	A (FT.)	B (FT.)	C (FT.)	XX	YY
URBAN (I 30 MPH*)	100	100	100	AHEAD	AHEAD
URBAN (35-40 MPH*)	200	200	200	AHEAD	AHEAD
URBAN (w 45 MPH*)	350	350	350	1000 FT.	AHEAD
RURAL	500	500	500	1500 FT.	1000 FT.
EXPRESSWAY / FREEWAY	1000	1500	2640	1 MILE	1/2 MILE

* PRECONSTRUCTION POSTED SPEED LIMIT

URBAN: (MEETS MORE THAN 1 OF THE FOLLOWING CRITERIA) SIDEWALKS, BICYCLE USAGE, CURBING, CLOSED DRAINAGE SYSTEMS, DRIVEWAY DENSITIES GREATER THAN 24 DRIVEWAYS PER MILE, MINOR COMMERCIAL DRIVEWAY DENSITIES OF 10 DRIVEWAYS PER MILE OR GREATER, MAJOR COMMERCIAL DRIVEWAYS, NUMEROUS RIGHT OF WAY CONSTRAINTS, HIGH DENSITY OF CROSS STREETS, 85TH PERCENTILE SPEEDS OF 45 MPH OR LESS.

RURAL: ANY AREA NOT EXHIBITING MORE THAN ONE OF THE ABOVE CHARACTERISTICS.

EXPRESSWAY: DIVIDED HIGHWAYS FOR TRAFFIC WITH FULL OR PARTIAL CONTROL OF ACCESS AND GENERALLY WITH GRADE SEPARATIONS AT MAJOR CROSSROADS.

FREEWAYS/INTERSTATE: LOCAL OR INTER REGIONAL HIGH-SPEED, DIVIDED, HIGH-VOLUME FACILITIES WITH FULL OR PARTIAL CONTROL OF ACCESS.

TABLE 6C-2 LONGITUDINAL BUFFER SPACE	
PRECONSTRUCTION POSTED SPEED LIMIT (MPH)	DISTANCE
25	155 FT.
30	200 FT.
35	250 FT.
40	305 FT.
45	360 FT.
50	425 FT.
55	495 FT.
60	570 FT.
65	645 FT.

TABLE 6C-3 TAPER LENGTH FOR TEMPORARY TRAFFIC CONTROL ZONES	
TYPE OF TAPER	TAPER LENGTH (L)
MERGING TAPER	L
SHIFTING TAPER	L/2
SHOULDER TAPER	L/3
ONE-LANE, TWO-WAY TRAFFIC TAPER	100 FT. MAXIMUM
DOWNSTREAM TAPER	100 FT. PER LANE

WORK ZONE TRAFFIC CONTROL LEGEND	
SYMBOL	DESCRIPTION
	ARROW PANEL
	ARROW PANEL, CAUTION MODE
	ARROW PANEL TRAILER OR SUPPORT
	CHANNELIZING DEVICE
	DIRECTION OF TEMPORARY TRAFFIC DETOUR
	DIRECTION OF TRAFFIC
	FLAGGER
	FLAG TREE
	SIGN, TEMPORARY
	TYPE III BARRICADE
	WORK SPACE
	WORK VEHICLE WITH TRUCK MOUNTED ATTENUATOR

SPECTRA ENERGY
ALGONQUIN INCREMENTAL MARKET (AIM)
HANOVER AND STONY POINT LIFT AND RELAY

WORK ZONE TRAFFIC CONTROL
LEGENDS AND NOTES

ROCKLAND COUNTY, NEW YORK

SCALE
N/A

Spectra Energy Partners.
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310 713.627.5400

Hatch Mott MacDonald
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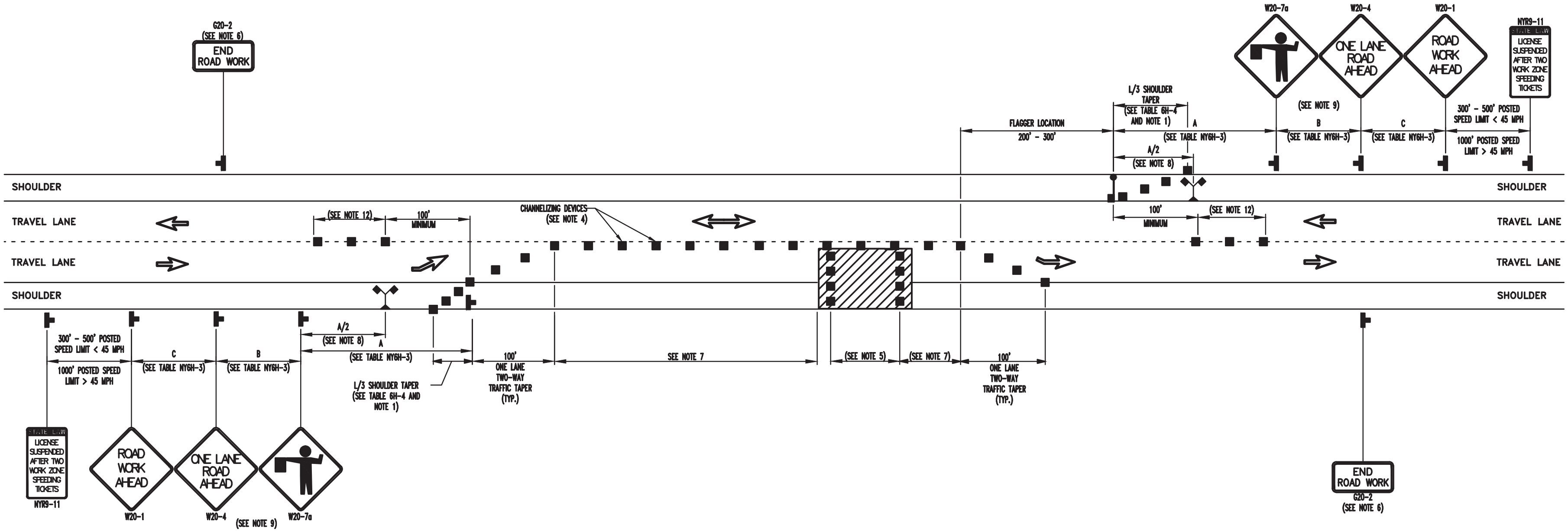

NOTES:

1. WHEN PAVED SHOULDERS HAVING A WIDTH OF 8' OR MORE ARE CLOSED, CHANNELIZING DEVICES SHALL BE USED TO CLOSE THE SHOULDER IN ADVANCE TO DELINEATE THE BEGINNING OF THE WORK AREA AND DIRECT VEHICULAR TRAFFIC TO REMAIN IN THE TRAVEL WAY.
2. WHEN A SIDE ROAD OR DRIVEWAY INTERSECTS THE ROADWAY WITHIN A WORK ZONE TRAFFIC CONTROL AREA, ADDITIONAL TEMPORARY TRAFFIC CONTROL DEVICES AND/OR FLAGGERS SHALL BE PLACED AS NEEDED. ADDITIONAL FLAGGERS SHALL BE LOCATED AT ALL INTERSECTIONS AND COMMERCIAL DRIVEWAYS LOCATED WITHIN OR NEAR THE ACTIVE WORK SPACE.
3. NO WORK ACTIVITY, EQUIPMENT, OR STORAGE OF VEHICLES, OR MATERIAL SHALL OCCUR WITHIN THE BUFFER SPACE AT ANY TIME.
4. CHANNELIZING DEVICE SPACING (CENTER TO CENTER) SHALL NOT EXCEED 40' IN THE ACTIVE WORK SPACE.
5. TRANSVERSE DEVICES SHALL BE REQUIRED (AS PER NYSDOT 619 STANDARD SPECIFICATIONS) WHEN A PAVED SHOULDER HAVING A WIDTH OF 8' OR GREATER IS CLOSED FOR A DISTANCE GREATER THAN 1500'.
6. THE END ROAD WORK SIGN (G20-2) SHALL BE PLACED A MAXIMUM OF 500' PAST THE END OF THE WORK SPACE.
7. WHERE DIRECTED BY THE ENGINEER, A BUFFER SPACE SHALL BE PROVIDED IN ORDER TO LOCATE THE ONE-LANE, TWO-WAY TRAFFIC TAPER PRIOR TO ANY HORIZONTAL OR VERTICAL CURVE, IN ORDER TO PROVIDE ADEQUATE SIGHT DISTANCE FOR THE FLAGGERS AND/OR A QUEUE OF STOPPED VEHICLES.
8. THE FLAG TREE SHALL BE LOCATED ON THE SHOULDER, AT APPROXIMATELY 1/2 THE DISTANCE BETWEEN THE FLAGGER SIGN (W20-7a) AND THE FLAGGER.
9. FLAGGER SIGN (W20-7a) AND ONE LANE ROAD AHEAD SIGN (W20-4) SHALL BE REMOVED, COVERED OR TURNED AWAY FROM ROAD USERS WHEN FLAGGING OPERATIONS ARE NOT OCCURRING.
10. FLAGGER AND FLAG TREE SHALL BE ILLUMINATED TO LEVEL II ILLUMINATION DURING NIGHT TIME OPERATIONS.
11. ALL FLAGGERS SHALL USE 24" (MIN.) OCTAGON SHAPED STOP/SLOW PADDLES HAVING 6' STAFF.
12. CENTERLINE CHANNELIZING DEVICES ARE OPTIONAL AND MAY BE ELIMINATED WHERE SPACE CONSTRAINTS EXIST.

SPECTRA ENERGY
ALGONQUIN INCREMENTAL MARKET (AIM)
HANOVER AND STORY POINT LIFT AND RELAY
TTC DETAIL #1
SHORT OR INTERMEDIATE TERM STATIONARY LANE
CLOSURE ON 2-LANE 2-WAY ROADWAY

ROCKLAND COUNTY, NEW YORK

SCALE
N/A

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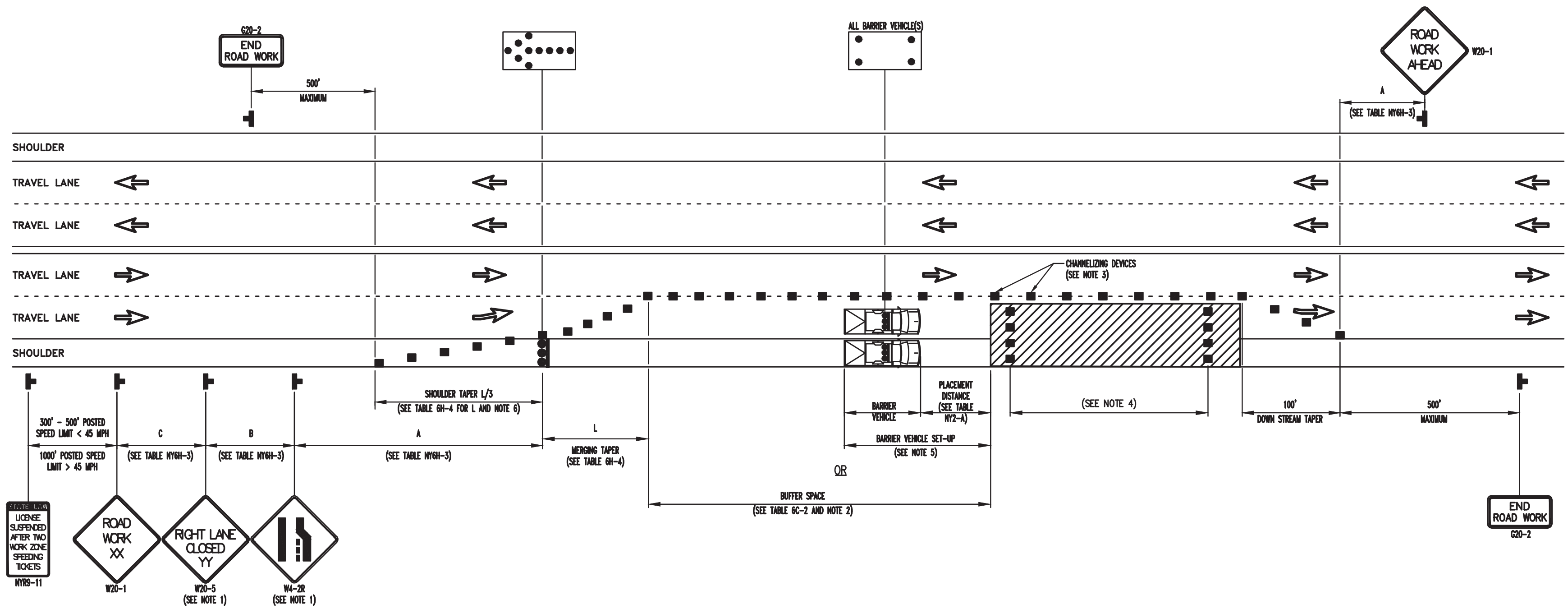

NOTES:

1. LEFT LANE CLOSURES ARE SYMMETRICAL TO RIGHT LANE CLOSURES. SUBSTITUTE LEFT LANE CLOSED SIGN (W20-5) AND THE CORRESPONDING LANE ENDS SIGN (W4-2L).
2. NO WORK ACTIVITY, EQUIPMENT, OR STORAGE OF VEHICLES, OR MATERIAL SHALL OCCUR WITHIN THE BUFFER SPACE AT ANY TIME.
3. CHANNELIZING DEVICE SPACING (CENTER TO CENTER) SHALL NOT EXCEED 40' IN THE ACTIVE WORK SPACE.
4. TRANSVERSE DEVICES SHALL BE REQUIRED (AS PER NYSDOT 619 STANDARD SPECIFICATIONS) WHEN A PAVED SHOULDER HAVING A WIDTH OF 8' OR GREATER IS CLOSED FOR A DISTANCE GREATER THAN 1500'.
5. FOR BARRIER VEHICLE USE REQUIREMENTS SEE TABLES NY1-A AND NY2-A ON THE STANDARD SHEET TITLED "WORK ZONE TRAFFIC CONTROL LEGENDS AND NOTES".
6. WHEN PAVED SHOULDERS HAVING A WIDTH OF 8' OR MORE ARE CLOSED, CHANNELIZING DEVICES SHALL BE USED TO CLOSE THE SHOULDER IN ADVANCE TO DELINEATE THE BEGINNING OF THE WORK SPACE AND TO DIRECT VEHICULAR TRAFFIC TO REMAIN IN THE TRAVELED WAY.

SPECTRA ENERGY
ALGONQUIN INCREMENTAL MARKET (AIM)
HANOVER AND STONY POINT LIFT AND RELAY
TTC DETAIL #2
SINGLE LANE CLOSURE SHORT OR INTERMEDIATE TERM STATIONARY
MULTI LANE HIGHWAY (UNDIVIDED)

ROCKLAND COUNTY, NEW YORK

SCALE
N/A

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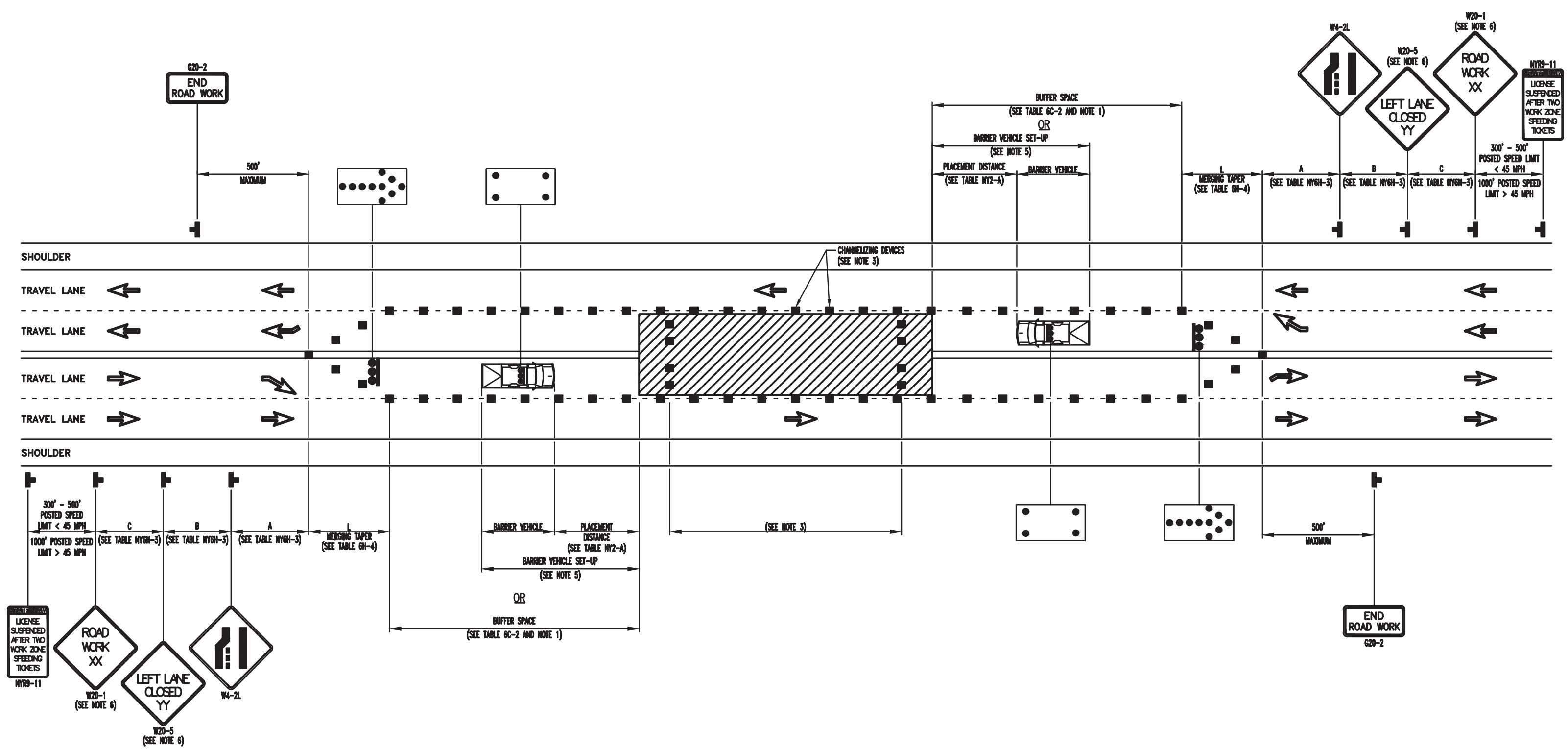

NOTES:

1. NO WORK ACTIVITY, EQUIPMENT, OR STORAGE OF VEHICLES, OR MATERIAL SHALL OCCUR WITHIN THE BUFFER SPACE AT ANY TIME.
2. CHANNELIZING DEVICE SPACING (CENTER TO CENTER) SHALL NOT EXCEED 40' IN THE ACTIVE WORK SPACE.
3. TRANSVERSE DEVICES SHALL BE REQUIRED (AS PER NYSDOT 619 STANDARD SPECIFICATIONS) WHEN A PAVED SHOULDER HAVING A WIDTH OF 8' OR GREATER IS CLOSED FOR A DISTANCE GREATER THAN 1500'.
4. FOR LONG DURATION LANE CLOSURES, TEMPORARY PAVEMENT MARKINGS SHALL BE USED IN ACCORDANCE TO THE CONTRACT DOCUMENTS. ANY EXISTING PAVEMENT MARKINGS THAT ARE CONFLICTING OR MISLEADING SHALL BE REMOVED OR COVERED.
5. FOR BARRIER VEHICLE USE REQUIREMENTS SEE TABLES NY1-A AND NY2-A ON THE STANDARD SHEET TITLED "WORK ZONE TRAFFIC CONTROL LEGENDS AND NOTES".
6. FOR LOW SPEED, LOW VOLUME URBAN STREETS, THE LEFT LANE CLOSED XXX FT. SIGN (W20-5) CAN BE OMITTED AND THE ROAD WORK AHEAD SIGN (W20-1) RELOCATED TO THAT LOCATION.

SPECTRA ENERGY
ALGONQUIN INCREMNTAL MARKET (AIM)
HANOVER AND STONY POINT LIFT AND RELAY
TTC DETAIL #3
DOUBLE INTERIOR LANE CLOSURE
MULTI LANE HIGHWAY

ROCKLAND COUNTY, NEW YORK

SCALE
N/A

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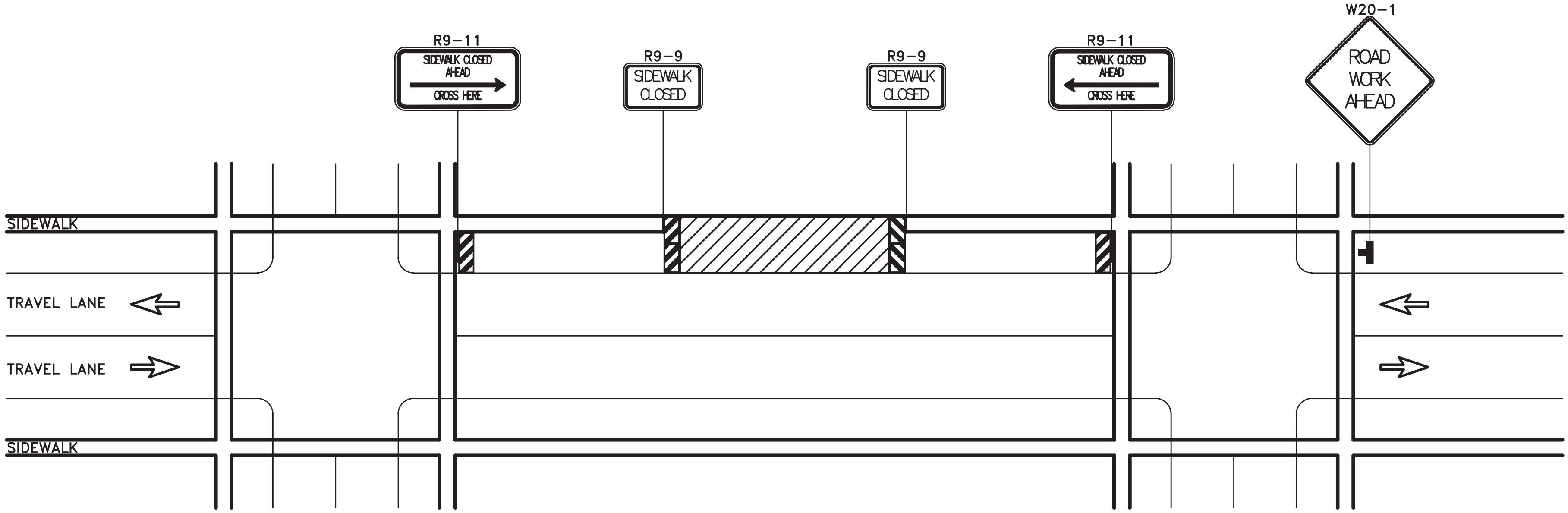


G-25

NOTES:

1. WHEN CROSSWALKS OR OTHER PEDESTRIAN FACILITIES ARE CLOSED OR RELOCATED, TEMPORARY FACILITIES SHALL BE DETECTABLE AND SHALL INCLUDE ACCESSIBILITY FEATURES CONSISTENT WITH THE FEATURES PRESENT IN THE EXISTING FACILITY.
2. WHERE HIGH SPEEDS ARE ANTICIPATED, A TEMPORARY TRAFFIC BARRIER AND TEMPORARY IMPACT ATTENUATOR SHOULD BE USED TO SEPARATE THE TEMPORARY SIDEWALKS FROM VEHICULAR TRAFFIC.
3. ONLY THE WORK ZONE TRAFFIC CONTROL DEVICES RELATED TO PEDESTRIANS ARE SHOWN. OTHER DEVICES, SUCH AS LANE CLOSURE SIGNING OR ROAD NARROWS SIGNS (W5-4), MAY BE USED TO CONTROL VEHICULAR TRAFFIC.
4. FOR NIGHTTIME CLOSURES, FLASHING WARNING LIGHTS SHALL BE USED ON BARRICADES SUPPORTING SIGNS AND CLOSING SIDEWALKS.
5. SIGNS SUCH AS KEEP RIGHT (LEFT) SHALL BE PLACED ALONG A TEMPORARY SIDEWALK, WHERE APPLICABLE AND ACCORDING TO AMERICAN WITH DISABILITIES STANDARDS, TO GUIDE OR DIRECT PEDESTRIANS.
6. TYPE II BARRICADES MAY BE SUBSTITUTED FOR TYPE III BARRICADES AS PER NYSDOT 619 STANDARD SPECIFICATIONS.

SPECTRA ENERGY
ALGONQUIN INCREMENTAL MARKET (AIM)
HANOVER AND STONY POINT LIFT AND RELAY
TTC DETAIL #4
SIDEWALK DETOUR SHORT OR INTERMEDIATE TERM STATIONARY
2-LANE 2-WAY ROADWAY

ROCKLAND COUNTY, NEW YORK

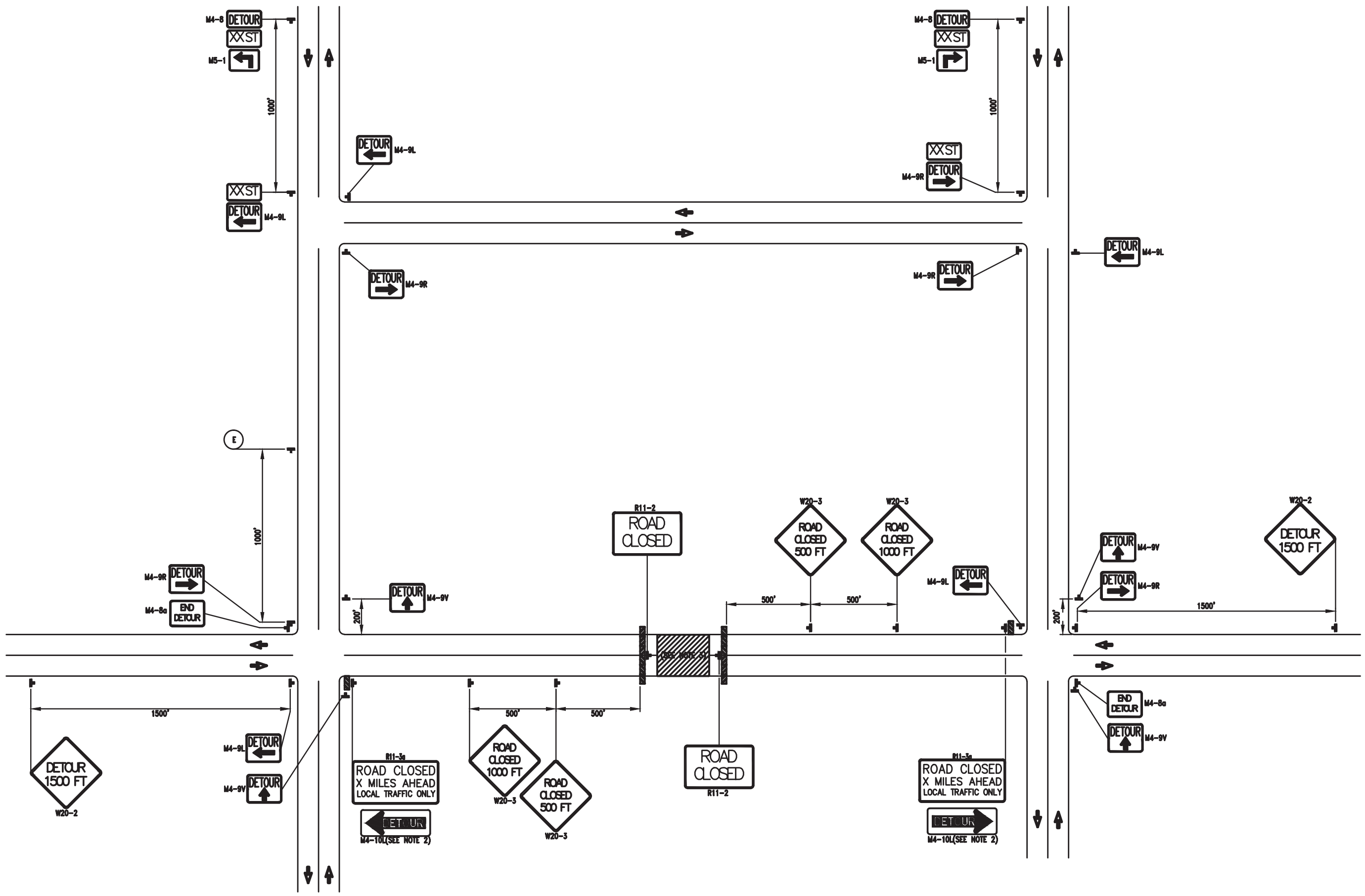
SCALE
N/A

Spectra Energy Partners.
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310 713/627-5400

Hatch Mott MacDonald
150 Lower Westfield Rd.
Holyoke, MA 01040
Ph: (413) 535-0135 Fax: (413) 535-0136

PRELIMINARY FOR REVIEW ONLY
05/16/2014 SPECTRA ENERGY
PROPRIETARY

DRAWN BY:	HMM 03/05/2014
CHECKED BY:	HMM
APPROVED BY:	HMM
REV. DATE:	
REVISION:	
DESC:	ISSUE FOR REVIEW
DWG:	



G-26

NOTES:

1. IF THE ROAD IS OPENED FOR SOME DISTANCE BEYOND THE INTERSECTION AND/OR THERE ARE SIGNIFICANT ORIGIN/DESTINATION POINTS BEYOND THE INTERSECTION, THE R11-3A ROAD CLOSED SIGN AND THE M4-10(L/R) SIGN ON TYPE III BARRICADES MAY BE LOCATED AT THE EDGE OF THE TRAVELED WAY.

2. ANY EXISTING SIGN, INCLUDING OVERHEAD SIGNS, WHICH CONFLICT WITH THE TEMPORARY TRAFFIC CONTROL SIGN LAYOUT SHALL BE COVERED, REMOVED, STORED OR RESET AOBE. BLANK COVERS USED TO COVER PORTIONS OF EXISTING SIGNS SHALL BE OF A COLOR AND REFLECTORIZED MATERIAL MATCHING THAT OF THE SIGN BEING PARTIALLY COVERED. THE CONTRACTOR SHALL BE LIABLE FOR ANY DAMAGE TO SIGNS CAUSED BY THE METHODS USED TO TEMPORARILY REMOVE, REPLACE, RELOCATE OR COVER SIGN PANELS OR SIGN TEXT, AT NO ADDITIONAL COST TO THE STATE. ALL APPROPRIATE EXISTING SIGNS SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AND/OR LOCATION UNLESS OTHERWISE REPLACED IN THE CONTACT DOCUMENTS.

3. M4-9 SERIES SIGNS SHALL ALWAYS BE POSTED A MAXIMUM OF 50' FROM AN INTERSECTION.

SPECTRA ENERGY
ALGONQUIN INCREMENTAL MARKET (AIM)
HANOVER AND STONY POINT LIFT AND RELAY
TTC DETAIL #5
ROAD CLOSURE WITH OFF SITE DETOUR
2-LANE 2-WAY ROADWAY

ROCKLAND COUNTY, NEW YORK

SCALE
N/A

Spectra Energy Partners.
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310 713/627-5400

Hatch Mott MacDonald
150 Lower Westfield Rd.
Holyoke, MA 01040
Ph: (413) 535-0135 Fax: (413) 535-0136

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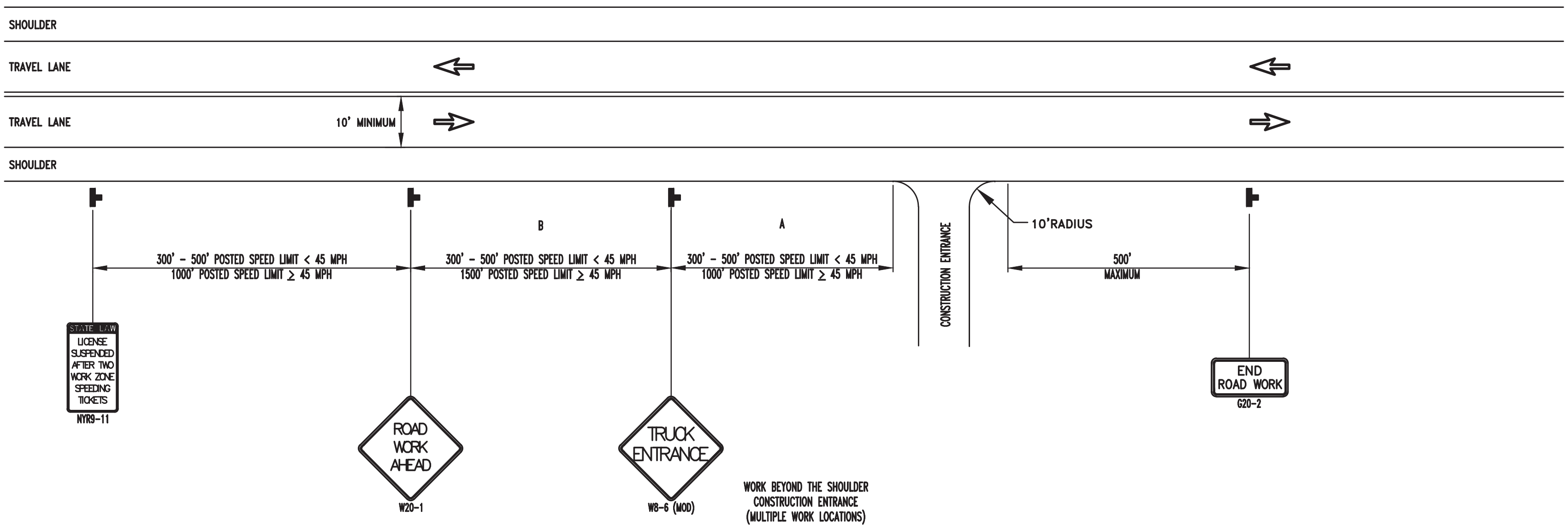

WORK BEYOND THE SHOULDER
CONSTRUCTION ENTRANCE
(MULTIPLE WORK LOCATIONS)

(NOT TO SCALE)

NOTES:

1. WHEN THE DISTANCE BETWEEN THE ADVANCE WARNING SIGNS AND WORK IS 2 MILES TO 5 MILES, A SUPPLEMENTAL DISTANCE PLAQUE (W7-3a) SHOULD BE USED WITH THE ROAD WORK AHEAD SIGN (W20-1).

2. IN THOSE SITUATIONS WHERE MULTIPLE WORK LOCATIONS EXIST WITHIN A LIMITED DISTANCE MAKE IT PRACTICAL
TO PLACE STATIONARY SIGNS, THE DISTANCE BETWEEN THE ADVANCE WARNING SIGN AND WORK SHALL NOT
EXCEED 5 MILES.

3. IN THE CASE WHERE A CONSTRUCTION ENTRANCE IS WITHIN THE LIMITS OF A LANE CLOSURE OR ROAD CLOSURE, THE TRAFFIC CONTROL ARRAY AND SIGNAGE SHALL FOLLOW THE LANE OR ROAD CLOSURE UNTIL THE ASSOCIATED WORK HAS BEEN COMPLETED.
IF THE CONSTRUCTION ENTRANCE IS REQUIRED AFTER SUCH WORK HAS BEEN COMPLETED, THE LANE OR ROAD CROSSING TRAFFIC CONTROL ARRAY AND SIGNAGE SHALL BE REPLACED BY DETAIL TTC #6.

SPECTRA ENERGY
ALGONQUIN INCREMENTAL MARKET (AIM)
HANOVER AND STONY POINT LIFT AND RELAY
TTC DETAIL #6
WORK BEYOND THE SHOULDER
CONSTRUCTION ENTRANCE

ROCKLAND COUNTY, NEW YORK

SCALE
N/A

Spectra Energy Partners.
Algonquin Gas Transmission, LLC
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Updated Traffic Management Assessment and Plans for the West Roxbury Lateral

Algonquin Gas Transmission, LLC

ALGONQUIN INCREMENTAL MARKET PROJECT

Updated Traffic Management Assessment and Plans for the West Roxbury Lateral

May 2014

TABLE OF CONTENTS

1.0 INTRODUCTION

Algonquin Gas Transmission, LLC ("Algonquin"), an indirect, wholly-owned subsidiary of Spectra Energy Partners, LP, is seeking authorization from the Federal Energy Regulatory Commission ("FERC" or "Commission") pursuant to Section 7(c) of the Natural Gas Act[1] ("NGA") to construct, install, own, operate, and maintain the Algonquin Incremental Market Project ("AIM Project" or "Project") which will involve expansion of its existing pipeline systems located in New York, Connecticut, Rhode Island and Massachusetts.

Within the Commonwealth of Massachusetts, Algonquin will install approximately 5.1 miles of new pipeline lateral from its existing I-4 System Lateral in Norfolk and Suffolk counties to provide National Grid with the service it has requested ("West Roxbury Lateral"). The West Roxbury Lateral will consist of approximately 4.2 miles of new 16-inch diameter pipeline and approximately 0.9 miles of new 24-inch diameter pipeline in the Towns of Westwood, Dedham and the West Roxbury section of the City of Boston.

In response to comments from the FERC, Massachusetts Energy Facilities Siting Board, landowners and other stakeholders, Algonquin has retained Vanasse Hangen Brustlin, Inc. ("VHB") to provide traffic engineering consulting services in support of the proposed Project facilities in Massachusetts. Algonquin is committed to working with each municipality along the Project limits to address potential transportation-related impacts associated with constructing the proposed pipeline.

This updated Traffic Management Assessment and Plans ("TMP") supplements the initial plan that was filed with the FERC on February 28, 2014 for this Project. This current updated version includes detailed current traffic counts at key locations along the Project corridor with associated analysis. This TMP includes a summary of existing traffic conditions along the roadways where the construction will take place and information regarding general traffic management strategies. Based on the research conducted to date, this report summarizes the currently proposed construction schedule, hours of operation, and provides representative traffic management plans that will be implemented during construction. The traffic management plans to be implemented during construction were developed considering observed traffic volumes and patterns, existing roadway geometry and traffic control, and measures to maintain appropriate access to abutting residents and businesses.

[1] 15 U.S.C. § 717f(c) (2006).

2.0 PROJECT DESCRIPTION

The construction work on the West Roxbury Lateral is planned to commence in May 2015 at selected locations following the issuance of all necessary approvals, and is expected to be completed by November 2016. To expedite the completion of the Project, weekday working hours between 7 AM and 7 PM are desirable. However, Algonquin recognizes that these hours may not be possible for all portions of the Project due to traffic management with consideration of abutting residential and commercial properties, and that night working hours may be required for some areas of the Project. To minimize the duration of construction, work may occur simultaneously in multiple areas as multiple dedicated construction crews are expected to be working on the Project. For each portion of the Project involving work in public roadways traffic management plans will be required to help ensure general public safety and to maintain appropriate traffic flow. In addition to measures to address motor vehicles, considerations also will be made for pedestrians, bicycles, and construction workers. As such, Algonquin will continue to work closely with the various municipalities and public agencies involved, as well as residential and commercial stakeholders that may be affected by the Project.

3.0 EXISTING TRAFFIC CONDITIONS

This TMP includes detailed current traffic counts at key locations along the Project corridor with associated analysis. The first step in conducting a traffic data collection effort was to review currently available data to help determine the most critical locations within the Project limits in terms of traffic management. This preliminary traffic count information was obtained from a variety of sources, including the MassDOT traffic count database, municipal websites and recent traffic studies prepared for development projects or roadway improvements in the area. Due to the age of some of this information updated traffic counts were required at multiple key locations within the Project study area as described in the following section. The updated traffic count data and expected roadway configurations during construction have been reviewed to identify the general operating conditions that can be expected. This effort includes evaluating level-of-service for key study area roadways or intersections both under existing conditions and during construction. As part of this effort, data from MassDOT's "Standard Details and Drawings for the Development of Traffic Management Plans" [2] have been reviewed to determine how the observed volumes compare to the expected roadway capacities during construction.

3.1 Traffic Volumes

Traffic volumes (i.e. vehicles, pedestrians, bicyclists) for the study area roadways and intersections were collected manually and mechanically by VHB to provide a basis from which to evaluate traffic conditions. In May 2014, VHB conducted Automatic Traffic Recorder counts (ATRs) for a 72- hour period along the following study area roadways:

- Elm Street Dedham - between Providence Highway and Legacy Place driveway
- Providence Highway Dedham - between Legacy Boulevard signal and Best Buy/Star signal
- East Street Dedham - north of High Street
- High Street Dedham - east of East Street
- Washington Street Dedham - between Lower East Street and Oak Street
- Grove Street West Roxbury - south of Centre Street
- Centre Street West Roxbury - south of Spring Street

The observed volumes on these roadways, and the manner in which the volumes vary over the course of a typical weekday and Saturday, are summarized in Table 1.

[2] MassDOT "MassHighway Standard Details and Drawings for the Development of Temporary Traffic Control Plans"; http://www.massdot.state.ma.us/portals/8/docs/flaggers/tcp.pdf. Accessed February 2014.

Table 1
Observed Variations of Traffic Volumes

	Weekday[1]	Hourly Traffic Range[2]			Commuter Hours[3]		Saturday	Hourly Traffic Range[2]		
Location	**Daily**	**Low**	**High**	**Average**	**AM Peak**	**PM Peak**	**Daily**	**Low**	**High**	**Average**
Dedham:										
Elm Street										
Eastbound	6,309	146	640	390	284	640	7,736	120	696	517
Westbound	8,636	240	698	545	500	661	10,768	181	950	687
Total	14,945	386	1,301	936	784	1,301	18,504	301	1,603	1,204
Providence Highway										
Northbound	24,178	1,294	1,735	1,545	1,634	1,735	25,667	646	1,993	1,633
Southbound	22,542	558	1,790	1,377	1,098	1,789	23,669	579	1,925	1,548
Total	46,720	1,992	3,524	2,921	2,732	3,524	49,336	1,225	3,826	3,181
East Street	1,981	67	161	124	141	161	2,298	38	208	152
High Street	16,181	796	1,362	1,101	1,221	1,362	14,522	465	1,089	954
Washington Street										
Northbound	11,358	513	802	692	661	795	11,976	250	926	704
Southbound	9,827	431	766	628	576	766	10,698	388	817	702
Total	21,185	944	1,561	1,320	1,237	1,561	22,674	638	1,687	1,405
West Roxbury										
Grove Street	8,569	402	724	597	682	724	7,266	229	589	478
Centre Street	7,282	331	637	513	577	637	6,219	190	506	400

Source: Automatic Traffic Recorder (ATR) Counts conducted in May 2014.
1 average daily traffic volume expressed in vehicles per day
2 volumes expressed in vehicles per hour and report low, high and average hourly traffic volumes between 7:00 AM and 7:00 PM. Volumes for northbound and southbound sections of Providence Highway do not necessarily add up to match total, as low- and high-volume conditions for the median-divided roadway may occur at different times.
3 volumes expressed in vehicles per hour and report commuter peak hour traffic between 7:00 AM – 9:00 AM (AM Peak) and between 4:00 PM – 6:00 PM (PM Peak).

Manual turning movement counts ("TMCs") also were collected at key signalized study area intersections where traffic flow may be affected by some travel lanes being temporarily unavailable during construction. The TMCs were collected at the study area intersections on a typical weekday from 7 AM to 9 AM and from 4 PM to 6 PM. Additional TMCs also were conducted during a midday off-peak period 11 AM to 1 PM for use in evaluating the feasibility of conducting construction during regular working hours but outside of the peak commuter time periods.

3.2 Traffic Management Strategy

Based on the automatic traffic recorder ("ATR") counts noted in the previous section, traffic flow within the study area remains relatively constant throughout the day. Given the consistently high volumes of traffic along certain study area roadways, it is important to maintain reasonable traffic flow in all directions throughout the day. Detours are not expected to be necessary, and all turning movements at intersections shall be maintained so that businesses and traffic patterns are not significantly impacted. However, lane closures and lane shifts are expected to occur at various times throughout the duration of construction for the Project. Therefore, the TMP for this Project has been developed with the goal of reducing the existing roadway cross-sections by no more than one lane (on multi-lane roadways) during regular working hours, with a primary goal being to prevent unnecessary delays to the motoring public. For the purposes of this Project, regular working hours are expected to be 7:00 AM to 7:00 PM when allowable by traffic conditions and as permitted by the various agencies and municipalities having control over the affected roadways. Any work that is to occur during peak traffic hours (7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM) will be coordinated in advance with MassDOT, Westwood, Dedham and/or West Roxbury. Maintaining two-way traffic flow also shall be closely coordinated with maintaining pedestrian accessibility, as well as providing access for businesses and residents. The traffic management plan developed and analyzed for this Project addresses the major aspects of construction. The following provides more details on the traffic management plan for the corridor.

For the purpose of this assessment, the Project was considered in the following five general representative segments:

1. East Street (Westwood) northerly to Providence Highway/Elm Street (Dedham)
2. Providence Highway at Elm Street northerly to Eastern Avenue
3. Eastern Avenue to Washington Street
4. Washington Street to Grove Street (West Roxbury)
5. Grove Street and Centre Street to Spring Street

General traffic conditions within each of these general areas are discussed in the following sections based on observations and updated traffic data collection.

3.3 East Street (Westwood) northerly to Providence Highway at Elm Street (Dedham)

The majority of the construction work in Westwood extending into the southerly portion of Dedham will occur on private property and not within public roadways. The southerly limits involve work on private property south and adjacent to the East Street rotary above Route I-95 in Westwood. The Project will cross the East Street, which is two-lane 30-foot wide roadway, just south of the section under MassDOT jurisdiction. Based on 2012 traffic counts[3], and projections for growth in this area, this road should carry approximately 16,500 and 9,500 vehicles per day ("vpd") on a typical weekday and Saturday, during the 2015/2016 construction seasons. Regardless, that crossing is expected to occur via underground boring beneath the roadway so that no traffic management will be required along this roadway.

After crossing East Street, the proposed pipeline will run south of and adjacent to Route I-95 before crossing underneath the Route I-95 highway roughly 900 feet to the north of East Street. Based on counts by MassDOT[4] Route I-95 carried approximately 139,439 vpd in 2012. As the pipe installation will occur underneath the highway via trenchless construction without any lane closures being needed on Route I-95. Specific traffic management plans have been prepared for the work in the vicinity of the Route I-95 South Exit 14 ramp and accompany this submittal. Based on record traffic counts from MassDOT[5], this ramp is estimated to carry approximately 7,000 vehicles on a typical weekday.

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[3] University Station – Traffic Impact Study; TetraTech / VAI (November 2012).

[4] MassDOT "Transportation Data Management System"; http://mhd.ms2soft.com/tcds/tsearch.asp?loc=Mhd&mod=; Accessed February 2014.

[5] Ibid.

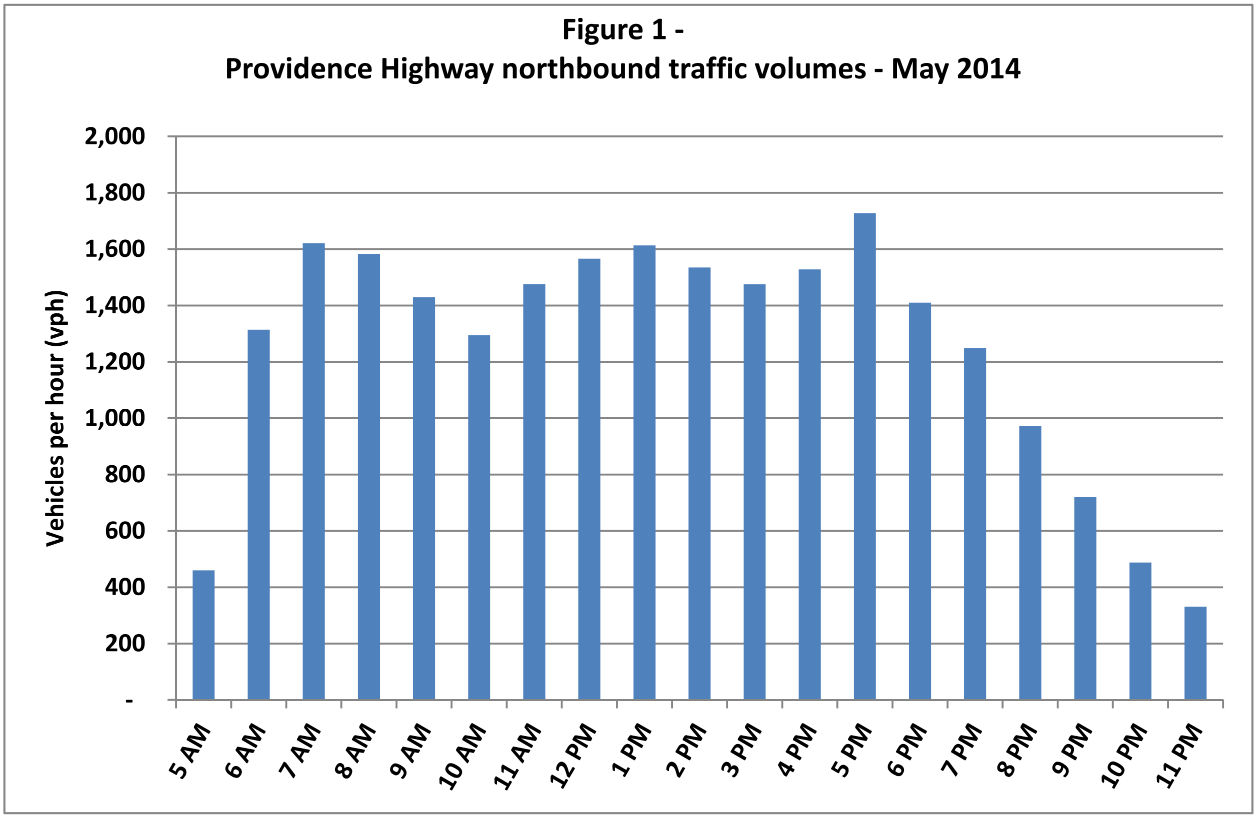
After crossing the highway, the pipeline will continue to Rustcraft Road in Dedham, which is a local two-lane road ranging from 28- to 32-feet in width. As the roadway alignment curves to the northeast the road is named Elm Street. The road has a general 36- to 38-foot width before flaring to a roughly 70-foot width at its intersection with Providence Highway (formerly known as Route 1). The Legacy Place shopping center is located north of and adjacent to Elm Street. Residential homes and an apartment building also are located along this road. The segment adjacent to the shopping center generally has a single eastbound lane and two westbound lanes.

Site-specific traffic management plans for the two-lane Rustcraft Road/Elm Street sections, and the multi-lane road section near the Providence Highway/Elm Street intersection have been included with this submittal. These reference drawings may be further refined following additional consultation with Westwood and Dedham, along with MassDOT and affected abutters. Based on automatic traffic recorder counts conducted by VHB in May 2014, Elm Street currently carries approximately 14,945 and 18,504 vpd on a typical weekday and Saturday, respectively. These counts were conducted to the west of the Legacy Place driveway on Elm Street and, as such, include volumes generated by that retail center as well as other nearby uses. As is discussed in Section 4.5.1, Algonquin has agreed to several construction mitigation measures after consulting with Legacy Place and other stakeholders to substantially reduce the associated traffic management needs in that area.

The observed hourly volumes summarized above also were compared to the roadway capacities which will be available in conjunction with the traffic management plans. This comparison is discussed in detail later in the "Traffic Management Plans" section of this report.

3.4 Providence Highway at Elm Street northerly to Eastern Avenue (Dedham)

Within the Project study area Providence Highway is a median-divided roadway carrying up to three travel lanes in each direction, with additional turning lanes provided at select locations. The roadway is under MassDOT jurisdiction. The segment of this roadway in the vicinity of Legacy Place was reconstructed as part of the construction of that shopping center in 2009. As part of this current evaluation, VHB conducted ATR counts on Providence Highway to the north of Legacy Boulevard for a continuous 72-hour period including a typical weekday and Saturday. The counts indicate that this roadway currently carries approximately 46,720 vehicles on a typical weekday. However, possibly due to the concentration of retail and restaurant uses along this corridor Friday volumes were observed to be higher, with approximately 49,050 vehicles traveling on this segment. Likewise, Saturday volumes were slightly higher with 49,336 vehicles observed on Providence Highway. The pipeline installation along this road segment is planned to occur entirely on the northbound side of the median-divided roadway. Accordingly, the hourly weekday volumes along this segment were reviewed as summarized in Figure 1.



As shown in Figure 1, northbound volumes on this roadway begin to increase significantly starting at 6 AM on a typical weekday. The volumes decline slightly from 9 AM to 11 AM before steadily climbing through the evening commuter peak period. These observed volumes also were compared to the Providence Highway capacity that will be provided while the traffic management plans are in place for this segment. This comparison is discussed in detail later in the "Traffic Management Plans" section of this report.

3.5 East Street to Washington Street (Dedham)

Just north of Providence Highway's intersection with Eastern Avenue the proposed pipeline will shift off of the road and onto private property. This will occur immediately north of the driveway to the Staples retail center. From that point, work will extend across private property until the pipeline crosses High Street and continues to the north along East Street. The work is then planned to continue along East Street to its intersection with Washington Street.

The High Street/East Street intersection along this route was recently reconstructed and signalized. While two-way traffic is allowed for almost the entire length of the roadway, East Street is one-way heading northbound at its intersection with Washington Street. As such, the observed southbound traffic on this roadway is associated solely with the uses along this roadway. Based on May 2014 ATR counts conducted for this evaluation East Street currently carries 1,981 vehicles on a typical weekday, which is consistent with prior counts in this area. Saturday volumes on this roadway were observed to be slightly higher, with 2,298 vehicles observed over the course of the Saturday counted. ATRs counts also were conducted on High Street immediately east of High Street as part of this evaluation. The counts indicate that High Street currently carries approximately 16,181 and 14,522 vehicles on a typical weekday and Saturday, respectively.

While the volume along this two-lane locally owned roadway is lower than other portions of the Project additional considerations will be required to minimize impacts to abutters. Site-specific traffic management plans have been developed for East Street and the proposed crossing at the High Street/East Street intersection and are discussed in more detail in the “Traffic Management Plans” section of this report.

3.6 Washington Street to Grove Street (West Roxbury)

At the northerly end of the East Street work, the construction will shift across a grassed area to the east of Washington Street. This proposed route will help to minimize impacts to the Washington Street/East Street/Dedham Mall signalized intersection. At that point, the route will cross Washington Street onto Lower East Street where it will cross Mother Brook and continue on Post Lane before intersecting Washington Street again. From that point, the gas line route will continue along the center/northerly side of Washington Street to Grove Street.

Starting in 2009, Washington Street was reconstructed from Providence Highway to the Boston City line. Following the completion of the right-of-way process, jurisdiction of this road will be transferred from MassDOT to the Town of Dedham. The portion of this roadway in Boston will continue to remain under City control unaffected by this change. Updated traffic counts conducted as part of this current Project assessment indicate that Washington Street currently carries 21,185 and 22,674 vehicles on a typical weekday and Saturday, respectively. Peak hour volumes ranged from 1,600 vph to 2,200 vph during the respective weekday morning and evening peak hours. Additional discussion regarding the observed traffic volumes relative to the planned traffic management plans is provided later in this assessment.

3.7 Grove Street and Centre Street to Spring Street (West Roxbury)

The pipeline installation will continue from Washington Street onto Grove Street continuing to the north. This two-lane local roadway is under City of Boston jurisdiction and is characterized by its residential nature. As part of this study, VHB conducted ATR counts on Grove Street to the south of Centre Street. The counts indicate that this roadway currently carries approximately 8,569 and 7,266 vehicles on a typical weekday and Saturday, respectively. ATR counts also were conducted on the northerly segment of this roadway after it transitions from Grove Street into Centre Street. The counts on this segment are slightly lower, with 7,282 and 6,219 vehicles observed on a typical weekday and Saturday, respectively. Site-specific traffic management plans depicting the expected temporary lane shifts are provided attached to this submittal. The traffic management plans developed will allow for two-way traffic flow on this segment throughout construction.

3.7.1 West Roxbury Crushed Stone quarry

The West Roxbury Crushed Stone quarry is located east and adjacent to Grove Street opposite Centre Street. Algonquin is not aware for any planned physical changes to this active facility which is expected to continue its regular quarry activity. However, the quarry has recently been discussing changes to on-site activity involving fill being accepted from area construction projects. Based on discussions between Algonquin and quarry representatives, between 100 and 150 trucks currently visit the quarry on a typical day. This translates into roughly 200 to 300 truck trips on a typical weekday. The single unit trucks are generally 18- to 20-feet in length, though there are a limited number of trailers leaving the site which are up to 32-feet long. This trucking activity is generally confined to March through December with that volume dropping by 50- to 60- daily trucks during the winter months. The first four or five trucks generally begin to exit the facility starting at 7:30 AM, with relatively constant departures occurring until about 1:30 PM after which exiting traffic decreases notably. In addition to this truck traffic there are also approximately 17 to 25 workers traveling to and from this site on a typical workday. These workers area generally on-site from 6 AM to 5 PM on weekdays, and 6 AM to noon on Saturdays. The facility is not in operation on Sundays.

VHB also conducted manual turning movement counts at the intersection of Grove Street/Centre Street with the quarry driveway. The counts were conducted on Thursday May 8, 2014 during from 7 AM to 9 AM, 11 AM to 1 PM, and 4 PM to 6 PM. The peak one-hour period for the quarry during the time period observed occurred between 8 AM and 9 AM. During this time, 24 vehicles entered the site while 25 exited. Approximately 80-percent of these trips were made by trucks with the remainder being employees or visitors to the site. As noted above, activity decreased throughout the day with 20 vehicles entering and 17 exiting between 11 AM and 12 noon, with over 80-percent of that traffic being trucks. By the later afternoon, only 9 employee vehicles were observed exiting the site between 4 PM and 5 PM.

Site-specific traffic management plans have been developed along Grove Street and Centre Street in this area and are discussed in detail later in this evaluation. These measures include provisions in the placement of traffic control devices to allow for quarry trucks to access and egress that site with minimal delay to help minimize impacts to that site and the surrounding neighborhood.

4.0 COORDINATION WITH AGENCIES / MUNICIPALITIES / PROJECT STAKEHOLDERS

Algonquin has continued to consult with multiple public agencies and other stakeholders in the area. Specifically, Algonquin is coordinating with officials from the Towns of Westwood and Dedham, and the City of Boston on an ongoing basis. Algonquin also has met several times with representatives of MassDOT.

The following sections provide a general summary of these initials discussions regarding the traffic management aspects of the Project.

4.1 Town of Westwood

As noted earlier, the majority of the construction work in the Town of Westwood will occur on private property and not on Town roads. However, in addition to discussions concerning general construction activity within the Town, Algonquin also has discussed the AIM work proposed to cross East Street near the Route I-95 rotary. While the planned work within the Route I-95 state highway layout is under MassDOT jurisdiction, the nature of this work also was discussed. To date, an introductory meeting was held with the Westwood Department of Public Works ("DPW") and the Police and Fire Chiefs on July 18, 2013. At a subsequent meeting on December 9, 2013, the Conservation Commission requirements were discussed along with general outreach plans for abutters and other interested parties. Additional meetings with the various town departments involved will occur as the Project advances through the federal and state permitting processes.

4.2 Town of Dedham

Algonquin has met with representatives of the Town of Dedham to discuss construction plans within Dedham. An initial meeting was held with the Dedham Engineering Department and Fire Department on July 18, 2013 to discuss general construction activity, potential working days/hours, and traffic management. Particular attention was given to measures to minimize potential impacts to residents and commercial entities in the area. The Town's road repair/restoration requirements relative to the Project also were reviewed as part of these discussions. Most recently, Algonquin met with the Town of Dedham DPW Director and Director of Engineering on December 9, 2013. At this meeting the Town requested that a traffic study be provided, and the need for both Dedham and MassDOT approval of appropriate working hours within portions of Providence Highway was discussed. The Conservation Commission requirements and Board of Selectmen requirements (for potential off-peak works hours) also were reviewed. Algonquin will continue to coordinate with the Town of Dedham throughout the remainder of the planning and construction processes.

4.3 City of Boston

Algonquin team had an introductory meeting with City representatives on July 10, 2013 to provide a general Project overview. The Project was discussed in greater detail at a subsequent July 25, 2013 meeting attended by representatives of the Boston DPW and Boston Transportation Department ("BTD"), as well as the Boston Mayor's Office West Roxbury Coordinator.

The general plans for construction activity and traffic management along the Washington Street and Grove Street corridors were discussed. The City placed a particular emphasis on the need to address potential concerns of local residents, schools and businesses along these roadways. Further meetings will be held with BTD and the Boston Department of Public Works as the construction plans are further refined. This Project also has been entered in the City of Boston Utility Coordination "COBUCS" database so that long-term planning for the timing of this Project relative to other planned projects in the area can begin.

4.4 MassDOT

As Route I-95 and portions of Providence Highway are state highways under MassDOT jurisdiction, Algonquin has met with the MassDOT District 6 office in Boston on multiple occasions. To date, Algonquin has met with MassDOT staff on July 22, 2013 to discuss general traffic management protocol, potential permitting needs associated with the construction, and other transportation-related matters. An additional meeting was held on December 2, 2013 to discuss these matters in greater detail, and Algonquin will continue this coordination to refine the traffic management plans if needed as the Project advances.

4.5 Project Stakeholders

In addition to the agency/municipality coordination outlined above, Algonquin also has engaged various other commercial stakeholders along the affected corridor. The following section provides a summary of this coordination, which will continue throughout the FERC review process and subsequent construction.

4.5.1 Legacy Place Shopping Center – Dedham

Following the December 3, 2013 public hearing on the Project, Algonquin and Legacy Place arranged to meet to discuss the planned construction in detail. This meeting with the management of the Legacy Place shopping center was held at the National Amusements offices in Norwood, Massachusetts on January 27, 2014. Algonquin's current proposal for construction activity in this area was presented, with input, thoughts and concerns of Legacy Place being discussed at length. A follow-up meeting to continue these discussions was held on March 11, 2014. Following this dialogue, the following general construction conditions were agreed upon between Algonquin and Legacy Place:

(1) Pipeline installation at Legacy Place's Elm Street driveway will be by trenchless construction, with no disturbance of the road surface or interference with traffic flow.

(2) Pipeline installation across Legacy Boulevard to the east of Providence Highway likely will be by open trench construction, provided that (a) all work will take place between the hours of 12AM and 8AM, and (b) at least one paved lane for each turning movement will be maintained at all times.

(3) Pipeline installation across the southerly Legacy Place driveway at Providence Highway (between LL Bean and P.F. Chang's China Bistro restaurant) likely will be by trenchless construction, provided that agreement is reached on a sufficient staging area to be used for this work. Algonquin may also present an open trench construction option for this driveway which would include the same time restriction and access condition noted in No.2 above.

(4) The Algonquin and Legacy Place teams will meet again within approximately one month after the completion of associated geotechnical survey work to go over the design details and construction methods for the above driveway crossings, the site specific traffic and access management plan for Legacy Place, and related matters.

Algonquin is committed to continued coordination with Legacy Place, and other abutters in this area, throughout the remainder of the permitting and construction process.

4.5.2 West Roxbury Civic and Improvement Association

Algonquin attended the December 11, 2013 meeting of the West Roxbury Civic and Improvement Association. Approximately thirty local residents were in attendance. The meeting included a summary of the Project with input, concerns, and general input from local residents being provided. In addition to traffic, construction constraints associated with the nearby West Roxbury Crushed Stone quarry were discussed along with the general safety and integrity of the proposed pipeline.

5.0 TRAFFIC MANAGEMENT PLANS

General traffic management plans have been developed and included as part of this submittal. The plans were developed following standards contained in the Manual on Uniform Traffic Control Devices ("MUTCD")[6]. While not all of the affected roadways are under MassDOT jurisdiction, MassDOT's "Standard Details and Drawings for the Development of Traffic Management Plans" also were reviewed. These resulting plans are expected to be implemented for the majority of the work areas. However, additional site-specific traffic management plans are required for certain key areas where unique conditions or constraints exist. The following section provides a summary of the attached traffic management plans.

5.1 Pedestrian Accommodations

Currently there are varying degrees of pedestrian activity within the Project area, with the busier sections being located in the residential areas of Dedham and West Roxbury. For those areas where sidewalks will need to be closed on a temporary basis, a proposed pedestrian bypass is provided within the standard details of the traffic management plans. Pedestrian access will be maintained on the same side of the roadway and temporary wheelchair ramps will be provided to ramp the pedestrians from the existing sidewalk to the roadway. The pedestrians will be separated from the travel lanes by drums. If the width is not sufficient to accommodate traffic and pedestrian activity, then pedestrians will be directed to cross to the sidewalk on the opposite side of the street or at the closest adjacent intersection.

In addition, the work being performed is in an area where there are concentrated sections of predominately retail and commercial business uses. Accordingly, the intent of the traffic management plan for this Project is that access to all properties must be maintained at all times. Safe and ready means of ingress and egress to all stores and shops, public and private and professional offices and any other businesses or residences in the project area, both day and night, shall be provided for the project duration. If the access needs to be restricted for a short period of time, the contractor shall coordinate with the owner to determine an acceptable time to perform the work.

5.2 Bicycle Accommodations

Currently, there is limited bicycle activity within the Project area. Based on field observations conducted as part of this assessment, most of this activity is oriented towards residential uses at the southerly limits of the Project along Elm Street, and further to the north in West Roxbury. Bicyclists currently share the road within the Project study area as shoulder width is minimal and there are not any separate bicycle facilities currently in place. Therefore, bicycles will be accommodated within normal vehicular traffic.

5.3 Lane Shifts and Closures

The following describes the traffic management details that may be used during construction. These plans are depicted in the detailed traffic management plans accompanying this submittal. As all roadways that are expected to be impacted by construction provide a variety of general configurations (i.e., multi-lane, median-divided, etc.) construction activity will be accomplished through one, or a combination, of the described lane closure/shift details.

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[6] U.S. Department of Transportation Federal Highway Administration, Manual on Uniform Traffic Control Devices, 2009 Edition; Washington DC, December 2009.

One-lane closure details shall be used in instances where there is a cross-section of two-lanes or more in a single direction and work needs to be performed within or along the edge of the roadway. It is expected that construction for the majority of the study area will be accomplished using this traffic set-up. As this detail will reduce the overall cross section and number of lanes, the roadway capacity would be impacted on a temporary basis as shown in Table 2.

Table 2
Arterial Work Zone Capacities

	Hourly Traffic Range[1]			Traffic Management Plan Capacity[2]		
Location	**Low**	**High**	**Average**	**Lanes[3]**	**Ideal Average Capacity[4]**	**Meets MassDOT[5]**
Dedham:						
Elm Street (westbound)	240	698	545	2 to 1 (WB)	1,340	Yes
Providence Highway (northbound)	1,294	1,735	1,545	3 to 2 (NB)	2,980	Yes
Providence Highway (northbound)	1,294	1,735	1,545	3 to 1 (NB)	1,170	No
Providence Highway (northbound)	1,294	1,735	1,545	2 to 1 (NB)	1,340	No
East Street	67	161	124	2 to 1	1,340	Yes
Washington Street (northbound)	513	802	692	2 to 1 (NB)	1,340	Yes
Washington Street (southbound)	431	766	628	2 to 1 (SB)	1,340	Yes

Source: Automatic Traffic Recorder (ATR) Counts conducted in May 2014.
Notes: NA = the traffic management plan is Not Applicable (NA) for this section
1 Volumes expressed in vehicles per hour and report low, high and average hourly traffic volumes (by direction) between the hours of 7:00 AM and 7:00 PM.
2 Traffic management plans provided accompanying this evaluation.
3 Indicates the cross sectional change for the corridor; i.e. 2 to 1 indicates that 2 travel lanes will be reduced to 1 travel lane during construction
4 Ideal Average Lane Capacity values obtained from FIGURE Gen-1, GENERAL GUIDELINES, Standard Details and Drawings for the Development of Traffic Management Plans, prepared by MassDOT.
5 Indicates whether this section of the corridor will meet the MassDOT guidelines for Average Lane Capacity in a work zone.

As the required details will reduce the overall cross section and number of lanes, the roadway capacity in certain areas will be impacted on a temporary basis. The streets where this condition is applicable all have adequate capacity to accommodate a single lane closure during the off peak periods as planned. The only exception to this is on the northerly segment of Providence Highway, where work during evening hours will be required to address the limited available capacity in that area.

5.3.1 Elm Street (Dedham) – one lane closure

For the majority of its length adjacent to the Legacy Place shopping center in Dedham Elm Street has a single eastbound lane and two westbound lanes. The pipeline installation is proposed to occur on the westbound side of the roadway which will require the lane closure treatment shown in the accompanying plans. As noted above, these plans are intended to show Algonquin's general approach to traffic management for a variety of representative conditions. The Elm Street single-lane closure plan is primarily focused on the area extending from the Legacy Place driveway to just south of the Providence Highway/Elm Street intersection. For the two-lane segment of Elm Street to the south of the Legacy Place driveway traffic will be managed using similar treatments to those discussed for Grove Street and Centre Street later in this section. As there is no on-street parking on Elm Street and fewer private driveways than on those roadways there should be additional flexibility in how traffic is managed in this area.

While the capacity of a single lane can generally range from 1,400 to 1,600 vph, the capacity in work zones is further reduced. However, as these volumes are well below the standard capacity level work-hour limitations should not be necessary strictly from a volume standpoint. Regardless, the Project team will continue to work with the Town of Dedham and the abutting businesses and residents to determine the exact appropriate work hours and schedule. It is expected that work in the vicinity of the Providence Highway/Elm Street intersection will occur during evening hours to minimize disruptions to traffic flow.

5.3.2 Providence Highway (Dedham) – lane closures

The pipe installation adjacent to the Legacy Place shopping center will occur on the right shoulder/sidewalk area of the northbound lanes. To the north of Legacy Boulevard the work will shift to the center lane for approximately 700 feet which will require the traffic management plan shown. The remainder of the work will be in the right-lane/shoulder area which will require a MassDOT standard single-lane closure treatment. Historically, MassDOT's general practice in this area has been to limit weekday construction to between the hours of 9 AM and 3 PM. However, with the required time for construction set up and other factors it could be more productive and less disruptive for traffic flow to limit work hours to times outside of the peak periods discussed earlier. As shown earlier in Table 2, the average hourly volume on the northbound side of Providence Highway on a typical weekday between 7 AM to 7 PM is approximately 1,545 vpd. Volumes during the weekday morning and evening peak hours are higher, with 1,634 and 1,735 vph observed, respectively. When two lanes are closed the available capacity would be approximately 1,170 vph. Accordingly, to maximize the length of available working hours for a given day it may be desirable for work to occur during overnight hours which, given the commercial nature of the Project area, should have minimal impact on adjacent properties. There are residential abutters located to the west of the northerly segment of the Providence Highway work area. For that roughly 1,500 segment to the south of Eastern Avenue construction may need to be limited to daytime hours, but outside of the commuter peak periods as to be defined by MassDOT. The general traffic management treatments anticipated to be used for other segments of the Project study area are discussed below.

5.3.3 East Street (Dedham) – single lane closure

East Street in Dedham is a two-lane residential roadway between High Street and Washington Street. Due to the narrow width of the roadway it will not be possible to maintain continuous two-way travel during most construction. Instead, traffic flow will alternate in both directions separately under police officer detail/flagger control using the traffic management plan shown. Provisions will be in place for emergency access at all times including steel plates for access to residential driveways.

5.3.4 Washington Street (Dedham/West Roxbury) – single lane closure

Similar to Providence Highway, Washington Street is a median-divided multi-lane roadway. However, work on this segment will generally occur adjacent to the median on the southbound side of the roadway. Traffic for this condition will be managed using the traffic management plan shown. As this corridor is near capacity during peak periods construction working hours may need to be limited to end prior the weekday evening peak period, or with other limitations. The exact work schedule and hours for construction will be discussed with the Town of Dedham and City of Boston as part of the ongoing

Project coordination. Representative traffic management plans depicting the expected temporary lane closures on Washington Street are provided attached to this submittal.

5.3.5 Grove Street (West Roxbury)

The majority of the approximately 0.5± miles of work within Grove Street will be on the northerly side of the roadway. The attached plans depict the required lane shifts for this work with accompanying police detail/flagger control. Some on-street parking spaces in certain areas will need to be temporarily removed for portions of construction as shown. These plans may be refined further both during the permitting process and during construction as needed to help ensure that impacts to abutting residents are minimized. Understanding the limited available on-street parking in this area Algonquin will implement measures to minimize the number of construction workers needing to drive to this area and park their own vehicle.

5.3.6 Centre Street (West Roxbury)

The remaining 0.70+ miles of work from Centre Street's intersection with Grove Street to Spring Street will be similar to that along Grove Street. Accordingly, the traffic management will be similar for both segments. As with Grove Street the traffic management plans will continue to be refined to meet the needs of residents along this roadway. Similar to Grove Street, Algonquin will implements measures to minimize construction worker traffic and parking impacts to this area.

5.4 Traffic at Intersections

The majority of the intersection work within the study area will be constructed by maintaining at least one lane on all approaches where work is proposed. If a lane needs to be closed, this work shall be conducted during off-peak conditions so that traffic flows are not constrained at the study area intersections. Details illustrating the traffic management plan for intersections are included in the traffic management plans accompanying this submittal. Traffic operations at key locations where capacity will be affected temporarily are discussed later in this section. The following sections summarize the analysis methodology used at these locations to evaluate traffic operations at intersections during construction.

5.4.1 Level of Service and Delay Criteria

The evaluation criteria used to analyze area intersections in this traffic study are based on the 2000 Highway Capacity Manual ("HCM")[7]. The term 'Level of Service' ("LOS") is used to denote the different operating conditions that occur on a given roadway segment under various traffic volume loads. It is a qualitative measure that considers a number of factors including roadway geometry, speed, travel delay and freedom to maneuver. LOS provides an index to the operational qualities of a roadway segment or an intersection. LOS designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions.

In addition to LOS, two other measures of effectiveness ("MOEs") are typically used to quantify the traffic operations at intersections; volume-to-capacity ratio (v/c) and delay (expressed in seconds per vehicle). For example, an existing v/c ratio of 0.9 for an intersection indicates that the intersection is operating at 90 percent of its available capacity. A delay of 15 seconds for a particular vehicular movement or approach indicates that vehicles on the movement or approach will experience an average additional travel time of 15 seconds. For a given LOS letter designation there may be a wide range of

7 Transportation Research Board, Highway Capacity Manual, Washington, D.C., 2000.

values for both v/c ratios and delay. Comparison of intersection capacity results therefore requires that, in addition to the LOS, the other MOEs should also be considered.

The LOS designations, which are based on delay, are reported differently for signalized and unsignalized intersections. For signalized intersections, the analysis considers the operation of all traffic entering the intersection and the LOS designation is for overall conditions at the intersection. For unsignalized intersections, however, the analysis assumes that traffic on the mainline is not affected by traffic on the side streets. Thus, the LOS designation is for the critical movement exiting the side street, which is generally the left turn out of the side street or site driveway. Table 3 shows the LOS criteria for both signalized intersections and unsignalized intersections.

It should be noted that the analytical methodologies typically used for the analysis of unsignalized intersections use conservative analysis parameters, such as long critical gaps. Actual field observations indicate that drivers on minor streets generally accept shorter gaps in traffic than those used in the analysis procedures and therefore experience less delay than reported by the analysis software. The analysis methodologies also do not fully take into account the beneficial grouping effects caused by nearby signalized intersections. The net effect of these analysis procedures is the over-estimation of calculated delays at unsignalized intersections in the study area. Cautious judgment should therefore be exercised when interpreting the capacity analysis results at unsignalized intersections.

Table 3
Level of Service Criteria

Level of Service	Delay – Signalized Intersection	Delay – Unsignalized Intersection
A	0 to 10 seconds	0 to 10 seconds
B	10 to 20 seconds	10 to 15 seconds
C	20 to 35 seconds	15 to 25 seconds
D	35 to 55 seconds	25 to 35 seconds
E	55 to 80 seconds	35 to 50 seconds
F	Greater than 80 seconds	Greater than 50 seconds

Source: 2000 Highway Capacity Manual Exhibits 16-2 and 17-2.

5.4.2 Signalized Intersection Capacity Analysis

Capacity analyses were conducted for key signalized study area intersections where intersection capacity will be reduced on a temporary basis. For comparison purposes, this analysis was conducted for both current conditions and the temporary conditions involving lane closures at intersections that will occur during construction. A summary of this analysis is presented below in Table 4.

Table 4
Signalized Intersection Capacity Analysis

Intersection	2014 Existing V/C[c]	Delay[b]	LOS[a]	95th % Queue[d]	2015 Construction V/C	Delay	LOS	95th % Queue
High Street at East Street / High Street								
Weekday AM								
Harris Street EB LTR	0.39	35.6	D	50	0.20	19.81	B	68
High Street WB L	0.94	44.4	D	#371	N/A	N/A	N/A	N/A
High Street WB TR	0.37	16.7	B	137	1.13	95.2	F	#757
High Street NB LT	0.05	10.8	B	31	0.07	16.8	B	35
High Street NB RT	0.20	2.7	A	14	0.20	10.1	B	38
East Street SB LTR	0.03	10.7	B	21	0.06	16.5	B	25
Overall	**0.53**	**25.7**	**C**		**0.75**	**63.6**	**E**	
Weekday Midday								
Harris Street EB LTR	0.51	28.2	C	80	0.47	20.5	C	151
High Street WB L	0.84	31.6	C	#194	N/A	N/A	N/A	N/A
High Street WB TR	0.27	15.9	B	81	1.18	120.3	F	#441
High Street NB LT	0.06	8.4	A	28	0.07	11.4	B	30
High Street NB RT	0.20	4.3	A	16	0.20	8.9	A	23
East Street SB LTR	0.02	8.1	A	8	0.02	11.0	B	9
Overall	**0.46**	**19.3**	**B**		**0.68**	**61.9**	**E**	
Weekday Evening								
Harris Street EB LTR	0.71	32.8	C	106	0.71	27.1	C	#266
High Street WB L	0.89	33.5	C	#296	N/A	N/A	N/A	N/A
High Street WB TR	0.22	12.5	B	77	1.62	311.0	F	#486
High Street NB LT	0.07	11.1	B	33	0.07	11.4	B	33
High Street NB RT	0.35	5.0	A	21	0.34	9.3	A	28
East Street SB LTR	0.06	11.1	B	21	0.06	11.3	B	21
Overall	**0.61**	**19.6**	**B**		**0.96**	**127.5**	**F**	

Table 4
Signalized Intersection Capacity Analysis

Intersection	2014 Existing V/C[c]	Delay[b]	LOS[a]	95th % Queue[d]	2015 Construction V/C	Delay	LOS	95th % Queue
Spring Street at Centre Street/Temple Street								
Weekday AM								
Spring Street EB LTR	0.58	19.8	B	229	0.46	22.7	B	277
Spring Street WB L	0.47	10.6	B	82	0.42	13.5	B	89
Spring Street WB TR	0.43	9.9	A	180	0.39	13.2	A	205
Centre Street NB LT	0.31	29.9	C	78	1.11	126.9	C	#643
Centre Street NB R	0.79	34.5	C	#182	N/A	N/A	N/A	N/A
Temple Street SB LTR	0.32	29.9	C	86	0.48	64.9	C	152
Overall	**0.67**	**18.7**	**B**		**0.68**	**40.9**	**B**	
Weekday Midday								
Spring Street EB LTR	0.58	20.8	C	#220	0.58	20.8	C	#220
Spring Street WB L	0.46	11.3	B	#106	0.46	11.3	B	#106
Spring Street WB TR	0.35	10.4	B	146	0.35	10.4	B	146
Centre Street NB LT	0.11	22.0	C	35	0.53	29.4	C	126
Centre Street NB R	0.30	17.7	B	40	N/A	N/A	N/A	N/A
Temple Street SB LTR	0.19	22.9	C	51	0.20	23.0	C	51
Overall	**0.47**	**15.9**	**B**		**0.55**	**17.1**	**B**	
Weekday PM								
Spring Street EB LTR	0.56	21.6	C	261	0.57	19.4	B	229
Spring Street WB L	0.70	14.9	B	#211	0.47	10.6	B	82
Spring Street WB TR	0.37	8.6	A	191	0.43	9.9	A	180
Centre Street NB LT	0.35	37.1	D	66	1.49	268.5	F	#453
Centre Street NB R	0.38	23.4	C	66	N/A	N/A	N/A	N/A
Temple Street SB LTR	0.63	43.8	D	166	0.38	31.4	C	88
Overall	**0.67**	**18.6**	**B**		**0.82**	**64.5**	**E**	

a Volume-to-capacity ratio.
b Average delay per vehicle in seconds.
c Level of Service.
d 95th percentile queue measured in feet
\# 95th percentile volume exceeds capacity, queue may be longer
Note: Delay cannot be accurately calculated when volume-to-capacity ratio exceeds 1.20 or 1/PHF; delays can be assumed to exceed 120 seconds.
EB = Eastbound; WB = Westbound; NB = Northbound; SB = Southbound;
L = Left; T = Through; R = Right

As shown in Table 4, High Street's intersection with East Street and Harris Street currently operates acceptably under peak-hour conditions and during a typical weekday midday period. However, the required lane closures at this intersection will temporarily impact traffic operations. The analysis indicates that construction during the typical weekday commuter periods is not advisable, but that off-peak daytime construction is feasible through the implementation of the accompanying traffic management plans. However, as the westbound queues approaching the intersection may extend into the adjacent signalized intersection to the east, evening construction hours are desirable to minimize any impacts further if permitted by the Town of Dedham. Likewise, traffic generally operates acceptably at the Spring Street/Centre Street intersection in West Roxbury throughout the day. With the planned pipeline construction route, the northbound Centre Street right-turn lane will need to be blocked off temporarily. The analysis indicates that the intersection can still operate efficiently throughout the day, though lengthy delays are expected on the northbound Centre Street approach to this intersection. To avoid excessive delays at this location, work in the vicinity of this intersection, should end prior to the late afternoon commuter peak period.

5.5 Crosswalks, sidewalks, intersections – various locations

Various portions of the Project will involve temporary closures of sidewalks or crosswalks across streets or intersections. To make sure that safe and appropriate accommodations are available for pedestrians plans have been developed for conditions typically encountered. Plans depicting traffic management during the temporary closure of lanes at the center or sides of various intersections also have been developed.

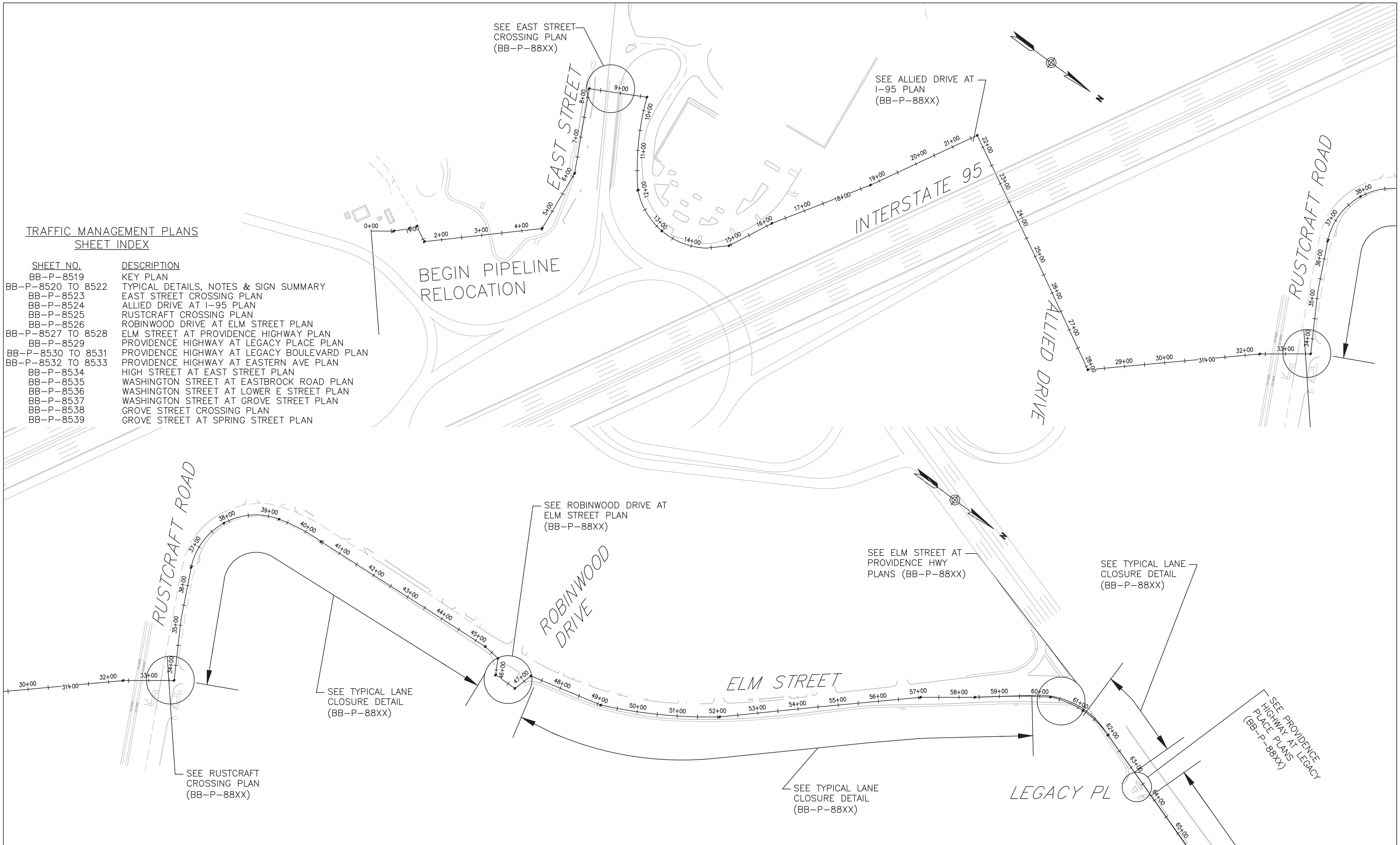
6.0 CONCLUSION

Algonquin has undertaken an extensive process of evaluating the traffic management measures which will be required during construction of the Project. To date, this effort has involved compiling available traffic count data and performing new traffic counts in the vicinity of the Project. The intent of this effort was to quantify existing traffic conditions, review notable traffic patterns, and to use this information to help identify appropriate working hours. Beyond the standard traffic data analysis, Algonquin also has taken the context of the surrounding area into consideration to help minimize any disruptions or impacts to nearby residences, businesses or schools. In doing so there has been an extensive ongoing community outreach and continued coordination efforts with the various municipalities and agencies involved with the Project.

In response to the thoughts and concerns of these various stakeholders, Algonquin has developed site-specific traffic management plans that will be implemented along the Project corridor. The general traffic management principles depicted on the attached plans are expected to be carried through for each portion of the Project to help minimize any disruptions to traffic operations in the area.

West Roxbury Lateral Site-Specific Traffic Management Plans

G-59



TRAFFIC MANAGEMENT PLANS SHEET INDEX

SHEET NO.	DESCRIPTION
BB-P-8519	KEY PLAN
BB-P-8520 TO 8522	TYPICAL DETAILS, NOTES & SIGN SUMMARY
BB-P-8523	EAST STREET CROSSING PLAN
BB-P-8524	ALLIED DRIVE AT I-95 PLAN
BB-P-8525	RUSTCRAFT CROSSING PLAN
BB-P-8526	ROBINWOOD DRIVE AT ELM STREET PLAN
BB-P-8527 TO 8528	ELM STREET AT PROVIDENCE HIGHWAY PLAN
BB-P-8529	PROVIDENCE HIGHWAY AT LEGACY PLACE PLAN
BB-P-8530 TO 8531	PROVIDENCE HIGHWAY AT LEGACY BOULEVARD PLAN
BB-P-8532 TO 8533	PROVIDENCE HIGHWAY AT EASTERN AVE PLAN
BB-P-8534	HIGH STREET AT EAST STREET PLAN
BB-P-8535	WASHINGTON STREET AT EASTBROCK ROAD PLAN
BB-P-8536	WASHINGTON STREET AT LOWER E STREET PLAN
BB-P-8537	WASHINGTON STREET AT GROVE STREET PLAN
BB-P-8538	GROVE STREET CROSSING PLAN
BB-P-8539	GROVE STREET AT SPRING STREET PLAN

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	DESCRIPTION	LN. FT.
		B			N/A 3/20/2009			
		A			ISSUE FOR BID 2/04/2009			
REFERENCE DRAWINGS					REVISIONS		MATERIALS	

Vanasse Hangen Brustlin, Inc.
Transportation
Land Development
Environmental Services
101 Walnut Street, P.O. Box 9151
Watertown, Massachusetts 02471-9151
617 924 1770 • FAX 617 924 2286

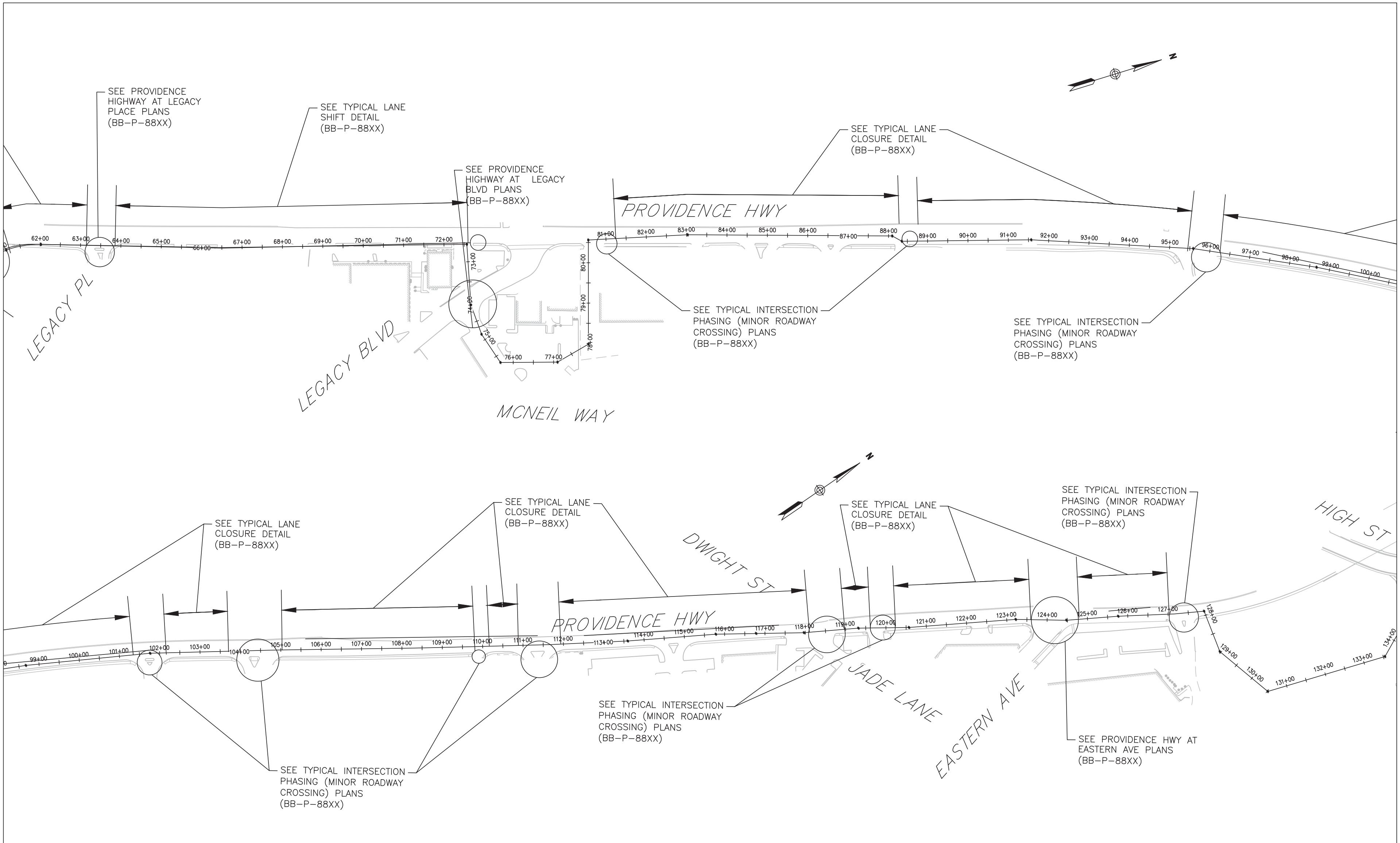
	ENGINEERING APPROVALS			
DRAWN BY:	BID		CONSTRUCTION	
S.L.T.		1/29		
TITLE	SIGNATURE	DATE	SIGNATURE	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

Spectra Energy
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

YEAR: 2014	W.O. 004110598	SCALE: 1"=500'	DWG. BB-P-8519	REV. B



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Land Development
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617 924 1770 • FAX 617 924 2286

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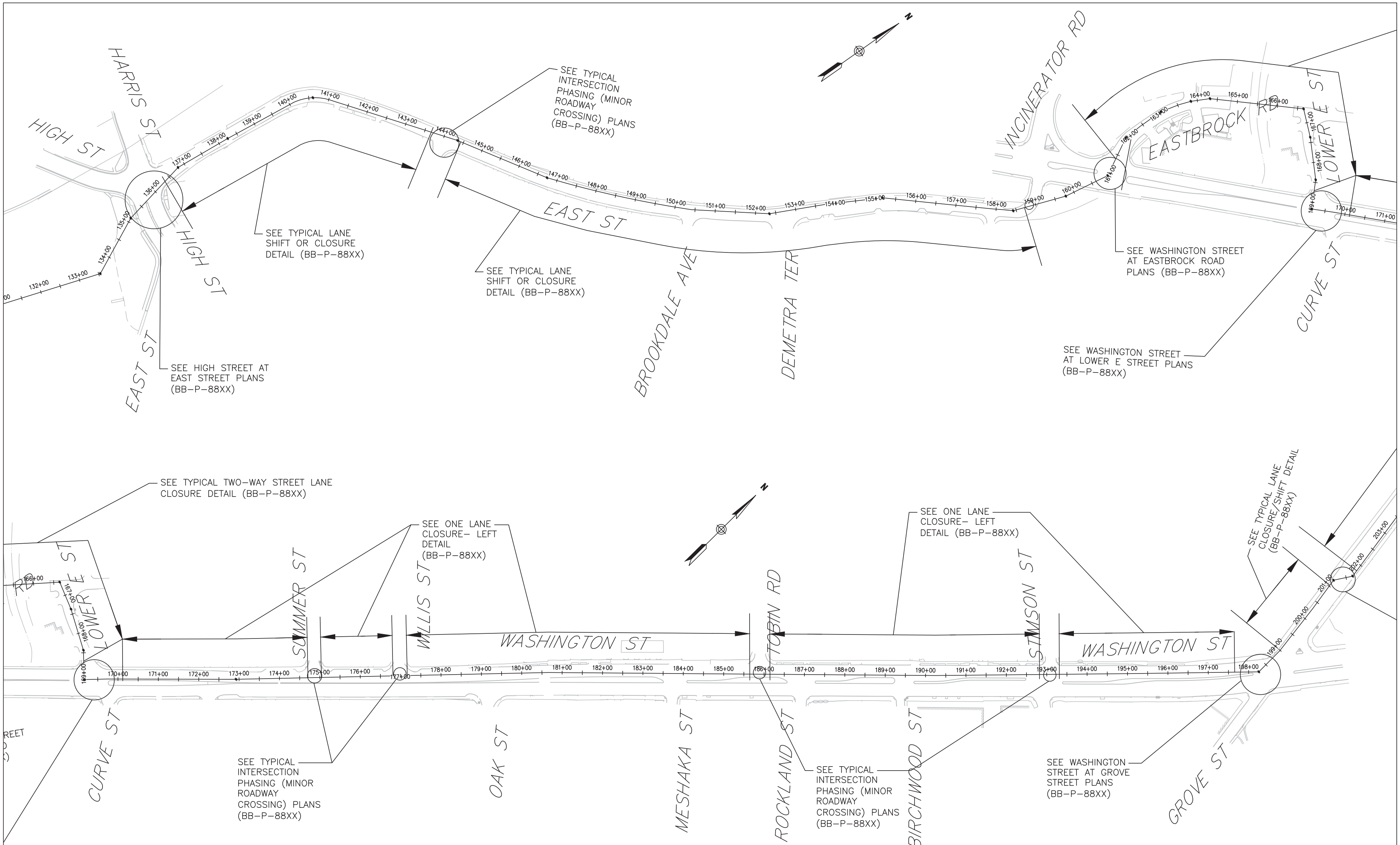

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VHB Vanasse Hangen Brustlin, Inc.
Transportation
Land Development
Environmental Services
101 Walnut Street, P.O. Box 9151
Watertown, Massachusetts 02471-9151
617 924 1770 • FAX 617 924 2286

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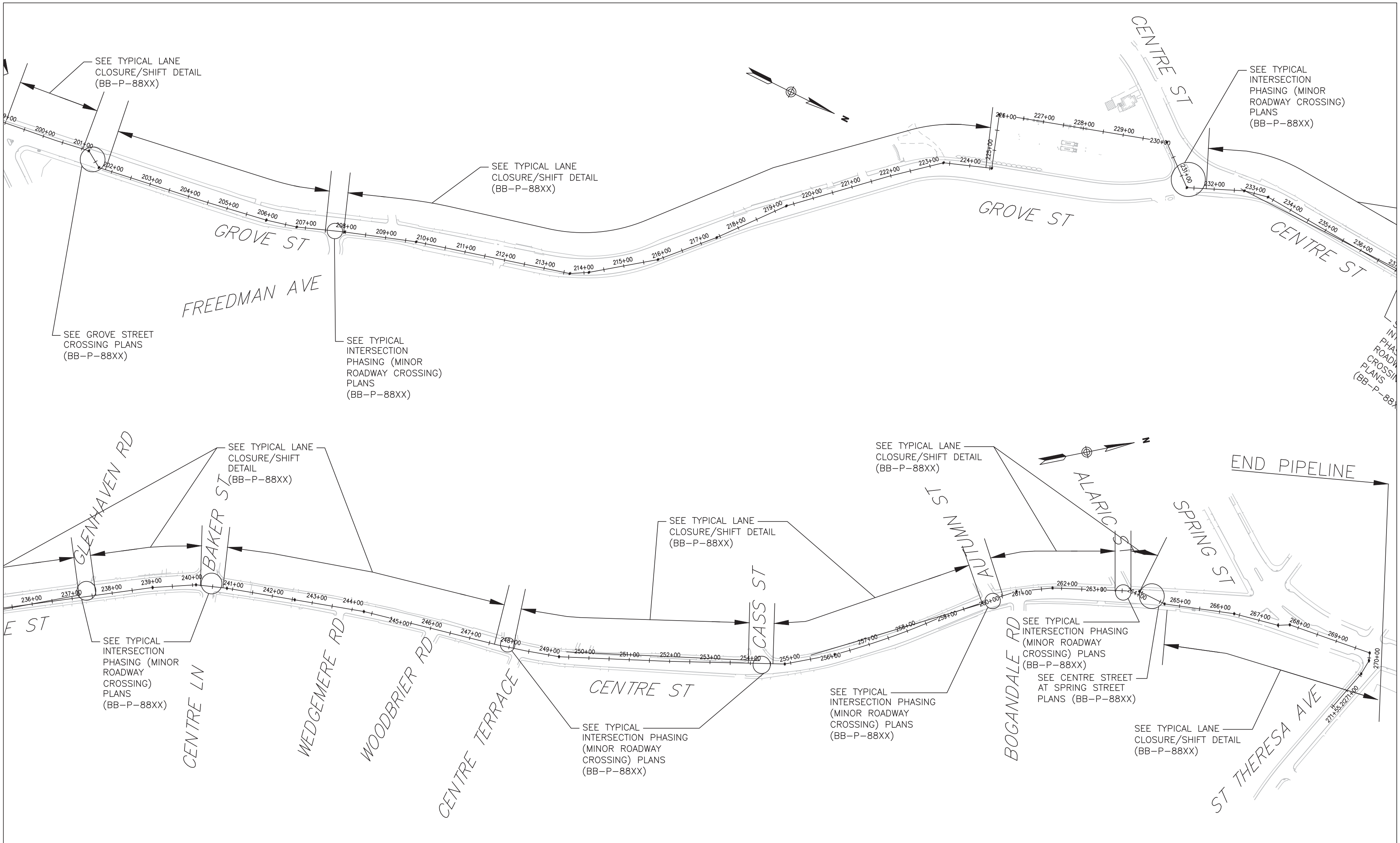

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		B			N/A 3/20/2009			
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Vanasse Hangen Brustlin, Inc.
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Land Development
Environmental Services
101 Walnut Street, P.O. Box 9151
Watertown, Massachusetts 02471-9151
617 924 1770 • FAX 617 924 2286

	ENGINEERING APPROVALS			
DRAWN BY:	BID		CONSTRUCTION	
S.L.T.		1/29		
TITLE	SIGNATURE	DATE	SIGNATURE	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

Spectra Energy
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

YEAR: 2014	W.O. 004110598	SCALE: 1"=500'	DWG. BB-P-8519	REV. B

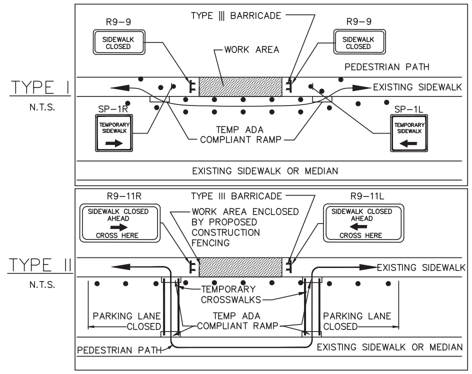
G-63

GENERAL NOTES

1. ALL CONSTRUCTION SIGNING, DRUMS, BARRICADES AND OTHER DEVICES SHALL CONFORM WITH THE 2003 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D.) AS AMENDED.
2. ALL DRUMS SHALL BE SET AT 20' (10' WITHIN THE CITY OF BOSTON JURISDICTION) ON CENTER MAX. UNLESS OTHERWISE NOTED OR ADJUSTED BY THE ENGINEER.
3. ALL DRUMS SHALL BE APPROXIMATELY PLACED AND MOVED AS NECESSARY TO MAINTAIN ADEQUATE ABUTTER ACCESS AT ALL TIMES. WORK MAY REQUIRE ADDITIONAL SIGNS, DRUMS AND OTHER TRAFFIC CONTROL DEVICES, GRADING AND TEMPORARY PAVEMENT FOR PASSAGE OF PEDESTRIAN, VEHICULAR AND EMERGENCY TRAFFIC THROUGH THE WORK AREAS, BOTH DURING AND AFTER WORKING HOURS, TO MAINTAIN SUCH ACCESS.
4. THE CONTRACTOR SHALL NOTIFY EACH ABUTTOR AT LEAST 48 HOURS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE THE TEMPORARY CLOSURE OF ACCESS OR PARKING RESTRICTIONS, SUCH AS CONDUIT INSTALLATION, EXISTING PAVEMENT EXCAVATION, TEMPORARY DRIVEWAY PAVEMENT PLACEMENT AND SIMILAR OPERATIONS.
5. A MINIMUM OF ONE LANE OF TRAFFIC IN EACH DIRECTION ON TWO WAY STREETS SHALL BE MAINTAINED AT ALL TIMES, EXCEPT THAT DURING WORKING HOURS, TRAFFIC MAY BE REDUCED TO ONE LANE UNDER POLICE CONTROL FOR SHORT TIME PERIODS WHEN REQUIRED FOR THE WORK, AS SHOWN.
6. GRADE SEPARATIONS IN EXCESS OF 2" DURING NON–WORKING HOURS WILL REQUIRE DELINEATION BY USE OF DRUMS.
7. EXCAVATION EDGES IN EXCESS OF 4" DEEP SHALL BE PROTECTED DURING NON–WORKING HOURS BY BACKFILLING WITH A WEDGE OF GRAVEL OR SOIL TO COMPACTED 1:4 SLOPE.
8. 11' MINIMUM LANE WIDTHS SHALL BE MAINTAINED.
9. NON–ESSENTIAL TRAFFIC CONTROL DEVICES SHALL BE COVERED OR REMOVED DURING NON–WORKING HOURS.
10. ALL PARKING AREAS WITHIN 400' OF WORK ZONES SHALL INCLUDE DRUMS ATTACHED WITH "NO PARKING" SIGNS. THESE SHALL BE PLACED 2 DAYS IN ADVANCE OF CONSTRUCTION.
11. ALL WORK SHALL BE IN COMFORMANCE OF TRENCH REGULATION 520 CMR 14.
12. CONTRACTOR SHALL PROVIDE PEDESTRIAN ROUTES WITH 48" MINIMUM WIDTH TO COMPLY WITH ADA REQUIREMENTS.
13. SPECTRA ENERGY SHALL PROVIDE AN ON SITE SAFETY INSPECTOR TO WORK WITH THE CONTRACTOR TO ASSURE THE CONTRACTOR'S COMPLIANCE WITH THESE TRAFFIC MANAGEMENT PLANS.
14. CONTRACTOR SHALL CARPOOL ALL EMPLOYEES. NO ON SITE EMPLOYEE PARKING WILL BE ALLOWED NEAR THE WORK ZONE.
15. CONTRACTOR SHALL PLACE A G20–2 (END ROAD WORK) SIGN (AT 100') FOLLOWING EACH DAILY SET UP IN EACH DIRECTION OF TRAVEL AFFECTED BY THE WORK.

PEDESTRIAN BYPASS

TO BE USED IN CONJUNCTION WITH THE PROPOSED LANE CLOSURE DETAILS AND DURING CONSTRUCTION STAGING AND AS DIRECTED BY THE ENGINEER.



PEDESTRIAN BYPASS NOTES:

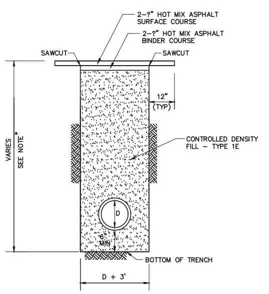
1. ADDITIONAL ADVANCE WARNING MAY BE NECESSARY.
2. CONTROLS FOR PEDESTRIAN TRAFFIC ONLY, ARE SHOWN. VEHICULAR TRAFFIC SHALL BE MAINTAINED AS SHOWN ELSEWHERE.
3. STREET LIGHTING SHOULD BE CONSIDERED WHEN LOCATING CONTROL DEVICES.
4. ⟷ DIRECTION OF PEDESTRIAN TRAVEL.
5. IF THE WORK ZONE DOES NOT PERMIT PEDESTRIANS TO TRAVEL ADJACENT TO IT AS SHOWN IN PEDESTRIAN BYPASS TYPE I, TEMPORARY CROSSWALKS WITH APPROPRIATE SIGNS SHALL BE INSTALLED TO CROSS PEDESTRIANS TO THE OPPOSITE SIDE OF THE STREET AS SHOWN IN PEDESTRIAN BYPASS TYPE II, AND AS DIRECTED BY THE ENGINEER.

TRAFFIC SIGN SUMMARY

IDENTIFI–CATION NUMBER	SIZE OF SIGN		TEXT
	WIDTH	HEIGHT	
W1–4 (LR)	36"	36"	
W4–2 (LR)	36"	36"	
W5–1	48"	48"	ROAD NARROWS
W20–1	48"	48"	ROAD CONSTRUCTION AHEAD
W20–2	48"	48"	DETOUR AHEAD
W20–3	48"	48"	ROAD CLOSED AHEAD
W20–4	48"	48"	ONE LANE ROAD AHEAD
W20–5 (LR) (XX')	48"	48"	LEFT LANE CLOSED XX FEET
W20–8	48"	48"	POLICE OFFICER AHEAD

IDENTIFI–CATION NUMBER	SIZE OF SIGN		TEXT
	WIDTH	HEIGHT	
W4–7 (LR)	36"	36"	THRU TRAFFIC MERGE LEFT
R9–9	24"	12"	SIDEWALK CLOSED
R9–10	24"	12"	SIDEWALK CLOSED ⟷ USE OTHER SIDE
R9–11 (LR)	24"	12"	SIDEWALK CLOSED AHEAD ← CROSS HERE
R3–7 (LR)	30"	30"	LEFT LANE MUST TURN LEFT
R4–7	24"	30"	
R3–2	30"	30"	
SP–1 (LR)	24"	12"	TEMPORARY SIDEWALK ←
SP–2	42"	30"	BUSINESSES OPEN DURING CONSTRUCTION
M4–9B (LR)	30"	24"	DETOUR →

NOTE:
1. CONTRACTOR SHALL HAVE "NO PARKING" SIGN APPROVED BY BOSTON TRAFFIC DEPARTMENT PRIOR TO FABRICATION.
2. CONTRACTOR TO USE PERMANENT MARKERS TO IDENTIFY DATES WORKING IN SPECIFIC WORK ZONE. MARKERS SHOULD BE ABLE TO BE ERADICATED WITH A PROPRIETRY CHEMICAL SOLVENT.



TRENCH DETAIL IN EXISTING HOT MIX ASPHALT
SCALE: NOT TO SCALE
DATE: APRIL 2003
DWG: TRENCH–04

*NOTE: TRENCHES OVER 5' DEPTH REQUIRE SUPPORT OF EXCAVATION

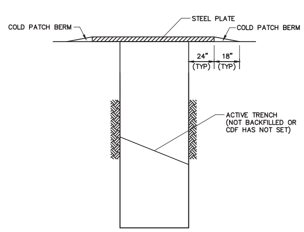
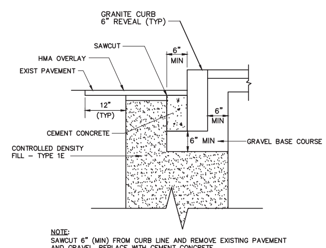
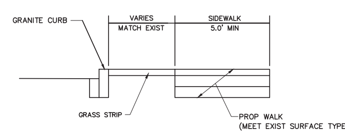


PLATE DETAIL (FOR NON–WORK HOURS)
SCALE: NOT TO SCALE
DATE: APRIL 2003
DWG: TRENCH–04



NOTE:
SAWCUT 6" (MIN) FROM CURB LINE AND REMOVE EXISTING PAVEMENT AND GRAVEL. REPLACE WITH CEMENT CONCRETE.

GRANITE CURB RESET OVER TRENCH
SCALE: NOT TO SCALE
DATE: APRIL 2003
DWG: CURB–04



PROPOSED CEMENT CONCRETE WALK

SURFACE: 4" CEMENT CONCRETE AIR ENTRAINED 4000PSI, 3/4", 610

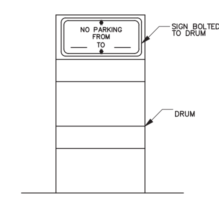
FOUNDATION: 8" GRAVEL BORROW, TYPE b

PROPOSED HOT MIX ASPHALT WALK

SURFACE: 3" HOT MIX ASPHALT PLACE IN TWO LAYERS, 1.5" TOP COURSE OVER 1.5" BINDER COURSE

FOUNDATION: 8" GRAVEL BORROW, TYPE b

PROPOSED SIDEWALK RECONSTRUCTION
SCALE: NOT TO SCALE
DATE: APRIL 2003
DWG: CURB–04



"NO PARKING" SIGN MOUNTED ON DRIM
SCALE: NOT TO SCALE
DATE: JANUARY 2009
DWG:

LEGEND

- DRUM
- POLICE OFFICER
- CONSTRUCTION SIGN
- TYPE III BARRICADES
- ACTIVE TRENCH AREA
- PROPOSED TRAFFIC FLOW
- ALTERNATING TRAFFIC UNDER POLICE DIRECTION
- SPECIAL LIGHTING UNIT (FLASHING ARROW)
- NTS NOT TO SCALE

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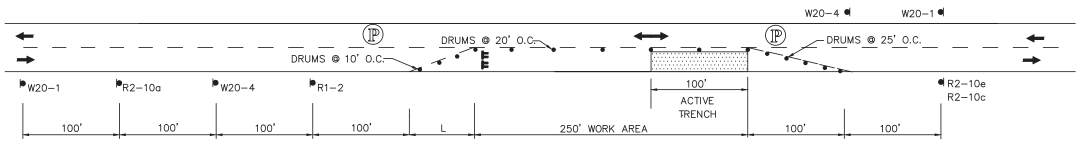
ALGONQUIN INCREMENTAL MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I–17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

YEAR: 2014 | W.O. 004110598 | SCALE: 1"=30' | DWG. BB–P–8519 | REV. B

Spectra Energy
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310



TYPICAL TWO WAY STREET LANE CLOSURE

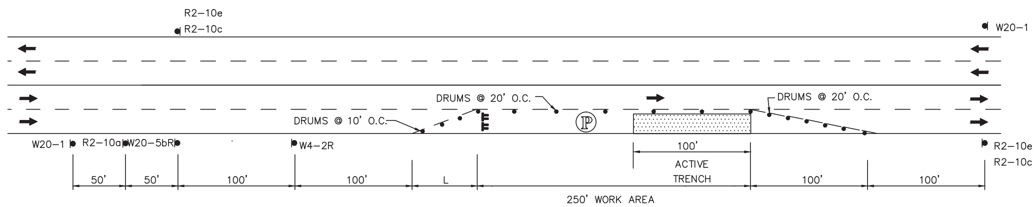
NOT TO SCALE

FOR POSTED SPEEDS GREATER THAN 40 MPH

$L = W \times S$ L=TAPER LENGTH
W=WIDTH OF ROADWAY TO BE SHIFTED OR REDIRECTED
S=POSTED SPEED LIMIT

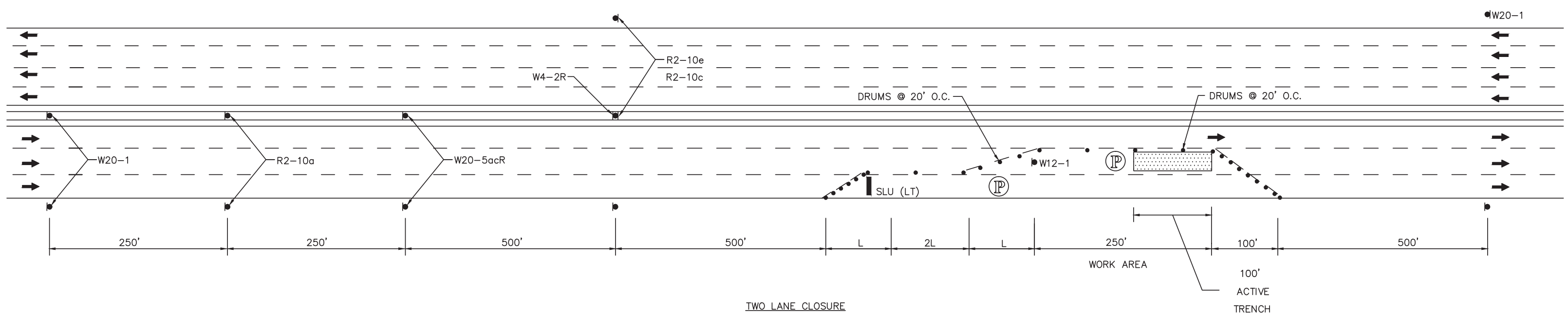
FOR POSTED SPEEDS OF 40 MPH OR LESS

$L = \frac{WS^2}{60}$ L=TAPER LENGTH
W=WIDTH OF ROADWAY TO BE SHIFTED OR REDIRECTED
S=POSTED SPEED LIMIT



ONE LANE CLOSURE – RIGHT

NOT TO SCALE



TWO LANE CLOSURE

NOT TO SCALE

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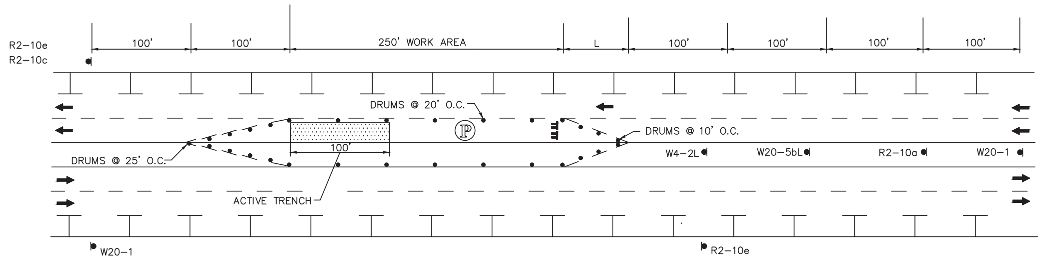
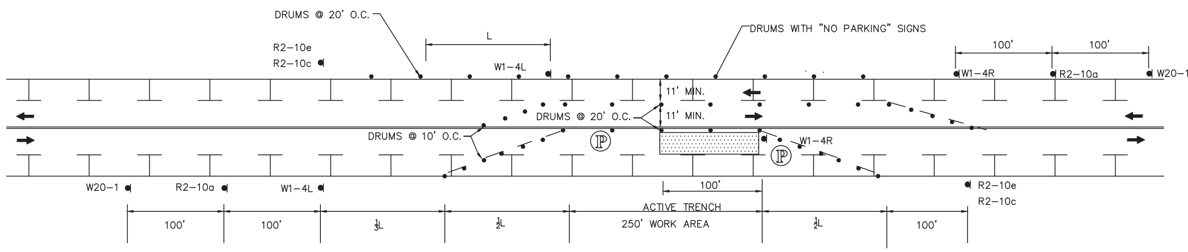
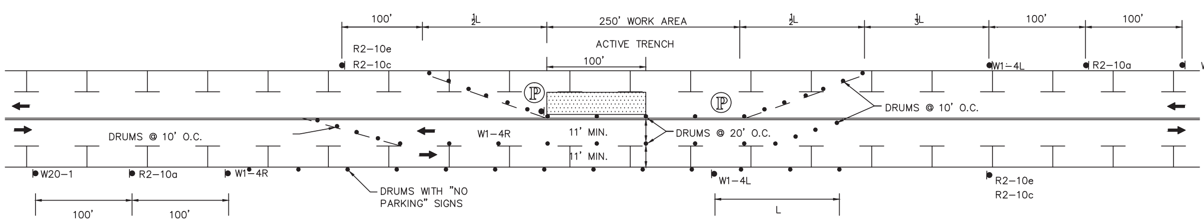


ONE LANE CLOSURE – LEFT
NOT TO SCALE



RIGHT LANE CLOSURE WITH PARKING – TWO DIRECTIONS
NOT TO SCALE



LEFT LANE CLOSURE WITH PARKING – TWO DIRECTIONS
NOT TO SCALE

FOR POSTED SPEEDS GREATER THAN 40 MPH

$L = W \times S$ L=TAPER LENGTH
W=WIDTH OF ROADWAY TO BE SHIFTED OR REDIRECTED
S=POSTED SPEED LIMIT

FOR POSTED SPEEDS OF 40 MPH OR LESS

$L = \frac{WS^2}{60}$ L=TAPER LENGTH
W=WIDTH OF ROADWAY TO BE SHIFTED OR REDIRECTED
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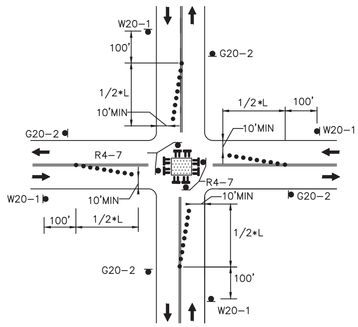
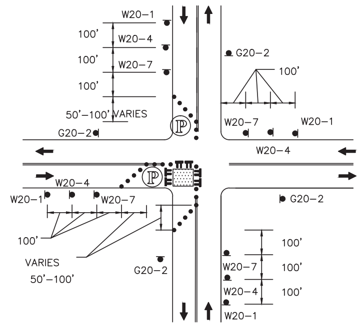
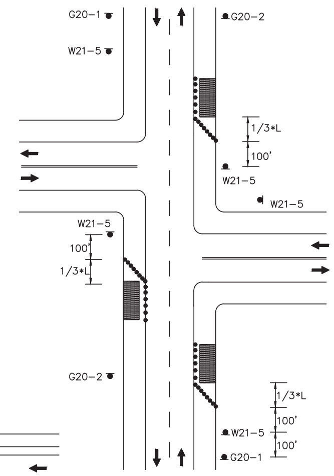
G-66



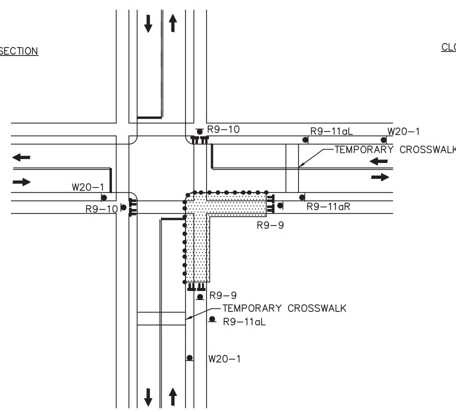
CLOSURE IN THE CENTER OF AN INTERSECTION
NOT TO SCALE



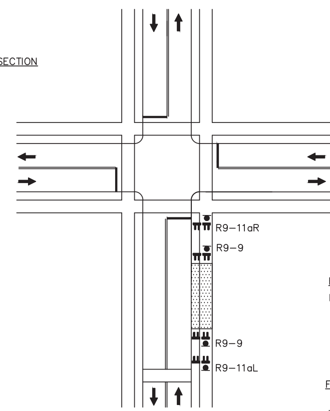
CLOSURE AT THE SIDE OF AN INTERSECTION
NOT TO SCALE



WORK ON THE SHOULDERS
NOT TO SCALE



CROSSWALK CLOSURES AND PEDESTRIAN DETOURS
NOT TO SCALE



SIDEWALK DETOUR OR DIVERSION
NOT TO SCALE

FOR POSTED SPEEDS GREATER THAN 40 MPH

L = W x S
L=TAPER LENGTH
W=WIDTH OF ROADWAY TO BE SHIFTED OR REDIRECTED
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FOR POSTED SPEEDS OF 40 MPH OR LESS

$L = \frac{WS^2}{60}$
L=TAPER LENGTH
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DESIGN DATA	ELM STREET	INTERSTATE 95	PROVIDENCE HIGHWAY	EAST STREET (WEST OF I-95)	EAST STREET	HIGH STREET	WASHINGTON STREET	GROVE STREET	CENTRE STREET	ROBINWOOD ROAD	EASTERN AVE	LEGACY BOULEVARD	RUSTCRAFT ROAD
FUNCTIONAL CLASSIFICATION	URBAN MINOR ARTERIAL	INTERSTATE	URBAN PRINCIPAL ARTERIAL	URBAN MINOR ARTERIAL	URBAN MINOR ARTERIAL	URBAN PRINCIPAL ARTERIAL	URBAN MINOR ARTERIAL	URBAN MINOR ARTERIAL	URBAN MINOR ARTERIAL	LOCAL ROAD	URBAN COLLECTOR	LOCAL ROAD	URBAN MINOR ARTERIAL
MUTCD ROAD TYPE	LOW SPEED URBAN	HIGH SPEED URBAN	HIGH SPEED URBAN	LOW SPEED URBAN	LOW SPEED URBAN	LOW SPEED URBAN	HIGH SPEED URBAN	LOW SPEED URBAN	LOW SPEED URBAN	LOW SPEED URBAN	LOW SPEED URBAN	LOW SPEED URBAN	LOW SPEED URBAN
SPEED LIMIT	30 MPH	60 MPH	45 MPH	35 MPH	25 MPH	30 MPH	40 MPH	30 MPH	25 MPH	25 MPH	25 MPH	25 MPH	30 MPH
TAPER WIDTH	12 FEET	12 FEET	12 FEET	12 FEET	15 FEET	12 FEET	12 FEET	16 FEET	12 FEET	10 FEET	12 FEET	11 FEET	12 FEET
TAPER LENGTH ($L=\frac{WS^2}{60}$)		720'	540'										
TAPER LENGTH (L=WS)	180'			245'	156'	180'	320'	240'	125'	104'	125'	115'	180'

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TRAFFIC MANAGEMENT SHEET

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YEAR: 2014	W.O. 004110598	SCALE: 1"=30'	DWG. BB-P-8519	REV. B

OPERATIONAL SIGNING

NOTE: ALL LOCATIONS WITHIN CITY OF SOMERVILLE JURISDICTION TO HAVE DRUM SPACING OF 10' O.C.

NOTES:
1. LANE CLOSURES SHOWN ARE FOR TEMPORARY CONSTRUCTION.
2. ALL DRUMS AND SIGNS ARE SHOWN AS THEY SHOULD APPEAR DURING THE WORKING DAY, OR WHILE OPERATING IN THE WORK ZONE.
3. DRUMS WITH "NO PARKING" SIGNS SHALL BE PLACED WHERE NECESSARY FOR THE LENGHT OF THE TEMPORARY CONSTRUCTION SETUP.

FOR POSTED SPEEDS OF 40 MPH OR LESS

$^{*}L=\frac{WS^2}{60}$ L=TAPER LENGTH
W=WIDTH OF ROADWAY TO BE SHIFTED OR REDIRECTED
S=POSTED SPEED LIMIT

FOR POSTED SPEEDS GREATER THAN 40 MPH

$^{*}L = W \times S$ L=TAPER LENGTH
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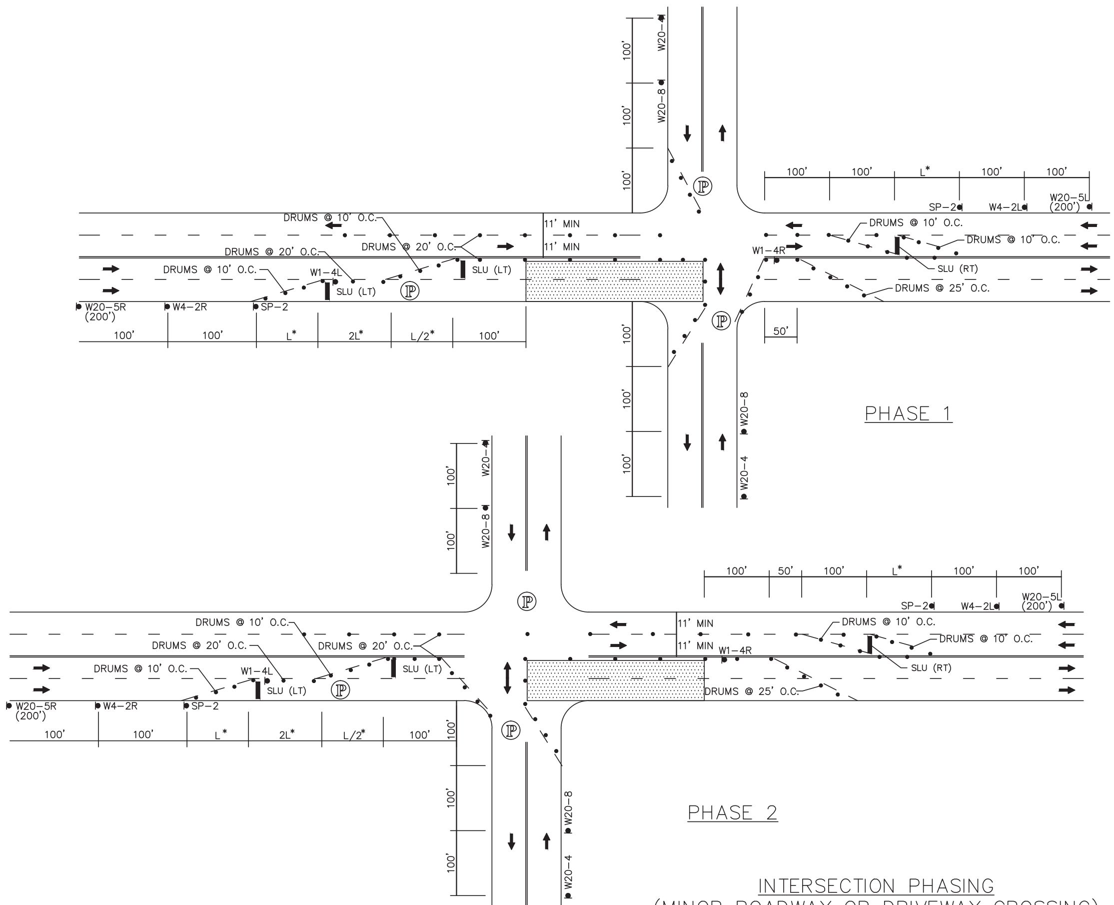
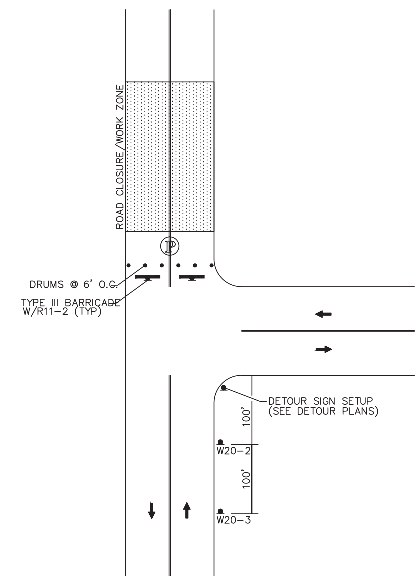


INTERSECTION PHASING
(MINOR ROADWAY OR DRIVEWAY CROSSING)
NOT TO SCALE



TYPICAL ROAD CLOSURE
(FOR ACTIVE DETOURS)
NOT TO SCALE

NOTE: FOR SIGN LEGEND AND DIMENSIONS SEE DWG. BB-P-8520

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G-68

EAST STREET CROSSING PHASE 1

EAST STREET CROSSING PHASE 2

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	DESCRIPTION	LN. FT.
		△						
		△						
		△						
		△						
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					N/A 3/20/2009			
					ISSUE FOR BID 2/04/2009			
REFERENCE DRAWINGS					REVISIONS		MATERIALS	

Vanasse Hangen Brustlin, Inc.
Transportation
Land Development
Environmental Services
101 Walnut Street, P.O. Box 9151
Watertown, Massachusetts 02471-9151
617 924 1770 • FAX 617 924 2286

	ENGINEERING APPROVALS			
DRAWN BY:	BID		CONSTRUCTION	
S.L.T.				
TITLE	SIGNATURE	DATE	SIGNATURE	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

Spectra Energy
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

YEAR: 2014	W.O. 004110598	SCALE: 1"=30'	DWG. BB-P-8519	REV. B

G-70

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	DESCRIPTION	LN. FT.
					N/A 3/20/2009			
					ISSUE FOR BID 2/04/2009			
REFERENCE DRAWINGS					REVISIONS		MATERIALS	

Vanasse Hangen Brustlin, Inc.
Transportation
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Environmental Services
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Watertown, Massachusetts 02471-9151
617 924 1770 • FAX 617 924 2286

DRAWN BY: S.L.T.

ENGINEERING APPROVALS

TITLE	BID SIGNATURE	DATE	CONSTRUCTION SIGNATURE	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

Spectra Energy
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

YEAR: 2014	W.O. 004110598	SCALE: 1"=30'	DWG. BB-P-8519	REV. B

G-71

RUSTCRAFT CROSSING PHASE 1

RUSTCRAFT CROSSING PHASE 2

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	DESCRIPTION	LN. FT.
					N/A 3/20/2009			
					ISSUE FOR BID 2/04/2009			
REFERENCE DRAWINGS					REVISIONS	MATERIALS		

Vanasse Hangen Brustlin, Inc.
Transportation
Land Development
Environmental Services
101 Walnut Street, P.O. Box 9151
Watertown, Massachusetts 02471-9151
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DRAWN BY: S.L.T.

TITLE	ENGINEERING APPROVALS			
	BID		CONSTRUCTION	
	SIGNATURE	DATE	SIGNATURE	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

Spectra Energy

Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

YEAR: 2014	W.O. 004110598	SCALE: 1"=30'	DWG. BB-P-8519	REV. B

ELM STREET AT ROBINWOOD ROAD PHASE 1

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	DESCRIPTION	LN. FT.
		2			N/A 3/20/2009			
		1			ISSUE FOR BID 2/04/2009			
REFERENCE DRAWINGS					REVISIONS	MATERIALS		

Vanasse Hangen Brustlin, Inc.
Transportation
Land Development
Environmental Services
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Watertown, Massachusetts 02471-9151
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DRAWN BY: S.L.T.

ENGINEERING APPROVALS				
TITLE	BID		CONSTRUCTION	
	SIGNATURE	DATE	SIGNATURE	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

Spectra Energy
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

YEAR: 2014	W.O. 004110598	SCALE: 1"=20'	DWG. BB-P-8519	REV. B

G-73

ELM STREET AT PROVIDENCE HIGHWAY PHASE 1

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	DESCRIPTION	LN. FT.
		B			N/A 3/20/2009			
		A			ISSUE FOR BID 2/04/2009			
REFERENCE DRAWINGS		REVISIONS				MATERIALS		

Vanasse Hangen Brustlin, Inc.
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Environmental Services
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Watertown, Massachusetts 02471-9151
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TITLE	ENGINEERING APPROVALS — BID SIGNATURE	DATE	CONSTRUCTION SIGNATURE	DATE
DRAWN BY: S.L.T.				

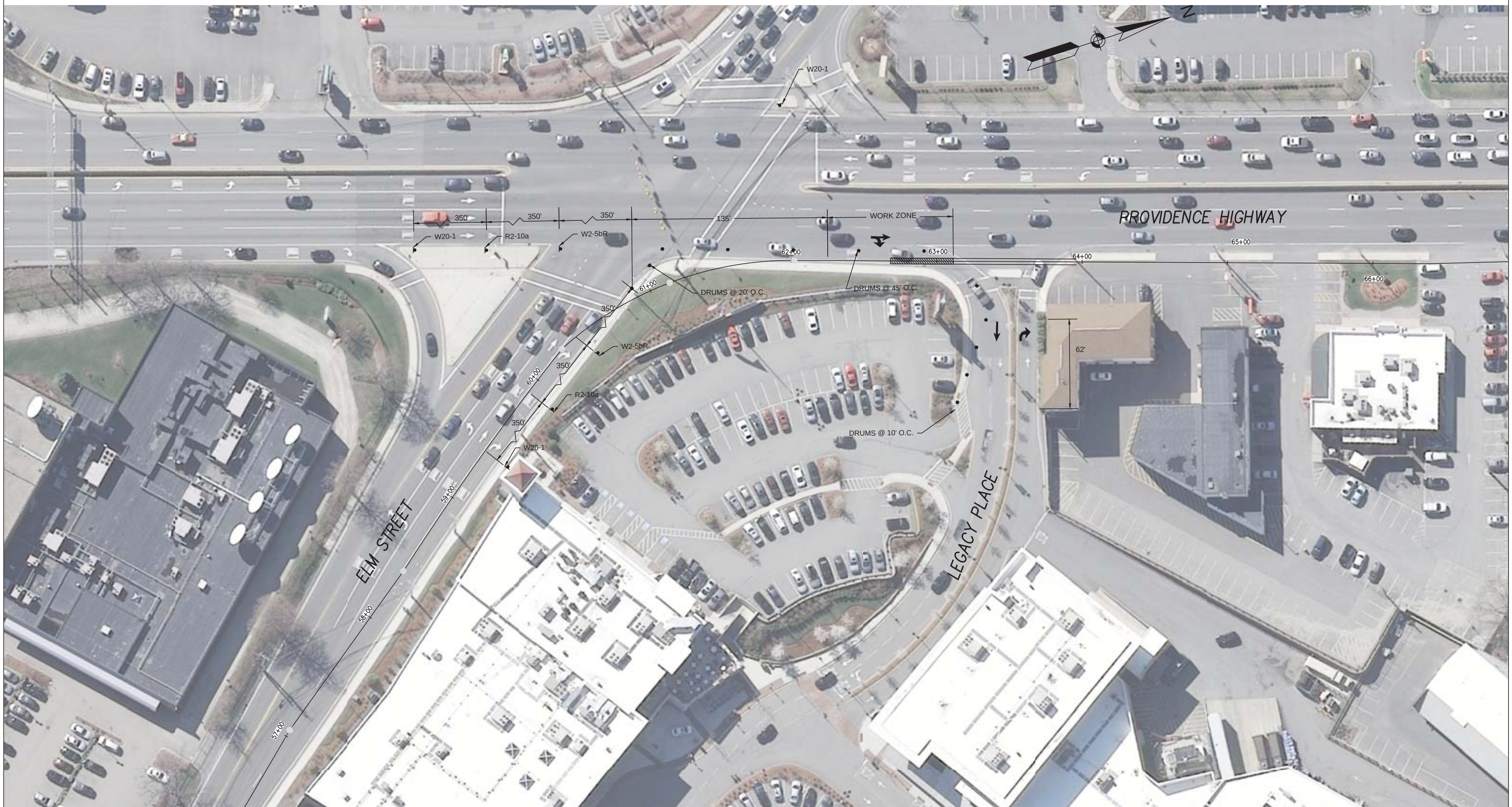
ALGONQUIN INCREMENTAL MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

Spectra Energy
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

YEAR: 2014	W.O. 004110598	SCALE: 1"=30'	DWG. BB-P-8519	REV. B

IG.#



PROVIDENCE HIGHWAY
AT LEGACY PLACE
PHASE 1

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	DESCRIPTION	LN. FT.
		B			N/A 3/20/2009			
		A			ISSUE FOR BID 2/04/2009			
REFERENCE DRAWINGS		REVISIONS				MATERIALS		

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	ENGINEERING APPROVALS			
	BID		CONSTRUCTION	
DRAWN BY:				
SALIT.				
TITLE	SIGNATURE	DATE	SIGNATURE	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

Spectra Energy
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

YEAR: 2014	W.O. 004110598	SCALE: 1"=30'	DWG. BB-P-8519	REV. B

G-75

PROVIDENCE HIGHWAY AT LEGACY PLACE PHASE 2

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	DESCRIPTION	LN. FT.
		B			N/A 3/20/2009			
		A			ISSUE FOR BID 2/04/2009			
REFERENCE DRAWINGS		REVISIONS				MATERIALS		

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Transportation
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	ENGINEERING APPROVALS			
DRAWN BY:	BID		CONSTRUCTION	
S.L.T.				
TITLE	SIGNATURE	DATE	SIGNATURE	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

Spectra Energy
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

YEAR: 2014 | W.O. 004110598 | SCALE: 1"=30' | DWG. BB-P-8519 | REV. B

IG.#

G-76

PROVIDENCE HIGHWAY AT LEGACY PLACE
PHASE 3

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	DESCRIPTION	LN. FT.
		B			N/A 3/20/2009			
		A			ISSUE FOR BID 2/04/2009			
REFERENCE DRAWINGS					REVISIONS		MATERIALS	

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	ENGINEERING APPROVALS			
DRAWN BY:	BID		CONSTRUCTION	
S.L.T.				
TITLE	SIGNATURE	DATE	SIGNATURE	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

Spectra Energy
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

YEAR: 2014 | W.O. 004110598 | SCALE: 1"=30' | DWG. BB-P-8519 | REV. B

PROVIDENCE HIGHWAY AT LEGACY BOULEVARD PHASE 1

PROVIDENCE HIGHWAY AT LEGACY BOULEVARD PHASE 2

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	DESCRIPTION	LN. FT.
		B			N/A 3/20/2009			
		A			ISSUE FOR BID 2/04/2009			
REFERENCE DRAWINGS					REVISIONS		MATERIALS	

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	ENGINEERING APPROVALS			
DRAWN BY:	BID		CONSTRUCTION	
S.L.T.		1/29		
TITLE	SIGNATURE	DATE	SIGNATURE	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

Spectra Energy
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

YEAR: 2014	W.O. 004110598	SCALE: 1"=30'	DWG. BB-P-8519	REV. B

G-78

HIGH STREET AT
EAST STREET
PHASE 1

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	DESCRIPTION	LN. FT.
		B			N/A 3/20/2009			
		A			ISSUE FOR BID 2/04/2009			
REFERENCE DRAWINGS					REVISIONS		MATERIALS	

Vanasse Hangen Brustlin, Inc.
Transportation
Land Development
Environmental Services
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Watertown, Massachusetts 02471-9151
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TITLE	ENGINEERING APPROVALS			
	BID		CONSTRUCTION	
DRAWN BY: S.L.T.				
	SIGNATURE	DATE	SIGNATURE	DATE

ALGONQUIN INCREMENTAL
MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

Spectra Energy
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

YEAR: 2014	W.O. 004110598	SCALE: 1"=30'	DWG. BB-P-8519	REV. B

HIGH STREET AT
EAST STREET
PHASE 2

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	DESCRIPTION	LN. FT.
		B			N/A 3/20/2009			
		A			ISSUE FOR BID 2/04/2009			
REFERENCE DRAWINGS					REVISIONS		MATERIALS	

Vanasse Hangen Brustlin, Inc.
Transportation
Land Development
Environmental Services
101 Walnut Street, P.O. Box 9151
Watertown, Massachusetts 02471-9151
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DRAWN BY: S.L.T.

ENGINEERING APPROVALS

TITLE	BID SIGNATURE	DATE	CONSTRUCTION SIGNATURE	DATE
DRAWN BY: S.L.T.				

ALGONQUIN INCREMENTAL
MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

YEAR: 2014 | W.O. 004110598 | SCALE: 1"=30' | DWG. BB-P-8519 | REV. B

Spectra Energy
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

G-80

EASTERN AT
PROVIDENCE
HIGHWAY
PHASE 1

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	DESCRIPTION	LN. FT.
					N/A 3/20/2009			
					ISSUE FOR BID 2/04/2009			
REFERENCE DRAWINGS					REVISIONS		MATERIALS	

Vanasse Hangen Brustlin, Inc.
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Environmental Services
101 Walnut Street, P.O. Box 9151
Watertown, Massachusetts 02471-9151
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DRAWN BY: S.L.T.

ENGINEERING APPROVALS

TITLE	BID SIGNATURE	DATE	CONSTRUCTION SIGNATURE	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

Spectra Energy
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

YEAR: 2014	W.O. 004110598	SCALE: 1"=30'	DWG. BB-P-8519	REV. B

G-81

EASTERN AT
PROVIDENCE
HIGHWAY
PHASE 2

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	DESCRIPTION	LN. FT.
		△						
		△						
		△						
		△						
		B			N/A 3/20/2009			
		A			ISSUE FOR BID 2/04/2009			
REFERENCE DRAWINGS					REVISIONS		MATERIALS	

Vanasse Hangen Brustlin, Inc.
Transportation
Land Development
Environmental Services
101 Walnut Street, P.O. Box 9151
Watertown, Massachusetts 02471-9151
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	ENGINEERING APPROVALS			
DRAWN BY:	BID		CONSTRUCTION	
S.L.T.		1/29		
TITLE	SIGNATURE	DATE	SIGNATURE	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

Spectra Energy
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

YEAR: 2014	W.O. 004110598	SCALE: 1"=30'	DWG. BB-P-8519	REV. B

G-82

EASTERN AT PROVIDENCE HIGHWAY PHASE 2

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	DESCRIPTION	LN. FT.
		A			N/A 3/20/2009			
		A			ISSUE FOR BID 2/04/2009			
REFERENCE DRAWINGS		REVISIONS				MATERIALS		

Vanasse Hangen Brustlin, Inc.
Transportation
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Environmental Services
101 Walnut Street, P.O. Box 9151
Watertown, Massachusetts 02471-9151
617 924 1770 • FAX 617 924 2286

DRAWN BY: S.L.T.

ENGINEERING APPROVALS

TITLE	BID SIGNATURE	DATE	CONSTRUCTION SIGNATURE	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

Spectra Energy
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

YEAR: 2014 | W.O. 004110598 | SCALE: 1"=30' | DWG. BB-P-8519 | REV. B

G-83

WASHINGTON STREET AT EASTBROCK ROAD
PHASE 1

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	DESCRIPTION	LN. FT.
		B			N/A 3/20/2009			
		A			ISSUE FOR BID 2/04/2009			
REFERENCE DRAWINGS		REVISIONS				MATERIALS		

IG.#

Vanasse Hangen Brustlin, Inc.
Transportation
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	ENGINEERING APPROVALS			
DRAWN BY:	BID		CONSTRUCTION	
S.L.T.				
TITLE	SIGNATURE	DATE	SIGNATURE	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

Spectra Energy
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

YEAR: 2014	W.O. 004110598	SCALE: 1"=30'	DWG. BB-P-8519	REV. B

G-84

WASHINGTON STREET AT
EASTBROCK ROAD
PHASE 2

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	DESCRIPTION	LN. FT.
		B			N/A 3/20/2009			
		A			ISSUE FOR BID 2/04/2009			
REFERENCE DRAWINGS		REVISIONS				MATERIALS		

Vanasse Hangen Brustlin, Inc.
Transportation
Land Development
Environmental Services
101 Walnut Street, P.O. Box 9151
Watertown, Massachusetts 02471-9151
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DRAWN BY: S.L.T.

ENGINEERING APPROVALS

TITLE	BID SIGNATURE	DATE	CONSTRUCTION SIGNATURE	DATE

ALGONQUIN INCREMENTAL
MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

Spectra Energy

Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

YEAR: 2014 | W.O. 004110598 | SCALE: 1"=30' | DWG. BB-P-8519 | REV. B

G-85

WASHINGTON STREET AT LOWER E STREET PHASE 1

WASHINGTON STREET AT LOWER E STREET PHASE 2

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	DESCRIPTION	LN. FT.
		△						
		△						
		△						
		△						
		B			N/A 3/20/2009			
		A			ISSUE FOR BID 2/04/2009			
REFERENCE DRAWINGS		REVISIONS				MATERIALS		

IC.#

Vanasse Hangen Brustlin, Inc.
Transportation
Land Development
Environmental Services
101 Walnut Street, P.O. Box 9151
Watertown, Massachusetts 02471-9151
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	ENGINEERING APPROVALS			
	BID		CONSTRUCTION	
DRAWN BY:				
S.L.T.		1/29		
TITLE	SIGNATURE	DATE	SIGNATURE	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

Spectra Energy
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

YEAR: 2014	W.O. 004110598	SCALE: 1"=30'	DWG. BB-P-8519	REV. B

G-86

WASHINGTON STREET
AT GROVE STREET
PHASE 1

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	DESCRIPTION	LN. FT.
		B			N/A 3/20/2009			
		A			ISSUE FOR BID 2/04/2009			
REFERENCE DRAWINGS		REVISIONS				MATERIALS		

Vanasse Hangen Brustlin, Inc.
Transportation
Land Development
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ENGINEERING APPROVALS

	BID		CONSTRUCTION	
DRAWN BY:				
S.L.T.		1/29		
TITLE	SIGNATURE	DATE	SIGNATURE	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

Spectra Energy
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

YEAR: 2014	W.O. 004110598	SCALE: 1"=30'	DWG. BB-P-8519	REV. B

IG.#

G-87

WASHINGTON STREET
AT GROVE STREET
PHASE 2

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	DESCRIPTION	LN. FT.
					N/A 3/20/2009			
					ISSUE FOR BID 2/04/2009			
REFERENCE DRAWINGS					REVISIONS		MATERIALS	

Vanasse Hangen Brustlin, Inc.
Transportation
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	ENGINEERING APPROVALS			
DRAWN BY:	BID		CONSTRUCTION	
S.L.T.		1/29		
TITLE	SIGNATURE	DATE	SIGNATURE	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

Spectra Energy
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

YEAR: 2014	W.O. 004110598	SCALE: 1"=30'	DWG. BB-P-8519	REV. B

G-88

GROVE STREET
CROSSING
PHASE 1

		△						
		△						
		△						
		△						
		B			N/A 3/20/2009			
		A			ISSUE FOR BID 2/04/2009			
DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	DESCRIPTION	LN. FT.
REFERENCE DRAWINGS		REVISIONS				MATERIALS		

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Vanasse Hangen Brustlin, Inc.
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Watertown, Massachusetts 02471-9151
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	ENGINEERING APPROVALS			
DRAWN BY:	BID		CONSTRUCTION	
S.L.T.				
TITLE	SIGNATURE	DATE	SIGNATURE	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

Spectra Energy
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

YEAR: 2014	W.O. 004110598	SCALE: 1"=30'	DWG. BB–P–8519	REV. B

G-89

GROVE STREET
CROSSING
PHASE 2

		△							
		△							
		△							
		△							
		B			N/A 3/20/2009				
		A			ISSUE FOR BID 2/04/2009				
DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	DESCRIPTION	LN. FT.	
REFERENCE DRAWINGS		REVISIONS				MATERIALS			

Vanasse Hangen Brustlin, Inc.
Transportation
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	ENGINEERING APPROVALS			
	BID		CONSTRUCTION	
DRAWN BY:				
S.L.T.				
TITLE	SIGNATURE	DATE	SIGNATURE	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

Spectra Energy
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

YEAR: 2014	W.O. 004110598	SCALE: 1"=30'	DWG. BB-P-8519	REV. B

IC.#

G-90

GROVE STREET CROSSING
PHASE 3

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	DESCRIPTION	LN. FT.
		B			N/A 3/20/2009			
		A			ISSUE FOR BID 2/04/2009			
REFERENCE DRAWINGS		REVISIONS				MATERIALS		

Vanasse Hangen Brustlin, Inc.
Transportation
Land Development
Environmental Services
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617 924 1770 • FAX 617 924 2286

DRAWN BY: S.L.T.

ENGINEERING APPROVALS

TITLE	BID SIGNATURE	DATE	CONSTRUCTION SIGNATURE	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

Spectra Energy
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

YEAR: 2014	W.O. 004110598	SCALE: 1"=30'	DWG. BB-P-8519	REV. B

G-91

CENTRE STREET AT
SPRING STREET
PHASE 1

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	DESCRIPTION	LN. FT.
		A			N/A 3/20/2009			
		B			ISSUE FOR BID 2/04/2009			
REFERENCE DRAWINGS					REVISIONS		MATERIALS	

Vanasse Hangen Brustlin, Inc.
Transportation
Land Development
Environmental Services
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Watertown, Massachusetts 02471-9151
617 924 1770 • FAX 617 924 2286

DRAWN BY: S.L.T.

ENGINEERING APPROVALS

TITLE	BID SIGNATURE	DATE	CONSTRUCTION SIGNATURE	DATE

ALGONQUIN INCREMENTAL
MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

Spectra Energy
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

YEAR: 2014 | W.O. 004110598 | SCALE: 1"=30' | DWG. BB-P-8519 | REV. B

CENTRE STREET AT
SRING STREET
PHASE 2

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	DESCRIPTION	LN. FT.
		△						
		△						
		△						
		△						
		B			N/A 3/20/2009			
		A			ISSUE FOR BID 2/04/2009			
REFERENCE DRAWINGS		REVISIONS				MATERIALS		

Vanasse Hangen Brustlin, Inc.
Transportation
Land Development
Environmental Services
101 Walnut Street, P.O. Box 9151
Watertown, Massachusetts 02471-9151
617 924 1770 • FAX 617 924 2286

	ENGINEERING APPROVALS			
DRAWN BY:	BID		CONSTRUCTION	
S.L.T.				
TITLE	SIGNATURE	DATE	SIGNATURE	DATE

ALGONQUIN INCREMENTAL
MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

Spectra Energy
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

YEAR: 2014	W.O. 004110598	SCALE: 1"=30'	DWG. BB-P-8519	REV. B

IG.#

G-93

CENTRE STREET AT
SPRING STREET
PHASE 3

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	DESCRIPTION	LN. FT.
					N/A 3/20/2009			
					ISSUE FOR BID 2/04/2009			
REFERENCE DRAWINGS					REVISIONS		MATERIALS	

Vanasse Hangen Brustlin, Inc.
Transportation
Land Development
Environmental Services
101 Walnut Street, P.O. Box 9151
Watertown, Massachusetts 02471-9151
617 924 1770 • FAX 617 924 2286

TITLE	ENGINEERING APPROVALS			
	BID		CONSTRUCTION	
DRAWN BY: S.L.T.				
	SIGNATURE	DATE	SIGNATURE	DATE

ALGONQUIN INCREMENTAL
MARKET PROJECT
WEST ROXBURY LATERAL
PROPOSED I-17 16"
TRAFFIC MANAGEMENT SHEET

LOC. NORFOLK COUNTY, MA

Spectra Energy
Algonquin Gas Transmission, LLC
5400 Westheimer Court, Houston, TX 77056-5310

YEAR: 2014	W.O. 004110598	SCALE: 1"=30'	DWG. BB-P-8519	REV. B

APPENDIX H

RESIDENCES AND OTHER STRUCTURES WITHIN 50 FEET OF THE CONSTRUCTION WORK AREA AND RESIDENTIAL CONSTRUCTION PLANS

TABLE H-1

Residences and Other Structures Within 50 Feet of the Construction Work Area for the AIM Project

Facility, County, State, Municipality	Milepost	Type of Structure	Approx. Distance from Construction Work Area (feet) [a]	Approx. Distance from Pipeline Centerline (feet)	Residential Drawing Number [b]
HAVERSTRAW TO STONY POINT TAKE-UP AND RELAY					
Rockland County, NY					
Haverstraw	0.38	Residential	5	15	HA-E-7001
	0.40	Residential	22	42	HA-E-7001
	0.42	Residential	25	46	HA-E-7001
	0.44	Residential	46	66	HA-E-7002
	0.47	Residential	3	23	HA-E-7002
	0.50	Residential	14	34	HA-E-7002
	0.57	Residential	44	64	HA-E-7003
	1.01	Residential	10	83	HA-E-7004
	1.04	Res./Comm.	9	108	HA-E-7004
	1.10	Residential	0	20	HA-E-7004
	1.10	Residential	0	18	HA-E-7004
	1.11	Residential	0	18	HA-E-7004
	1.12	Residential	0	20	HA-E-7004
	1.13	Residential	35	90	HA-E-7004
	1.13	Residential	2	22	HA-E-7005
	1.14	Residential	40	117	HA-E-7005
	1.14	Residential	43	99	HA-E-7005
	1.15	Residential	0	92	HA-E-7005
	1.15	Residential	0	49	HA-E-7005
	1.16	Residential	25	82	HA-E-7005
Stony Point	1.7	Residential	26	69	HA-E-7006
	2.02	Residential	15	35	HA-E-7007
	2.1	Residential	10	16	HA-E-7007
	2.23	Residential	17	62	HA-E-7008
	2.25	Residential	35	55	HA-E-7008
	2.26	Residential	49	104	HA-E-7008
	2.29	Residential	14	55	HA-E-7008
	2.30	Residential	28	48	HA-E-7008
	2.34	Residential	31	86	HA-E-7008
	2.35	Residential	0	18	HA-E-7008
	2.41	Residential	12	54	HA-E-7009
	2.42	Residential	17	37	HA-E-7009
	2.82	Residential	50	116	HA-E-7010
	3.14	Radio Tower Facility	10	75	NA
STONY POINT TO YORKTOWN TAKE-UP AND RELAY					
Rockland County, NY					
Stony Point	0.41	Res./Comm.	14	75	S7-E-7001
	0.42	Res./Comm.	40	114	S7-E-7002
	0.60	Shed	0	11	S7-E-7003
	0.61	Gazebo	29	54	S7-E-7003
	0.61	Residential	44	69	S7-E-7003

TABLE H-1 (cont'd)

Residences and Other Structures Within 50 Feet of the Construction Work Area for the AIM Project

Facility, County, State, Municipality	Milepost	Type of Structure	Approx. Distance from Construction Work Area (feet)	Approx. Distance from Pipeline Centerline (feet)	Residential Drawing Number [a]
	0.62	Residential	48	123	S7-E-7003
	0.65	Residential	24	99	S7-E-7003
	0.67	Residential	15	35	S7-E-7003
	1.48	Garage	12	62	NA
	1.68	Residential	43	68	S7-E-7004
	1.77	Shed	18	43	S7-E-7005
	1.79	Residential	24	49	S7-E-7005
	2.09	Patio	27	47	NA
	2.10	Shed/Pool	9	29	S7-E-7006
	2.11	Residential	0	19	S7-E-7006
	2.11	Residential	46	101	S7-E-7006
	2.17	Residential	9	64	S7-E-7006
	2.18	Residential	37	68	S7-E-7006
	2.29	Residential	10	30	S7-E-7007
	2.33	Residential	12	67	S7-E-7007
	2.43	Residential	15	35	S7-E-7008
	3.08	Residential	41	76	S7-E-7009
Westchester County, NY					
Buchanan	5.52	Garage	43	113	NA
	5.60	Commercial	42	77	NA
	5.69	Commercial	5	35	NA
	5.69	Commercial	5	70	NA
Peekskill	5.77	Commercial	5	20	S7-E-7010
	5.78	Residential	5	20	S7-E-7010
	5.80	Commercial	15	75	S7-E-7010
	5.80	Shed	10	75	S7-E-7010
	5.80	Shed	10	65	S7-E-7010
	5.80	Residential	48	148	S7-E-7010
Cortlandt	6.41	Residential	47	82	S7-E-7011
	6.53	Residential	42	107	S7-E-7011
	6.60	Residential	within	30	S7-E-7012
	8.10	Barn	5	35	S7-E-7013
	8.10	Garage	38	103	S7-E-7013
	8.11	Residential	13	78	S7-E-7013
	8.12	Ranch/Residential	45	80	S7-E-7013
	8.33	Residential	30	65	S7-E-7014
	8.35	Garage	15	50	S7-E-7014
	8.95	Shed	26	124	NA
	8.98	Residential	18	38	S7-E-7015
	9.01	Residential	15	70	S7-E-7015
	9.03	Residential	10	30	S7-E-7015
	9.07	Residential	9	29	S7-E-7015
	9.16	Residential	27	82	S7-E-7016
	9.34	Residential	5	61	S7-E-7017
	9.38	Residential	43	63	S7-E-7017
	9.41	Residential	13	68	S7-E-7017
	9.45	Residential	27	47	S7-E-7017
	9.52	Garage	35	55	NA

TABLE H-1 (cont'd)

Residences and Other Structures Within 50 Feet of the Construction Work Area for the AIM Project

Facility, County, State, Municipality	Milepost	Type of Structure	Approx. Distance from Construction Work Area (feet)	Approx. Distance from Pipeline Centerline (feet)	Residential Drawing Number [a]
	9.54	Residential	44	64	S7-E-7018
	9.58	Residential	18	73	S7-E-7018
	9.62	Residential	5	31	S7-E-7018
	9.65	Residential	25	80	S7-E-7018
	9.71	Residential	38	93	S7-E-7019
	9.75	Shed	14	34	S7-E-7019
	9.77	Residential	9	29	S7-E-7019
	9.78	Residential	18	106	S7-E-7019
	9.82	Residential	1	19	S7-E-7019
	9.83	Shed	0	20	S7-E-7020
	9.85	Residential	3	58	S7-E-7020
	9.89	Residential	30	85	S7-E-7020
	9.98	Residential	49	104	S7-E-7020
	10.00	Residential	36	56	S7-E-7021
	10.02	Residential	14	69	S7-E-7021
	10.03	Shed	30	85	S7-E-7021
	10.05	Residential	22	77	S7-E-7021
	10.08	Residential	0	20	S7-E-7021
	10.09	Residential	20	75	S7-E-7021
	10.11	Patio	15	35	S7-E-7021
	10.12	Residential	2	22	S7-E-7021
	10.18	Residential	16	71	S7-E-7022
	10.19	Residential	32	52	S7-E-7022
	10.29	Commercial	35	205	NA
	10.34	Commercial	42	204	NA
	10.36	Commercial	40	197	NA
	10.37	Commercial	38	137	NA
	10.38	Commercial	0	10	S7-E-7023
	10.38	Commercial	35	55	S7-E-7023
	10.40	Residential	40	95	S7-E-7023
	10.41	Commercial	5	25	S7-E-7023
	10.41	Residential	44	100	S7-E-7023
	10.43	Residential	5	60	S7-E-7023
	10.65	Garage	5	40	S7-E-7024
	10.67	Residential	6 [c]	17	S7-E-7024
	10.67	Residential	15	54	S7-E-7024
	10.70	Residential	0	53	S7-E-7024
	11.06	Residential	30	95	S7-E-7025
SOUTHEAST TO MLV 19 TAKE-UP AND RELAY					
Fairfield County, CT					
Danbury	0.58	Garage Entrance Ramp	20	55	NA
	1.30	Weigh Station	50	145	NA
	1.46	Commercial	18	107	NA
	1.87	Commercial	35	39	NA
	1.89	Commercial	30	130	NA
	1.91	Commercial	10	53	NA
	2.01	Commercial	5	32	NA

TABLE H-1 (cont'd)

Residences and Other Structures Within 50 Feet of the Construction Work Area for the AIM Project

Facility, County, State, Municipality	Milepost	Type of Structure	Approx. Distance from Construction Work Area (feet)	Approx. Distance from Pipeline Centerline (feet)	Residential Drawing Number [a]
	2.04	Commercial	50	80	NA
	2.20	Commercial	12	75	NA
	2.18	Residential	46	96	SQ-E-7001
	2.34	Residential	16	36	SQ-E-7002
	2.38	Residential	31	81	SQ-E-7002
	2.42	Residential	2	60	SQ-E-7002
	2.42	Residential	25	60	SQ-E-7002
	2.66	Commercial	37	72	NA
	3.14	Residential	7	53	SQ-E-7003
	3.22	Residential	48	98	SQ-E-7003
	3.23	Shed	0	32	SQ-E-7003
	3.24	Residential	46	96	SQ-E-7003
	3.30	Residential	11	62	SQ-E-7004
	3.32	Residential	3	23	SQ-E-7004
	3.34	Residential	44	119	SQ-E-7004
	3.36	Residential	23	71	SQ-E-7005
	3.42	Residential	29	82	SQ-E-7005
	3.49	Residential	9	51	SQ-E-7006
	3.77	Residential	19	69	SQ-E-7007
	3.80	Residential	10	56	SQ-E-7007
	3.84	Residential	6	56	SQ-E-7007
	3.85	Residential	35	85	SQ-E-7007
	3.88	Residential	4	52	SQ-E-7007
	3.97	Shed	46	96	SQ-E-7008
	4.01	Residential	33	83	SQ-E-7008
	4.23	Residential	25	77	SQ-E-7009
	4.28	Shed	8	61	SQ-E-7009
	4.30	Residential	32	62	SQ-E-7009
	4.30	Residential	11	52	SQ-E-7009
	4.43	Residential	30	71	SQ-E-7010
LINE-36A LOOP EXTENSION					
Middlesex County, CT					
Cromwell	1.28	Residential	8	34	CJ-E-7001
E-1 SYSTEM LATERAL LOOP EXTENSION					
New London County, CT					
Montville	0.12	Residential	23	48	CJ-E-7201
WEST ROXBURY LATERAL					
Norfolk County, MA					
Westwood	0.00	Commercial	14	65	NA
Dedham	0.52	Commercial	32	82	NA
	0.74	Commercial	47	94	NA
	0.79	Commercial	2	58	NA
	0.82	Commercial	48	101	NA
	0.85	Residential	42	91	BB-P-8500
	0.88	Residential	25	67	BB-P-8500
	0.90	Residential	16	55	BB-P-8500
	0.91	Residential	21	58	BB-P-8500
	0.92	Residential	29	69	BB-P-8500

TABLE H-1 (cont'd)

Residences and Other Structures Within 50 Feet of the Construction Work Area for the AIM Project

Facility, County, State, Municipality	Milepost	Type of Structure	Approx. Distance from Construction Work Area (feet)	Approx. Distance from Pipeline Centerline (feet)	Residential Drawing Number [a]
	0.93	Residential	26	67	BB-P-8500
	0.94	Commercial	35	53	BB-P-8500
	0.95	Residential	32	69	BB-P-8500
	0.96	Residential	23	61	BB-P-8501
	0.99	Residential	50	95	BB-P-8501
	1.01	Residential	25	68	BB-P-8501
	1.02	Residential	27	70	BB-P-8501
	1.04	Commercial	41	64	NA
	1.07	Commercial	0	74	NA
	1.13	Commercial	2	23	NA
	1.21	Commercial	8	36	NA
	1.23	Commercial	23	49	NA
	1.25	Commercial	22	46	NA
	1.27	Commercial	22	47	NA
	1.28	Commercial	18	43	NA
	1.31	Commercial	16	44	NA
	1.32	Commercial	15	44	NA
	1.36	Commercial	0	15	NA
	1.42	Commercial	20	45	NA
	1.50	Commercial	7	27	NA
	1.51	Commercial	6	27	NA
	1.67	Commercial	33	67	NA
	2.08	Commercial	43	88	BB-P-8503
	2.09	Residential	47	66	BB-P-8503
	2.20	Commercial	31	52	BB-P-8504
	2.25	Residential	47	72	BB-P-8504
	2.30	Commercial	36	49	NA
	2.35	Commercial	48	78	NA
	2.57	Commercial	2	75	NA
	2.59	Commercial	2	38	NA
	2.61	Residential	2	16	BB-P-8505
	2.62	Residential	5	20	BB-P-8505
	2.62	Residential	11	25	BB-P-8505
	2.63	Residential	0	29	BB-P-8505
	2.63	Residential	4	34	BB-P-8505
	2.64	Residential	12	25	BB-P-8505
	2.64	Residential	6	37	BB-P-8505
	2.64	Residential	20	33	BB-P-8505
	2.66	Residential	24	44	BB-P-8505
	2.67	Residential	12	38	BB-P-8505
	2.67	Residential	12	39	BB-P-8505
	2.68	Residential	9	25	BB-P-8505
	2.69	Residential	15	31	BB-P-8505
	2.69	Residential	24	52	BB-P-8506
	2.71	Residential	14	30	BB-P-8506
	2.71	Residential	5	30	BB-P-8506
	2.73	Residential	21	35	BB-P-8506
	2.75	Residential	40	70	BB-P-8506

TABLE H-1 (cont'd)

Residences and Other Structures Within 50 Feet of the Construction Work Area for the AIM Project

Facility, County, State, Municipality	Milepost	Type of Structure	Approx. Distance from Construction Work Area (feet)	Approx. Distance from Pipeline Centerline (feet)	Residential Drawing Number [a]
	2.76	Residential	36	67	BB-P-8506
	2.77	Residential	37	50	BB-P-8506
	2.78	Residential	22	49	BB-P-8507
	2.79	Residential	5	16	BB-P-8507
	2.79	Residential	25	56	BB-P-8507
	2.80	Residential	23	55	BB-P-8507
	2.80	Residential	10	21	BB-P-8507
	2.80	Residential	7	17	BB-P-8507
	2.81	Residential	29	38	BB-P-8507
	2.82	Residential	26	57	BB-P-8507
	2.82	Residential	7	17	BB-P-8507
	2.82	Residential	20	50	BB-P-8507
	2.83	Residential	6	19	BB-P-8507
	2.84	Residential	38	66	BB-P-8507
	2.84	Residential	10	25	BB-P-8507
	2.85	Residential	7	23	BB-P-8507
	2.86	Residential	9	25	BB-P-8508
	2.87	Residential	23	55	BB-P-8508
	2.88	Residential	8	23	BB-P-8508
	2.89	Residential	4	17	BB-P-8508
	2.90	Residential	4	15	BB-P-8508
	2.90	Residential	22	57	BB-P-8508
	2.92	Residential	4	15	BB-P-8508
	2.93	Residential	6	19	BB-P-8508
	2.94	Residential	32	46	BB-P-8509
	2.96	Residential	36	55	BB-P-8509
	2.97	Residential	20	39	BB-P-8509
	2.99	Residential	11	34	BB-P-8509
	3.05	Residential	22	104	BB-P-8510
	3.08	Residential	23	64	BB-P-8510
	3.08	Res./Comm.	28	44	BB-P-8510
	3.16	Residential	14	46	BB-P-8511
	3.17	Residential	18	41	BB-P-8511
	3.18	Residential	30	54	BB-P-8511
	3.19	Residential	10	50	BB-P-8511
	3.22	Residential	12	56	BB-P-8512
	3.23	Residential	22	64	BB-P-8512
	3.24	Residential	29	51	BB-P-8512
	3.24	Residential	17	60	BB-P-8512
	3.25	Residential	19	60	BB-P-8512
	3.27	Residential	14	52	BB-P-8512
	3.28	Residential	44	64	BB-P-8512
	3.29	Residential	44	68	BB-P-8512
	3.29	Residential	23	68	BB-P-8512
	3.30	Residential	36	58	BB-P-8512
	3.30	Residential	36	83	BB-P-8513
	3.32	Residential	31	49	BB-P-8513
	3.32	Residential	34	82	BB-P-8513

TABLE H-1 (cont'd)

Residences and Other Structures Within 50 Feet of the Construction Work Area for the AIM Project

Facility, County, State, Municipality	Milepost	Type of Structure	Approx. Distance from Construction Work Area (feet)	Approx. Distance from Pipeline Centerline (feet)	Residential Drawing Number [a]
	3.33	Residential	25	43	BB-P-8513
	3.34	Residential	26	43	BB-P-8513
	3.34	Residential	28	79	BB-P-8513
	3.36	Residential	24	39	BB-P-8513
	3.37	Residential	16	70	BB-P-8513
	3.38	Residential	39	96	BB-P-8513
	3.38	Residential	30	42	BB-P-8513
	3.40	Residential	34	47	BB-P-8514
	3.40	Commercial	30	85	BB-P-8514
	3.41	Residential	43	56	BB-P-8514
Suffolk County, MA					
West Roxbury, Boston	3.42	Commercial	46	102	BB-P-8514
	3.43	Residential	28	42	BB-P-8514
	3.44	Residential	28	43	BB-P-8514
	3.46	Commercial	21	77	NA
	3.46	Commercial	34	52	NA
	3.48	Residential	15	67	BB-P-8515
	3.50	Commercial	14	37	NA
	3.51	Residential	30	54	BB-P-8515
	3.51	Residential	50	102	BB-P-8515
	3.54	Residential	17	51	BB-P-8515
	3.54	Residential	19	44	BB-P-8515
	3.55	Residential	10	62	BB-P-8515
	3.57	Residential	28	80	BB-P-8515
	3.58	Residential	5	58	BB-P-8515
	3.58	Residential	7	60	BB-P-8516
	3.59	Commercial	22	73	BB-P-8516
	3.60	Residential	39	65	BB-P-8516
	3.61	Commercial	22	74	BB-P-8516
	3.63	Residential	47	71	BB-P-8516
	3.63	Commercial	16	70	BB-P-8516
	3.64	Residential	47	70	BB-P-8516
	3.67	Residential	30	51	BB-P-8517
	3.67	Commercial	39	95	NA
	3.69	Residential	34	53	BB-P-8517
	3.69	Residential	11	69	BB-P-8517
	3.70	Residential	35	54	BB-P-8517
	3.73	Commercial	15	72	NA
	3.73	Commercial	18	36	NA
	3.74	Commercial	21	44	NA
	3.75	Commercial	6	54	NA
	3.76	Commercial	13	84	NA
	3.78	Commercial	5	20	NA
	3.78	Commercial	5	20	NA
	3.79	Commercial	6	22	NA
	3.80	Commercial	0	44	BB-P-8518
	3.81	Residential	15	30	BB-P-8518
	3.82	Commercial	0	34	BB-P-8518

TABLE H-1 (cont'd)

Residences and Other Structures Within 50 Feet of the Construction Work Area for the AIM Project

Facility, County, State, Municipality	Milepost	Type of Structure	Approx. Distance from Construction Work Area (feet)	Approx. Distance from Pipeline Centerline (feet)	Residential Drawing Number [a]
	3.82	Residential	8	21	BB-P-8518
	3.83	Residential	7	21	BB-P-8518
	3.85	Residential	8	22	BB-P-8518
	3.86	Residential	11	26	BB-P-8518
	3.87	Residential	7	22	BB-P-8518
	3.88	Residential	13	56	BB-P-8518
	3.88	Residential	3	19	BB-P-8518
	3.90	Residential	21	37	BB-P-8519
	3.91	Residential	22	63	BB-P-8519
	3.91	Residential	28	41	BB-P-8519
	3.92	Residential	14	25	BB-P-8519
	3.93	Residential	10	53	BB-P-8519
	3.95	Residential	14	56	BB-P-8519
	3.97	Residential	16	58	BB-P-8519
	3.97	Residential	13	28	BB-P-8519
	3.98	Residential	24	62	BB-P-8519
	3.99	Residential	23	65	BB-P-8520
	3.99	Residential	4	21	BB-P-8520
	3.99	Residential	21	63	BB-P-8520
	3.99	Residential	6	22	BB-P-8520
	4.00	Residential	15	58	BB-P-8520
	4.00	Residential	5	20	BB-P-8520
	4.02	Residential	10	53	BB-P-8520
	4.02	Residential	7	22	BB-P-8520
	4.03	Residential	6	21	BB-P-8520
	4.03	Residential	6	21	BB-P-8520
	4.08	Residential	25	62	BB-P-8521
	4.11	Residential	19	59	BB-P-8521
	4.12	Residential	24	59	BB-P-8521
	4.14	Residential	21	52	BB-P-8521
	4.15	Residential	10	36	BB-P-8521
	4.16	Residential	20	41	BB-P-8521
	4.20	Residential	16	41	BB-P-8522
	4.21	Residential	9	36	BB-P-8522
	4.34	Residential	12	77	BB-P-8523
	4.39	Commercial	21	37	BB-P-8523
	4.40	Residential	37	85	BB-P-8523
	4.41	Residential	34	76	BB-P-8523
	4.42	Commercial	14	50	BB-P-8524
	4.42	Commercial	16	45	BB-P-8524
	4.45	Residential	22	55	BB-P-8524
	4.46	Residential	22	55	BB-P-8524
	4.47	Residential	25	59	BB-P-8524
	4.47	Residential	15	29	BB-P-8524
	4.48	Residential	23	56	BB-P-8524
	4.48	Residential	17	29	BB-P-8524
	4.49	Residential	34	67	BB-P-8524
	4.49	Residential	13	27	BB-P-8524

TABLE H-1 (cont'd)

Residences and Other Structures Within 50 Feet of the Construction Work Area for the AIM Project

Facility, County, State, Municipality	Milepost	Type of Structure	Approx. Distance from Construction Work Area (feet)	Approx. Distance from Pipeline Centerline (feet)	Residential Drawing Number [a]
	4.50	Residential	26	40	BB-P-8524
	4.51	Residential	4	36	BB-P-8524
	4.51	Residential	28	43	BB-P-8524
	4.51	Residential	5	37	BB-P-8524
	4.52	Residential	9	40	BB-P-8524
	4.53	Residential	16	47	BB-P-8524
	4.53	Residential	23	38	BB-P-8524
	4.54	Residential	15	45	BB-P-8525
	4.55	Residential	23	41	BB-P-8525
	4.55	Residential	8	39	BB-P-8525
	4.56	Residential	25	43	BB-P-8525
	4.56	Residential	25	49	BB-P-8525
	4.57	Residential	13	30	BB-P-8525
	4.57	Residential	10	33	BB-P-8525
	4.57	Residential	13	30	BB-P-8525
	4.59	Residential	25	41	BB-P-8525
	4.60	Residential	16	40	BB-P-8525
	4.60	Residential	11	28	BB-P-8525
	4.61	Residential	25	50	BB-P-8525
	4.61	Residential	21	39	BB-P-8525
	4.62	Residential	24	48	BB-P-8525
	4.64	Residential	11	27	BB-P-8526
	4.66	Residential	30	55	BB-P-8526
	4.66	Residential	9	24	BB-P-8526
	4.66	Residential	9	37	BB-P-8526
	4.67	Residential	13	29	BB-P-8526
	4.67	Residential	9	35	BB-P-8526
	4.68	Residential	13	31	BB-P-8526
	4.69	Residential	10	35	BB-P-8526
	4.69	Residential	17	37	BB-P-8526
	4.70	Residential	25	45	BB-P-8526
	4.71	Residential	12	37	BB-P-8526
	4.71	Residential	27	46	BB-P-8526
	4.71	Residential	23	47	BB-P-8526
	4.72	Residential	38	54	BB-P-8527
	4.73	Residential	21	45	BB-P-8527
	4.75	Residential	12	27	BB-P-8527
	4.75	Residential	8	24	BB-P-8527
	4.77	Residential	15	33	BB-P-8527
	4.78	Residential	24	41	BB-P-8527
	4.79	Residential	13	29	BB-P-8527
	4.80	Residential	7	22	BB-P-8527
	4.82	Residential	24	57	BB-P-8528
	4.82	Residential	40	54	BB-P-8528
	4.83	Residential	13	27	BB-P-8528
	4.84	Residential	19	32	BB-P-8528
	4.85	Residential	24	40	BB-P-8528
	4.86	Residential	24	40	BB-P-8528

TABLE H-1 (cont'd)

Residences and Other Structures Within 50 Feet of the Construction Work Area for the AIM Project

Facility, County, State, Municipality	Milepost	Type of Structure	Approx. Distance from Construction Work Area (feet)	Approx. Distance from Pipeline Centerline (feet)	Residential Drawing Number [a]
	4.88	Residential	23	36	BB-P-8528
	4.89	Residential	22	36	BB-P-8528
	4.90	Residential	12	25	BB-P-8528
	4.91	Residential	21	33	BB-P-8529
	4.92	Residential	23	40	BB-P-8529
	4.93	Residential	13	40	BB-P-8529
	4.93	Residential	11	29	BB-P-8529
	4.95	Residential	16	27	BB-P-8529
	4.95	Residential	25	60	BB-P-8529
	4.95	Residential	27	37	BB-P-8529
	4.97	Residential	6	19	BB-P-8529
	4.97	Residential	25	63	BB-P-8529
	4.97	Residential	29	67	BB-P-8529
	4.99	Residential	34	73	BB-P-8529
	4.99	Residential	36	48	BB-P-8529/8530
	5.00	Residential	3	25	BB-P-8530
	5.03	Commercial	24	73	BB-P-8530
	5.08	Commercial	16	70	BB-P-8530
	5.09	Commercial	15	64	BB-P-8530
	5.12	Church	16	46	NA

[a] A distance of 0 feet indicates that the structure is located at the edge of the construction work area.
[b] "NA" indicates non-residential structures not included on residential plan drawings.
[c] Residence would be displaced as a result of construction and operation of the AIM Project (see section 4.9.7 of the EIS).

AIM PROJECT
RESIDENTIAL SITE SPECIFIC CROSSING PLANS - DETAIL SHEET

General

In general, the following measures will be taken in residential properties:

- Notify local residents in advance of construction activities;
- Install safety fence, a minimum 100' on either side of 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 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 stricture or when an open ditch would adversely impact a residential or commercial structure. The technique involves installing 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. 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-0001
- 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, and 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 as practicable to their previous locations.
- Removal and replacement responsibility will be an issue that is 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 1-866-873-2579. 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.

REV.#	DESCRIPTION	DATE
D	RE-ISSUED FOR CLIENT REVIEW	03/11/14
C	NOT ISSUED	03/11/14
B	NOT ISSUED	03/11/14
A	ISSUED FOR INTERNAL REVIEW	01/27/14

IG. #

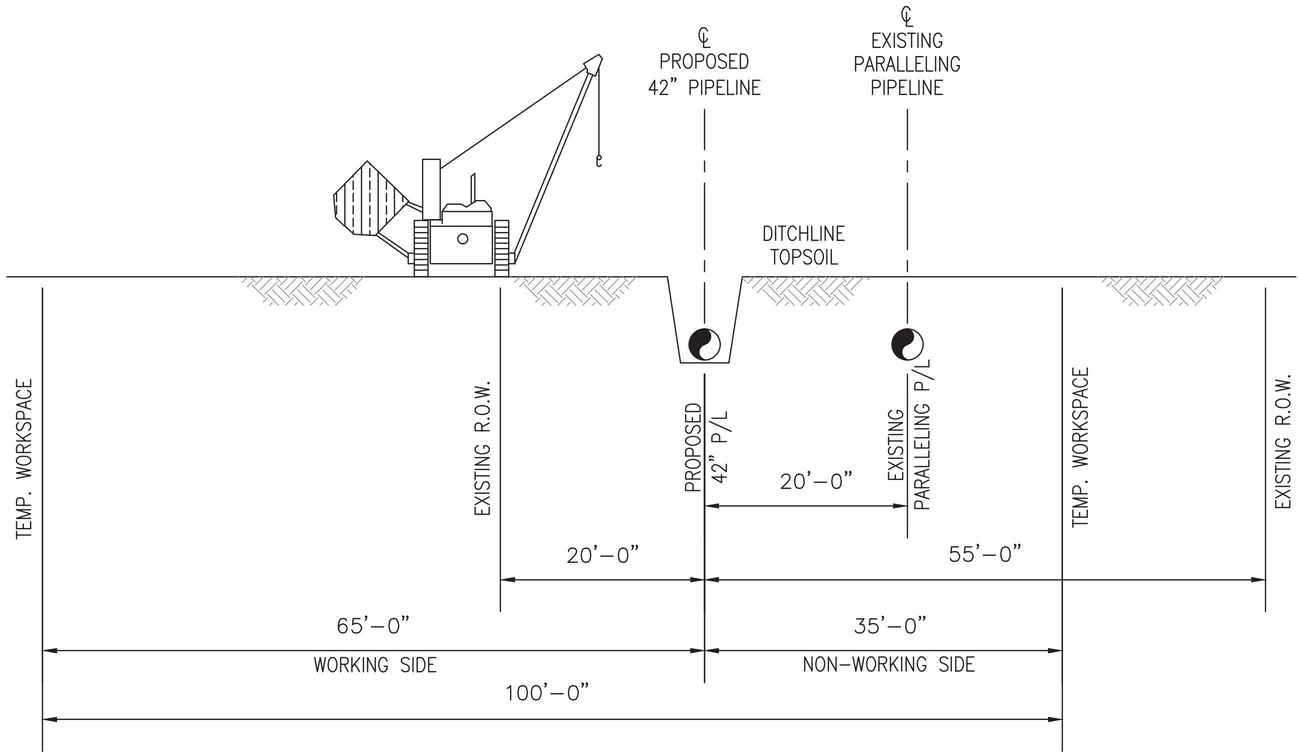
PROJ. ENG.	CCW	01/29/14
CHECKED BY:	CCW	01/29/14
DRAWN BY:	APW	01/23/14
SCALE:		DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
RESIDENTIAL SITE SPECIFIC CROSSING PLANS
DETAIL SHEET

LOC.: REV.: D
YR.: 2014 W.O.: DWG. NO.: HA-E-7011

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400



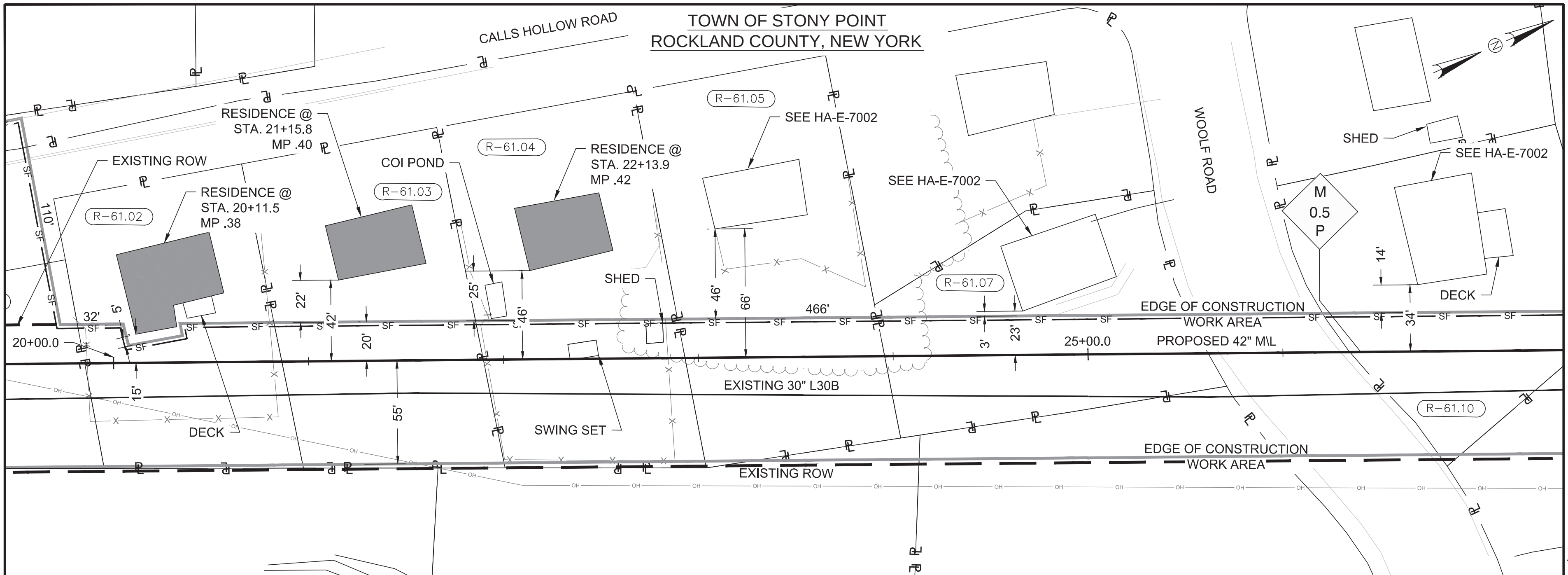
TYPICAL 100' PIPELINE CONSTRUCTION
R.O.W. CONFIGURATION FOR 42" PIPELINE

LOC.: N/A			REV.: C
CKD. BY: CCW	ENG.: CCW	DATE: 10/24/13	W.O.
DRN. BY: APW	SCALE: N.T.S.	DWG. NO.: ES–0001	

I.G. #

Spectra Energy

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400



SCALE: 1"=50'

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UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

DESCRIPTION:

AT SURVEY STATION 20+11.5 THERE IS A RESIDENCE 5' LEFT OF THE CWA AND 15' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M\L.

AT SURVEY STATION 21+15.8 THERE IS A RESIDENCE 22' LEFT OF THE CWA AND 42' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M\L.

AT SURVEY STATION 22+13.9 THERE IS A RESIDENCE 25' LEFT OF THE CWA AND 46' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M\L.

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
D	RE-ISSUED FOR CLIENT REVIEW	03/11/14
C	RE-ISSUED FOR CLIENT REVIEW	03/06/14
B	ISSUED FOR CLIENT REVIEW	12/12/13
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

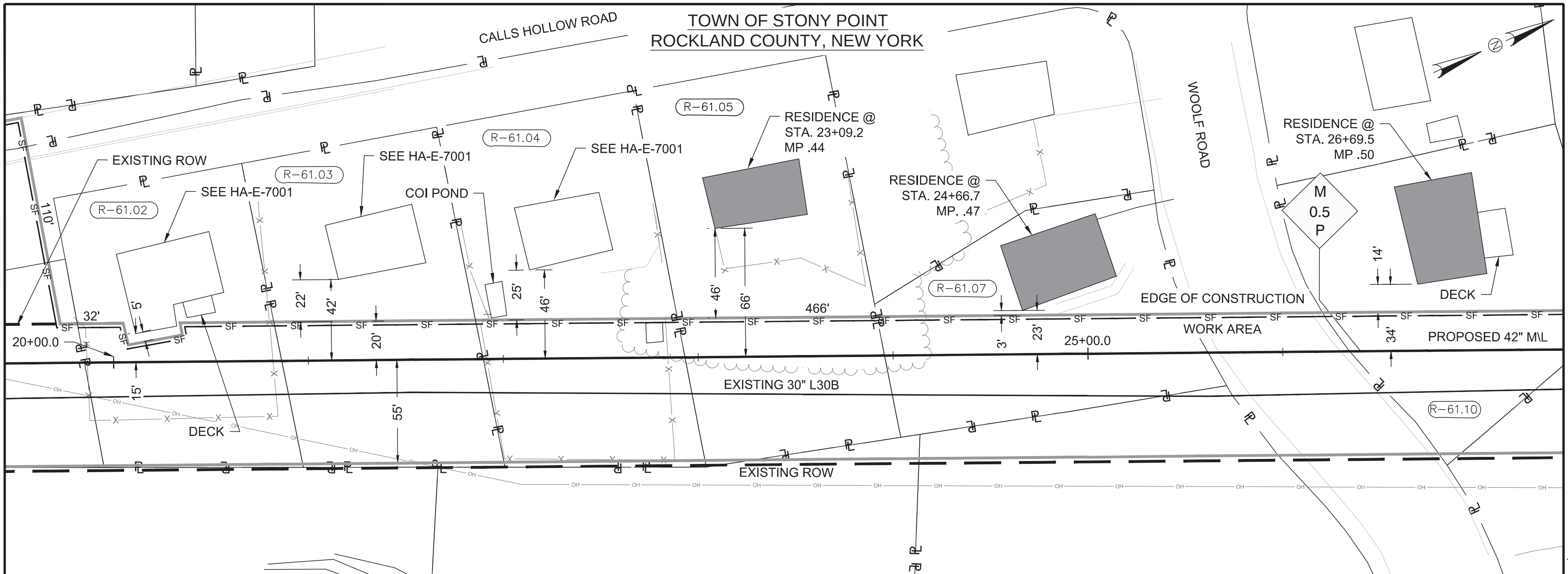
PROJ. ENG.	CCW	12/12/13
CHECKED BY:	APW	12/12/13
DRAWN BY:	TMR	11/13/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
HANOVER DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: ROCKLAND COUNTY, NEW YORK | REV.: D
YR.: 2014 | W.O.: | DWG. NO.: HA-E-7001

Spectra Energy Partners.
Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 - Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series - Site specific residential dwgs\Hanover\HA-E-7001.dwg - PLOT TIME: 3/11/2014 5:41 PM



SCALE: 1"=50'

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UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

DESCRIPTION:

AT SURVEY STATION 23+09.2 THERE IS A RESIDENCE 46' LEFT OF THE CWA AND 66' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M\L.

AT SURVEY STATION 24+66.7 THERE IS A RESIDENCE 3' LEFT OF THE CWA AND 23' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M\L.

AT SURVEY STATION 26+69.5 THERE IS A RESIDENCE 14' LEFT OF THE CWA AND 34' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M\L.

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
D	RE-ISSUED FOR CLIENT REVIEW	03/11/14
C	RE-ISSUED FOR CLIENT REVIEW	03/06/14
B	ISSUED FOR CLIENT REVIEW	12/12/13
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	12/12/13
CHECKED BY:	APW	12/12/13
DRAWN BY:	TMR	11/13/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
HANOVER DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: ROCKLAND COUNTY, NEW YORK | REV.: D

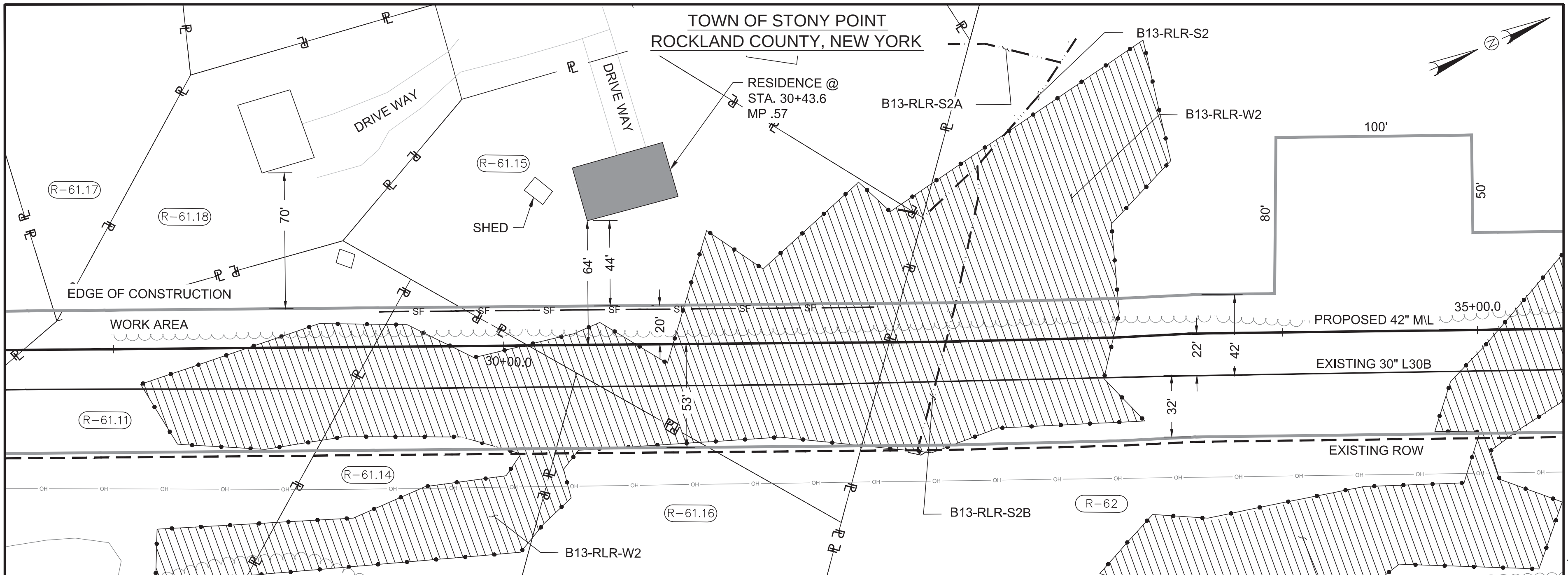
YR.: 2014 | W.O.: | DWG. NO.: HA-E-7002

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 - Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series - Site specific residential dwgs\Hanover\HA-E-7002.dwg - PLOT TIME: 3/11/2014 2:56 PM

APPENDIX H (cont'd)



SCALE: 1"=50'

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UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

DESCRIPTION:

AT SURVEY STATION 30+43.6 THERE IS A RESIDENCE 44' LEFT OF THE CWA AND 64' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M\L.

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
D	RE-ISSUED FOR CLIENT REVIEW	03/11/14
C	RE-ISSUED FOR CLIENT REVIEW	03/06/14
B	ISSUED FOR CLIENT REVIEW	12/12/13
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	12/12/13
CHECKED BY:	APW	12/12/13
DRAWN BY:	TMR	11/13/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
HANOVER DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

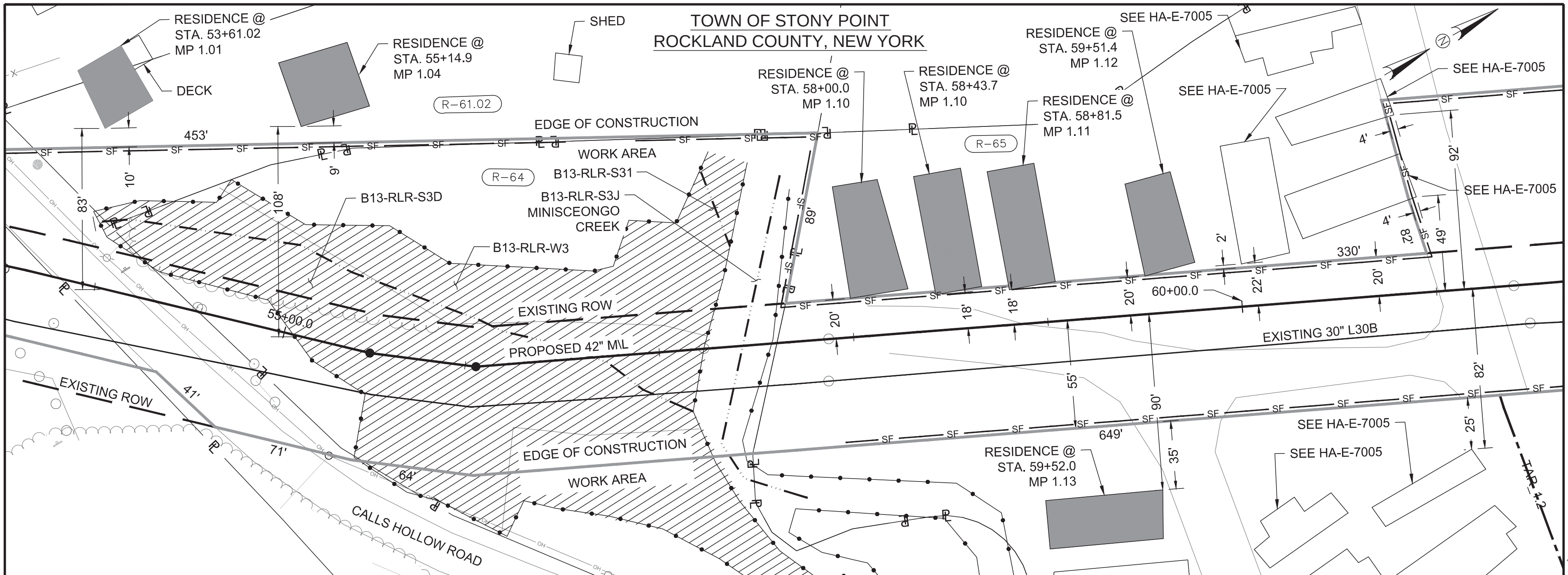
LOC.: ROCKLAND COUNTY, NEW YORK — REV.: D

YR.: 2014 — W.O.: — DWG. NO.: HA-E-7003

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 - Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series - Site specific residential dwgs\Hanover\HA-E-7003.dwg - PLOT TIME: 3/11/2014 5:38 PM



SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

LEGEND

PROPOSED PIPELINE	
EXISTING RIGHT-OF-WAY (ROW)	
NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)	
CONSTRUCTION WORK AREA (CWA)	
EXISTING PIPELINE	
FENCE LINE	X
SAFETY FENCE	SF
PROPERTY LINE	PL
OVERHEAD POWER LINE	OH
TREE LINE	

DESCRIPTION:

AT SURVEY STATION 53+61.02 THERE IS A RESIDENCE 10' LEFT OF THE CWA AND 83' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 55+14.9 THERE IS A RESIDENCE 9' LEFT OF THE CWA AND 108' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 58+00.0 THERE IS A RESIDENCE AT THE EDGE OF THE CWA AND 20' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 58+43.7 THERE IS A RESIDENCE AT THE EDGE OF THE CWA AND 18' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 58+81.5 THERE IS A RESIDENCE AT THE EDGE OF THE CWA AND 18' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L

DESCRIPTION CONTINUED:

AT SURVEY STATION 59+51.4 THERE IS A RESIDENCE AT THE EDGE OF THE CWA AND 20' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 59+52.0 THERE IS A RESIDENCE 35' RIGHT OF THE CWA AND 90' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
D	RE-ISSUED FOR CLIENT REVIEW	03/11/14
C	RE-ISSUED FOR CLIENT REVIEW	03/06/14
B	ISSUED FOR CLIENT REVIEW	12/12/13
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	12/12/13
CHECKED BY:	APW	12/12/13
DRAWN BY:	TMR	11/13/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
HANOVER DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: ROCKLAND COUNTY, NEW YORK | REV.: D

YR.: 2014 | W.O.: | DWG. NO.: HA-E-7004

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 - Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series - Site specific residential dwgs\Hanover\HA-E-7004.dwg - PLOT TIME: 3/11/2014 5:26 PM

APPENDIX H (cont'd)

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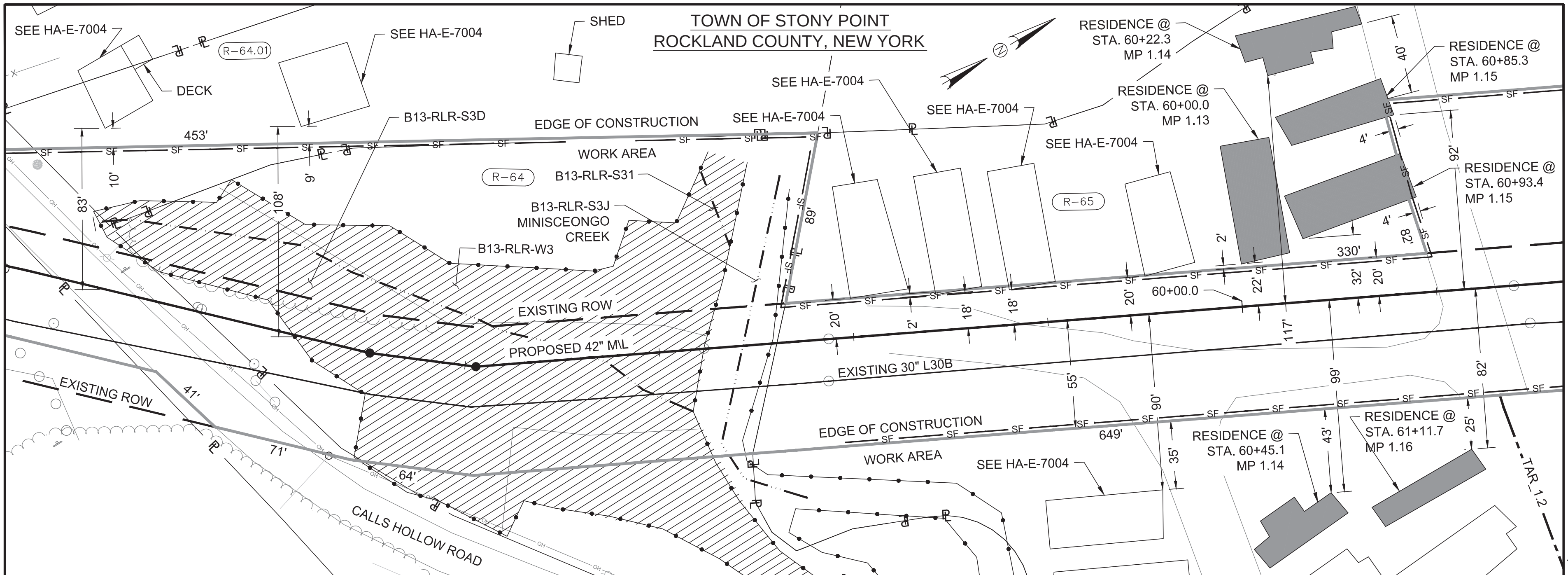


SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

DESCRIPTION:

AT SURVEY STATION 60+00.0 THERE IS A RESIDENCE 2' LEFT OF THE CWA AND 22' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 60+22.3 THERE IS A RESIDENCE 40' LEFT OF THE CWA AND 117' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 60+45.1 THERE IS A RESIDENCE 43' RIGHT OF THE CWA AND 99' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 60+93.4 THERE IS A RESIDENCE AT THE EDGE OF THE CWA AND 49' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 60+85.3 THERE IS A RESIDENCE AT THE EDGE OF THE CWA AND 92' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

DESCRIPTION CONTINUED:

AT SURVEY STATION 61+11.7 THERE IS A RESIDENCE 25' RIGHT OF THE CWA AND 82' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
D	RE-ISSUED FOR CLIENT REVIEW	03/11/14
C	RE-ISSUED FOR CLIENT REVIEW	03/06/14
B	ISSUED FOR CLIENT REVIEW	12/12/13
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	12/12/13
CHECKED BY:	APW	12/12/13
DRAWN BY:	TMR	11/13/13
SCALE:	1"=50'	DATE

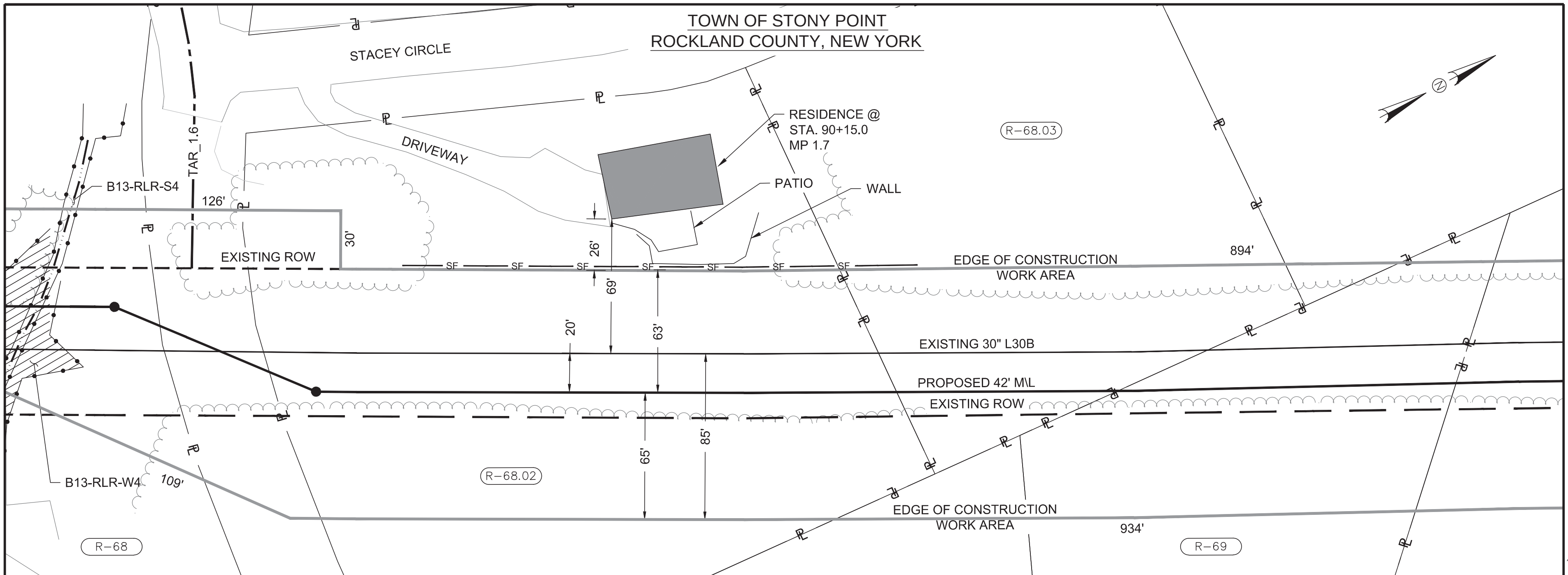
ALGONQUIN INCREMENTAL MARKET PROJECT
HANOVER DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: ROCKLAND COUNTY, NEW YORK | REV.: D

YR.: 2014 | W.O.: | DWG. NO.: HA-E-7005

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400



SCALE: 1"=50'

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UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

DESCRIPTION:

AT SURVEY STATION 90+15.0 THERE IS A RESIDENCE 26' LEFT OF THE CWA AND 69' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE (X)
- SAFETY FENCE (SF)
- PROPERTY LINE (PL)
- OVERHEAD POWER LINE (OH)
- TREE LINE

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
D	RE-ISSUED FOR CLIENT REVIEW	03/11/14
C	RE-ISSUED FOR CLIENT REVIEW	03/06/14
B	ISSUED FOR CLIENT REVIEW	12/12/13
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	12/12/13
CHECKED BY:	APW	12/12/13
DRAWN BY:	TMR	11/13/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
HANOVER DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: ROCKLAND COUNTY, NEW YORK | REV.: D

YR.: 2014 | W.O.: | DWG. NO.: HA-E-7006

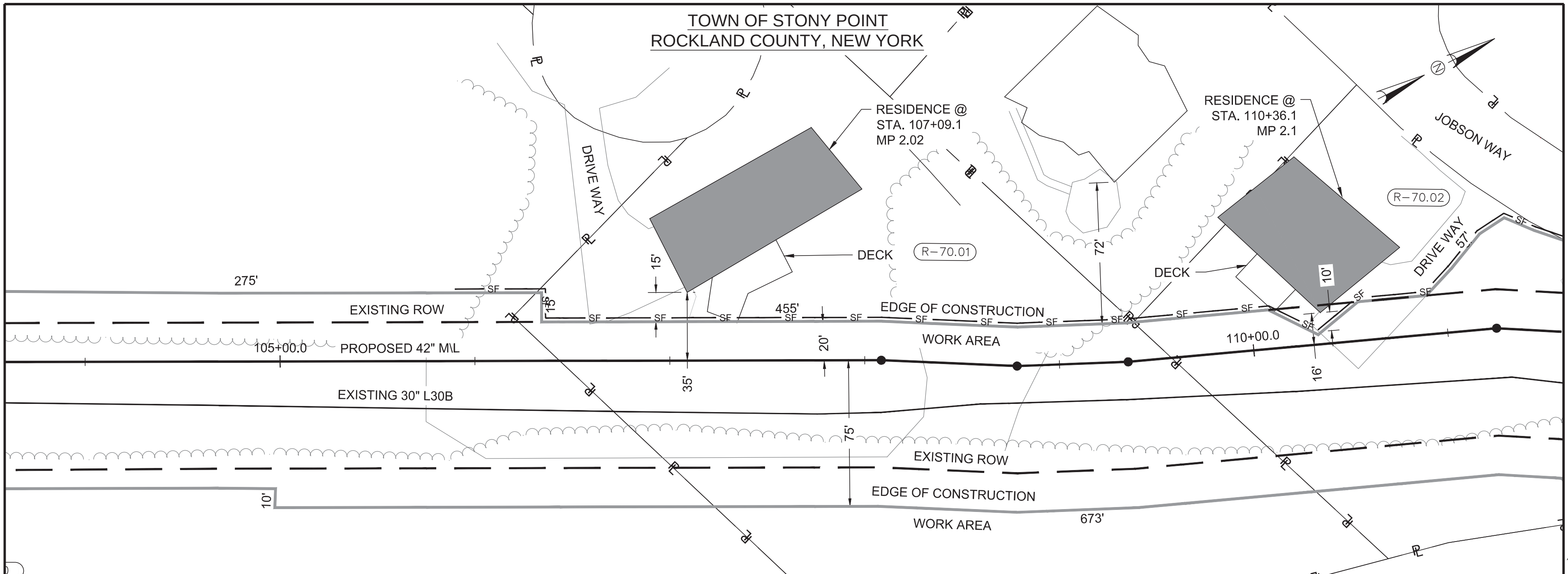
Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 – Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series – Site specific residential dwgs\Hanover\HA-E-7007.dwg – PLOT TIME: 3/11/2014 3:44 PM

H-19

APPENDIX H (cont'd)



SCALE: 1"=50'

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UTM NAD83, ZONE 18, US FOOT (UTM83–18F)

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT–OF–WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT–OF–WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

DESCRIPTION:

AT SURVEY STATION 107+09.1 THERE IS A RESIDENCE 15' LEFT OF THE CWA AND 35' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 110+36.1 THERE IS A RESIDENCE 10' LEFT OF THE CWA AND 16' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING–SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
D	RE–ISSUED FOR CLIENT REVIEW	03/11/14
C	RE–ISSUED FOR CLIENT REVIEW	03/06/14
B	ISSUED FOR CLIENT REVIEW	12/12/13
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG. #

PROJ. ENG.	CCW	12/12/13
CHECKED BY:	APW	12/12/13
DRAWN BY:	TMR	11/13/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
HANOVER DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

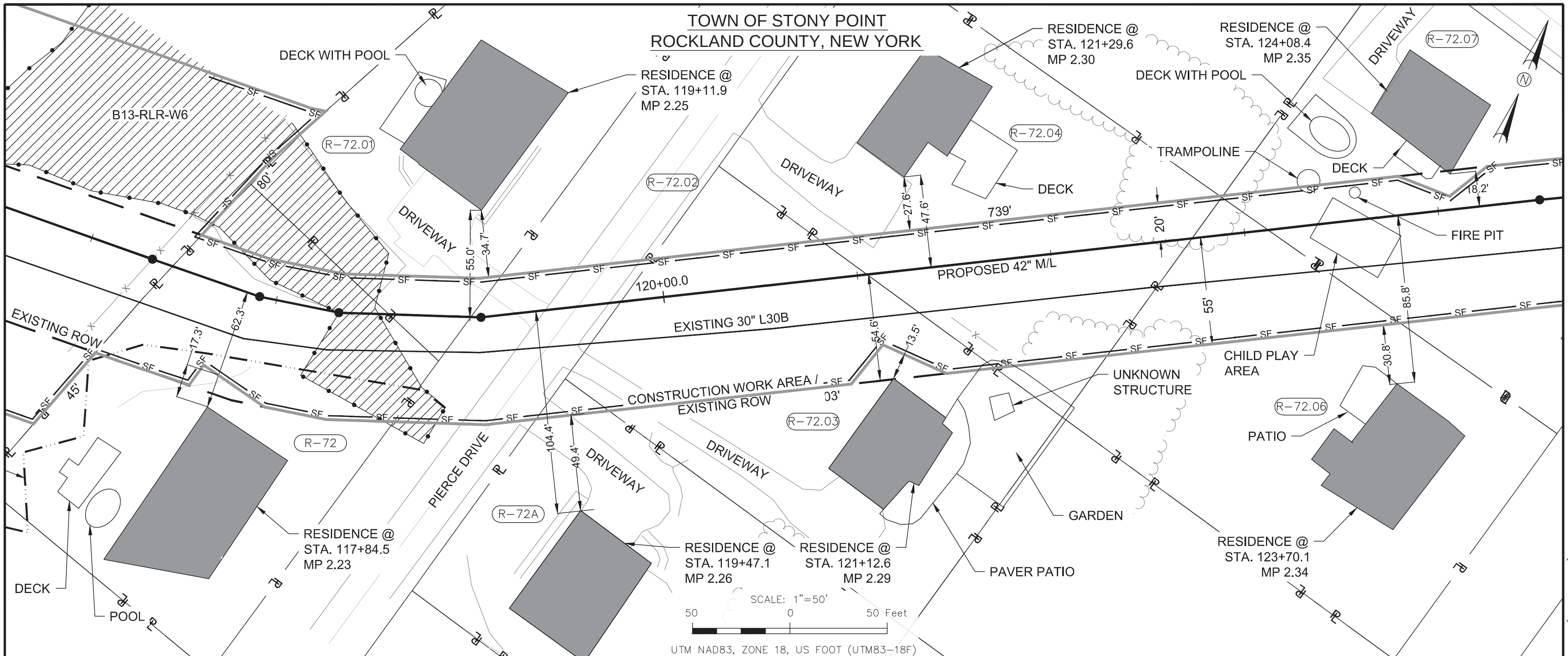
LOC.: ROCKLAND COUNTY, NEW YORK | REV.: D

YR.: 2014 | W.O.: | DWG. NO.: HA–E–7007

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 - Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series - Site specific residential dwgs\Hanover\HA-E-7008.dwg - PLOT TIME: 3/11/2014 5:29 PM



LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

DESCRIPTION:

AT SURVEY STATION 117+84.5 THERE IS A RESIDENCE 17.3' RIGHT OF THE CWA AND 62.3' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 119+11.9 THERE IS A RESIDENCE 34.7' LEFT OF THE CWA AND 55.0' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 119+47.1 THERE IS A RESIDENCE 49.4' RIGHT OF THE CWA AND 104.4' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 121+12.6 THERE IS A RESIDENCE 13.5' RIGHT OF THE CWA AND 54.6' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 121+29.6 THERE IS A RESIDENCE 27.6' LEFT OF THE CWA AND 47.6' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 123+70.1 THERE IS A RESIDENCE 30.8' LEFT OF THE CWA AND 85.8' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 124+08.4 THERE IS A RESIDENCE AT THE EDGE OF THE CWA AND 18.2' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

REV.#	DESCRIPTION	DATE
E	RE-ISSUED FOR CLIENT REVIEW	03/11/14
D	RE-ISSUED FOR CLIENT REVIEW	03/06/14
C	ISSUED FOR CLIENT REVIEW	02/13/14
B	ISSUED FOR INTERNAL REVIEW	12/12/13

IG.#

PROJ. ENG.	CCW	12/12/13
CHECKED BY:	APW	12/12/13
DRAWN BY:	TMR	11/13/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
HANOVER DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: ROCKLAND COUNTY, NEW YORK | REV.: E

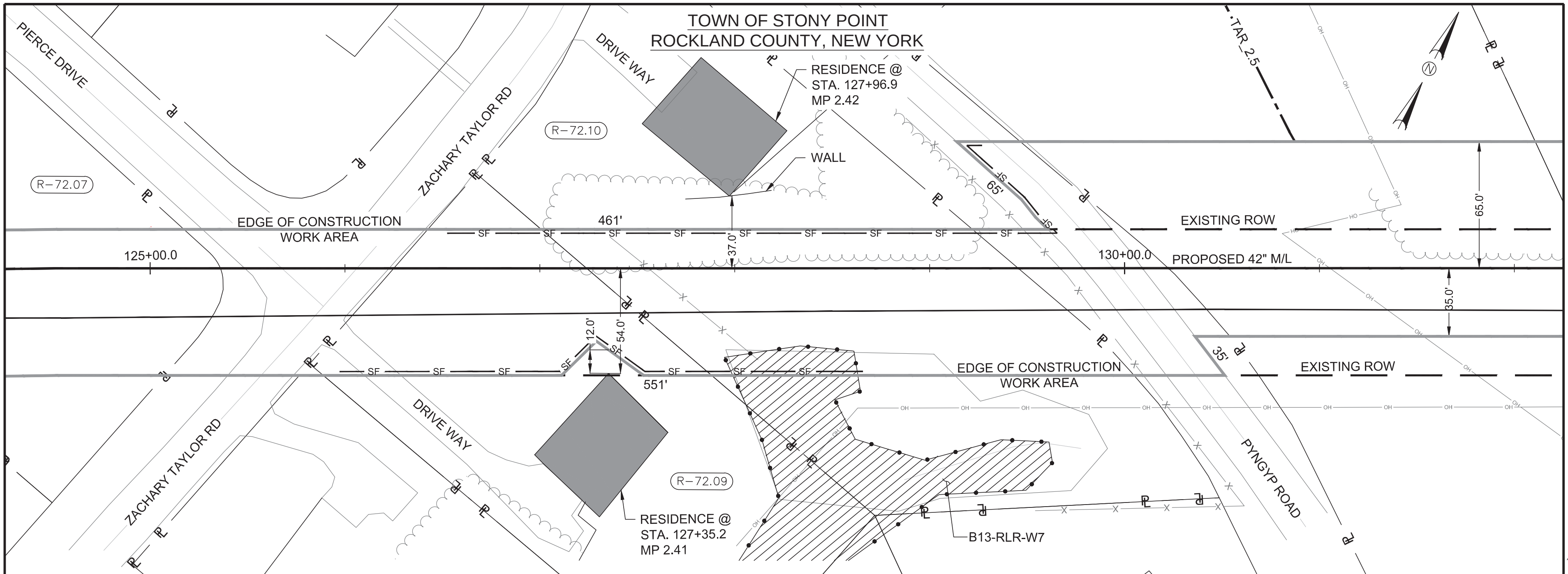
YR.: 2014 | W.O.: | DWG. NO.: HA-E-7008

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 - Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series - Site specific residential dwgs\Hanover\HA-E-7009.dwg - PLOT TIME: 3/11/2014 4:04 PM

TOWN OF STONY POINT
ROCKLAND COUNTY, NEW YORK



SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

DESCRIPTION:

AT SURVEY STATION 127+35.2 THERE IS A RESIDENCE 12.' RIGHT OF THE CWA AND 54' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 127+96.9 THERE IS A RESIDENCE 17' LEFT OF THE CWA AND 37' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE (X)
- SAFETY FENCE (SF)
- PROPERTY LINE (℄)
- OVERHEAD POWER LINE (OH)
- TREE LINE

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

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D	RE-ISSUED FOR CLIENT REVIEW	03/11/14
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B	ISSUED FOR CLIENT REVIEW	12/12/13
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	12/12/13
CHECKED BY:	APW	12/12/13
DRAWN BY:	TMR	11/13/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
HANOVER DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

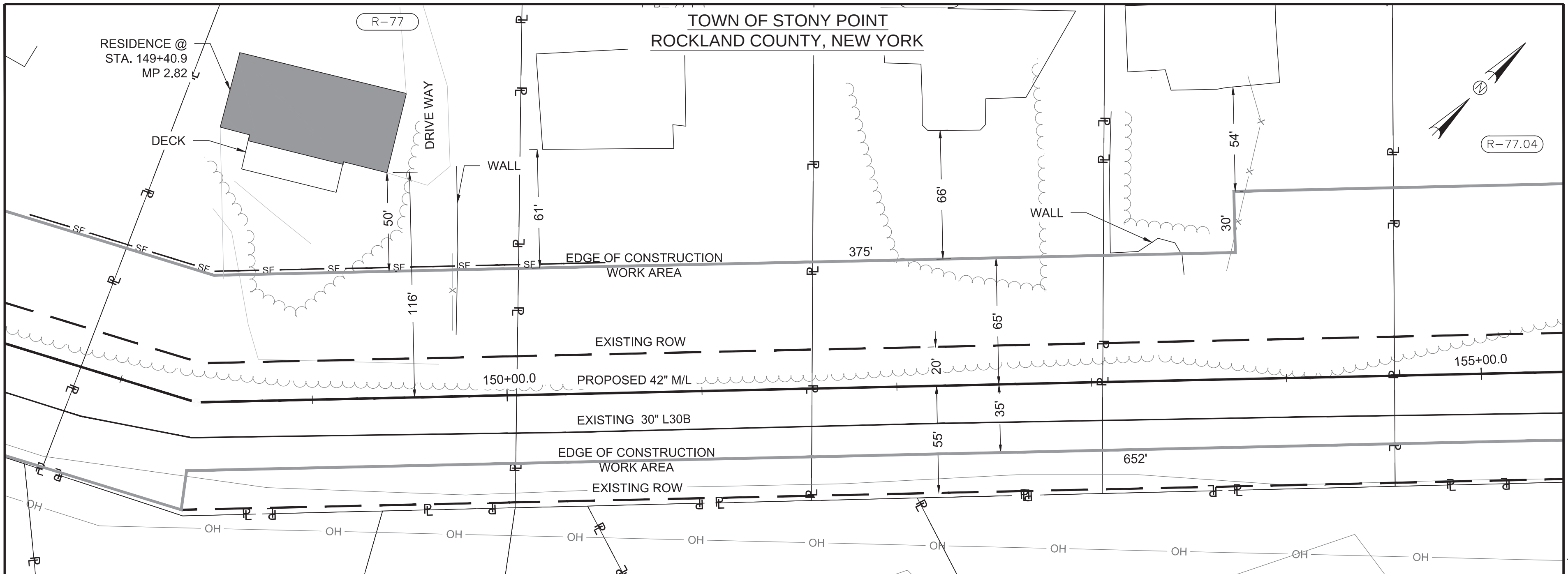
LOC.: ROCKLAND COUNTY, NEW YORK | REV.: D
YR.: 2014 | W.O.: | DWG. NO.: HA-E-7009

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

H-21

APPENDIX H (cont'd)



SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

DESCRIPTION:

AT SURVEY STATION 149+40.9 THERE IS A RESIDENCE 50' LEFT OF THE CWA AND 116' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
D	RE-ISSUED FOR CLIENT REVIEW	03/11/14
C	RE-ISSUED FOR CLIENT REVIEW	03/06/14
B	ISSUED FOR CLIENT REVIEW	12/12/13
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	12/12/13
CHECKED BY:	APW	12/12/13
DRAWN BY:	TMR	11/13/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
HANOVER DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: ROCKLAND COUNTY, NEW YORK | REV.: D

YR.: 2014 | W.O.: | DWG. NO.: HA-E-7010

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

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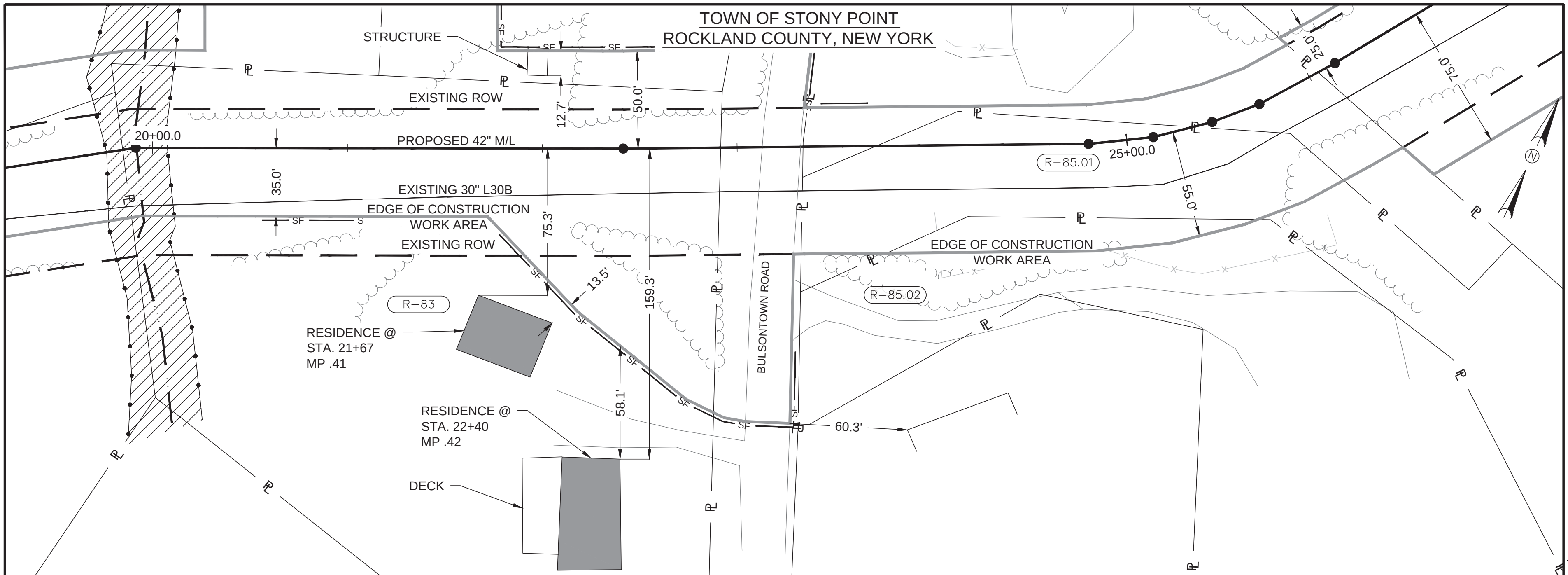


SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

DESCRIPTION:

AT SURVEY STATION 22+67 THERE IS A STRUCTURE 13.5' RIGHT OF THE CWA AND 75.3' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 22+40 THERE IS A STRUCTURE 58.1' RIGHT OF THE CWA AND 159.3' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

LEGEND

PROPOSED PIPELINE
EXISTING RIGHT-OF-WAY (ROW)
NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
CONSTRUCTION WORK AREA (CWA)
EXISTING PIPELINE
FENCE LINE
SAFETY FENCE
PROPERTY LINE
OVERHEAD POWER LINE
TREE LINE

NOTES:
1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
B	ISSUED FOR CLIENT REVIEW	03/12/14
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	03/12/14
CHECKED BY:	APW	03/12/14
DRAWN BY:	TMR	11/14/13
SCALE:	1"=50'	DATE

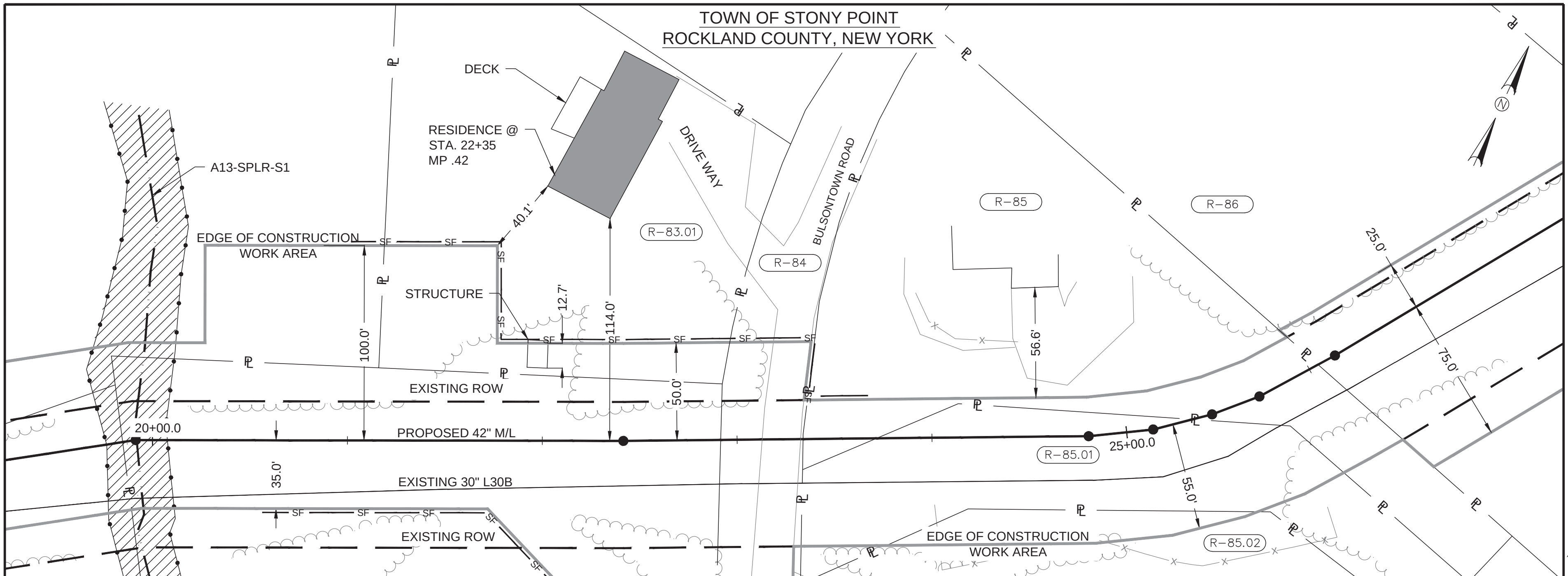
ALGONQUIN INCREMENTAL MARKET PROJECT
STONY POINT TO DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: ROCKLAND COUNTY, NEW YORK | REV.: B
YR.: 2014 | W.O.: | DWG. NO.: S7-E-7001

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

APPENDIX H (cont'd)



SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

DESCRIPTION:

AT SURVEY STATION 22+35 THERE IS A STRUCTURE 40.1' RIGHT OF THE CWA AND 114' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

NOTES:
1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
B	ISSUED FOR CLIENT REVIEW	03/12/14
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IC.#

PROJ. ENG.	CCW	03/12/14
CHECKED BY:	APW	03/12/14
DRAWN BY:	TMR	11/14/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
STONY POINT TO DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

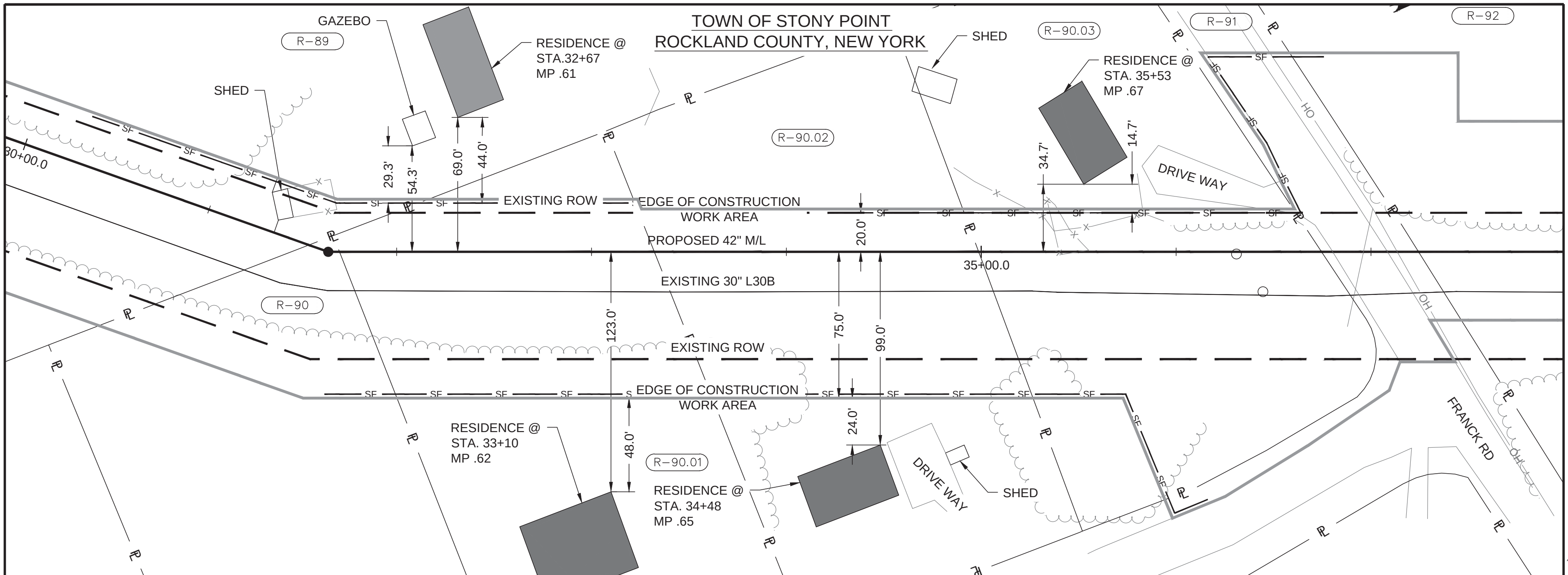
LOC.: ROCKLAND COUNTY, NEW YORK | REV.: B

YR.: 2014 | W.O.: | DWG. NO.: S7-E-7002

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 - Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series - Site specific residential dwgs\Stony Point\S7-E-7002.dwg - PLOT TIME: 3/12/2014 1:21 PM



SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

DESCRIPTION:

AT SURVEY STATION 32+43 THERE IS A STRUCTURE 29.3' LEFT OF THE CWA AND 54.3' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 32+67 THERE IS A RESIDENCE 44.0' LEFT OF THE CWA AND 69.0' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 33+10 THERE IS A STRUCTURE 48.0' RIGHT OF THE CWA AND 123.0' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 34+48 THERE IS A RESIDENCE 24.0' RIGHT OF THE CWA AND 99.0' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 35+53 THERE IS A RESIDENCE 14.7' LEFT OF THE CWA AND 34.7' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

NOTES:
1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
B	ISSUED FOR CLIENT REVIEW	03/12/14
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	03/12/14
CHECKED BY:	APW	03/12/14
DRAWN BY:	TMR	11/18/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
STONY POINT TO DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: ROCKLAND COUNTY, NEW YORK | REV.: B

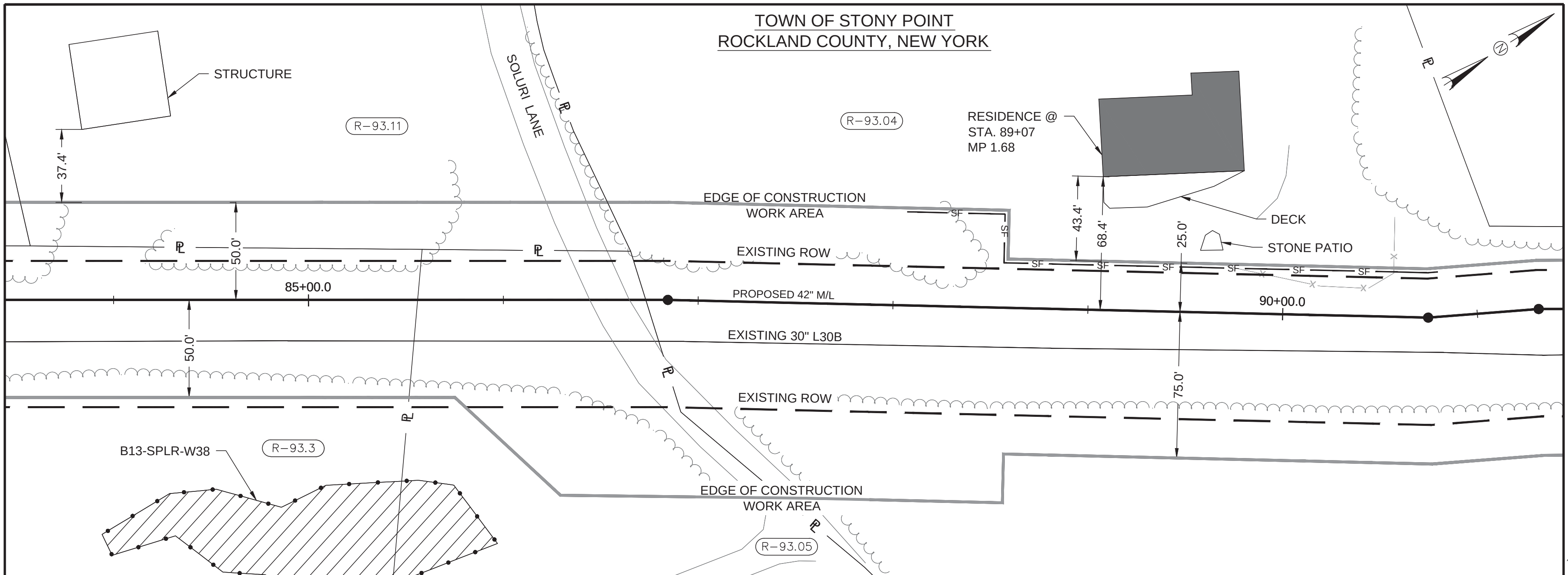
YR.: 2014 | W.O.: | DWG. NO.: S7-E-7003

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 - Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series - Site specific residential dwgs\Stony Point\S7-E-7003.dwg - PLOT TIME: 3/12/2014 1:10 PM

APPENDIX H (cont'd)



SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83–18F)

DESCRIPTION:

AT SURVEY STATION 89+07 THERE IS A RESIDENCE 43.4' LEFT OF THE CWA AND 68.4' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT–OF–WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT–OF–WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING–SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
B	ISSUED FOR CLIENT REVIEW	03/12/14
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	03/12/14
CHECKED BY:	APW	03/12/14
DRAWN BY:	TMR	11/18/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
STONY POINT TO DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: ROCKLAND COUNTY, NEW YORK | REV.: B

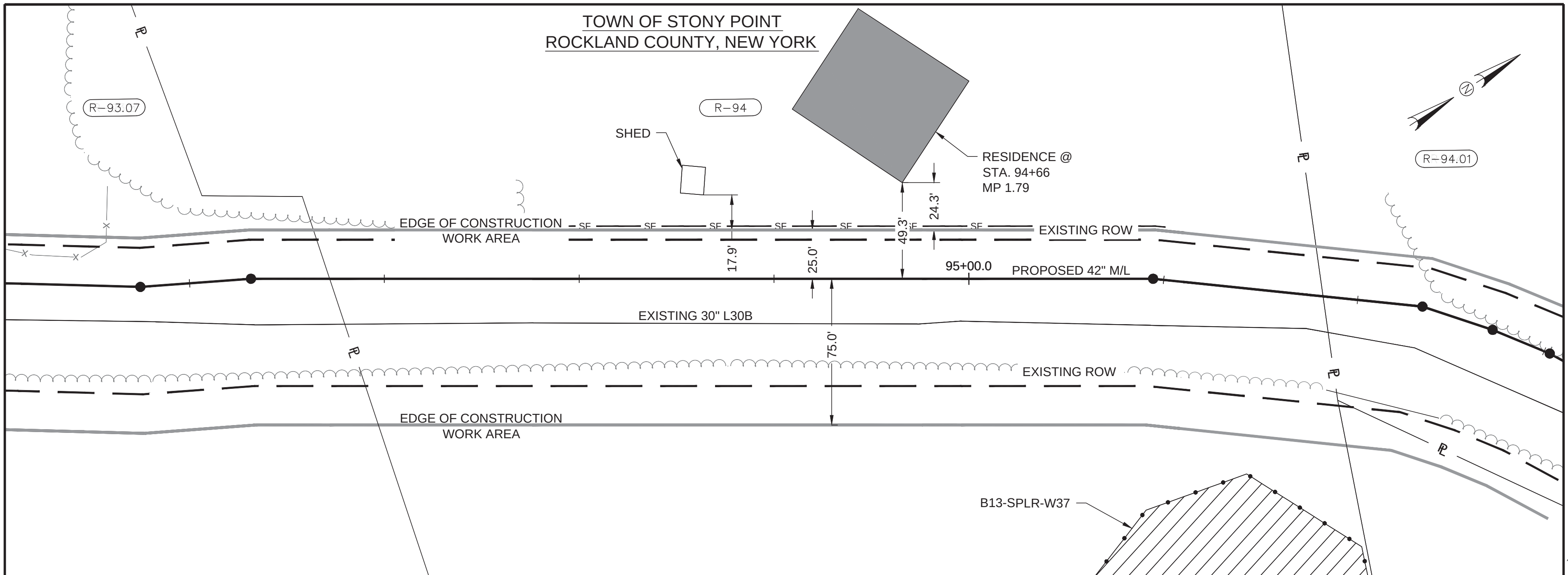
YR.: 2014 | W.O.: | DWG. NO.: S7–E–7004

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 – Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series – Site specific residential dwgs\Stony Point\S7–E–7004.dwg – PLOT TIME: 3/12/2014 1:19 PM

APPENDIX H (cont'd)



SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83–18F)

DESCRIPTION:

AT SURVEY STATION 94+66 THERE IS A STRUCTURE 24.3' LEFT OF THE CWA AND 49.3' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT–OF–WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT–OF–WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE (SF)
- PROPERTY LINE (PL)
- OVERHEAD POWER LINE (OH)
- TREE LINE

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING–SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
B	ISSUED FOR CLIENT REVIEW	03/12/14
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	03/12/14
CHECKED BY:	APW	03/12/14
DRAWN BY:	TMR	11/18/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
STONY POINT TO DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

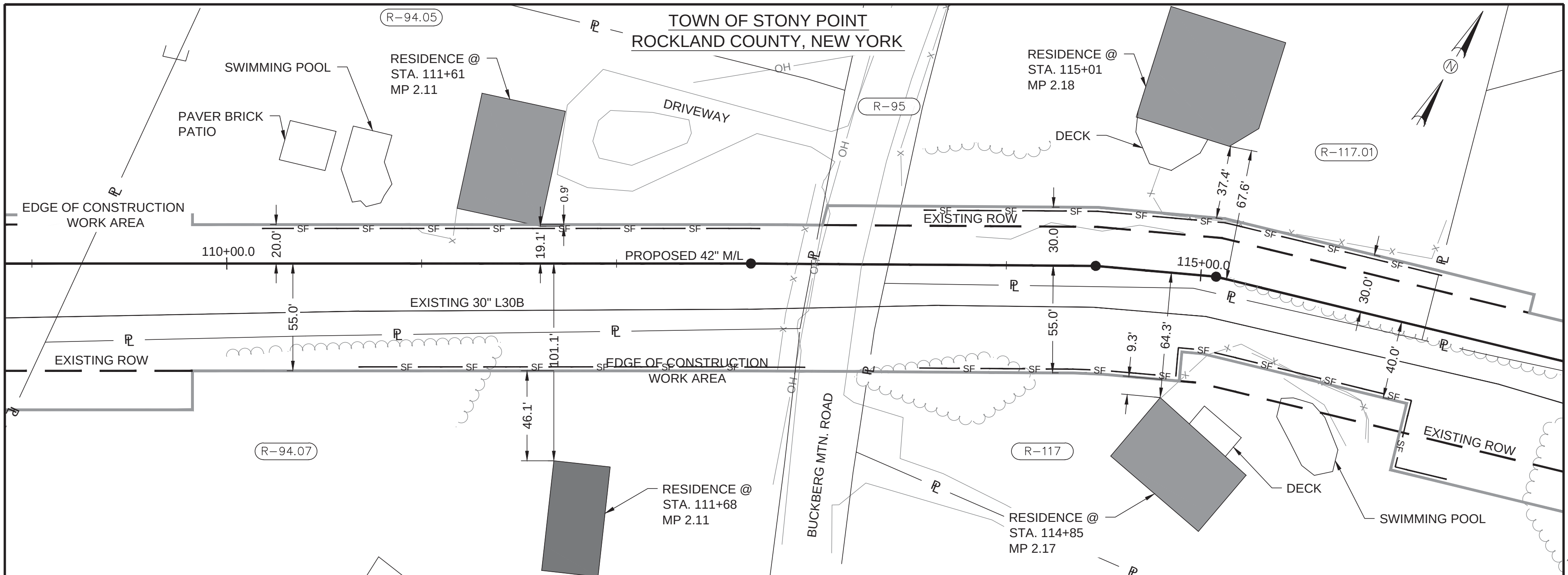
LOC.: ROCKLAND COUNTY, NEW YORK | REV.: B

YR.: 2014 | W.O.: | DWG. NO.: S7–E–7005

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 – Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series – Site specific residential dwgs\Stony Point\S7–E–7005.dwg – PLOT TIME: 3/12/2014 1:25 PM



SCALE: 1"=50'

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UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

LEGEND

PROPOSED PIPELINE	
EXISTING RIGHT-OF-WAY (ROW)	
NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)	
CONSTRUCTION WORK AREA (CWA)	
EXISTING PIPELINE	
FENCE LINE	x
SAFETY FENCE	SF
PROPERTY LINE	ℙ
OVERHEAD POWER LINE	OH
TREE LINE	

DESCRIPTION:

AT SURVEY STATION 111+61 THERE IS A RESIDENCE AT THE EDGE OF THE CWA AND 19.1' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 111+68 THERE IS A RESIDENCE 46.1' RIGHT OF THE CWA AND 101.1' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L..

AT SURVEY STATION 114+85 THERE IS A RESIDENCE 9.3' RIGHT OF THE CWA AND 64.3' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 115+01 THERE IS A RESIDENCE 37.4' LEFT OF THE CWA AND 67.6' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
B	ISSUED FOR CLIENT REVIEW	03/12/14
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	03/12/14
CHECKED BY:	APW	03/12/14
DRAWN BY:	TMR	11/18/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
STONY POINT TO DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

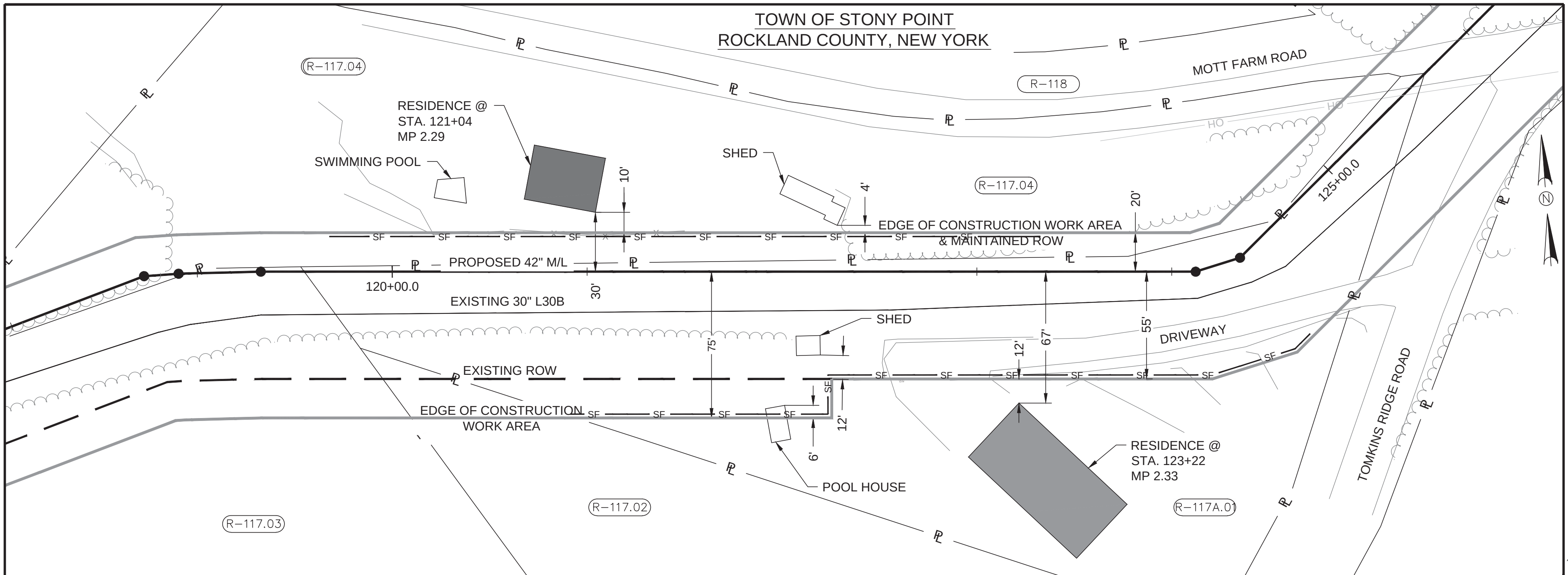
LOC.: ROCKLAND COUNTY, NEW YORK | REV.: B
YR.: 2014 | W.O.: | DWG. NO.: S7-E-7006

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 - Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series - Site specific residential dwgs\Stony Point\S7-E-7006.dwg - PLOT TIME: 3/12/2014 1:29 PM

APPENDIX H (cont'd)



SCALE: 1"=50'

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UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

DESCRIPTION:

AT SURVEY STATION 121+04 THERE IS A STRUCTURE 10' LEFT OF THE CWA AND 30' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 123+22 THERE IS A RESIDENCE 12' RIGHT OF THE CWA AND 67' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
C	RE-ISSUED FOR CLIENT REVIEW	03/12/14
B	ISSUED FOR CLIENT REVIEW	01/09/14
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	03/12/14
CHECKED BY:	APW	03/12/14
DRAWN BY:	TMR	01/09/14
SCALE:	1"=50'	DATE

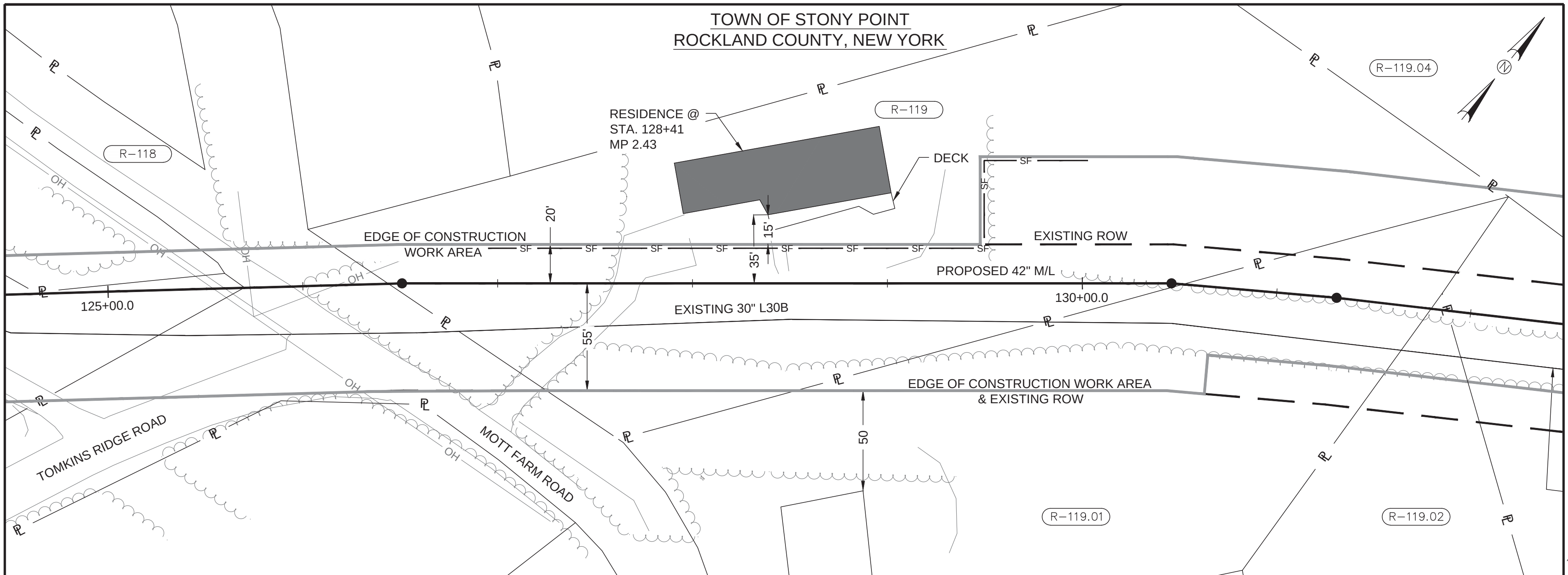
ALGONQUIN INCREMENTAL MARKET PROJECT
STONY POINT TO DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: ROCKLAND COUNTY, NEW YORK | REV.: C
YR.: 2014 | W.O.: | DWG. NO.: S7-E-7007

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 - Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series - Site specific residential dwgs\Stony Point\S7-E-7007.dwg - PLOT TIME: 3/12/2014 1:39 PM



SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83–18F)

DESCRIPTION:

AT SURVEY STATION 128+41 THERE IS A RESIDENCE 15' LEFT OF THE CWA AND 35' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT–OF–WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT–OF–WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING–SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
C	RE–ISSUED FOR CLIENT REVIEW	03/12/14
B	ISSUED FOR CLIENT REVIEW	01/09/14
A	ISSUED FOR INTERNAL REVIEW	11/20/13

PROJ. ENG.	CCW	03/12/14
CHECKED BY:	APW	03/12/14
DRAWN BY:	TMR	01/09/14
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
STONY POINT TO DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: ROCKLAND COUNTY, NEW YORK | REV.: C

YR.: 2014 | W.O.: | DWG. NO.: S7–E–7008

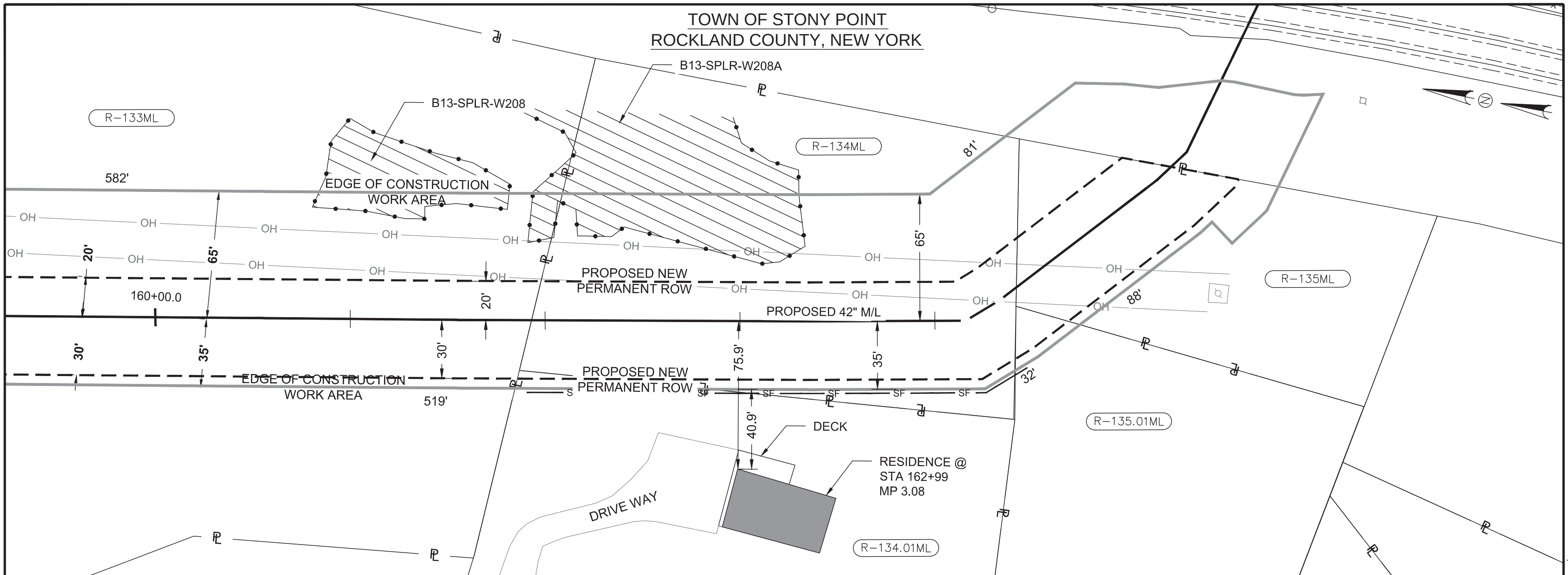
IG.#

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 – Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series – Site specific residential dwgs\Stony Point\S7–E–7008.dwg – PLOT TIME: 3/12/2014 1:40 PM

APPENDIX H (cont'd)



SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

DESCRIPTION:

AT SURVEY STATION 162+99 THERE IS A RESIDENCE 40.9' RIGHT OF THE CWA AND 75.9' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
C	RE-ISSUED FOR CLIENT REVIEW	03/12/14
B	ISSUED FOR CLIENT REVIEW	03/12/14
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	03/12/14
CHECKED BY:	APW	03/12/14
DRAWN BY:	TMR	01/09/14
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
STONY POINT TO DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

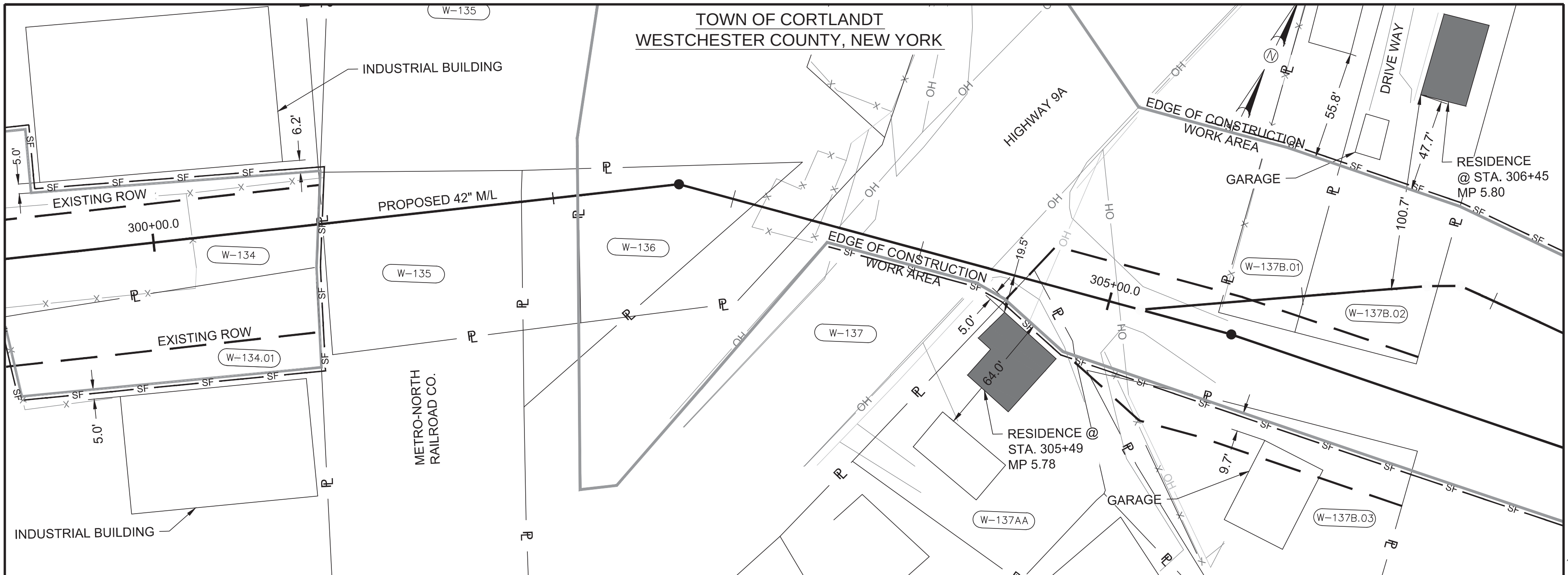
LOC.: WESTCHESTER COUNTY, NEW YORK | REV.: C

YR.: 2014 | W.O.: | DWG. NO.: S7-E-7009

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 - Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series - Site specific residential dwgs\Stony Point\S7-E-7009.dwg - PLOT TIME: 3/12/2014 2:18 PM



SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

DESCRIPTION:

AT SURVEY STATION 305+49 THERE IS A RESIDENCE 5.0' RIGHT OF THE CWA AND 19.5' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 306+45 THERE IS A RESIDENCE 47.7' LEFT OF THE CWA AND 147.7' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
B	ISSUED FOR CLIENT REVIEW	03/12/14
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	03/12/14
CHECKED BY:	APW	03/12/14
DRAWN BY:	TMR	11/19/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
STONY POINT TO DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: WESTCHESTER COUNTY, NEW YORK | REV.: B

YR.: 2014 | W.O.: | DWG. NO.: S7-E-7010

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 - Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series - Site specific residential dwgs\Stony Point\S7-E-7010.dwg - PLOT TIME: 3/12/2014 1:55 PM

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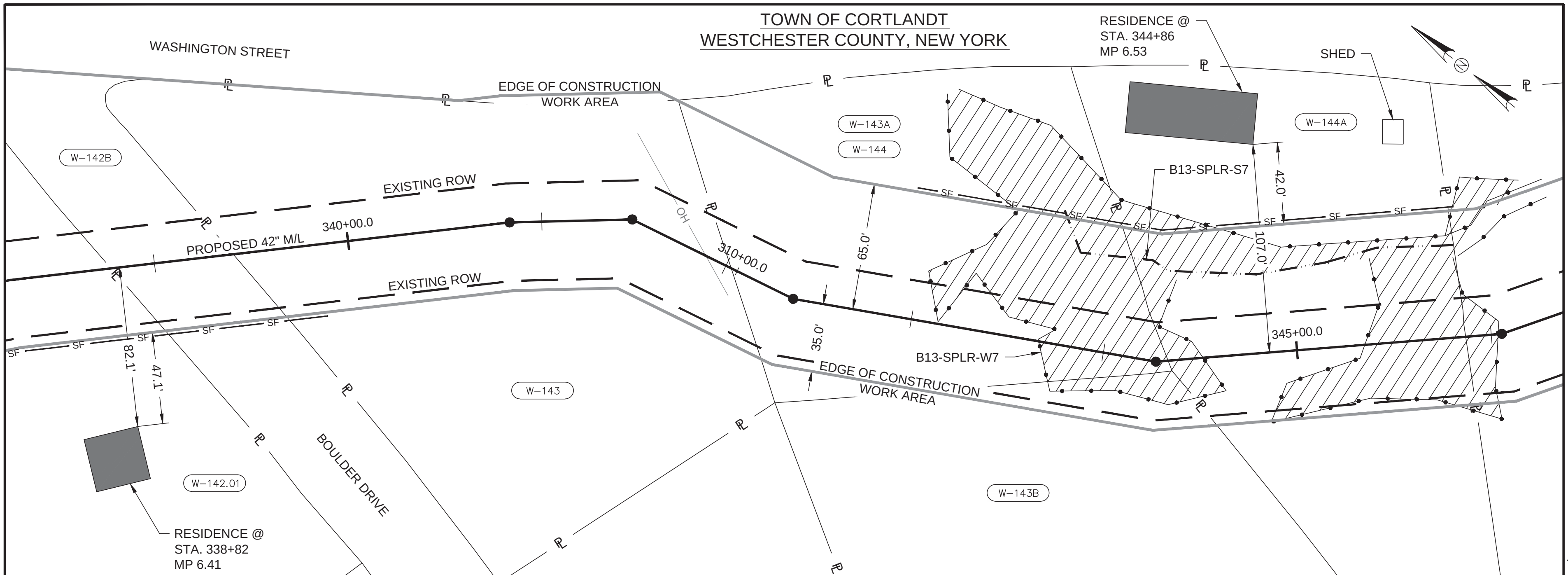
H-33

APPENDIX H (cont'd)



SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

DESCRIPTION:

AT SURVEY STATION 338+82 THERE IS A RESIDENCE 47.1' RIGHT OF THE CWA AND 82.1' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 344+86 THERE IS A RESIDENCE 42.0' LEFT OF THE CWA AND 107.0' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
B	ISSUED FOR CLIENT REVIEW	03/12/14
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	03/12/14
CHECKED BY:	APW	03/12/14
DRAWN BY:	TMR	11/20/13
SCALE:	1"=50'	DATE

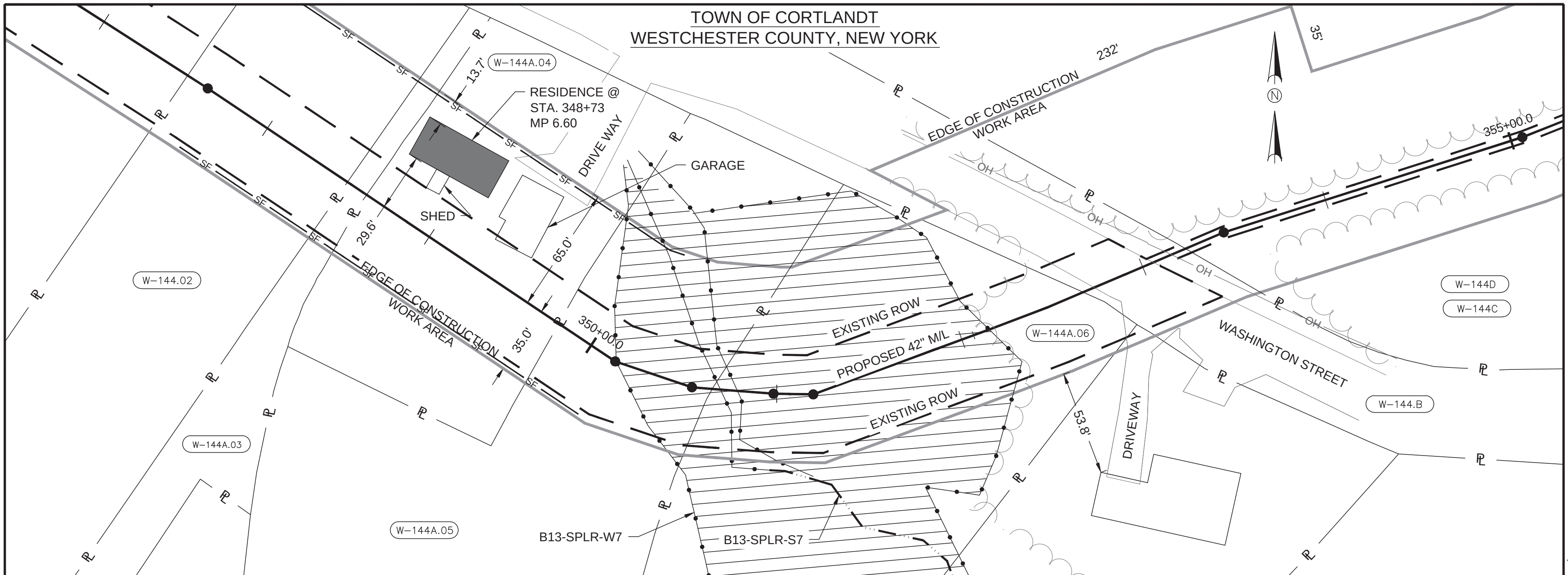
ALGONQUIN INCREMENTAL MARKET PROJECT
STONY POINT TO DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: WESTCHESTER COUNTY, NEW YORK | REV.: B

YR.: 2014 | W.O.: | DWG. NO.: S7-E-7011

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400



SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

DESCRIPTION:

AT SURVEY STATION 348+73 THERE IS A RESIDENCE 13.7' RIGHT OF THE CWA AND 29.6' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

NOTES:
1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
B	ISSUED FOR CLIENT REVIEW	03/12/14
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	03/12/14
CHECKED BY:	APW	03/12/14
DRAWN BY:	TMR	11/20/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
STONY POINT TO DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: WESTCHESTER COUNTY, NEW YORK | REV.: B

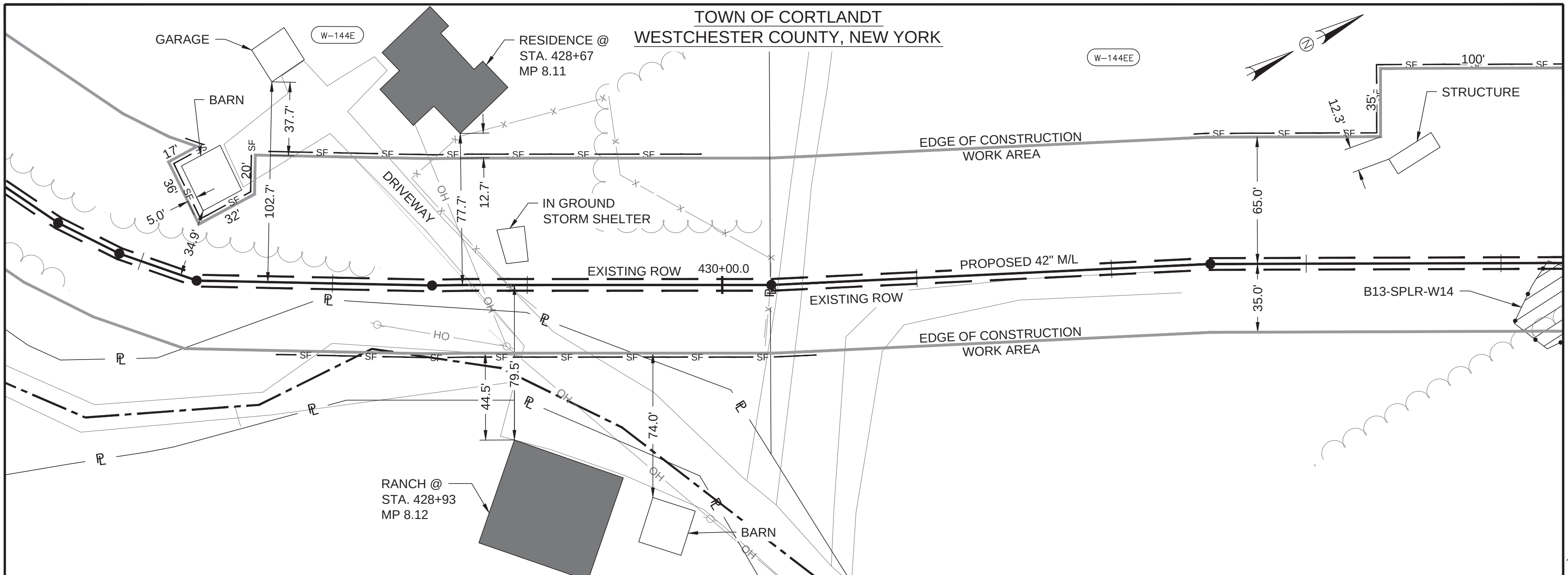
YR.: 2014 | W.O.: | DWG. NO.: S7-E-7012

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 – Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series – Site specific residential dwgs\Stony Point\S7-E-7012.dwg – PLOT TIME: 3/12/2014 2:03 PM

TOWN OF CORTLANDT
WESTCHESTER COUNTY, NEW YORK



SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

DESCRIPTION:

AT SURVEY STATION 428+67 THERE IS A RESIDENCE 12.7' LEFT OF THE CWA AND 77.7' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 428+93 THERE IS A RANCH 44.5' RIGHT OF THE CWA AND 79.5' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

NOTES:
1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
B	ISSUED FOR CLIENT REVIEW	03/12/14
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

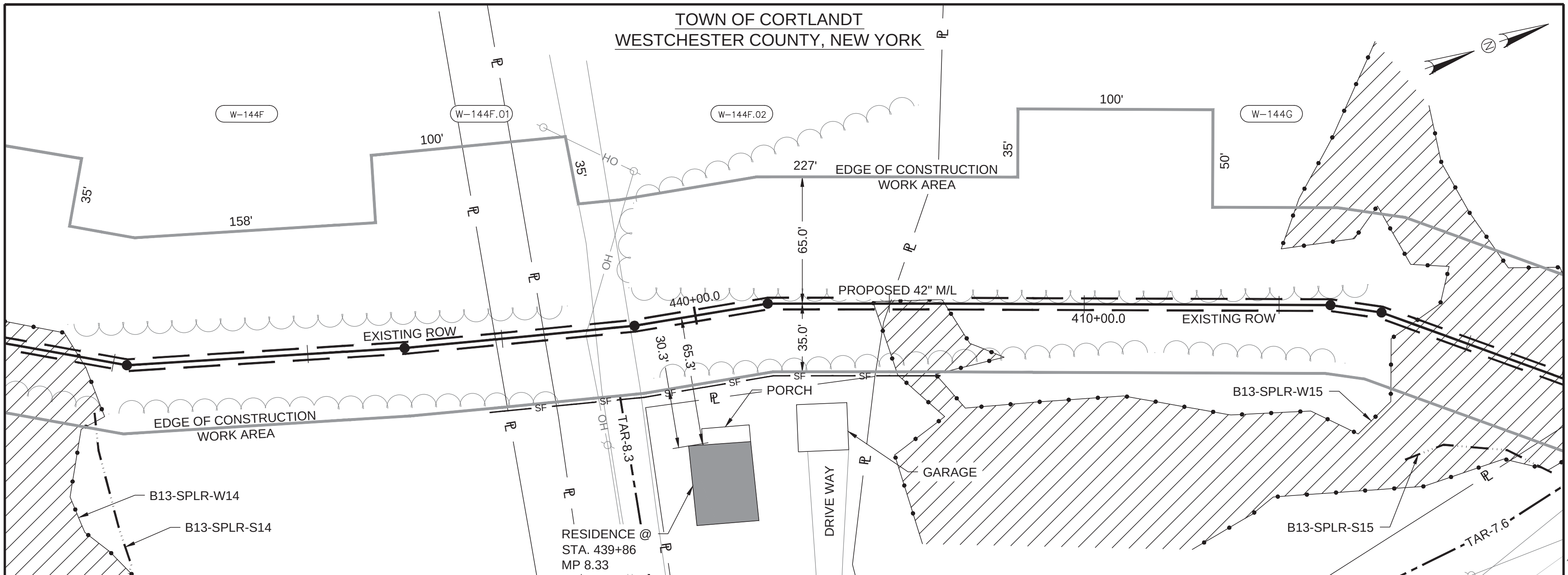
PROJ. ENG.	CCW	03/12/14
CHECKED BY:	APW	03/12/14
DRAWN BY:	TMR	11/20/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
STONY POINT TO DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: WESTCHESTER COUNTY, NEW YORK		REV.: B
YR.: 2014	W.O.:	DWG. NO.: S7-E-7013

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400



SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83–18F)

DESCRIPTION:

AT SURVEY STATION 439+86 THERE IS A RESIDENCE 30.3' RIGHT OF THE CWA AND 65.3' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT–OF–WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT–OF–WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE (x)
- SAFETY FENCE (SF)
- PROPERTY LINE (PL)
- OVERHEAD POWER LINE (OH)
- TREE LINE

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING–SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
B	ISSUED FOR CLIENT REVIEW	03/12/14
A	ISSUED FOR INTERNAL REVIEW	11/21/13

IG.#

PROJ. ENG.	CCW	03/12/14
CHECKED BY:	APW	03/12/14
DRAWN BY:	TMR	11/21/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
STONY POINT TO DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: WESTCHESTER COUNTY, NEW YORK | REV.: B

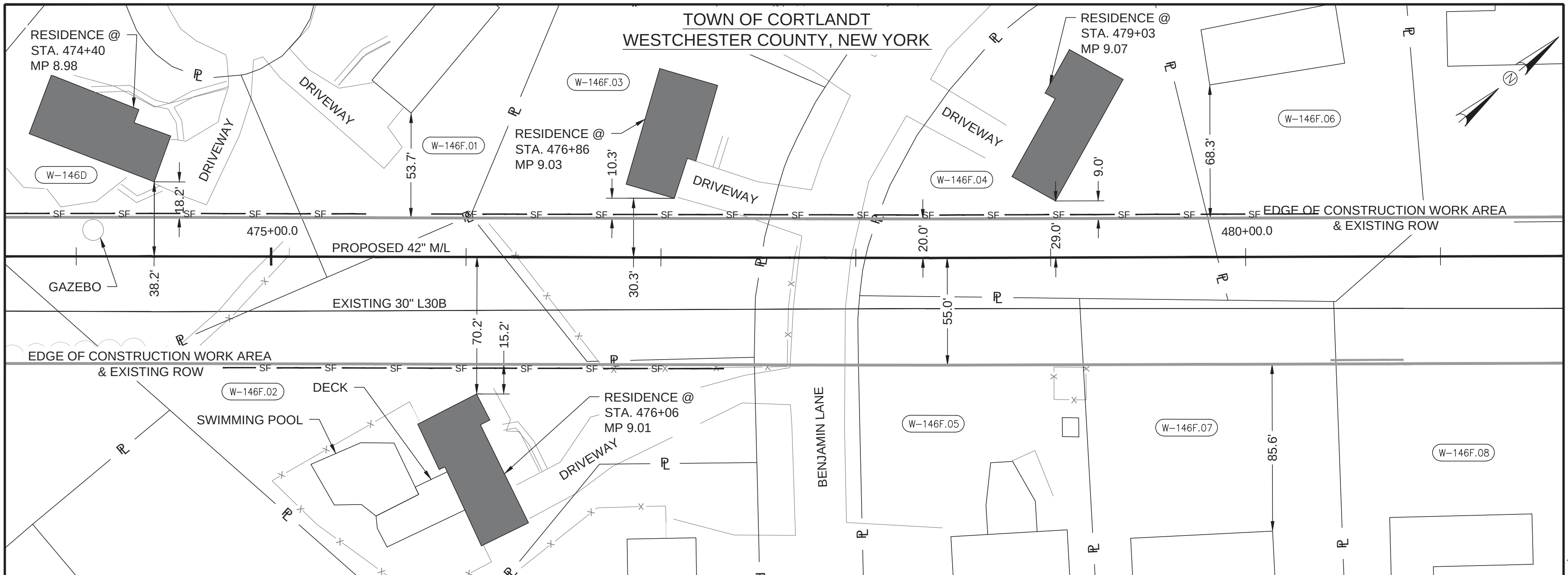
YR.: 2014 | W.O.: | DWG. NO.: S7–E–7014

Spectra Energy Partners

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 – Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series – Site specific residential dwgs\Stony Point\S7–E–7014.dwg – PLOT TIME: 3/12/2014 2:11 PM

APPENDIX H (cont'd)



SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

DESCRIPTION:

AT SURVEY STATION 474+40 THERE IS A STRUCTURE 18.2' LEFT OF THE CWA AND 38.2' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 476+06 THERE IS A STRUCTURE 15.2' RIGHT OF THE CWA AND 70.2' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 476+86 THERE IS A STRUCTURE 10.3' LEFT OF THE CWA AND 30.3' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 479+03 THERE IS A STRUCTURE 9.0' LEFT OF THE CWA AND 29.0' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

NOTES:
1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
B	ISSUED FOR CLIENT REVIEW	03/12/14
A	ISSUED FOR INTERNAL REVIEW	11/25/13

IG.#

PROJ. ENG.	CCW	03/12/14
CHECKED BY:	APW	03/12/14
DRAWN BY:	TMR	11/25/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
STONY POINT TO DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

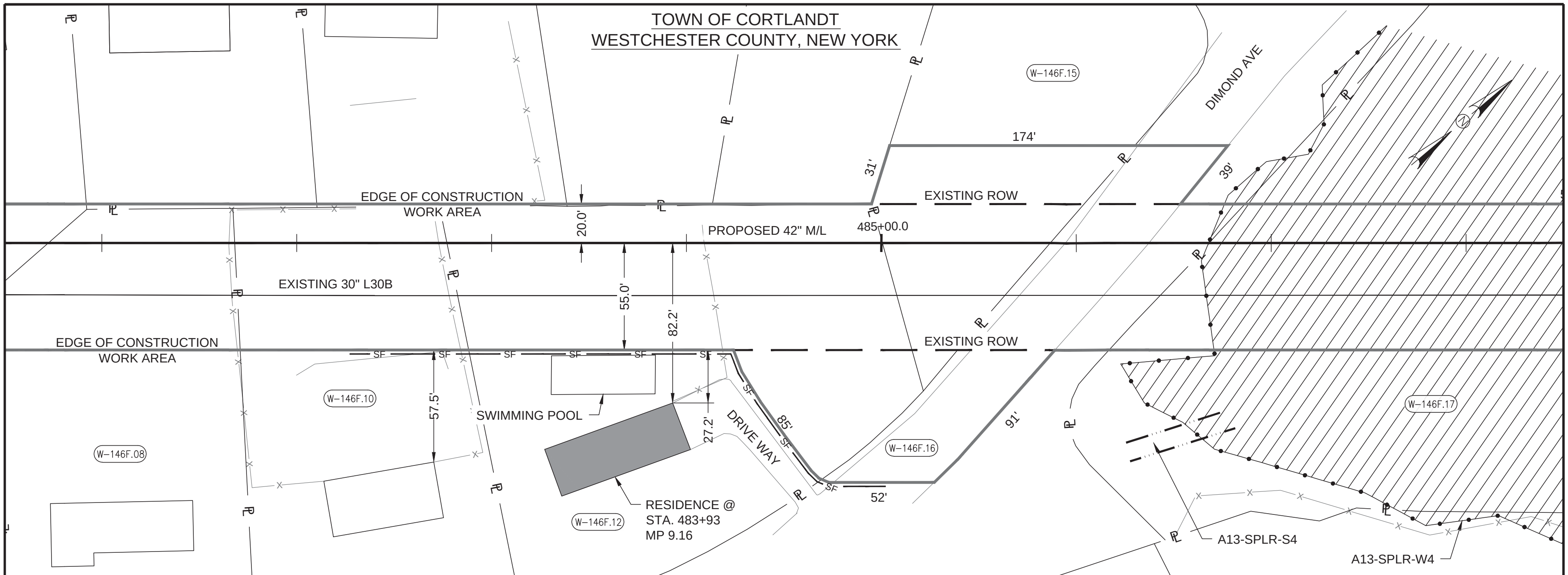
LOC.: WESTCHESTER COUNTY, NEW YORK | REV.: B

YR.: 2014 | W.O.: | DWG. NO.: S7-E-7015

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 - Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series - Site specific residential dwgs\Stony Point\S7-E-7015.dwg - PLOT TIME: 3/12/2014 2:20 PM



SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

DESCRIPTION:

AT SURVEY STATION 483+93 THERE IS A RESIDENCE 27.2' RIGHT OF THE CWA AND 82.2' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

NOTES:
1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

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IC.#

PROJ. ENG.	CCW	03/12/14
CHECKED BY:	APW	03/12/14
DRAWN BY:	TMR	11/25/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
STONY POINT TO DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: WESTCHESTER COUNTY, NEW YORK | REV.: B

YR.: 2014 | W.O.: | DWG. NO.: S7-E-7016

Spectra Energy Partners

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

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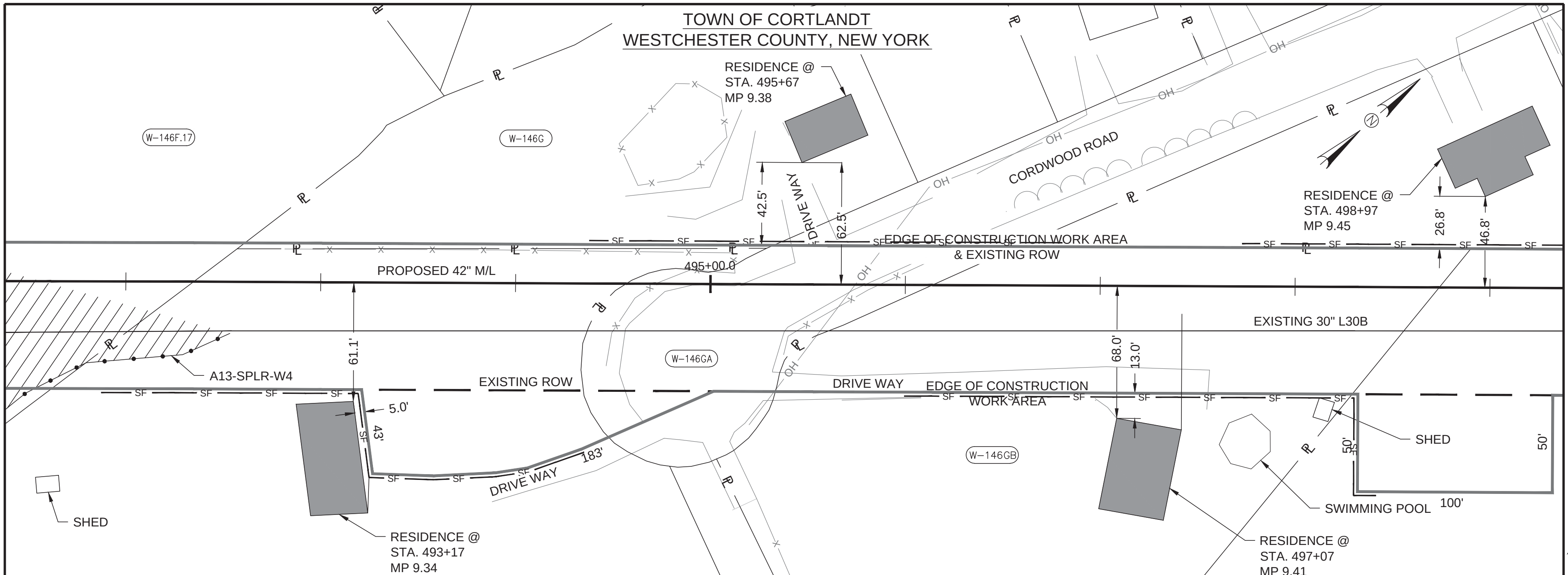

SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

LEGEND

PROPOSED PIPELINE
EXISTING RIGHT-OF-WAY (ROW)
NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
CONSTRUCTION WORK AREA (CWA)
EXISTING PIPELINE
FENCE LINE
SAFETY FENCE
PROPERTY LINE
OVERHEAD POWER LINE
TREE LINE

DESCRIPTION:

AT SURVEY STATION 493+17 THERE IS A RESIDENCE 5.0' LEFT OF THE CWA AND 61.1' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 495+67 THERE IS A RESIDENCE 42.5' LEFT OF THE CWA AND 62.5' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 497+07 THERE IS A RESIDENCE 13.0' RIGHT OF THE CWA AND 68.0' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L..

AT SURVEY STATION 498+97 THERE IS A RESIDENCE 26.8' LEFT OF THE CWA AND 46.8' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

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ALGONQUIN INCREMENTAL MARKET PROJECT
STONY POINT TO DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: WESTCHESTER COUNTY, NEW YORK | REV.: B
YR.: 2014 | W.O.: | DWG. NO.: S7-E-7017

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

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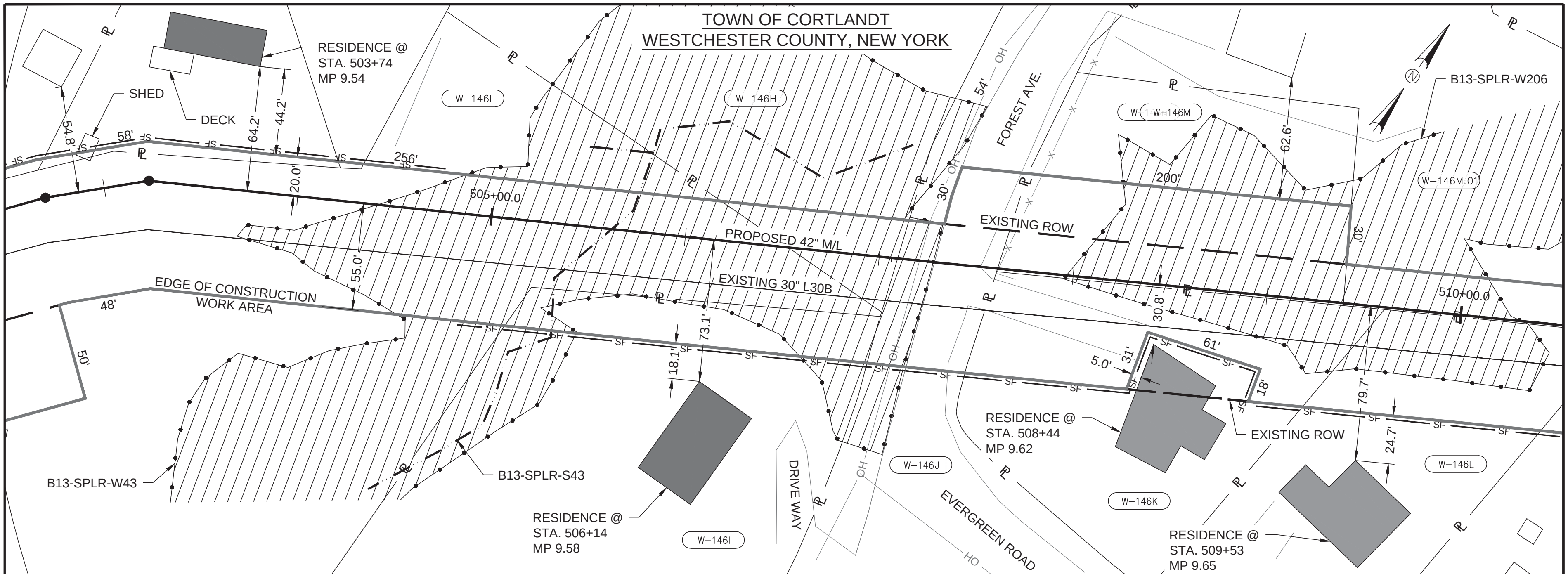

SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

LEGEND

PROPOSED PIPELINE
EXISTING RIGHT-OF-WAY (ROW)
NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
CONSTRUCTION WORK AREA (CWA)
EXISTING PIPELINE
FENCE LINE
SAFETY FENCE
PROPERTY LINE
OVERHEAD POWER LINE
TREE LINE

DESCRIPTION:

AT SURVEY STATION 503+74 THERE IS A RESIDENCE 44.2' LEFT OF THE CWA AND 64.2' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 506+14 THERE IS A RESIDENCE 18.1' RIGHT OF THE CWA AND 73.1' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 508+44 THERE IS A RESIDENCE 5.0' RIGHT OF THE CWA AND 30.8' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 509+53 THERE IS A RESIDENCE 24.7' RIGHT OF THE CWA AND 79.7' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

NOTES:
1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

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SCALE:	1"=50'	DATE

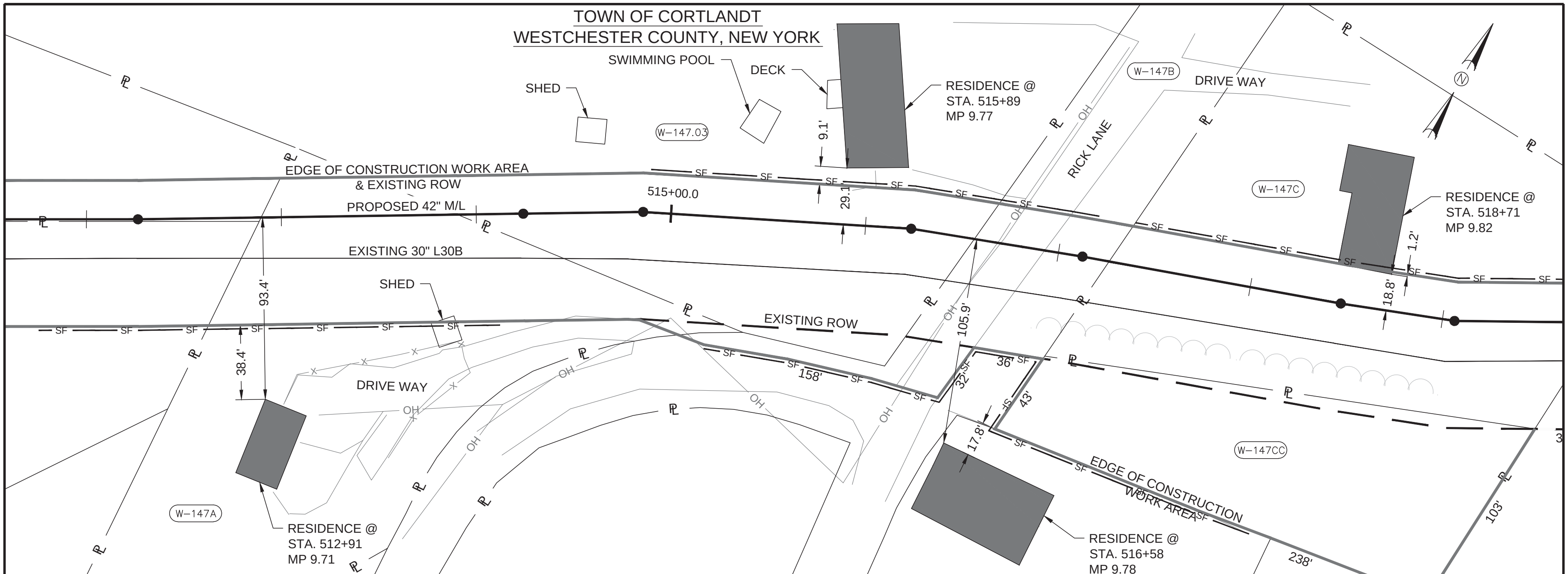
ALGONQUIN INCREMENTAL MARKET PROJECT
STONY POINT TO DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: WESTCHESTER COUNTY, NEW YORK | REV.: B
YR.: 2014 | W.O.: | DWG. NO.: S7-E-7018

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 – Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series – Site specific residential dwgs\Stony Point\S7-E-7018.dwg – PLOT TIME: 3/12/2014 2:31 PM



SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

DESCRIPTION:

AT SURVEY STATION 512+91 THERE IS A RESIDENCE 38.4' RIGHT OF THE CWA AND 93.4' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 515+89 THERE IS A RESIDENCE 9.1' LEFT OF THE CWA AND 29.1' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 516+58 THERE IS A RESIDENCE 17.8' RIGHT OF THE CWA AND 105.9' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 518+71 THERE IS A RESIDENCE 1.2' LEFT OF THE CWA AND 18.8' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

NOTES:
1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

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PROJ. ENG.	CCW	03/12/14
CHECKED BY:	APW	03/12/14
DRAWN BY:	TMR	11/25/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
STONY POINT TO DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: WESTCHESTER COUNTY, NEW YORK | REV.: B

YR.: 2014 | W.O.: | DWG. NO.: S7-E-7019

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

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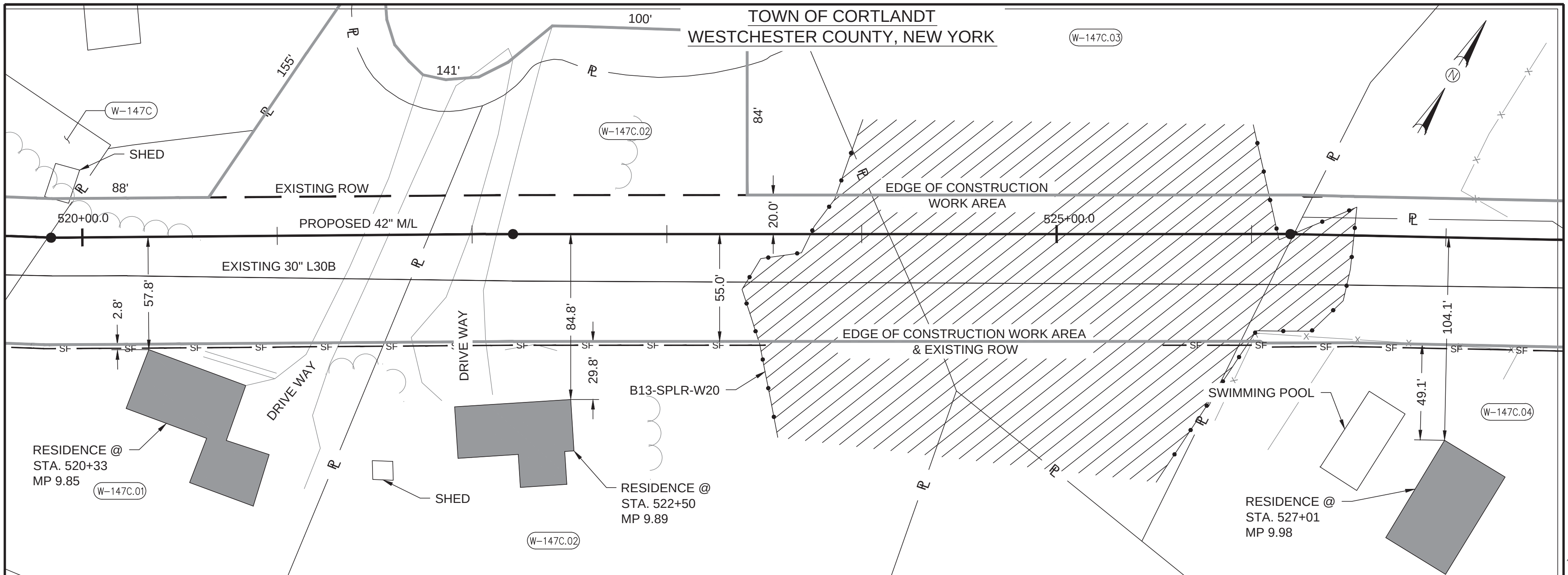

SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

DESCRIPTION:

AT SURVEY STATION 520+33 THERE IS A RESIDENCE 2.8' RIGHT OF THE CWA AND 57.8' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 522+50 THERE IS A RESIDENCE 29.8' RIGHT OF THE CWA AND 84.8' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 527+01 THERE IS A RESIDENCE 49.1' RIGHT OF THE CWA AND 104.1' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

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IG.#

PROJ. ENG.	CCW	03/12/14
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DRAWN BY:	TMR	11/26/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
STONY POINT TO DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: WESTCHESTER COUNTY, NEW YORK | REV.: B

YR.: 2014 | W.O.: | DWG. NO.: S7-E-7020

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

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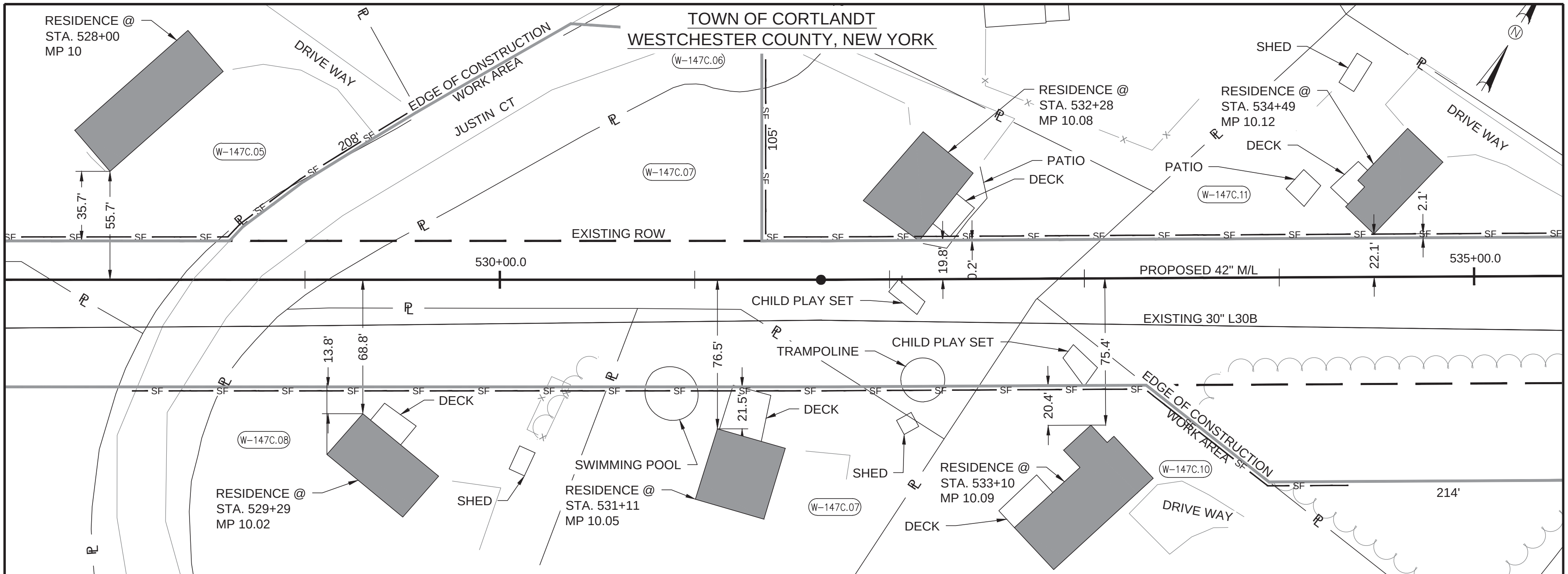

SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

LEGEND

PROPOSED PIPELINE
EXISTING RIGHT-OF-WAY (ROW)
NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
CONSTRUCTION WORK AREA (CWA)
EXISTING PIPELINE
FENCE LINE
SAFETY FENCE
PROPERTY LINE
OVERHEAD POWER LINE
TREE LINE

DESCRIPTION:

AT SURVEY STATION 528+00 THERE IS A RESIDENCE 35.7' LEFT OF THE CWA AND 55.7' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 529+29 THERE IS A RESIDENCE 13.8' RIGHT OF THE CWA AND 68.8' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 531+11 THERE IS A RESIDENCE 21.5' RIGHT OF THE CWA AND 76.5' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

DESCRIPTION CONTINUED:

AT SURVEY STATION 532+28 THERE IS A RESIDENCE AT THE EDGE OF THE CWA AND 19.8' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 533+10 THERE IS A RESIDENCE 20.4' RIGHT OF THE CWA AND 75.4' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 534+49 THERE IS A RESIDENCE 2.1' LEFT OF THE CWA AND 22.1' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

NOTES:
1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

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IG.#

PROJ. ENG.	CCW	03/12/14
CHECKED BY:	APW	03/12/14
DRAWN BY:	TMR	11/25/13
SCALE:		DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
STONY POINT TO DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: WESTCHESTER COUNTY, NEW YORK | REV.: B

YR.: 2014 | W.O.: | DWG. NO.: S7-E-7021

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 - Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series - Site specific residential dwgs\Stony Point\S7-E-7021.dwg - PLOT TIME: 3/12/2014 2:40 PM

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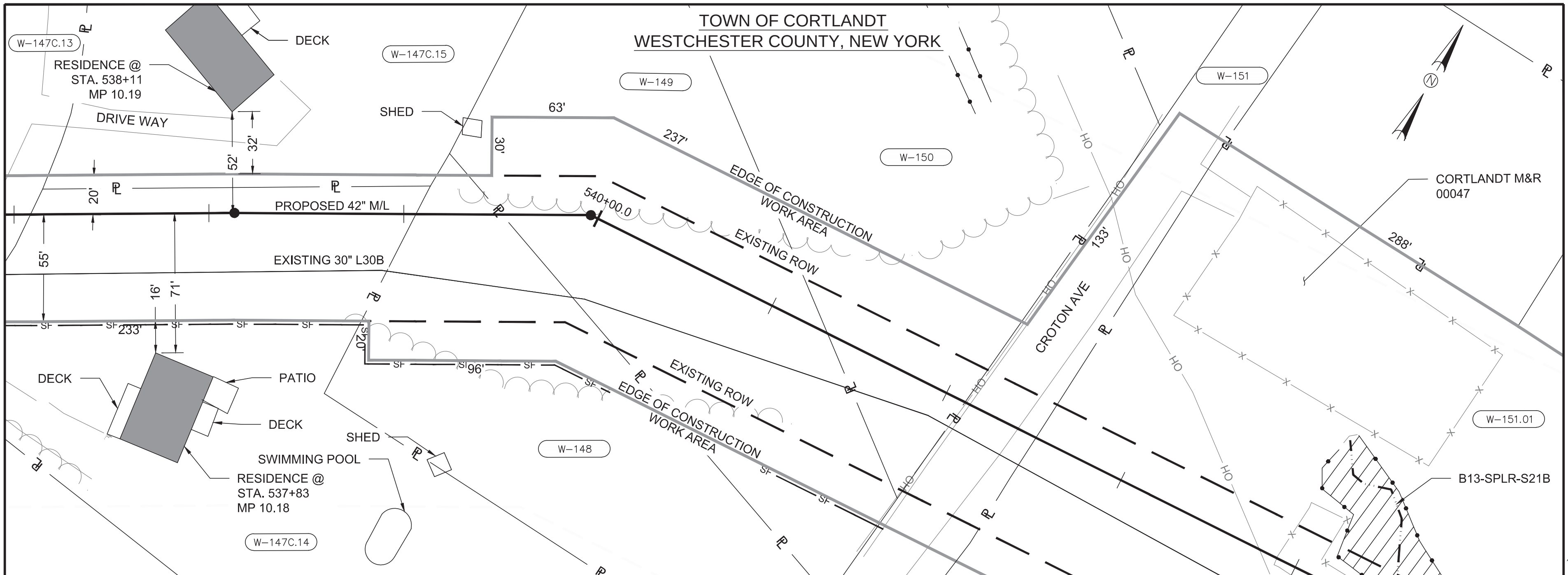

SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

DESCRIPTION:

AT SURVEY STATION 538+11 THERE IS A RESIDENCE 16' RIGHT OF THE CWA AND 71' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 537+83 THERE IS A RESIDENCE 32' LEFT OF THE CWA AND 52' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

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PROJ. ENG.	CCW	03/12/14
CHECKED BY:	APW	03/12/14
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SCALE:	1"=50'	DATE

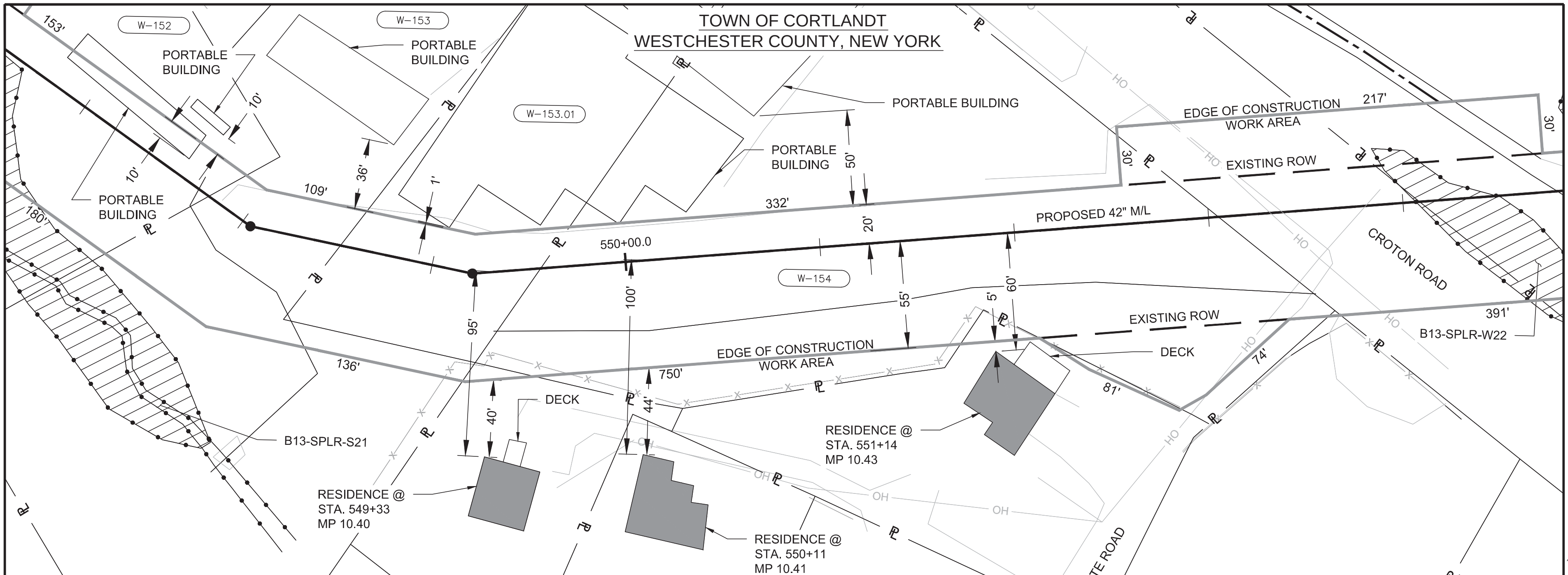
ALGONQUIN INCREMENTAL MARKET PROJECT
STONY POINT TO DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: WESTCHESTER COUNTY, NEW YORK | REV.: B

YR.: 2014 | W.O.: | DWG. NO.: S7-E-7022

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400



APPENDIX H (cont'd)

SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

DESCRIPTION:

AT SURVEY STATION 549+33 THERE IS A RESIDENCE 40' OF THE CWA AND 95' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 550+11 THERE IS A RESIDENCE 44' LEFT OF THE CWA AND 100' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 551+14 THERE IS A RESIDENCE 5' LEFT OF THE CWA AND 60' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

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SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
STONY POINT TO DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: WESTCHESTER COUNTY, NEW YORK | REV.: B
YR.: 2014 | W.O.: | DWG. NO.: S7-E-7023

Spectra Energy Partners

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

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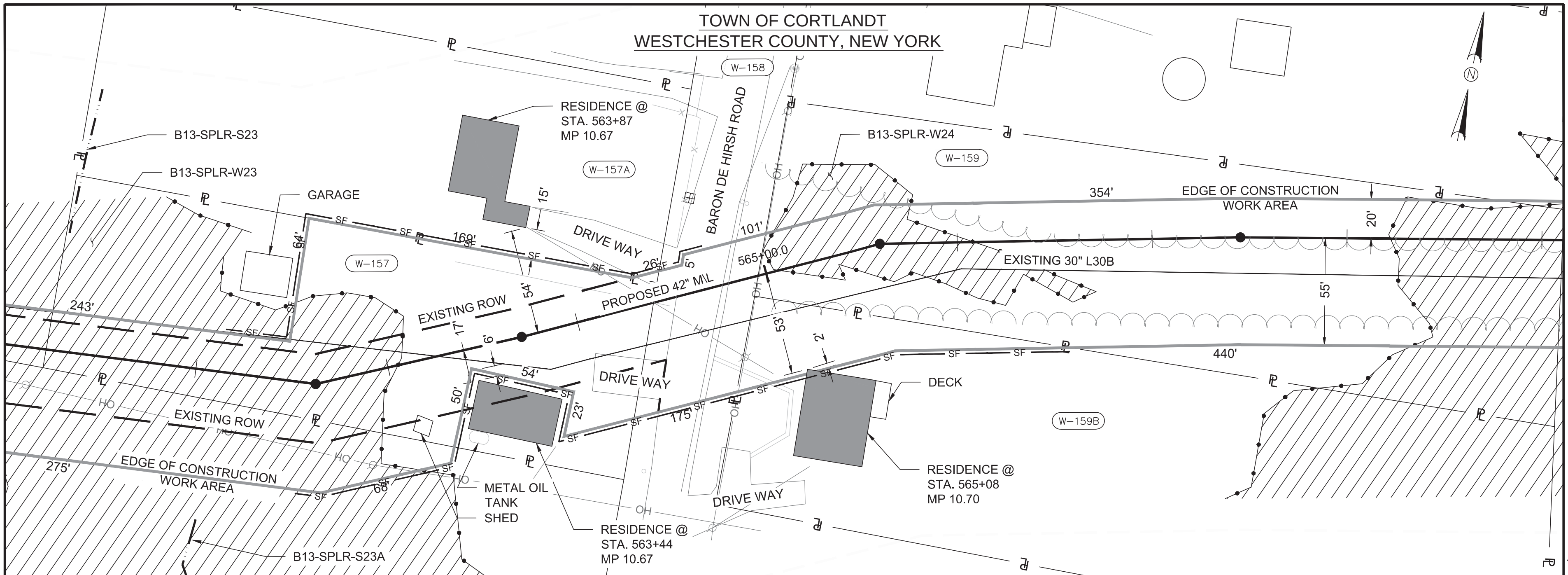


SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

DESCRIPTION:

AT SURVEY STATION 563+44 THERE IS A RESIDENCE 6' LEFT OF THE CWA AND 17' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 563+87 THERE IS A RESIDENCE 15' RIGHT OF THE CWA AND 54' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 565+08 THERE IS A STRUCTURE AT THE EDGE OF THE CWA AND 53' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
B	ISSUED FOR CLIENT REVIEW	03/12/14
A	ISSUED FOR INTERNAL REVIEW	11/20/13

PROJ. ENG.	CCW	03/12/14
CHECKED BY:	APW	03/12/14
DRAWN BY:	TMR	11/13/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
STONY POINT TO DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: WESTCHESTER COUNTY, NEW YORK — REV.: B

YR.: 2014 — W.O.: — DWG. NO.: S7-E-7024

Spectra Energy Partners.

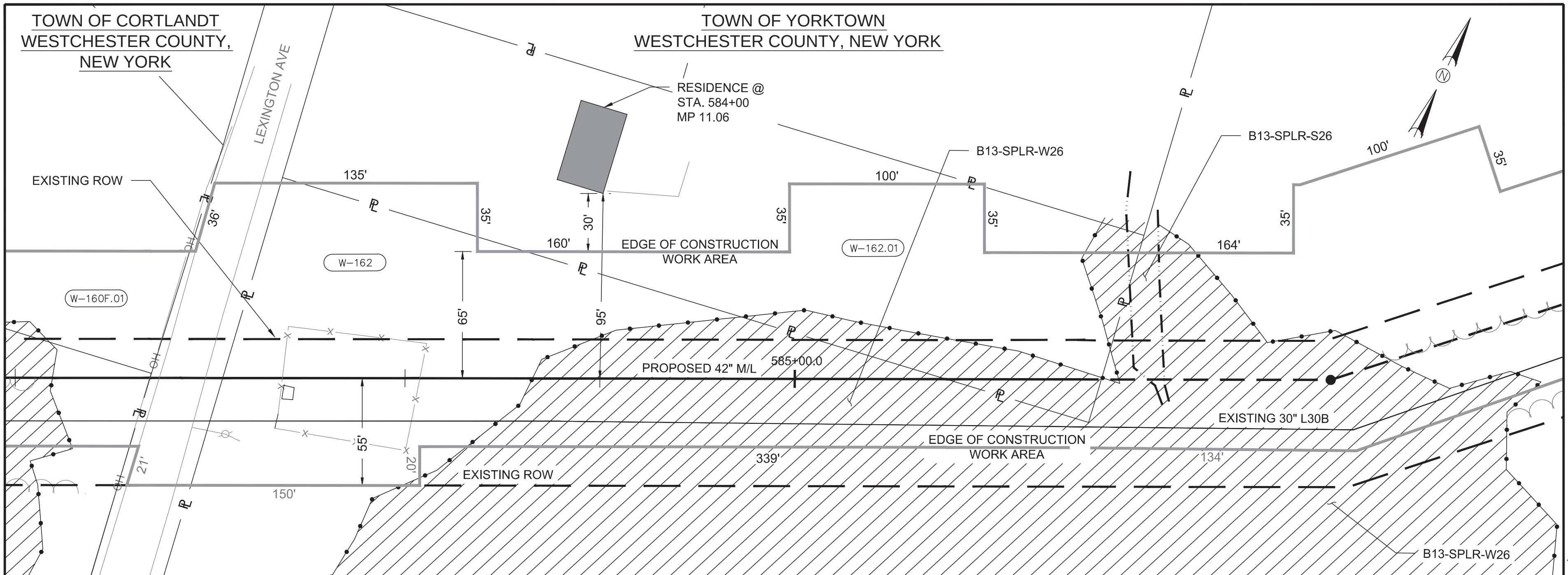
Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

IG.#

R:\101490 - Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series - Site specific residential dwgs\Stony Point\S7-E-7024.dwg - PLOT TIME: 3/12/2014 2:48 PM

H-47

APPENDIX H (cont'd)



SCALE: 1"=50'

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UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

DESCRIPTION:

AT SURVEY STATION 584+00 THERE IS A RESIDENCE 30' LEFT OF THE CWA AND 95' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- PROPOSED RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
B	ISSUED FOR CLIENT REVIEW	03/12/14
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	03/12/14
CHECKED BY:	APW	03/12/14
DRAWN BY:	TMR	11/13/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
STONY POINT TO DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

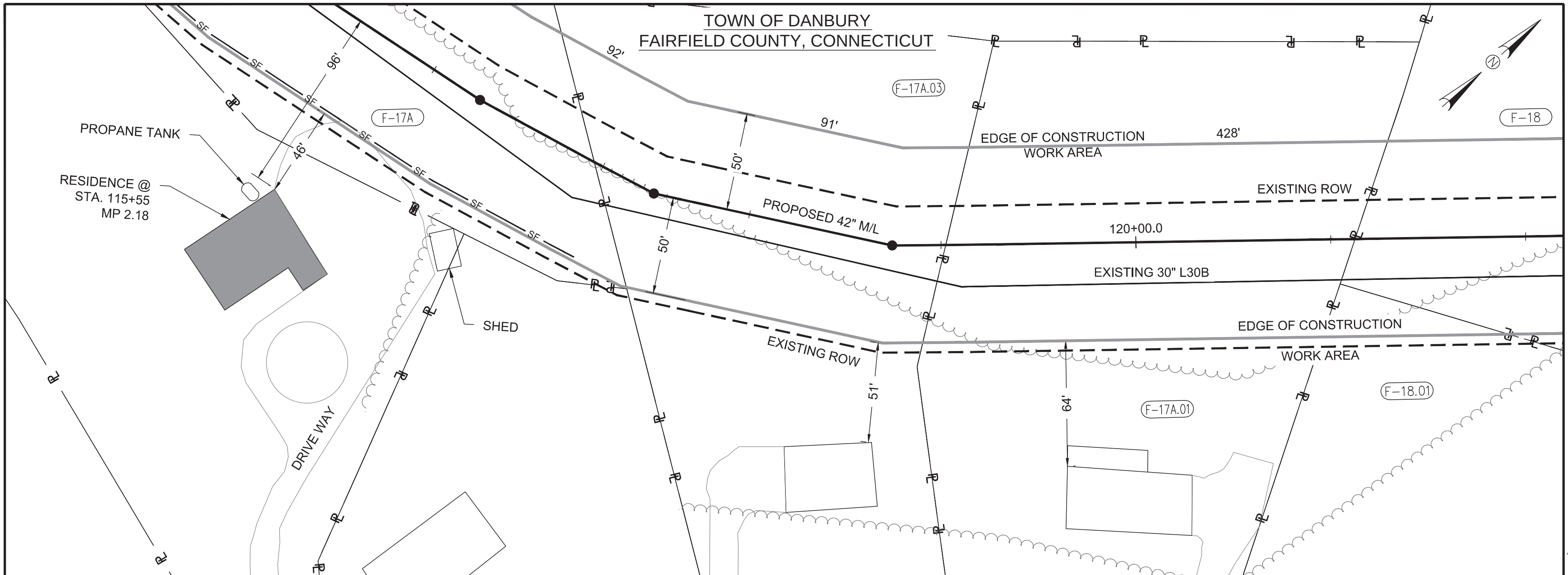
LOC.: WESTCHESTER COUNTY, NEW YORK | REV.: B

YR.: 2014 | W.O.: | DWG. NO.: S7-E-7025

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 - Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series - Site specific residential dwgs\Stony Point\S7-E-7025.dwg - PLOT TIME: 3/12/2014 2:49 PM



SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

DESCRIPTION:

AT SURVEY STATION 115+55 THERE IS A RESIDENCE 46' RIGHT OF THE CWA AND 96' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
D	RE-ISSUED FOR CLIENT REVIEW	03/13/2014
C	RE-ISSUED FOR CLIENT REVIEW	03/06/2014
B	ISSUED FOR CLIENT REVIEW	12/12/13
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IC.#

PROJ. ENG.	CCW	12/12/13
CHECKED BY:	APW	12/12/13
DRAWN BY:	TMR	11/13/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
SOUTHEAST DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

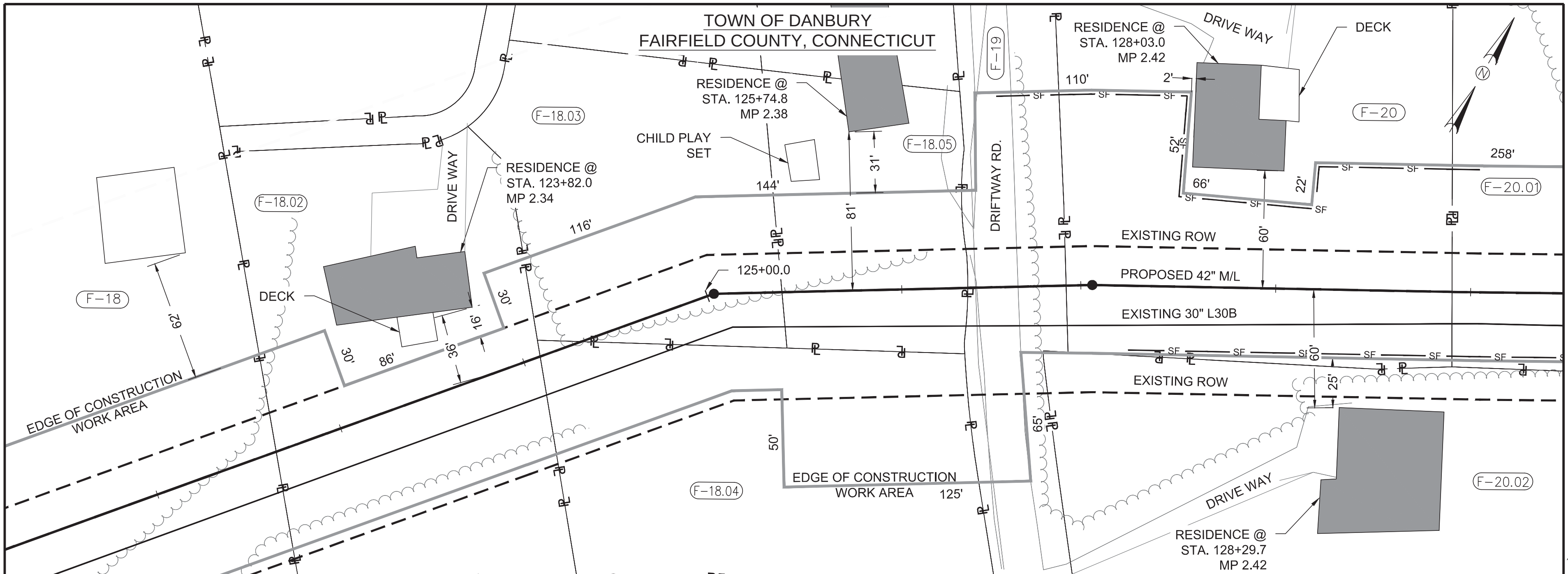
LOC.: FAIRFIELD COUNTY, CONNECTICUT | REV.: D

YR.: 2014 | W.O.: | DWG. NO.: SQ-E-7001

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 - Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series - Site specific residential dwgs\Southeast\SQ-E-7001model.dwg - PLOT TIME: 3/13/2014 9:43 AM



SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

DESCRIPTION:

AT SURVEY STATION 123+82.0 THERE IS A RESIDENCE 16' LEFT OF THE CWA AND 36' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 125+74.8 THERE IS A RESIDENCE 31' LEFT OF THE CWA AND 81' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 128+03.0 THERE IS A RESIDENCE 2' LEFT OF THE CWA AND 60' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 128+29.7 THERE IS A RESIDENCE 25' RIGHT OF THE CWA AND 60' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
D	RE-ISSUED FOR CLIENT REVIEW	03/13/2014
C	RE-ISSUED FOR CLIENT REVIEW	03/06/2014
B	ISSUED FOR CLIENT REVIEW	12/12/13
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	12/12/13
CHECKED BY:	APW	12/12/13
DRAWN BY:	TMR	11/13/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
SOUTHEAST DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: FAIRFIELD COUNTY, CONNECTICUT | REV.: D

YR.: 2014 | W.O.: | DWG. NO.: SQ-E-7002

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 - Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series - Site specific residential dwgs\Southeast\SQ-E-7002.dwg - PLOT TIME: 3/13/2014 8:49 AM

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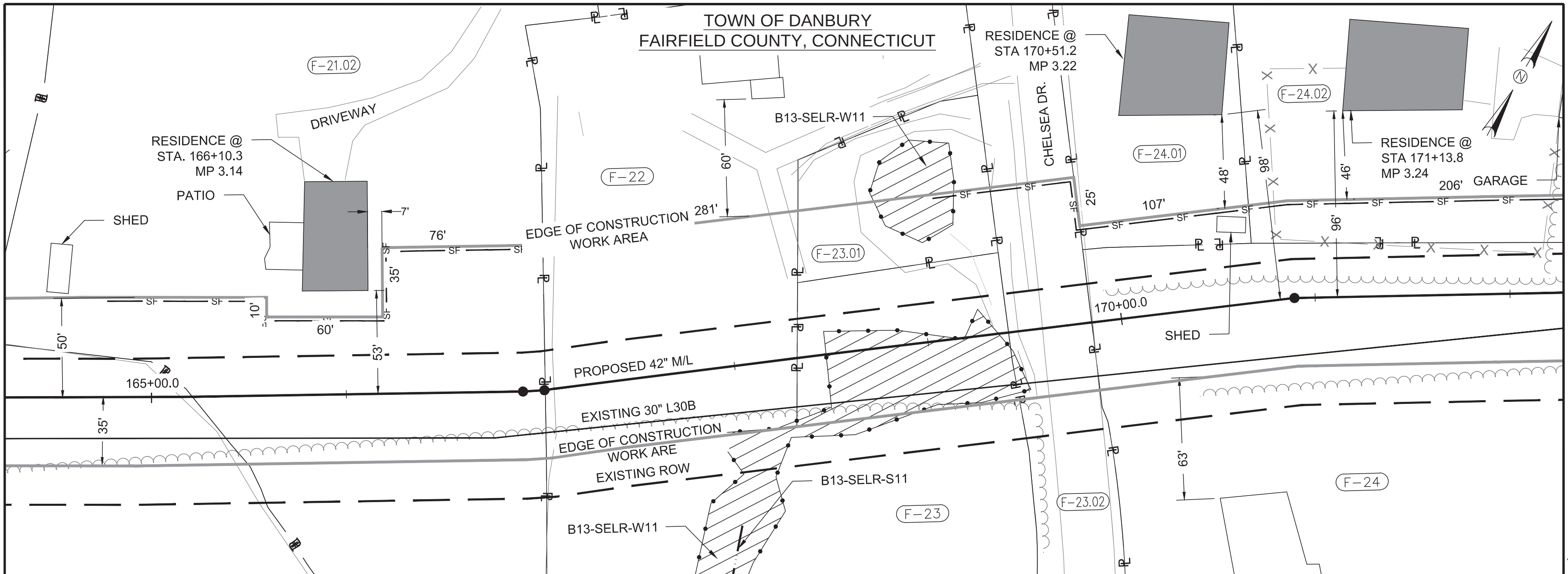
H-50

APPENDIX H (cont'd)



SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83–18F)

LEGEND

PROPOSED PIPELINE
EXISTING RIGHT–OF–WAY (ROW)
NEW PROPOSED PERMANENT RIGHT–OF–WAY (ROW)
CONSTRUCTION WORK AREA (CWA)
EXISTING PIPELINE
FENCE LINE
SAFETY FENCE
PROPERTY LINE
OVERHEAD POWER LINE
TREE LINE

DESCRIPTION:

AT SURVEY STATION 166+10.3 THERE IS A RESIDENCE 7' LEFT OF THE CWA AND 53' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 170+51.2 THERE IS A RESIDENCE 48' LEFT OF THE CWA AND 98' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 171+13.8 THERE IS A RESIDENCE 46' LEFT OF THE CWA AND 96' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING–SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
D	RE–ISSUED FOR CLIENT REVIEW	03/13/2014
C	RE–ISSUED FOR CLIENT REVIEW	03/06/2014
B	ISSUED FOR CLIENT REVIEW	12/12/13
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	12/12/13
CHECKED BY:	APW	12/12/13
DRAWN BY:	TMR	11/13/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
SOUTHEAST DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

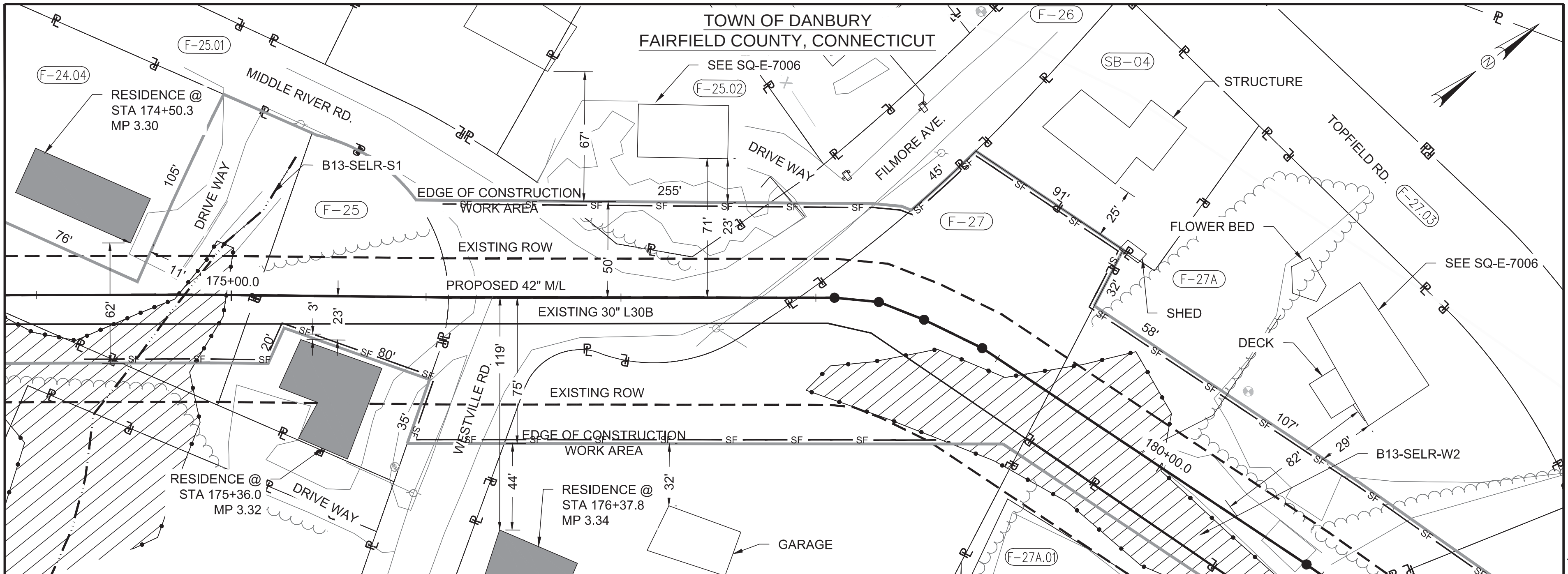
LOC.: FAIRFIELD COUNTY, CONNECTICUT | REV.: D

YR.: 2014 | W.O.: | DWG. NO.: SQ–E–7003

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 – Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series – Site specific residential dwgs\Southeast\SQ-E-7004.dwg – PLOT TIME: 3/13/2014 8:46 AM



SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83–18F)

LEGEND

PROPOSED PIPELINE	
EXISTING RIGHT-OF-WAY (ROW)	
NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)	
CONSTRUCTION WORK AREA (CWA)	
EXISTING PIPELINE	
FENCE LINE	x
SAFETY FENCE	SF
PROPERTY LINE	℞
OVERHEAD POWER LINE	OH
TREE LINE	

DESCRIPTION:

AT SURVEY STATION 174+50.3 THERE IS A RESIDENCE 11' LEFT OF THE CWA AND 62' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 175+36.0 THERE IS A RESIDENCE 3' RIGHT OF THE CWA AND 23' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 176+37.8 THERE IS A RESIDENCE 44' RIGHT OF THE CWA AND 119' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
D	RE-ISSUED FOR CLIENT REVIEW	03/13/2014
C	RE-ISSUED FOR CLIENT REVIEW	03/06/2014
B	ISSUED FOR CLIENT REVIEW	12/12/13
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	12/12/13
CHECKED BY:	APW	12/12/13
DRAWN BY:	TMR	11/13/13
SCALE:	1"=50'	DATE

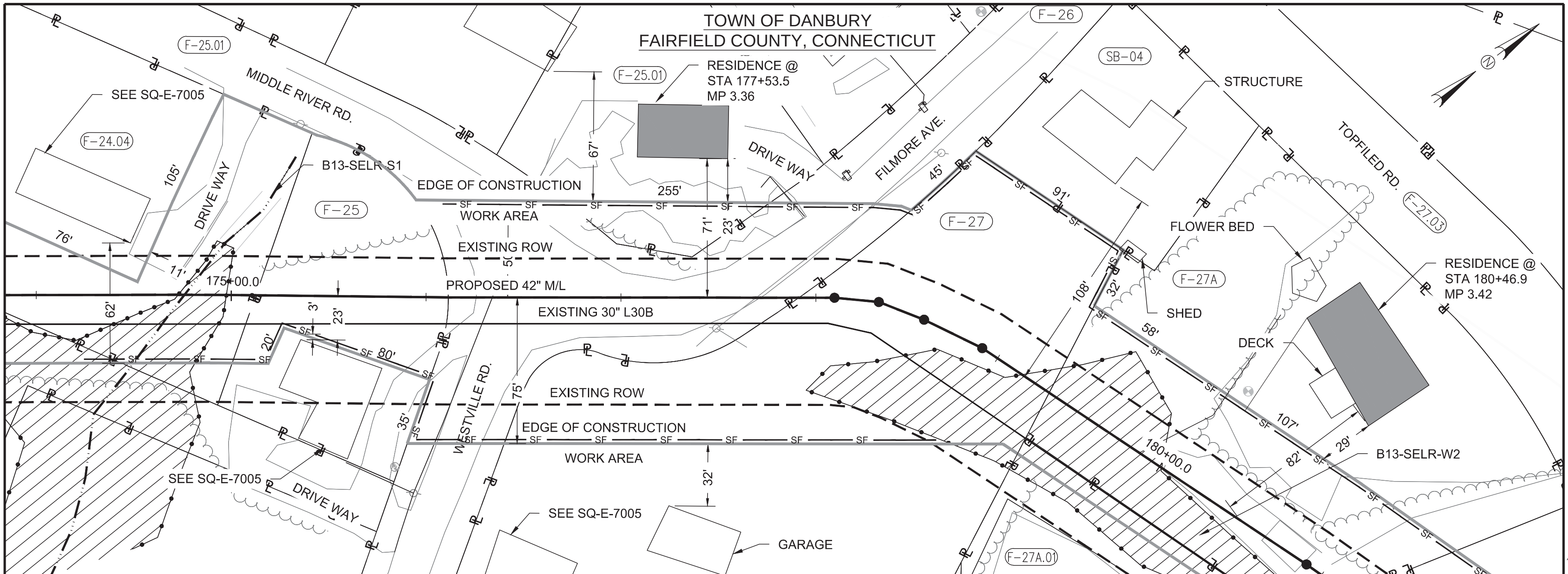
ALGONQUIN INCREMENTAL MARKET PROJECT
SOUTHEAST DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: FAIRFIELD COUNTY, CONNECTICUT | REV.: D

YR.: 2014 | W.O.: | DWG. NO.: SQ-E-7004

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400



SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

DESCRIPTION:

AT SURVEY STATION 177+53.5 THERE IS A RESIDENCE 23' LEFT OF THE CWA AND 71' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 179+06.3 THERE IS A STRUCTURE 25' LEFT OF THE CWA AND 108' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 180+46.9 THERE IS A RESIDENCE 29' LEFT OF THE CWA AND 82' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

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B	ISSUED FOR CLIENT REVIEW	12/12/13
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	12/12/13
CHECKED BY:	APW	12/12/13
DRAWN BY:	TMR	12/30/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
SOUTHEAST DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

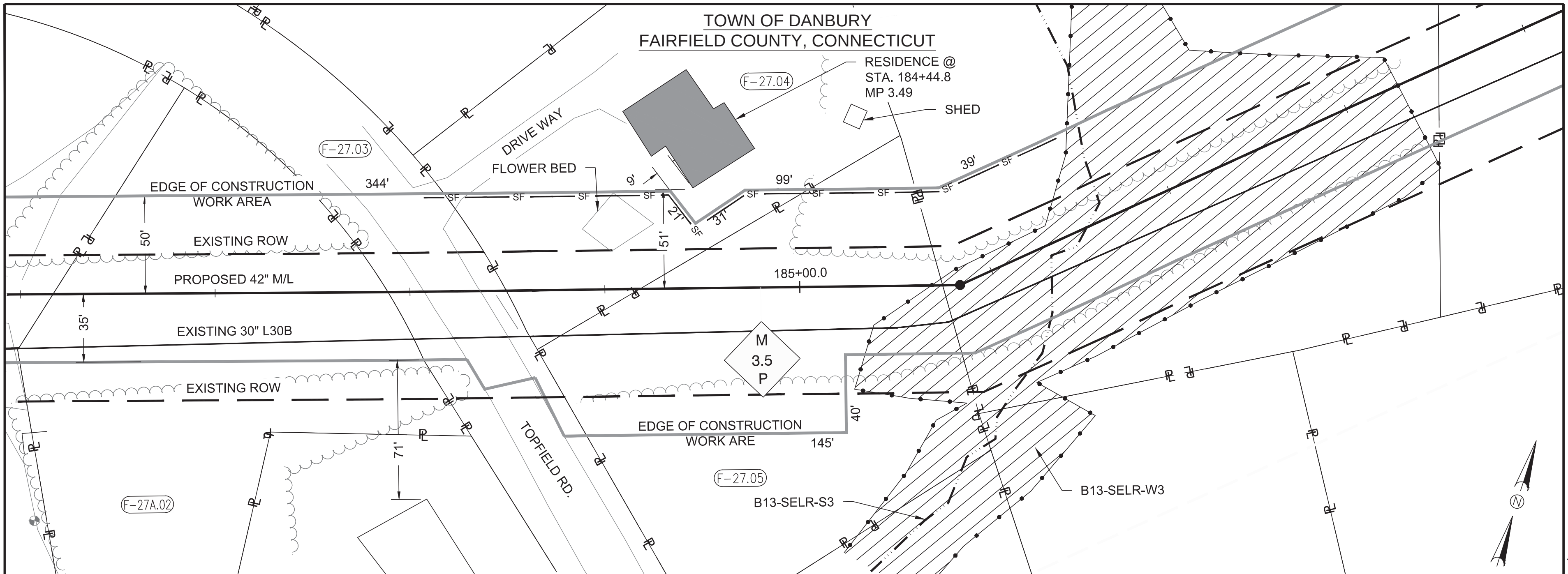
LOC.: FAIRFIELD COUNTY, CONNECTICUT | REV.: D

YR.: 2014 | W.O.: | DWG. NO.: SQ-E-7005

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 – Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series – Site specific residential dwgs\Southeast\SQ-E-7005.dwg – PLOT TIME: 3/13/2014 8:45 AM



SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

DESCRIPTION:

AT SURVEY STATION 184+44.8 THERE IS A RESIDENCE 9' LEFT OF THE CWA AND 51' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

NOTES:
1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
D	RE-ISSUED FOR CLIENT REVIEW	03/13/2014
C	RE-ISSUED FOR CLIENT REVIEW	03/06/2014
B	ISSUED FOR CLIENT REVIEW	12/12/13
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	12/12/13
CHECKED BY:	APW	12/12/13
DRAWN BY:	TMR	11/13/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
SOUTHEAST DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: FAIRFIELD COUNTY, CONNECTICUT | REV.: D
YR.: 2014 | W.O.: | DWG. NO.: SQ-E-7006

Spectra Energy Partners

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 - Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series - Site specific residential dwgs\Southeast\SQ-E-7006.dwg - PLOT TIME: 3/13/2014 8:37 AM

H-54

APPENDIX H (cont'd)

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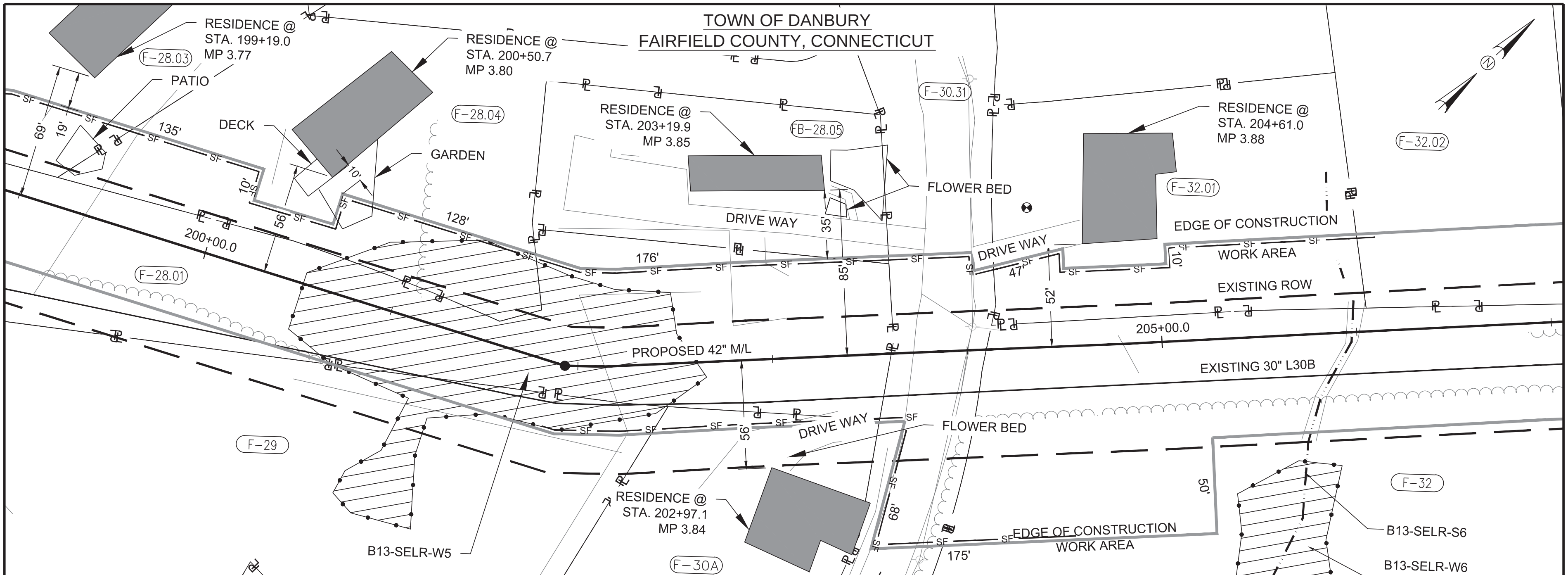

SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

LEGEND

PROPOSED PIPELINE
EXISTING RIGHT-OF-WAY (ROW)
NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
CONSTRUCTION WORK AREA (CWA)
EXISTING PIPELINE
FENCE LINE
SAFETY FENCE
PROPERTY LINE
OVERHEAD POWER LINE
TREE LINE

DESCRIPTION:

AT SURVEY STATION 199+19.0 THERE IS A RESIDENCE 19' LEFT OF THE CWA AND 69' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 200+50.7 THERE IS A RESIDENCE 10' LEFT OF THE CWA AND 56' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 202+97.1 THERE IS A RESIDENCE 6' RIGHT OF THE CWA AND 56' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 203+19.9 THERE IS A RESIDENCE 35' LEFT OF THE CWA AND 85' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 204+61.0 THERE IS A RESIDENCE 4' LEFT OF THE CWA AND 52' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
D	RE-ISSUED FOR CLIENT REVIEW	03/13/2014
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A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	12/12/13
CHECKED BY:	APW	12/12/13
DRAWN BY:	TMR	11/13/13
SCALE:	1"=50'	DATE

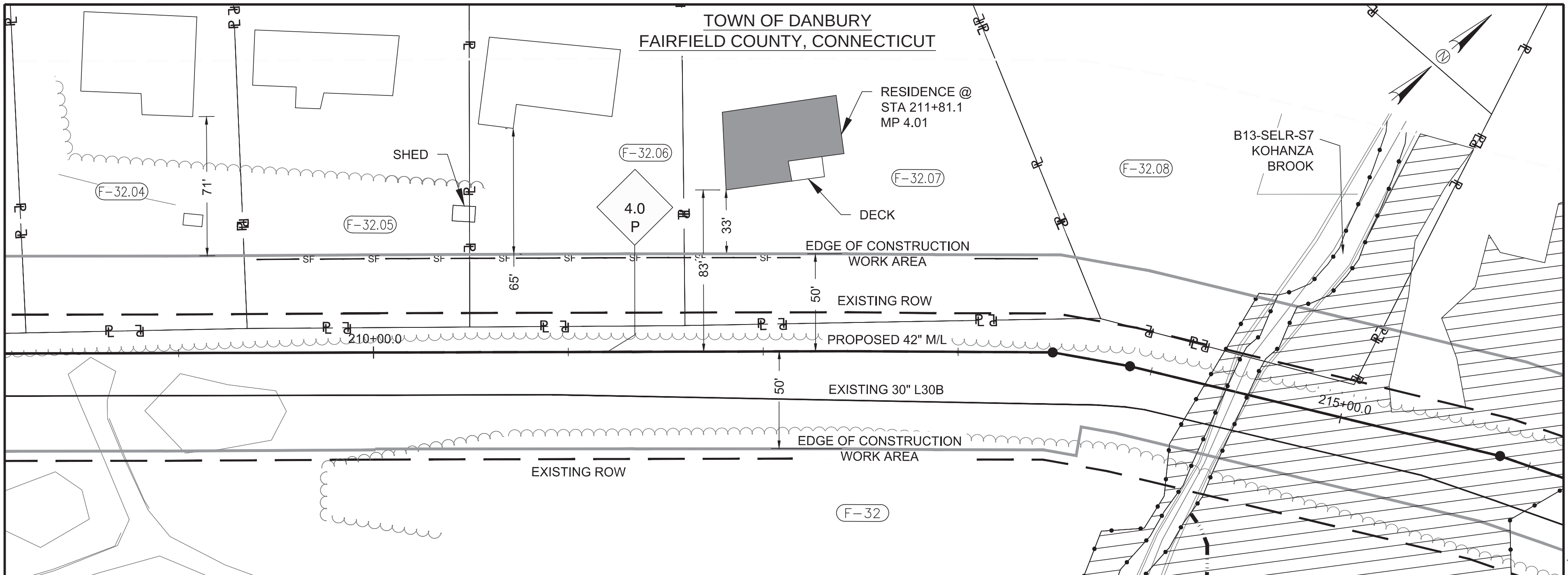
ALGONQUIN INCREMENTAL MARKET PROJECT
SOUTHEAST DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: FAIRFIELD COUNTY, CONNECTICUT | REV.: D

YR.: 2014 | W.O.: | DWG. NO.: SQ-E-7007

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400



SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

DESCRIPTION:

AT SURVEY STATION 211+81.1 THERE IS A RESIDENCE 33' LEFT OF THE CWA AND 83' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

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C	RE-ISSUED FOR CLIENT REVIEW	03/06/2014
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IG.#

PROJ. ENG.	CCW	12/12/13
CHECKED BY:	APW	12/12/13
DRAWN BY:	TMR	11/13/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
SOUTHEAST DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: FAIRFIELD COUNTY, CONNECTICUT | REV.: D

YR.: 2014 | W.O.: | DWG. NO.: SQ-E-7008

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 - Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series - Site specific residential dwgs\Southeast\SQ-E-7008.dwg - PLOT TIME: 3/13/2014 8:28 AM

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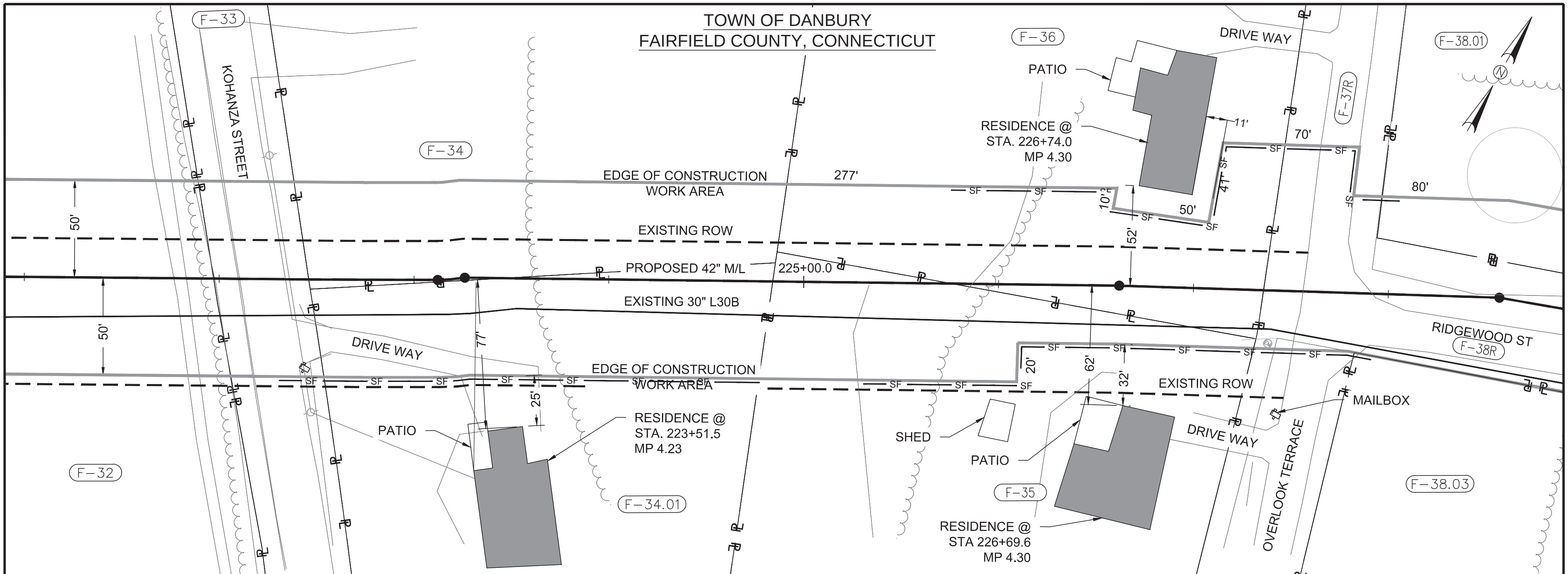


SCALE: 1"=50'

50 0 50 Feet

UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

DESCRIPTION:

AT SURVEY STATION 223+51.5 THERE IS A RESIDENCE 25' RIGHT OF THE CWA AND 77' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 226+69.6 THERE IS A RESIDENCE 32' RIGHT OF THE CWA AND 62' RIGHT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

AT SURVEY STATION 226+74.0 THERE IS A RESIDENCE 11' LEFT OF THE CWA AND 52' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

NOTES:
1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
D	RE-ISSUED FOR CLIENT REVIEW	03/13/14
C	RE-ISSUED FOR CLIENT REVIEW	01/27/14
B	ISSUED FOR CLIENT REVIEW	12/12/13
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	12/12/13
CHECKED BY:	APW	12/12/13
DRAWN BY:	TMR	11/13/13
SCALE:	1"=50'	DATE

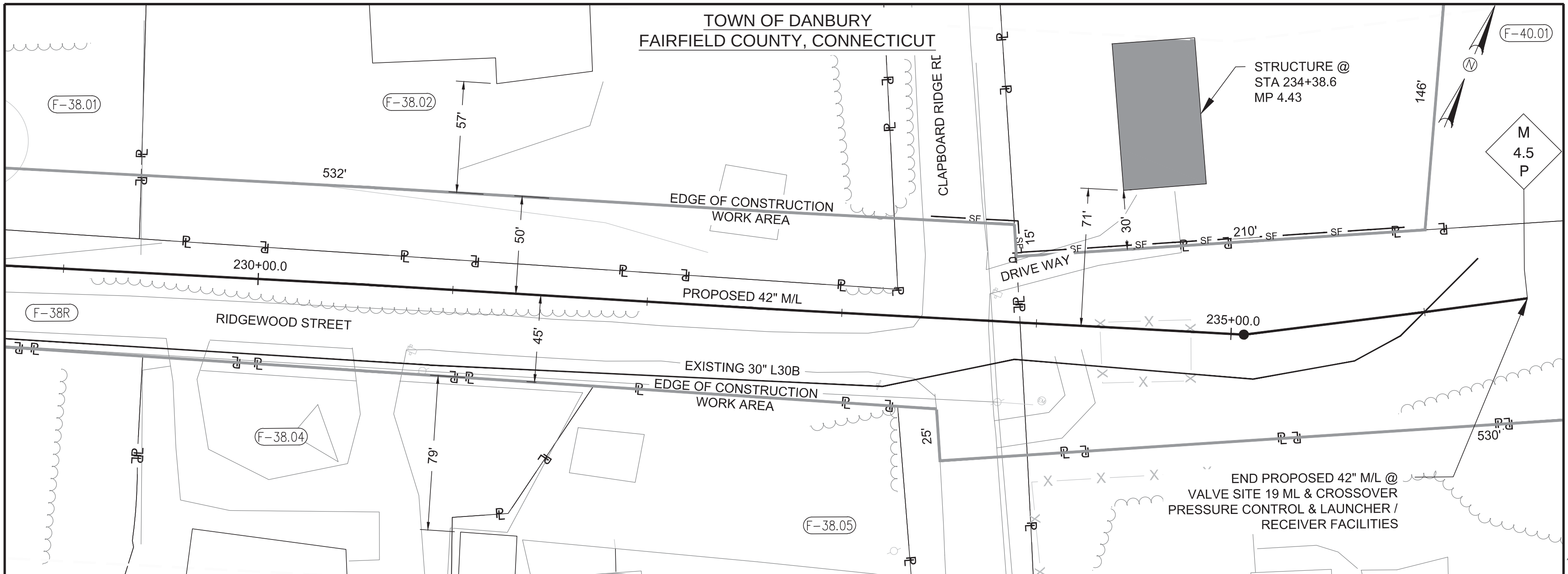
ALGONQUIN INCREMENTAL MARKET PROJECT
SOUTHEAST DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: FAIRFIELD COUNTY, CONNECTICUT | REV.: D

YR.: 2014 | W.O.: | DWG. NO.: SQ-E-7009

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400



SCALE: 1"=50'

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UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

DESCRIPTION:

AT SURVEY STATION 234+38.6 THERE IS A STRUCTURE 30' LEFT OF THE CWA AND 71' LEFT OF THE CENTERLINE OF THE PROPOSED 42" M/L.

LEGEND

- PROPOSED PIPELINE
- EXISTING RIGHT-OF-WAY (ROW)
- NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
- CONSTRUCTION WORK AREA (CWA)
- EXISTING PIPELINE
- FENCE LINE
- SAFETY FENCE
- PROPERTY LINE
- OVERHEAD POWER LINE
- TREE LINE

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
D	RE-ISSUED FOR CLIENT REVIEW	03/13/2014
C	ISSUED FOR CLIENT REVIEW	03/06/2014
B	NOT ISSUED	03/06/2014
A	ISSUED FOR INTERNAL REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	12/12/13
CHECKED BY:	APW	12/12/13
DRAWN BY:	TMR	11/13/13
SCALE:	1"=50'	DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
SOUTHEAST DISCHARGE
PROPOSED 42" M/L
RESIDENTIAL SITE SPECIFIC DRAWING

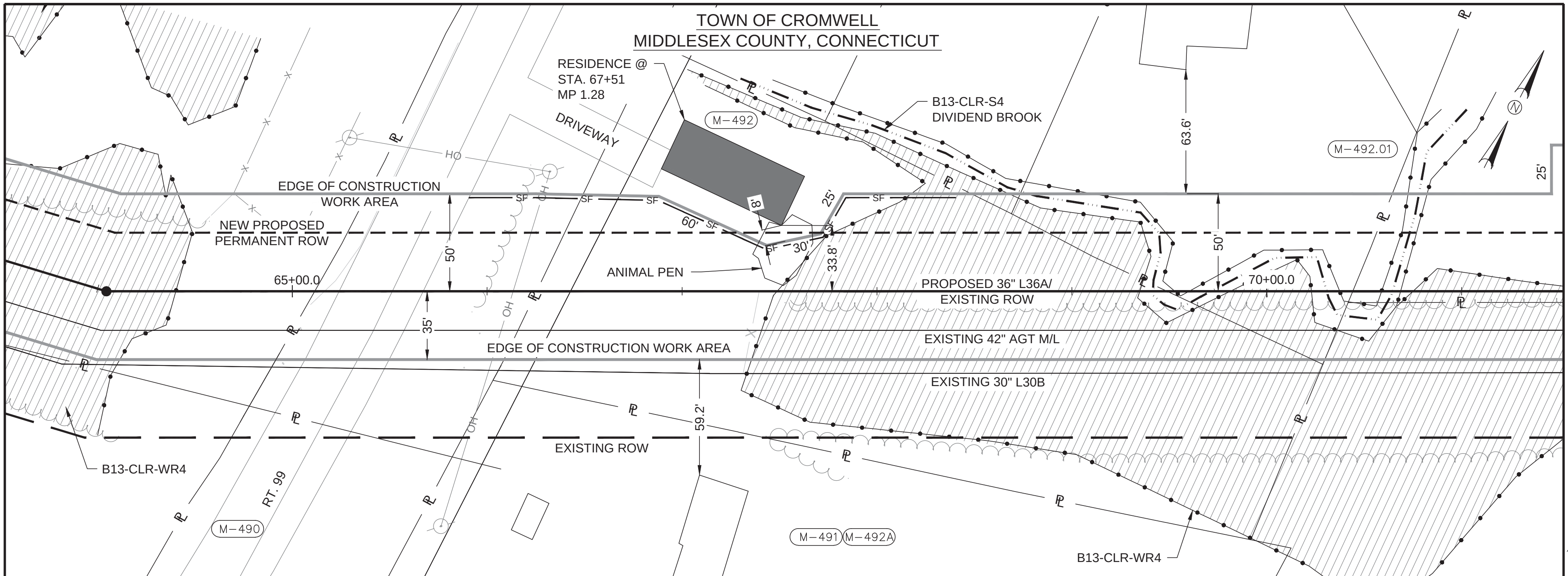
LOC.: FAIRFIELD COUNTY, CONNECTICUT | REV.: D

YR.: 2014 | W.O.: | DWG. NO.: SQ-E-7010

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 - Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series - Site specific residential dwgs\Southeast\SQ-E-7010.dwg - PLOT TIME: 3/13/2014 9:15 AM



SCALE: 1"=50'

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UTM NAD83, ZONE 18, US FOOT (UTM83–18F)

DESCRIPTION:

AT SURVEY STATION 67+51 THERE IS A STRUCTURE 8.3' LEFT OF THE CWA AND 33.8' LEFT OF THE CENTERLINE OF THE PROPOSED 36" L36A.

LEGEND

PROPOSED PIPELINE	
EXISTING RIGHT–OF–WAY (ROW)	
NEW PROPOSED PERMANENT RIGHT–OF–WAY (ROW)	
CONSTRUCTION WORK AREA (CWA)	
EXISTING PIPELINE	
FENCE LINE	x x
SAFETY FENCE	SF
PROPERTY LINE	℞
OVERHEAD POWER LINE	OH
TREE LINE	

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING–SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
E	ISSUED FOR CLIENT REVIEW	03/12/14
D	RE-ISSUED FOR FERC APPLICATION	02/2014
C	RE-ISSUED FOR FERC APPLICATION	02/2014
B	ISSUED FOR FERC APPLICATION	02/2014

IG.#

PROJ. ENG.	CCW	12/12/13
CHECKED BY:	APW	12/12/13
DRAWN BY:	TMR	11/13/13
SCALE:		DATE

ALGONQUIN INCREMENTAL MARKET PROJECT
CROMWELL DISCHARGE
PROPOSED 36" L36A
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: MIDDLESEX COUNTY, CONNECTICUT | REV.: E
YR.: 2014 | W.O.: | DWG. NO.: CJ–E–7001

Spectra Energy Partners.

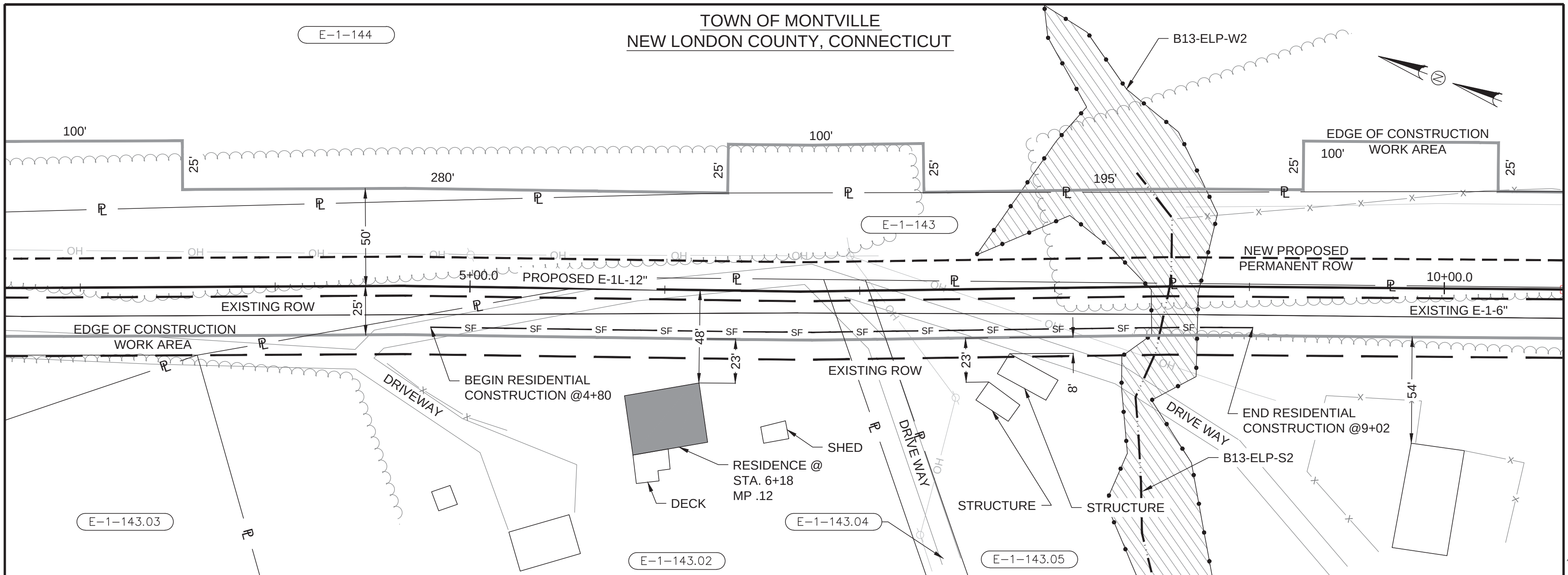
Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

R:\101490 – Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series – Site specific residential dwgs\Cromwell\CJ-E-7001.dwg – PLOT TIME: 3/12/2014 3:35 PM

APPENDIX H (cont'd)

H-59

R:\101490 – Spectra AIM\08 Deliverables WIP\04.11 Pipeline\04.11.665 PL Permits\7000 Series – Site specific residential dwgs\E-1-B\CJ-E-7201.dwg – PLOT TIME: 3/12/2014 3:24 PM



SCALE: 1"=50'

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UTM NAD83, ZONE 18, US FOOT (UTM83-18F)

LEGEND

PROPOSED PIPELINE
EXISTING RIGHT-OF-WAY (ROW)
NEW PROPOSED PERMANENT RIGHT-OF-WAY (ROW)
CONSTRUCTION WORK AREA (CWA)
EXISTING PIPELINE
FENCE LINE
SAFETY FENCE
PROPERTY LINE
OVERHEAD POWER LINE
TREE LINE

DESCRIPTION:

AT SURVEY STATION 6+18 THERE IS A RESIDENCE 23' RIGHT OF THE CWA AND 48' RIGHT OF THE CENTERLINE OF THE PROPOSED E-1L-12".

NOTES:

1. EXISTING STRUCTURES INCLUDING BUT NOT LIMITED TO; FENCES, SHEDS, SWING-SETS, TRAMPOLINES, SHRUBBERY, TREES, GARDENS, FLOWERBEDS, POOLS WILL BE REMOVED FROM THE CONSTRUCTION WORK AREA. LANDOWNERS WILL BE MADE AWARE OF WHAT WILL BE RELOCATED DURING NEGOTIATIONS. ALGONQUIN WILL PRESERVE ALL MATURE TREES AND LANDSCAPING WHERE PRACTICAL, CONSISTENT WITH CONSTRUCTION SAFETY.

REV.#	DESCRIPTION	DATE
E	RE-ISSUED FOR CLIENT REVIEW	03/12/14
D	RE-ISSUED FOR FERC APPLICATION	02/2014
C	ISSUED FOR FREC APPLICATION	02/2014
B	ISSUED FOR CLIENT REVIEW	11/20/13

IG.#

PROJ. ENG.	CCW	03/12/14
CHECKED BY:	APW	03/12/14
DRAWN BY:	TMR	11/13/13
SCALE:	1":50'	DATE

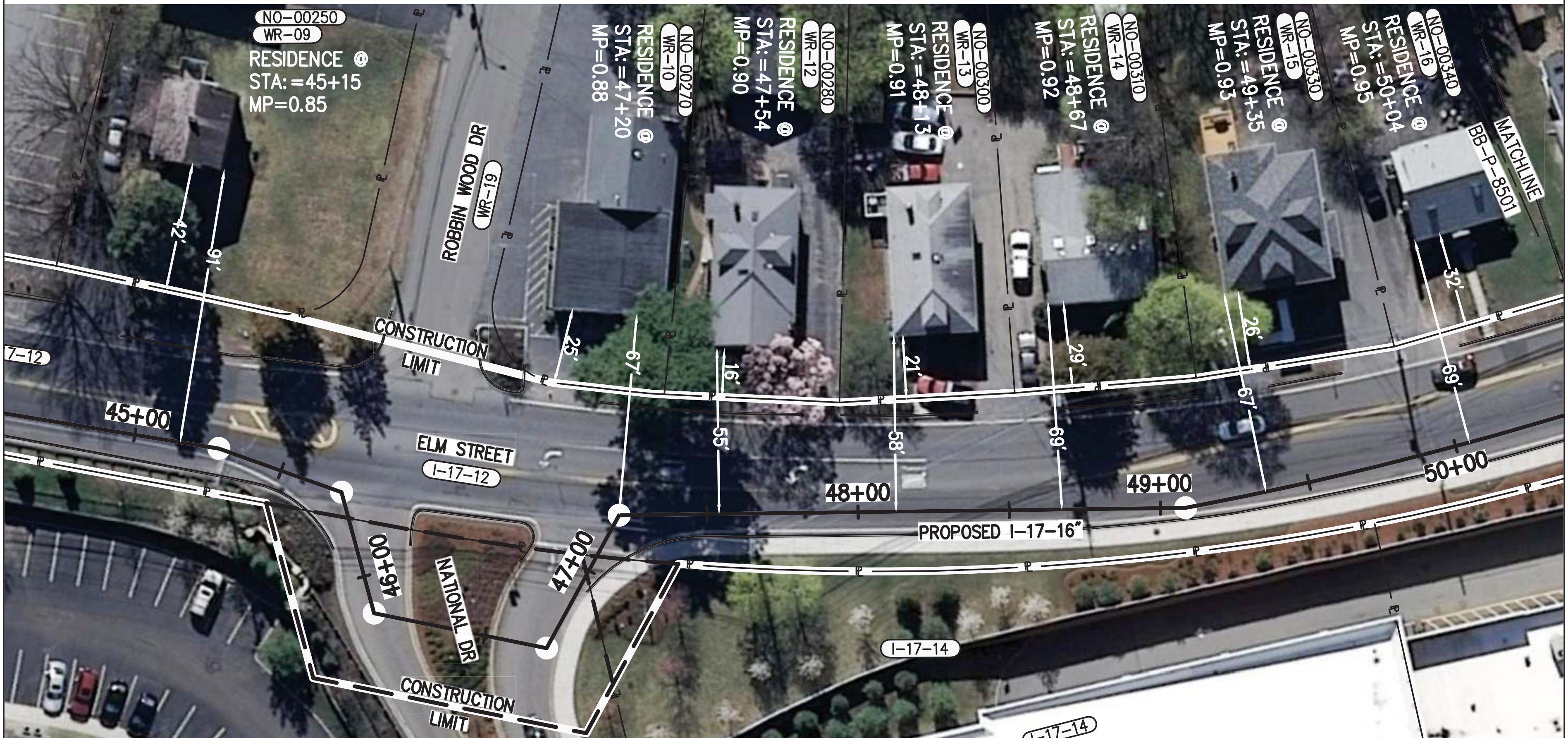
ALGONQUIN INCREMENTAL MARKET PROJECT
CROMWELL DISCHARGE
PROPOSED E-1L-12"
RESIDENTIAL SITE SPECIFIC DRAWING

LOC.: NEW LONDON CO., CONNECTICUT | REV.: E
YR.: 2014 | W.O.: | DWG. NO.: CJ-E-7201

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

NORFOLK COUNTY, MASSACHUSETTS
TOWN OF DEDHAM



GENERAL NOTES:

1. LOCATION OF BUILDING STRUCTURES ARE BASED ON GIS, THEY ARE NOT THE RESULT OF A FIELD SURVEY.
2. PROPERTY LINES SHOWN ARE GRAPHICAL AND ARE NOT THE RESULT OF A ON THE GROUND SURVEY OR PLAN OF RECORD
3. TRENCH SPOIL WILL BE PLACED IN DUMP TRUCKS AND TRANSFERRED OFF SITE, TYPICAL RIGHT-OF-WAY CONFIGURATIONS DO NOT APPLY.
4. APPROVED TRAFFIC MANAGEMENT PLAN DEVICES AND PUBLIC SAFETY DEVICES WILL REPLACE AND/OR BE UTILIZED IN CONJUNCTION WITH SAFETY FENCING.

			TITLE: I-17 WEST ROXBURY LATERAL			
			LOC. NORFOLK COUNTY, MASSACHUSETTS			REV.1
			CHK. BY DP	DATE: 3/13/2014	CE000030.002	
REV.#	DESCRIPTION	DATE	DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8500	1 of 30

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

NORFOLK COUNTY, MASSACHUSETTS
TOWN OF DEDHAM

GENERAL NOTES:

1. LOCATION OF BUILDING STRUCTURES ARE BASED ON GIS, THEY ARE NOT THE RESULT OF A FIELD SURVEY.
2. PROPERTY LINES SHOWN ARE GRAPHICAL AND ARE NOT THE RESULT OF A ON THE GROUND SURVEY OR PLAN OF RECORD
3. TRENCH SPOIL WILL BE PLACED IN DUMP TRUCKS AND TRANSFERRED OFF SITE, TYPICAL RIGHT-OF-WAY CONFIGURATIONS DO NOT APPLY.
4. APPROVED TRAFFIC MANAGEMENT PLAN DEVICES AND PUBLIC SAFETY DEVICES WILL REPLACE AND/OR BE UTILIZED IN CONJUNCTION WITH SAFETY FENCING.

			TITLE: I-17 WEST ROXBURY LATERAL			
			LOC. NORFOLK COUNTY, MASSACHUSETTS			REV.1
			CHK. BY DP		DATE: 3/13/2014	CE000030.002
REV.#	DESCRIPTION	DATE	DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8501	2 of 30

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

NORFOLK COUNTY, MASSACHUSETTS
TOWN OF DEDHAM

GENERAL NOTES:

1. LOCATION OF BUILDING STRUCTURES ARE BASED ON GIS, THEY ARE NOT THE RESULT OF A FIELD SURVEY.
2. PROPERTY LINES SHOWN ARE GRAPHICAL AND ARE NOT THE RESULT OF A ON THE GROUND SURVEY OR PLAN OF RECORD
3. TRENCH SPOIL WILL BE PLACED IN DUMP TRUCKS AND TRANSFERRED OFF SITE, TYPICAL RIGHT-OF-WAY CONFIGURATIONS DO NOT APPLY.
4. APPROVED TRAFFIC MANAGEMENT PLAN DEVICES AND PUBLIC SAFETY DEVICES WILL REPLACE AND/OR BE UTILIZED IN CONJUNCTION WITH SAFETY FENCING.

REV.#	DESCRIPTION	DATE

TITLE:
I-17
WEST ROXBURY LATERAL

LOC. NORFOLK COUNTY, MASSACHUSETTS			REV.1
CHK. BY DP	DATE: 3/13/2014	CE000030.002	
DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8503	3 of 30

Spectra Energy Partners.
Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

NORFOLK COUNTY, MASSACHUSETTS
TOWN OF DEDHAM

GENERAL NOTES:

1. LOCATION OF BUILDING STRUCTURES ARE BASED ON GIS, THEY ARE NOT THE RESULT OF A FIELD SURVEY.
2. PROPERTY LINES SHOWN ARE GRAPHICAL AND ARE NOT THE RESULT OF A ON THE GROUND SURVEY OR PLAN OF RECORD
3. TRENCH SPOIL WILL BE PLACED IN DUMP TRUCKS AND TRANSFERRED OFF SITE, TYPICAL RIGHT-OF-WAY CONFIGURATIONS DO NOT APPLY.
4. APPROVED TRAFFIC MANAGEMENT PLAN DEVICES AND PUBLIC SAFETY DEVICES WILL REPLACE AND/OR BE UTILIZED IN CONJUNCTION WITH SAFETY FENCING.

REV.#	DESCRIPTION	DATE

TITLE:

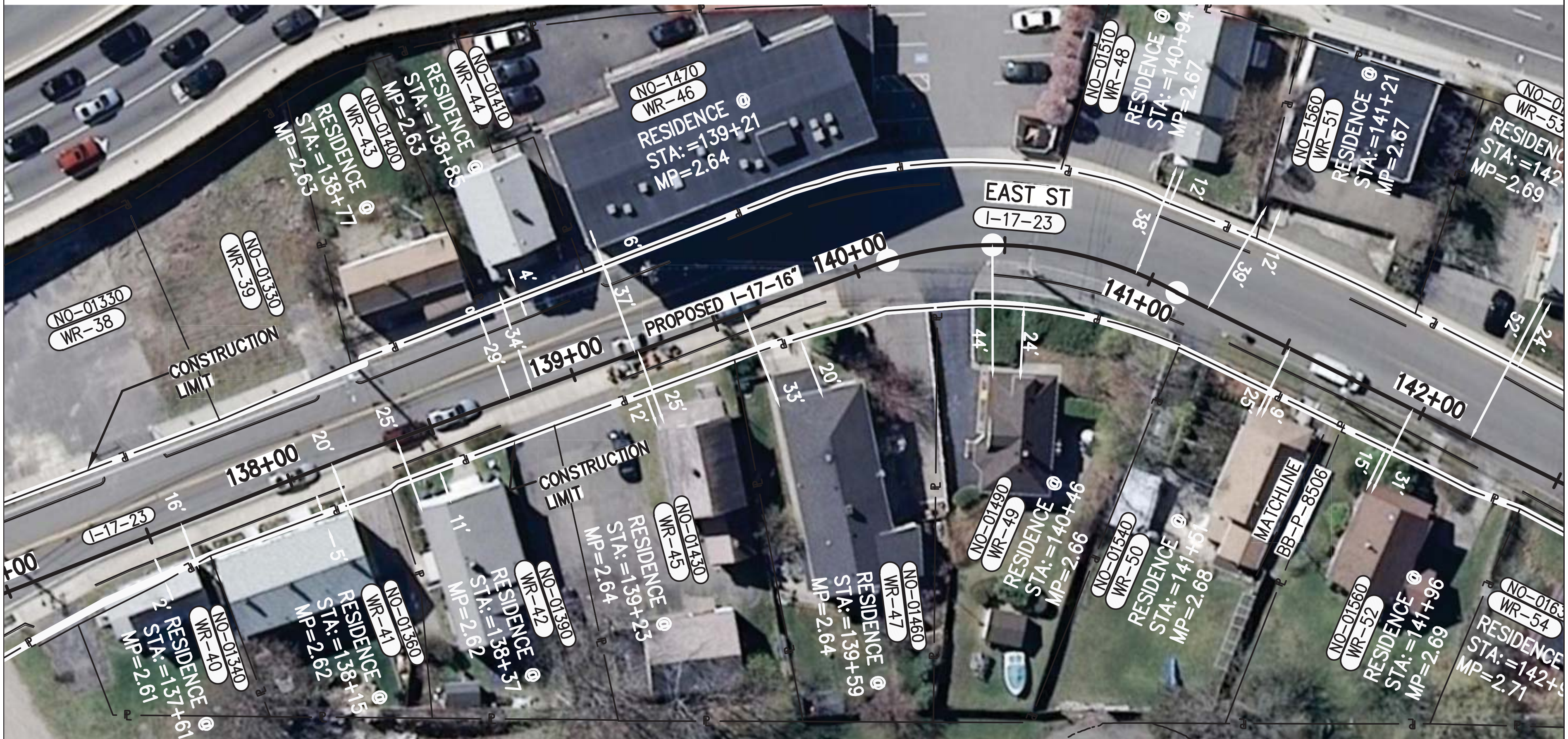
I-17
WEST ROXBURY LATERAL

LOC. NORFOLK COUNTY, MASSACHUSETTS			REV.1
CHK. BY DP	DATE: 3/13/2014	CE000030.002	
DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8504	4 of 30

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

NORFOLK COUNTY, MASSACHUSETTS
TOWN OF DEDHAM



GENERAL NOTES:

1. LOCATION OF BUILDING STRUCTURES ARE BASED ON GIS, THEY ARE NOT THE RESULT OF A FIELD SURVEY.
2. PROPERTY LINES SHOWN ARE GRAPHICAL AND ARE NOT THE RESULT OF A ON THE GROUND SURVEY OR PLAN OF RECORD
3. TRENCH SPOIL WILL BE PLACED IN DUMP TRUCKS AND TRANSFERRED OFF SITE, TYPICAL RIGHT-OF-WAY CONFIGURATIONS DO NOT APPLY.
4. APPROVED TRAFFIC MANAGEMENT PLAN DEVICES AND PUBLIC SAFETY DEVICES WILL REPLACE AND/OR BE UTILIZED IN CONJUNCTION WITH SAFETY FENCING.

REV.#	DESCRIPTION	DATE	TITLE: I-17 WEST ROXBURY LATERAL		
			LOC. NORFOLK COUNTY, MASSACHUSETTS		REV.1
			CHK. BY DP	DATE: 3/13/2014	CE000030.002
			DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8505 — 5 of 30

Spectra Energy Partners

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

NORFOLK COUNTY, MASSACHUSETTS
TOWN OF DEDHAM

GENERAL NOTES:

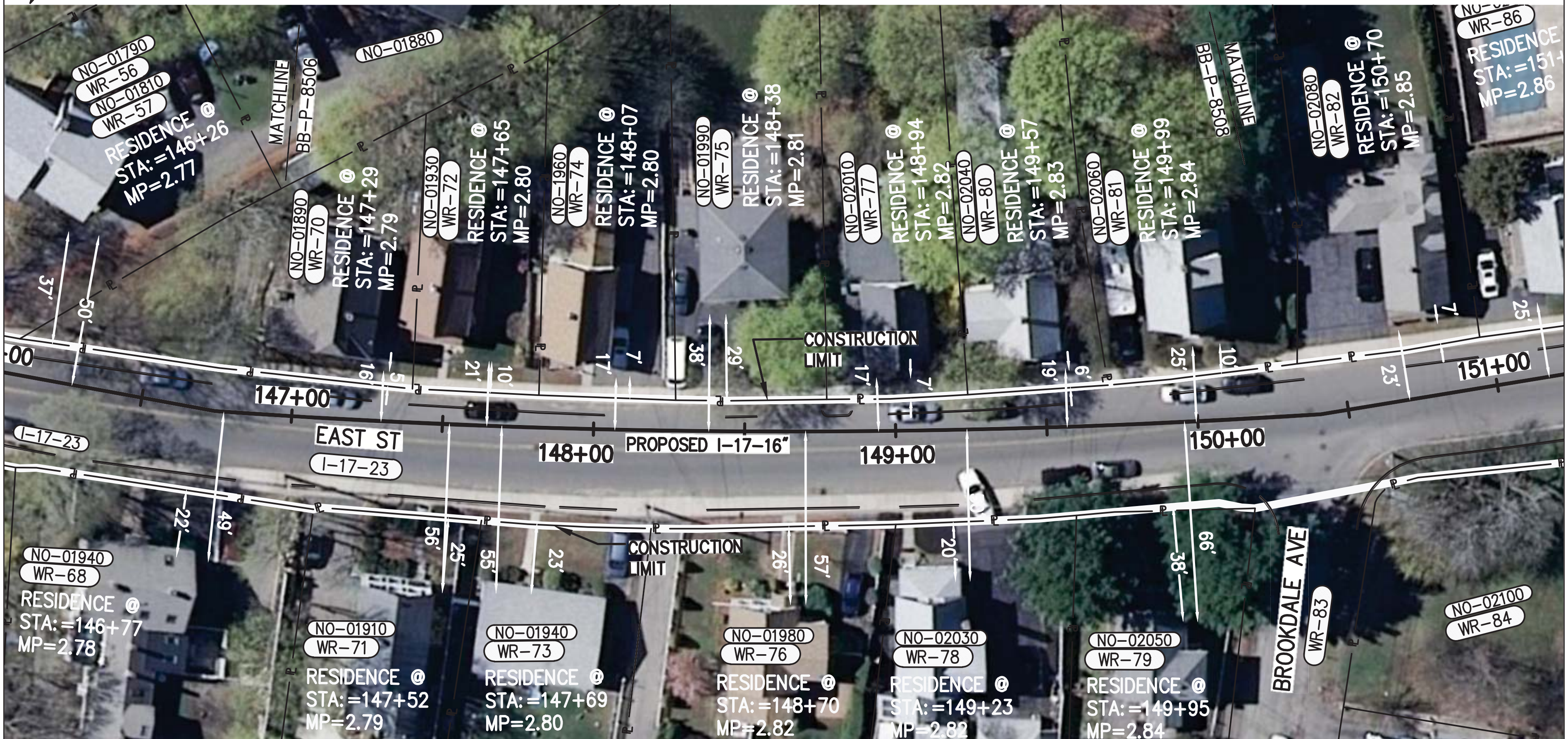
1. LOCATION OF BUILDING STRUCTURES ARE BASED ON GIS, THEY ARE NOT THE RESULT OF A FIELD SURVEY.
2. PROPERTY LINES SHOWN ARE GRAPHICAL AND ARE NOT THE RESULT OF A ON THE GROUND SURVEY OR PLAN OF RECORD
3. TRENCH SPOIL WILL BE PLACED IN DUMP TRUCKS AND TRANSFERRED OFF SITE, TYPICAL RIGHT-OF-WAY CONFIGURATIONS DO NOT APPLY.
4. APPROVED TRAFFIC MANAGEMENT PLAN DEVICES AND PUBLIC SAFETY DEVICES WILL REPLACE AND/OR BE UTILIZED IN CONJUNCTION WITH SAFETY FENCING.

			TITLE: I-17 WEST ROXBURY LATERAL
			LOC. NORFOLK COUNTY, MASSACHUSETTS — REV.1
			CHK. BY DP — DATE: 3/13/2014 — CE000030.002
REV.#	DESCRIPTION	DATE	DRN. BY VHB — SCALE: 1"=50' — DWG. BB-P-8506 — 6 of 30

Spectra Energy Partners

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

NORFOLK COUNTY, MASSACHUSETTS
TOWN OF DEDHAM



GENERAL NOTES:

1. LOCATION OF BUILDING STRUCTURES ARE BASED ON GIS, THEY ARE NOT THE RESULT OF A FIELD SURVEY.
2. PROPERTY LINES SHOWN ARE GRAPHICAL AND ARE NOT THE RESULT OF A ON THE GROUND SURVEY OR PLAN OF RECORD
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4. APPROVED TRAFFIC MANAGEMENT PLAN DEVICES AND PUBLIC SAFETY DEVICES WILL REPLACE AND/OR BE UTILIZED IN CONJUNCTION WITH SAFETY FENCING.

REV.#	DESCRIPTION	DATE

TITLE:

I-17
WEST ROXBURY LATERAL

LOC. NORFOLK COUNTY, MASSACHUSETTS			REV.1
CHK. BY DP	DATE: 3/13/2014	CE000030.002	
DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8507	7 of 30

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

APPENDIX H (cont'd)

NORFOLK COUNTY, MASSACHUSETTS
TOWN OF DEDHAM

GENERAL NOTES:

1. LOCATION OF BUILDING STRUCTURES ARE BASED ON GIS, THEY ARE NOT THE RESULT OF A FIELD SURVEY.
2. PROPERTY LINES SHOWN ARE GRAPHICAL AND ARE NOT THE RESULT OF A ON THE GROUND SURVEY OR PLAN OF RECORD
3. TRENCH SPOIL WILL BE PLACED IN DUMP TRUCKS AND TRANSFERRED OFF SITE, TYPICAL RIGHT-OF-WAY CONFIGURATIONS DO NOT APPLY.
4. APPROVED TRAFFIC MANAGEMENT PLAN DEVICES AND PUBLIC SAFETY DEVICES WILL REPLACE AND/OR BE UTILIZED IN CONJUNCTION WITH SAFETY FENCING.

			TITLE: I-17 WEST ROXBURY LATERAL			
			LOC. NORFOLK COUNTY, MASSACHUSETTS			REV.1
			CHK. BY DP		DATE: 3/13/2014	CE000030.002
REV.#	DESCRIPTION	DATE	DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8508	8 of 30

Spectra Energy Partners

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

NORFOLK COUNTY, MASSACHUSETTS
TOWN OF DEDHAM

GENERAL NOTES:

1. LOCATION OF BUILDING STRUCTURES ARE BASED ON GIS, THEY ARE NOT THE RESULT OF A FIELD SURVEY.
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4. APPROVED TRAFFIC MANAGEMENT PLAN DEVICES AND PUBLIC SAFETY DEVICES WILL REPLACE AND/OR BE UTILIZED IN CONJUNCTION WITH SAFETY FENCING.

REV.#	DESCRIPTION	DATE	TITLE: I-17 WEST ROXBURY LATERAL			
			LOC. NORFOLK COUNTY, MASSACHUSETTS			REV.1
			CHK. BY DP	DATE: 3/13/2014	CE000030.002	
			DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8509	9 of 30

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

NORFOLK COUNTY, MASSACHUSETTS
TOWN OF DEDHAM

GENERAL NOTES:

1. LOCATION OF BUILDING STRUCTURES ARE BASED ON GIS, THEY ARE NOT THE RESULT OF A FIELD SURVEY.
2. PROPERTY LINES SHOWN ARE GRAPHICAL AND ARE NOT THE RESULT OF A ON THE GROUND SURVEY OR PLAN OF RECORD
3. TRENCH SPOIL WILL BE PLACED IN DUMP TRUCKS AND TRANSFERRED OFF SITE, TYPICAL RIGHT-OF-WAY CONFIGURATIONS DO NOT APPLY.
4. APPROVED TRAFFIC MANAGEMENT PLAN DEVICES AND PUBLIC SAFETY DEVICES WILL REPLACE AND/OR BE UTILIZED IN CONJUNCTION WITH SAFETY FENCING.

REV.#	DESCRIPTION	DATE

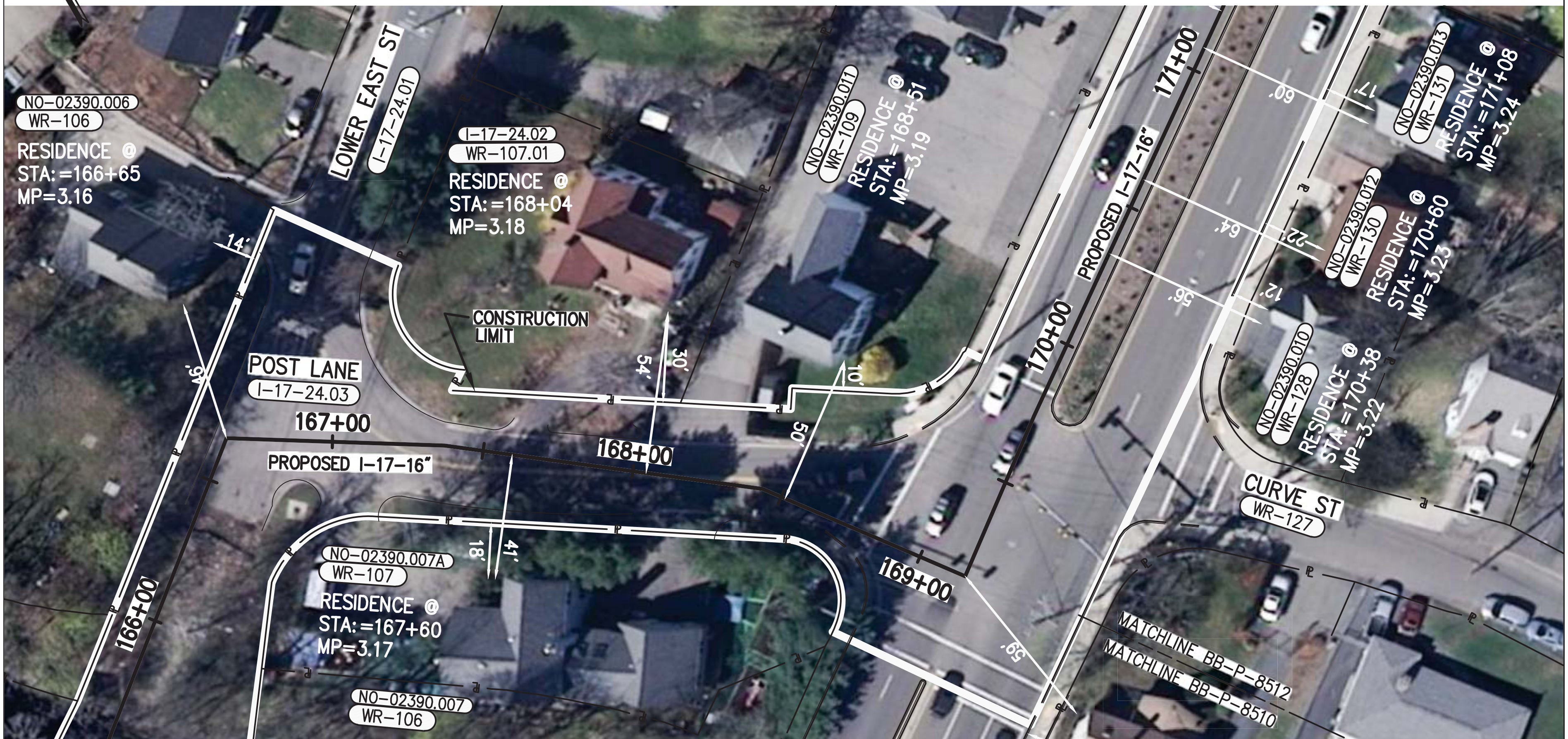
TITLE:
I-17
WEST ROXBURY LATERAL

LOC. NORFOLK COUNTY, MASSACHUSETTS		REV.1
CHK. BY DP	DATE: 3/13/2014	CE000030.002
DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8510	10 of 30

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

NORFOLK COUNTY, MASSACHUSETTS
TOWN OF DEDHAM



GENERAL NOTES:

1. LOCATION OF BUILDING STRUCTURES ARE BASED ON GIS, THEY ARE NOT THE RESULT OF A FIELD SURVEY.
2. PROPERTY LINES SHOWN ARE GRAPHICAL AND ARE NOT THE RESULT OF A ON THE GROUND SURVEY OR PLAN OF RECORD
3. TRENCH SPOIL WILL BE PLACED IN DUMP TRUCKS AND TRANSFERRED OFF SITE, TYPICAL RIGHT-OF-WAY CONFIGURATIONS DO NOT APPLY.
4. APPROVED TRAFFIC MANAGEMENT PLAN DEVICES AND PUBLIC SAFETY DEVICES WILL REPLACE AND/OR BE UTILIZED IN CONJUNCTION WITH SAFETY FENCING.

REV.#	DESCRIPTION	DATE

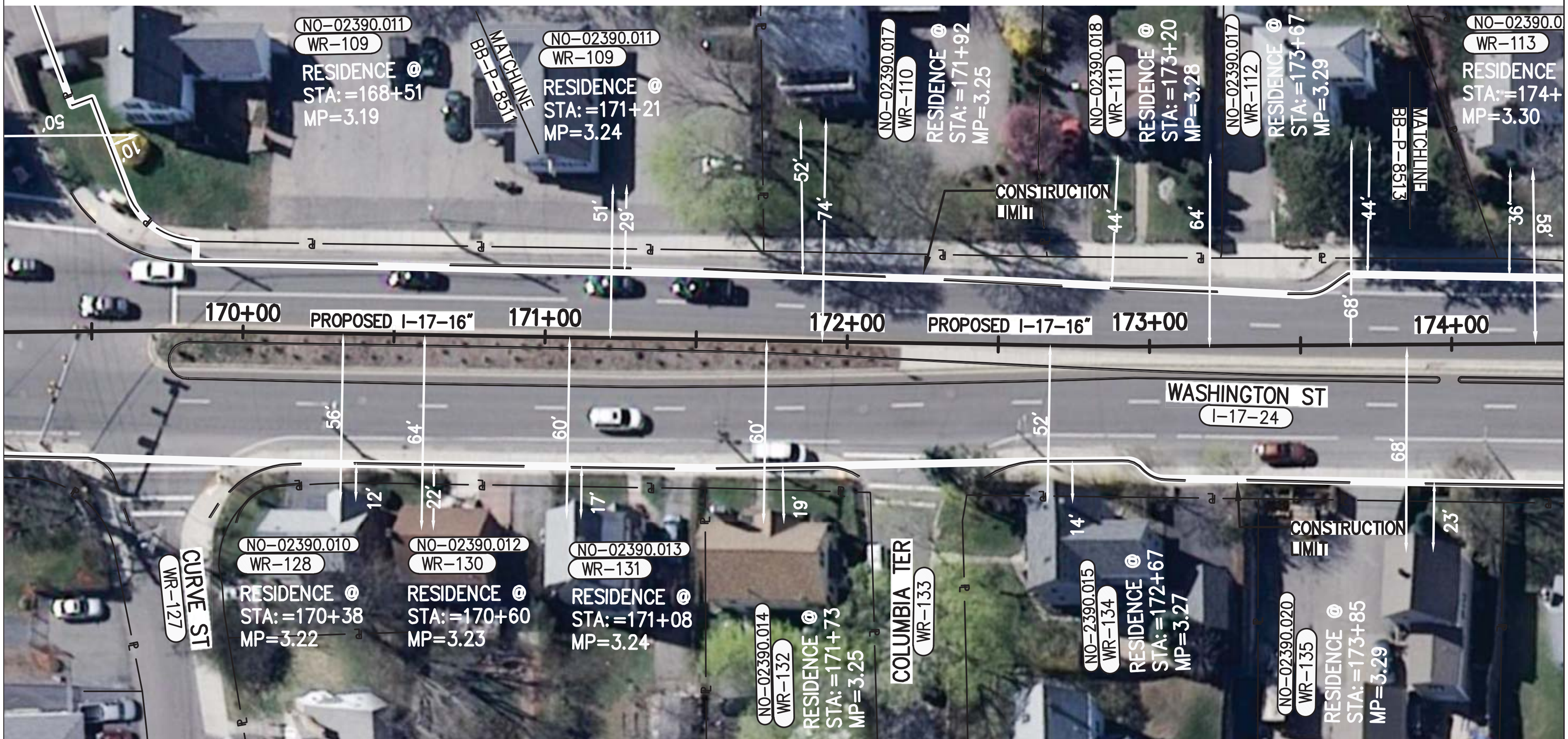
TITLE:
I-17
WEST ROXBURY LATERAL

LOC. NORFOLK COUNTY, MASSACHUSETTS			REV.1
CHK. BY DP	DATE: 3/13/2014	CE000030.002	
DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8511	11 of 30

Spectra Energy Partners

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

NORFOLK COUNTY, MASSACHUSETTS
TOWN OF DEDHAM



GENERAL NOTES:

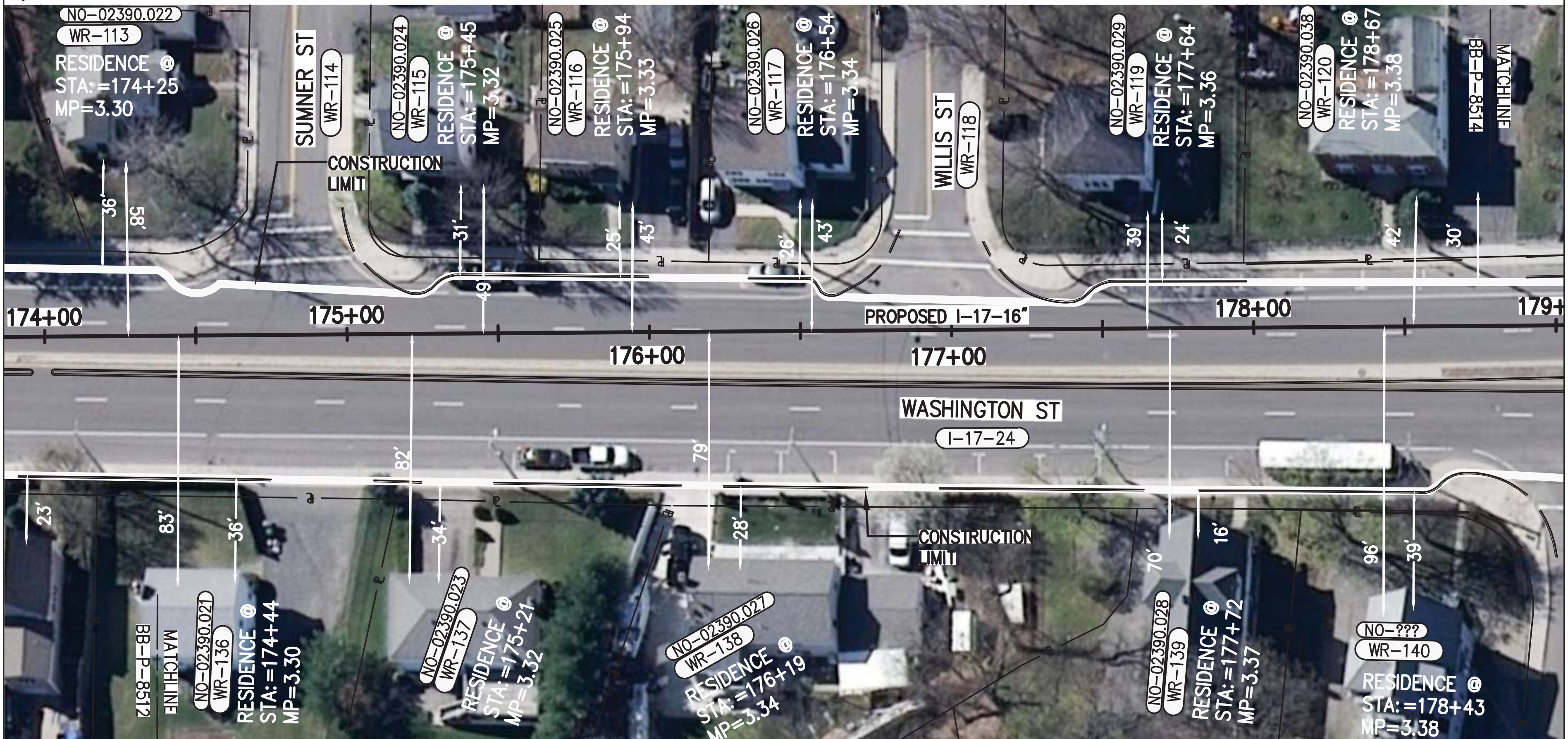
1. LOCATION OF BUILDING STRUCTURES ARE BASED ON GIS, THEY ARE NOT THE RESULT OF A FIELD SURVEY.
2. PROPERTY LINES SHOWN ARE GRAPHICAL AND ARE NOT THE RESULT OF A ON THE GROUND SURVEY OR PLAN OF RECORD
3. TRENCH SPOIL WILL BE PLACED IN DUMP TRUCKS AND TRANSFERRED OFF SITE, TYPICAL RIGHT-OF-WAY CONFIGURATIONS DO NOT APPLY.
4. APPROVED TRAFFIC MANAGEMENT PLAN DEVICES AND PUBLIC SAFETY DEVICES WILL REPLACE AND/OR BE UTILIZED IN CONJUNCTION WITH SAFETY FENCING.

			TITLE: I-17 WEST ROXBURY LATERAL			
			LOC. NORFOLK COUNTY, MASSACHUSETTS			REV.1
			CHK. BY DP	DATE: 3/13/2014	CE000030.002	
REV.#	DESCRIPTION	DATE	DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8512	12 of 30

Spectra Energy Partners

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

NORFOLK COUNTY, MASSACHUSETTS
TOWN OF DEDHAM



GENERAL NOTES:

1. LOCATION OF BUILDING STRUCTURES ARE BASED ON GIS, THEY ARE NOT THE RESULT OF A FIELD SURVEY.
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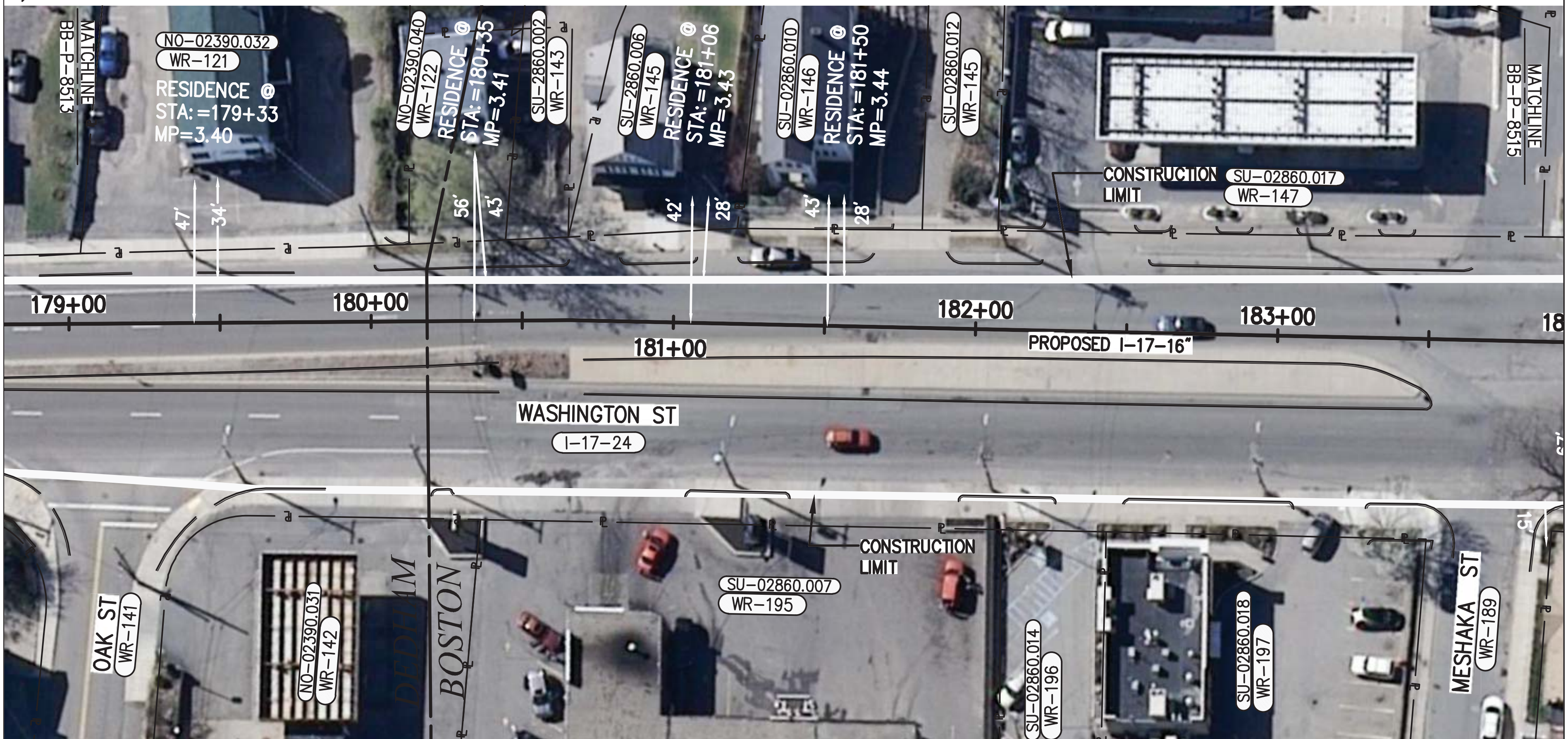
			TITLE: I-17 WEST ROXBURY LATERAL			
			LOC. NORFOLK COUNTY, MASSACHUSETTS			REV.1
			CHK. BY DP		DATE: 3/13/2014	CE000030.002
REV.#	DESCRIPTION	DATE	DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8513	13 of 30

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

APPENDIX H (cont'd)

NORFOLK / SUFFOLK COUNTY, MASSACHUSETTS
TOWN OF DEDHAM / CITY OF BOSTON



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REV.#	DESCRIPTION	DATE

TITLE: I-17 WEST ROXBURY LATERAL

LOC. NORFOLK/SUFFOLK COUNTY, MASSACHUSETTS			REV.1
CHK. BY DP	DATE: 3/13/2014	CE000030.002	
DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8514	14 of 30

Spectra Energy Partners

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

SUFFOLK COUNTY, MASSACHUSETTS
CITY OF BOSTON

GENERAL NOTES:

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			TITLE: I-17 WEST ROXBURY LATERAL			
			LOC. SUFFOLK COUNTY, MASSACHUSETTS			REV.1
			CHK. BY DP		DATE: 3/13/2014	CE000030.002
REV.#	DESCRIPTION	DATE	DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8515	15 of 30

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

SUFFOLK COUNTY, MASSACHUSETTS
CITY OF BOSTON

H-75

APPENDIX H (cont'd)

GENERAL NOTES:

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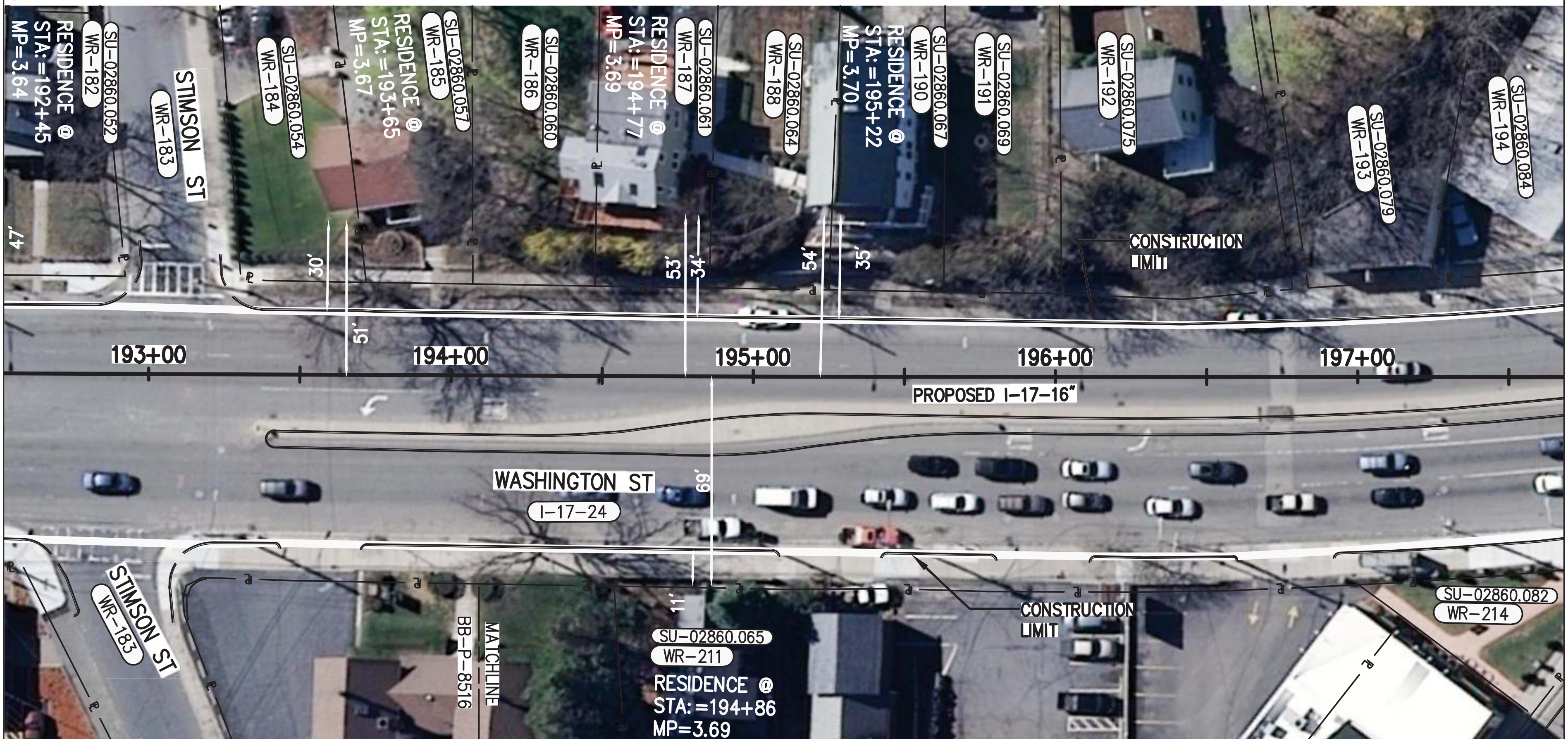
			TITLE: I-17 WEST ROXBURY LATERAL				Spectra Energy Partners
			LOC. SUFFOLK COUNTY, MASSACHUSETTS			REV.1	
			CHK. BY DP	DATE: 3/13/2014	CE000030.002		Algonquin Gas Transmission, LLC
REV.#	DESCRIPTION	DATE	DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8516	16 of 30	5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

SUFFOLK COUNTY, MASSACHUSETTS
CITY OF BOSTON



H-76

APPENDIX H (cont'd)

GENERAL NOTES:

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REV.#	DESCRIPTION	DATE

TITLE:

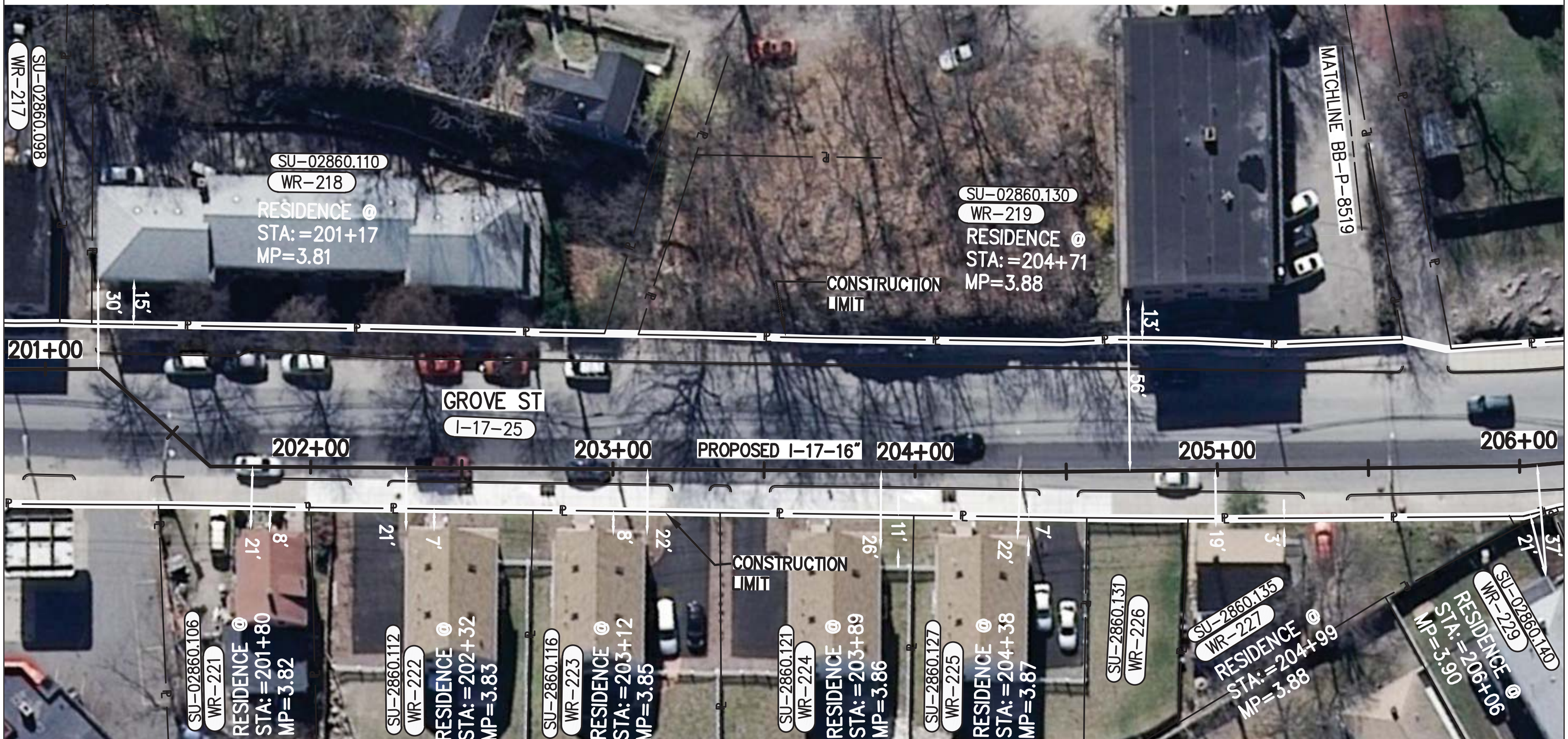
I-17
WEST ROXBURY LATERAL

LOC. SUFFOLK COUNTY, MASSACHUSETTS			REV.1
CHK. BY DP	DATE: 3/13/2014	CE000030.002	
DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8517	17 of 30

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

SUFFOLK COUNTY, MASSACHUSETTS
CITY OF BOSTON



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REV.#	DESCRIPTION	DATE

TITLE:
I-17
WEST ROXBURY LATERAL

LOC. SUFFOLK COUNTY, MASSACHUSETTS			REV.1
CHK. BY DP	DATE: 3/13/2014	CE000030.002	
DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8518	18 of 30

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

SUFFOLK COUNTY, MASSACHUSETTS
CITY OF BOSTON

GENERAL NOTES:

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REV.#	DESCRIPTION	DATE

TITLE:

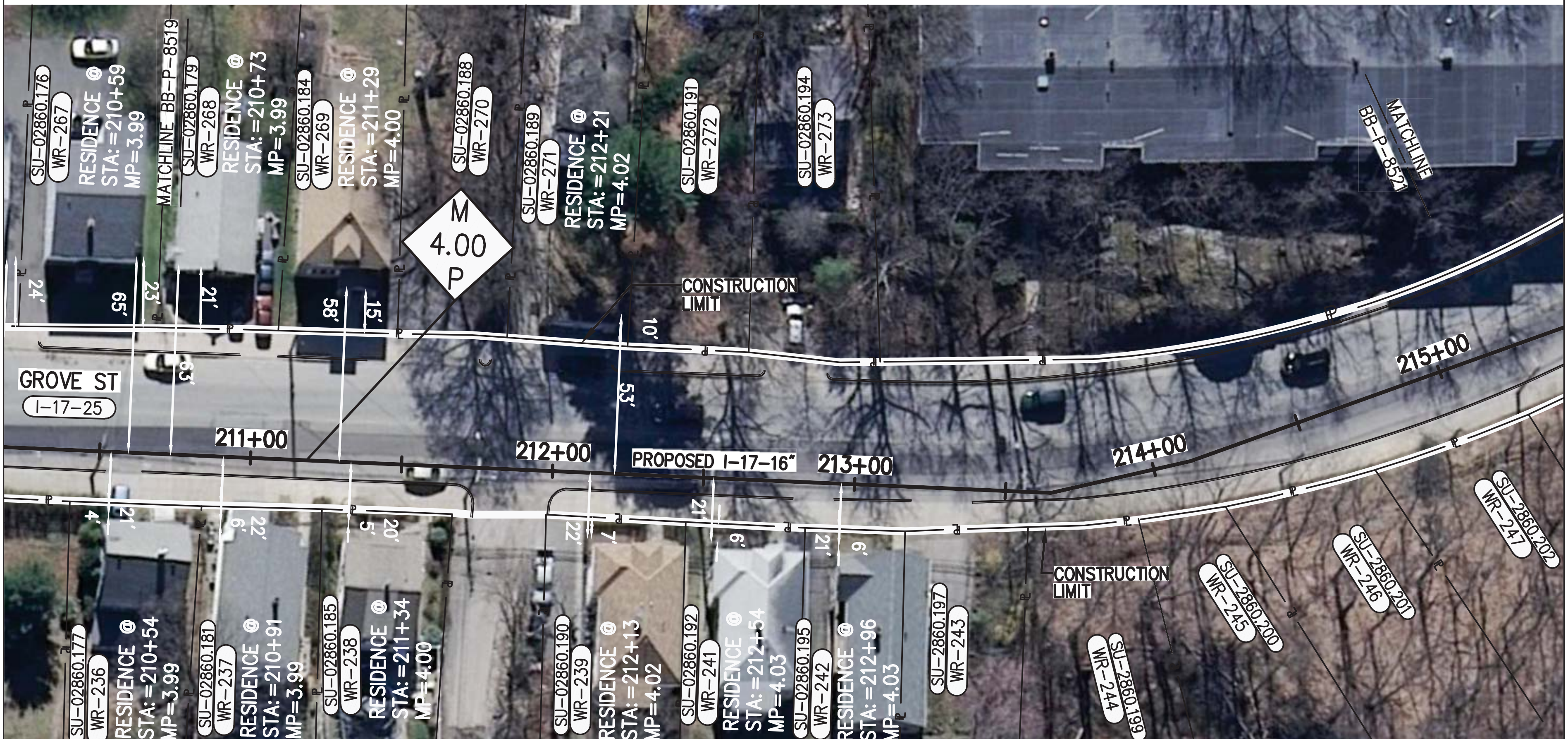
I-17
WEST ROXBURY LATERAL

LOC. SUFFOLK COUNTY, MASSACHUSETTS			REV.1
CHK. BY DP	DATE: 3/13/2014	CE000030.002	
DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8519	19 of 30

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

SUFFOLK COUNTY, MASSACHUSETTS
CITY OF BOSTON



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REV.#	DESCRIPTION	DATE

TITLE:
I-17
WEST ROXBURY LATERAL

LOC. SUFFOLK COUNTY, MASSACHUSETTS			REV.1
CHK. BY DP	DATE: 3/13/2014	CE000030.002	
DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8520	20 of 30

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

SUFFOLK COUNTY, MASSACHUSETTS
CITY OF BOSTON

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REV.#	DESCRIPTION	DATE

TITLE:
I-17
WEST ROXBURY LATERAL

LOC. SUFFOLK COUNTY, MASSACHUSETTS			REV.1
CHK. BY DP	DATE: 3/13/2014	CE000030.002	
DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8521	21 of 30

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

SUFFOLK COUNTY, MASSACHUSETTS
CITY OF BOSTON

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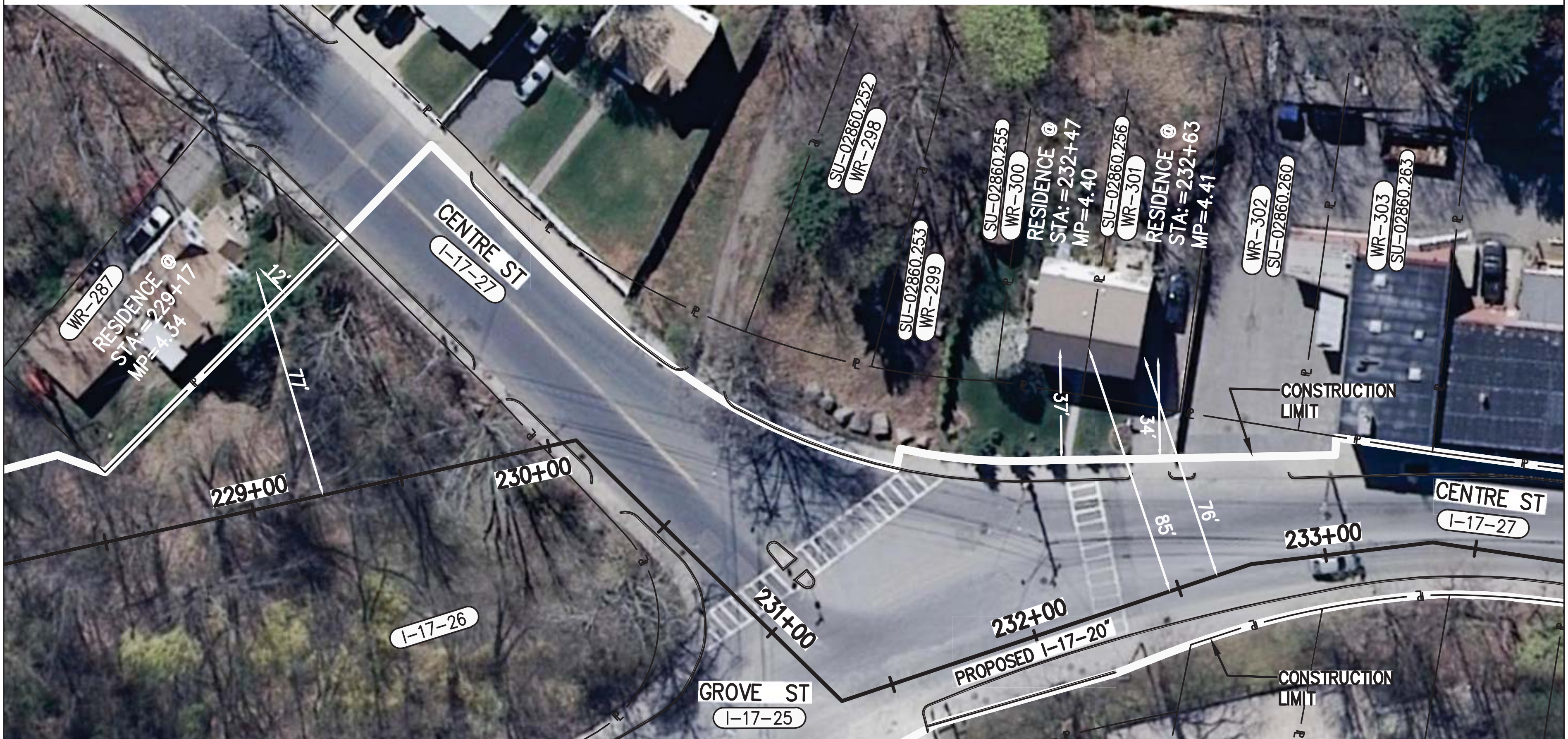
REV.#	DESCRIPTION	DATE	TITLE: I-17 WEST ROXBURY LATERAL			
			LOC. SUFFOLK COUNTY, MASSACHUSETTS			REV.1
			CHK. BY DP		DATE: 3/13/2014	CE000030.002
			DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8522	22 of 30

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

SUFFOLK COUNTY, MASSACHUSETTS
CITY OF BOSTON



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REV.#	DESCRIPTION	DATE

TITLE: I-17 WEST ROXBURY LATERAL

LOC. SUFFOLK COUNTY, MASSACHUSETTS			REV.1
CHK. BY DP	DATE: 3/13/2014	CE000030.002	
DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8523	23 of 30

Spectra Energy Partners

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

SUFFOLK COUNTY, MASSACHUSETTS
CITY OF BOSTON

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REV.#	DESCRIPTION	DATE

TITLE:
I-17
WEST ROXBURY LATERAL

LOC. SUFFOLK COUNTY, MASSACHUSETTS			REV.1
CHK. BY DP		DATE: 3/13/2014	CE000030.002
DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8524	24 of 30

Spectra Energy Partners

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

SUFFOLK COUNTY, MASSACHUSETTS
CITY OF BOSTON

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REV.#	DESCRIPTION	DATE

TITLE:
I-17
WEST ROXBURY LATERAL

LOC. SUFFOLK COUNTY, MASSACHUSETTS			REV.1
CHK. BY DP	DATE: 3/13/2014	CE000030.002	
DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8525	25 of 30

Spectra Energy Partners.
Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

SUFFOLK COUNTY, MASSACHUSETTS
CITY OF BOSTON

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REV.#	DESCRIPTION	DATE	TITLE: I-17 WEST ROXBURY LATERAL			
			LOC. SUFFOLK COUNTY, MASSACHUSETTS			REV.1
			CHK. BY DP	DATE: 3/13/2014	CE000030.002	
			DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8526	26 of 30

Spectra Energy Partners

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

SUFFOLK COUNTY, MASSACHUSETTS
CITY OF BOSTON

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REV.#	DESCRIPTION	DATE

TITLE:
I-17
WEST ROXBURY LATERAL

LOC. SUFFOLK COUNTY, MASSACHUSETTS			REV.1
CHK. BY DP	DATE: 3/13/2014	CE000030.002	
DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8527	27 of 30

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

SUFFOLK COUNTY, MASSACHUSETTS
CITY OF BOSTON

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REV.#	DESCRIPTION	DATE

TITLE: I-17 WEST ROXBURY LATERAL

LOC. SUFFOLK COUNTY, MASSACHUSETTS — REV.1

CHK. BY DP — DATE: 3/13/2014 — CE000030.002

DRN. BY VHB — SCALE: 1"=50' — DWG. BB-P-8528 — 28 of 30

Spectra Energy Partners

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

SUFFOLK COUNTY, MASSACHUSETTS
CITY OF BOSTON

GENERAL NOTES:

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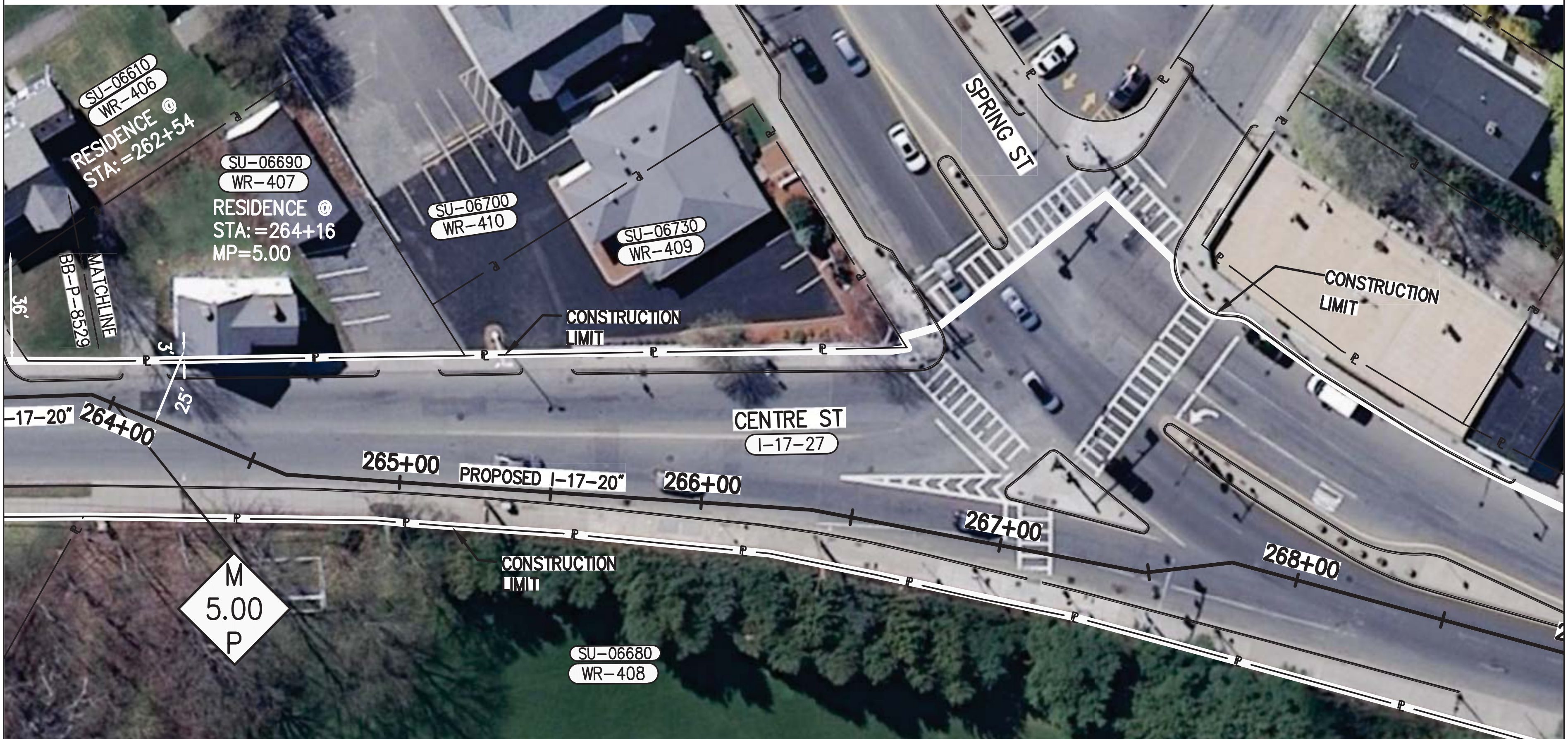
REV.#	DESCRIPTION	DATE	TITLE: I-17 WEST ROXBURY LATERAL			
			LOC. SUFFOLK COUNTY, MASSACHUSETTS			REV.1
			CHK. BY DP	DATE: 3/13/2014	CE000030.002	
			DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8529	29 of 30

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

SUFFOLK COUNTY, MASSACHUSETTS
CITY OF BOSTON



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			LOC. SUFFOLK COUNTY, MASSACHUSETTS		REV.1
			CHK. BY DP	DATE: 3/13/2014	CE000030.002
			DRN. BY VHB	SCALE: 1"=50'	DWG. BB-P-8530 — 30 of 30

Spectra Energy Partners.

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

APPENDIX I

WATERBODY CROSSING TABLE

TABLE I-1

Waterbodies Crossed by the AIM Project

Facility, Waterbody ID	Waterbody Name	Milepost [a]	Municipality	County	Crossing Width (Feet) [b]	Flow Type	FERC Classification [c]	Fishery Type	State Water Quality Classification [d]	Proposed Crossing Method [e]
PIPELINE FACILITIES										
Take-up And Relay										
Haverstraw to Stony Point										
B13-RLR-S1C	UNT to Mahwah River	0.29	Haverstraw	Rockland	1	I	Minor	Coldwater (Trout)	A(T)	Dry Crossing
B13-RLR-S2B	UNT to Minisceongo Creek	0.61	Haverstraw	Rockland	1.5	I	Minor	Coldwater	C(T)	Dry Crossing
B13-RLR-S3	UNT to Minisceongo Creek	0.81	Haverstraw	Rockland	1	I	Minor	Coldwater	C(T)	Dry Crossing
B13-RLR-S3A	UNT to Minisceongo Creek	0.81	Haverstraw	Rockland	1	I	Minor	Coldwater	C(T)	Dry Crossing
B13-RLR-S3E	UNT to Minisceongo Creek	0.90	Haverstraw	Rockland	0.5	I	Minor	Coldwater	C(T)	Dry Crossing
B13-RLR-S3D	UNT to Minisceongo Creek	0.90	Haverstraw	Rockland	4	P	Minor	Coldwater (Trout)	C(T)	Dry Crossing
B13-RLR-S3F	UNT to Minisceongo Creek	0.92	Haverstraw	Rockland	1	I	Minor	Coldwater	C(T)	Dry Crossing
B13-RLR-S3D	UNT to Minisceongo Creek	0.93	Haverstraw	Rockland	4	P	Minor	Coldwater (Trout)	C(T)	Dry Crossing
B13-RLR-S3G	UNT to Minisceongo Creek	1.00	Haverstraw	Rockland	1	I	Minor	Coldwater	C(T)	Dry Crossing
B13-RLR-S3H	UNT to Minisceongo Creek	1.00	Haverstraw	Rockland	0.5	I	Minor	Coldwater	C(T)	Dry Crossing
B13-RLR-S3D	UNT to Minisceongo Creek	1.00	Haverstraw	Rockland	4	P	Minor	Coldwater (Trout)	C(T)	Dry Crossing
B13-RLR-S3D	UNT to Minisceongo Creek	1.07	Haverstraw	Rockland	4	P	Minor	Coldwater (Trout)	C(T)	Dry Crossing
B13-RLR-S3I	UNT to Minisceongo Creek	1.08	Haverstraw	Rockland	2	P	Minor	Coldwater	C(T)	Dry Crossing
B13-RLR-S3J	Minisceongo Creek	1.09	Haverstraw	Rockland	20	P	Intermediate	Coldwater (Trout)	C(T)	Dry Crossing
B13-RLR-S4	UNT to Minisceongo Creek	1.65	Stony Point	Rockland	6	P	Minor	Coldwater	C	Dry Crossing
B13-RLR-S6	UNT to Minisceongo Creek	2.24	Stony Point	Rockland	0.5	I	Minor	Coldwater	C	Dry Crossing

TABLE I-1 (cont'd)

Waterbodies Crossed by the AIM Project

Facility, Waterbody ID	Waterbody Name	Milepost [a]	Municipality	County	Crossing Width (Feet) [b]	Flow Type	FERC Classification [c]	Fishery Type	State Water Quality Classification [d]	Proposed Crossing Method [e]
B13-RLR-S10	Cedar Pond Brook	2.99	Stony Point	Rockland	30	P	Intermediate	Coldwater (Trout Spawning)	C(TS)	Dry Crossing
B13-RLR-S10A	UNT to Cedar Pond Brook	3.04	Stony Point	Rockland	6	P	Minor	Coldwater (Trout Spawning)	C(TS)	Dry Crossing
Stony Point to Yorktown										
A13-SPLR-S1	UNT to Cedar Pond Brook	0.37	Stony Point Rockland	Rockland	25	P	Intermediate	Coldwater	A	Dry Crossing
B13-SPLR-S207	UNT to Hudson River	2.90	Stony Point Rockland	Rockland	14	I	Intermediate	Warmwater	B	Dry Crossing
Hudson River	Hudson River	3.21	Stony Point	Rockland Westchester	3,538	P	Major	Saline	SB	HDD
B13-SPLR-S17	Dickey Brook	5.66	Cortlandt	Westchester	30	P	Intermediate	Saline	SC	Dry Crossing
B13-SPLR-S2	Dickey Brook	5.97	Cortlandt	Westchester	13	P	Intermediate	Warmwater	C	Dry Crossing
B13-SPLR-S3A	UNT to Dickey Brook	6.02	Cortlandt	Westchester	1	I	Minor	Warmwater	C	Dry Crossing
B13-SPLR-S3	UNT to Dickey Brook	6.03	Cortlandt	Westchester	1	I	Minor	Warmwater	C	Dry Crossing
B13-SPLR-S7	UNT to Dickey Brook	6.65	Cortlandt	Westchester	3	P	Minor	Warmwater	B	Dry Crossing
B13-SPLR-S7	UNT to Dickey Brook	6.66	Cortlandt	Westchester	3	P	Minor	Warmwater	B	Dry Crossing
B13-SPLR-S13	UNT to Furnace Brook	7.59	Cortlandt	Westchester	2	I	Minor	Warmwater	B	Dry Crossing
B13-SPLR-S13A	UNT to Furnace Brook	7.61	Cortlandt	Westchester	3	I	Minor	Warmwater	B	Dry Crossing
B13-SPLR-S13B	UNT to Furnace Brook	7.89	Cortlandt	Westchester	1	I	Minor	Warmwater	B	Dry Crossing
B13-SPLR-S14	UNT to Furnace Brook	8.25	Cortlandt	Westchester	2	P	Minor	Warmwater	B	Dry Crossing
B13-SPLR-S18	UNT to Furnace Brook	8.83	Cortlandt	Westchester	5	I	Minor	Warmwater	C	Dry Crossing
B13-SPLR-S43	UNT to Peekskill Hollow Creek	9.59	Cortlandt	Westchester	3	I	Minor	Warmwater	C	Dry Crossing
B13-SPLR-S21A	UNT to Hunter Brook	10.34	Cortlandt	Westchester	5	P	Minor	Warmwater	C	Dry Crossing
B13-SPLR-S21B	UNT to Hunter Brook	10.36	Cortlandt	Westchester	4	I	Minor	Warmwater	C	Dry Crossing
B13-SPLR-S22	UNT to Hunter Brook	10.57	Cortlandt	Westchester	5	I	Minor	Warmwater	C	Dry Crossing
B13-SPLR-S25	UNT to Hunter Brook	10.80	Cortlandt	Westchester	4	P	Minor	Warmwater	C	Dry Crossing

TABLE I-1 (cont'd)

Waterbodies Crossed by the AIM Project

Facility, Waterbody ID	Waterbody Name	Milepost [a]	Municipality	County	Crossing Width (Feet) [b]	Flow Type	FERC Classification [c]	Fishery Type	State Water Quality Classification [d]	Proposed Crossing Method [e]
B13-SPLR-S26	UNT to Hunter Brook	11.13	Yorktown	Westchester	6	P	Minor	Warmwater	C	Dry Crossing
B13-SPLR-S27	UNT to Hunter Brook	11.51	Yorktown	Westchester	7	P	Minor	Warmwater	C	Dry Crossing
Southeast to MLV 19										
B13-SELR-S8	Sawmill River	0.27	Danbury	Fairfield	8	P	Minor	Warmwater	AA	Dry Crossing
A13-SELR-S1	UNT to Still River	1.04	Danbury	Fairfield	0.5	I	Minor	Warmwater	AA	Dry Crossing
A13-SELR-S3	UNT to Still River	1.25	Danbury	Fairfield	9	I	Minor	Warmwater	AA	Dry Crossing
B13-SELR-S12 f	Still River	1.74	Danbury	Fairfield	12	P	Intermediate	Warmwater (Trout)	AA	HDD
A13-SELR-S6	UNT to Boggs Pond Brook	3.03	Danbury	Fairfield	6	I	Minor	Warmwater	AA	Dry Crossing
B13-SELR-S1	UNT to Boggs Pond Brook	3.33	Danbury	Fairfield	2	I	Minor	Warmwater	AA	Dry Crossing
B13-SELR-S3	UNT to Boggs Pond Brook	3.55	Danbury	Fairfield	1	I	Minor	Warmwater	AA	Dry Crossing
B13-SELR-S4	Boggs Pond Brook	3.72	Danbury	Fairfield	8	P	Minor	Warmwater	AA	Dry Crossing
B13-SELR-S6	UNT to Kohanza Brook	3.92	Danbury	Fairfield	4	I	Minor	Warmwater	AA	Dry Crossing
B13-SELR-S7	Kohanza Brook	4.08	Danbury	Fairfield	12	I	Minor	Warmwater	AA	Dry Crossing
E-1 System Lateral										
A13-ELR-S1	Susquetonscut Brook	0.67	Lebanon	New London	37	P	Intermediate	Warmwater (Trout)	A	Dry Crossing
A13-ELR-S2	UNT to Susquetonscut Brk	0.70	Lebanon	New London	1.5	I	Minor	Warmwater	A	Dry Crossing
B13-ELR-S1	UNT to Susquetonscut Brk	1.21	Lebanon	New London	0.5	I	Minor	Warmwater	A	Dry Crossing
B13-ELR-S4B	UNT to Susquetonscut Brk	1.82	Lebanon	New London	0.75	I	Minor	Warmwater	A	Dry Crossing
B13-ELR-S4A	UNT to Susquetonscut Brk	1.85	Lebanon	New London	3	I	Minor	Warmwater	A	Dry Crossing
A13-ELR-S2A	Susquetonscut Brook	2.01	Lebanon	New London	29	P	Intermediate	Warmwater (Trout)	A	Dry Crossing
A13-ELR-S2E	UNT to Susquetonscut Brk	2.14	Lebanon	New London	2	I	Minor	Warmwater	A	Dry Crossing
A13-ELR-S2C	UNT to Susquetonscut Brk	2.14	Lebanon	New London	2	I	Minor	Warmwater	A	Dry Crossing
A13-ELR-S2D	UNT to Susquetonscut Brk	2.16	Lebanon	New London	2	I	Minor	Warmwater	A	Dry Crossing

TABLE I-1 (cont'd)

Waterbodies Crossed by the AIM Project

Facility, Waterbody ID	Waterbody Name	Milepost [a]	Municipality	County	Crossing Width (Feet) [b]	Flow Type	FERC Classification [c]	Fishery Type	State Water Quality Classification [d]	Proposed Crossing Method [e]
A13-ELR-S2B	UNT to Susquetonscut Brk	2.16	Lebanon	New London	2	I	Minor	Warmwater	A	Dry Crossing
A13-ELR-S3	UNT to Susquetonscut Brk	2.34	Lebanon	New London	1	I	Minor	Warmwater	A	Dry Crossing
A13-ELR-S4	UNT to Susquetonscut Brk	2.47	Lebanon	New London	1	I	Minor	Warmwater	A	Dry Crossing
A13-ELR-S6A	UNT to Susquetonscut Brk	3.04	Lebanon	New London	1	I	Minor	Warmwater	A	Dry Crossing
A13-ELR-S8B	UNT to Susquetonscut Brk	3.24	Lebanon	New London	11	P	Intermediate	Warmwater	A	Dry Crossing
A13-ELR-S8A	UNT to Susquetonscut Brk	3.15	Lebanon	New London	1	I	Minor	Warmwater	A	Dry Crossing
A13-ELR-S9B	UNT to Susquetonscut Brk	3.52	Lebanon	New London	7	P	Minor	Warmwater	A	Dry Crossing
A13-ELR-S10	UNT to Susquetonscut Brk	3.76	Lebanon	New London	4	I	Minor	Warmwater	A	Dry Crossing
B13-ELR-S16	UNT to Susquetonscut Brk	4.33	Franklin	New London	1	I	Minor	Warmwater	A	Dry Crossing
B13-ELR-S15	UNT to Susquetonscut Brk	4.47	Franklin	New London	4	I	Minor	Warmwater	A	Dry Crossing
B13-ELR-S14	UNT to Susquetonscut Brk	4.68	Franklin	New London	5	P	Minor	Warmwater	A	Dry Crossing
B13-ELR-S13A	UNT to Susquetonscut Brk	4.80	Franklin	New London	3	I	Minor	Warmwater	A	Dry Crossing
B13-ELR-S13B	UNT to Susquetonscut Brk	4.80	Franklin	New London	2	I	Minor	Warmwater	A	Dry Crossing
B13-ELR-S11	UNT to Susquetonscut Brk	4.91	Franklin	New London	1.5	I	Minor	Warmwater	A	Dry Crossing
B13-ELR-S10	UNT to Susquetonscut Brk	4.93	Franklin	New London	1.5	I	Minor	Warmwater	A	Dry Crossing
B13-ELR-S9C	UNT to Susquetonscut Brk	5.04	Franklin	New London	2	I	Minor	Warmwater	A	Dry Crossing
B13-ELR-S9B	UNT to Susquetonscut Brk	5.26	Franklin	New London	3	I	Minor	Warmwater	A	Dry Crossing
B13-ELR-S9	UNT to Susquetonscut Brk	5.51	Franklin	New London	1	I	Minor	Warmwater	A	Dry Crossing
B13-ELR-S5A	UNT to Susquetonscut Brk	5.82	Franklin	New London	2	I	Minor	Warmwater (Trout)	A	Dry Crossing

TABLE I-1 (cont'd)

Waterbodies Crossed by the AIM Project

Facility, Waterbody ID	Waterbody Name	Milepost [a]	Municipality	County	Crossing Width (Feet) [b]	Flow Type	FERC Classification [c]	Fishery Type	State Water Quality Classification [d]	Proposed Crossing Method [e]
B13-ELR-S5B	Susquetonscut Brook	5.83	Franklin	New London	37	P	Intermediate	Warmwater (Trout)	A	Dry Crossing
A13-ELR-S11	UNT to Susquetonscut Brk	6.10	Franklin	New London	1	I	Minor	Warmwater	A	Dry Crossing
A13-ELR-S50	UNT to Susquetonscut Brk	6.52	Franklin	New London	17	I	Intermediate	Warmwater	A	Dry Crossing
B13-ELR-S23	UNT to Susquetonscut Brk	7.16	Franklin	New London	5	I	Minor	Warmwater	A	Dry Crossing
B13-ELR-S22 f	Johnnycake Brook (Ponded)	7.28	Franklin	New London	56	N/A	Intermediate	Warmwater	A	Dry Crossing
B13-ELR-S19	UNT to Elisha Brook	8.32	Franklin	New London	1	I	Minor	Coldwater (Trout)	A	Dry Crossing
B13-ELR-S18	Elisha Brook	8.51	Norwich	New London	6	P	Minor	Coldwater (Trout)	A	Dry Crossing
B13-ELR-S25	UNT to Norwichtown Brook	8.83	Norwich	New London	2	P	Minor	Warmwater	A	Dry Crossing
B13-ELR-S25A	UNT to Norwichtown Brook	8.87	Norwich	New London	1	E	Minor	Warmwater	A	Dry Crossing
B13-ELR-S24	UNT to Norwichtown Brook	8.92	Norwich	New London	1	E	Minor	Warmwater	A	Dry Crossing
B13-ELR-S17	UNT to Norwichtown Brook	9.06	Norwich	New London	2	E	Minor	Warmwater	A	Dry Crossing
LOOP EXTENSION										
Line 36-A Loop Extension										
B13-CLR-S1	Coles Brook	0.05	Cromwell	Middlesex	4	P	Minor	Warmwater	A	Dry Crossing
B13-CLR-S2	UNT to Dividend Brook	0.79	Cromwell	Middlesex	1	I	Minor	Coldwater	A	Dry Crossing
B13-CLR-S2C	UNT to Dividend Brook	0.88	Cromwell	Middlesex	1	I	Minor	Coldwater	A	Dry Crossing
B13-CLR-S2A	Dividend Brook	0.89	Cromwell	Middlesex	20	P	Minor	Coldwater (Trout)	A	Dry Crossing
B13-CLR-S2B	UNT to Dividend Brook	0.90	Cromwell	Middlesex	2	I	Minor	Coldwater	A	Dry Crossing
B13-CLR-S2D	UNT to Dividend Brook	0.90	Cromwell	Middlesex	1.5	I	Minor	Coldwater	A	Dry Crossing
B13-CLR-S2E	UNT to Dividend Brook	0.91	Cromwell	Middlesex	2	P	Minor	Coldwater	A	Dry Crossing

TABLE I-1 (cont'd)

Waterbodies Crossed by the AIM Project

Facility, Waterbody ID	Waterbody Name	Milepost [a]	Municipality	County	Crossing Width (Feet) [b]	Flow Type	FERC Classification [c]	Fishery Type	State Water Quality Classification [d]	Proposed Crossing Method [e]
B13-CLR-S4	Dividend Brook	1.31	Cromwell	Middlesex	10	P	Minor	Coldwater (Trout)	A	Dry Crossing
B13-CLR-S4	Dividend Brook	1.32	Cromwell	Middlesex	21	P	Intermediate	Coldwater (Trout)	A	Dry Crossing
B13-CLR-S4	Dividend Brook	1.33	Cromwell	Middlesex	15	P	Intermediate	Coldwater (Trout)	A	Dry Crossing
B13-CLR-S4	Dividend Brook	1.34	Cromwell	Middlesex	10	P	Minor	Coldwater (Trout)	A	Dry Crossing
E-1 System Lateral Loop Extension										
B13-ELP-S3	UNT to Stony Brook	0.04	Montville	New London	13	P	Minor	Coldwater (Trout)	A	Dry Crossing
B13-ELP-S2	UNT to Stony Brook	0.16	Montville	New London	1.5	I	Minor	Coldwater (Trout)	A	Dry Crossing
B13-ELP-S4	UNT to Stony Brook	0.32	Montville	New London	10	I	Minor	Coldwater (Trout)	A	Dry Crossing
B13-ELP-S4A	UNT to Stony Brook	0.34	Montville	New London	1	I	Minor	Coldwater (Trout)	A	Dry Crossing
B13-ELP-S5	Falls Brook	0.80	Montville	New London	25	P	Intermediate	Coldwater (Trout)	A	Dry Crossing
B13-ELP-S6	UNT to Stony Brook	0.94	Montville	New London	5	I	Minor	Coldwater (Trout)	A	Dry Crossing
B13-ELP-S7	UNT to Stony Brook	1.18	Montville	New London	1	I	Minor	Coldwater (Trout)	A	Dry Crossing
NEW PIPELINE										
West Roxbury Lateral										
B13-WRL-S5	UNT to Purgatory Brook	0.07	Dedham	Norfolk	9	P	Minor	Warmwater	B	Dry Crossing
B13-WRL-S3	Mother Brook	3.11	Dedham	Norfolk	41	P	Intermediate	Warmwater	B	Dry Crossing
ABOVEGROUND FACILITIES										
None										

[a] Milepost is the approximate pipeline entry point of each waterbody.
[b] Crossing width measured from water's edge.
[c] Minor Waterbody – Includes all waterbodies less than or equal to 10 feet wide at the water's edge at the time of crossing.
Intermediate Waterbody – Includes all waterbodies greater than 10 feet wide by less than or equal to 100 feet wide at the water's edge at the time of crossing.
Major Waterbody – Includes all waterbodies greater than 100 feet wide at the water's edge at the time of crossing.

TABLE I-1 (cont'd)

Waterbodies Crossed by the AIM Project

Facility, Waterbody ID	Waterbody Name	Milepost [a]	Municipality	County	Crossing Width (Feet) [b]	Flow Type	FERC Classification [c]	Fishery Type	State Water Quality Classification [d]	Proposed Crossing Method [e]

[d] State Designations and Use Descriptions:

New York:

1. The classifications A, AA, A-S and AA-S indicate a best usage for a source of drinking water, swimming and other recreation, and fishing.
2. Classification B indicates a best usage for swimming and other recreation, and fishing.
3. Classification C indicates a best usage for fishing.
4. Classification D indicates a best usage of fishing, but these waters will not support fish propagation.
5. Classification SA (marine waters) indicates a best usage for shellfishing for market purposes, swimming and other recreation, and fishing.
6. Classification SB (marine waters) indicates a best usage for swimming and other recreation, and fishing.
7. Classification SC (marine waters) indicates a best usage for fishing.
8. Classification I (marine waters) indicates a best usage for secondary contact recreation, and fishing.
9. Classification SD (marine waters) indicates a best usage for fishing, but these waters may not support fish propagation.
10. The symbol (T or TS) after any classification means that designated waters are trout waters (T) or suitable for trout spawning (TS). See the DEC Rules & Regulations (parts 800-941) for a complete definition.

Connecticut:

AA – These waters can be used as existing or proposed drinking water sources, habitat for fish and other aquatic life or wildlife, recreation, and industrial or agricultural water supply.

A – These waters are appropriate for fish, aquatic life and wildlife habitat, potential drinking water supply, recreation, navigation, and industrial or agricultural water supply.

B – These waters are appropriate for fish, aquatic life and wildlife habitat, recreation, navigation, and industrial or agricultural water supply.

Massachusetts:

A – These waters are designated as a source of public water supply. To the extent compatible with this use they shall be an excellent habitat for fish, other aquatic life and wildlife, and suitable for primary and secondary contact recreation. These waters shall have excellent aesthetic value. These waters are designated for protection as Outstanding Resource Waters under 314 CMR 4.04(3).

B – These waters are designated as a habitat for fish. Other aquatic life, and wildlife, and for primary and secondary contact recreation. Where designated they shall be suitable as a source of public water supply with appropriate treatment. They shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. These waters shall have consistently good aesthetic value.

C – These waters are designated as a habitat for fish. Other aquatic life, and wildlife, and for secondary contact recreation. These waters shall be suitable for the irrigation of crops used for consumption after cooking and for compatible industrial cooling and process uses. These waters shall have good aesthetic value.

SB – These waters are designated as habitat for fish, other aquatic life and wildlife, and for primary and secondary contact recreation. In approved areas they shall be suitable for shellfish harvesting with depuration (Restricted Shellfish Areas). These waters shall have consistently good aesthetic value.

[e] The proposed pipeline crossing methods of "dry" and "HDD" are described in detail in section 2.3.1.2.

[f] Indicates partial estimated delineation via aerial imagery within construction workspace.

APPENDIX J

BEST DRILLING PRACTICES, MONITORING, AND CLEAN-UP OF HORIZONTAL DIRECTIONAL DRILLING INADVERTENT RETURNS PLAN AND SITE-SPECIFIC HORIZONTAL DIRECTIONAL DRILL CROSSING PLANS

Best Drilling Practices, Monitoring and Clean-up of Horizontal Directional Drilling Inadvertent Returns for the Algonquin Incremental Market Project

February 2014

TABLE OF CONTENTS

1.0 INTRODUCTION

Algonquin Gas Transmission, LLC ("Algonquin"), an indirect, wholly-owned subsidiary of Spectra Energy Partners, is seeking authorization from the Federal Energy Regulatory Commission ("FERC" or "Commission") pursuant to Section 7(c) of the Natural Gas Act[1] ("NGA") to construct, install, own, operate, and maintain the Algonquin Incremental Market Project ("AIM Project" or "Project") which will involve expansion of its existing pipeline systems located in New York, Connecticut, Rhode Island and Massachusetts.

Algonquin has developed this Best Drilling Practices Plan ("BDP Plan") for monitoring the Horizontal Directional Drilling ("HDD") program. This BDP Plan will be kept on-site at all drill locations and will be available and implemented by all proposed personnel described in the following sections of this BDP Plan. All HDD activities will be managed in accordance with this BDP Plan.

2.0 BEST AVAILABLE DRILLING PRACTICES

2.1 Description of the Work

Algonquin will use the HDD method at designated locations to construct the Project. Two HDDs are proposed. They include:

- 42-inch Hudson River HDD – Beginning at approximately MP 3.19 in Stony Point, New York, on the west side of the Hudson River and terminating at approximately MP 3.91 in the Hamlet of Verplank in the Town of Cortlandt, New York on the east side of the Hudson River
- 42-inch I-84/Still River HDD – Beginning at approximately MP 1.4 in Danbury, Connecticut in the paved portion of the Connecticut Department of Transportation I-84 Rest Area and terminating at approximately MP 2.1 on the east side of Mill Plain Road (U.S. 202/U.S. 6) in the Town of Danbury, Connecticut.

The HDD method always involves establishing staging areas along both sides of the proposed crossing typically at the entry and exit points. The process commences with the boring of a pilot hole into the ground beneath the obstruction, wetland or water body, and then enlarging the hole with one or more passes of a reamer until the hole is the necessary diameter to facilitate the pull-back (installation) of the pipeline.

Once the reaming passes are completed, prefabricated pipe segments are then pulled through the hole to complete the crossing; additional welding between segments will be required. While the HDD method is a proven technology, there are certain impacts that could occur as a result of the drilling such as the inadvertent release of drilling fluid, which is a slurry of bentonite clay and water which is classified as non-toxic to the aquatic environment and is a non-hazardous substance. Drilling fluids that are released typically contain a lower concentration of bentonite when they surface because the bentonite is filtered out as its passes through existing sediments of varying types. The proposed drilling program for both HDDs is expected to be initiated and completed in 2015.

The following sections provide the process of HDD and procedures to be implemented in the case of HDD failure or the inadvertent release of drilling fluid.

[1] 15 U.S.C. §§ 717f(b) and 717f(c) (2006).

2.2 Background

The HDD process uses bentonite-based drilling fluids. The drilling fluids are tested for specific engineering properties to ensure a successful HDD installation. The environmental impact associated with HDD is the inadvertent release of drilling fluids to the surface along the drill alignment during drilling operations.

The drilling fluids are typically a mixture of fresh water and bentonite (sodium montmorillonite). Bentonite is natural clay usually mined in Wyoming. Bentonite is extremely hydrophilic and can absorb up to ten times its weight in water. Typically, the drilling fluid contains no more than 5 percent bentonite (95 percent fresh water).

The HDD Contractor maintains fluid performance through sampling, testing and recording of the fluid properties during drilling operations; analyzing and then adjusting and maintaining to afford the most efficient drilling fluid rheology to adapt to various geological conditions.

The slurry is designed to:

- ♦ Stabilize the bore hole against collapse; stabilizes formations and prevents fluid loss;
- ♦ Lubricate, cool, and clean the tooling cutters; cool guidance electronics;
- ♦ Transport cuttings by suspension to enable flow to the surface at entry/exit points for recycling;
- ♦ Produce lubrication for drill string and downhole assembly while drilling which reduces friction forces from the formation and pull loads;
- ♦ Produce hydrostatic fluid pressure in the bore hole to offset ground formation/ground water pressure; and
- ♦ Drive downhole drill motor for rock drilling.

2.2.1 HDD Working Procedures

Prior to drilling operations, site-specific HDD Procedures will be prepared by the HDD contractor and submitted to Algonquin for review and approval. As a minimum, the HDD Procedures will address the following:

<u>Annular Pressure or Release Mitigation</u> – Once it is indicated to the driller that annular pressures are abnormally high or fluid loss is apparent and that a release has occurred, the driller has the following options (or any combination of these options):

- ♦ Dispatch experienced company personnel observers to monitor the area in the vicinity of the drilled path;
- ♦ Decrease pump pressure;
- ♦ Decrease penetration rate;
- ♦ Temporarily cease drilling operations and shut down mud pump;
- ♦ Re-start pump and stroke bore hole in 30 ft. +/- lengths to restore circulation ("swab" the hole) as many as 6 times but no fewer than 2 times;
- ♦ Introduce additional flow along the borehole starting at the entry/exit using "weeper" subs; and
- ♦ Modify the drilling mud with a change in viscosity and/or lost circulation additives.

If inadvertent returns are observed surfacing on the ground surface at a location that is inaccessible; the following procedures will be followed:

- Contractor will ensure all reasonable measures within the limitations of current technology have been taken to re-establish circulation; and
- Continue drilling utilizing a minimal amount of drilling fluid as required to penetrate the formation or to maintain a successful product pull back.

3.0 MONITORING OF INADVERTENT RETURNS

3.1 Personnel and Responsibilities

The actions in this BDP Plan are to be implemented by the following personnel:

Chief Inspector – Algonquin will designate an HDD Chief Inspector for the Project. The CI will have overall authority for construction activities that occur on the Project.

Environmental Inspector – At least one Environmental Inspector (“EI”) will be designated by Algonquin to monitor the HDD activities. The EI will have peer status with all other activity inspectors and will report directly to the HDD CI who has overall authority. The EI will 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.

HDD Superintendent – is the senior on-site representative of the HDD contractor. The HDD Superintendent has overall responsibility for implementing this BDP Plan on behalf of the HDD Contractor - The HDD Superintendent will be familiar with all aspects of the drilling activities, the contents of the BDP Plan and the conditions of approval under which the activity is permitted to take place. The HDD Superintendent will make available a copy of this BDP Plan on all drill sites and distribute to the appropriate construction personnel. The HDD Superintendent will ensure that workers are properly trained and familiar with the necessary procedures for response to an inadvertent release.

HDD Operator – is HDD contractor’s driller operating the drilling rig and mud pumps. The HDD Operator is responsible for monitoring circulation back to the entry and exit locations and for monitoring annular pressures during pilot-hole drilling. In the event of loss of circulation or higher than expected annular pressures, the HDD Operator must communicate the event to the HDD Superintendent and HDD contractor field crews as well as the on-site Algonquin inspection staff. The HDD Operator is responsible for stoppage or changes to the drilling program in the event of observed or anticipated inadvertent returns.

HDD Contractor Personnel – during HDD installation, field crews will be responsible to monitor the HDD alignment along with the Applicant’s field representatives’. Field crews in coordination with the EI are responsible for timely notifications and responses to observed releases in accordance with this BDP Plan. The EI ultimately must sign off on the action plan for mitigating the release.

3.2 Training

Prior to drilling, the HDD Superintendent, CI and the Applicant’s EI will verify that the HDD Operator and field crew receive the following site-specific training but not limited to:

- Project specific safety training;
- Review provisions of this BDP Plan and site-specific permit requirements;
- Review location of sensitive environmental resources at the site;
- Review drilling procedures for release prevention;
- Review the site-specific monitoring requirements;

- Review the location and operation of release control equipment and materials; and
- Review protocols for reporting observed inadvertent returns.

3.3 Monitoring & Reporting

Appropriate Monitoring & Reporting actions will be:

- If the HDD Operator observes an increase in annular fluid pressure or loss of circulation, the Operator will notify the HDD Superintendent and field crews of the event and approximate position of the tooling;
- Where practical, a member of the field crew will visually inspect the ground surface near the position of the cutting head;
- If an inadvertent release is observed:
    - Field crew will notify (via hand-held radio or cell phone) the HDD Operator;
    - The HDD Operator will temporarily cease pumping of the drilling fluid and notify the HDD Superintendent and CI;
    - The CI will notify and coordinate a response with the EI;
    - The EI will notify appropriate permit authorities as necessary of the event and proposed response and provide required documentation within 24 hours; and
- The CI will prepare a report that summarizes the incident.

4.0 RESPONSE TO INADVERTENT RETURNS

Typically, inadvertent releases are most often detected in an area near the entry or exit points of the drill alignment when the pilot bore is at shallow depths, above bedrock, and in permeable/porous soils. In these occurrences the release will be assessed by the HDD Superintendent, EI and CI to determine an estimated volume and foot-print of the release. They will also assess the potential of the release to reach adjacent waterbodies, wetlands, or other types of infrastructure.

The HDD Superintendent will assess the drilling parameters (depth, annular pressures, fluid flow rate and drill fluid characteristics) and incorporate appropriate changes.

The HDD Superintendent, EI, and CI will implement installation of appropriate containment structures and additional response measures. Access for personnel and equipment to the release site is a major factor in determining the methods used for containment and disposal. Typically, containment is achieved by excavating a small sump pit (5 cubic yards) at the site of the release and to surround the release with hay bales, silt fence and/or sand bags. Once contained, the drilling fluid is either collected by vacuum trucks or pumped back to the mud recycle unit, or to a location where vacuum trucks can be accessed. The fluids are then transported either back to the HDD Drilling Rig or to a disposal site.

If the release is mitigated and controlled, forward progress of the drilling will be approved by the EI in coordination with the HDD Superintendent and CI.

The site-specific response will follow these guidelines:

4.1 Upland Location

- Evaluate the amount of release to determine if containment structures are warranted and if they will effectively contain the release.

- Promptly implement appropriate containment measures as needed to contain and recover the slurry.
- If the release is within 50-foot of a wetland or waterbody, silt fence and/or hay bales will be installed between the release site and the wetland or waterbody.
- If the release cannot be contained, then the operator must suspend drilling operations until appropriate containment is in place.
- Remove the fluids using either a vacuum truck or by pumping to a location where a vacuum truck is accessible.
- After the HDD installation is complete, perform final clean-up (see Section 5).

4.2 Wetland Location

Algonquin's proposed HDD's are being designed to minimize the potential for inadvertent releases to the HDD crossing locations. Although final design is still in progress, Algonquin expects that the I-84/Still River HDD will be a rock drill thereby limiting the potential for inadvertent returns to occur. To further minimize the potential for inadvertent returns, casing will be installed through overburden soils to the bedrock interface (as feasible) at both ends of the HDD. Even with these controls in place, if a release of drilling fluids does occur the following steps will be taken:

- Evaluate the amount of release to determine if containment structures are warranted and if they will effectively contain the release.
- Promptly implement appropriate containment measures to contain and recover the slurry;
  - Efforts to contain and recover slurry in wetlands may result in further disturbance by equipment and personnel, and possibly offset the benefit gained in removing the slurry.
  - If the amount of the slurry is too small to allow the practical collection from the affected area, the fluid will be diluted with fresh water or allowed to dry and dissipate naturally.
- If the release cannot be controlled or contained, immediately suspend drilling operations until appropriate containment is in place.
- Remove the fluids using either a vacuum truck or by pumping to a location where a vacuum truck is accessible.
- After the HDD installation is complete, perform final clean-up (see Section 5).

4.3 Hudson River Crossing

Due to geotechnical limitations and the extreme depth of the bedrock profile, the Hudson River HDD has been designed to be a soft soil HDD. This crossing method is consistent with the successful HDD crossing of the Hudson River that was completed by Spectra Energy in 2013 as part of the NJ-NY Expansion Project. Because the crossing of the Hudson River will occur in soft soils, casing will be driven deep into the substrata at both ends of the HDD and will remain in place for the duration of the crossing. This will allow flow of drilling fluids from the drill path below the river bed back to the surface. Because this crossing is categorized as a "soft" crossing by passing through organics, silt and sands, the drilling process will occur quite quickly as opposed to a hard rock crossing. While it is possible for some drilling fluid to inadvertently release to the river bed, the volume would be minimal and would not accumulate due to the rapid drilling rates. Additionally, Algonquin's contractor will drill the pilot holes from both sides of this crossing and perform an intersect, thereby decreasing the distance, and subsequently decreasing the resistance/pressure required for the drilling fluid to travel back to the entry points via the conductor casing.

Because of the design, the river current, marine traffic, existing turbidity and other pollutants that contribute to the discoloration of the major water body locations it is extremely unlikely any inadvertent returns could be identifiable and any amount of accumulation will not occur other than that described above. Algonquin will remove the drilling fluid as described above in the near shore areas of the Hudson River if required. Algonquin does not believe it is feasible to identify, safe or technically possible to effectively perform any reclamation of inadvertent returns that in all probability will never accumulate in the navigation channels of the major waterbody crossings.

5.0 CLEAN-UP

After completion of the HDD installation, site-specific clean-up measures will be developed by the CI, HDD Superintendent, for approval by the EI. Potential for secondary impact from the clean-up process is to be evaluated and benefits of clean-up activities.

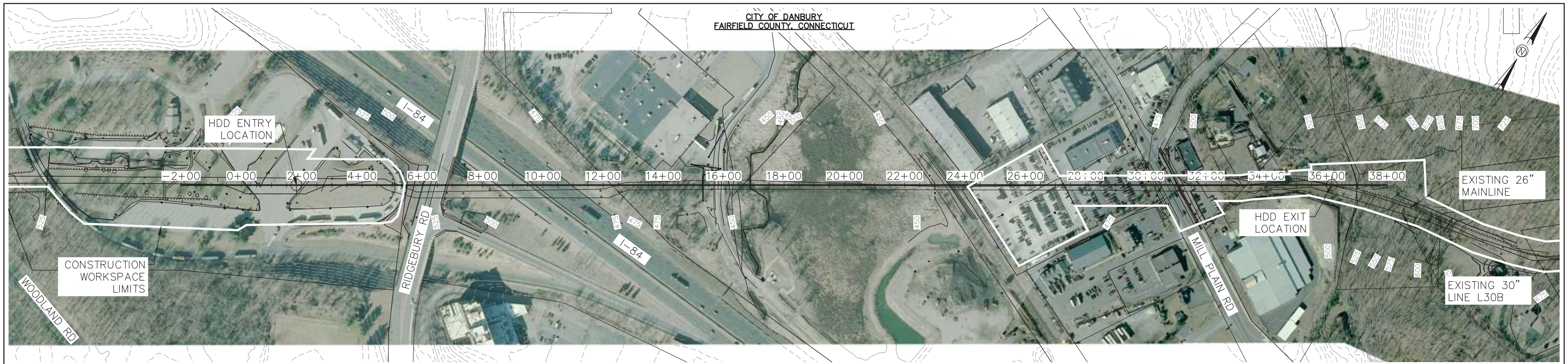
The following measures are considered appropriate:

- Drilling mud will be cleaned up by hand using hand shovels, buckets and soft bristled brooms minimizing damage to existing vegetation;
- Fresh water washes may be employed if deemed beneficial and feasible;
- Containment structures will be pumped out and the ground surface scraped to bare topsoil minimizing loss of topsoil or damage to adjacent vegetation;
- The recovered drilling fluid will be recycled or disposed of at an approved upland location or disposal facility. No recovered drilling fluid will be disposed of in streams or storm drains
- All containment structures will be removed; and
- Recovered materials will be collected in containers for temporary storage prior to removal from the site.

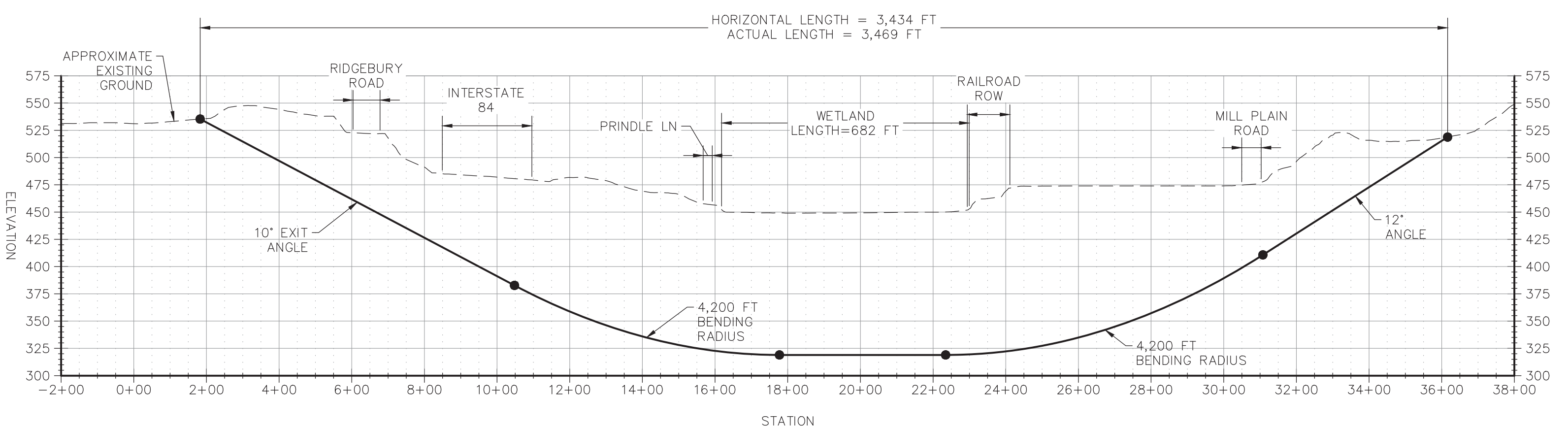
Site-Specific Horizontal Directional Drill Crossing Plans

J-13

E:\Pipelines Group\Spectra Energy\AIM\Drawings\I-84 Plan and Profile – Alt FERC ONLY.dwg – PLOT TIME: 3/31/2014 12:00 PM



PLAN
SCALE: 1"=150'



PROFILE

150 0 150 300
SCALE: 1" = 150'
HORIZONTAL

50 0 50 100
SCALE: 1" = 50'
VERTICAL

DWG. NO.	REFERENCE DWG.	REV	DSN	CK	DESCRIPTION
	03/31/2014				

ENGINEERING APPROVALS				
DRAWN BY:	BID		CONSTRUCTION	
TITLE	SIGNATURE	DATE	SIGNATURE	DATE

SOUTHEAST DISCHARGE
AIM PROJECT
PROPOSED 42" M/L
CONCEPTUAL HDD PLAN & PROFILE
LOC. FAIRFIELD COUNTY, CONNECTICUT

Spectra Energy Partners
Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

YEAR: 2015	W.B.S.	SCALE: AS NOTED	DWG. SQ-Z-3001	REV. 0

J-14

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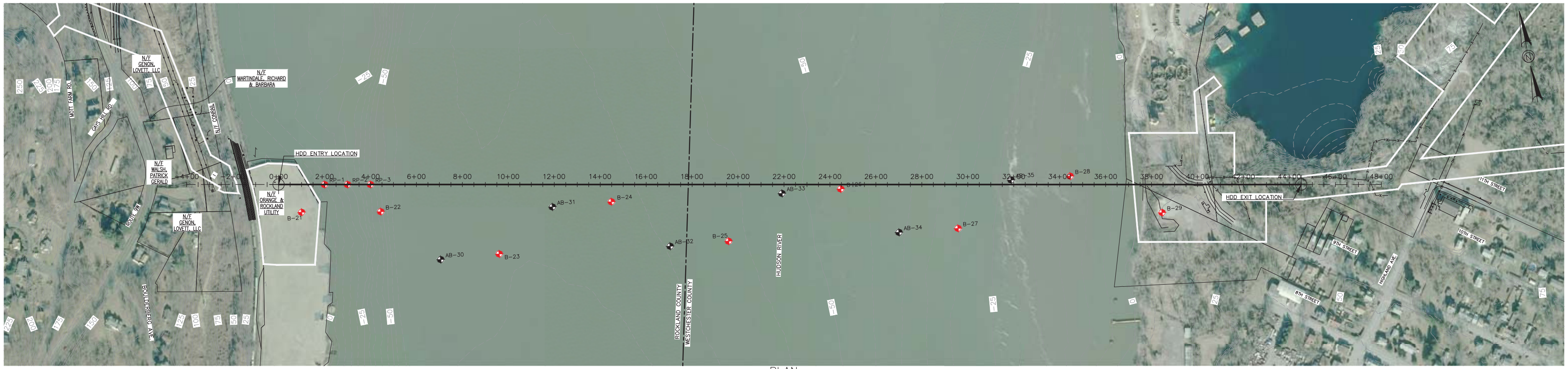
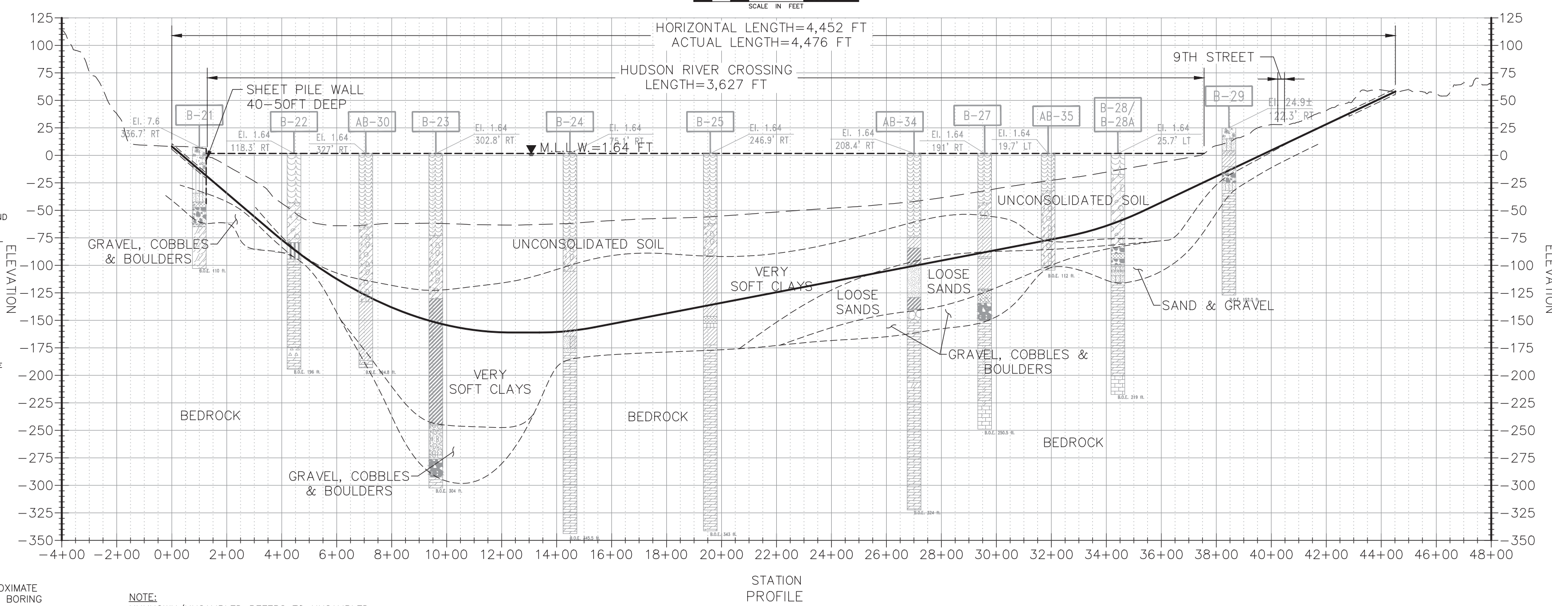
TOWN OF STONY POINT
ROCKLAND COUNTY, NEW YORK

TOWN OF BUCHANAN
WESTCHESTER COUNTY, NEW YORK



PLAN

SCALE IN FEET



PROFILE

SOIL AND ROCK STRATIGRAPHY:

BOULDERS, CL, FILL, GP, GW, MH, ML, MUDLINE, SANDY SILT, SM, SP, SW, SW–SM, WATER, WELL GRADED GRAVELLY SAND, WELL GRADED SANDY GRAVEL, BRECCIATED ZONE, DOLOMITE, LIMESTONE, SCHIST

BORING LEGEND:

EXPLORATION DESIGNATION
GROUND SURFACE ELEVATION AT EXPLORATION
OFFSET DISTANCE AND DIRECTION FROM CENTERLINE
BOUNDARY BETWEEN DIFFERING SOIL/ROCK TYPES
BOTTOM OF EXPLORATION

LEGEND:

B-1 DESIGNATION AND APPROXIMATE LOCATION OF SOIL TEST BORING DRILLED BETWEEN OCTOBER 9, 2013 AND MARCH 27,2014.

NOTE:
UNKNOWN/UNSAMPLED REFERS TO UNSAMPLED MATERIAL BEGINNING AT THE INFERRED MUDLINE WHERE CASING WAS ADVANCED WITH LITTLE TO NO RESISTANCE.

SCALE: 1" = 200' HORIZONTAL

SCALE: 1" = 50' VERTICAL

ROCK PROBES	
PROBE	TOP OF ROCK ELEVATION
RP1	61'
RP2	85'
RP3	88'

DWG. NO.	REFERENCE DWG.	REV	DSN	CK	DESCRIPTION

05/09/2014

ENGINEERING APPROVALS

DRAWN BY:	BID		CONSTRUCTION	
TITLE	SIGNATURE	DATE	SIGNATURE	DATE

STONY POINT DISCHARGE
AIM PROJECT
PROPOSED 42" M/L
CONCEPTUAL HDD PLAN & PROFILE
LOC. ROCKLAND AND WESTCHESTER COUNTIES, NEW YORK

YEAR: 2015 | W.B.S. | SCALE: AS NOTED | DWG. S7-Z-3001A | REV. 0

Spectra Energy Partners
Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310

APPENDIX K

WETLAND CROSSINGS

TABLE K-1

Wetlands Crossed by the AIM Project

Facility, State, Wetland ID	NWI Classification [a]	Hydro [b]	Enter Milepost [c]	Exit Milepost [c]	Town	County	Crossing Length (feet) [d]	Total Wetland Acreage Impacted [e]		Total Forested Wetland Acreage Impacted [e]	Total Wetland Acreage Impacted by Mainten-ance [f]	Total Forested Wetland Acreage Impacted by Mainten-ance [f]
								Within Existing ROW	Outside of Existing ROW			
PIPELINE FACILITIES												
New York												
Haverstraw to Stony Point Take-up and Relay												
B13-RLR-W1	PEM/PFO	SAT	0.24	0.24	Haverstraw	Rockland	9.77	0.15	0.00	0.01	0.00	0.00
B13-RLR-W2	PEM/PFO	SAT	0.54	0.56	Haverstraw	Rockland	102.08	0.78	0.05	0.07	0.00	0.00
B13-RLR-W2	PEM/PFO	SAT	0.57	0.58	Haverstraw	Rockland	57.38					
B13-RLR-W2	PEM/PFO	SAT	0.58	0.63	Haverstraw	Rockland	226.03					
B13-RLR-W2	PEM/PFO	SAT	0.66	0.68	Haverstraw	Rockland	68.51					
B13-RLR-W3 g/	PEM/PFO	PF	0.77	1.01	Haverstraw	Rockland	1,299.46	1.97	0.81	0.50	0.00	0.00
B13-RLR-W3 g/	PEM/PFO	PF	1.04	1.08	Haverstraw	Rockland	212.67					
B13-RLR-W4	PEM/PSS	SAT	1.62	1.65	Stony Point	Rockland	184.56	0.22	0.06	0.05	0.00	0.00
B13-RLR-W5	PEM/PFO	SAT	2.13	2.14	Stony Point	Rockland	77.73	0.24	0.03	0.06	0.00	0.00
B13-RLR-W6	PSS/PEM/ PFO	SAT	2.14	2.16	Stony Point	Rockland	87.10	0.08	0.22	0.21	0.00	0.00
B13-RLR-W6	PSS/PEM/ PFO	SAT	2.24	2.25	Stony Point	Rockland	20.67					
B13-RLR-W7	PSS	SAT	2.42	2.44	Stony Point	Rockland	0	0.02	0.00	0.00	0.00	0.00
B13-RLR-W8	PSS/PEM	SAT	2.66	2.75	Stony Point	Rockland	0	0.39	0.00	0.00	0.00	0.00
B13-RLR-W9	PSS/PEM	SF/ SAT	2.96	2.96	Stony Point	Rockland	27.63	0.03	0.05	0.05	0.00	0.00
B13-RLR-W10	PEM/PFO	SAT	3.03	3.05	Stony Point	Rockland	0	0.01	0.01	0.01	0.00	0.00
Stony Point to Yorktown Take-up and Relay												
B13-SPLR-W40	PFO/PEM	SF/ SAT	1.27	1.28	Stony Point	Rockland	43.97	0.04	0.01	0.00	0.00	0.00
B13-SPLR-W37[h]	PFO	SF	1.90	1.91	Stony Point	Rockland	0	0.00	0.00	0.00	0.00	0.00
B13-SPLR-W208	PEM1E	SAT	3.05	3.06	Stony Point	Rockland	0	0.00	0.02	0.00	0.00	0.00

TABLE K-1 (cont'd)

Wetlands Crossed by the AIM Project

Facility, State, Wetland ID	NWI Classification [a]	Hydro [b]	Enter Milepost [c]	Exit Milepost [c]	Town	County	Crossing Length (feet) [d]	Total Wetland Acreage Impacted [e]		Total Forested Wetland Acreage Impacted [e]	Total Wetland Acreage Impacted by Mainten-ance [f]	Total Forested Wetland Acreage Impacted by Mainten-ance [f]
								Within Existing ROW	Outside of Existing ROW			
B13-SPLR-W208A	PEM1E	SAT	3.06	3.08	Stony Point	Rockland	0	0.00	0.08	0.00	0.00	0.00
B13-SPLR-W50	PFO/PSS/ PEM	SAT	4.44	4.45	Cortlandt	Westchester	0	0.00	0.17	0.17	0.05	0.05
B13-SPLR-W203	PEM	SAT	4.56	4.56	Cortlandt	Westchester	0	0.00	0.02	0.02	0.00	0.00
B13-SPLR-W205	PFO	DRY	4.74	4.74	Cortlandt	Westchester	0	0.00	0.04	0.04	0.01	0.01
B13-SPLR-W202	PFO	SAT	4.82	4.82	Cortlandt	Westchester	17.19	0.00	0.07	0.07	0.03	0.03
B13-SPLR-W16	PFO	SAT	5.06	5.06	Cortlandt	Westchester	44.34	0.00	1.59	1.27	0.94	0.75
B13-SPLR-W16	PFO/PEM	SAT	5.16	5.17	Cortlandt	Westchester	36.20					
B13-SPLR-W16	PFO/PEM	SAT	5.18	5.20	Cortlandt	Westchester	100.75					
B13-SPLR-W16	PFO/PEM	SAT	5.25	5.37	Cortlandt	Westchester	640.64					
B13-SPLR-W17	PFO/PEM	SAT	5.62	5.64	Cortlandt	Westchester	98.08	0.17	0.13	0.13	0.00	0.00
B13-SPLR-W17	PFO/PEM	SAT	5.64	5.64	Cortlandt	Westchester	0.01					
B13-SPLR-W17	PFO/PEM	SAT	5.65	5.66	Cortlandt	Westchester	67.98					
B13-SPLR-W2	PEM/PFO1	SAT	5.90	5.99	Peekskill/ Cortlandt	Westchester	484.03	0.75	0.76	0.80	0.00	0.00
B13-SPLR-W3	PFO/PEM	SF	6.03	6.05	Cortlandt	Westchester	74.26	0.26	0.04	0.04	0.00	0.00
B13-SPLR-W3	PFO/PEM	SF	6.07	6.09	Cortlandt	Westchester	95.58					
B13-SPLR-W5	PFO	SF/ SAT	6.28	6.28	Cortlandt	Westchester	0	0.00	0.05	0.05	0.00	0.00
B13-SPLR-W7	PFO/PEM	SF	6.53	6.54	Cortlandt	Westchester	85.37	0.40	0.45	0.13	0.00	0.00
B13-SPLR-W7	PFO/PEM	SF	6.56	6.57	Cortlandt	Westchester	68.63					
B13-SPLR-W7	PFO/PEM	SF	6.65	6.69	Cortlandt	Westchester	199.46					
B13-SPLR-W8	PFO/PEM	SAT	6.83	6.84	Cortlandt	Westchester	58.35	0.01	0.11	0.01	0.00	0.00
B13-SPLR-W10	PFO/PEM	SAT	7.02	7.04	Cortlandt	Westchester	77.37	0.02	0.06	0.05	0.00	0.00
B13-SPLR-W10	PFO/PEM	SAT	7.04	7.04	Cortlandt	Westchester	5.25					
B13-SPLR-W10	PFO/PEM	SAT	7.04	7.05	Cortlandt	Westchester	65.38					
B13-SPLR-W11	PEM/PFO	SAT	7.09	7.09	Cortlandt	Westchester	0	0.00	0.05	0.00	0.00	0.00
B13-SPLR-W12	PFO/PEM	SF	7.34	7.36	Cortlandt	Westchester	103.39	0.12	1.21	0.27	0.00	0.00
B13-SPLR-W12	PFO/PEM	SF	7.37	7.51	Cortlandt	Westchester	769.95					

TABLE K-1 (cont'd)

Wetlands Crossed by the AIM Project

Facility, State, Wetland ID	NWI Classification [a]	Hydro [b]	Enter Milepost [c]	Exit Milepost [c]	Town	County	Crossing Length (feet) [d]	Total Wetland Acreage Impacted [e]		Total Forested Wetland Acreage Impacted [e]	Total Wetland Acreage Impacted by Mainten-ance [f]	Total Forested Wetland Acreage Impacted by Mainten-ance [f]
								Within Existing ROW	Outside of Existing ROW			
B13-SPLR-W13	PFO/PEM/PSS	SF	7.56	7.62	Cortlandt	Westchester	303.99	0.21	2.09	0.78	0.00	0.00
B13-SPLR-W13	PFO/PEM/PSS	SF	7.64	7.85	Cortlandt	Westchester	1,077.77					
B13-SPLR-W13	PFO/PEM/PSS	SF	7.85	7.86	Cortlandt	Westchester	34.62					
B13-SPLR-W13	PFO/PEM/PSS	SF	7.90	7.92	Cortlandt	Westchester	112.44					
B13-SPLR-W14	PEM/PFO	SF	8.24	8.24	Cortlandt	Westchester	3.99	0.03	0.23	0.02	0.00	0.00
B13-SPLR-W14	PEM/PFO	SF	8.26	8.29	Cortlandt	Westchester	188.37					
B13-SPLR-W15	PFO/PEM	SF/SAT	8.37	8.38	Cortlandt	Westchester	36.43	0.02	0.25	0.11	0.00	0.00
B13-SPLR-W15	PFO/PEM	SF/SAT	8.42	8.45	Cortlandt	Westchester	129.86					
A13-SPLR-W2	PFO/PEM	SAT	8.46	8.58	Cortlandt	Westchester	620.05	1.62	0.71	0.56	0.00	0.00
A13-SPLR-W2	PFO/PEM	SAT	8.59	8.71	Cortlandt	Westchester	629.96					
A13-SPLR-W2	PFO/PEM	SAT	8.75	8.77	Cortlandt	Westchester	86.83					
B13-SPLR-W18	PFO/PEM	SAT	8.81	8.89	Cortlandt	Westchester	401.72	0.43	0.09	0.09	0.00	0.00
A13-SPLR-W4	PFO/PEM	SF/SAT	9.24	9.36	Cortlandt	Westchester	626.97	1.00	0.00	0.15	0.00	0.00
B13-SPLR-W43	PFO/PEM	SAT	9.57	9.63	Cortlandt	Westchester	286.57	0.46	0.00	0.08	0.00	0.00
B13-SPLR-W206	PFO/PEM	SAT	9.64	9.68	Cortlandt	Westchester	234.95	0.24	0.08	0.00	0.00	0.00
B13-SPLR-W20[h]	PEM	SAT	9.94	9.98	Cortlandt	Westchester	239.73	0.48	0.00	0.13	0.00	0.00
B13-SPLR-W20[h]	PEM	SAT	9.99	9.99	Cortlandt	Westchester	32.29					
B13-SPLR-W21	PEM/PSS	SF/SAT	10.33	10.37	Cortlandt	Westchester	165.52	0.29	0.05	0.04	0.00	0.00
B13-SPLR-W22	PEM/PFO	SAT	10.51	10.52	Cortlandt	Westchester	41.53	0.46	0.04	0.15	0.00	0.00
B13-SPLR-W22	PEM/PFO	SAT	10.54	10.59	Cortlandt	Westchester	248.94					
B13-SPLR-W23	PEM	SAT	10.63	10.68	Cortlandt	Westchester	298.18	0.31	0.24	0.25	0.00	0.00
B13-SPLR-W24	PEM	SAT	10.72	10.74	Cortlandt	Westchester	101.86	0.09	0.00	0.00	0.00	0.00

TABLE K-1 (cont'd)

Wetlands Crossed by the AIM Project

Facility, State, Wetland ID	NWI Classification [a]	Hydro [b]	Enter Milepost [c]	Exit Milepost [c]	Town	County	Crossing Length (feet) [d]	Total Wetland Acreage Impacted [e]		Total Forested Wetland Acreage Impacted [e]	Total Wetland Acreage Impacted by Mainten-ance [f]	Total Forested Wetland Acreage Impacted by Mainten-ance [f]
								Within Existing ROW	Outside of Existing ROW			
B13-SPLR-W25	PFO/PSS/ PEM	SAT	10.78	10.82	Cortlandt	Westchester	198.79	0.39	0.07	0.13	0.00	0.00
B13-SPLR-W25	PFO/PSS/ PEM	SAT	10.83	10.84	Cortlandt	Westchester	62.62					
B13-SPLR-W41	PEM/PFO	SAT	10.98	11.03	Cortlandt	Westchester	228.22	0.28	0.02	0.01	0.00	0.00
B13-SPLR-W26	PFO/PEM	PF	11.07	11.13	Yorktown	Westchester	295.10	0.57	0.11	0.14	0.00	0.00
B13-SPLR-W26	PFO/PEM	PF	11.13	11.16	Yorktown	Westchester	141.20					
B13-SPLR-W27	PFO/PEM	SAT	11.51	11.54	Yorktown	Westchester	203.76	0.24	0.20	0.26	0.00	0.00
B13-SPLR-W28	PEM/PFO	SAT	11.70	11.73	Yorktown	Westchester	151.85	0.53	0.00	0.06	0.00	0.00
B13-SPLR-W28	PEM/PFO	SAT	11.75	11.75	Yorktown	Westchester	20.91					
B13-SPLR-W28	PEM/PFO	SAT	11.75	11.81	Yorktown	Westchester	301.63					
B13-SPLR-W29	PFO/PEM	SAT	11.97	11.98	Yorktown	Westchester	46.85	0.05	0.04	0.03	0.00	0.00
B13-SPLR-W30	PSS/PEM	SAT	12.20	12.24	Yorktown	Westchester	186.32	0.24	0.08	0.09	0.00	0.00
Connecticut												
Southeast to MLV-19 Take-up and Relay												
B13-SELR-W8	PFO1/PEM1	SAT	0.17	0.21	Danbury	Fairfield	235.43	0.74	0.23	0.12	0.00	0.00
B13-SELR-W8	PFO1/PEM1	SAT	0.24	0.30	Danbury	Fairfield	344.21					
B13-SELR-W9	PEM/PFO	SF/ SAT	0.66	0.71	Danbury	Fairfield	274.58	1.08	0.51	0.63	0.00	0.00
B13-SELR-W9	PEM/PFO	SF/ SAT	0.74	0.85	Danbury	Fairfield	573.81					
A13-SELR-W1	PEM/PFO	SAT	1.03	1.04	Danbury	Fairfield	77.86	0.15	0.03	0.04	0.00	0.00
A13-SELR-W2	PEM/PFO	SAT	1.15	1.17	Danbury	Fairfield	111.96	0.38	0.03	0.02	0.00	0.00
A13-SELR-W2	PEM/PFO	SAT	1.18	1.22	Danbury	Fairfield	193.15					
A13-SELR-W3	PEM/PSS/ PFO	SAT	1.24	1.27	Danbury	Fairfield	156.97	0.18	0.14	0.15	0.00	0.00
B13-SELR-W12	PEM/PSS	SF	1.72	1.85	Danbury	Fairfield	684.06	HDD	HDD	HDD	HDD	HDD
B13-SELR-W10	PEM/PFO	SF/ SAT	2.06	2.11	Danbury	Fairfield	277.87	0.57	0.2	0.25	0.00	0.00
B13-SELR-W10	PEM/PFO	SF/ SAT	2.13	2.14	Danbury	Fairfield	42.81					

TABLE K-1 (cont'd)

Wetlands Crossed by the AIM Project

Facility, State, Wetland ID	NWI Classification [a]	Hydro [b]	Enter Milepost [c]	Exit Milepost [c]	Town	County	Crossing Length (feet) [d]	Total Wetland Acreage Impacted [e]: Within Existing ROW	Total Wetland Acreage Impacted [e]: Outside of Existing ROW	Total Forested Wetland Acreage Impacted [e]	Total Wetland Acreage Impacted by Mainten-ance [f]	Total Forested Wetland Acreage Impacted by Mainten-ance [f]
A13-SELR-W4	PEM/PFO	SAT	2.64	2.68	Danbury	Fairfield	197.07	0.53	0.24	0.25	0.00	0.00
A13-SELR-W4	PEM/PFO	SAT	2.69	2.72	Danbury	Fairfield	145.82					
A13-SELR-W5	PEM/PFO	SF/ SAT	2.76	2.86	Danbury	Fairfield	499.85	0.30	0.00	0.03	0.00	0.00
A13-SELR-W6	PEM/PFO	SAT	3.00	3.13	Danbury	Fairfield	642.26	0.79	0.27	0.37	0.00	0.00
B13-SELR-W11	PEM/PFO	SAT	3.21	3.23	Danbury	Fairfield	68.20	0.09	0.02	0.02	0.00	0.00
B13-SELR-W11	PEM/PFO	SAT	3.23	3.23	Danbury	Fairfield	17.39					
B13-SELR-W1	PEM	SAT	3.33	3.34	Danbury	Fairfield	24.72	0.15	0.00	0.00	0.00	0.00
B13-SELR-W2	PEM/PFO	SAT	3.42	3.43	Danbury	Fairfield	86.09	0.23	0.02	0.07	0.00	0.00
B13-SELR-W3	PEM/PFO	SAT	3.54	3.59	Danbury	Fairfield	261.54	0.33	0.09	0.19	0.00	0.00
B13-SELR-W4	PEM/PFO	Dry	3.70	3.72	Danbury	Fairfield	117.93	0.15	0.08	0.14	0.00	0.00
B13-SELR-W5	PEM/PFO	SAT	3.82	3.86	Danbury	Fairfield	208.22	0.24	0.08	0.01	0.00	0.00
B13-SELR-W7	PEM/PFO	HWT	4.08	4.12	Danbury	Fairfield	193.43	0.23	0.11	0.25	0.00	0.00
Line-36A Loop Extension												
A13-CCS-W1	PFO/PEM	SAT	0.03	0.05	Cromwell	Middlesex	88.16	0.09	0.04	0.04	0.02	0.01
A13-CCS-W1	PFO/PEM	SAT	0.05	0.06	Cromwell	Middlesex	71.45					
A13-CCS-W1	PFO/PEM	SAT	0.13	0.14	Cromwell	Middlesex	54.08					
B13-CLR-W2	PFO/PEM	SF/ SAT	0.74	0.80	Cromwell	Middlesex	319.00	0.72	0.77	0.78	0.49	0.48
B13-CLR-W2	PFO/PEM	SF/ SAT	0.81	0.81	Cromwell	Middlesex	16.62					
B13-CLR-W2	PFO/PEM	SF/ SAT	0.82	0.92	Cromwell	Middlesex	517.61					
B13-CLR-W2	PFO/PEM	SF/ SAT	0.92	0.93	Cromwell	Middlesex	17.75					
B13-CLR-W3[g]	PFO/PEM	SAT	1.17	1.22	Cromwell	Middlesex	265.40	0.22	0.23	0.06	0.16	0.00
B13-CLR-W4	PFO/PEM	SAT	1.28	1.31	Cromwell	Middlesex	186.10	0.34	0.19	0.04	0.14	0.01
B13-CLR-W4	PFO/PEM	SAT	1.32	1.33	Cromwell	Middlesex	41.75					
B13-CLR-W4	PFO/PEM	SAT	1.34	1.36	Cromwell	Middlesex	98.25					

TABLE K-1 (cont'd)

Wetlands Crossed by the AIM Project

Facility, State, Wetland ID	NWI Classification [a]	Hydro [b]	Enter Milepost [c]	Exit Milepost [c]	Town	County	Crossing Length (feet) [d]	Total Wetland Acreage Impacted [e]		Total Forested Wetland Acreage Impacted [e]	Total Wetland Acreage Impacted by Mainten-ance [f]	Total Forested Wetland Acreage Impacted by Mainten-ance [f]
								Within Existing ROW	Outside of Existing ROW			
E-1 System Lateral Take-up and Relay												
B13-ELR-W200	PEM/PFO	SAT	0.01	0.07	Lebanon	New London	317.83	0.26	0.46	0.29	0.07	0.00
A13-ELR-W1	PEM/PSS/ PFO	SF/ SAT	0.69	0.82	Lebanon	New London	678.50	0.54	0.59	0.56	0.15	0.11
B13-ELR-W3	PEM/PFO	SAT	1.46	1.49	Lebanon	New London	0	0.00	0.08	0.00	0.00	0.00
B13-ELR-W4	PEM1/PFO1	SF/ SAT	1.82	1.86	Lebanon	New London	229.08	0.29	0.12	0.21	0.00	0.00
A13-ELR-W2	PEM/PFO	PF	1.95	1.96	Lebanon	New London	67.29	1.24	1.28	0.99	0.14	0.11
A13-ELR-W2	PEM/PFO	PF	1.97	2.24	Lebanon	New London	1,406.63					
A13-ELR-W3	PEM/PFO	SF/ SAT	2.33	2.35	Lebanon	New London	111.23	0.09	0.11	0.08	0.03	0.00
A13-ELR-W4	PEM/PFO	SF/ SAT	2.45	2.48	Lebanon	New London	152.30	0.12	0.14	0.10	0.04	0.00
A13-ELR-W5	PEM/PSS/ PFO	SAT	2.54	2.62	Lebanon	New London	405.25	0.33	0.38	0.23	0.10	0.00
A13-ELR-W5	PEM/PSS/ PFO	SAT	2.62	2.62	Lebanon	New London	6.61					
A13-ELR-W6	PEM/PSS/ PFO	SF/ SAT	2.65	2.69	Lebanon	New London	186.01	1.03	1.22	0.81	0.29	0.03
A13-ELR-W6	PEM/PSS/ PFO	SF/ SAT	2.70	2.80	Lebanon	New London	492.20					
A13-ELR-W6	PEM/PSS/ PFO	SF/ SAT	2.82	2.83	Lebanon	New London	61.38					
A13-ELR-W6	PEM/PSS/ PFO	SF/ SAT	2.88	2.91	Lebanon	New London	172.79					
A13-ELR-W6	PEM/PSS/ PFO	SF/ SAT	2.94	2.96	Lebanon	New London	87.21					
A13-ELR-W6	PEM/PSS/ PFO	SF/ SAT	2.99	3.00	Lebanon	New London	89.13					
A13-ELR-W6	PEM/PSS/ PFO	SF/ SAT	3.03	3.06	Lebanon	New London	168.29					

TABLE K-1 (cont'd)

Wetlands Crossed by the AIM Project

Facility, State, Wetland ID	NWI Classification [a]	Hydro [b]	Enter Milepost [c]	Exit Milepost [c]	Town	County	Crossing Length (feet) [d]	Total Wetland Acreage Impacted [e]		Total Forested Wetland Acreage Impacted [e]	Total Wetland Acreage Impacted by Mainten-ance [f]	Total Forested Wetland Acreage Impacted by Mainten-ance [f]
								Within Existing ROW	Outside of Existing ROW			
A13-ELR-W8	PEM/PSS/ PFO	SF/ SAT	3.17	3.24	Lebanon	New London	372.66	0.32	0.19	0.04	0.07	0.00
A13-ELR-W8	PEM/PSS/ PFO	SF/ SAT	3.27	3.28	Lebanon	New London	21.28					
A13-ELR-W9	PEM/PFO	SF/ SAT	3.35	3.38	Lebanon	New London	132.42	0.13	0.14	0.12	0.03	0.00
B13-ELR-W16	PEM/PFO	SAT	4.09	4.14	Franklin	New London	222.58	0.91	1.26	0.00	0.29	0.00
B13-ELR-W16	PEM/PFO	SAT	4.20	4.39	Franklin	New London	1,000.14					
B13-ELR-W15	PEM/PFO	SAT	4.48	4.50	Franklin	New London	0	0.00	0.01	0.00	0.00	0.00
B13-ELR-W12	PEM1/PFO	SAT	4.87	4.87	Franklin	New London	12.38	0.01	0.01	0.00	0.00	0.00
B13-ELR-W10	PEM1/PFO1	SAT	4.93	4.94	Franklin	New London	0	0.00	0.01	0.00	0.00	0.00
B13-ELR-W9	PEM/PFO	SF	5.40	5.53	Franklin	New London	679.69	0.50	0.70	0.49	0.02	0.00
B13-ELR-W7	PSS1/PFO1	SF	5.59	5.61	Franklin	New London	100.27	0.09	0.04	0.03	0.01	0.00
B13-ELR-W8	PEM/PFO	SAT	5.65	5.65	Franklin	New London	36.88	0.03	0.02	0.00	0.01	0.00
B13-ELR-W6	PEM/PFO	SAT	5.67	5.69	Franklin	New London	114.95	0.15	0.28	0.17	0.07	0.04
B13-ELR-W6	PEM/PFO	SAT	5.74	5.76	Franklin	New London	120.41					
B13-ELR-W5	PEM/PFO	SAT	5.84	5.87	Franklin	New London	150.93	0.35	0.23	0.16	0.08	0.04
B13-ELR-W5	PEM/PFO	SAT	5.95	6.00	Franklin	New London	274.60					
A13-ELR-W11	PEM	SAT	6.09	6.10	Franklin	New London	42.69	0.04	0.01	0.00	0.01	0.00
A13-ELR-W12	PEM/PFO	SAT	6.32	6.32	Franklin	New London	22.04	0.03	0.08	0.04	0.00	0.00
A13-ELR-W12	PEM/PFO	SAT	6.33	6.33	Franklin	New London	0.68					
A13-ELR-W13	PFO	SAT	6.89	6.89	Franklin	New London	0	0.00	0.00	0.00	0.00	0.00
A13-ELR-W14	PEM/PFO	SAT	6.95	6.96	Franklin	New London	0	0.02	0.00	0.00	0.00	0.00
B13-ELR-W23	PFO	SAT	7.11	7.12	Franklin	New London	0	0.00	0.01	0.01	0.00	0.00
B13-ELR-W22	PEM/PFO	SAT	7.27	7.31	Franklin	New London	195.74	0.15	0.21	0.08	0.05	0.00
B13-ELR-W21	PFO/PEM	SAT	7.39	7.42	Franklin	New London	155.27	0.13	0.09	0.10	0.03	0.03
B13-ELR-W20	PFO/PEM	SAT	7.88	7.88	Franklin	New London	36.58	0.02	0.21	0.22	0.05	0.05

TABLE K-1 (cont'd)

Wetlands Crossed by the AIM Project

Facility, State, Wetland ID	NWI Classification [a]	Hydro [b]	Enter Milepost [c]	Exit Milepost [c]	Town	County	Crossing Length (feet) [d]	Total Wetland Acreage Impacted [e]: Within Existing ROW	Total Wetland Acreage Impacted [e]: Outside of Existing ROW	Total Forested Wetland Acreage Impacted [e]	Total Wetland Acreage Impacted by Mainten-ance [f]	Total Forested Wetland Acreage Impacted by Mainten-ance [f]
B13-ELR-W19	PSS/PFO1	SAT	8.31	8.33	Franklin/ Norwich	New London	86.28	0.20	0.18	0.24	0.05	0.05
B13-ELR-W19	PSS/PFO1	SAT	8.36	8.39	Franklin/ Norwich	New London	158.12					
B13-ELR-W25	PEM/PFO	SAT	8.74	8.76	Norwich	New London	60.65	0.33	0.34	0.42	0.09	0.09
B13-ELR-W25	PEM/PFO	SAT	8.82	8.89	Norwich	New London	326.74					
B13-ELR-W24	PEM/PFO	SAT	8.92	8.92	Norwich	New London	23.48	0.03	0.00	0.00	0.00	0.00
E-1 System Lateral Loop Extension												
B13-ELP-W3	PFO/PSS	SAT	0.03	0.04	Montville	New London	0	0	0.02	0.02	0.00	0.00
B13-ELP-W2	PFO/PSS	SAT	0.16	0.17	Montville	New London	26.44	0.01	0.08	0.09	0.02	0.02
B13-ELP-W4	PFO	SAT	0.31	0.40	Montville	New London	486.75	0.42	0.96	0.87	0.41	0.30
B13-ELP-W4	PFO/PEM	SAT	0.40	0.43	Montville	New London	126.56					
B13-ELP-W4	PFO	SAT	0.44	0.50	Montville	New London	302.60					
B13-ELP-W7	PFO	SF/ SAT	1.16	1.19	Montville	New London	138.19	0.1	0.15	0.15	0.06	0.06
						Project Total	**30,420.72**	**28.98**	**23.28**	**17.07**	**4.01**	**2.27**

Notes: ROW = right-of-way; HDD = horizontal directional drill

[a] NWI Classifications:
PEM – Palustrine emergent wetland
PSS – Palustrine scrub-shrub wetland
PFO – Palustrine forested wetland

[b] SAT – Saturated; SF – Seasonally Flooded; PF – Permanently Flooded; HWT – High Water Table

[c] Where the pipeline crosses the wetland; enter milepost, exit milepost, and crossing length reflect the actual pipeline intersection of wetlands. Where the pipeline does not cross the wetland and the construction workspace does, the enter milepost and exit milepost are the first and last mileposts where this occurs and the crossing length is the longest length of the wetland parallel to the pipeline that is crossed.

[d] Crossing length of pipeline where the pipe centerline crosses the wetland.

[e] Total wetland/forested wetland acreage impacted includes impacts associated with all areas within the construction workspace limits, temporary and permanent. Wetlands crossed by HDD would not be impacted outside of designated construction workspace areas.

[f] Total wetland/forested wetland acreage impacted by maintenance includes impacts associated with new vegetation maintenance areas outside of the existing and currently maintained pipeline right-of-way.

[g] Indicates partial estimated delineation via aerial imagery within construction workspace.

[h] Indicates partial estimated delineation via aerial imagery outside of construction workspace.

APPENDIX L

BEDROCK GEOLOGY TABLES

TABLE L-1

Bedrock Geology of the Pipeline Facilities for the AIM Project

Facility/Geologic Unit	Length (miles)	Description
Take-up and Relay		
Haverstraw to Stony Point		
Hornblende granite and granite gneiss	3.3	Middle Proterozoic age hornblende granite and granite gneiss with subordinate leucogranite.
Stony Point to Yorktown		
Hornblende granite and granite gneiss	3.0	See description above.
Diorite with hornblende and/or biotite	0.2	Upper Ordovician age diorite with hornblende and/or biotite that is part of the Cortlandt and smaller mafic complexes.
Balmville Limestone	0.4	Middle Ordovician age limestone that is part of the Lorraine, Trenton, and Black River Groups.
Manhattan Formation	0.5	Middle Ordovician age schist with secondary marble and calc-silitic rock.
Manhattan Formation, undivided	0.5	Ordovician age pelitic schists, amphibolites, and part of Trenton Group and Metamorphic Equivalents up to 8,000 feet (2,400 meters). The unit is mapped under Om in digital mapping but can be subdivided into Cambrian eugeosynclinal rocks (Omb, Omc, and Omd) (Fisher et al., 1970). Subunit Omd is comprised of sillimanite-garnet-muscovite-biotite-plagioclase-quartz gneiss. Subunit Omc is comprised of sillimanite-garnet-muscovite-biotite-quartz-plagioclase schistose gneiss, sillimanite nodules, and local quartz-rich layers. Subunit Omb is comprised of a discontinuous unit of amphibolite and schist.
Biotite augite norite	1.8	Upper Ordovician norite that is part of the Cortlandt and smaller mafic complexes.
Hornblende norite	2.0	Upper Ordovician norite that is part of the Cortlandt and smaller mafic complexes. The hornblende is poikilitic.
Olivine Pyroxenite	0.3	Upper Ordovician pyroxenite with poikilitic hornblende that is part of the Cortlandt and smaller mafic complexes. A secondary rock type is peridotite.
Muscovite-biotite granodiorite	2.2	Upper Devonian age muscovite-biotite granodiorite that is part of the Peekskill Pluton.
Muscovite-biotite granite	0.7	Upper Devonian granite that is part of the Peekskill Pluton.
Water	0.7	Water
Southeast to MLV 19		
Manhattan Formation, undivided	0.1	See description above.
Gneiss of highlands massifs	1.5	Proterozoic age gneiss with secondary amphibolite and schist that was part of the proto-North American terrane. It may include a mixture of rock types when they are not mapped separately, including pink granitic gneiss (Ygr), Augen gneiss (Yga), layered gneiss (Ygn), Hornblende gneiss and amphibolite (Ygh), and rusty mica schist and gneiss.
Stockbridge marble	0.2	Lower Ordovician and Cambrian age white to gray, massive to layered marble, generally dolomitic but containing calcite marble in the upper part, locally interlayered with schist or phyllite and with calcareous siltstone or sandstone. The Stockbridge Marble represents the carbonate shelf of the Proto-North American terrane.
Basal marble member of Walloomsac schist	0.3	Middle Ordovician dark gray to white, massive to layered schistose or phyllitic calcite-phlogopite marble.

TABLE L-1 (cont'd)

Bedrock Geology of the Pipeline Facilities for the AIM Project

State/Facility/Geologic Unit	Length (miles)	Description
Hornblende gneiss and amphilolite	0.8	Proterozoic age hornblende gneiss and amphibolite that is dark gray to mottled, fine- to medium-grained, massive to foliated amphibolite and gneiss, composed of hornblende and plagioclase with biotite and minor quartz. This formation is often interlayered with banded felsic gneiss and locally contains calc-silicate rock or diopsidic calcite marble.
Pink granite gneiss	1.6	Proterozoic granitic gneiss that is light pink to gray in color, medium to coarse texture, foliated but generally massive or poorly layered granitic gneiss having quartz, microline, oligoclase, and either biotite or muscovite (or both), with amphibole or epidote occurring locally.
E-1 System Lateral		
Lebanon Gabbro	1.0	Devonian age, dark, speckled, massive (but locally sheared) gabbro, composed of hornblende, labradorite, and opaques. Some rock bodies contain biotite and quartz, and some smaller bodies are almost pure hornblende with local augite. The Lebanon Gabbro is part of the Iapetus (Oceanic) Terrane and the Merrimack Synclinorium.
Hebron Gneiss	3.4	Silurian and Ordivician age interlayered dark-gray colored, medium to coarse-grained schist, composed of andesine, quartz, biotite, and local potassium feldspar and greenish-grey, fine to medium-grained calc-silicate rock, composed of labradorite, quartz, biotite, anctinolite, hornblende, and diopside, with local scapolite. There are local lenses of graphitic two-mica schist. The Hebron Gneiss is part of the Iapetus (Oceanic) Terrane and the Merrimack Synclinorium.
Brimfield Schist	0.2	Upper (possibly) and middle Ordivician age gray colored (weathering to rust), medium to coarse-grained, interlayered schist and gneiss, composed of oligoclase, quartz, potassium feldspar, and biotite, commonly with garnet, sillimanite, graphite, and pyrrhotite. Potassium feldspar often occurs as augen 1 to 3 centimeters across. Minor layers and lenses include hornblende- and pyroxene-bearing gneiss, amphibolite, and calc-silicate rock.
Dioritic phase of Lebanon Gabbro	0.1	Devonian age white to black, streaked, medium-grained, foliated or sheared mafic gneiss, composed of plagioclase, biotite, quartz, and often hornblende.
Scotland Schist	2.5	Devonian or Silurian age silvery (with local rust coloration), fine- to medium-grained schist containing quartz, muscovite, biotite, staurolite, and oligoclase (locally with kyanite or sillimanite) and interlayered with quartz-oligoclase-biotite schist and granofels and quartzite, typically near the base and on the west side of the formation. The Scotland Schist is part of the Iapetus (Oceanic) Terrane and the Merrimack Synclinorium.
Quartzite unit in Scotland Schist	0.3	Devonian or Silurian age quartzite, generally micaceous, interlayered with mica schist.
Canterbury Gneiss	1.1	Devonian age light gray, medium grained, variably foliated, locally strongly lineated gneiss. Composed of quartz, oligoclase, microcline, and biotite, typically with megacrysts 1 to 2 centimeters long on either of both feldspars.
Yantic Member of Tatnic Hill Formation	0.5	Upper and Middle Ordovician age medium to dark gray, fine- to medium-grained schist, composed of quartz, oligoclase, biotite, and muscovite, some layers with garnet, staurolite, and kyanite or garnet and sillimanite, local epidote, or potassium feldspar and some layers of rusty-weathering graphititc, pyrrhotitic, two-mica schist.

TABLE L-1 (cont'd)

Bedrock Geology of the Pipeline Facilities for the AIM Project

State/Facility/Geologic Unit	Length (miles)	Description
Loop Extension		
Line-36A Loop		
Portland arkrose	2.0	Lower Jurassic age reddish-brown to maroon colored micaceous arkose and siltsone and red to black fissile silty shale. On the east it grades into coarse conglomerate.
E-1 System Lateral Loop Extension		
Waterford Group	<0.1	Light to dark, generally medium-grained gneiss, composed of plagioclase, quartz, and biotite, with hornblende in some layers and microcline in others. There are layers of amphibolite. The Waterford group is Proterozoic in age and part of the Avalonian Terrane and the Avalonian Anticlinorium.
Plainfield Formation	0.8	Comprised of several rock types: Intelayered light gray, thin-bedded quartzite, in places with feldspar, mica, graphite, or pyrite; light to medium gray gneiss composed of quartz, oligoclase, and biotite; medium to dark gray schist composed of quartz, oligoclase, biotite, sillimanite, and garnet; dark gray or green gneiss composed of plagioclase, quartz, biotite, and hornblende; and amphibolite, diopsite-bearing quartzite, and calc-silicate rock. The Plainfield Formation is Proterozoic in age and part of the Avalonian Terrane and the Avalonian Anticlinorium.
Hope Valley Alaskite Gneiss	0.5	Light pink to gray, medium- to coarse-grained, locally porphyritic, variably lineated and foliated alaskitic gneiss, composed of microcline, quartz, albite or oligoclase, and minor magnetite, and locally biotite and muscovite. The Hope Valley Alaskite Gneiss is Proterozoic in age and part of the Avalonian Terrane, the Avalonian Anticlinorium, and the Sterling Plutonic Group.
Potter Hill Granite Gneiss	<0.1	Light pink to gray (weathering tan) fine- to medium-grained, rarely porphyritic, well-foliated granitic gneiss composed of microcline, quartz, oligoclase (or albite), biotite, and magnetite, minor muscovite and local garnet. The Potter Hill Granite Gneiss is Proterozoic in age and part of the Avalonian Terrane and the Avalonian Anticlinorium.
New Pipeline		
West Roxbury Lateral		
Westwood Granite	0.2	Proterozoic age light gray to pinkish gray, fine to medium-grained granite.
Dedham Grainte	4.9	Proterozoic age, light grayish-pink to greenish-gray, equigranular to slightly porphyritic, variably altered granite with secondary diorite and quartz monzonite.

Sources:

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TABLE L-2

Bedrock Geology of the Aboveground Facilities for the AIM Project

Facility/Geologic Unit	Area Affected During Construction (acres)	Description
Existing Compressor Station Modifications		
Stony Point Compressor Station		
Hornblende granite and granite gneiss	20.3	Middle Proterozoic age hornblende granite and granite gneiss with subordinate leucogranite.
Southeast Compressor Station		
Manhattan Formation, undivided	15.9	Ordovician age pelitic schists, amphibolites, and part of Trenton Group and Metamorphic Equivalents up to 8,000 feet (2,400 meters). The unit is mapped under Om in digital mapping but can be subdivided into Cambrian eugeosynclinal rocks (Omb, Omc, and Omd) (Fisher et al., 1970). Subunit Omd is comprised of sillimanite-garnet-muscovite-biotite-plagioclase-quartz gneiss. Subunit Omc is comprised of sillimanite-garnet-muscovite-biotite-quartz-plagioclase schistose gneiss, sillimanite nodules, and local quartz-rich layers. Subunit Omb is comprised of a discontinuous unit of amphibolite and schist.
Oxford Compressor Station		
Waterbury Gneiss	0.0	Proterazoic or Cambiran age gneiss. Medium to dark gray, fine to medium grained, typically irregularly foliated and lenticular. Composed of biotite, quartz, oligoclase, kyanite, and garnet.
Cromwell Compressor Station		
Portland arkose	14.9	Lower Jurassic age reddish-brown to maroon colored micaceous arkose and siltsone and red to black fissile silty shale.
Chaplin Compressor Station		
Hebron gneiss	11.7	Silurian and Ordivician age interlayered dark-gray colored, medium to coarse-grained schist, composed of andesine, quartz, biotite, and local potassium feldspar and greenish-grey, fine to medium-grained calc-silicate rock, composed of labradorite, quartz, biotite, anctinolite, hornblende, and diopside, with local scapolite. There are local lenses of graphitic two-mica schist. The Hebron Gneiss is part of the Iapetus (Oceanic) Terrane and the Merrimack Synclinorium.
Burrillville Compressor Station		
Esmond igneous suite	16.7	Late Proterozoic age granodiorite. Gray, greenish, or pale pink in color. Medium to coarse-grained primarily porphyritic rock composed or microcline, perthite, plagioclase, quartz, and accessory biotite, epidote, zircon, allanite, monazite, apatite, sphene, and opaque minerals.
Existing M&R Station Modifications		
Stony Point M&R Station		
Muscovite-biotite granondirorite	2.2	Upper Devonian age muscovite-biotite granodiorite that is part of the Peekskill Pluton.
Peekskill M&R Station		
Biotite augite norite	2.1	Upper Ordovician norite that is part of the Cortlandt and smaller mafic complexes.
Cortlandt M&R Station		
Hornblende granite and granite gneiss	3.8	See description above.

TABLE L-2 (cont'd)

Bedrock Geology of the Aboveground Facilities for the AIM Project

Facility/Geologic Unit	Area Affected During Construction (acres)	Description
West Danbury M&R Station		
Gneiss of Highlands massifs	2.6	Proterozoic age gneiss with secondary amphibolite and schist that was part of the proto-North American terrane. It may include a mixture of rock types when they aren't mapped separately, including pink granitic gneiss (Ygr), Augen gneiss (Yga), layered gneiss (Ygn), Hornblende gneiss and amphibolite (Ygh), and rusty mica schist and gneiss.
Southbury M&R Station		
Taine Mountain Formation	0.6	Lower Ordovician age granofels that includes the Taine Mountain Formation.
Collinsville Formation	<0.1	Middle Ordovician age gneiss with secondary amphibolite, felsic, and mafic metavolcanic rocks and granulite.
Waterbury M&R Station		
Waterbury Gneiss	0.4	See description above.
North Haven M&R Station		
New Haven Arkose	0.5	Upper Triassic and possibly lower Triassic age red, pink, and gray colored coarse-grained poorly sorted and indurated arkose, with conglomerate locally, that is interbedded with brick-red micaceous, locally shaly siltstone and fine-grained feldspathic clayey sandstone.
Guilford M&R Station		
Waterford Group, Stony Creek Granite Gneiss and Narragansett Pier Granite Undivided	0.4	Proterozoic age gneiss and granitic gneiss intruded by Permian age gneiss with considerable pegmatite formations.
Waterford Group	0.1	Light to dark, generally medium-grained gneiss, composed of plagioclase, quartz, and biotite, with hornblende in some layers and microcline in others. There are layers of amphibolite. The Waterford group is Proterozoic in age and part of the Avalonian Terrane and the Avalonian Anticlinorium.
Farmington M&R Station		
New Haven arkose	0.4	See description above.
Glastonbury M&R Station		
Portland arkose	0.7	See description above.
Glastonbury Gneiss	0.1	Ordovician age gray, medium to coarse grained, massive to well folicated granitoid gneiss composed of oligoclase, quartz, microcline, and biotite.
Middletown M&R Station		
Maromas Granite Gneiss	0.5	Devonian age light-gray to buff colored, medium- to fine-grained granitic gneiss, composed of quartz and microcline with minor plagioclase and biotite. Pegmatite bodies are common in the vicinity.
Salem Pike M&R Station		
Tatnic Hill Formation	0.2	Ordovician age medium to dark gray, medium-grained gneiss or schist composed of quartz, andesine, biotite, garnet, and sillimanite (locally kyanite, muscovite, or potassium feldspar) that is interlayered with graphitic pyrrhotitic two-mica schist, amphibolite, and calc-silicate rock.

TABLE L-2 (cont'd) Bedrock Geology of the Aboveground Facilities for the AIM Project		
Facility/Geologic Unit	Area Affected During Construction (acres)	Description
Montville M&R Station		
Waterford Group	1.0	See description above.
Plainfield Formation	0.2	Comprised of several rock types: intelayered light gray, thin-bedded quartzite, in places with feldspar, mica, graphite, or pyrite; light to medium gray gneiss composed of quartz, oligoclase, and biotite; medium to dark gray schist composed of quartz, oligoclase, biotite, sillimanite, and garnet; dark gray or green gneiss composed of plagioclase, quartz, biotite, and hornblende; and amphibolite, diopsite-bearing quartzite, and calc-silicate rock. The Plainfield Formation is Proterozoic in age and part of the Avalonian Terrane and the Avalonian Anticlinorium.
Willimantic M&R Station		
Tatnic Hill Formation	0.9	See description above.
Pomfret M&R Station		
Scotland Schist	0.4	Devonian or Silurian age silvery (with local rust coloration), fine- to medium-grained schist containing quartz, muscovite, biotite, staurolite, and oligoclase (locally with kyanite or sillimanite) and interlayered with quartz-oligoclase-biotite schist and granofels and quartzite, typically near the base and on the west side of the formation. The Scotland Schist is part of the Iapetus (Oceanic) Terrane and the Merrimack Synclinorium.
Putnam M&R Station		
Tatnic Hill Formation	0.3	See description above.
North Fall River M&R Station		
Granite of Fall River pluton	1.5	Proterozoic age light-gray, medium-grained, biotite granite, partially mafic-poor.
New Bedford M&R Station		
Gneiss and schist near New Bedford	1.8	Proterozoic age hornblende and biotite schist and gneiss, amphibolite.
Middleborough M&R Station		
Granite, gneiss, and schist	0.6	Plutonic and metamorphic rocks, which are probably Proterozoic in age.
Brockton M&R Station		
Rhode Island Formation	0.6	Upper and Middle Pennsylvanian age gray sandstone, graywacke, shale, and conglomerate and black shale. Also contains minor meta-anthracite beds.
Norwood M&R Station		
Wamsuttea Formation	0.8	Middle to Lower Pennsylvanian age, red to pink colored, well-sorted conglomerate, greywacke, sandstone, and shale.
Needham M&R Station		
Roxbury Conglomerate	0.4	Proterozoic to early Paleozoic age conglomerate, sandstone, siltstone, argillite, and metaphyre.
Wellesley M&R Station		
Roxburry Conglomerate	0.5	See description above.
Mystic M&R Station		
Cambridge Argillite	0.7	Proterozoic to early Paleozoic age gray argillite to minor quartzite with some sandstone and conglomerate.

TABLE L-2 (cont'd)

Bedrock Geology of the Aboveground Facilities for the AIM Project

Facility/Geologic Unit	Area Affected During Construction (acres)	Description
New M&R Stations		
Oakland Heights M&R Station		
Tatnic Hill Formation	2.4	See description above.
Assonet M&R Station		
Granite of Fall River pluton	1.5	See description above.
West Roxbury M&R Station		
Dedham Granite	1.0	Proterozoic age, light grayish-pink to greenish-gray, equigranular to slightly porphyritic, variably altered granite with secondary diorite and quartz monzonite.
Existing M&R Station Removal		
Greenville M&R Station		
Tatnic Hill Formation	0.3	See description above.

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APPENDIX M

PRELIMINARY CONCEPTUAL MITIGATION PLAN

ALGONQUIN INCREMENTAL MARKET PROJECT

Preliminary Conceptual Mitigation Plan

Revised June 2014

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS

AIM	Algonquin Incremental Market
Algonquin	Algonquin Gas Transmission, LLC
BMPs	best management practices
CFR	Code of Federal Regulations
CTDEEP	Connecticut Department of Energy & Environmental Protection
E&SCP	Erosion and Sediment Control Plan
FERC	Federal Energy Regulatory Commission
FERC Procedures	FERC's Wetland and Waterbody Construction and Mitigation Procedures
HDD	horizontal directional drill
hp	horsepower
MLV	mainline valve
MP	milepost
M&R	metering and regulating
NGA	Natural Gas Act
NYSDEC	New York State Department of Environmental Conservation
OHWM	ordinary high water mark
PAR	Permanent Access Road
PEM	palustrine emergent
PFO	palustrine forested
Plan	Conceptual Mitigation Plan
Project	AIM Project
PSS	palustrine scrub-shrub
ROW	right-of-way
TAR	temporary access road
U.S.	United States
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey

1.0 INTRODUCTION

This Conceptual Mitigation Plan ("Plan") describes the methods that will be implemented during construction of the Algonquin Gas Transmission, LLC ("Algonquin") Incremental Market Project ("AIM Project" or "Project") to minimize, avoid, and mitigate for temporary and permanent impacts to wetlands and waterbodies. This Plan also includes a brief description of the Project and a listing of wetland and waterbody temporary and permanent impacts. The AIM Project location is depicted on Figure 1.1-1 in Resource Report 1.

2.0 PROJECT DESCRIPTION

Algonquin, an indirect, wholly-owned subsidiary of Spectra Energy Partners, LP, is seeking authorization from the Federal Energy Regulatory Commission ("FERC" or "Commission") pursuant to Section 7(c) of the Natural Gas Act[1] ("NGA") to construct, install, own, operate, and maintain the AIM Project which will involve expansion of its existing pipeline system located in New York, Connecticut, Rhode Island and Massachusetts. Algonquin is also seeking authorization pursuant to Section 7(b) of the NGA[2] to abandon certain segments of existing mainline pipeline as a related component of the AIM Project. The AIM Project will create 342,000 dekatherms per day of firm transportation capacity to deliver natural gas to the Northeast markets to meet immediate and future supply and load growth requirements of the Project Shippers as defined in Section 1.2 of Resource Report 1. Specifically, the Project will create additional pipeline capacity from the Ramapo, New York receipt point on the Algonquin system to various Algonquin city gate delivery points in Connecticut, Rhode Island, and Massachusetts. The target in-service date for the AIM Project is November 1, 2016.

The AIM Project includes the construction of approximately 37.6 miles of take-up and relay, loop and lateral pipeline facilities, modifications to six existing compressor stations resulting in the addition of 81,620 horsepower ("hp") of compression, modifications to 24 existing metering and regulating ("M&R") stations, the construction of three new M&R stations and the removal of one existing M&R station. These proposed Project facilities are located in New York, Connecticut, Rhode Island and Massachusetts. Refer to Figure 1.1-1 in Resource Report 1 for a Project overview map that shows the location of all proposed facilities and their association with Algonquin's existing pipeline facilities. A complete discussion of the proposed Project facilities follows.

Proposed Pipeline Facilities

The proposed AIM Project includes approximately 37.6 miles of pipeline composed of the following facilities:

- Construction of approximately 20.1 miles of mainline pipeline, comprised of the following:
    - Haverstraw to Stony Point Take-up & Relay - Take-up and relay 3.3 miles of 26-inch diameter pipeline with 42-inch diameter pipeline in Rockland County, New York upstream of Algonquin's existing Stony Point Compressor Station;
    - Stony Point to Yorktown Take-up & Relay - Take-up and relay 9.4 miles of 26-inch diameter pipeline with 42-inch diameter pipeline and the installation of an approximately 2.9-mile section of new pipeline ROW that includes a 0.7-mile horizontal directional drill ("HDD") crossing of the Hudson River. This 12.3-mile segment is located in Rockland County, New York and Westchester County, New York downstream of Algonquin's existing Stony Point Compressor Station; and
    - Southeast to MLV 19 Take-up & Relay - Take-up and relay 4.5 miles of 26-inch diameter mainline pipeline with 42-inch diameter pipeline (including a new 0.7-mile long, 42-inch diameter HDD pipeline crossing of Interstate 84 and the Still River) located in Putnam County, New York and Fairfield County, Connecticut downstream of and between Algonquin's existing Southeast Compressor Station and mainline valve ("MLV") 19;

[1] 15 U.S.C. §§ 717f(b) and 717f(c) (2006).

[2] 15 U.S.C. § 717P(b) (2006).

- Line-36A Loop Extension - Installation of 2.0 miles of 36-inch diameter pipeline loop extension in Middlesex County, Connecticut and Hartford County, Connecticut downstream of Algonquin's existing Cromwell Compressor Station;

- E-1 System Lateral Take-up & Relay - Take-up and relay 9.1 miles of 6-inch diameter pipeline with 16-inch diameter pipeline on Algonquin's existing E-1 System in New London County, Connecticut;

- E-1 System Lateral Loop - Installation of 1.3 miles of 12-inch diameter pipeline loop on Algonquin's existing E-1 System in New London County, Connecticut;

- West Roxbury Lateral - Installation of 4.2 miles of new 16-inch diameter pipeline and 0.9 miles of new 24-inch diameter pipeline off of Algonquin's existing I-4 System in Norfolk and Suffolk Counties, Massachusetts.

Modifications to Existing Algonquin Compressor Stations

Algonquin will modify six existing Algonquin compressor stations to add an additional 81,620 hp to its pipeline system as part of the AIM Project. This increase in horsepower will be achieved with the installation of six new compressor units. The proposed compressor modifications include the following:

Stony Point Compressor Station - Rockland County, New York
- Install two (2) Solar Mars 100 (15,900 hp each) natural gas-fired compressor units;
- Restage one (1) existing compressor driven by a Solar Taurus 60 natural gas-fired turbine;
- Install gas cooling for the new units; and
- Station piping modifications.

Southeast Compressor Station - Putnam County, New York
- Install one (1) Solar Taurus 70 (10,320 hp) natural gas-fired turbine compressor unit;
- Restage one (1) existing compressor driven by a Solar Taurus 70 natural gas-fired turbine;
- Replace the compressor body driven by an existing Solar Mars 90 natural gas fired turbine;
- Install gas cooling for the new unit; and
- Station piping modifications.

Oxford Compressor Station – New Haven County, Connecticut
- Restage one (1) existing compressor driven by a Solar Taurus 60 natural gas-fired turbine;

Cromwell Compressor Station - Middlesex County, Connecticut
- Install one (1) Solar Mars 100 (15,900 hp) natural gas-fired turbine compressor unit;
- Install gas cooling for the new unit and two (2) existing turbine compressor units; and
- Station piping modifications.

Chaplin Compressor Station - Windham County, Connecticut
- Install one (1) Solar Taurus 60 (7,700 hp) natural gas-fired turbine compressor unit;
- Restage two (2) existing compressors driven by Solar Taurus 60 natural gas-fired turbines;
- Install gas cooling for the new unit and two (2) existing turbine compressor units; and
- Station piping modifications.

Burrillville Compressor Station - Providence County, Rhode Island
- Install one (1) Solar Mars 100 (15,900 hp) natural gas-fired turbine compressor unit;
- Restage two (2) existing compressors driven by Solar Taurus 60 natural gas-fired turbines;

- Install gas cooling for the new unit; and
- Station piping modifications.

Modifications to Existing Algonquin M&R Stations

The AIM Project will include modifications to 24 existing Algonquin M&R stations in New York, Connecticut and Massachusetts, to accept the new gas flows associated with the AIM Project. Three M&R stations are located in New York, 13 are located in Connecticut and eight are located in Massachusetts. The types of modifications will include the replacement of existing heaters and metering facilities, piping modifications, and facility uprates. In addition, one existing M&R station (Greenville) will be removed in Connecticut.

Modifications at 21 of these existing stations are minor in nature and will take place within the existing fenced facilities. Three of the remaining M&R stations will require complete reconstruction and one will be decommissioned and removed (Greenville M&R). The stations requiring reconstruction are all in Connecticut and include the Willimantic M&R Station, Guilford M&R Station and Glastonbury M&R Station. The Glastonbury and Guilford M&R stations will be rebuilt within the same station footprint while the Willimantic M&R Station will be rebuilt on a new parcel of land being acquired by Algonquin adjacent to the existing station property. The M&R station locations are shown on the United States Geological Survey ("USGS") quadrangle excerpts and aerial photo based site plans provided in Appendix 1A of Resource Report 1.

Construction of New Algonquin M&R Stations

Algonquin will construct three new M&R stations: two are located in Bristol and Suffolk counties in Massachusetts and one is located in New London County, Connecticut.

- Construct one (1) new M&R station in Connecticut:
  - Oakland Heights M&R Station – construct a new M&R station, including regulation, in the City of Norwich, New London County.

- Construct two (2) new M&R stations in Massachusetts:
  - Assonet M&R Station – construct a new M&R station, including regulation, in the Town of Freetown, Bristol County; and
    West Roxbury M&R Station – construct a new M&R station, including regulation, in the City of Boston, Suffolk County.

3.0 WETLANDS

Wetlands are defined by the U.S. Army Corps of Engineers ("USACE") as areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, including swamps, marshes, bogs, and bottomlands. Algonquin delineated wetland boundaries using the methodology described in the USACE's Wetlands Delineation Manual (Environmental Laboratory, 1987) and Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2). The 1987 Manual and more recent supplements identify three environmental factors to consider when making wetland determinations: indicators of hydrophytic vegetation, hydric soil, and wetland hydrology.

3.1 Wetlands Crossed by the Project

Field surveys were conducted within a 300-foot wide study area across the Project area to identify and map wetlands, except for the West Roxbury Lateral where the study corridor was variable due to the developed nature of that route. Based on this survey, a total of 163 wetland crossings were identified in the AIM Project construction workspace; 77 in New York and 86 in Connecticut. The AIM Project facilities proposed in Rhode Island and Massachusetts will not cross any wetlands. The complete listing of wetland crossings, including crossing length and total impact to each wetland, is provided in Table 2D-1 located in Appendix 2D, Resource Report 2.

3.1.1 Pipeline Facilities

New York

The AIM Project facilities in New York will have a total of 77 wetland crossings. These wetlands are primarily characterized as PEM wetlands that are dominated by *Phragmites australis* in the right-of-way ("ROW") and as palustrine forested ("PFO") wetlands off the maintained ROW. Wetlands along the Haverstraw to Stony Point Take-up and Relay segment were located in areas of topographic relief given that this survey area is extremely hilly. Sloping stream drainages were often associated with bordering wetlands. A particularly large wetland system in the Town of Haverstraw is associated with tributaries to Minisceongo Creek. Wetlands within the maintained pipeline ROW along the Stony Point to Yorktown Take-up & Relay segment are also dominated by *Phragmites australis* while the off-ROW sections are primarily wooded. A large wetland system is encountered in the drainage area of Dickey Brook and its tributaries in the Town of Cortlandt. Within the Blue Mountain Reservation, there are also several large wetland systems crossed by the pipeline.

New York State has mapped wetland areas that are regulated under its Freshwater Wetlands Act. There are five New York State Department of Environmental Conservation ("NYSDEC") mapped wetlands that are crossed or are in close proximity to the pipeline ROW along the Stony Point to Yorktown Take-up & Relay pipeline. Algonquin has discussed and confirmed these crossings in a meeting with NYSDEC on December 5, 2013. These areas include the following:

- Town of Cortlandt
  - NYSDEC Wetland P-3 – This is a Class 1 wetland that is crossed by the Stony Point to Yorktown Take-up & Relay pipeline between milepost ("MP") 7.70 and MP 7.85. This NYSDEC mapped wetland has been field delineated as B13-SPLR-W13 for the AIM Project.

  - NYSDEC Wetland P-1 – This is a Class 2 wetland that is crossed between MP 8.50 and MP 8.75. This NYSDEC mapped wetland has been field delineated as A13-SPLR-W2 for the AIM Project.
  - NYSDEC Wetland A-35 – This is a Class 2 wetland that is crossed in two areas north of Crompond Road. The first wetland crossing occurs between MP 10.63 and MP 10.68 and the second is crossed between MP 10.79 and MP 10.81. These wetlands have been assigned the following identification numbers for the AIM Project: B13-SPLR-W23 and B13-SPLR-W25.
- Town of Yorktown
  - NYSDEC Wetland A-10 – This is a Class 2 wetland that is crossed between MP 11.04 and MP 11.12 on the east side of Lexington Avenue. This wetland has been field delineated as B13-SPLR-W26 for the AIM Project.
- Town of Southeast
  - NYSDEC Wetland BR-36 – This is a Class 2 wetland that is located along the western edge of the existing Southeast Compressor Station in Putnam County. The proposed work at the compressor station will not impact this wetland but construction workspace is located within the 100-foot Adjacent Area. This wetland has been field delineated as A13-SECS-W1 for the AIM Project.

Wetlands are also regulated by the municipalities along the AIM Project route in New York State and generally include wetlands smaller than wetlands regulated by NYSDEC under New York State law. Accordingly, the delineations provided above include all wetland areas, not just those sized 12.4 acres pursuant to NYSDEC regulations.

Connecticut

The AIM Project facilities in Connecticut will have a total of 86 wetland crossings. These wetlands vary greatly between segments but for the most part consist of PEM wetlands within the existing ROW and PFO wetlands outside the existing ROW.

The Southeast to MLV 19 Take-up & Relay pipeline segment crosses 23 wetland areas. Notable are three large wetland systems, one associated with the Sawmill River, one located at MP 0.17 in Danbury, and a third associated with the Still River at MP 1.74. The wetland system associated with the Still River will be crossed by utilizing the HDD method. The majority of the remaining small wetlands were located within heavy residential areas, most often in the ROW as PEM wetlands dominated by *Phragmites australis*.

The Line-36A Loop Extension pipeline segment crosses 11 wetland areas, all associated with streams. This segment of the pipeline is located in an area of relatively flat topography. There is a PEM/PFO wetland system associated with Coles Brook between MP 0.03 and MP 0.14. A tributary to Dividend Brook is associated with a large wetland system dominated by *Phragmites australis* that contains several small intermittent streams and an open water area. The remaining wetlands are dominated by *Phragmites australis* in the ROW and are associated with Dividend Brook.

The E-1 System Lateral Take-up & Relay pipeline segment runs northwest to southeast in a generally parallel orientation with Susquetonscut Brook from MP 0.0 to MP 6.0. As a result of this alignment, there are numerous wetland crossings along this stretch that are associated with minor tributaries of Susquetonscut Brook. Most of these are PEM wetlands located within the existing pipeline ROW. Outside the maintained ROW, the wetland cover type is primarily PFO. South of MP 6.0, the wetlands crossed by the pipeline are associated with small intermittent and ephemeral streams and drainages, the largest wetlands being located at MP 7.3 and between MP 8.7 and 8.9. These wetlands were classified as PEM wetlands within the ROW and most often classified as PFO wetlands outside the ROW.

The E-1 System Lateral Loop pipeline segment crosses six wetland areas consisting of one large wetland system and three smaller wetland systems along the maintained pipeline ROW. The largest wetland system is crossed between MP 0.31 and MP 0.49 and is predominantly a PFO wetland with a minor stream.

Rhode Island

There are no wetland impacts in Rhode Island.

Massachusetts

There are no wetland impacts in Massachusetts.

3.1.2 Aboveground Facilities

As proposed, the aboveground facilities will not have an impact on wetlands.

3.1.3 Access Roads

Algonquin is proposing to use existing roads along the AIM Project area as temporary access roads ("TARs") and permanent access roads ("PARs"). Algonquin does not anticipate impacts to any wetlands as a result of the use of these access roads. In areas where wetlands are adjacent to the access road, construction crews will avoid the wetland so that no impact will occur.

3.2 Wetland Impacts and Mitigation

Construction of the AIM Project pipeline segments will result in temporary impacts to 52.3 acres of wetlands. Of this amount, 24.0 acres will be impacted by the New York pipeline facilities and 28.3 acres will be impacted by the Connecticut pipeline facilities. Impacts to wetlands associated with the Hudson River in New York and the Still River in Connecticut will be avoided as Algonquin intends to cross these areas utilizing the HDD method. No wetlands will be affected in Rhode Island or Massachusetts and no wetlands will be affected during construction at existing and proposed aboveground facilities.

Construction of the proposed pipeline segments will result in temporary impacts to 35.2 acres of emergent and scrub-shrub wetlands and 17.1 acres of forested wetlands. Approximately 2.3 acres of previously forested wetland will be permanently converted to non-forested cover types and maintained by means of mechanical cutting and mowing as part of pipeline operation. The remaining 14.8 acres of forested wetland will be allowed to revert to a forested state following construction and restoration of the ROW. Table 2D-1 located in Appendix 2D of Resource Report 2 summarizes wetland impacts for the AIM Project facilities.

3.2.1 Mitigation and Restoration Measures

Construction and mitigation activities in wetlands will be conducted in accordance with the procedures and best management practices ("BMPs") in the AIM Project Erosion and Sediment Control Plan ("E&SCP") and the conditions of related permits. The E&SCP can be found in Appendix 1B of Resource Report 1.

Algonquin has begun initial discussions with the USACE New England and New York Districts as well as NYSDEC and Connecticut Department of Energy and Environmental Protection ("CTDEEP") to discuss wetland impacts and mitigation.

The AIM Project E&SCP was developed using the FERC's Upland Erosion Control, Revegetation, and Maintenance Plan and Wetland and Waterbody Construction and Mitigation Procedures ("FERC Procedures"). Also reflected in the AIM Project E&SCP is Algonquin's significant experience and practical knowledge of pipeline construction and effective environmental protection measures. Lessons and insights gained from past construction projects have been incorporated into the AIM Project E&SCP. Recommended practices include, wherever practical:

- A reduction of construction corridor widths where possible;
- A 50-foot setback for ATWS for wetlands;
- Minimization of riparian clearing to the extent practicable while ensuring safe construction conditions;
- Expedited construction in and around wetlands;
- Confinement of stump removal to the trench-line to minimize soil disturbance (unless safety or access considerations require stump removal elsewhere);
- Return of wetland bottoms and drainage patterns to their original configurations and contours to the extent practicable;
- Permanent stabilization of upland areas near wetlands as soon as practicable after trench backfilling to reduce sediment run-off;
- Segregation of topsoil in unsaturated wetlands to preserve the native seed source (which will facilitate re-growth of herbaceous vegetation once pipeline installation is complete);
- Utilization of recommended seed mixes as specified by relevant land management agencies;
- Periodic inspection of the construction corridor during and after construction;
- Post-construction wetland monitoring to evaluate the progress of wetland revegetation; and
- Documentation of invasive species prior to construction and post-construction monitoring to compare pre- and post-construction occurrences.

In accordance with the AIM Project E&SCP, Algonquin will conduct post-construction maintenance and monitoring of the ROW in affected wetlands to assess the success of restoration and revegetation. Monitoring efforts will include documenting occurrences of exotic invasive species to compare to pre-construction conditions.

To assist with these periodic monitoring and surveillance efforts, and to comply with the U.S. Department of Transportation Safety Standards (49 CFR Part 192), a 30-foot corridor centered on the pipeline will routinely be cleared of woody growth greater than 15 feet in height, with a 10-foot strip centered over the pipeline being maintained in an herbaceous state. Because of this vegetation maintenance restriction within wetland areas, 20 feet of Algonquin's 50-foot wide permanent ROW easement within wetlands will be allowed to revert to scrub-shrub and forested cover types.

3.2.2 Compensatory Mitigation

Federal

The USACE will usually require compensatory mitigation (e.g., purchase of mitigation credits, payment of in-lieu fee, development of a site-specific mitigation plan) for loss of "waters of the U.S." greater than 0.10 acre.

No permanent loss of "waters of the U.S." will occur as a result of the Project. During pipeline trenching operations, fill placement (side-cast material) will be placed back in the pipeline trench. The USACE considers this permanent fill placement even though wetland side-cast material is being replaced in the same trench where it was excavated. The wetland impacts resulting from the fill placement are temporary since the wetland will continue to function as a wetland.

PEM wetlands impacted during construction will be restored in accordance with the FERC Procedures. These areas should quickly recover following construction. Compensatory mitigation for temporary effects to PEM wetlands is not proposed.

Palustrine scrub-shrub ("PSS") wetlands impacted during construction will be restored in accordance with the FERC Procedures. Although the herbaceous understory within these areas should quickly recover following construction, there may be a temporal lag before the sub-canopy reaches maturity. Compensatory mitigation for temporary effects to PSS wetlands is not proposed.

PFO wetland areas not within the maintained permanent ROW impacted during construction will also be restored in accordance with the FERC Procedures. Although these areas will remain in a wetland state, there is a temporal time lag associated with these areas regaining their wetland canopy function. Similarly, forested wetland areas that are located within the new proposed permanent ROW areas will remain in a wetland state but will permanently lose their wetland canopy function.

Algonquin proposes to provide compensatory mitigation for the PFO wetland areas that will be temporarily and permanently affected (through conversion to PEM) as a result of the Project. The USACE New England District will accept payment to an in-lieu fee program[3] for PFO wetland impacts in Connecticut. A permit applicant may make a payment to an in-lieu fee program that will conduct wetland, stream or other aquatic resource restoration, creation, enhancement, or preservation activities. In-lieu fee programs are generally administered by government agencies or non-profit organizations that have established an agreement with the regulatory agencies to use in-lieu fee payments collected from permit applicants.

The USACE New York District will require on-site restoration for temporary PFO wetland impacts (e.g. replant workspace, control invasive species, monitoring). However, the USACE New York District will require off-site mitigation for permanent impacts to forested wetlands from new maintained ROW. Off-site mitigation must be "in-kind", in the same watershed as the impact, and at a 2:1 ratio.

Algonquin proposes to contribute to an approved in-lieu-fee program where acceptable by federal and state agencies, and to conduct on-site or off-site in-kind mitigation where it is not. On-site restoration at agency designated ratios will be the preferred method of mitigation.

New York[4]

At this time Algonquin has not confirmed state compensatory mitigation requirements for both temporary and permanent PFO wetland impacts in New York. As previously stated temporary impacts to PEM and PSS wetlands will be through restoration of these areas. Temporary disturbances, where pre-construction conditions are essentially restored, for example when laying a pipeline, do not require compensatory

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[3] Details on the use of the in-lieu fee program are available at http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/final_mitig_rule.pdf.

[4] Further details on NYSDEC's guidelines on compensatory mitigation are available online at http://www.dec.ny.gov/docs/wildlife_pdf/wetlmit.pdf.

mitigation since there is no permanent loss. Compensatory mitigation is only used when it can offset project impacts that cannot be avoided entirely or reduced any further. Compensatory mitigation should preferably be "in-kind" and "on-site". In-kind mitigation means replacing a wetland that is being altered with a wetland of the same type, for example replacing emergent marsh with emergent marsh. Functions and benefits of the replacement wetland are assumed to be generally the same as those of the wetland being replaced. On-site mitigation is mitigation undertaken within or contiguous to the wetland impacted by a project. It does not necessarily have to be within the same site boundaries as the project, but it must involve the same wetland. The preferred order of compensatory mitigation is wetland restoration, then creation, and finally enhancement.

The NYSDEC regulates impacts to "mapped wetlands" larger than 12.4 acres in size under the Freshwater Wetlands Act (Environmental Conservation Law Article 24). Impacts to wetlands not mapped will be subject to the mitigation requirements of the USACE New York District described above. At this time it is assumed that the compensatory mitigation proposal submitted to the USACE New York District for PFO impacts will be deemed acceptable to NYSDEC.

Connecticut

At this time Algonquin has not confirmed state compensatory mitigation requirements for both temporary and permanent PFO wetland impacts in Connecticut. As previously stated temporary impacts to PEM and PSS wetlands will be through restoration of these areas. Initial discussions with the CTDEEP has indicated that they will not accept payment to an in-lieu fee program as required by the USACE. Additional discussions with CTDEEP will have to take place to coordinate an appropriate level of mitigation. Algonquin is concerned that two totally distinct compensatory mitigation approaches in Connecticut will be required for the same impacts.

Massachusetts

There are no wetland impacts associated with proposed Massachusetts Project facilities and, therefore, no compensatory mitigation is proposed in Massachusetts.

Rhode Island

There are no wetland impacts associated with proposed Rhode Island Project facilities and, therefore, no compensatory mitigation is proposed in Rhode Island.

4.0 WATERBODIES

A total of 108 surface waterbodies will be affected by construction of AIM Project pipeline facilities. These included 42 perennial streams, 62 intermittent streams, 3 ephemeral streams and 1 pond (see Table 2C-1 in Appendix 2C, Resource Report 2). Of these 108 waterbodies, 90 are minor crossings (less than 10 feet wide), 17 are intermediate crossings (10 to 100 feet wide), and one is a major crossing, the Hudson River (greater than 100 feet wide). Two of the 108 waterbodies are classified as estuarine waterbodies while the remaining 106 are freshwater waterbodies.

No waterbodies will be impacted by the work at the existing and proposed aboveground facilities. However, a few aboveground facility sites are located in relatively close proximity to mapped waterbodies. Algonquin will use existing roads in the AIM Project area as TARs and PARs. Algonquin does not anticipate impacts to any waterbodies as a result of the use of these existing access roads.

In accordance with the FERC Procedures, all waterbody crossings will be completed within 24 to 48 hours. Stream bed and bank contours will be restored in accordance with the FERC Procedures and waterbody banks will be stabilized as soon as possible after construction activities have been completed to prevent sloughing. Stream functions should be quickly restored following restoration activities.

The USACE will usually require compensatory mitigation (e.g., purchase of mitigation credits, development of a site-specific mitigation plan) for loss of “waters of the U.S.” greater than 0.10 acre. The proposed waterbody crossings do not represent a loss of “waters of the U.S.” and therefore, Algonquin does not propose to provide any compensatory mitigation.

5.0 REFERENCES

Environmental Laboratory. (1987). "Corps of Engineers wetlands delineation manual," Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS., NTIS No. AD A176 912.

APPENDIX N

COMMON WILDLIFE SPECIES OFTEN ASSOCIATED WITH THE VEGETATIVE COVER TYPES FOUND WITHIN THE PROJECT AREA

TABLE N-1

Common Wildlife Species Often Associated with the Vegetative Cover Types Found Within the AIM Project Area

Species	Upland Forest	Open Uplands	Forested Wetland	Open Wetlands	Urban	Estuary
Amphibians						
Spotted salamander (*Ambystoma maculatum*)	X	X	X	X		
Red-spotted newt (*Notophtalmus v. viridescens*)	X	X	X	X		
Northern-dusky salamander (*Desmognathus f. fuscus*)	X		X			
Redback salamander (*Plethodon cinereus*)	X		X			
Four-toed salamander (*Hemidactylium scutatum*)			X			
Northern two-lined salamander (*Eurycea b. blislineata*)	X		X			
Eastern American toad (*Bufo a. americanus*)	X	X	X	X		
Fowler's toad (B*ufo woodhousii fowleri*)	X	X	X	X		
Gray treefrog (*Hyla versicolor*)	X		X	X		
Northern spring peeper (*Pseudacris c. crucifer*)	X		X	X		
Bullfrog (*Rana catesbeiana*)	X		X	X	X	
Green frog (*Rana clamitans*)			X	X	X	
Pickerel frog (*Rana palustris*)				X		
Wood frog (*Rana sylvatica*)	X	X	X	X		
Reptiles						
Common snapping turtle (*Chelydra s. serpentine*)				X		X
Common musk turtle (*Sternotherus odoratus*)				X		
Red eared slider (*Trachemys s. elegans*)				X		
Eastern painted turtle (*Chrysemys p. picta*)				X	X	X
Northern water snake (*Nerodia s. sipedon*)			X	X		
Northern b)rown snake (*Storeria d. dekayi*)	X	X	X	X		
Northern redbelly snake (*Storeria o. occipitomaculata*)	X		X	X		
Eastern garter snake (*Thamnophis s. sirtalis*)	X	X	X	X	X	
Northern ringneck snake (*Diadophis punctatus edwardsi*)	X		X			
Northern black racer (*Coluber c. constrictor*)	X	X				
Eastern milk snake (*Lampropeltis t. triangulum*)	X	X	X			
Birds						
Green heron (*Butorides striatus*)			X	X		X
Black-crowned night-heron (*Nycticorax nycticorax*)				X		X
Yellow-crowned night-heron (*Nycticorax violaceus*)				X		X
Double-crested cormorant (*Phalacrocorax auritus*)						X
Mute swan (*Cygnus olor*)				X		X
Canada goose (*Branta canadensis*)				X	X	X
Brant (*Branta bernicula*)				X	X	X
Wood duck (*Aix sponsa*)			X	X		
American black duck (*Anas rubripes*)			X	X	X	X
Mallard (*Anas playtrhynchos*)				X	X	X
Greater scaup (*Aythya marila*)						X
Lesser scaup (*Aythya affinis*)						X

TABLE N-1 (cont'd)

Common Wildlife Species Often Associated with the Vegetative Cover Types Found Within the AIM Project Area

Species	Upland Forest	Open Uplands	Forested Wetland	Open Wetlands	Urban	Estuary
Bufflehead (*Bucephala albeola*)						X
Common goldeneye (*Bucephala clangula*)						X
Gadwall (*Anas strepera*)						X
Black vulture (*Coragyps atratus*)	X	X	X	X		
Turkey vulture (*Cathartes aura*)	X	X	X	X		
Broad-winged hawk (*Buteo platypterus*)	X		X			
Red-tailed hawk (*Buteo jamaicensis*)	X	X	X			
Ruffed grouse (*Bonasa umbellus*)	X	X	X			
Wild turkey (*Meleagris gallopavo*)	X	X	X			
Clapper rail (*Rallus longirostris*)				X		X
Virginia rail (*Rallus limicola*)				X		X
Common moorhen (*Gallinula chloropus*)				X		X
Willet (*Tringa semipalmata*)				X		X
Greater yellowlegs (*Tringa melanoleuca*)				X		X
Lesser yellowlegs (*Tringa flavipes*)				X		X
Semipalmated sandpiper (*Calidris pusilla*)				X		X
Least sandpiper (*Calidris minutilla*)				X		X
Dunlin (*Calidris alpine*)				X		X
Short-billed dowitcher (*Limnodromus griseus*)				X		X
Black-bellied plover (*Pluvialis squatarola*)				X		X
Semipalmated plover (*Charadrius semipalmatus*)				x		x
Killdeer (*Charadrius vociferus*)		X			X	X
Spotted sandpiper (*Actitis macularia*)			X	X		
Wilson's snipe (*Gallinago delicate*)		X		X		
American woodcock (*Scolopax minor*)	X	X	X	X		
Ring-billed gull (*Larus delawarensis*)					X	X
Herring gull (*Larus argentatus*)					X	X
Great black-backed gull (*Larus marinus*)					X	X
Rock pigeon (*Columba livia*)					X	
Mourning dove (*Zenaida macroura*)	X	X	X		X	
Black-billed cuckoo (*Coccyzus erythropthalmus*)	X	X		X		
Yellow-billed cuckoo (*Coccyzus americanus*)	X	X	X			
Eastern screech-owl (*Otus asio*)	X		X			
Great horned owl (*Bubo virginianus*)	X	X	X	X		
Chimney swift (*Chaetura pelagica*)		X			X	
Ruby-throated hummingbird (*Archilochus colubris*)	X	X	X			
Belted kingfisher (*Ceryle alcyon*)				X		X
Red-bellied woodpecker (*Melanerpes carolinus*)	X		X			
Downy woodpecker (*Picoides pubescens*)	X	X	X			
Hairy woodpecker (*Picoides villosus*)	X		X			
Northern flicker (*Colaptes auratus*)	X	X	X			

TABLE N-1 (cont'd)

Common Wildlife Species Often Associated with the Vegetative Cover Types Found Within the AIM Project Area

Species	Upland Forest	Open Uplands	Forested Wetland	Open Wetlands	Urban	Estuary
Pileated woodpecker (*Dryocopus pileatus*)	X		X			
Eastern wood-pewee (*Contopus virens*)	X		X			
Acadian flycatcher (*Empidonax virescens*)	X			X		
Willow flycatcher (*Empidonax trailii*)	X	X		X		
Least flycatcher (*Empidonax minimus*)	X		X			
Eastern phoebe (*Sayornis phoebe*)	X		X			
Great crested flycatcher (*Myiarchus crinitus*)	X		X			
Eastern kingbird (*Tyrannus tyrannus*)	X	X	X			
Tree swallow (*Tachycineta bicolor*)		X	X	X		X
Northern rough-winged swallow (*Stelgidopteryx serripennis*)		X	X	X		X
Barn swallow (*Hirundo rustica*)		X	X	X	X	X
Blue jay (*Cyanocitta cristata*)	X	X	X			
American crow (*Corvus brachyrhynchos*)	X	X	X	X	X	
Fish crow (*Corvus ossifragus*)	X	X	X	X	X	
Common raven (*Corvus corax*)	X		X			
Black-capped chickadee (*Parus atricapillus*)	X	X	X			
Tufted titmouse (*Parus bicolor*)	X		X			
White-breasted nuthatch (*Sitta carolinensis*)	X		X			
House wren (*Troglodytes aedon*)	X	X	X			
Marsh wren (*Cistothorus palustris*)				X		
Carolina wren (*Thryothorus ludovicianus*)	X	X	X			
Gold-crowned kinglet (*Regulus satrapa*)	X		X			
Blue-gray gnatcatcher (*Polioptila caerulea*)	X	X	X	X		
Eastern bluebird (*Sialia sialis*)	X	X	X			
Veery (*Catharus fuscescens*)	X	X	X			
Wood thrush (*Hylocichla mustelina*)	X		X			
American robin (*Turdus migratorius*)	X	X	X	X		
Gray catbird (*Dumetella carolinensis*)	X	X	X	X		
Northern mockingbird (*Mimus polyglottos*)		X			X	
Brown thrasher (*Toxostoma rufum*	X	X	X			
Cedar waxwing (*Bombycilla cedrorum*)	X	X	X	X		
European starling (*Sturnus vulgaris*)	X	X			X	
Yellow-throated vireo (*Vireo flavifrons*)	X		X			
White-eyed vireo (*Vireo griseus*)	X	X	X	X		
Warbling vireo (*Vireo gilvus*)	X		X			
Red-eyed vireo (*Vireo olivaceus*)	X		X			
Blue-winged warbler (*Vermivora pinus*)	X	X	X	X		
Yellow warbler (*Dendroica petechial*)	X	X	X	X		
Chestnut-sided warbler (*Dendroica pensylvanica*)		X	X	X		
Magnolia warbler (*Dendroica magnolia*)	X		X			

TABLE N-1 (cont'd)

Common Wildlife Species Often Associated with the Vegetative Cover Types Found Within the AIM Project Area

Species	Upland Forest	Open Uplands	Forested Wetland	Open Wetlands	Urban	Estuary
Yellow-rumped warbler (*Dendroica coronate*)	X	X	X	X		
Black-throated Green warbler (*Dendroica virens*)	X		X			
Pine warbler (*Dendroica pinus*)	X					
Prairie warbler (*Dendroica discolor*)	X	X				
Black-and-white warbler (*Mniotilta varia*)	X		X			
American redstart (*Setophaga ruticilla*)	X		X			
Ovenbird (*Seiurus aurocapillus*)	X		X			
Common yellowthroat (Geothlypis trichas)	X	X	X	X		
Scarlet tanager (*Piranga olivacea*)	X					
Northern cardinal (*Cardinalis cardinalis*)	X	X	X	X		
Rose-breasted grosbeak (*Pheucticus ludovicianus*)	X		X			
Indigo bunting (*Passerina cyanea*)	X	X				
Eastern towhee (*Pipilo erythrophthalmus*)	X	X	X	X		
Chipping sparrow (*Spizella passerine*)	X	X	X			
Field sparrow (*Spizella pusilla*)		X				
Song sparrow (*Melospiza melodia*)	X	X	X	X		
Swamp sparrow (*Melospiza georgiana*)			X	X		
Red-winged blackbird (*Agelaius phoeniceus*)		X	X	X		
Boat-tailed grackle (*Quiscalus major*)			X	X		
Common grackle (*Quiscalus quiscula*)	X	X	X	X	X	
Brown-headed cowbird (*Molothrus ater*)	X	X	X	X		
Orchard oriole (*Icterus spurius*)	X		X			
Baltimore oriole (*Icterus galbula*)	X		X			
House finch (*Carpodacus mexicanus*)	X	X			X	
American goldfinch (*Cardeulis tristis*)	X	X	X	X		
House sparrow (*Passer domesticus*)		X			X	
Mammals						
Virginia opossum (*Didelphis virginiana*)	X	X	X	X		
Masked shrew (*Sorex cinereus*)	X	X	X	X		
Northern short-tailed shrew (*Blarina brevicuada*)	X	X	X	X		
Eastern cottontail (*Sylvilagus floridanus*)	X	X	X	X	X	
Eastern chipmunk (*Tamias striatus*)	X	X	X		X	
Woodchuck (*Marmota monax*)	X	X				
Gray squirrel (*Sciurus carolinensis*)	X		X		X	
Red squirrel (*Tamiasciurus hudsonicus*)	X		X			
House mouse (*Mus musculus*)		X			X	
White-footed Mouse (*Peromyscus leucopus*)	X	X	X	X	X	
Meadow vole (*Microtus pennsylvanicus*)	X	X	X	X		
Woodland vole (*Microtus pinetorum*)	X	X	X			
Norway rat (*Rattus norvegicus*)					X	
Muskrat (*Ondatra zibethicus*)				X	X	

TABLE N-1 (cont'd)

Common Wildlife Species Often Associated with the Vegetative Cover Types Found Within the AIM Project Area

Species	Upland Forest	Open Uplands	Forested Wetland	Open Wetlands	Urban	Estuary
Coyote (*Canis latrans*)	X	X	X	X	X	
Red fox (*Vulpes vulpes*)	X	X	X	X		
Gray fox (*Urocyon cinereoargenteus*)	X	X	X	X		
Raccoon (*Procyon lotor*)	X	X	X	X	X	
Long-tailed weasel (*Mustela frenata*)	X	X	X	X		
Mink (*Mustela vison*)	X		X	X		
Striped skunk (*Mephitis mephitis*)	X	X	X	X		
White-tailed deer (*Odocoileus virginianus*)	X	X	X	X	X	

APPENDIX O

MIGRATORY BIRD PRIORITY SPECIES AND ASSOCIATED HABITATS POTENTIALLY LOCATED WITHIN THE AIM PROJECT AREA

TABLE O-1

Migratory Bird Priority Species and Associated Habitats Potentially Located Within the AIM Project Area

		Land Birds			Shorebirds			Waterbirds			Waterfowl		
Species [a]	Habitat Type [b]	**BCR 14**	**BCR 28**	**BCR 30**	**BCR 14**	**BCR 28**	**BCR 30**	**BCR 14**	**BCR 28**	**BCR 30**	**BCR 14**	**BCR 28**	**BCR 30**
American avocet (M)	Estuarine emergent marsh									x			
American bittern (B)	Palustrine emergent marsh							x	x	x			
American black duck (B,W)	Estuaries and bays/freshwater lakes, rivers, streams/ palustrine emergent marsh/ forested wetland										x		x
American golden plover (M)	Grasslands – agriculture				x		x						
American oystercatcher (B)	Estuarine emergent marsh						x						
American redstart (B)	Deciduous and mixed forests/ mixed forests	x											
American widgeon (W, M)	Freshwater emergent marsh									x			
American woodcock (B)	Shrub-scrub/shrub – early successional/grasslands – agriculture				x	x	x						
Atlantic brant (M)	Estuaries and bays										x		
Bachman's sparrow (B)	Forested upland communities			x									
Bald eagle (B,W)	Freshwater lakes	x	x	x									
Baltimore oriole (B)	Forested upland communities			x									
Bank swallow (B)	Freshwater lakes, rivers, streams	x											
Barn swallow (B)	Palustrine emergent marsh/ grasslands – agriculture/urban – suburban	x											
Barrow's goldeneye (W)	Estuaries and bays/freshwater lakes, rivers, streams										x		
Bay-breasted warbler (B)	Forested upland communities			x									
Bicknell's thrush (B)	Mountaintop forests	x	x	x									
Black rail (B)	Estuarine emergent marsh									x			
Black scoter (W)	Estuaries and bays										x		x
Black skimmer (B)	Estuaries and bays									x			
Black-and-white warbler (B)	Forested upland communities			x									
Black-backed woodpecker (B,W)	Coniferous forests	x											
Black-bellied plover (M)	Grasslands – agriculture				x		x						
Black-billed cuckoo (B)	Deciduous and mixed forests	x	x										
Blackburnian warbler (B)	Coniferous forests/mixed forests	x		x									
Black-crowned night heron (B)	Palustrine emergent marsh/ forested wetland							x		x			
Blackpoll warbler (B)	Coniferous forests/mountaintop forests	x											
Black-throated blue warbler (B)	Deciduous and mixed forests/ mixed forests	x											
Black-throated green warbler	Coniferous forests/mixed forests	x											

TABLE O-1 (cont'd)

Migratory Bird Priority Species and Associated Habitats Potentially Located Within the AIM Project Area

Species [a]	Habitat Type [b]	Land Birds			Shorebirds			Waterbirds			Waterfowl		
		BCR 14	**BCR 28**	**BCR 30**	**BCR 14**	**BCR 28**	**BCR 30**	**BCR 14**	**BCR 28**	**BCR 30**	**BCR 14**	**BCR 28**	**BCR 30**
Blue-winged warbler (B)	Shrub – early successional	x	x	x									
Bobolink (B)	Grasslands – agriculture	x											
Boreal chickadee (B,W)	Coniferous forests	x											
Boreal owl (W)	Coniferous forests/mixed forests	x											
Broad-winged hawk (B)	Forested upland communities			x									
Brown creeper (B,W)	Coniferous forests/ mixed forests	x											
Brown thrasher (B)	Shrub-scrub		x	x									
Brown-headed nuthatch (B, W)	Forested upland communities			x									
Bufflehead (B,W,M)	Estuaries and bays/wooded lakes and ponds									x			
Canada goose-NAP (M)	Estuaries and bays/grasslands – agriculture										x		x
Canada warbler (B)	Shrub-scrub/ deciduous and mixed forests/ coniferous forests/mixed forests	x	x	x									
Canvasback (W, M)	Estuaries and bays/emergent marsh									x			
Cape may warbler (B)	Coniferous forests	x											
Cerulean warbler (B)	Deciduous forests		x	x									
Chestnut-sided warbler (B)	Shrub – early successional	x											
Chimney swift (B)	Deciduous and mixed forests/ urban – suburban	x		x									
Clapper rail (B)	Estuarine emergent wetlands									x			
Coastal plain swamp sparrow (B)	Freshwater emergent wetlands									x			
Common eider (B,W)	Estuaries and bays										x		x
Common goldeneye (B,W)	Estuaries and bays/ freshwater lakes, rivers, streams/ forested wetland										x		x
Common loon (B,W)	Estuaries and bays/ freshwater lakes, rivers, streams							x					
Common nighthawk (B)	Urban – suburban	x											
Common snipe (B,W,M)	Freshwater emergent wetlands									x			
Common tern (B)	Freshwater lakes							x		x			
Dunlin (W, M)	Beach, sand, mud flat							x		x			
Eastern meadowlark (B,W)	Grasslands – agriculture		x										
Eastern wood-pewee (B)	Deciduous and mixed forests	x											
Eastern kingbird (B)	Grassland communities			x									
Eastern towhee (B,W,M)	Shrub-scrub/shrub – early successional			x									
Field sparrow (B, M)	Shrub-scrub/shrub – early successional			x									

TABLE O-1 (cont'd)

Migratory Bird Priority Species and Associated Habitats Potentially Located Within the AIM Project Area

		Land Birds			Shorebirds			Waterbirds			Waterfowl		
Species [a]	Habitat Type [b]	BCR 14	BCR 28	BCR 30	BCR 14	BCR 28	BCR 30	BCR 14	BCR 28	BCR 30	BCR 14	BCR 28	BCR 30
Forster's tern (B, M)	Freshwater emergent wetlands									x			
Gadwall (B, W, M)	Freshwater emergent wetlands/ freshwater lakes, rivers, streams									x			
Glossy ibis (B)	Freshwater emergent wetlands									x			
Golden-winged warbler (B)	Shrub-scrub/shrub – early successional/deciduous and mixed forests		x	x									
Grasshopper sparrow (B)	Grasslands – agriculture		x	x									
Gray catbird (B)	Shrub-scrub/shrub – early successional			x									
Gray jay (B,W)	Coniferous forests	x											
Great cormorant (B,W)	Estuaries and bays							x					
Great crested flycatcher (B)	Forested upland communities			x									
Greater scaup (W)	Estuaries and bays										x		x
Greater shearwater (M)	Marine open water									x			
Greater snow goose (M)	Grasslands – agriculture										x		
Greater yellowlegs (W, M)	Beach, sand, mud flat						x						
Green-winged teal (B,W,M)	Freshwater emergent wetlands			x									
Harlequin duck (W)	Freshwater lakes										x		x
Henslow's sparrow (B)	Estuarine emergent wetlands/ grassland communities			x									
Herring gull (B,W)	Estuaries and bays/ freshwater lakes, rivers, streams							x					
Hooded merganser (B,W,M)	Forested wetland communities			x									
Horned grebe (W)	Estuaries and bays							x		x			
Horned lark (B)	Grasslands – agriculture	x											
Ipswich savannah sparrow (B)	Grasslands – agriculture	x		x									
Killdeer (B)	Grasslands – agriculture/urban – suburban				x		x						
King rail (B, W)	Estuarine emergent wetlands									x			
Least bittern (B)	Palustrine emergent marsh					x	x						
Least sandpiper (M)	Palustrine emergent marsh				x		x						
Least tern (B, M)	Beach, sand, mud flat						x						
Lesser scaup (W, M)	Freshwater lakes, rivers, streams									x			
Lesser yellowlegs (W, M)	Beach, sand, mud flat						x						
Little blue heron (B, W)	Freshwater emergent wetlands/ forested wetland communities									x			
Loggerhead shrike (B)	Grassland communities			x									
Long-eared owl (B)	Coniferous forests/mixed forests	x											

TABLE O-1 (cont’d)

Migratory Bird Priority Species and Associated Habitats Potentially Located Within the AIM Project Area

		Land Birds			Shorebirds			Waterbirds			Waterfowl		
Species [a]	Habitat Type [b]	BCR 14	BCR 28	BCR 30	BCR 14	BCR 28	BCR 30	BCR 14	BCR 28	BCR 30	BCR 14	BCR 28	BCR 30
Long-tailed duck (W)	Estuaries and bays										x		x
Louisiana waterthrush	Freshwater rivers, streams/forests		x	x									
Mallard (B, W, M)	Freshwater emergent wetlands/ forested wetland communities												x
Marsh wren (M)	Freshwater emergent wetlands			x									
Nelson’s sharp-tailed sparrow (B, M)	Estuarine emergent wetlands			x									
Northern bobwhite (B, W)	Shrub-scrub/shrub – early successional			x									
Northern flicker (B)	Deciduous and mixed forests/ mixed forests	x		x									
Northern gannet (W, M)	Marine open water									x			
Northern goshawk (B,W)	Coniferous forests/mixed forests	x											
Northern harrier (B)	Palustrine emergent marsh/ grasslands – agriculture	x	x										
Northern parula (B)	Coniferous forests/mixed forests	x											
Northern pintail (W, M)	Estuarine emergent wetlands									x			
Olive-sided flycatcher (B)	Shrub-scrub/coniferous forests/ mixed forests/shrub – early successional	x	x										
Ovenbird (B)	Deciduous and mixed forests/ mixed forests	x											
Palm warbler (B)	Shrub-scrub/shrub – early successional	x											
Peregrine falcon (B)	Urban – suburban		x										
Prairie warbler (B)	Shrub-scrub/shrub – early successional		x	x									
Prothonotary warbler (B)	Forested wetland communities			x									
Purple finch (B,W)	Coniferous forests/mixed forests/ mountaintop forests	x											
Purple sandpiper (W, M)	Rocky coasts						x						
Red phalarope (M)	Estuaries and bays				x		x	x		x			
Red-breasted merganser (W, M)	Forested wetland communities			x									
Red-cockaded woodpecker (B, W)	Forested upland communities			x									
Red-headed woodpecker (B,W)	Grasslands – agriculture/urban – suburban		x	x									
Red-necked grebe (W)	Estuaries and bays							x					
Red-necked phalarope (M)	Marine open water									x			
Red-throated loon (W)	Estuaries and bays							x		x			
Resident Canada goose (B,W)	Freshwater lakes, rivers, streams/ grasslands – agriculture										x		
Roseate tern (B)	Estuaries and bays							x		x			
Rose-breasted grosbeak (B)	Deciduous and mixed forests	x											

TABLE O-1 (cont'd)

Migratory Bird Priority Species and Associated Habitats Potentially Located Within the AIM Project Area

Species [a]	Habitat Type [b]	Land Birds			Shorebirds			Waterbirds			Waterfowl		
		BCR 14	**BCR 28**	**BCR 30**	**BCR 14**	**BCR 28**	**BCR 30**	**BCR 14**	**BCR 28**	**BCR 30**	**BCR 14**	**BCR 28**	**BCR 30**
Royal tern (B)	Beach, sand, mud flat						x						
Ruddy duck (W, M)	Freshwater marsh communities									x			
Ruffed grouse (B,W)	Deciduous and mixed forests/ mixed forests/shrub – early successional	x	x										
Rusty blackbird (B)	Forested wetland/shrub-scrub	x		x									
Saltmarsh sharp-tailed sparrow (B, W, M)	Estuarine emergent wetlands									x			
Sanderling (W, M)	Beach, sand, mud flat						x						
Scarlet tanager (B)	Forested upland communities			x									
Sedge wren (B)	Palustrine emergent marsh/ grasslands – agriculture		x	x									
Semipalmated plover (M)	Beach, sand, mud flat						x						
Short-bicher (M)	Estuarine emergent wetlands						x						
Short-eared owl (B, M)	Palustrine emergent marsh/ grasslands – agriculture	x	x	x									
Snowy egret (B, W)	Freshwater emergent wetlands									x			
Solitary sandpiper (M)	Freshwater emergent wetlands									x			
Sora (B, M)	Freshwater emergent wetlands									x			
Spotted sandpiper (B, M)	Freshwater lakes, rivers, streams									x			
Swainson's warbler (B)	Forested upland communities			x									
Surf scoter (W)	Estuaries and bays										x		x
Tricolored heron (B)	Freshwater emergent wetlands									x			
Tundra swan – eastern (W, M)	Marshy lakes and bays									x			
Upland sandpiper (B)	Grasslands – agriculture				x	x	x						
Veery (B)	Deciduous and mixed forests/ mixed forests	x											
Vesper sparrow (B)	Grasslands – agriculture	x											
Western sandpiper (M)	Beach, sand, mud flat						x						
Whip-poor-will (B)	Deciduous and mixed forests/ shrub – early successional	x	x	x									
White-rumped sandpiper (M)	Beach, sand, mud flat						x						
White-winged scoter (W, M)	Marine open water									x			
Willet (B)	Grasslands – agriculture				x		x						
Willow flycatcher (B)	Scrub-shrub – early successional			x									
Wilson's phalarope (M)	Freshwater emergent wetlands									x			
Wilson's snipe (B)	Palustrine emergent marsh/ grasslands – agriculture				x								
Wood duck (B)	Freshwater lakes, rivers, streams/ palustrine emergent marsh/										x		x

TABLE O-1 (cont'd)

Migratory Bird Priority Species and Associated Habitats Potentially Located Within the AIM Project Area

		Land Birds			Shorebirds			Waterbirds			Waterfowl		
Species [a]	Habitat Type [b]	BCR 14	BCR 28	BCR 30	BCR 14	BCR 28	BCR 30	BCR 14	BCR 28	BCR 30	BCR 14	BCR 28	BCR 30
	forested wetland												
Wood thrush (B)	Deciduous and mixed forests/ mixed forests	x	x	x									
Worm-eating warbler (B)	Forested wetland communities			x									
Yellow rail (B)	Palustrine emergent marsh							x					
Yellow-bellied flycatcher (B)	Shrub-scrub	x											
Yellow-bellied sapsucker (B)	Deciduous and mixed forests	x											
Yellow-breasted chat (B)	Shrub-scrub		x										
Yellow-crowned night heron (B, M)	Forested wetland communities			x									
Yellow-throated vireo (B)	Forested upland communities			x									

[a] Priority migratory bird species are denoted with their primary season of occurrence: breeding (B), migration (M), and winter (W).

[b] The Habitat Types listed only represent habitats found within or near the Project area. These habitat types are based on the priority species-habitat suites for Atlantic Northern Forest Bird Conservation Region – BCR 14, Appalachian Mountains Bird Conservation Region – BCR 28, and New England/Mid-Atlantic Coast Bird Conservation Region – BCR 30.

APPENDIX P

PUBLIC LANDS, RECREATION, AND SPECIAL INTEREST AREAS CROSSED OR WITHIN 0.25 MILE

APPENDIX P

TABLE P-1

Public Lands, Recreation, and Special Interest Areas Crossed by or Within 0.25 Mile of the AIM Project[a]

Facility/County, State	Enter Milepost	Exit Milepost	Distance and Direction from Nearest Point Along Construction Work Area	Name of Area/Ownership	Crossing Length (feet)	Acreage Affected by Construction Temp.	Acreage Affected by Construction Perm.[b]
PIPELINE FACILITIES							
Haverstraw to Stony Point Take-up and Relay							
Rockland County, NY	0.0	0.3	Inside	Harriman State Park/ Palisades Interstate Park Commission	1,666	3.9	0.0
Rockland County, NY	NA	NA	90 feet southeast from milepost (MP) 2.5	Patriot Hills Public Golf club/Town of Stony Point	NA	NA	NA
Rockland County, NY	0.6	1.0	Inside	Cheesecote Mountain/ Town of Haverstraw	2,090	5.3	0.0
Rockland County, NY	0.8	0.8	Inside	Letchworth Village Cemetery/State of New York	185	0.2	0.0
Stony Point to Yorktown Take-up and Relay							
Rockland County, NY	0.7	1.3	Inside	Camp Bullowa/Boy Scouts of America, Hudson Valley Council	3,126	7.4	0.0
Rockland County, NY	2.5	2.6	Inside	Harriman State Park/ Palisades Interstate Park Commission	299	0.6	0.0
Rockland County, NY	2.8	3.0	Inside	Simpson Memorial Church, Inc.	1,023	2.6	1.2
Rockland County, NY	3.0	3.0	Inside	Washington-Rochambeau National Historic Trail/ National Park Service and Rockland Riverfront Trails	75	0.2	0.1
Rockland County, NY	3.2	3.9	Inside/River	New York Critical Environmental Areas (CEAs) (Hudson River Crossing)	3,605	0.1	0.8
Westchester County, NY	4.1	4.2	Inside	St. Patrick's Church	158	0.3	0.0
Westchester County, NY	4.4	4.9	Inside	Indian Point Energy Center/Entergy Nuclear Operations, Inc.	2,159	1.9	2.4
Westchester County, NY	4.8	4.8	Inside	Washington-Rochambeau National Historic Trail/ National Park Service	75	0.4	0.2
Westchester County, NY	NA	NA	450 feet south of MP 4.9	Buchanan-Verplanck Elementary School/ Village of Buchanan	NA	NA	NA
Westchester County, NY	5.1	5.1	Inside	Village Park/Village of Buchanan	313	0.7	0.3
Westchester County, NY	5.8	5.8	Inside	Washington-Rochambeau National Historic Trail/ National Park Service	75	0.4	0.0

TABLE P-1 (cont'd)

Public Lands, Recreation, and Special Interest Areas Crossed by or Within 0.25 Mile of the AIM Project[a]

Facility/County, State	Enter Milepost	Exit Milepost	Distance and Direction from Nearest Point Along Construction Work Area	Name of Area/Ownership	Crossing Length (feet)	Acreage Affected by Construction Temp.	Acreage Affected by Construction Perm.[b]
Westchester County, NY	5.8	5.9	Inside	Washington-Rochambeau National Historic Trail/National Park Service	75	1.1	0.0
Westchester County, NY	6.7	8.1	Inside	Blue Mountain Reservation/ Westchester County (includes CEAs)	7,089	17.7	0.0
Westchester County, NY	8.4	8.5	Inside	Blue Mountain Reservation/Westchester County (includes CEAs)	380	1.1	0.0
Westchester County, NY	10.6	10.7	Inside	Town of Cortlandt/empty lot	100	0.1	0.0
Westchester County, NY	10.3	10.3	Inside	Catskill Aqueduct/City of New York Bureau of Water Supply	79	0.2	0.0
Westchester County, NY	10.3	10.4	Inside	Catskill Aqueduct/City of New York Bureau of Water Supply	527	2.5	0.1
Westchester County, NY	11.0 11.1 11.9	11.1 11.8 12.3	Inside	Sylvan Glen Park Preserve (Granite Knolls Park West)/Town of Yorktown	6,238	15.6	0.5
Southeast to MLV 19 Take-up and Relay							
Fairfield County, CT	3.9	4.2	Inside	Ridgewood County Club (private)/Ridgewood County Club, Inc.	1,787	1.4	0.0
E-1 System Lateral Take-up and Relay							
New London County, CT	NA	NA	Adjacent on west side of workspace at MP 1.9	Trumbull Cemetery/Town of Lebanon	NA	NA	NA
New London County, CT	2.0	2.2	Inside	Aspinall Recreation Property and Lebanon Elementary School/Town of Lebanon	1,061	1.9	0.1
New London County, CT	8.7 8.9	8.9 9.0	Inside	Senator Thomas J. Dodd Memorial Stadium/City of Norwich	1,489	3.1	0.4
New London County, CT	NA	NA	865 feet east of MP 9.1	Bog Meadow Reservoir (state-protected open space)	NA	NA	NA
Line-36A Loop Extension							
Middlesex County, CT	0.5	0.8	Inside	Watrous Park/Town of Cromwell Middle School	1,326	2.5	0.9
Middlesex County, CT	1.1	1.2	Inside	Cromwell Fire District	524	1.0	0.4
Hartford County, CT	NA	NA	63 feet north of MP 1.6	Dividend Pond Open Space/Town of Rocky Hill	NA	NA	NA

TABLE P-1 (cont'd)

Public Lands, Recreation, and Special Interest Areas Crossed by or Within 0.25 Mile of the AIM Project[a]

Facility/County, State	Enter Milepost	Exit Milepost	Distance and Direction from Nearest Point Along Construction Work Area	Name of Area/Ownership	Crossing Length (feet)	Acreage Affected by Construction Temp.	Acreage Affected by Construction Perm.[b]
E-1 System Lateral Loop Extension							
New London County, CT	NA	NA	255 feet east of MP 1.1	Boy Scouts of America/ Mohegan District of the Connecticut Rivers Council	NA	NA	NA
New London County, CT	1.1	1.1	Inside	Mohegan Tribe of Indians, federally recognized Indian Nation	279	0.4	0.10
West Roxbury Lateral							
Norfolk County, MA	0.0	0.0	Inside	Canton Street Buffer/ Town of Westwood	38	0.3	0.1
Norfolk County, MA	0.0	0.1	Inside	Norfolk Golf Club (private)	633	1.3	0.7
Norfolk County, MA	NA	NA	393 feet east	Wigwam Pond Conservation Area/Town of Dedham	N/	NA	NA
Norfolk County, MA	NA	NA	115 feet southeast of MP 2.33	Barnes Memorial Park/ Town of Dedham	NA	NA	NA
Norfolk County, MA	2.4	2.6	Inside	Gonzalez Field/Town of Dedham	634	1.3	0.8
Norfolk County, MA	NA	NA	1,139 feet northwest of MP 2.7	Charles River Reservation/ Massachusetts Department of Conservation and Recreation (MADCR)	NA	NA	NA
Norfolk County, MA	3.0	3.7	Inside	Washington-Rochambeau National Historic Trail/National Park Service	3,485	5.8	0.0
Norfolk County, MA	3.1	3.2	Inside	Mother Brook Reservation/MADCR	53	0.1	0.0
Norfolk County, MA	2.8	3.1	Inside	Brookdale Cemetery/ Town of Dedham	272	0.4	0.0
Norfolk County and Suffolk County, MA	NA	NA	610 feet northwest of MP 3.4	Boston United Hand & Hand Cemetery/ Chestnut Hill's Congregation Mishka Tefila	NA	NA	NA
Suffolk County, MA	NA	NA	8 feet northwest of MP 3.6	Mary Draper Playground/ municipal	NA	NA	NA
Suffolk County, MA	NA	NA	132 feet northwest of MP 3.7	Grove Street Cemetery/ Jewish Cemetery Association of Massachusetts	NA	NA	NA
Suffolk County, MA	NA	NA	525 feet east of MP 3.9	Beethoven Elementary School and Playground/ City of Boston	NA	NA	NA
Suffolk County, MA	4.2	4.3	Inside	Centre Marsh/Algonquin Gas	NA	NA	NA

TABLE P-1 (cont'd)

Public Lands, Recreation, and Special Interest Areas Crossed by or Within 0.25 Mile of the AIM Project[a]

Facility/County, State	Enter Milepost	Exit Milepost	Distance and Direction from Nearest Point Along Construction Work Area	Name of Area/Ownership	Crossing Length (feet)	Acreage Affected by Construction Temp.	Acreage Affected by Construction Perm.[b]
Suffolk County, MA	NA	NA	0 feet east of MP 4.3	West Roxbury Quarry Urban Wild/West Roxbury Crushed Stone, Co./private	NA	NA	NA
Suffolk County, MA	NA	NA	219 feet southeast of MP 5.1	Guy Cammarata Complex/baseball fields	NA	NA	NA
Suffolk County, MA	NA	NA	15 feet southeast of MP 5.0	Roxbury Latin School/ private	NA	NA	NA
Suffolk County, MA	NA	NA	15 feet northeast of MP 5.1	St. Theresa of Avila School/private	NA	NA	NA
ABOVEGROUND FACILITIES							
Burrillville Compressor Station							
Providence County, RI	NA	NA	1,147 feet south	George Washington State Campground and Management Area	NA	NA	NA
Farmington M&R Station							
Hartford County, CT	NA	NA	Within 120 feet east	State Protected Open Space (planned bike trail)	NA	NA	NA
Multiple Facilities							
New London and Windham Counties, CT	NA	NA	Facilities are within the area	Quinebaug and Shetucket Rivers Valley National Heritage Corridor	NA	NA	NA
Waterbury M&R Station							
New Haven County, CT	NA	NA	6 feet southeast	Formerly Larkin State Park Trail/state-owned property	NA	NA	NA
West Roxbury M&R Station							
Suffolk County, MA	NA	NA	Facility is within the area	Centre Marsh/Algonquin Gas	NA	1.0	1.0

a NA (not applicable) indicates that the Project would not cross the area, but would be located within 0.25 mile.

b Only includes the new permanent right-of-way, not Algonquin's existing permanent easement.

APPENDIX Q

CONSULTATIONS WITH FEDERALLY RECOGNIZED INDIAN TRIBES

TABLE Q-1

Consultations with Federally Recognized Indian Tribes for the AIM Project

Indian Tribe/Date	Comments
Delaware Nation of Oklahoma	
5/17/13	Initial outreach letter from Public Archaeology Lab (PAL), on behalf of Algonquin Gas Transmission, LLC (Algonquin).
10/25/13	PAL provided the archaeological overview/identification survey technical memoranda and the draft Unanticipated Discovery Plan for review.
11/25/13	Initial consultation letter from the Federal Energy Regulatory Commission (FERC) requesting comments on the Project to ensure that the concerns of the tribes are identified and properly considered in our environmental analysis, and requesting the tribes' assistance in identifying properties of traditional, religious, or cultural importance that may be affected by the Project.
12/3/13	PAL provided copies of Resource Reports 1 through 12 and associated maps.
12/23/13	Email to the FERC requesting the tribe be updated to any changes in the event of project changes or inadvertent discoveries.
2/4/14	FERC third-party contractor followed up via email to on FERC request for comments/consultation.
2/24/14	PAL provided draft overview/technical reports for review.
Delaware Tribe of Indians	
5/17/13	Initial outreach letter from PAL.
5/30/13	Letter to PAL requesting information on resources identified and to continue to be consulted.
7/3/13	Letter to PAL proving information on states and counties where Delaware have historical connection.
7/22/13	PAL provided request for consultation and maps.
7/29/13	Letter to PAL indicating no known sites of religious significance and requesting copies of cultural resource survey reports.
10/25/13	PAL provided the archaeological overview/identification survey technical memoranda and the draft Unanticipated Discovery Plan for review.
11/5/13	Letter to PAL recommending Phase II investigations for sites within Project corridor.
11/25/13	Initial consultation letter from the FERC requesting comments on the Project to ensure that the concerns of the tribes are identified and properly considered in our environmental analysis, and requesting the tribes' assistance in identifying properties of traditional, religious, or cultural importance that may be affected by the Project.
12/3/13	PAL provided copies of Resource Reports 1 through 12 and associated maps.
12/11/13	Letter to PAL on survey report, indicating that there are no religious or culturally significant sites in the Project area and no objections to the proposed Project.
2/4/14	FERC third-party contractor followed up via email to on FERC request for comments/consultation.
2/24/14	PAL provided draft overview/technical reports for review.
Mashantucket (Western) Pequot Tribal Nation [a]	
5/17/13	Initial outreach letter from PAL, on behalf of Algonquin.
5/30/13	Email to PAL requesting copies of survey reports when completed.
10/25/13	PAL provided the archaeological overview/identification survey technical memoranda and the draft Unanticipated Discovery Plan for review.
11/14/13	Email to PAL requesting name of FERC cultural resources contact. Email from PAL providing requested contact information.
11/15/13	Emails to FERC on review of technical memoranda, agreeing with recommendations.
11/16/13	Emails to FERC on review of technical memoranda, agreeing with recommendations.
11/22/13	Email to FERC providing review comments on Unanticipated Discovery Plan.
11/25/13	Initial consultation letter from the FERC requesting comments on the Project to ensure that the concerns of the tribes are identified and properly considered in our environmental analysis, and requesting the tribes' assistance in identifying properties of traditional, religious, or cultural importance that may be affected by the Project.
12/3/13	PAL provided copies of Resource Reports 1 through 12 and associated maps.
12/27/13	Email to PAL acknowledging receipt of Resource Reports.
2/4/14	FERC third-party contractor followed up via email to on FERC request for comments/consultation.
2/24/14	PAL provided draft overview/technical reports for review.
3/3/14	PAL provided copies of Resource Reports 1 through 12 and alignment sheets.
3/12/14	Met directly with FERC to discuss section 106 concerns and procedures.
6/12/14	Email to FERC on review of progress memo.

TABLE Q-1 (cont'd)

Consultations with Federally Recognized Indian Tribes for the AIM Project

Indian Tribe/Date	Comments
Mashpee Wampanoag Indian Tribe	
5/17/13	Initial outreach letter from PAL, on behalf of Algonquin.
10/25/13	PAL provided the archaeological overview/identification survey technical memoranda and the draft Unanticipated Discovery Plan for review.
11/25/13	Initial consultation letter from the FERC requesting comments on the Project to ensure that the concerns of the tribes are identified and properly considered in our environmental analysis, and requesting the tribes' assistance in identifying properties of traditional, religious, or cultural importance that may be affected by the Project.
12/3/13	PAL provided copies of Resource Reports 1 through 12 and associated maps.
2/4/14	FERC third-party contractor followed up via email to on FERC request for comments/consultation.
2/24/14	PAL provided draft overview/technical reports for review.
4/8/14	Letter to FERC indicating that periodic visits by tribal monitors would be required during ground-disturbing activities.
Mohegan Tribe [a]	
5/17/13	Initial outreach letter from PAL, on behalf of Algonquin.
5/30/13	Email to FERC requesting information on the Project.
6/18/13	Letter from Algonquin to arrange for meeting.
6/27/13	Meeting held with Algonquin and PAL.
8/2/13	Letter from PAL with copy of meeting notes.
9/25/13	Phone message from PAL regarding upcoming fieldwork schedule.
10/25/13	PAL provided the archaeological overview/identification survey technical memoranda and the draft Unanticipated Discovery Plan for review.
11/14/13	Emails with PAL coordinating archaeological testing of a site.
11/25/13	Initial consultation letter from the FERC requesting comments on the Project to ensure that the concerns of the tribes are identified and properly considered in our environmental analysis, and requesting the tribes' assistance in identifying properties of traditional, religious, or cultural importance that may be affected by the Project.
12/3/13	PAL provided copies of Resource Reports 1 through 12 and associated maps.
2/4/14	FERC third-party contractor followed up via email to on FERC request for comments/consultation.
2/24/14	PAL provided draft overview/technical reports for review.
3/3/14	PAL provided copies of Resource Reports 1 through 12 and alignment sheets.
3/12/14	Met directly with FERC to discuss section 106 concerns and procedures.
Narragansett Indian Tribe [a]	
5/17/13	Initial outreach letter from PAL, on behalf of Algonquin.
10/25/13	PAL provided the archaeological overview/identification survey technical memoranda and the draft Unanticipated Discovery Plan for review.
10/28/13	Telephone call from regarding upcoming field investigations.
	Email from PAL advising of mailing sensitivity assessment/scope of work for upcoming archaeological investigations.
10/30/13	Email from PAL to coordinate archaeological hand testing.
11/25/13	Initial consultation letter from the FERC requesting comments on the Project to ensure that the concerns of the tribes are identified and properly considered in our environmental analysis, and requesting the tribes' assistance in identifying properties of traditional, religious, or cultural importance that may be affected by the Project.
12/3/13	PAL provided copies of Resource Reports 1 through 12 and associated maps.
2/4/14	FERC third-party contractor followed up via email to on FERC request for comments/consultation.
2/24/14	PAL provided draft overview/technical reports for review.
3/3/14	PAL provided copies of Resource Reports 1 through 12 and alignment sheets.
3/12/14	Met directly with FERC to discuss section 106 concerns and procedures.
4/14/14	Met with PAL to receive information about cultural resource investigations.

TABLE Q-1 (cont'd)

Consultations with Federally Recognized Indian Tribes for the AIM Project

Indian Tribe/Date	Comments
Saint Regis Mohawk Tribe	
5/17/13	Initial outreach letter from PAL, on behalf of Algonquin.
10/25/13	PAL provided the archaeological overview/identification survey technical memoranda and the draft Unanticipated Discovery Plan for review.
11/25/13	Initial consultation letter from the FERC requesting comments on the Project to ensure that the concerns of the tribes are identified and properly considered in our environmental analysis, and requesting the tribes' assistance in identifying properties of traditional, religious, or cultural importance that may be affected by the Project.
12/3/13	PAL provided copies of Resource Reports 1 through 12 and associated maps.
2/4/14	FERC third-party contractor followed up via email to on FERC request for comments/consultation.
2/24/14	PAL provided draft overview/technical reports for review.
Stockbridge-Munsee Community Band of Mohican Indians	
5/17/13	Initial outreach letter from PAL, on behalf of Algonquin.
5/29/13	Letter to PAL indicating tribe is not aware of cultural resources in the Project area.
10/25/13	PAL provided the archaeological overview/identification survey technical memoranda and the draft Unanticipated Discovery Plan for review.
11/25/13	Initial consultation letter from the FERC requesting comments on the Project to ensure that the concerns of the tribes are identified and properly considered in our environmental analysis, and requesting the tribes' assistance in identifying properties of traditional, religious, or cultural importance that may be affected by the Project.
12/3/13	PAL provided copies of Resource Reports 1 through 12 and associated maps.
2/4/14	FERC third-party contractor followed up via email to on FERC request for comments/consultation.
2/24/14	PAL provided draft overview/technical reports for review.
Wampanoag Tribe of Gay Head (Aquinnah) [a]	
5/17/13	Initial outreach letter from PAL, on behalf of Algonquin.
7/23/13	Email from PAL to coordinate tribal involvement in field surveys. Email to PAL asking for Spectra/Algonquin and FERC contacts.
7/25/13	Email from Spectra/Algonquin to coordinate tribal involvement field survey.
10/25/13	PAL provided the archaeological overview/identification survey technical memoranda and the draft Unanticipated Discovery Plan for review.
11/25/13	Initial consultation letter from the FERC requesting comments on the Project to ensure that the concerns of the tribes are identified and properly considered in our environmental analysis, and requesting the tribes' assistance in identifying properties of traditional, religious, or cultural importance that may be affected by the Project.
12/3/13	PAL provided copies of Resource Reports 1 through 12 and associated maps. Call to PAL to discuss investigations.
12/4/13	Meeting with PAL to discuss Project, permitting process, and schedule.
1/27/14	Letter from PAL providing copy of meeting notes.
2/4/14	FERC third-party contractor followed up via email to on FERC request for comments/consultation.
2/24/14	PAL provided draft overview/technical reports for review.
3/3/14	PAL provided copies of Resource Reports 1 through 12 and alignment sheets.
3/12/14	Met directly with FERC to discuss section 106 concerns and procedures.

[a] Participated in mostly weekly calls and/or email updates on on-going cultural resource field investigations with FERC, Algonquin, and Algonquin's cultural resources contractor beginning April 3, 2014 until cultural resource field investigations were completed.

APPENDIX R

REFERENCES AND CONTACTS

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APPENDIX S

LIST OF PREPARERS

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Federal Energy Regulatory Commission

Suter, Magdalene – Environmental Project Manager, Executive Summary, Proposed Action, Alternatives, Land Use, Socioeconomics, Air Quality and Noise, Reliability and Safety, Cumulative Impacts
B.S., Environmental Systems Engineering, 2004, Pennsylvania State University

Kochhar, Medha – Deputy Project Manager, Alternatives, Land Use
Ph.D., Plant Ecology, 1974, North Carolina State University
M.S., Botany, 1968, B.I.T.S., Pilani, India
B.S., Biology and Chemistry, 1966, University of Delhi

Howard, Eric – Cultural Resources
M.A., Anthropology, 1997, University of Tennessee
B.A., Anthropology, 1992, University of Tennessee

Rana, Tony – Soils, Geology, Groundwater Resources
B.S., Geology, 1984, New Jersey City University
Graduate Studies, International Development, 2009-present, Tulane University Payton Center for International Development
Graduate Studies, Hydrogeology and Geochemistry, 1985-1988, Oklahoma State University

Wachholder, Joanne –Water Resources, Wetlands, Vegetation, Wildlife and Aquatic Resources, Special Status Species
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

Buchanan, Stu – Principal
B.S., Wildlife Management, 1974, University of Maine
A.A.S., Forestry, 1972, Paul Smith's College

Lee, Jennifer – Project Manager, Quality Assurance Review, Introduction, Project Description, Land Use

B.A., Environmental Studies and Geography, 1995, University of St. Thomas

Baltzersen, Wendy –Wildlife and Aquatic Resources, Special Status Species
Ph.D., Fish and Wildlife Biology and Management, 2011, State University of New York, College of Environmental Science and Forestry
M.S., Fish and Wildlife Biology and Management, 2003, State University of New York, College of Environmental Science and Forestry, New York,
B.A., Zoology, 1994, Oregon State University

Enright, Troy – Air Quality and Noise
B.S., Environmental Science, 2005, University of Wisconsin, River Falls

Grissom, Lindsay – Reliability and Safety
M.S., Cell and Molecular Biology, 2002, Tulane University
B.S., Zoology/Physiology, 2000, Louisiana State University

Hubner, Dan – Land Use
B.S., Environmental Studies, 2007, Portland State University

Jones, DeeAn – Vegetation
B.S., Wildlife and Fisheries Biology, 1993, University of California at Davis

Koester, Mike – Reliability and Safety
B.S., Environmental Management, 2001, University of South Alabama

Lyons, Tina – Quality Assurance Review, 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

Mash, Lisa – Socioeconomics, Cumulative Impacts
B.S., Marine Biology, 1995, University of South Carolina at Columbia

Nunley, Janet – Water Resources, Wetlands
M.S., Interdisciplinary Ecology, 2002, University of Florida
B.S., Zoology, 2000, University of Florida

Robblee, Pat – Alternatives
M.A., Anthropology with a specialization in Historical Archaeology, 1995, College of William and Mary
B.A., Anthropology, 1993, University of Massachusetts at Amherst

Thomas, Brian – Cultural Resources
J.D., 2013, Georgia State University College of Law
Ph.D., Anthropology, 1995, State University of New York at Binghamton
M.A., Anthropology, 1991, Wake Forest University
B.A., History and Philosophy, 1983, Wofford College

Thornton, Andrea – Geology, Soils
B.A., Environmental Geology, 2006, Northeastern University
B.A., Environmental Studies, 2006, Northeastern University

Timpson, Mike – Water Resources, Wetlands
Ph.D., Plant and Soil Science, 1992, University of Tennessee
M.S., Soil Science, 1985, North Dakota State University
B.S., Natural Resources, 1982, University of Rhode Island

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