2.0 PROPOSED ACTION

This section describes the proposed facilities and land requirements of the NE-07 Project. It is organized by the separate project components proposed by each applicant. The project components identified in this section are: the Millennium Phase I Project, the Empire Connector Project, the Algonquin Ramapo Expansion Project, and Iroquois MarketAccess Project.

2.1 PROPOSED FACILITIES

The facilities proposed for the NE-07 Project are detailed by project component in the following subsections and are summarized in table 2.1-1.

2.1.1 MILLENNIUM PIPELINE PROJECT – PHASE I

As explained in section 1, the Millennium Phase I Project would include some of the facilities and routing of the Millennium Pipeline Project that was approved by the Commission in the "Order Issuing Certificate, Granting and Denying Requests for Rehearing, and Granting and Denying Requests for Clarification" issued on September 19, 2002 (Millennium Order) and in the "Interim Order" issued December 19, 2001, with certain proposed modifications and additional facilities. Therefore, this DSEIS will only describe the proposed route modifications and new facilities, and will only update where appropriate the environmental information related to the portion of the approved pipeline route that would be constructed by Millennium for its Phase I Project. This document does not revisit issues related to the original Millennium Pipeline Project that were addressed in the 2001 FEIS and the Interim and Final Millennium Orders. As stated in section 1, that information has been incorporated by reference into this document. Millennium would still be required to abide by the environmental conditions of the Interim and Millennium Orders as they would relate to the project it has proposed in its amendment application and to any new requirements that may be developed during the analysis of the amendment application if the Commission approves the Millennium Phase I Project.

The Millennium Phase I Project pipeline facilities would include:

- construction of about 181.7 miles of 30-inch-diameter pipeline by lift and lay (or same ditch replacement) and looping from Corning, New York, to Ramapo, New York, from MP 190.6 to MP 376.6 including four proposed route variations within this area;
- acquisition from Columbia and continued use of approximately 7.1 miles of 24-inch-diameter Line A-5 pipeline from MP 340.5 to MP 347.7 (this pipeline segment is associated with the Neversink River crossing);
- replacement of 10-inch-diameter pipeline with 24-inch-diameter pipeline between MPs 343.8 and 344.0;

Table 2.1-1.
Components of the NE-07 Project

Project Component and Proposed Facilities	Status in Relation to Previous FERC Review and Other Remarks
Millennium Pipeline Project – Phase I (CP98-150-006, CP98-150-007, and CP98-150-008)	This is an amendment, referred to as Phase I, of the previously certificated 373.4 miles of 36-inch and 50.6 miles of 24-inch pipeline. Refer to the Commission Final EIS for the Millennium Pipeline Project (October 2001) for more detailed analyses regarding portions of the Phase I project that remain the same as previously certificated.
1) 181.7 miles of 30-inch pipeline (between previously certificated MPs 190.6 – 376.7) in Steuben, Chemung,Tioga, Broome, Delaware, Sullivan, Orange, and Rockland Counties, NY	General modifications to originally certificated project: • Proposed diameter of pipeline reduced from 36-inch to 30-inch. • MAOP reduced from 1,440 to 1,200 pounds psig. • Four route variations on Millennium Pipeline and two route variations on Columbia Line A-5 Project.
• Includes three route variations/realignments totaling approximately 19 miles along the existing NYSEG powerline ROW: a) Chemung Variation (MP 198.0 – 203.6) b) Tioga–Broome Variation (MP 232.2 – 245.0) c) Delaware Variation (MP 284.4 – 284.9)	These three route variations are substantially similar to the previously certificated route; changes consist primarily of realigning the pipeline from one side of the existing ROW (or down center of ROW) to the other side of ROW, with some minor segments where the route diverges from the previously used corridor. In the previously issued FERC certificate for Millennium (condition #45), the Commission required Millennium to continue consulting with NYSEG regarding the placement of the pipeline within NYSEG ROW between MP 232.2 and 243.5, and to submit a revised routing plan through this area that reduced the risk of pipeline accident during construction and operation. The Tioga Broome Variation is in response to this Commission requirement/condition.
• Includes a 5,600-ft (1.1-mile) route variation/change around Warwick Isle subdivision (MP 350.8 – 351.6)	Proposed Route change to accommodate an approved subdivision in the Town of Warwick, Orange County, NY.
• Also includes acquisition from Columbia and use of 7.1 miles of Columbia's existing 24-inch Line A-5 pipeline (MP 340.5 – 347.7). Within this segment, a short length of existing 10-inch diameter pipe would be replaced with 24-inch diameter pipe (MP 343.8-344.0).	Millennium states that its proposed reuse of Line A-5 is to avoid a making a new crossing of (and associated impacts to) Neversink River and avoid construction along 7.1 mi of ROW.
• **Columbia Line A-5 Replacement Project (CP05-19-000) (Millennium proposes as a component of its Phase I Project)** a) Replacement of approximately 8.8 miles of 8- and 16-inch-diameter segments of the existing Line A-5 Pipeline with 30-inch pipeline (Orange and Rockland Counties, NY) between MP 367.9 and MP 376.7. b) Modification of three existing M&R stations on this segment of Line A-5 to accommodate the larger diameter pipeline • Tuxedo/Central Hudson M&R Station • Sloatsburg M&R Station • Ramapo M&R Station c) Abandonment in place of about 1.0 mile of the existing Line A-5 pipeline	There are two proposed route variations on the Line A-5 Replacement: 1) The Sterling Forest – Laurel Ridge Route Variation (MP 367.9 – 368.5), and 2) HDD Alternative Route Across Ramapo River (mp 369.5 – 370.3).

Table 2.1-1. (cont'd)
Components of the NE-07 Project

Project Component and Proposed Facilities	Status in Relation to Previous FERC Review and Other Remarks
2) New compression facilities (one 15,002-bhp compressor unit) at the existing Columbia CS at Corning, Steuben County, NY	This is a new project modification necessitated by the proposed interconnect with the Empire Connector Project at Corning, NY.
3) New Wagoner Meter and Regulator (M&R) Station in Milford, PA	FERC previously approved overpressure and valve facilities at this location (see the 2001 FEIS for Millennium Pipeline Project). No change to workspace footprint.
4) Upgrades to the existing Ramapo M&R Station in Ramapo, NY	FERC previously approved these upgrades (see 2001 FEIS for Millennium Pipeline Project).
5) Modification of waterbody crossing procedures for 7 major waterbodies	Millennium is proposing modified construction techniques for crossing Owego Creek, Nanticoke Creek, Susquehanna River, W. Branch Delaware R., E. Branch Delaware R. Wallkill River, and Pochuck Creek.
Empire Connector Project (Docket No. CP 06-5-000, previously PF04-16-000)	
1) 77.9 miles of 24-inch pipeline in Ontario, Yates, Schuyler, Chemung, Steuben Counties, NY • Includes replacement of 1.4 miles of existing Empire State Pipeline at north end of Project.	
2) New CS (20,620 hp) in Oakfield, Genesee County, NY	
3) Seven (7) mainline valves and two interconnect facilities: • Interconnect Facility 1/Mainline Valve 1 (Ontario County); • Mainline Valves 2 and 3 (Ontario County); • Mainline Valves 4 and 5 (Yates County); • Mainline Valve 6 (Schuyler County); and, • Interconnect Facility 2/Mainline Valve 7 (Chemung County).	The existing Empire State Pipeline pressure reduction station would be incorporated into this interconnect facility (IF-1/MLV-1). Located at the existing Columbia Corning CS.
4) Construction of six (6) cathodic protection anode beds spaced along the proposed pipeline.	
Algonquin Ramapo Expansion Project (CP06-76-000, previously PF06-5-000)	
1) Replacement of 4.93 miles of existing 26-inch pipeline with a 42-inch pipeline (Rockland County, NY)	Also, construction of new pig launchers and receivers at the terminal facilities.
2) Miscellaneous pipeline and meter station modifications: • Modification of the Ramapo Meter Station 202 (Rockland County, NY); • Relocation of 30-inch mainline valves on parallel Algonquin Loop Line (Rockland County, NY) (MP 0.0 and MP 4.93); and • Modification of Hudson River Valve Site (west bank Hudson River) (Rockland County, NY).	Ramapo station - Piping modifications including the addition of gas heaters and regulator valves at interconnect. Relocate data building and expand station yard and roads, as required. Remove existing 30-inch-diameter mainline valves on parallel Algonquin Loop Line and relocate to new terminal locations for 26/42-inch pipeline replacement HRV site – Remove existing 12-inch valve and 18-inch OD piping and replace with 24-inch OD piping and 24-inch valve.

Table 2.1-1. (cont'd)
Components of the NE-07 Project

Project Component and Proposed Facilities	Status in Relation to Previous FERC Review and Other Remarks
3) Modifications to three (3) existing compressor stations:	
• Hanover (Morris County), NJ - new 40x60-ft building and new Taurus turbine compressor, 7,700 hp;	Also, add a new Emergency Generator in new skid mounted 40x12-ft building. Remove and replace the existing station boiler for fuel gas heater. Install gas coolers on 30-inch discharge piping. Upgrade road. Minor piping modifications.
• Stony Point (Rockland County), NY - replace two existing Centaur 40 turbines (4,700 hp each) with two Taurus 60 turbines (7,700 hp each). Rebuild existing Mars 90 turbine (12,600 hp) to a Mars 100 turbine (15,000 hp); and,	Also, remove and replace existing Emergency Generator. Remove and replace existing station boiler for fuel gas heater. Install new gas cooler system. Minor piping and building modifications. Install approximately 150 ft of new road.
• Southeast (Putnam County), NY – new 70x80-ft building and two new turbines: Taurus 60 (7,700 hp) and Taurus 70 (10,310 hp).	Also, add a new Emergency Generator in a new skid mounted 40x12-ft auxiliary building. Remove and replace existing station boiler for fuel gas system. Install gas coolers. Minor piping modifications. Upgrade road and parking areas.
4) New compressor station in Oxford (New Haven County), CT New Compressor Station with two Mars 100 turbine compressors (15,000 hp each) and a new Taurus 60 turbine compressor (7,700 hp).	Includes all associated ancillary equipment, instrumentation, and controls. Install new gas coolers, four new buildings, access roads, utilities and parking facilities. Note: an alternative site is also being considered, located in Oxford, Connecticut, approximately 1 mile east of the previously proposed site, and 0.85 mile east of the Oxford Airport runway.
5) New meter station at an existing Iroquois Gas Transmission System meter station site in Brookfield (Fairfield County), CT.	Install new meter building and filter separator, minor modifications to existing piping at meter station. Minor site work to upgrade roads and facilities. Note: this is within the same site Iroquois is proposing for their new compressor station in Brookfield, Connecticut.
Iroquois Market Access Project (Docket No. CP02-31-002, previously PF06-6-000)	
1) New compressor station and gas coolers in Brookfield (Fairfield County), CT	Note: Algonquin's proposed new meter station at Brookfield, CT is within the same site Iroquois is proposing for their new compressor station.
2) Installation of gas coolers at existing compressor station in Dover (Dutchess County), NY	

- construction of the Columbia Line A-5 Replacement Project (proposed in Docket No. CP05-19-000.[1] as part of the Millennium Phase I Project. As originally described in Columbia's application, the Line A-5 Replacement Project would involve:
    - replacement of about 8.8 miles of 8- and 16-inch-diameter pipeline segments of the existing Line A-5 Pipeline with 30-inch-diameter pipeline (in Orange and Rockland Counties, New York) between MP 367.9 and MP 376.7 and includes possible route variations (see section 3).
    - modification of three existing M&R stations (the Central Hudson/Tuxedo, Sloatsburg, and Ramapo M&R Stations) to accommodate the larger diameter pipeline; and,
    - Abandonment in place of about 1.0 mile of the existing Line A-5 pipeline.
- construction of a new 15,002 hp compressor station and M&R facilities at a site adjacent to Columbia's existing Corning Compressor Station (MP 190.6) and on property owned by Columbia in Steuben County, New York;
- construction of the Wagoner M&R station in Deer Park, New York;
- upgrading the Ramapo M&R station in Ramapo, New York.

Figure 2.1.1-1 shows the general locations of the facilities proposed for the Millennium Phase I Project. Detailed maps of the proposed facility locations and a compressor station plot plan are in appendix B1. As summarized in tables 2.1-1 and 2.2-1, the principal modifications that Millennium proposes for the Phase I Project, compared to the Millennium Pipeline Project approved in the Millennium Order are:

- Reduction of the diameter of the pipeline from 36 inches to 30 inches;
- Reduction of the Maximum Allowable Operating Pressure (MAOP) from 1,440 to 1,200 pounds per square inch gauge (psig);
- Realignment of a total of 19.0 miles of the approved pipeline route pursuant to environmental condition number 45 of the Interim Order and as a result of discussions with New York State Electric & Gas (NYSEG), where the approved route would parallel NYSEG's overhead powerlines; Millennium and NYSEG have reached a preliminary agreement regarding the siting of the Millennium pipeline near all of NYSEG's facilities. This agreement would require realignment of the Millennium pipeline in three locations:

    1. NYSEG Chemung Variation from MP 198.0 to MP 203.6,
    2. NYSEG Tioga-Broome Variation from MP 232.2 to MP 245.0 and,
    3. NYSEG Delaware Variation from MP 284.4 to MP 284.9.

    These variations are referred to collectively as the "NYSEG Route Variation".

- Rerouting the approved pipeline route for about 5,600 feet between MPs 350.8 and 351.6 to accommodate a planned residential subdivision in the Town of Warwick, Orange County, New York (the Warwick Isle Route Variation, see section 3 for additional information);[2]

[1] Columbia requested that this proceeding be consolidated with the review of the Millennium Phase I Project. Columbia's Line A-5 Replacement Project would be along the easternmost portion of the pipeline route proposed for Millennium's Phase I Project between MPs 367.9 and 376.4, or between the Central Hudson/Tuxedo and Ramapo M&R Stations in Orange and Rockland Counties, New York.

[2] The previously certificated route in this area would have impacted the property owner's ability to implement the approved subdivision plans. In coordination with the surrounding landowners, Millennium has developed the Warwick Isle Route Variation.

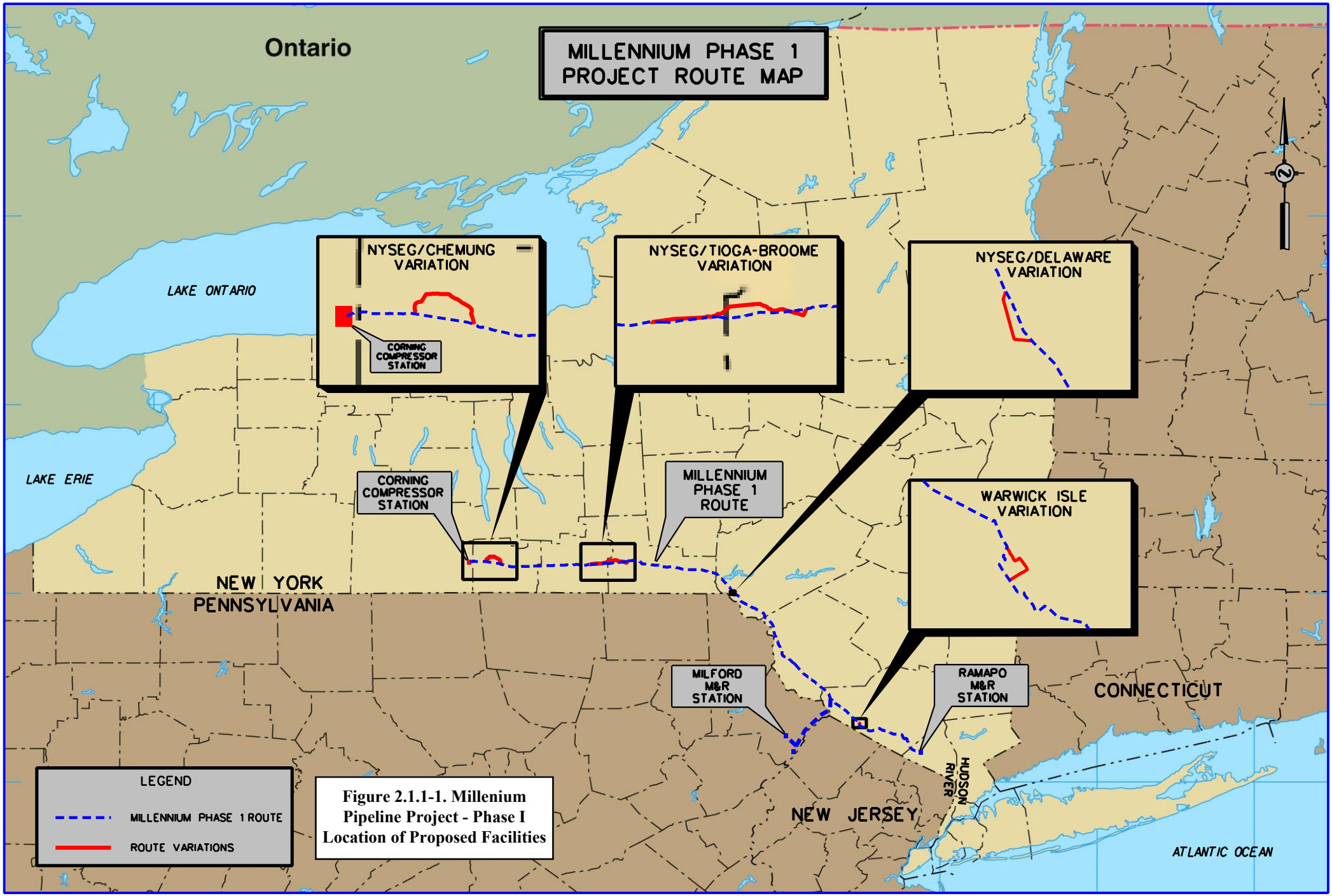


Figure 2.1.1-1. Millenium Pipeline Project - Phase I Location of Proposed Facilities

Table 2.2-1.
Land Requirements for the NE-07 Project

Project Component / Proposed Facilities	Previously Certificated?	Total Length (mi)	Land Affected During Construction / Temporary Acres	Land Affected During Operation / Permanent Acres
Millennium Pipeline Project – Phase I (CP98-150-006 and CP98-150-007)				
181.7 miles of 30-inch pipeline (between previously certificated MPs 190.6 – 376.7) in Steuben, Chemung, Tioga, Broome, Delaware, Sullivan, Orange, and Rockland Counties, NY	(Yes/Part; All except pipeline variations listed below)			
• Pipeline		**181.7 mi**	**2,021.8** (included in pipeline acreage)	**1,142.3** (included in pipeline acreage)
• Extra Workspace Areas			**95.7**	**0.0**
• Access Roads			**226.1**	**0.0**
• Pipe Storage/Contractor Yards				
Above totals include the following breakdown by proposed variations (4) and pipeline replacements (2):				
Chemung Variation (MP 198.0 – 203.6)	No			
a) Pipeline		5.89 mi	52.90	35.40
b) Extra Workspace Areas			13.30	0.0
c) Access Roads			0.34	0.0
Tioga–Broome Variation (MP 232.2 – 245.0)	No			
a) Pipeline		13.54 mi	106.27	80.80
b) Extra Workspace Areas			19.83	0.0
c) Access Roads			5.59	0.0
Delaware Variation (MP 284.4 – 284.9)	No			
a) Pipeline		0.52 mi	4.72	3.15
b) Extra Workspace Areas			2.08	0.00
c) Access Roads			0.00	0.00
Warwick Isle subdivision (MP 350.8 – 351.6)	No			
a) Pipeline		1.21 mi	9.66	7.20
b) Extra Workspace Areas			2.04	0.0
c) Access Roads			0.00	0.0
Acquisition from Columbia and use of 7.1 miles of Columbia's existing 24-inch-diameter Line A-5 Replacement Project pipeline (MP 340.5 – 347.7). Within this segment, a short length of existing 10-inch-diameter pipe would be replaced with 24-inch-diameter pipe (MP 343.8-344.0).	No	7.1 mi	1.8	43.0

Table 2.2-1. (cont'd)
Land Requirements for the NE-07 Project

Project Component / Proposed Facilities	Previously Certificated?	Total Length (mi)	Land Affected During Construction / Temporary Acres	Land Affected During Operation / Permanent Acres
Columbia Line A-5 Replacement Project (CP05-19-000)	No			
a) Replacement of approximately 8.8 miles of 8- and 16-inch-diameter segments of the existing Line A-5 Pipeline with 30-inch-diameter pipeline (Orange and Rockland Counties, NY) between MP 367.9 and MP 376.7.	No	8.8 mi	101.8	54.3
- Pipeline			13.7	0.0
- Extra Workspace Areas			11.5	0.0
- Access Roads			12.5	0.0
- Pipe Storage/Contractor Yards				
b) Modification of three existing M&R stations on this segment of Line A-5 to accommodate the larger diameter pipeline:	No			
- Tuxedo/Central Hudson M&R Station		0.32 ac	0.32	0.32 (0 new)
- Sloatsburg M&R Station		0.34 ac	0.34	0.34 (0 new)
- Ramapo M&R Station		0.48 ac	0.48	0.48 (0 new)
c) Abandonment in place of about 1.0 mile of the existing Line A-5 pipeline	No	1.0 mi	0.0	0.0
New compression facilities (totaling 15,002 bhp) at the existing Columbia Gas compressor station at Corning, Steuben County, NY	No	N/A	12.5	6.5
New Wagoner M&R Station in Deer Park, Orange County, NY	Yes	N/A	0.5	0.5
Upgrades to the existing Ramapo M&R Station in Ramapo, NY	Yes	N/A	1.5	1.5
Modification of waterbody crossing procedures for seven (7) major waterbodies	No	N/A	(included in pipeline acreage above)	(included in pipeline acreage above)
Total for Millennium Phase I Project			**2,358.1**	**1,150.8**

Table 2.2-1. (cont'd)
Land Requirements for the NE-07 Project

Project Component / Proposed Facilities	Previously Certificated?	Total Length (mi)	Land Affected During Construction / Temporary Acres	Land Affected During Operation / Permanent Acres
Empire Connector Project (Docket No. CP 06-5-000, previously PF04-16-000)				
77.9 miles of 24-inch-diameter pipeline in Ontario, Yates, Schuyler, Chemung, Steuben Counties, NY	No			
• Includes replacement of 1.4 miles of existing Empire State Pipeline at north end of Project.				
- Pipeline		77.9 mi	839	472
- Extra Workspace Areas			24.0	0.0
- Temporary Access Roads			13.3	0.0
- Permanent Access Road			9.7	1.2
- Pipe Storage/Contractor Yards/Offices/Trailers			59.0	0.0
New compressor station (totaling 20,620 hp) in Oakfield, Genesee County, NY	No	N/A	19.0	6.7
Seven (7) mainline valves and two interconnect facilities:	No			
• Interconnect Facility 1/Mainline Valve 1 (Ontario County);			0.5	0.2
• Mainline Valves 2 and 3 (Ontario County);			0.04	0.02
• Mainline Valves 4 and 5 (Yates County);			0.04	0.02
• Mainline Valve 6 (Schuyler County); and,			0.02	0.01
• Interconnect Facility 2/Mainline Valve 7 (Chemung County).			0.6	0.3
Six (6) new cathodic protection anode beds spaced along the proposed pipeline.	No	0.45 mi total	4.1	4.1
	Total for Empire Connector Project		**969.3**	**480.5**
Algonquin Ramapo Expansion Project (CP06-76-000, previously PF06-5-000)				
Replacement of 4.93 miles of existing 26-inch-diameter pipeline with a 42-inch-diameter pipeline (Rockland County, NY) and construction of new pig launchers and receivers at the terminal facilities.	No			
• Pipeline		4.93 mi	60.5	44.1
• Extra Workspace Areas			5.4	0.0
• Access Roads			0.2	0.2
• Pipe Storage/Contractor Yards			TBD	0.0

Table 2.2-1. (cont'd)
Land Requirements for the NE-07 Project

Project Component / Proposed Facilities	Previously Certificated?	Total Length (mi)	Land Affected During Construction / Temporary Acres	Land Affected During Operation / Permanent Acres
Miscellaneous pipeline and meter station modifications:	No			
• Modification of the Ramapo Meter Station 202 (Rockland County, NY);		N/A	1.4	1.4
• Relocation of 30-inch mainline valves on parallel Algonquin Loop Line (Rockland County, NY) (AMP 0.0 and AMP 4.93); and		N/A	0.46	0.46
• Modification of Hudson River Valve Site (west bank Hudson River) (Rockland County, NY).		N/A	0.55	0.55 (0 new)
Modifications to three (3) existing compressor stations:	No			
• Hanover (Morris County), NJ - new 40 by 60 foot building and new compressor unit (7,700 hp);		N/A	12.1	4.3 (0 new)
• Stony Point (Rockland County), NY - replace and rebuild compressor units; and,		N/A	12.2	11.5 (0 new)
• Southeast (Putnam County), NY – new 70 by 80 foot building and two new compressor units (totaling 18,010 hp)		N/A	12.3	8.8 (0 new)
New compressor station (37,700 hp) in Oxford (New Haven County), CT	No	N/A	17.8	17.8
New meter station at an existing Iroquois Gas Transmission System meter station site in Brookfield (Fairfield County), CT.	No	N/A	0.8	0.8
	Total for Ramapo Expansion Project		**123.7**	**86.9**
Iroquois Market Access Project (Docket No. CP02-31-002, previously PF06-6-000)				
New compressor station and gas coolers in Brookfield (Fairfield County), CT.	Yes (except gas coolers)	N/A	7.3 (0.3 ac of this is temp, would be allowed to revert)	7.0 (3.3 ac of this within existing sales meter fenceline)
Installation of gas coolers at existing Dover Compressor Station in Dover (Dutchess County), NY.	No	N/A	2.7 (1.0 ac of this is temp, would be allowed to revert)	1.7 (0.6 ac of this inside Dover C-Sta. fenceline)
	Total for Market Access Project		**10.0**	**8.7**

- Acquisition from Columbia of about 7.1 miles of 24-inch-diameter pipeline between MPs 340.5 and 347.7 in Orange County, New York, rather than replacing the pipeline with larger diameter pipeline through this area. This is in response to environmental condition number 34 of the Interim Order. Millennium was required to develop a contingency plan for the crossing of the Neversink River (MP 341.0), in consultation with the FWS, the NYSDEC, and The Nature Conservancy (TNC); in the event that the proposed bore construction technique for crossing this waterbody could not be completed. This consultation was required due to the presence of federally endangered species in the vicinity of this crossing, and minimizing disturbance to the streambed was desired. After conducting a site-specific detailed engineering analysis, Millennium concluded that a conventional bore under the Neversink River would not be practicable. However, Millennium also conducted a separate analysis of the anticipated market demand for the Phase I Project and the proposed construction and operation of the Phase I Project with a smaller pipeline diameter and a lower MAOP. It concluded that under these operating conditions, it could leave the existing 24-inch-diameter pipeline in place and include it within the Millennium pipeline system. Use of this segment of existing Line A-5 pipeline would eliminate the need for the installation of a new pipeline across the Neversink River and for construction along a total of approximately 7.1 miles of ROW.
- Construction of a new compressor station consisting of 15,002 bhp of compression, as well as M&R facilities, within the boundaries of property owned by Columbia and already occupied in part by Columbia's Corning Compressor Station. Columbia would retain ownership of the Corning Compressor Station. Millennium would own and operate the new compression facilities, which would be built adjacent to Columbia's compressor station.
- Use of alternative construction techniques/procedures for crossing seven (7) waterbodies: Owego Creek, Nanticoke Creek, Susquehanna River, West Branch Delaware River, East Branch Delaware River, Wallkill River, and Pochuck Creek, in response to meetings with TNC, FWS, NYSDEC and COE. Millennium had previously proposed to cross several of these waterbodies using a horizontal bore technique. However, after additional engineering analysis, Millennium concluded that this method may not be practicable at these seven waterbodies.

Millennium anticipates that the Phase I Project would be completed and in service by November 1, 2007. Pending the receipt of all appropriate federal and state authorizations, Millennium plans to begin mobilization for project construction late in 2006, and if feasible (based on issuance of the Commission's authorization to construct and other required authorizations) would construct the segment between MPs 337.9 and 359.3 (which includes the 7.1-mile-long segment of Columbia's Line A-5 that would be reused/remain in service), several additional waterbody crossings (East Branch Delaware River, West Branch Delaware River, Mongaup Reservoir, Chenango River, Pochuck Creek, Wallkill River, and Wheeler Creek), the Interstate-84 Crossing, and the M&R Stations in 2006. Millennium anticipates that it would construct the remaining facilities between April and November 2007, including pipeline from MP 190.6 to MP 337.9, and MP 359.3 to MP 376.7. Millennium anticipates that the majority of the cleanup and restoration work would also be completed by November 1, 2007. However, depending on prevailing weather conditions, some of the final restoration and revegetation work may take place during the following growing season (2008).

Millennium anticipates dividing the segment of the project that is proposed for the 2006 construction season into two mainline construction spreads or teams: Spread 5 (MP 337.9 to 347.8; 150 field personnel) and Spread 6 (MP 347.8 to MP 359.3; 300 field personnel), plus

separate mini-crews ranging between 20 and 100 field personnel to construct each of the river crossings, the Interstate 84 crossing, and the M&R stations. For the 2007 construction season, Millennium anticipates mobilizing six mainline construction spreads: Spread 1 (MP 190.6 to MP 245.8; 600 field personnel), Spread 2 (MP 245.8 to MP 285.5; 600 field personnel), Spread 3 (MP 285.5 to MP 311.7; 600 field personnel), Spread 4 (MP 311.7 to MP 337.9; 600 field personnel), Spread 7 (MP 359.3 to MP 364.3; 200 field personnel), and Spread 8 (MP 364.3 to MP 376.6; 300 field personnel). In addition, Millennium would use separate mini-crews ranging between 30 and 100 field personnel to construct the Corning Compressor Station, the Wagoner M&R Station, upgrades to the Ramapo M&R Station, and the major/larger waterbody crossings.

2.1.2 EMPIRE CONNECTOR PROJECT

The Empire Connector Project would involve:

- Construction of about 78 miles of 24-inch-diameter pipeline from an interconnection with the existing Empire State Pipeline at SMP[3] 91.0 near the Town of Victor in Ontario County, through Yates, Schuyler, Chemung, and Steuben Counties, New York, where it would interconnect with the Millennium Pipeline at Columbia's existing Corning Compressor Station.
- Replacement (lift and lay) of approximately 1.4 miles of the existing Empire State Pipeline at the northwest end of the project in Ontario County.
- Relocation and replacement of an existing pressure reduction station at SMP 92.4 with a new pressure reduction station at CMP[4] 0.0 of the Empire Connector Pipeline. About 180 feet of pipeline would be constructed to connect the new lift and lay pipeline to the new pressure reduction station and about 255 feet of discharge pipeline would be constructed to discharge the reduced pressure gas to the eastern end of the Empire State Pipeline that operates at 1000 psig. The existing pipeline between the points of interconnection for the new lines and the pressure reduction station would be purged and capped and remain in place.
- Construction of a new compressor station in Oakfield, Genesee County, New York (near Empire State Pipeline's existing SMP 47.0). The station would consist of two centrifugal turbine-driven compressor units, each rated at approximately 10,310 hp, for a total of 20,620 hp. The new compressor station would be connected to the existing Empire State Pipeline through new suction and discharge pipelines. The station's other components and equipment would include:
    - Three buildings: compressor building, auxiliary building, and meter building, built on reinforced concrete foundations; and,
    - Valves, fuel gas/start gas equipment, heating equipment, air systems equipment, tanks and pumps (four fuel storage tanks, one waste oil tank, and sump pumps), auxiliary piping, electrical equipment including back-up generator, system control equipment (to allow automatic and manual control and monitoring of the station and supervisory control and data acquisition [SCADA] systems), site security and safety.

[3] "SMP" refers to mileposts on Empire's existing pipeline.

[4] "CMP" refers to mileposts on the Empire Connector Pipeline.

- A new, 20-foot-wide, 2,000+-foot-long permanent access road would be constructed from Lockport Road to the compressor station.

- Construction of seven (7) mainline valves (used to stop the flow of gas and to isolate sections of the pipeline during maintenance and repair activities) at sites located along the proposed pipeline ROW with spacing consistent with the requirements of 49 Code of Federal Register (CFR) part 192.
- Construction of an interconnect facility at CMP 78.2, to connect with the proposed Millennium Phase I Project at the site of Columbia's existing Corning Compressor Station .
- Construction of six cathodic protection anode beds spaced along the proposed pipeline to provide corrosion protection. Each cathodic protection area would include a connection to an electrical service line, a connection to the pipeline, and the underground installation of a header cable with 20 to 25 anodes at 15 foot spacing. These facilities would each require an area approximately 50 feet wide by 600 feet long for installation.

Figure 2.1.2-1 shows the general locations of the facilities proposed as part of the Empire Connector Project. Detailed maps of the proposed facility locations, a compressor station plot plan, conceptual mainline valve site plans, conceptual interconnect site plans, and cathodic protection areas are in appendix B2.

Empire anticipates that construction would commence in the Spring of 2007, pending the receipt of all appropriate federal and state authorizations, and be completed in November 2007, with the possible exception of final restoration of portions of the construction ROW. If restoration is not completed by October 1, Empire would develop and implement a winterization plan to stabilize and monitor disturbed areas through the winter and subsequent spring thaw. In this event, all restoration activities would be completed no later than the Spring of 2008.

Empire anticipates that the construction of pipeline facilities would require two construction spreads. Separate construction crews are anticipated for the construction of the compressor station and the lift-and-lay pipeline replacement segment. Empire stated it would cross environmentally sensitive resources (e.g., waterbodies with designated fisheries) and agricultural lands (i.e., topsoil management) in accordance with state timing restrictions where applicable. This could require the use of additional "tie-in" crews working separately from the main construction spreads to connect pipeline segments together where areas have been skipped due to construction timing or other restrictions.

2.1.3 ALGONQUIN RAMAPO EXPANSION PROJECT

The Algonquin Ramapo Expansion Project would involve:

- Replacement of about 4.9 miles of Algonquin's existing 26-inch-diameter mainline with a 42-inch-diameter pipeline. This replacement would begin at the Algonquin/Columbia interconnection in Ramapo, New York, extend northeast towards the Stony Point Compressor Station along the existing Algonquin ROW, and end at a new terminal in the Town of Haverstraw, New York. The MAOP for the 42-inch-diameter pipeline segment would be 850 pounds per square inch (psi). After installation of the new 42-inch-diameter pipeline along this 4.9-mile-long segment of Algonquin's ROW, natural gas flow from Algonquin's 30-inch-diameter pipeline would crossover to the new 42-inch-

diameter pipeline. Natural gas flow in Algonquin's remaining 26-inch-diameter pipeline would crossover into the 30-inch-diameter pipeline along this segment.

- Modification of facilities at Algonquin's existing M&R Station 202 (Columbia Gas Meter Station) in the Town of Ramapo, Rockland County, New York, including:
  - piping and regulator valve modifications to accommodate the crossover;
  - the addition of gas heaters;
  - regulator valves;
  - a 30-inch-diameter pig receiver installed on the 26-inch-diameter mainline;
  - a 48-inch-diameter pig launcher installed on the 42-inch-diameter replacement pipeline; and
  - a new 8-foot by 10-foot Remote Terminal Unit (RTU) building to house the RTU and battery back-up systems as well as instrumentation for remote operation.

    The terminal facilities at the existing Columbia interconnect would allow split flow into Algonquin's 26/42-inch- and 30-inch-diameter mainlines. The Ramapo Interconnect/Meter Station 202 is currently operating as a delivery point by Algonquin to the Columbia system. Columbia is proposing to modify the existing meter station to allow for reverse flow to Algonquin. These modifications would include:
  - Installation of new gas heaters and regulator valves to enable receipt of gas from Columbia; and
  - Expansion of the existing station yard to accommodate the installation of these new facilities.
- New pig launcher and pig receiver on the terminal facility/Algonquin interconnect at Haverstraw, New York, including:
  - a new 30-inch-diameter pig launcher on the 26-inch-diameter mainline;
  - a new 48-inch-diameter pig receiver on the new 42-inch-diameter pipeline segment;
  - crossover piping with various valves to transfer gas from the new 42-inch-diameter pipeline segment back into the existing 30-inch-diameter loop line; and
  - crossover piping with various valves to transfer gas from the existing 30-inch-diameter loop pipeline back into the existing 26-inch-diameter mainline.
- Relocation of the existing 26-inch and 30-inch mainline valves (MLVs) No. 13 and No. 14 to the new terminal locations. The corresponding 30-inch-diameter valves on the existing Algonquin 30-inch-diameter pipeline would also be relocated to the new terminal locations.
  - Approximately 600 feet of new, permanent access road would be constructed at the new terminal facility in Haverstraw, New York (AMP 4.93). In addition, a new 12-inch-diameter remote blow-off line, including an about 150-ft road extension, would also be required at this location due to the proximity of high-voltage, overhead power lines.

EMPIRE STATE PIPELINE

NEW VICTOR INTERCONNECT TO EMPIRE STATE PIPELINE

COMPRESSOR STATION 42 MILES WEST IN OAKFIELD, GENESEE COUNTY (SEE INSET BELOW)

SECTION OF EMPIRE STATE PIPELINE TO BE REPLACED

WAYNE CO.
ONTARIO CO.

MONROE CO.
ONTARIO CO.

SENECA CO.
ONTARIO CO.

EMPIRE CONNECTOR PIPELINE

LIVINGSTON CO.
ONTARIO CO.

ONTARIO CO.
YATES CO.

SENECA CO.
YATES CO.

LIVINGSTON CO.
STEUBEN CO.

YATES CO.
STEUBEN CO.

EMPIRE CONNECTOR PIPELINE

SCHUYLER CO.
STEUBEN CO.

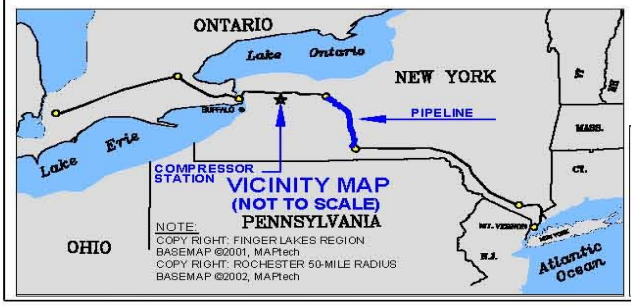
SCHUYLER CO.
CHEMUNG CO.

INTERCONNECT TO MILLENNIUM PIPELINE

PROPOSED MILLENNIUM PIPELINE

COMPRESSOR STATION LOCATION

EMPIRE STATE PIPELINE



0 2 4
SCALE IN MILES

LEGEND

EXISTING 24" EMPIRE STATE PIPELINE

PROPOSED MILLENNIUM PIPELINE

EXISTING UTILITY CORRIDOR

PRIMARY ROUTE

ISSUE	DATE	REVISIONS	BY
C	FEB 2006	FERC SUBMITTAL	H&A
B	JUL 2005	FERC SUBMITTAL	H&A
A	1/17/05	DRAFT FERC SUBMITTAL PRE-FILING	H&A

Empire Pipeline

HALEY & ALDRICH

Figure 2.1.2-1. Empire Connector Project Location of Proposed Facilities

SCALE: AS SHOWN

FEBRUARY 2006

FIGURE 1.2-1

- Modifications at the existing Stony Point Compressor Station, Town of Stony Point, Rockland County, New York. Modifications would occur within the existing station fence, and include:
    - Replacement of two existing 4,700-hp (ISO) Centaur 40 turbines, with two 7,700-hp (ISO) Taurus 60 turbines;
    - Upgrade of an existing, 12,600-hp (ISO) Mars 90 turbine to a 15,000-hp (ISO) Mars 100 turbine;
    - Associated upgrades to the fuel gas system, inlet air and exhaust systems and modification to the existing compressor piping;
    - New gas coolers and noise mitigation would be installed on the station discharge piping. Approximately 100 feet of the discharge piping from the compressors to the coolers would be excavated and recoated for high temperature service;
    - Approximately 150 feet of road would be installed to access the new gas coolers; and,
    - Replacement of the existing emergency generator and fuel gas heaters due to increased requirements from the new units.
- Piping modifications at the existing Hudson River Valve Site to improve throughput by eliminating the flow restriction on existing aboveground and below ground facilities (located on the west bank of the Hudson River in Stony Point, New York). The work activities would be located at the river crossing valves, approximately 150 feet from the river, west of the existing Conrail railroad corridor and West Shore Road/Gray's Mill Road. Activities at this site include:
    - Removal of an existing 12-inch-diameter valve and 18-inch-diameter piping between the 26-inch-diameter mainline and an existing 24-inch-diameter auxiliary line and replacing it with 24-inch-diameter valves and piping. Approximately 100 linear feet of pipe would be removed and replaced.
- Modifications at the existing Southeast Compressor Station, Town of Southeast, Putnam County, New York. Modifications would occur on the existing station property, and include:
    - Installation of two new turbine-compressors: one new 7,700-hp (ISO) Taurus 60 unit, and one new 10,310-hp (ISO) Taurus 70 unit;
    - Construction of a new compressor building (approximately 70 feet x 80 feet);
    - New suction and discharge piping to the new compressor units, and extension of the existing enclosure for unit valves and ancillary equipment;
    - New gas coolers and noise mitigation would be installed on the existing discharge piping. Approximately 150 feet of the existing discharge piping would be excavated and recoated for high temperature service;
    - Approximately 150 feet of new road would be installed to access the new coolers; and,
    - A new skid-mounted building (approximately 12 feet x 40 feet) would be installed to house a new 350 KW emergency generator, battery back-up system and power distribution system for the new compressor units, gas coolers and other ancillary equipment. The existing boilers for the fuel gas system would be

replaced due to increased heating requirements for the new units. The existing station roads would be modified to accommodate the new compressor building and other modifications.

- New compressor station, Oxford Compressor Station, located in the Town of Oxford, New Haven County, Connecticut. The new station would include:
  - Three new turbine-compressors: two new 15,000-hp (ISO) Mars 100 turbines, and one new 7,700-hp (ISO) Taurus 60 turbine;
  - New compressor building (about 80 feet by 150 feet);
  - Other new buildings, including office/warehouse building (about 70 feet by 65 feet), a control/auxiliary building (about 80 feet by 40 feet), and a garage/maintenance building (about 50 feet by 60 feet). Algonquin would work with local officials to develop acceptable building exteriors that would be compatible with other commercial/light industrial structures in the area;
  - Additional equipment includes an emergency generator, an air compressor, lube oil coolers, fuel gas heater, station control system, emergency shut down system and normal domestic utility systems for heating, cooling and lighting of the buildings;
  - New tie-ins would be made to the existing Algonquin mainline pipelines that pass through the property and new suction and discharge piping would be installed from the pipelines to the compressors. Algonquin plans to install enclosures around the unit valves, air inlet and exhaust systems at the compressor building to reduce noise and improve the appearance of the facility;
  - Gas coolers would be installed on the station discharge piping;
  - About 700 feet of new access road would be installed from a new entrance off Airport Road in Oxford to the station. Additional roads and parking areas would be installed to connect the buildings inside the station;
  - A new connection would be made to access commercial power in the area. A new water well and septic system would also be installed for domestic purposes; and,
  - New security fencing would be installed around the station and all sensitive above ground facilities, and landscaping would be added to improve the appearance of the facility.
  - Algonquin states that this new station is required to recover pressure losses that would occur on the Algonquin system downstream of the Southeast Compressor Station and allow transportation of the additional volumes of natural gas proposed for the project. The new Oxford Compressor Station would also provide enhanced reliability and flexibility for Algonquin's existing shippers and customers by providing back-up compression capability on the Algonquin system.
- Modification of the existing Hanover Compressor Station in the Town of Hanover, Morris County, New Jersey, would include:
  - a new compressor building (40 feet by 60 feet) and courtyard to house a new, 7,700hp Taurus 60 turbine and ancillary equipment and controls;

- a new gas cooler system for discharge into the existing 30-inch-diameter Algonquin loop in this area.
- new foundations, changes to the existing station yard, and about 150 feet of new permanent access road. A new skid-mounted auxiliary building (about 40 feet by 12 feet) also would be installed to house a new emergency generator, battery back-up system, and the power distribution for the new compressor, gas coolers and other ancillary equipment; and
- Modification of the existing roads and parking areas to accommodate the new facilities.

- New meter station at the existing Iroquois Brookfield Meter Station (M&R station #251) site in Brookfield, Fairfield County, Connecticut. The new meter station would consist of:
  - a new meter building containing two 12-inch-diameter and one 4-inch-diameter ultrasonic meters, valves, piping, instrumentation and controls;
  - new filter-separator and associated liquid handling facilities, including piping and foundations; and,
  - minor modifications to the existing station roads.

Figure 2.1.3-1 shows the general locations of the facilities proposed as part of the Ramapo Expansion Project. Detailed maps of the proposed facility locations and aboveground facility plot plans are in appendix B3.

Algonquin anticipates that construction of these proposed project components would commence in the second quarter of 2007, pending the receipt of all appropriate federal and state authorizations, and all construction would be completed, by the fourth quarter of 2007. Algonquin anticipates using one construction spread for the pipeline replacement with a total workforce of approximately 150 personnel. Separate contractors with a workforce of approximately 50 to 60 personnel each would be responsible for the construction activities at each compressor station site. The duration of construction for the aboveground facilities would be about six months.

2.1.4 IROQUOIS MARKETACCESS PROJECT

The Iroquois MarketAccess Project would involve:

- Construction of a new transfer compressor station in the Town of Brookfield, Fairfield County, Connecticut. Iroquois owns two parcels on High Meadow Road in Brookfield, Connecticut, which together total 68.3 acres. One parcel is about 65.0 acres in size. The second, 3.3-acre parcel, contains the existing Brookfield Sales Meter Station and Algonquin's M&R Station # 251. The proposed facilities at this location would include:
  - a new compressor building to house a 7,700 hp compressor;
  - new control/utility buildings, a storage building, a local control building, a cooler MCC building, a small emergency generator, and a domestic gas building;
  - gas coolers to accommodate deliveries of natural gas. The gas coolers would consist of four bays (each bay consisting of two fan units), with a combined footprint of about 50 feet by 60 feet, and would be about 20 to 25 feet in height;

- associated paved parking and access areas, including a 500-ft-long driveway for vehicular access between High Meadow Road and the compressor station;[5] and,
- new chain link fence to enclose the new compressor station.

- New gas coolers at Iroquois's existing Dover Compressor Station in Dover, Duchess County, New York. This existing Dover Compressor Station is within a 45.89-acre parcel owned by Iroquois and accessed from Dover Furnace Road (County Road 26).
  - The gas coolers would be installed outside of the existing fenced compressor station, about 100 feet east of the fence line. The fence line would be expanded to incorporate these facilities.
  - The proposed cooling facilities would consist of eight bays, with a combined footprint of about 50 feet by 120 feet, and would be about 20 to 25 feet in height. A cooler local control building would be installed adjacent to the coolers.

Figure 2.1.4-1 shows the general locations of the facilities proposed as part of the Iroquois MarketAccess Project. Detailed maps of the proposed facility locations and aboveground facility plot plans are in appendix B4.

Iroquois anticipates that construction of these proposed facilities would commence in April 2007, pending the receipt of all appropriate federal and state authorizations, and be completed in October 2007. Iroquois anticipates organizing two construction spreads for this project with a total workforce of approximately 100 personnel. One spread would be responsible for construction of the Brookfield Compressor Station and the other would be responsible for the construction of the gas coolers at the Dover Compressor Station.

2.2 LAND REQUIREMENTS

The land requirements for construction and operation of the proposed NE-07 Project are summarized in the following subsections. Table 2.2-1 details the land requirements by project component.

Each pipeline company proposes using certain amounts of workspace to construct their respective projects, and has shown the locations and amounts of proposed workspace and permanent land requirements on construction alignment sheets filed with the Commission. The amount of construction workspace in specific areas varies as necessary to accommodate equipment needs, site conditions, and safety requirements. The land requirements for pipeline construction typically consist of a nominal construction ROW of a prescribed width (usually 75 feet), plus temporary extra workspace areas (also referred to as additional temporary workspace [ATWS] areas) outside the nominal construction ROW. These ATWS are where additional space may be required to facilitate construction across roads, railroads, rivers, waterbodies, wetlands; for crossovers of existing pipelines; in areas of side slope, cultivated agricultural land (to accommodate storage of topsoil); and to accommodate equipment turnaround areas. Typically, each extra workspace would be between 100 and 150 feet long and between 15 and 75 feet wide, and would be situated on the working side of the construction ROW. Similarly, in areas where the ROW may be restricted (such as near residences or other sensitive resource areas), the temporary construction ROW may be reduced to minimize impacts on these resources.

[5] The road would be built by improving the existing roadbed into the property. In addition, paved access would be constructed from the new compressor station facilities to the existing meter station.

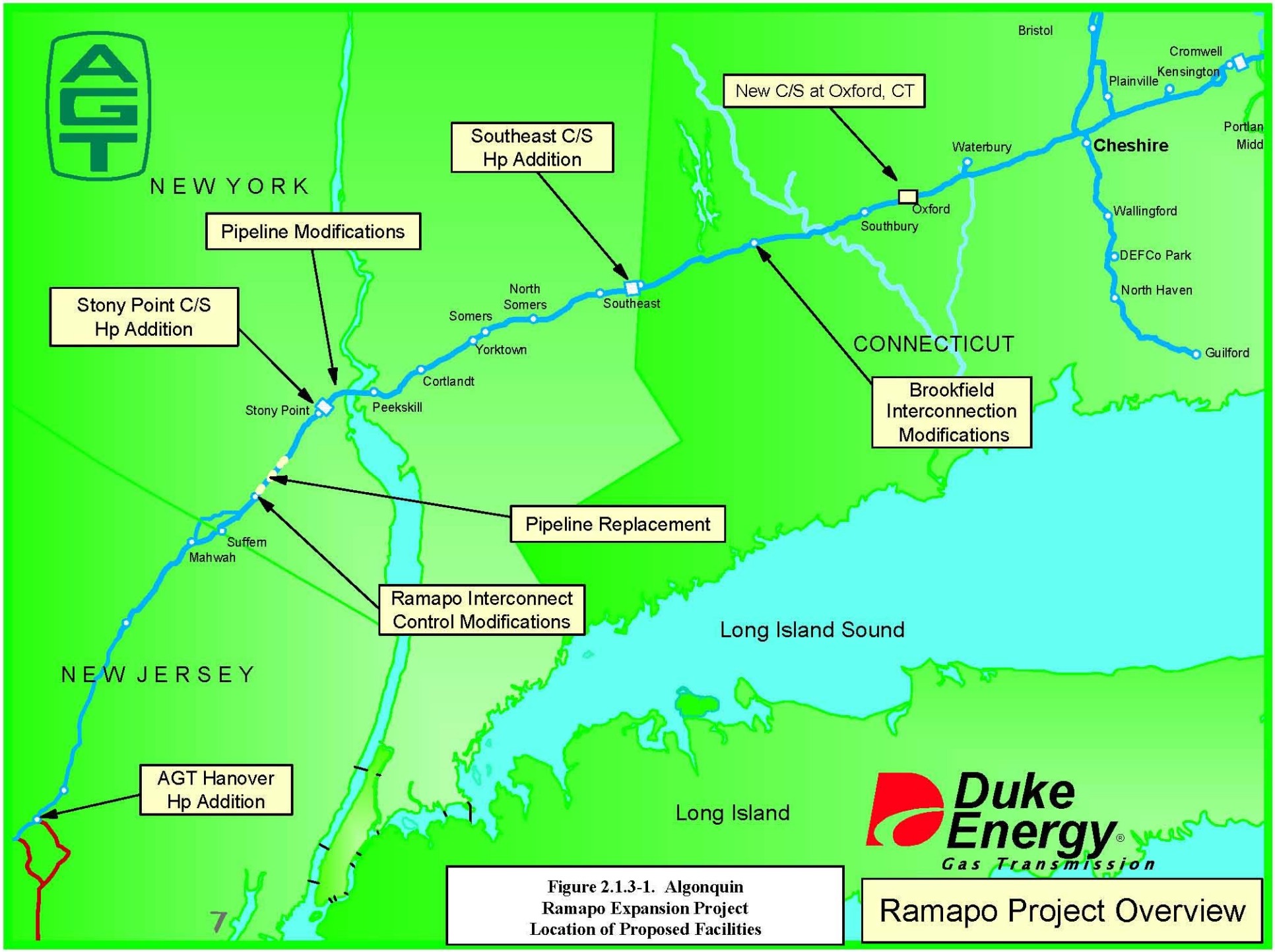


Figure 2.1.3-1. Algonquin Ramapo Expansion Project Location of Proposed Facilities

Aboveground facilities would either be adjacent to and/or within the operational ROW (compressor stations, M&R stations, blowdown valves) or within the operational ROW (mainline valves and pig launchers/receivers).

Project construction would also require disturbance in areas outside the construction ROW for pipeline and aboveground faculties. These areas would include temporary and permanent access roads and areas used for pipe storage/contractor yards. Although access to the construction ROW would generally be from existing public roads and along the construction ROW, some identified private roads would be used for access to the construction ROW. These may require minor grading or improvements to support construction traffic. The applicants have also identified areas that would be used as pipe storage/contractor yards. These yards are typically located on level sites in open or commercial areas near construction work areas.

2.2.1 MILLENNIUM PIPELINE PROJECT – PHASE I AND COLUMBIA LINE A-5 REPLACEMENT PROJECT

Millennium would use a nominal 75-foot-wide pipeline construction ROW plus extra workspaces identified in specific locations to facilitate construction. Following construction, Millennium would maintain a 50-foot-wide permanent ROW along its pipeline. Detailed cross-sections, showing the pipeline within the proposed construction and operational rights-of-way, are in appendix C.

Similarly, for the Columbia Line A-5 Replacement Project, a 75-foot-wide construction ROW would be used and 50-foot-wide permanent ROW would be maintained. Approximately 90 percent of the Line A-5 Replacement pipeline length would be constructed as lift-and-lay of the existing pipeline, thereby minimizing the amount of new ROW required. As stated in section 1, Millennium would construct Columbia's Line A-5 Replacement Project as part of its Phase I Project. The construction, restoration, operation, and maintenance procedures proposed by Millennium would apply to the Line A-5 project, too.

Both existing public and private roads would be used to reach construction workspaces. Where new access roads are required, Millennium would use previously disturbed areas if available. Access roads may need to be graded up to a width of 25 feet with additional width at turns and at entrances to public roads. For the previously certificated Millennium Pipeline Project, Millennium had identified (and the Commission approved) 121 private roads that would be used for access to the construction ROW along the pipeline ROW proposed for the Phase I Project. Millennium has identified 17 additional private roads it proposes to use for access to the project area. These additional roads include:

- Two roads in Broome County (MPs 261.2 and 263.2);
- Three roads in Delaware County (MPs 275.8, 277.0, and 291.8);
- Two roads in Sullivan County (MPs 304.9 and 324.8);
- Seven roads in Orange County (MPs 350.9, 351.1, 351.2, 368.8, 369.7, 369.8, and 369.9); and,
- Three roads in Rockland County (MPs 373.3, 375.0, and 376.6).

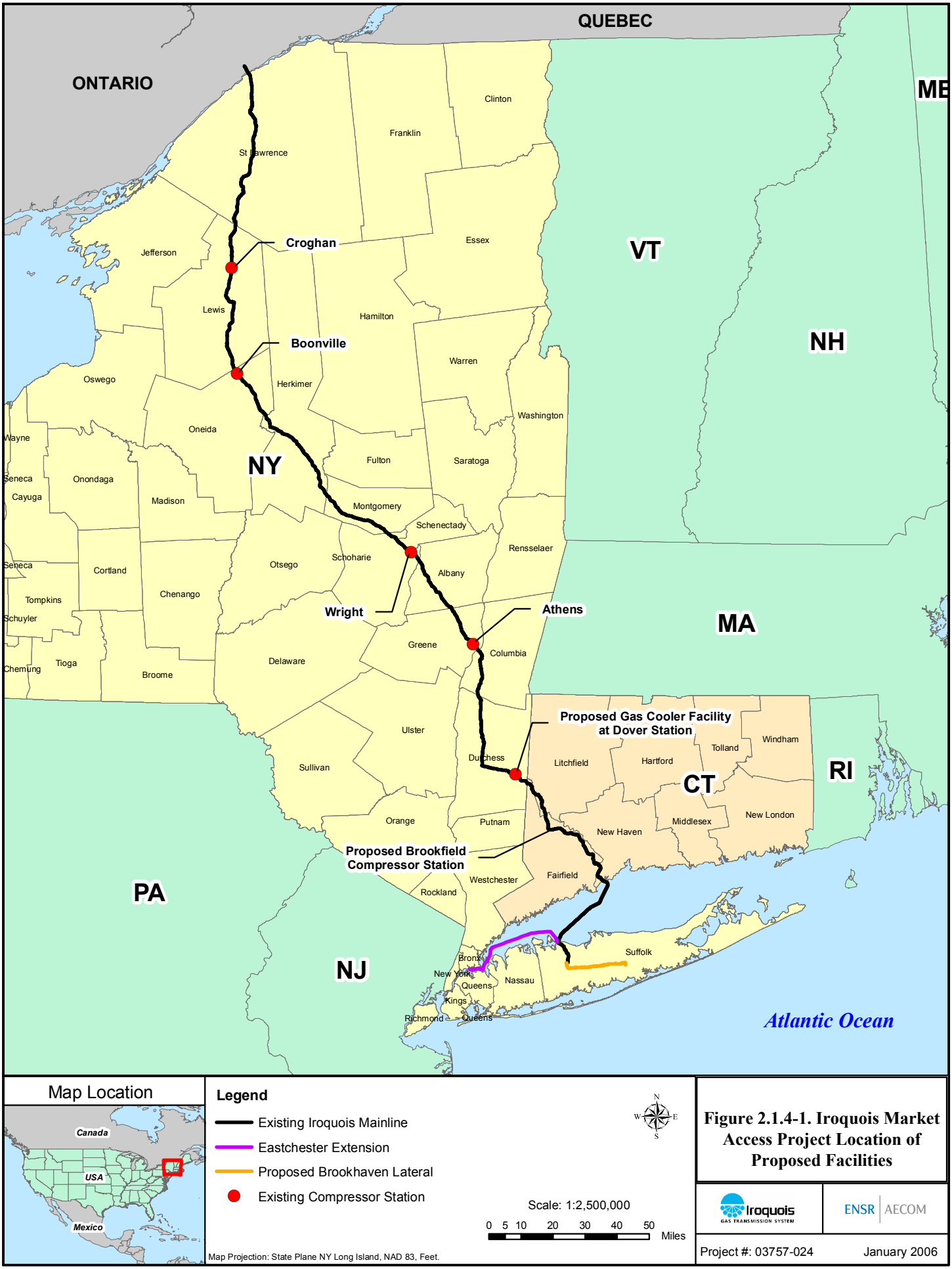


Figure 2.1.4-1. Iroquois Market Access Project Location of Proposed Facilities

As detailed in table 2.2-1, construction of the Millennium Phase I Project (including the Columbia Line A-5 Replacement) would affect a total of about 2,358.1 acres. This total includes workspaces for construction and replacement of the pipelines, modification of the three M&R stations on Line A-5, the Corning Compressor Station, the previously approved Wagoner M&R Station, and modifications to the Ramapo M&R Station. This construction acreage total includes the permanent ROW and temporary workspaces (temporary construction ROW; extra workspace areas; storage/contractors' yards; staging areas; storage areas for slash, brush, logs, and excess rock; and access roads). About 1,207.3 acres of the construction workspace would be temporary workspace that would be restored and allowed to revert to its previous land use following construction. Millennium proposes to use temporarily about 226.1 acres for pipe/contractor/ storage yards it identified in its May 3, 2006 amendment application (see appendix B1 for the locations of these areas).

The project would permanently occupy a total of about 1,150.8 acres, including 1,142.3 acres for the Phase I Project permanent pipeline ROW, 6.5 acres for the Corning Compressor Station, 0.5 acres for the new Wagoner M&R Station to be constructed at the existing M&R station at the interconnection of Columbia's Line K and Line A-5, which would be replaced by the construction of the Phase I Project pipeline at MP 337.9, and 1.5 acres for the upgrades to the Ramapo Meter Station.

2.2.2 EMPIRE CONNECTOR PROJECT

Empire would use a nominal 75-foot-wide construction ROW for installation of the pipeline, with extra workspaces identified in specific locations to facilitate construction. Where the proposed route would parallel existing pipelines, Empire would maintain a minimum separation distance of 25 feet from the existing pipeline. Following construction, Empire would maintain a 50-foot-wide permanent ROW easement along its pipeline. Detailed cross-sections showing the pipeline within the proposed construction and operational rights-of-way are in appendix C.

Empire would use public and private roads to reach construction work areas on a temporary basis. To the extent possible, Empire would use existing access roads and maintain and/or improve them as needed. In addition, Empire would develop and maintain permanent access roads for access to its aboveground facilities. The proposed temporary and permanent access roads are listed in Appendix D. Where new access roads would be required, Empire would use previously disturbed areas if available, and would design and construct them in accordance with local, state, and federal standards and codes (e.g., with respect to specifications, materials, adequate drainage) as applicable.

As detailed in Table 2.2-1, construction of the Empire Connector Project would affect a total of about 969.3 acres, including workspace for construction and replacement of the pipelines, the new Oakfield Compressor Station, seven mainline valves, two interconnect facilities, and six cathodic protection anode beds. This construction acreage includes the permanent ROW and temporary work areas (temporary construction ROW; extra workspace areas; storage/contractors' yards; staging areas; and temporary and permanent access roads). About 488.8 acres of the construction work area would be used temporarily and would be restored and allowed to revert to its previous land use following construction.

The project would permanently affect a total of about 480.5 acres, including 472.0 acres for the permanent pipeline ROW, 6.7 acres for the Oakfield Compressor Station, 4.1 acres total

for the cathodic protection anode beds, and a total of 0.55 acre for the mainline valve and interconnect facility sites.

2.2.3 ALGONQUIN RAMAPO EXPANSION PROJECT

Algonquin would use a nominal 100-foot-wide construction ROW for construction/replacement of the pipeline replacement portion of its project (replacing 4.9 miles of 26-inch-diameter pipeline with 42-inch-diameter pipeline). The proposed replacement pipeline would be typically an in-situ, same ditch, or lift and lay replacement (i.e., within the original trenchline) in the existing Algonquin ROW that is co-located with Algonquin's 30-inch-diameter Loop Line and existing 75-foot-wide permanent easement. Therefore, Algonquin's 100-foot-wide construction ROW would be situated within its existing 75-foot-wide permanent ROW, plus an additional 25 feet of temporary workspace. Following construction, Algonquin would maintain the same width (75 feet) for its permanent ROW. Detailed cross-sections, showing the pipeline within the proposed construction and operational rights-of-way, are in appendix C.

Algonquin identified one 0.73-acre remote staging area for use during construction, near Algonquin MP (AMP) 3.15. At this time, Algonquin has not identified any additional areas for pipe storage and contractor yards in the vicinity of the proposed facilities. Once these areas are identified, Algonquin would perform all necessary surveys and provide the locations to the Commission for review and approval.

Algonquin has identified eight temporary access roads, consisting of a combination of existing paved and gravel roads that would be used to access the pipeline ROW during construction. These proposed access roads would intersect the construction ROW at AMPs 0.11, 0.28, 1.32, 3.18, 4.10, 4.33, 4.68, and 4.94. Algonquin proposes to use these access roads with minor improvements, as necessary, to the surfaces of the roads. Some of these access roads are currently used by Algonquin to access the existing pipeline ROW for maintenance, and are considered permanent access points (access roads at AMPs 0.28 and 4.33). The temporary access road at AMP 0.11 would be used by Millennium and Algonquin during construction. Algonquin has also identified the need to construct one new permanent access road at AMP 4.93. This permanent access road would provide Algonquin with a means of permanent access to the downstream pipeline terminal installation and proposed 12-inch remote blow-off valve at approximate AMP 4.93.

As detailed in table 2.2-1, construction of the Ramapo Expansion Project would affect a total of about 123.7 acres, including workspace for the pipeline replacement, modifications at the three existing compressor stations, construction of the new Oxford Compressor Station, modifications at the Ramapo Meter Station 202, construction of the new Brookfield Meter Station, the relocation of two mainline valves, and the modification of various ancillary piping. This construction acreage includes the permanent pipeline ROW and temporary work areas (temporary construction ROW; extra workspace areas; and staging areas; but does not include the anticipated additional acreage for temporary storage yards that Algonquin would file with the Commission when identified). About 36.8 acres of the construction work area would be used temporarily and would be restored and allowed to revert to its previous land use following construction. General plot plans for the proposed aboveground facilities are in appendix B3.

The project would permanently occupy a total of about 86.9 acres, including 41.1 acres for the permanent pipeline ROW, 1.4 acres at the Ramapo Meter Station (no expansion to existing property), 0.46 acres for construction of remote blow-off valves, 36.6 acres for modifications to the three existing compressor stations (no expansion to existing properties), 17.8

acres of developed land at the new Oxford Compressor Station, and 0.8 acres at the new Brookfield meter station. The construction workspace for the 30-inch mainline valve relocations is included in the workspace for the pipeline replacement component of the project.

2.2.4 IROQUOIS MARKETACCESS PROJECT

Based on its preliminary design, Iroquois estimates that the MarketAccess Project would require a total of about 10.0 acres of workspace for construction of the new Brookfield Compressor Station and installation of the gas coolers at the existing Dover Compressor Station. Of this total, a total of approximately 8.7 acres would be required permanently for operation, including 7.0 acres of developed areas (3.3 of these acres are within the Brookfield Sales Meter Station fence line) at the proposed Brookfield Compressor Station and 1.7 acres of developed area at the existing Dover Compressor Station. All of the proposed construction activities would take place on land owned by Iroquois. Iroquois would restore the work areas following the completion of construction in accordance with our Upland Erosion Control, Revegetation, and Maintenance Plan (Plan) and Wetland and Waterbody Construction and Mitigation Procedures (Procedures). Plot/site plans of the proposed Brookfield transfer compressor station/gas coolers and the proposed gas coolers at the existing Dover Compressor Station are in appendix B4.

Iroquois would use public roads and existing paved driveways on the subject properties to access the work locations. As a result, Iroquois has not proposed to construct any new, off-site access roads for this project.

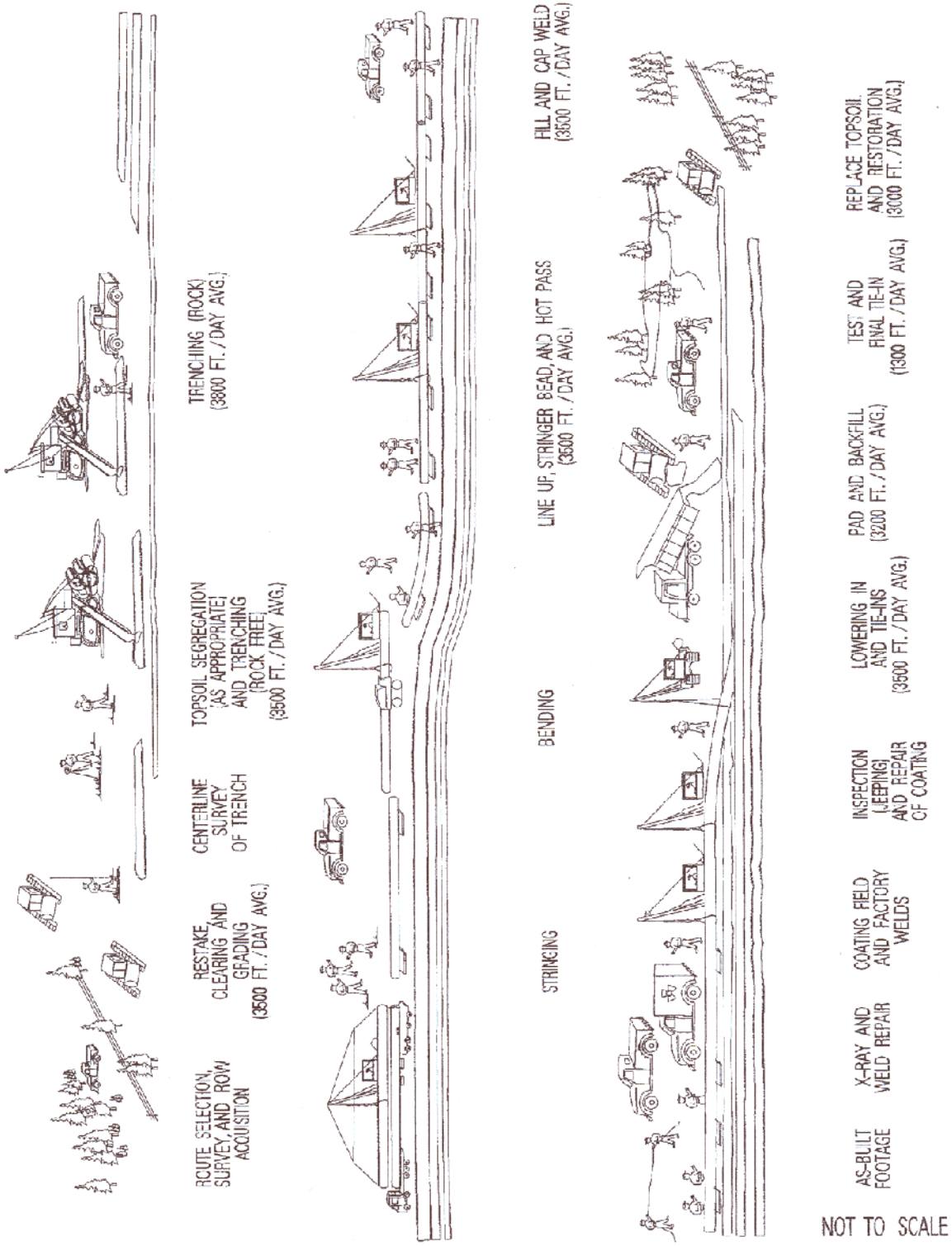
2.3 CONSTRUCTION PROCEDURES

Pipeline construction typically proceeds as a moving assembly line, as shown in figure 2.3-1 and described below. Most activities in the construction sequence proceed at an average rate of about 3,000 to 4,000 feet per day, depending on terrain and the density and/or sensitivity of nearby development and environmental resources. Accordingly, each area along the pipeline would be subject to each phase of pipeline construction activities for a limited timeframe during the construction period. When construction conditions are ideal (e.g., generally flat, few obstacles, and good weather), it is reasonable to assume that a construction spread or team would take about six to eight weeks to work through a one-mile section of pipeline, from clearing and grading to final clean-up and restoration. Additional factors that can affect the construction duration include the weather and extent to which tie-in crews are needed to return to an area to tie-in the pipeline sections (e.g., waterbody crossing).

The following subsections present a general description of the environmental inspection programs that the pipeline companies would implement during construction of the project, as well as company-specific descriptions of the construction procedures that they would use for their proposed project facilities.

2.3.1 ENVIRONMENTAL INSPECTION

The sponsoring pipeline companies would incorporate environmental requirements in their construction documents and agreements with construction contractors, would conduct environmental training for construction workers, and would provide routine environmental monitoring during construction, cleanup, and restoration of the project.



TYPICAL UPLAND PIPELINE CONSTRUCTION SEQUENCE

Figure 2.3-1

To monitor compliance with environmental requirements, each pipeline company would assign one or more environmental inspectors (EIs) to inspect construction activities for the purpose of monitoring, facilitating, and achieving environmental compliance with all permit conditions and requirements during construction. The EIs would be responsible for monitoring construction activities for compliance with the conditions of the Commission certificate and all other applicable federal, state, and local permits. The duties of the EIs include monitoring and reporting on activities such as erosion control, revegetation, wetland and waterbody crossings and signage, environmental permit compliance, threatened and endangered species protection, and fencing at environmentally sensitive sites.

Before construction begins, the pipeline companies would conduct environmental training for the EIs to familiarize them with the specific conditions and issues for this project. Separate training of contractor personnel would also be performed to familiarize construction personnel with the environmental requirements of this project.

The Commission also would assign monitors to inspect construction and restoration of the project. For larger projects with multiple spreads, the Commission typically assigns a team of two monitors during construction (and one inspector during restoration) to each of the longer spreads, or to two or three spreads if the spreads are shorter in length. The inspection frequency on each spread varies, but can be as often as every week during the early phases of construction, to once or twice a month during later phases of construction, to every month or 6 to 8 weeks during restoration. The frequency of inspections on each spread depends on the problems observed during previous inspections and the sensitivity of the resource being affected. For example, inspection frequency may increase on spreads where numerous problems have been identified, when sensitive waterbodies or wetlands are being crossed, or when landowners or regulatory agencies have identified concerns with construction or restoration. The duration of each inspection varies from 2 to 3 days to 1 week.

The Commission has also implemented a more reactive and comprehensive environmental inspection program, in which third-party environmental monitors (reporting directly to the FERC project manager) are assigned full-time (6 days a week, 10 hours a day) to specific spreads. The monitors would have limited authority to make field decisions about modifications to construction procedures that are defined in the terms of the third-party contract.

Because of the magnitude and complexity of this project, **we recommend:**

- **Each NE-07 Project applicant hire and fund a third-party contractor, to work under the direction of the Commission staff, for the sole purpose of monitoring compliance with the environmental conditions attached to the orders for their respective projects, including all measures proposed by the applicants. A draft monitoring program should be developed by the applicants and filed with the Commission for review and approval of the Director of Energy Projects (OEP), along with a proposal from potential contractors that would be available to provide the monitoring and reporting services. The monitoring program should include the following elements:**

  a. the employment by the contractor of one to two full-time, on-site monitors per construction spread, plus additional monitors as warranted for construction at aboveground facilities;

b. the employment by the contractor of a full-time compliance manager to direct and coordinate with the monitors, manage the reporting systems, and provide technical support to the Commission staff;
c. a systematic strategy for the review and approval by the contract compliance manager and monitors of variance requests for certain construction activities as may be required, based on site-specific field conditions;
d. the development of an Internet web site for the posting of daily or weekly inspection reports submitted by both the third-party monitors and each company's environmental inspectors; and,
e. a discussion of how the monitoring program could incorporate and/or be coordinated with the monitoring or reporting that may be required by other federal and state agencies.

The Commission's monitors are responsible for inspecting the project to ensure that it is being constructed in compliance with the environmental conditions of the Commission certificate issued for the project. They are not responsible for any permit requirements issued by other agencies unless this responsibility is agreed to as part of the overall monitoring program in consultation with other federal and state agencies as noted above.

2.3.2 PIPELINE CONSTRUCTION PROCEDURES

The pipeline and aboveground facilities would be designed, constructed, operated, and maintained in accordance with:

- U.S. Department of Transportation (USDOT) regulations in 49 CFR 192, "Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards;" and

- Title 18, CFR 380.15, "Siting and Maintenance Requirements."

In addition, the applicants would implement the construction and restoration procedures identified our Upland Erosion Control, Revegetation, and Maintenance Plan (Plan) and Wetland and Waterbody Construction and Mitigation Procedures (Procedures) (see FERC website at www.ferc.gov).

Millennium and Columbia have incorporated these procedures into its Environmental Construction Standards (ECS) (see appendix E1). In the Black Dirt Area in Orange County, Millennium would implement its Archeological and Construction Work Plan for the Proposed Millennium Pipeline Project Black Dirt Area, April 2006 version (Black Dirt Plan, see appendix E1a).

Empire has incorporated our Plan and Procedures into its Erosion and Sedimentation Control and Agricultural Plan (ESCAMP) (see appendix E2). The ESCAMP also incorporates additional recommendations the New York State Department of Agriculture and Markets (NYSDA&M) due to potential impact on agricultural areas (see section 4.2).

Algonquin has incorporated our Plan and Procedures into its Erosion and Sedimentation Control (E&SC) Plan (see appendix E3). Algonquin has requested a few variances from our Plan and Procedures. These are described in section 4.2.3 and 4.7.3.

Iroquois has stated that it would construct its proposed facilities in a manner consistent with our Plan and Procedures.

We believe the proposed company- and project-specific environmental construction plans are adequate.

2.3.2.1 Environmental Inspection

To monitor compliance with environmental requirements, each applicant would assign one full-time lead environmental specialist to each construction spread to support its environmental and agricultural inspectors (as needed). One or more environmental and agricultural inspectors would be assigned to each spread and the duties of the inspectors are described in the respective environmental construction plans. Each construction contractor would provide at least one environmental compliance specialist per spread to monitor the contractor's maintenance of erosion control devices and construction in environmentally sensitive areas on shore. All environmental inspectors would be responsible for monitoring construction activities for compliance with the conditions of the FERC certificate; the applicant's environmental construction plan, and all other applicable federal, state, and local permits and landowner agreements.

The FERC has implemented a more reactive and comprehensive environmental inspection program, in which third-party environmental monitors (reporting directly to the FERC project manager) are assigned full-time (6 days a week, 10 hours a day) to specific spreads. The monitors would have limited authority to make field decisions about modifications to construction procedures that are defined in the terms of the third-party contract. Some of the other federal and state permitting agencies have expressed an interest in participating in this program.

Because of the magnitude and complexity of this project, **we recommend that:**

- **Millennium, Empire, Algonquin, and Iroquois hire and fund a third-party contractor, to work under the direction of the Commission staff, for the sole purpose of monitoring compliance with the environmental conditions attached to the order for their respective projects, including all measures proposed by the companies. A draft monitoring program should be developed by the companies and filed with the Commission for review and approval of the Director of OEP, along with a proposal from potential contractors that will be available to provide the monitoring and reporting services. The monitoring program should include the following elements:**

  a. the employment by the contractor of one to two full-time, on-site monitors per construction spread;
  b. the employment by the contractor of a full-time compliance manager to direct and coordinate with the monitors, manage the reporting systems, and provide technical support to the Commission staff;
  c. a systematic strategy for the review and approval by the contract compliance manager and monitors of variances to certain construction activities as may be required by each company based on site-specific field conditions;
  d. the development of an Internet web site for the posting of daily or weekly inspection reports submitted by both the third-party monitors and each

company's environmental inspectors; and

e. a discussion of how the monitoring program could incorporate and/or be coordinated with the monitoring or reporting that may be required by other Federal and state agencies.

The recommended third-party monitors would be responsible for inspecting the project to ensure that it is being constructed in compliance with the environmental conditions of the FERC certificate issued for the projects.

2.3.2.2 General Overland Pipeline Construction Procedures

Typical pipeline construction proceeds as a moving assembly line. Most construction activities proceed along the pipeline corridor at an average rate of about 3,000 to 3,800 feet per day. The trench would not remain open for more than 30 days in any area, and there would be an additional 2 weeks between initial grading and trenching. So, typically, there would be no more than 44 days between initial grading and backfilling.

Right-of-Way Survey

Before the start of construction, land surveys would be finalized, the pipeline centerline and construction work space would be marked, and land or easement acquisition would be completed. If the necessary land or easements cannot be obtained through good faith negotiations with landowners and the project has been certificated by the Commission, Millennium may use the right of eminent domain granted to it under section 7(h) of the NGA and the Rules of Civil Procedure to obtain a right-of-way.

The construction work area (e.g., nominal construction right-of-way and extra work areas) would first be surveyed and staked. Existing utility lines and other sensitive resources, identified in easement agreements or by federal and state agencies, would be located and marked to prevent accidental damage during pipeline construction. Typically, the construction ROW would be a nominal 75 feet wide. In some areas, the construction ROW would overlap an adjacent ROW and this area would be used for excess spoil storage and as a travel way for light-duty vehicles. Landowners would generally be notified at least 5 days before the start of construction unless earlier notice is requested in the easement negotiations. If temporary or permanent bridges would be installed across waterbodies along the construction ROW or access roads, the applicant's would need to coordinate with the COE and NYSDEC so that they are adequately sized and don't restrict steam flow, and so that they area disturbed by their use is adequately restored when they are removed.

Foreign pipelines and utilities would be identified during preliminary surveys. Prior to construction, contractors would contact the "Call Before You Dig" or "One Call" system to verify and mark all utilities along the project workspaces to minimize the potential for damage to other buried facilities in the area. Where there is a question as to the location of utilities, such as water, cable, gas, and sewer lines, they would be located by field instrumentation and test pits.

Removal or Abandonment of Existing Pipeline

Some pipeline would be either abandoned would either be abandoned in place or by removal. Pipeline may be abandoned in place in areas such as highway, railroad, and waterbody crossings or where removal could result in adverse environmental impact. Where the pipe would be abandoned in place, the pipe would be emptied of all gas and cleaned using cleaning pigs to

remove all foreign matter. The openings would then be capped and sealed before abandonment. There would be no disturbance of the existing ROW, except in areas where the pipeline is capped. Removal of the existing pipeline would involve excavating a trench over the old pipeline, removing the pipe.

Some project components would involve replacing removed pipeline with a larger diameter pipeline by the lift and lay method or the same ditch replacement method. This would involve excavating a trench to remove the old pipe; widening and deepening the trench (as appropriate) for accommodate the new, larger diameter pipeline; and installing the replacement pipe in the same location as the old pipe using the standard cross-country construction methods discussed below. Alternatively, the trench may be backfilled and compacted, and then retrenched for the installation of the new pipe.

Where pipeline to be removed would cross major roadways, and is cased, the carrier pipe would be removed, and the casing pipe would be abandoned in place by capping, coating, and filling with appropriate material. At major road crossings where the carrier pipe is not cased, the carrier pipe would be abandoned in place in the same manner.

Clearing and Grading

The construction work area would be cleared and graded to provide a relatively level surface for trench excavating equipment and a sufficiently wide work space for the passage of heavy construction equipment. Vegetation would be removed by mechanical cutting or by hand. Temporary erosion controls would be installed immediately after initial disturbance of the soils and would be maintained throughout construction. In upland areas, brush would be disposed of by piling adjacent to the construction work area, or it may be burned, or chipped and either given away, buried, or thinly spread across the right-of-way (less than 2 inches thick), depending on local ordinances and landowner agreements.

Logs and other usable wood products would remain the property of the landowner and would not be used unless permission is granted in the easement agreement. Timber would be cut into even lengths and stockpiled adjacent to the construction work area. Tree stumps and large rocks, which have been excavated or blasted from the trench, would be disposed of as agreed with the landowner and may be buried within the construction work area, windrowed adjacent to the construction work area, or removed to an approved landfill. No brush, timber, stumps, or large rocks would be stockpiled or buried within 50 feet of streams, or in wetlands, agricultural, or residential areas. No chips would be spread over wetlands or waterbodies.

In agricultural areas, up to 16 inches of topsoil would be stripped from the construction work area in annually cultivated or rotated agricultural land, in idle or fallow fields (improved pasture)[6], and where requested by the landowner during easement negotiations. In areas maintained as residential lawns or yards, up to 12 inches of topsoil would be stripped from the construction work area. In wetlands without standing water or saturated soils, the top 12 inches of soil would be conserved from graded areas and the trench.

Additional grading may be required in areas where the pipeline runs up and down steep slopes. Steep slopes often need to be flattened to accommodate to the bending limitations of the pipe. In such areas, the slopes would be cut away, and, after the pipeline is installed, reconstructed to their original contours during excavation.

[6] Pasture from which crops or hay could be harvested.

In areas where the pipeline would run laterally along the side of a slope, additional grading may also be required. Generally, on steep side slopes, soil from the high side of the ROW would be moved to the low side of the ROW to create a safe and level terrace. This is called side-hill construction or two-toning. After the pipeline is installed, the soil from the low side of the ROW would be returned to the high side, and the slope's original contours would be restored.

Trenching

The trench would be excavated to a depth sufficient to provide the minimum cover required by USDOT specifications. Typically, the trench would be about 6 feet deep, to allow for about 3 feet of cover, about 6 to 8 feet wide in stable soils and rock, and up to 12 feet wide at the top in sandy and saturated soils. Trench breakers or barriers to slow the movement of water along the trench would be installed every 15 feet as soon as the trench is completed. In agricultural areas, depth of cover would be increased to 4 feet and would be at least 1 foot below existing drainage tile. All excavated soil would be temporarily stored on the non-working side of the right-of-way. Generally, the trench would not remain open for more than 30 days, except at hydrostatic test locations. The trench would not be excavated until the pipe is ready for installation and would be backfilled immediately at the crossings of waterbodies, roads that are open cut, residential areas, and trails. Where access across the trench is required, trench plugs or steel plates would be installed to permit safe crossing for livestock, vehicles, equipment, or people. Fencing would also be installed at the access points to the crossovers to prevent entry into the trench.

In areas where mechanical equipment cannot break up and loosen the bedrock, blasting would be required. All blasting would be conducted only during daylight hours and in accordance with applicable Federal, state, and local laws, permits, and authorizations. Landowners would be provided one week prior notice, with at least 24 hours confirming notice, before blasting. With the landowner's approval, pre- and post-blasting inspections would be conducted at all residential or commercial structures or utilities within 150 feet of blasting. Pipeline construction often involves crossing or other utilities. All affected utility owners would be contacted and advised of the schedule for crossing their facilities. An inspector from the utility may be present during construction across the utility line. Generally, excavated rock would be used to backfill the trench to the top of the existing bedrock profile, except in agricultural land where specific depths of cover over excavated rock material would apply. Large rock not suitable for use as backfill material would either be windrowed along the edge of the right-of-way with the landowner's permission, or hauled off the ROW and disposed of in an approved disposal area.

Dewatering

During periods of excessive precipitation or high water table the excavated trench may collect water and may need to be dewatered. This would be done in accordance our Plan and Procedures. Under no circumstances would heavily silt-laden water be discharged from the trench directly into wetlands or waterbodies. To the extent possible, discharges would occur in well-vegetated upland areas on stable, non-erosive surfaces. If dewatering/discharge activities must be located off-ROW, locations would be chosen that would minimize off-ROW impacts and impacts to sensitive resources. Water would often be discharged into an energy dissipating devise (e.g., straw bale structure/silt fencing surrounding a silt bag), or by reducing pumping rates, to minimize off-ROW impacts.

Pipe Stringing, Bending, and Welding

After trenching, the pipe would be strung along the ROW and individual sections of pipe would be bent where necessary to fit the contours of the trench, aligned, welded together into long strings, and placed on temporary supports along the edge of the trench. All welds would be x-rayed to insure structural integrity and compliance with the requirements established by the American Petroleum Institute Standard 1104, American Society of Mechanical Engineers, and American Petroleum Institute standards. Those welds that do not meet established specifications would be repaired or removed. Once the welds are approved, the welded joints would be coated with a protective coating equal to the rest of the pipeline to protect the pipeline from corrosion.

Pipe Coating, Inspection and Repair

Pipeline used for interstate transport of natural gas is typically coated to protect it from the environment and accelerated degradation. Using coated pipeline is the modern standard. Pipe is normally mill-coated or yard-coated prior to stringing. However, the pipeline also would require a coating in the field at the welded joints where bare metal has been exposed. Prior to lowering-in the pipeline segment into the trench, the pipeline coating would be visually and electronically inspected to locate and repair coating faults or voids; this is commonly referred to as “jeeping” the pipe.

Lowering In and Backfilling

The trench would be dewatered, cleaned of debris, and padded as necessary before the pipeline is lowered into the trench. Trench barriers and breakers would be installed before backfilling to prevent water movement along the pipeline. The trench would then be backfilled using the excavated materials. If the excavated material is rocky, the pipeline would be padded with select fill from commercial borrow areas or by separating suitable material from the existing trench spoil. No topsoil would be used for pipeline padding. After the trench is backfilled, the pipeline would be cleaned of any dirt, water, or debris by pipeline "pigs" which are propelled through the pipeline.

Tie-In Crews

Tie-in crews are self-sufficient crews that work in tandem with the construction spread. They have equipment, welders, and labor to perform a specialized task (e.g., waterbody/wetland crossing, road crossing). Tie-in crews would be used in areas that would normally slow-down the main spread or in locations where construction has been skipped due to lack of access.

Hydrostatic Testing

After backfill and cleaning, each segment of the pipeline would be hydrostatically tested according to USDOT specifications with water obtained from nearby surface waters or available municipal supplies. Test water would be pumped into each test section, pressurized to design test pressure, and maintained at that pressure for about 8 hours. Leaks would be repaired, and the pipeline would then be retested until the specifications are met. After testing a segment, the water may be pumped into the next test segment or discharged in one of the following ways: through an energy dissipater and erosion control devices off right-of-way, back into the source waterbody through an aeration type energy dissipater, or into a transport trailer tank to be disposed of in

compliance with each applicant's National Pollutant Discharge Elimination System (NPDES) permit.

The pipeline would be internally inspected after testing to detect whether dents or other damage occurred during construction. If the pipeline fails the hydrostatic test, or if damage to the pipeline was detected during the in-line tool inspection, it would be exposed, repaired, and retested as needed.

Cleanup and Restoration

Within 10 days of backfilling, weather and soil conditions permitting, all work areas would be final graded and restored to preconstruction contours as closely as possible. To minimize future settling, the trench would either be crowned (with landowner permission) or compacted with tracked construction equipment. Surplus construction material and debris would be removed and disposed of at appropriate sites. Initially, subsoil would be ripped to help alleviate compaction in agricultural areas and the topsoil would be returned to its original horizon. Permanent erosion controls (waterbars or slope breakers) would be installed within the right-of-way, except in agricultural and pasture land where the landowner has not consented to their installation.

Restoration would begin within 6 days of final grading, weather and soil conditions permitting, and the construction work areas would be fertilized and seeded with appropriate seed mixes. Private property such as fences, gates, and driveways would be restored to a condition equal to or better than preconstruction condition, and pipeline markers and warning signs would be installed at roads as required. In areas of new right-of-way, off-road vehicle control (trees, slash and timber barriers, gates, and fencing) would be installed as agreed with each landowner or land manager. Special considerations would be given to lawns, yards, road crossings, stream crossings, and sensitive environmental sites.

The construction work area would be regraded to match the grade of areas outside of the construction work area, and special features noted in the pre-construction survey would be restored. Surveyed contours for major waterbody crossings would be used to assist in restoring these construction work areas. However, some slopes and bluffs cannot be restored to their original contours. Appropriate erosion controls, such as water diversion bars, would be installed at appropriate locations to address this change and minimize potential erosion problems.

Post Construction Monitoring

All areas disturbed by construction would be monitored until the ROW surface conditions are similar to the adjacent undisturbed land and all temporary erosion control devices are removed. Agricultural areas would be monitored for at least 2 years (and the black dirt area for 5 years) for loss in crop productivity, soil settling, excessive soil compaction, excessive rocks, and excessive wetness. Other upland areas would be monitored for at least two full growing seasons. Upland revegetation would be considered successful when the density and cover of non-nuisance vegetation on the disturbed right-of-way are similar to the density and cover off the right-of-way. In accordance with our Procedures, wetlands would be monitored for 3 to 5 years for the reestablishment of wetland vegetation. Revegetation would be considered successful when the cover of native herbaceous and/or woody species is at least 80 percent of the total area and the diversity of native species is at least 50 percent of the diversity originally found in the wetland. Millennium would repair and correct any areas where restoration and revegetation is not successful. The COE will require a mitigation plan for the project as part of its permit. As part of

the mitigation plan, the applicants would consult with the COE and NYSDEC to develop a time period for monitoring wetland mitigation activities.

2.3.2.3 Waterbodies

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

In general, equipment refueling and lubricating would take place in upland areas more than 100 feet from the edges of streams and rivers and their associated wetlands. There may be certain instances where equipment refueling and lubrication may be necessary in or near streams and rivers. For example, stationary equipment, such as water pumps for hydrostatic test water, may need to be operated continuously on the banks of waterbodies and may require refueling in place. Each applicant's SPCC Plan addresses the handling of fuel and other potentially hazardous materials in or within 100 feet of waterbodies.

Clearing would involve the removal of trees and brush from the construction ROW and ATWS. Woody vegetation would be cleared to the edge of the waterbodies, but a 50-foot-long herbaceous strip would be left on the approaches until immediately before construction to provide a natural sediment filter and minimize the potential for erosion immediately adjacent to the waterbodies. Initial grading of the herbaceous strip would be limited to the extent needed to install bridges.

During clearing, sediment barriers would be installed adjacent to waterbodies and within ATWS to minimize the potential for sediment runoff. These would be maintained during the construction period and until restoration is adequate. Silt fence and/or staked straw bales would be installed across the full width of the construction ROW immediately after clearing. Silt fence or straw bales placed across the working side of the ROW would be removed during the day when vehicle traffic is present and would be replaced each night. Alternatively, drivable berms may be installed and maintained across the ROW in lieu of silt fence or straw bales.

To minimize the possibility of construction interfering with fish migration and spawning, in-stream construction in coldwater fisheries would occur between June 1 and September 30, and in coolwater and warmwater fisheries considered significant by the state, between June 1 and November 30. Other time windows may be used if permitted or required by federal or state agencies.

Construction across rivers and streams would be accomplished by either trenching across the waterbody (open-cut crossing or wet trench) or using "dry crossing" construction techniques. An open-cut crossing involves trenching and installing the pipe directly across the stream flow. Proposed dry crossing techniques include directional drilling under wide waterbodies, conventional bore, a dam and pump (pumping the water flow around the trench by installing dams upstream and downstream of the crossing), or a flumed crossing (directing the water flow through flumes and excavating the trench and installing the pipe under the flumes).

Dam and Pump Crossing Method

The dam and pump crossing method involves constructing temporary sand or pea gravel bag dams upstream and downstream of the proposed crossing site while using a high capacity pump to divert water from the upstream side around the construction area to the downstream side. Energy dissipation devices, such as plywood boards would be placed on the downstream side at the discharge point to prevent streambed scour.

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

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

After trenching across the stream bed is complete, a prefabricated segment of pipe would be installed in the trench. The streambed portion of the trench would be immediately backfilled with stream bed spoil. Clean gravel or native cobbles would be used to backfill the top 12 inches of the trench in all coldwater fisheries. Once restoration of the streambed is complete, the dams would be removed and normal flow would be re-established in the stream.

Flume Crossing Method

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

Backhoes located on both banks of the stream would excavate a trench under the flume pipe in the isolated stream bed. Spoil excavated from the stream trench would be placed or stored a minimum of 10 feet from the edge of the waterbody for temporary storage. Once the trench is excavated, a prefabricated segment of pipe would be installed beneath the flume pipes. The trench would then be backfilled with native spoil from the stream bed. Clean gravel or native cobbles would be used to backfill the top 12 inches of the trench in coldwater fisheries.

If trench dewatering is necessary near waterbodies, the trench water would be discharged into an energy dissipation/sediment filtration device, such as geotextile filter bag or straw bale structure, away from the water's edge to prevent heavily silt-laden water from flowing into the waterbody.

Open Cut or Wet Trench Crossing Method

This method would involve trenching through a stream while water continues to flow. After clearing the stream approaches and installing sediment control measures, track hoes would excavate a trench in the flowing stream from both banks of the waterbody. Spoil excavated from the trench would be placed a minimum of 10 feet from the edge of the waterbody for temporary storage. Earthen trench plugs would be left in place on both banks of the waterbody until immediately before pipe installation to separate the river trench from the upland trench. Trench plugs prevent muddy water that accumulates in the upland trench from flowing into the stream trench.

Once the trench is excavated, a prefabricated segment of pipe would be installed in the trench. The trench would then be backfilled with native streambed spoil.

Horizontal Directional Drill (HDD)

A horizontal directional drill (HDD) would involve drilling a pilot hole underneath the waterbody and then enlarging that hole until the hole is large enough to accommodate the pipe. Pipe sections would be staged and welded along the right-of-way and then pulled through the drilled hole. Because the pipe must be pulled down and through this hole, bending naturally to fit the contour of the hole, this technique is not effective for minor streams and is usually only used for wider waterbody crossings, where geologic conditions are acceptable.

Completed stream crossings using the wet trench, flume, or dam and pump techniques would be stabilized within 24 hours of backfilling. Original stream bed and bank contours would be re-established, and mulch, jute thatching, or bonded fiber blankets would be installed on the stream banks. Where the flume technique is used, stream banks would be stabilized before removing the flume pipes and returning flow to the waterbody channel.

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

2.3.2.4 Wetlands

In general, the method of pipeline construction and the required construction ROW width in wetlands would depend upon the soil stability and existing conditions in the wetland. Stable temporary work surfaces may be constructed in wetlands where soils are saturated and unstable. Installing timber rip-rap or construction mats in the travel lane are typical methods of stabilization. Typically, temporary extra workspaces would be located a minimum of 50 feet from the edge of designated wetlands. If a riparian wetland is located adjacent to a waterbody, extra workspace may be requested and placed in the wetland. Within wetlands, vegetation would be cut to ground level except over the trench. Grading and stump removal would be performed over the trench except where safety conditions dictate additional removal on the working side of the ROW.

The construction procedures used to cross unsaturated wetlands would be similar to those used on dry land areas. Topsoil would be segregated in unsaturated wetlands in a manner similar

to that used in agricultural lands. Temporary trench plugs may be left in the ditchline at the edge of the wetland if there is a significant possibility of water flowing down the ditch and into the wetland. The temporary trench plugs would minimize the discharge of sediment into the wetland from the upland ditch. Silt fences and/or straw bales would be installed at edges of the construction ROW in wetlands where there is a possibility for spoil to flow into undisturbed areas of the wetlands. Original topographic conditions and contours would be restored after completion of construction.

Construction techniques in highly saturated areas may involve the "push" or "pull" construction technique. These techniques involve floating a prefabricated pipe section in the water-filled trench and either pushing or pulling it across the saturated wetland area. With this method, the trench would be made with a backhoe, dragline, clamshell dredge or a combination of this equipment. The push and pull sites, the pipe storage sites, and fabricating areas would be located outside the saturated portion of the wetland. Floats would be attached to the pipe to achieve positive buoyancy. After the pipe is floated into place, the floats would be removed and the pipe, which has lost its buoyancy, would settle to the bottom of the trench. This operation would be repeated as necessary until the wetland crossing is complete. Excavated material would be used as backfill and placed over the pipe to fill in the trench and the original contours of the wetland are re-established.

Construction across drier wetlands would be accomplished by conventional pipeline construction techniques. In saturated wetlands, the push-pull method would be used. This involves assembling the pipeline in an upland area, pushing/pulling it along the flooded trench through the wetland, and then lowering it into the trench. Mats or timber riprap would be used to stabilize the travel lane for passage of construction equipment. Wetlands, with standing water or saturated soils, would be constructed separately to minimize the duration of construction disturbance. To minimize wetland impacts, the companies would implement the procedures described in their environmental construction plans which are consistent with our Procedures.

2.3.2.5 Residential Areas

Construction within 50 feet of a residence would be accomplished by conventional pipeline, stove-pipe, or drag-section construction techniques. For stove-pipe construction, a short section of trench is dug, a section of pipe is laid and welded into place, and that section of the trench is backfilled immediately. It is generally best suited for situations where the available workspace is limited. For drag-section construction, a separate work space is required for prefabrication of short pipeline segments consisting of several sections of pipe. Once the trench has been dug, the prefabricated pipeline segments are moved into place, laid in the trench, welded into place, and the trench is backfilled. Restoration in residential areas should begin immediately after backfilling. Both techniques limit the amount of land required for construction and the time the trench is left open in the vicinity of the affected residences.

The applicant's would make every effort to ensure that construction activities would minimize impacts to residences and residential areas and that cleanup would be quick and thorough. The duration of an open trench would be minimized to the contractors working hours for a distance of 100 feet on either side of a nearby residence.

Homeowners would be notified in advance of construction activities and any scheduled disruption of household utilities. Disruptions would be minimized to the extent possible. If access to a residence is disrupted, typically the applicant would offer to temporarily relocate the landowner to other accommodations and provide a meal allowance. The applicants would

attempt to leave mature trees and landscaping intact within the temporary construction ROW unless the trees and landscaping interfere with the installation techniques or present unsafe working conditions. Fences, mailboxes, and other structures that have been removed would be restored. Sidewalks, driveways, and roads would be restored as soon as practical.

2.3.2.6 Roads, Highways, and Railroads

Construction across roads, highways, and railroads would be in accordance with requirements of applicable permits or approvals. Railroads, highways, and most paved roads would be crossed by boring underneath the crossing (bored crossing) and installing the pipe within a casing if required by the permitting authority.

A bore requires excavating pits on both sides of the road or waterbody at the depth of the pipeline and boring a hole large enough for the diameter of the pipe or casing, if required. The depth of the pits depends on topography and the depth required to cross under the road or waterbody, but is usually at least 10 feet deep. A boring machine would be lowered into the bore pit and a casing advanced through the soil with an auger that removes soil from within the casing. Spoil would be removed from the bore pit, and excess spoil typically would be hauled off site for disposal. Once the casing is in place, the pipe would be placed through the casing. If additional pipe sections are required, they are usually welded to the first section of pipe in the bore pit before being pushed through the bore hole. When the pipe is in place, the casing would be removed, the pipe welded to the adjacent pipe sections, and the pits would be filled in and restored.

There would be little or no disruption of traffic on roads that are bored. Other roads and driveways may be crossed by trenching across the road (open-cut crossing). Any open trenches would be either fenced off or covered with steel plates during non-working hours.

2.3.2.7 Corrosion Protection and Detection Systems

Corrosion prevention and detection systems would be installed and would meet the USDOT requirements for protection of metallic facilities from external, internal, and atmospheric corrosion. These systems would be routinely monitored by survey crews as part of ongoing pipeline integrity programs. Cathodic protection may be supplied primarily by deep well groundbeds within the permanent ROW and may be supplemented at some locations with remote groundbeds and/or magnesium or zinc anodes attached to the pipe.

Generally, remote conventional ground beds would be installed a minimum of 500 feet from the pipeline, and anodes would be installed perpendicular to the pipeline. The ground bed would affect an area 900 feet long by 50 feet wide in which a 2-foot-deep by 1-foot-wide trench would be excavated along the length of the ground bed. The anodes would be installed in 12-inch-diameter by 108-inch-deep vertical holes adjacent to the trench. After installation, the area would be backfilled and marked to prevent damage. Deep well anodes could also be installed using a 10-inch-diameter well drilled a minimum of 50 feet below the surface and connecting to a surface junction box. This would require an approximate 500-foot by 50-foot area that is perpendicular to the right-of-way and protected by a permanent fence.

The anode beds would be constructed at about the same time as the pipeline and are designed for the life of the facility. For a coated pipeline, the anode beds would be spaced many miles apart depending on the results of the cathodic protection survey. The cathodic protection

system would be monitored, and anode beds would be replaced when or if they become depleted due to changed field conditions.

The low voltage direct current used in a cathodic protection system would have no effect on other metallic facilities near the pipeline. The path of the circuit is primarily from the anode bed through the earth to the pipeline, and back along the pipeline to the anode bed. There would be no magnetic fields set up in the area. There are no known health hazards associated with cathodic protection.

2.3.2.8 Blasting

Blasting may be necessary in areas with shallow depth to bedrock. Where blasting is the selected method to remove shallow bedrock, the work would be performed by licensed contractors using appropriate safety precautions. Additional information on blasting procedures is presented in section 4.1.

2.3.3 MILLENNIUM PIPELINE PROJECT PHASE I

2.3.3.1 General Pipeline Construction Procedures

Millennium would use the general pipeline construction procedures described in sections 2.3.2. which would be consistent with those previously approved by the Commission for the Millennium Pipeline Project in the Interim and Millennium Orders, except as specifically requested for or modified by the Phase I amendment.

Lift and Lay

Millennium would use this construction method between MPs 285.6 and 376.4 where it would remove the Columbia Line A-5 pipeline and install the new 30-inch-diameter pipeline.

2.3.3.2 Special Construction Techniques

As a result of detailed engineering and constructability reviews, Millennium proposes to modify the construction procedures for crossing Owego Creek, Nanticoke Creek, Susquehanna River, West Branch Delaware River, East Branch Delaware River, Wallkill River, and Pochuck Creek. Most of these changes to the construction procedures involve the substitution of a type of dry-ditch crossing method over the method identified previously. Millennium proposes to construct the majority of crossings using the dam and flume technique, as opposed to the dam and pump technique previously proposed/approved for this project. Millennium states that improvements in temporary dam technology have occurred in the industry and have convinced Millennium that the use of dam and flume crossing techniques would provide a more reliable method of constructing minor- to intermediate-size waterbody crossings than depending on pumping to move stream flows around construction sites. Contingency plans and site-specific drawings for the Susquehanna River, Chenango River, and West Branch Delaware River have also been provided for our review and are discussed in section 4.3.2.2. Millennium has discussed the proposed modified construction methods for these waterbodies with the NYSDEC, COE, FWS, TNC, and Trout Unlimited.

Powerlines

The proposed NYSEG route variations would be constructed adjacent to or within powerline ROWs. Safety and design considerations for construction under or near powerlines are addressed in 29 CFR 1910.269 (Electric Power Generation, Transmission and Distribution), 1926.950-960 (Power Transmission and Distribution), 1926.416 (Electrical Safety Related Practices), and 1926.550 (Cranes and Derricks) and in state regulations including the Consolidated Laws of New York Labor section 202-h ("High-Voltage Proximity Act"), Compilation of Codes, Rules and Regulations of the State of New York Title 16, section 25.467 (relating to external corrosion control and electrical isolation),Title 16, section 127.1 (relating to allowable induced voltages in pipelines), Title 12, section 23-1.13 (electrical hazards), and Title 12, section 23-9.6(e)(7) (aerial baskets). These regulations establish safe clearances for equipment and personnel working near powerlines as well as precautionary actions that must be taken to protect equipment and personnel from electric shock. In addition to state regulations, the powerline company may want Millennium to use additional precautions to minimize the potential for damage to the powerline structures and associated facilities, and possible power outages.

Consultation with NYSEG, and consideration of the sited regulations, resulted in NYSEG's request that the pipeline be installed at least 55 feet from any grounded NYSEG powerline structure.

Although construction techniques would not significantly differ from those described above, additional special construction, maintenance, and operating procedures would be implemented to minimize risk to workers, the pipeline, and the powerline. These procedures can include specialized training for workers, maintaining minimum distances between power structures and lines, providing grounding equipment on all construction vehicles, and additional monitoring of construction equipment operating within powerline ROWs. These procedures would be developed between Millennium and the affected powerline company.

2.3.3.3 Aboveground Facility Construction Procedures

Construction activities at the proposed Corning Compressor Station site would include grading; installing concrete foundations; erecting metal buildings; and installing compressors, metering facilities, and appurtenances. Initial work at the compressor station would focus on preparing foundations for the buildings and equipment. Building foundations and pipe trenches would be excavated with standard construction earthmoving equipment. Millennium does not anticipate that blasting would be required at this site. Following foundation work, station equipment and buildings would be brought to the site and installed, using any necessary trailers or cranes for delivery and installation. Following installation of the buildings and primary facilities, associated equipment, piping, and electrical systems would be installed. Necessary equipment testing and start-up activities would occur on a concurrent basis.

Similarly, work at the new Corning M&R Station would require the installation of supports and piping, including the actual metering facility, as well as construction of an 850-foot long permanent driveway to the facility from an existing gravel road.

Final cleanup at the Corning Compressor Station and new M&R station would include establishment of final grade and application of gravel to provide a safe working surface for operation personnel. All surplus materials and construction debris would be removed, and the compressor station and meter station would be fenced with security fencing. All disturbed areas

not required for operation at the compressor station and new meter site would be properly reclaimed, including spreading of any salvaged topsoil and reseeding using an approved seed mix.

Millennium would modify the existing facilities at the Ramapo M&R Station and the existing M&R station at the interconnection of Columbia Line K and Line A-5 (and which would be renamed the Wagoner M&R Station). No new access roads would be required for these facilities.

2.3.4 EMPIRE CONNECTOR PROJECT

2.3.4.1 General Pipeline Construction Procedures

Empire would use the pipeline construction procedures described in section 2.3.2 which would be consistent with our Plan and Procedures. Empire's general pipeline construction procedures are described in its ESCAMP which also incorporated the additional recommendations of the NYSDA&M due to potential impact on agricultural areas (see section 4.2).

2.3.4.2 Special Construction Techniques

In addition to the standard construction practices listed above, Empire would use the following special construction methods in certain areas during construction.

Lift and Lay

The initial 1.4 miles of the proposed pipeline would involve removing a portion of the existing Empire State Pipeline and replacing it with a new pipeline in the existing ROW. This portion of the pipeline construction would likely be completed using a tie-in crew or mini-spread, which is a self-sufficient crew of equipment, welders, and labor needed to complete this activity. The execution of this work would coincide with planned natural gas supply outages to accommodate existing downstream customers.

Agricultural Crossings

Empire states that it has selected its proposed pipeline route to avoid, to the extent feasible, sensitive soils that are of high agricultural value. Empire has initiated inquiries with landowners and agricultural agents to determine the locations and configuration of drain tiles and other important features (diversion ditches, etc.) to avoid or accommodate during construction. It has modified its route through affected agricultural land to minimize impacts to drain tiles and, therefore, the impact of its project agricultural resources. Further, Empire has engaged an agricultural/drainage specialist to review the route within agricultural properties. Empire would continue to work actively with landowners to identify site conditions (i.e., to include drain tiles and header systems) crossed by pipeline facilities so that impacts and disruptions can be minimized. Empire would segregate and restore topsoil consistent with its ESCAMP and guidance provided by NYSDAM. Additionally, Empire would continue to locate drain tiles in affected agricultural fields during constriction and would repair those that are disturbed by construction, to as-found condition or better. Section 4.2 (Soils) and appendix E2 (Empire's ESCAMP) provide more detail regarding Empire's proposed construction techniques and impact minimization measures in agricultural areas.

Trenchless Techniques

Trenchless construction techniques include: boring, pipe-jacking, and HDD. Trenchless methods allow the installation of the pipeline with minimal impacts or disturbance to surficial features. Boring techniques are regularly used when crossing transportation corridors that cannot be disrupted (e.g., roadways, railroads). HDDs may be used when trenching is not feasible or permissible, and re-routing alternatives are limited. Empire anticipates using bores for road and railroad crossings except where an open-cut crossing is determined to be feasible and the roadway authority approves (e.g. town, county). HDDs are planned for two waterbody crossing locations: Keuka Outlet and Canandaigua Outlet. A discussion of the HDDs at these locations is included in section 4.3.2.3. See figures 1.4-2 and 1.4-3 in appendix E2 for typical layouts of a HDD crossing and a bore crossing.

2.3.4.3 Aboveground Facility Construction Procedures

Empire proposes constructing several aboveground facilities, including one compressor station, one pressure reduction station (at the upstream interconnect to the existing Empire State Pipeline), one metering and flow control facility (at the downstream interconnect to the Columbia Corning Compressor Station), and seven mainline valve facilities. Empire's construction procedures for aboveground facilities are discussed in the following paragraphs.

Empire would clear and grade the proposed aboveground facility locations to the extent necessary to install the facility and provide a level platform and sufficient space to execute the work safely. Empire would use onsite material as structural backfill where permitted by engineering specifications. When necessary, Empire would use clean imported structural backfill material if a sufficient amount of onsite material is not available.

Empire would design foundations primarily of reinforced concrete with an appropriate strength rating to support planned loads. Concrete pours would be randomly sampled to verify compliance with minimum strength requirements. Empire would not construct concrete foundations for its proposed mainline valve locations; instead, they would have prepared gravel/rock surfacing. The identified equipment for the proposed aboveground facilities would be delivered by truck. Empire would offload and position, level, grout, and secure the equipment with anchor bolts as necessary and according to equipment specifications. Equipment installation would include the inspecting mechanical and electrical systems, other inspecting (i.e., both visual and radiographic) as may be applicable, painting, and finishing.

Empire would restore the areas temporarily disturbed by construction activities to pre-existing conditions or better. Some site modifications (e.g. re-contouring) may be required to provide sufficient drainage and site access.

2.3.5 ALGONQUIN RAMAPO EXPANSION PROJECT

2.3.5.1 General Pipeline Construction Procedures

Algonquin would use the pipeline construction procedures described in section 2.3.2 which would be consistent with our Plan and Procedures and are described in its E&SCP (see

appendix E3). However, Algonquin has requested variances[7] from these documents. These are addressed in sections 4.2.3 and 4.7.3. No active croplands would be crossed by Algonquin's project facilities.

Lift and Lay

Algonquin would excavate and raise the existing 26-inch-diameter pipeline from the trench, cut it into manageable lengths, and remove it from the ROW for disposal. The used pipe would be shipped to Algonquin's Holliston pipe yard located in Holliston, Massachusetts, for storage prior to disposal. The trench would be enlarged in depth and width to accommodate the new 42-inch-diameter pipeline. The trench would be backfilled and the area restored in a manner consistent with the construction procedures described in section 2.3.2.1. This construction technique would be used along the pipeline replacement portion of the project.

2.3.5.2 Special Construction Techniques

Streams and Rivers

Algonquin is currently evaluating available construction methods to effectively perform the pipeline replacement at the Mahwah River crossing. This evaluation includes consultations with the NYSDEC and the COE. Once a preferred crossing technique has been selected, Algonquin would provide this supplemental construction information to the Commission. (See section 4.3.2.4.)

In particular, Algonquin is evaluating (1) a pipeline crossing/replacement of the Mahwah River, and (2) Algonquin intends to utilize a temporary bridge across the Mahwah River at temporary access road AMP 0.11 for heavy equipment access to Algonquin's existing Ramapo M&R Station 202. The temporary bridge crossing is to be permitted and constructed by Millennium/Columbia, as proposed in their respective filings.

In general, Algonquin proposes construct waterbody crossings in a manner consistent with the procedures described in section 2.3.2.2 and would use of additional temporary work spaces (ATWS) on both sides of waterbodies to stage construction, fabricate the pipeline, and to store materials. ATWS would be located in upland areas a minimum of 50 feet from the waterbody edge. However, Algonquin states that there would likely be some locations where workspaces would need to be situated less than 50 feet from a waterbody or even within a waterbody or wetland. Algonquin has requested a variance from our Procedures at specific locations which would allow it to place ATWS less than 50 feet from these resources. We have addressed this issue in section 4.3.3.

Wetlands

Wetland construction would be done in accordance with our Procedures and as described in section 2.3.2.3. In addition, Algonquin would follow the SPCC Plan and the E&SCP it has proposed for this project to minimize the potential for adverse effects to wetlands. Algonquin has requested a variance from our Procedures at specific locations which would allow it to place

[7] Our Plan and Procedures are called "Guidelines" until an applicant states that it would construct its project by implementing these documents, or that it has incorporated them into its project-specific environmental construction plan. For any instance where the applicant's construction plan differs from our Plan or Procedures, the applicant must request a variance.

additional temporary workspaces less than 50 feet from wetland boundaries. This is addressed in section 4.7.3.

2.3.5.3 Aboveground Facility Construction Procedures

Algonquin would construct its proposed aboveground facilities in accordance with industry standards.

Modifications at Existing Compressor Stations

Algonquin's construction activities at existing compressor stations would include installation of new buildings to enclose proposed facilities at two of the existing compressor stations and removal and replacement of existing turbine-compressors in the same building at the remaining compressor station. No expansions of station property lines are proposed. The majority of construction activities would occur within the existing compressor station sites, however additional temporary workspace would be required outside of the fenced-in portions of the compressor stations.

Most construction activities would be similar to those at other commercial construction sites. An erosion and sedimentation control plan would be developed and implemented at each site. Limited clearing and grading would be performed for new facilities and workspaces. Where required, new foundations would be poured and the new equipment and buildings would be installed. New gas piping, conduit and electrical systems, and other utility piping would be integrated into existing compressor station systems. As with pipeline installation, all welded gas piping would be radiographically inspected and pressure tested prior to activation. All compressor station systems, including the emergency shut-down system, would be thoroughly tested prior to operation of the new turbine units. As work is completed in an area of the site, the adjoining workspaces would be cleaned up and restored.

New Compressor Station at Oxford, Connecticut

The proposed site of the new Oxford Compressor Station is north of Airport Road, east of State Route 188 in the Town of Oxford, Connecticut. The construction site consists mostly of fallow, overgrown field with some mature trees in the area. Construction procedures at this site would be similar to those outlined for modifications at existing compressor stations; however, the amount of site preparation work required would be much greater. An erosion and sediment control plan would be developed and implemented at the site. A new access road would be installed from the main roadway. Algonquin would work with local road officials to establish a safe, effective entrance drive. Next, the proposed work area would be cleared and graded to prepare a safe, level work site. The proposed building locations would be laid out and new foundations would be poured. Four buildings are proposed: an office building, the main turbine-compressor building, a control building, and a garage/storage building. During the same period, work would begin on installation of the gas piping to tie into the existing Algonquin pipelines that traverse the southern portion of the proposed compressor station site. Work on the interior station roads, installation of new utility connections, and other miscellaneous piping systems would be performed as work on the buildings progresses.

The three turbine compressors would be set and the various piping, instrumentation and control systems would be connected to them. As with pipeline installation, all welded gas piping would be radiographically inspected and pressure tested prior to activation. Final connection to the Algonquin pipelines would not be made until all affected systems are ready for gas service.

All compressor station control systems, including the emergency shut-down system, would be thoroughly tested prior to operation of the new turbine units. As work would be completed in an area of the site, the adjoining workspaces would be cleaned and restored. Compressor station roads would be paved and security fencing would be installed around the perimeter of the compressor station.

Meter and Regulator Station Work

Work at M&R Stations would consist of rebuilding one existing meter station and modifications at another existing station. The work to be performed at the meter stations would be similar to that described for the existing compressor stations, but with a greatly reduced scale. Some clearing and grading may be necessary at each location. Prefabricated structures may be used to house sensitive metering and instrumentation equipment. Alterations would be made to the piping configurations as well as equipment changes or additions. The construction process would generally follow the procedures outlined for the compressor station sites with the same emphasis on safety and protection of the environment.

2.3.6 IROQUOIS MARKETACCESS PROJECT

2.3.6.1 General Pipeline Construction Procedures

Iroquois has not proposed any general pipeline construction; therefore, no pipeline construction procedures were provided.

2.3.6.2 Special Construction Techniques

Iroquois has not proposed any special pipeline construction techniques.

2.3.6.3 Aboveground Facility Construction Procedures

Iroquois provided the following summary of aboveground facility construction procedures. However, Iroquois noted that the actual equipment and methods may vary in the field based on final design and federal, state and local permit conditions. Wastes generated during construction would be disposed in an appropriate manner. Overall construction and maintenance activities would be in compliance with applicable regulatory requirements of the Commission and with DOT requirements (e.g., 49 CFR Part 192).

Erosion Control Procedures

During the construction at both the Brookfield Compressor Station and the Dover Compressor Station sites, Iroquois would require its contractors to install and maintain appropriate erosion controls (e.g., silt fence and/or hay bales) to minimize the potential for erosion from construction of the facilities. The implementation of erosion control procedures would follow our Plan and Procedures and applicable general permit provisions of each state's EPA-relegated NPDES program for stormwater discharges associated with construction activities. Iroquois does not propose any exceptions or variances to our Plan or Procedures.

Proposed Compressor Station Construction (Including Cooler Installation)

As Iroquois has currently proposed, construction activities would include facilities at the existing Brookfield Sales Meter Station. These activities would include:

- clearing and grading the site;
- constructing the access road to the proposed station from High Meadow Road and constructing parking areas;
- installing foundations for the compressor and control/utility buildings, gas coolers, other ancillary buildings, piping and major equipment;
- erecting the structures to house the compressor and associated facilities;
- constructing stormwater management systems;
- installing and hydrostatically testing the high pressure piping;
- installing the compressor, gas coolers, and auxiliary equipment, piping, and other electrical and mechanical systems;
- conducting the testing of compressor controls and the start-up testing of the turbo-compressor equipment; and,
- final site grading, restoration, and landscaping.

The typical construction activities that are anticipated during the construction of the Brookfield Compressor Station are summarized in the following subsections.

Clearing and Grading

The site for the compressor station, coolers, and temporary workspace would be cleared of vegetation and graded as necessary to create a consistent surface for the movement of construction vehicles on the site and to prepare the area for the building foundations. The access road would provide access from High Meadow Road and would have an approximately 20-foot wide paved or gravel surface.

After completion of clearing, Iroquois would install silt fence or hay bales around disturbed areas in accordance with our Plan. Part IV.F.2c of our 2003 Plan and Part IV.B.3 of our Procedures recommend that sediment barriers be installed along the edge of wetlands and waterbodies where they are located adjacent to and down slope from construction workspaces, as necessary to prevent sediment flow into the wetland or waterbody. Although relatively flat, the Brookfield site is in proximity to wetland areas. Iroquois would require its contractor to install erosion control barriers along the down-gradient limit of construction workspace to prevent runoff of sediments into these wetland areas. Iroquois' Environmental and/or Chief Inspector would assess factors, including weather conditions, in determining if additional erosion control barriers are warranted.

Blasting may be required to prepare a level site area. Such blasting, if required, would be conducted in accordance with appropriate regulations.

In addition, there are two adjacent warehouse/storage buildings on the site, with a combined building footprint of 80 feet by 100 feet. These buildings are in poor repair, and would be demolished, including the concrete foundations. Demolition of these structures would occur prior to commencement of other construction activities on the compressor station site. All waste materials collected during building demolition would be safely disposed of off-site at an appropriate disposal site or in an appropriate manner.

An impervious paved access and parking area is currently in place along the south and east sides of the buildings. This paved area may be used as a temporary laydown area during construction activities, but Iroquois plans to remove this pavement prior to completion of final grading and landscaping of the compressor station site.

Foundations

Iroquois anticipates that building and gas cooler foundations would be made of poured reinforced concrete. A site specific geotechnical evaluation would be conducted to determine the recommended design of foundations. If present, topsoil would be stripped from the area of the building foundations. Such soil may be used on-site either for landscaping or to provide soil cover for the septic system leach field, if acceptable. Additional soil or subsurface materials may be imported from approved sources to achieve the desired site/foundation grade.

Building and Cooler Design and Construction

The control building would have overall dimensions estimated to be about 40 feet by 100 feet, with a roof peak to grade dimension of about 27 feet. The control building would include space for offices, a control room for the compressor station, a utility area, storage for supplies and materials, and a garage.

The storage building would be about 40 feet by 40 feet, with a roof peak to grade height of approximately 23 feet. The building would be constructed of a steel frame and metal or other sheet siding material.

The compressor building would be about 50 feet by 74 feet in plan, with a roof peak to grade height of about 38 feet. The compressor building would house the turbo-compressor equipment. The turbo-compressor equipment would be fueled by natural gas. The turbine equipment would have a stack height of 50 feet. These building and stack dimensions have been confirmed appropriate by Iroquois' air quality modeling, but could be revised during the air permit preparation, and agency review and approval process. The compressor unit design would incorporate various safety features in accordance with DOT requirements.

Typically, the steel frame would be erected, followed by the installation of the roof structural steel, interior skin, insulation, and exterior skin. Cutouts for protrusions through the siding (e.g., inlet and exhaust vents) would be flashed to ensure that the building would be weather-tight.

The proposed cooling facilities would have a footprint of about 50 feet by 60 feet. The units would have a height dimension of about 20 to 25 feet. The cooler construction would commence after completion of its respective foundation. Typically, the steel frame would be erected, followed by the installation of the coolers, mechanical and electrical assembly.

High Pressure Piping

Iroquois proposes to design and construct the high pressure piping to meet the DOT requirements of 49 CFR Part 192. The high pressure gas piping in the station yard would be designed to operate at a MAOP of 1,480 psig. The station discharge pressure would be controlled to result in main line operating pressures at or below the main line MAOP of 1,440 psig.

Iroquois would implement two measures for corrosion protection of the station piping. First, Iroquois would externally coat the station piping for protection against corrosion. In addition, Iroquois would install a cathodic protection system to protect the buried piping.

Pressure Testing

Prior to placing the station in-service, Iroquois would conduct hydrostatic pressure testing of the piping system of its pipeline within the compressor station yard. This test would be conducted in accordance with applicable codes, including Connecticut's general permit requirements for the discharge of test water.

Infrastructure Facilities

The Brookfield Compressor Station would require a permanent water supply, as well as on-site sanitary waste disposal facilities. These needs would be met by drilling a water well, and developing and maintaining a domestic waste disposal system (e.g., septic system) in accordance with state and local codes. These facilities were identified as being needed for the Brookfield Compressor Station in the original project approved on October 31, 2002.

Iroquois anticipates that the aboveground electric line would be extended from the distribution facilities in the existing metering station to the compressor station to accommodate station power requirements. The suitability of the existing service would be confirmed during detailed engineering design. Power and communication cable that would run between buildings on site would be installed in buried precast cable trenches. During a meeting Iroquois held with the Connecticut Light & Power Company (CL&P), the local electrical utility for the area, CL&P indicated that the power lines on High Meadow Road and adjacent to the proposed compressor station site are adequately sized to provide all of the necessary electrical power to the proposed compressor station. CL&P would extend an underground electrical service from a power pole just outside of the property of High Meadow Road, along the existing fence line, to a transformer just east of the proposed control building. The electric line installation is further discussed in section 1.4.

Controls Commissioning and Engine Start-Up

Before the new compressor is put into service, Iroquois would develop and implement a station commissioning plan. Iroquois anticipates that this plan would include the checking and testing of controls and safety features including the emergency shutdown system, relief valves, gas and fire detection facilities, over-speed, vibration, and other on- and off-engine protection and safety devices. Following the successful completion of the station commissioning, turbo-compressor equipment would be trial-operated. Iroquois anticipates that the initial trial operation of turbo-compressor equipment would consist of several runs of short duration.

Final Grading and Landscaping

Prior to construction, Iroquois would develop a plan for the final grading and landscaping of the project area consistent with our Plan and Procedures. The post-construction surface conditions would generally consist of developed areas occupied by the buildings and pavement, and mowed lawn within the station fencing.

A number of activities would be performed as part of the completion of the construction work. Iroquois would extend the existing permanent security fence around the meter station to

include the compressor station. Iroquois also would pave the permanent extension of the site access road and additional parking area. After the completion of these activities and the start-up and testing of the new compressor equipment, or as soon thereafter as weather and other conditions permit, Iroquois would complete the final grading and landscaping of the compressor station site, in accordance with the above-mentioned plans.

Proposed Gas Cooler Installation at the Dover Compressor Station

The proposed gas cooler installation at the existing Dover Compressor Station would be conducted in a similar manner as described for the Brookfield, Connecticut site. This installation would include installing foundations for the gas cooler, erecting the structure to support the cooler; installing various piping, and other electrical and mechanical systems.

Clearing and Grading

The site for the gas cooler and work area would be cleared of vegetation and graded as necessary to create a level surface for the movement of construction vehicles on the site and to prepare the area for the building foundations. Iroquois expects minimal clearing would be required as the proposed workspace is predominately a grass field.

After the completion of clearing, Iroquois would install silt fence or hay bales around disturbed areas in accordance with the recommendations in our Plan and Procedures. The proposed workspace at the Dover Compressor Station is relatively flat (5 percent or less gradient) and is at least 100 feet from wetland areas. Iroquois would instruct its contractor to install either safety or silt fencing along the southern limit of the proposed temporary workspace as part of mitigation measures associated with a culturally significant site identified south of the project area. Iroquois' Environmental and/or Chief Inspector would assess factors, including weather conditions, in determining if new or additional erosion controls are warranted to prevent runoff of sediments into off-site wetland areas.

Iroquois does not anticipate the need for blasting, but if required, blasting would be conducted in accordance with appropriate regulations.

Foundations

Iroquois anticipates that the gas cooler foundations would be constructed of poured reinforced concrete. A site specific geotechnical evaluation would be conducted to determine the recommended design of foundations. The gas cooler foundations would be constructed of poured reinforced concrete. Topsoil may be stripped from the area of the gas cooler foundations. Such soil may be used on-site for landscaping. Additional soil or subsurface materials may be imported from approved sources to achieve the desired site/foundation grade.

Gas Cooler Design and Construction

The foot print for the gas cooler would have dimensions of about 50 feet by 120 feet, with a height of about 20 to 25 feet. The footprint dimensions of the gas coolers would be confirmed during detailed engineering design. The gas cooler construction would commence after completion of its respective foundation. Typically, the steel frame would be erected, followed by the installation of the gas coolers, mechanical and electrical assembly.

High Pressure Piping

Iroquois would design and construct the high pressure piping to meet the DOT requirements of 49 CFR Part 192 requirements. Iroquois proposes to design the high pressure gas piping in the station yard for a MAOP of 1,480 psig. Iroquois would control the station discharge pressure to result in main line pressures at or below the main line MAOP of 1,440 psig.

Iroquois would implement two measures for corrosion protection of the gas cooler piping. First, Iroquois proposes to externally coat the piping for protection against corrosion. Second, Iroquois would install a cathodic protection system to protect the buried piping.

Hydrostatic Testing

Prior to placing the proposed facilities in-service, Iroquois would conduct hydrostatic pressure testing of the piping system. Iroquois would conduct this test in accordance with applicable codes.

Infrastructure Facilities

The gas cooler would require modifications to the existing station discharge piping. Iroquois anticipates that electric lines would be installed from existing station power facilities to the gas coolers. Electric cables from existing facilities to the gas cooler location would be buried.

Installation of New Station Discharge Line, Isolation Valve, and Heavy Wall Pipe

As part of the gas cooler construction, a new discharge line isolation valve would be installed, with an estimated 30 feet of existing discharge pipe being replaced. The new isolation valve would be constructed within the existing fenced compressor station. The valve is required to direct the gas into the coolers. The coolers would require a below ground suction and discharge header, each up to 250 feet in length.

Because of the variable depth of the water table in the area, trench dewatering may be required prior to pipe installation. If so, ditch de-watering would be conducted so as to minimize erosion and would be accomplished in accordance with our Plan and Procedures.

Iroquois would prefabricate, test, and connect the new isolation valve assembly and associated piping to the existing station discharge piping.

Controls Commissioning and Start-Up

Before the new gas coolers are put into service, Iroquois would develop and implement a commissioning plan. Iroquois anticipates this plan would include the checking and testing of controls and safety features including possibly the emergency shutdown system, relief valves, gas and fire detection facilities, and other on- and off-engine protection and safety devices. Following the successful completion of commissioning, the gas coolers would be trial-operated.

Final Grading and Landscaping

Prior to construction, Iroquois would develop a plan for the final grading and landscaping of the project area consistent with our Plan for the restoration of uplands. The ground surfaces within the newly disturbed areas at the Dover Compressor Station site would be gravel-covered

under the gas coolers, paved along the driveway extension to the gas cooler area, and mowed lawn within the remaining yard.

A number of activities would be performed as part of the completion of the construction work. Iroquois would extend the existing permanent security fence to include the gas cooler additions. After the completion of these activities and the start-up and testing of the gas cooler unit, or as soon thereafter as weather and other conditions permit, Iroquois would complete final grading and landscaping of the site, in accordance with the above-mentioned plans.

2.4 OPERATION AND MAINTENANCE

All of the applicants would operate and maintain their facilities in accordance with the applicable safety standards established by the DOT [49 Code of Federal Regulations (CFR) Part 192]. The standards imposed are in accordance with the Natural Gas Pipeline Safety Act of 1968, as amended. The pipeline system would be monitored and controlled 24 hours a day by gas controllers that detect pressure drops in the pipeline that could indicate a leak. Pipeline facilities, including the aboveground facilities, may be part of a Supervisory Control and Data Acquisition ("SCADA") system, which monitors the pipeline system on a 24-hour per day basis.

Routine pipeline operation and maintenance activities would include periodic aerial reconnaissance and ground patrols to visually inspect the route from above or on the ground for activities such as vegetative or other encroachment, evidence of unauthorized activity, damaged or exposed pipeline facilities, areas of environmental concern (e.g., subsidence, erosion), and other concerns that could affect public safety and operation of the project. Routine aerial patrols of the pipeline ROW would be conducted in accordance with each applicant's operating procedures.

Vegetation along the permanent pipeline ROW would be maintained to prevent woody growth from encroaching onto the permanent easement (e.g., brush cutting, tree trimming). The maintenance is necessary to assure pipeline integrity and ROW accessibility. Other maintenance functions would include: periodic seasonal mowing of the ROW in accordance with the timing restrictions outlined in our Plan and Procedures; terrace repair, backfill replacement and drain tile repair as necessary; periodic inspection of water crossings; and maintenance of a supply of emergency pipe, leak repair clamps, sleeves, and other equipment needed for repair activities. Herbicides or pesticides would not be used within 100 feet of a wetland or waterbody unless approved by appropriate state and local agencies.

The proposed facilities would be operated and maintained in a manner such that pipeline integrity is maintained in the interest of assuring that a safe, continuous supply of natural gas reaches its ultimate destination. Maintenance activities would include regularly scheduled gas-leak surveys and measures necessary to repair any potential leaks. The latter may include repair or replacement of pipe segments. All fence posts, signs, marker posts, aerial markers, and decals would be painted or replaced to ensure that the pipeline locations would be visible from the air and ground.

The valve settings and associated valves on the block valves would be inspected at least once per year and no less frequently than every 15 months. During the inspection, the valve would be greased and partially operated. Other maintenance activities may include isolating a section of pipeline, evacuating the gas from that section, and painting of aboveground piping on an as-needed basis.

The measurement facilities would be inspected a minimum of once every 2 months, depending on the equipment installed at the facility. Maintenance activities may include inspecting the meter, calibrating pressure and temperature transducers, calibrating the chromatograph, maintaining the building and yard, checking for leaks, and painting of aboveground piping.

The regulator stations and associated equipment (such as heaters) would be inspected at least twice per year to make sure they are operating properly. Other activities may include heater maintenance, including cleaning the burner assembly and adding heater fluid, checking for leaks, calibrating controllers, changing filters, making pressure adjustments, painting of aboveground piping, and maintaining the building and yard.

The pig launchers/receivers involve smart pigging the pipeline to check the integrity of the pipeline. This would be done immediately after the pipeline is constructed and periodically thereafter as needed. Pigging may also be used to remove fluid from the pipeline.

Pipeline personnel and subcontracted entities would be qualified and properly trained for the tasks for which they are assigned. They would be well qualified to perform both emergency and routine maintenance on interstate pipeline facilities. The DOT requires that pipeline companies develop and maintain a written qualifications program for individuals performing certain safety-related tasks, known as the Operator Qualification Program. The Operator Qualification Program would document formal training and on-the-job experience. The intent is to ensure a qualified workforce and reduce the possibility of incidents caused by human error.

Cathodic protection of the pipeline would be installed with impressed current systems that employ rectifier/groundbed systems. Rectifier units would be installed along the pipeline and aboveground test stations would be installed at various locations along the pipeline to gather accurate information for potential current adjustments. The cathodic protection system would be regularly monitored to maintain required pipe-to-soil potential and would be achieved in accordance with the specifications that would meet or exceed DOT regulations.

In areas where the proposed pipeline parallels high-voltage electric transmission lines, an alternating current ("AC") mitigation system would be implemented as necessary to reduce stray current and prevent possible shock to personnel during post-construction activities and prevent interference with the cathodic protection system.

2.4.1 MILLENNIUM PIPELINE PROJECT - PHASE I

Millennium would operate and maintain the proposed facilities in accordance with the applicable safety standards established by the DOT [49 Code of Federal Regulations (CFR) Part 192]. The standards imposed are in accordance with the Natural Gas Pipeline Safety Act of 1968, as amended. It would implement the operation and maintenance procedures described above, as appropriate.

2.4.2 EMPIRE CONNECTOR PROJECT

Empire's project would be operated and maintained by appropriately trained and licensed Empire employees and contracted entities, in accordance with regulatory permit conditions and authorizations, engineering design specifications, recommended manufacturer maintenance practices, and Empire operating policies and procedures consistent with 49 CFR Part 192. It would implement the operation and maintenance procedures described above, as appropriate.

Empire expects that the 20,620-hp Oakfield Compressor Station would be manned on a full-time basis by Empire personnel and required vendor representatives during the initial system commissioning. Personnel would also be present at certain valve locations when the system is pressurized and the line is filled with natural gas. These activities would be conducted in accordance with an engineering commissioning procedure that would include general operations surveillance, line fill, equipment checks and troubleshooting, starting and stopping equipment, equipment maintenance, permit compliance testing (e.g. emissions), and inventory accounting.

Empire would develop and/or modify existing procedures to properly operate the pipeline facilities in accordance with governmental regulations; permit requirements and authorizations; manufacturer recommendations; and Empire Operating Plans and Procedures. These standardized and systematic procedures would enhance performance, reliability, and safety of the pipeline. The manual would address those routine pipeline operations (e.g., system checks, cleaning, and maintenance) and non-routine activities (e.g., trouble-shooting, system analysis, and emergency response).

2.4.3 ALGONQUIN RAMAPO EXPANSION PROJECT

Algonquin would own and maintain the Ramapo Expansion Project. Algonquin would operate and maintain the newly constructed pipeline in the same manner as it currently operates and maintains its major interstate pipeline facilities in the Northeast and in accordance with the requirements of the DOT in 49 CFR Part 192. It would implement the operation and maintenance procedures described above, as appropriate.

The project would require additional permanent staff and new operations offices and/or district offices for operation and maintenance of the proposed 37,700 hp Oxford Compressor Station to be located in the Town of Oxford, New Haven County, Connecticut.

2.4.4 IROQUOIS MARKETACCESS PROJECT

Iroquois would operate and maintain the proposed 7,700 hp Brookfield Compressor Station and modified Dover Compressor Station in accordance with DOT requirements in 49 CFR part 192 and standard procedures designed to ensure the integrity and safe operation of the pipeline system and to maintain firm natural gas transportation service. In addition to on-site operation and maintenance activities, the proposed Brookfield Compressor Station would be linked to Iroquois' Supervisory Control and Data Acquisition ("SCADA") system, which monitors the pipeline system on a 24-hour per day basis.

In accordance with the DOT requirements, Iroquois would conduct various routine maintenance and operations procedures to ensure that the station operates safely. Standard Iroquois operations at existing compressor stations include activities such 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 application of fertilizer, etc. Standard Iroquois operations currently also include the periodic checking of safety and emergency equipment and any cathodic protection systems.

2.5 FUTURE PLANS AND ABANDONMENT

2.5.1 MILLENNIUM PIPELINE PROJECT - PHASE I

Millennium has no current plans for facility abandonment. Columbia states that the proposed Line A-5 Replacement Project would accommodate future potential system capacity expansion. Neither company has any immediate plans for expansion of its proposed or existing facilities. However, this may change with developing market conditions. Millennium and Columbia would seek appropriate federal and state authorizations for any facility abandonment or construction.

2.5.2 EMPIRE CONNECTOR PROJECT

Empire states that at this time, there are no foreseeable future plans to expand the Empire Connector Project beyond the description and scope currently proposed. However, certain design aspects (e.g., compression capabilities) have been engineered to allow for project expansion if market conditions change such that an expansion is justified. For example, Empire states that it may pursue an interconnection with the Seneca Lake Storage facility that exists near the route at some future time. Additionally, Empire states that at some time in the future, project facilities could be decommissioned and abandoned, but the circumstances and timing are not known and cannot be predicted with any reasonable accuracy.

2.5.3 ALGONQUIN RAMAPO EXPANSION PROJECT

Algonquin has not identified any current or reasonably foreseeable plans for future expansion of the facilities proposed in this docket. However, Algonquin states that to the extent that expansion of facilities is required due to additional demand for natural gas service, this expansion could involve other pipeline segments not proposed in this docket. Any new facilities would be designed to be compatible with existing or proposed facilities.

2.5.4 IROQUOIS MARKETACCESS PROJECT

Iroquois states that it currently has no plans for future expansion of the proposed facilities or for the abandonment or removal of existing pipeline facilities. If natural gas demands warrant additional major facilities in the future, separate authorizations by the Commission and by any other involved regulatory agencies would probably be required.

2.6 PERMITS, APPROVALS, AND REGULATORY REQUIREMENTS

The Commission is required to ensure compliance with section 7 of the Endangered Species Act (ESA) and section 106 of the National Historic Preservation Act (NHPA).

Section 7 of the ESA, as amended, states that any project authorized, funded, or conducted by any federal agency (e.g., the Commission) 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 U.S. Code §1536(a)(2) 1988). The Commission is required to consult with the FWS and the NMFS 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, upon review of existing data, the Commission determines that these species or habitats may be affected by the project, the Commission is required to prepare a Biological Assessment (BA) to identify the nature and extent

of adverse impact, and to recommend mitigation measures that would avoid the habitat and/or species, or reduce potential impact to acceptable levels. If, however, the Commission determines that no federally listed or proposed endangered or threatened species or their designated critical habitat would be affected by the project, no further action is necessary. See section 4.6 of this DSEIS for the status of this review.

Section 106 of the NHPA requires the FERC to take into account the effects of its undertakings on any prehistoric or historic sites, districts, buildings, structures, objects, or properties of traditional religious or cultural importance to Native Americans, listed on or eligible for listing on the National Register of Historic Places (NRHP), and to afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the undertaking. The Commission has requested that Millennium, as a non-federal party, assist it in meeting its obligations under section 106 by preparing the necessary information and analyses as required by the ACHP procedures in 36 CFR part 800. The FERC is required to consult with the appropriate state historic preservation officer (SHPO) regarding the NRHP eligibility of cultural resources and the potential effects of the proposed undertaking on any NRHP-listed or -eligible cultural resources. See section 4.9 of this DSEIS for the status of this review.

In addition to the FERC's requirement for a Certificate, other federal, state, or local regulatory agencies may have environmental permit or approval authority over portions of the proposed project (see tables 2.6-1a and 2.6-1b). The Commission states in its orders that applicants should cooperate with state and local agencies. However, any state or local permits issued with respect to the jurisdictional facilities must be consistent with the conditions of any Certificate the Commission may issue. Although the Commission encourages cooperation between interstate pipelines and local authorities, this does not mean that state and local agencies, through application of state or local laws, may prohibit or unreasonably delay the construction or operation of facilities approved by the Commission.

2.6.1 MILLENNIUM PIPELINE PROJECT – PHASE I

On May 9, 2002, the New York State Department of State (NYSDOS) determined the original Millennium Pipeline Project to be inconsistent with New York State's coastal management program. The NYSDOS reviewed Millennium's project pursuant to section 307(c)(3)(a) of the Coastal Zone Management Act (CZMA), 16 USC section 1456(c)(3)(a), and the implementing regulations of the Department of Commerce at 15 CFR Part 930, Subpart D. Millennium appealed this decision to the Department of Commerce. On December 12, 2004, the Department of Commerce ruled on Millennium's consistency appeal concluding that the project did not satisfy the all elements of the two grounds set forth in the Coastal Zone Management Act for allowing a project to proceed notwithstanding a state's objections. On March 31, 2006, a Decision in the U.S. District Court for the District of Columbia was issued in Civil Action No. 04-233(RCL) supporting the previous appeal decision and the case was dismissed with prejudice. On May 3, 2006, Millennium filed with the Secretary of the Commission an amendment application which in part seeks to vacate the portions of the original Millennium Pipeline Project that were not included as part of the described Phase I Project facilities. This request would remove from further consideration pipeline facilities within the New York coastal zone.

On January 20, 2004, the Corps denied without prejudice Millennium's COE permit application for the FERC approved route, in accordance with 33 CFR 320.4(j)(1), as the individual coastal zone consistency concurrence for Millennium's project was denied on May 9, 2002 by the NYSDOS. This determination was upheld by the U.S. Secretary of Commerce on December 15, 2003. The Corps identified the proposed Hudson River crossing at Haverstraw

Bay as one of the remaining issues of concern. The Corps also noted that if a considerable amount of time passed prior to the reinstatement of a permit application, the Corps may determine that a re-evaluation of aquatic resources to be impacted by the construction of the pipeline is necessary.

The environmental permits required for the Millennium Pipeline Project – Phase 1 are listed in table 2.6-1a. The permits required for the Columbia Line A-5 Project are listed in table 2.6-1b.

Table 2.6-1a.
Permits and Approvals for the Millennium Pipeline Project – Phase I

Agency	Permit/Approval
Federal	
Federal Energy Regulatory Commission	FERC sections 7 (b) and 7(c), Natural Gas Act, Certificate of Public Convenience and Necessity
U.S. Army Corps of Engineers, New York District	Section 404, Clean Water Act (CWA), Individual Permit
U.S. Army Corps of Engineers, New York District	Section 10, River and Harbors Act (RHA), Individual Permit
U.S. Army Corps of Engineers, Buffalo District	Section 404, CWA, Individual Permit
U.S. Army Corps of Engineers, Buffalo District	Section 10, RHA, Individual Permit
U.S. Fish and Wildlife Service	Section 7, Endangered Species Act, Threatened and Endangered Species Consultation
Advisory Council on Historic Preservation	Comment on the project and its effects on historic properties
Interstate	
Palisades Interstate Parkway Commission	Easement for Sterling Forest State Park
Palisades Interstate Parkway Commission	Easement for Harriman State Park
Delaware River Basin Commission	Review of Project Impacts on Upper Delaware National Scenic and Recreational Area
State	
New York State Department of Agriculture and Markets	Agricultural Mitigation Coordination
New York State Department of Environmental Conservation	Section 401, CWA, Certification Section 402, CWA, Construction Stormwater Permit – General Permit Section 402, CWA, Hydrostatic Test Water Discharge Permit
New York State Department of Environmental Conservation - Natural Heritage Program	Natural Heritage Program Consultation
New York State Department of Transportation	Highway Crossing Permit
New York State Dormitory Commission	Temporary Revocable Permit to Cross Dormitory Commission Lands
New York Office of Parks, Recreation, and Historic Preservation, Field Services Bureau	Section 106, National Historic Preservation Act, review and comment on undertakings potentially affecting cultural resources
New York Office of Parks, Recreation and Historic Preservation	Easement
Pennsylvania Historical and Museum Commission, Bureau for Historic Preservation	Section 106, National Historic Preservation Act, review and comment on undertakings potentially affecting cultural resources

Table 2.6-1a.
Permits and Approvals for the Millennium Pipeline Project – Phase I

Agency	Permit/Approval
Local	
County Road Commissions	Road Crossing Permits
County Conservation Districts	Soil Erosion and Sedimentation Control Reviews
Towns	Road Crossing Permits

Table 2.6-1b.
Permits and Approvals for the Columbia Line A-5 Replacement Project

Agency	Permit/Approval
Federal	
Federal Energy Regulatory Commission	Sections 7(b) and 7(c), Natural Gas Act, Certificate of Public Convenience and Necessity
U.S. Army Corps of Engineers, New York District	Section 404, CWA, Individual Permit
U.S. Fish and Wildlife Service	Section 7, Endangered Species Act, Threatened and Endangered Species Consultation
Advisory Council on Historic Preservation	Comment on the project and its effects on historic properties
Interstate	
Palisades Interstate Park Commission	Easement for Sterling Forest ® State Park
Palisades Interstate Park Commission	Easement for Harriman State Park
State	
New York State Department of Environmental Conservation	Section 401, CWA, Water Quality Certification Section 402, CWA, Construction Stormwater Permit – General Permit Section 402, CWA, Hydrostatic Test Water Discharge Permit State Facility Air Permit
New York State Historic Preservation Officer	Section 106, National Historic Preservation Act, review and comment on undertakings potentially affecting cultural resources
New York State Department of Transportation	Road Crossing Permits
Local	
County Road Commissions	Road Crossing Permits

2.6.2 EMPIRE CONNECTOR PROJECT

The environmental permits required for the Millennium Pipeline Project – Phase 1 are listed in table 2.6-2.

Table 2.6-2.
Permits and Approvals for the Empire Connector Project

Agency	Permit/Approval
Federal	
Federal Energy Regulatory Commission	Section 7(c), Natural Gas Act, Certificate of Public Convenience and Necessity
U.S. Army Corps of Engineers, Buffalo District	Section 404, CWA, Individual Permit
U.S. Fish and Wildlife Service	Section 7, Endangered Species Act, Threatened and Endangered Species Consultation
Advisory Council on Historic Preservation	Comment on the project and its effects on historic properties
State	
New York State Department of Environmental Conservation	Section 401, CWA, Water Quality Certification Section 402, CWA, Construction Stormwater Permit – General Permit Section 402, CWA, Hydrostatic Test Water Discharge Permit State Facility Air Permit
New York State Historic Preservation Officer	Section 106, National Historic Preservation Act, review and comment on undertakings potentially affecting cultural resources
New York State Department of Agriculture and Markets	Agriculture and Agriculture Commodities, sensitive soils review
New York State Thruway Authority	Access Permit
Local	
Towns	Building Permits – as required
Towns	Oakfield Zoning Variance – Special Use Permit
Towns and Railroads	Roads and Railroad crossing permits/approvals
County Road Commissions	Road Crossing Permits
County Conservation Districts	Soil Erosion and Sedimentation Control Reviews

2.6.3 ALGONQUIN RAMAPO EXPANSION PROJECT

The environmental permits required for the Algonquin Ramapo Expansion Project are listed in table 2.6-3.

Table 2.6-3.
Permits and Approvals for the Algonquin Ramapo Expansion Project

Agency	Permit/Approval
Federal	
Federal Energy Regulatory Commission	Section 7(c), Natural Gas Act, Certificate of Public Convenience and Necessity
U.S. Army Corps of Engineers, New York District	Section 404, CWA, Individual Permit Section 10, RHA, Individual Permit
U.S. Army Corps of Engineers, New England District	Section 404, CWA, Individual Permit

Table 2.6-3.
Permits and Approvals for the Algonquin Ramapo Expansion Project

Agency	Permit/Approval
U.S. Fish and Wildlife Service	Section 7, Endangered Species Act, Threatened and Endangered Species Consultation Clearance
State – Connecticut	
Connecticut Siting Council	Petition for Advisory Ruling
Connecticut Natural Diversity Data Base	Section 7, Endangered Species Act, Threatened and Endangered Species Consultation
Connecticut Historical Commission	Section 106, National Historic Preservation Act, review and comment on undertakings potentially affecting cultural resources
Connecticut Department of Environmental Protection	Section 402, CWA, Construction Stormwater Permit – General Permit Section 402, CWA, Hydrostatic Test Water Discharge Permit General Permit for Diversion of Water for Consumptive Use Title V Operating Permit Permits to Construct/Certificate to operate air contamination source – Air quality permit to construct and operate stationary natural gas turbo-compressor
State – New York	
New York State (NYS) Department of Environmental Conservation (DEC) Natural Heritage Program	Section 7, Endangered Species Act, Threatened and Endangered Species Consultation
New York State Department of Environmental Conservation	Section 401, CWA, Water Quality Certification Section 402, CWA, Construction Stormwater Permit – General Permit Section 402, CWA, Hydrostatic Test Water Discharge Permit Freshwater Wetlands Permit Permit to Construct and Certificate to Operate Stationary Combustion Installation (or waiver)
NYS of State, Division of Coastal Resources	Coastal Zone Consistency Review (Hudson River Valve Site)
NYS Office of Parks, Recreation and Historic Preservation	Section 106, National Historic Preservation Act, review and comment on undertakings potentially affecting cultural resources
NYS Office of General Services	Utility Easement
State – New Jersey	
New Jersey Office of Permit Coordination & Environmental Review/Pollution Prevention	Permit Coordination & Environmental Review
New Jersey Department of Environmental Protection (NJ DEP), Land Use Regulation Program	Section 402, CWA, Construction Stormwater Permit – General Permit Section 402, CWA, Hydrostatic Test Water Discharge Permit Freshwater Wetlands Act Permit
NJ DEP Air Quality Permitting Program	Application for Banking and/or Verifying Creditable Emission Reductions Air Pollution Control Permit
NJ SHPO	Section 106, National Historic Preservation Act, review and comment on undertakings potentially affecting cultural resources

Table 2.6-3.
Permits and Approvals for the Algonquin Ramapo Expansion Project

Agency	Permit/Approval
NJ Natural Heritage Program	Section 7, Endangered Species Act, Threatened and Endangered Species Consultation
Local	
Town of Oxford, CT Inland Wetlands Commission	Inland Wetlands and Watercourses Permit
Rockland County Drainage Agency, New York	Rockland County Stream Control Act Permit
New York City Department of Environmental Protection	Storm Water Pollution Prevention Plan - Review and Approval (Southeast Compressor Station) / review of erosion and sedimentation control drawings and construction sequencing plans

2.6.4 IROQUOIS MARKETACCESS PROJECT

The environmental permits required for the Iroquois MarketAccess Project are listed in table 2.6-4.

Table 2.6-4.
Permits and Approvals for the Iroquois MarketAccess Project

Agency	Permit/Approval
Federal	
Federal Energy Regulatory Commission	Certificate of Public Convenience and Necessity
U.S. Fish and Wildlife Service – New England Ecological Field Office	Section 7, Endangered Species Act, Threatened and Endangered Species Consultation
U.S. Fish and Wildlife Service – New York Ecological Field Office	Section 7, Endangered Species Act, Threatened and Endangered Species Consultation
State - Connecticut	
Connecticut Department of Environmental Protection	Section 402, CWA, Construction Stormwater Permit – General Permit Section 402, CWA, Hydrostatic Test Water Discharge Permit Permits to Construct/Certificate to operate air contamination source – Air quality permit to construct and operate stationary natural gas turbo-compressor Clearance/no impacts to Rare Species and Habitat – General construction and operation of the proposed project.
Connecticut State Historic Preservation Office	Section 106, National Historic Preservation Act, review and comment on undertakings potentially affecting cultural resources
State – New York	
New York State Department of Environmental Conservation	Section 402, CWA, Construction Stormwater Permit – General Permit Section 402, CWA, Hydrostatic Test Water Discharge Permit
New York State Historic Preservation Office	Section 106, National Historic Preservation Act, review and comment on undertakings potentially affecting cultural resources.

Table 2.6-4.
Permits and Approvals for the Iroquois MarketAccess Project

Local	
Town of Brookfield Building/Health Department	Local Approvals for Compressor site Buildings and Structures – Construction of compressor building. May include site plan review, septic design approval, well installation, etc.
Town of Brookfield Inland Wetlands and Watercourses Agency	Inland Wetland and Watercourses Permit – Construction within buffer zone of inland wetlands and watercourses.
Town of Dover	Negative Determination – State Environmental Quality Review Act (SEQRA) – Activities involving a local action. Compliance with state threatened and endangered species laws are part of this SEQRA review.
Town of Dover	Land Use Permit Application/Site Plan Approval – Local approvals for adding gas cooler and LCC building at Dover compressor station. May include site plan approval or building height variance.

2.7 COMPLAINT RESOLUTION

Overall, we believe that our review of impacts and proposed mitigation measures in this DSEIS; our recommendations for additional mitigation measures and actions that the applicants must complete before construction; and other agencies' review, recommendations and required mitigation measures as part of the various other required federal, state, and local permit approval processes, would serve to identify and avoid, minimize, or mitigate for impacts resulting from construction and operation of the proposed project.

However, due to the high level of sensitivity of certain areas (such as residential areas) and the potential for daily construction and construction-related activities to create an inconvenience or nuisance in these areas, specific landowner or other issues could arise which are difficult to anticipate during preconstruction planning. Furthermore, these issues can often be resolved if lines of communication are open between the landowners and the pipeline company, and the company establishes a procedure for receiving and addressing complaints.

To monitor implementation of construction procedures and mitigation measures, we would require that the pipeline companies file weekly status reports that include a description of landowner/resident complaints and how these complaints were addressed or resolved. In addition, issues or concerns can be reported directly to the FERC enforcement hotline for follow-up during FERC staff inspections.

Additionally, to ensure that all affected landowners would know whom to contact when they have questions or problems with pipeline construction or restoration, **we recommend that**:

- **Each pipeline company should establish an environmental mitigation complaint resolution procedure that would be in place throughout construction and restoration of the Millennium Pipeline Project. The procedure shall provide landowners and/or abutters with clear and simple directions for identifying and resolving their environmental mitigation problems/concerns during construction of the pipeline facilities and restoration of the ROW. Prior to construction, the company should mail the complaint procedure to each landowner whose property would be crossed by the project and abutters whose properties are adjacent to a road or utility ROW that**

would be used for installation of the pipeline. The complaint resolution procedure must:

a. include a local contact (and telephone number) and the pipeline company's "hotline" contact (and toll-free telephone number) that the landowner/abutter should first call with his/her concerns;
b. indicate how long it would take after complaints/inquiries are made for the pipeline company to respond;
c. indicate that the response would inform the caller how and when problems were or would be resolved; and
d. instruct the landowner/abutter that if they are still not satisfied with the response from contacting the pipeline company's "hotline," then the Commission's Enforcement Hotline may be contacted at (877) 303-4340.

In addition, **we recommend that**:

- **Each pipeline company should include in its weekly status report a table that contains the following information for each problem/concern reported:**

  a. the identity of the caller and the date of the call;
  b. the CAS alignment sheet number, property identification number, and milepost/survey station number of the property;
  d. a description of the concern/problem; and
  e. an explanation of how and when the problem was resolved, or why it has not been resolved.