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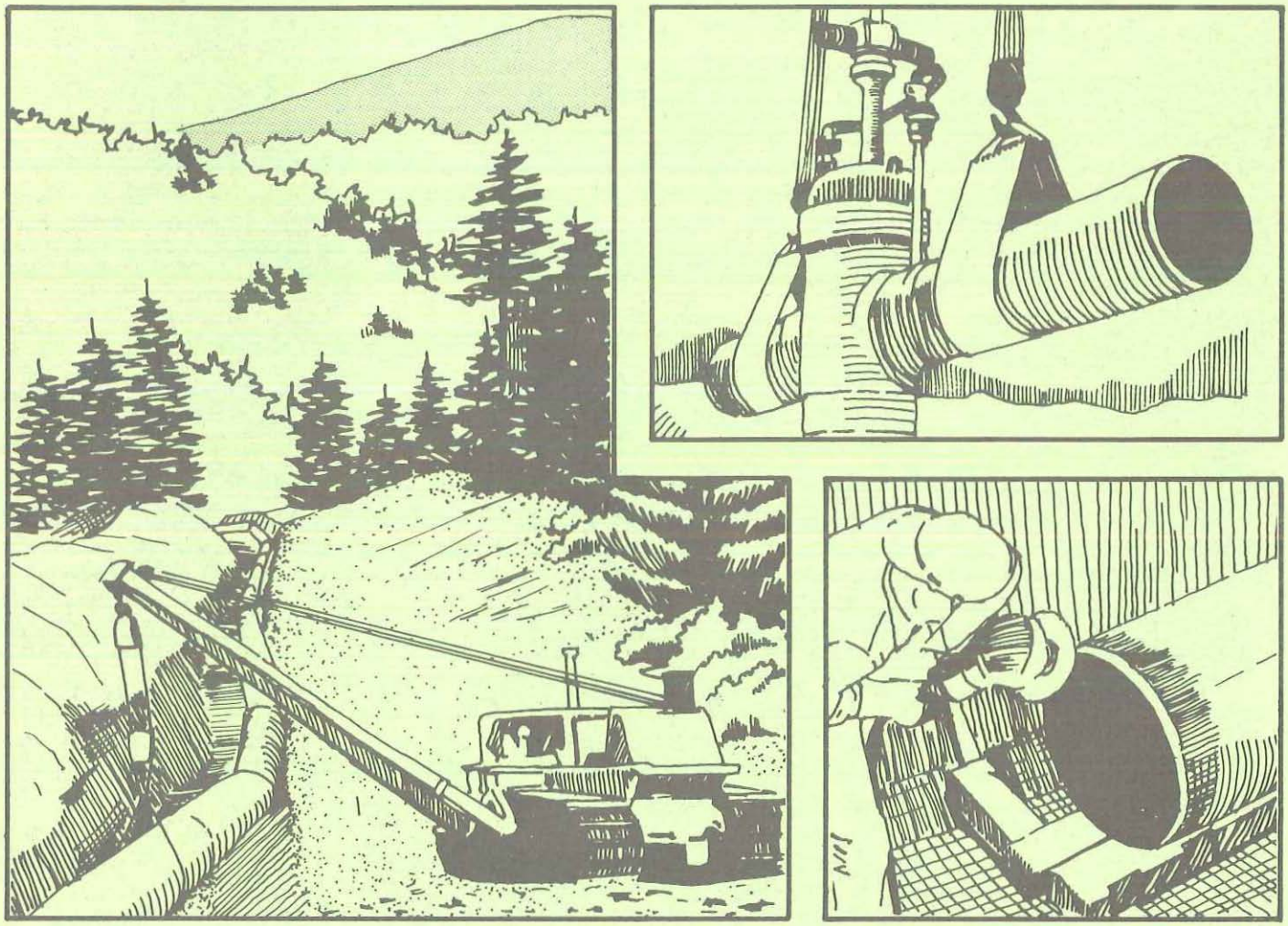
Federal Energy Regulatory Commission

Office of Pipeline and Producer Regulation

November 1989

FERC/EIS-0054D & 0055D
Iroquois Gas Transmission System
Tennessee Gas Pipeline Company
Champlain Pipeline Company
Algonquin Gas Transmission Company

Docket Nos. CP89-634-000
CP89-815-000
CP89-629-000
CP89-646-000
CP89-654-000
CP89-661-000



IROQUOIS / TENNESSEE AND CHAMPLAIN PIPELINE PROJECTS

Draft Environmental Impact Statement
Regional System Alternatives

Volume II

WASHINGTON, DC 20426

IROQUOIS/TENNESSEE AND CHAMPLAIN PIPELINE PROJECTS

Draft Environmental Impact Statement
Regional System Alternatives

Volume II

FEDERAL ENERGY REGULATORY COMMISSION
OFFICE OF PIPELINE AND PRODUCER REGULATION

NOVEMBER 1989

EXECUTIVE SUMMARY

This volume is Volume II for each of two environmental impact statements. These EISs are for the Champlain Pipeline Project and the Iroquois/Tennessee Pipeline Project, and are being issued concurrently.

Volume II contains the environmental analysis of major system alternatives to the approval and construction of both of the above projects. These single pipeline alternatives would provide most or all of the service proposed in the Champlain and Iroquois/Tennessee Pipeline Projects. The four alternatives studied include the:

(1) Existing Systems Expansion Alternative;
(2) Iroquois Mainline Single Pipeline Alternative;
(3) Iroquois/GNE Single Pipeline Alternative; and the
(4) Champlain-based Single Pipeline Alternative.

The analysis presented in this volume concludes that the last three of these alternatives may each be environmentally preferable to the approval and construction of both the Champlain and Iroquois/Tennessee Pipeline Projects.

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1.0 INTRODUCTION

This document is Volume II of two three-volume Environmental Impact Statements (EIS) prepared by the FERC staff in compliance with the National Environmental Policy Act (NEPA) and the Commission's implementing regulations under Chapter I, Title 18, Code of Federal Regulations, Part 380. These two EISs, one for the Iroquois/Tennessee Pipeline Project and one for the Champlain Pipeline Project, are being released concurrently. The information contained in this volume includes the results of studies of the environmental impact of two regional single pipeline alternatives which would replace both projects, compared to the environmental impact of both the proposed Iroquois/Tennessee and Champlain Pipeline projects (Two Pipeline Alternative), and maps showing the locations of facilities not described in either Volume I. The information in Volume I of the Iroquois/Tennessee Pipeline Project EIS and a separate Volume I for the Champlain Pipeline Project EIS provides: a description of the proposed projects; their purpose; project alternatives; affected environment; environmental consequences; and conclusions and recommendations. Each Volumne III of the Iroquois/Tennessee Pipeline Project EIS (Iroquois/Tennessee EIS) and the Champlain Pipeline Project EIS (Champlain EIS) is a compendium of maps which shows, for the appropriate EIS, the locations of the respective facilities. Location maps include details of the proposed pipeline routes and major aboveground facilities.

1.1 PURPOSE

The Iroquois Gas Transmission System (Iroquois) and Tennessee Gas Pipeline Company (Tennessee) have jointly proposed to construct natural-gas pipeline facilities to transport Canadian gas to local distribution companies (LDCs), cogeneration companies, and electric power generation companies in the New York, New Jersey, and southern New England areas. On January 17, 1989, Iroquois applied in Docket CP89-634-000 to the Federal Energy Regulatory Commission (FERC or Commission) for authorization to transport approximately 533,900 thousand cubic feet per day (Mcfd) through its proposed pipeline system, and Tennessee applied in Docket CP89-629-000 for authorization to transport approximately 319,740 Mcfd through its existing and proposed pipeline system. The environmental impact of that joint project is described in the Iroquois/Tennessee EIS, Volume I.

The Champlain Pipeline Company (Champlain) and Algonquin Gas Transmission Company (Algonquin) have applied to the FERC for authorization to construct and operate natural gas pipeline facilities to transport Canadian gas to LDCs, cogeneration, and electric power generating companies in the New England region. On January 17, 1989, Champlain, in Docket Nos. CP89-646-000 and CP89-654-000, and Algonquin, in Docket No. CP89-661-000, requested that the FERC issue Certificates of Public Convenience and Necessity needed to transport approximately 430,600 Mcfd through Champlain's proposed pipeline system and to deliver and transport approximately 307,200 Mcfd through Algonquin's existing and proposed pipeline system. Docket No. CP89-661-000 also includes facilities to transport part of the 60,790 Mcfd from the ANR Project for redelivery to the NEP Brayton Point and Manchester Street plants, and to deliver about 87,047 Mcfd for the Iroquois/Tennessee Pipeline Project. The environmental analysis of the Algonquin project is described in the Champlain EIS Volume I.

Champlain has recently informed the Commission that it no longer wishes to pursue authorization of the Berkshire Branch portion of the proposed project. Accordingly, this EIS does not include an analysis of the Berkshire Branch facilities or any of its associated nonjurisdictional facilities, nor are the Berkshire Branch facilities and deliveries considered in the context of the Two Pipeline Alternative and Single Pipeline Alternatives.

In short, the Berkshire Branch is no longer a part of the Champlain Pipeline Project currently under review. It has not been determined whether the full 4,000 horsepower of compression is still required for the scaled-down project. We have, however, included an analysis of the proposed Middlebury Compressor Station with the Two Pipeline Alternative and compared it with the Single Pipeline Alternatives. A final determination on compression requirements will be made for inclusion in the final EIS.

In addition, planned or potential changes to the actual proposed customers receiving natural gas could have an effect on the volumes proposed to be transported, and ultimately the sizing of the facilities.

When the Iroquois/Tennessee and Champlain Pipeline projects are subjected to a technical and environmental comparison, it is apparent that the two projects have many similarities, could conceivably serve some of the same areas, and would involve additive environmental impacts. Given this and the fact that both pipeline systems originate at the U.S./Canadian border, approximately 110 miles apart, and both receive natural gas produced in Alberta, Canada from the TransCanada PipeLines Limited (TransCanada) system, it appears prudent to evaluate regional system alternatives. Moreover, both pipelines service predominantly New England and Long Island customers and both interconnect with existing interstate pipelines within the service region. Thus, either pipeline could, with modifications, serve almost all the same customers. When the common gas source and service region for both pipelines are more closely compared, a reasonable case can be developed for consolidated pipeline systems, referred to herein as regional system alternatives.

This volume (Volume II to both the Iroquois/Tennessee EIS, and the Champlain EIS) addresses environmental impacts of regional system alternatives and compares them to the impacts of the Two Pipeline Alternative comprised of the proposed Iroquois/Tennessee Pipeline Project and the Champlain Pipeline Project.

1.2 ASSESSMENT OF REGIONAL SYSTEM ALTERNATIVES

Alternatives to the Iroquois/Tennessee Pipeline Project (as addressed in the Iroquois/Tennessee EIS, Volume I) and the Champlain Pipeline Project (as addressed in the Champlain EIS, Volume I) were sought that would meet the objectives of both pipeline projects, while reducing overall potential environmental impacts. These alternative systems were referred to as "single" pipeline systems since they were alternatives to the construction of the two proposed pipeline systems (also referred to as the Two Pipeline Alternative). Four such regional system alternatives were identified. These four alternatives include: (1) the **Existing System Expansion Alternative**; (2) the **Iroquois Mainline Single Pipeline Alternative**; (3) the **Iroquois/GNE Single Pipeline Alternative**; and (4) the **Champlain-based Single Pipeline Alternative.**

(1) The **Existing System Expansion Alternative** would import the gas volumes for the Champlain and Iroquois/Tennessee Pipeline projects near Niagara, New York, and expand existing systems to transport the gas to the northeast.

(2) The **Iroquois Mainline Single Pipeline Alternative** would import the gas volumes for the Champlain and Iroquois/Tennessee Pipeline projects near Waddington, New York, and use the Iroquois proposed route with additional expansion of existing systems to transport the gas to the northeast.

(3) The **Iroquois/GNE Single Pipeline Alternative** would import the gas volumes for the Champlain and Iroquois/Tennessee Pipeline projects near Waddington, New York, and use the Iroquois proposed route as far as Canajoharie, New York, where the GNE route would then deliver the gas to existing systems in eastern Massachusetts. Additional expansion of existing systems to transport the gas to the customers would also be required.

(4) The **Champlain-based Single Pipeline Alternative** would import the gas volumes Champlain and Iroquois/Tennessee Pipeline projects near Highgate, Vermont, and use the Champlain proposed route with additional expansion of existing systems in eastern Massachusetts. Additional expansion of existing systems to transport the gas to the customers would also be required.

The general location of the Existing System Expansion Alternative and the Iroquois Mainline Single Pipeline Alternative are shown in figures 1.2-1 and 1.2-2, respectively. The location of the Iroquois/GNE Single Pipeline Alternative and the Champlain-based Single Pipeline Alternative are shown in figures 2.2-1 and 2.3-1, respectively.

Of the four single pipeline alternatives, only the Champlain-based Single Pipeline Alternative would serve all of the proposed customers of both proposed pipeline. Minor deliveries to North Springfield and Springfield, Vermont and Keene, New Hampshire totaling 2700 Mcfd would not be achieved under the other three single pipeline alternatives because the length of additional pipeline facilities necessary to perform this minor service is not considered to be economically feasible (approximately 73 additional miles of pipeline would be required).

1.2.1 Existing System Expansion Alternative

The Existing System Expansion Alternative (see figure 1.2-1) was examined to determine the feasibility of expanding the existing pipeline systems so they would be capable of transporting the total of 985,000 Mcfd of natural gas as proposed for the Iroquois/Tennessee and Champlain Pipeline projects.

The existing interstate pipeline systems involved in this alternative include those owned and operated by National Fuel Gas Supply Corporation (NFG), Tennessee, Algonquin, and CNG Transmission Corporation (CNG). This alternative also makes use of Niagara Mohawk Power Corporation (Niagara Mohawk) and Vermont Gas Systems, Inc. (VGS) facilities. All but CNG would require facility expansion.

The analysis assumes that essentially all of the gas would be received by Tennessee at its existing point of interconnection with TransCanada at Niagara, New York (see figure 1.2-1). An additional assumption is that 2,700 Mcfd of service to North Springfield and Springfield, Vermont and Keene, New Hampshire, would not be achieved.

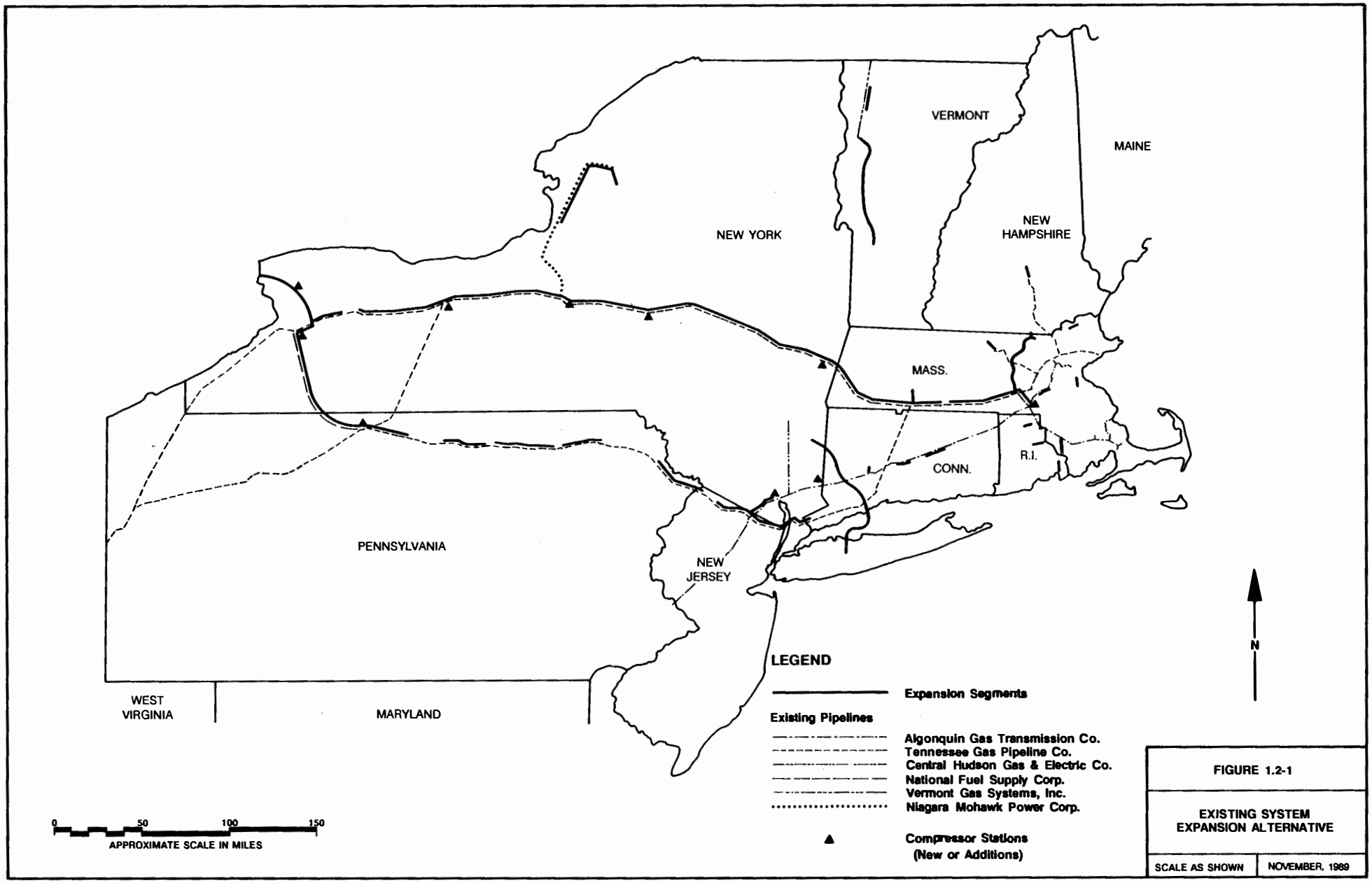

FIGURE 1.2-1

EXISTING SYSTEM EXPANSION ALTERNATIVE

SCALE AS SHOWN | NOVEMBER, 1989

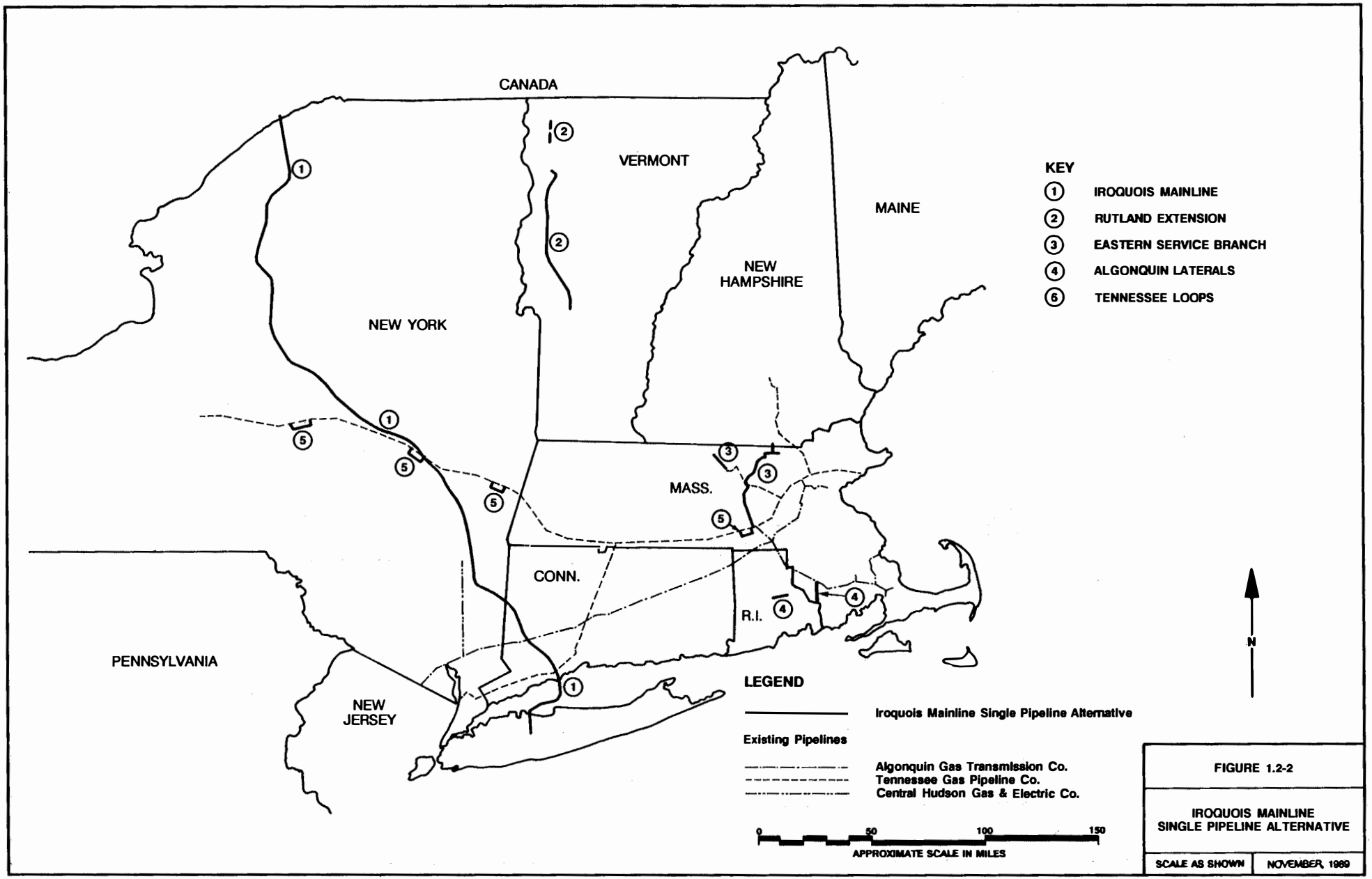

FIGURE 1.2-2

IROQUOIS MAINLINE
SINGLE PIPELINE ALTERNATIVE

SCALE AS SHOWN | NOVEMBER, 1989

The analysis further assumes that the Niagara Import Point Project (NIPP) facilities would be in place and operating as proposed.[1] It also assumes that the Long Island Sound crossing, extending from Brookfield, Connecticut to South Commack, New York would be needed to transport the Iroquois volumes to Long Island. Alternatives to this crossing have been evaluated and eliminated from further study.

The following is a summary of the facilities required to implement this single pipeline transmission system alternative and estimated costs:

Company	Required Pipeline Facilities	Required Compressor Horsepower	Estimated Cost
Algonquin	171.6 miles	23,600	$ 286.3 Million
National Fuel	94.5 miles	7,300	$ 121.4 Million
Tennessee	731.1 miles	16,469	$ 961.7 Million
Niagara Mohawk	53.0 miles	—	$ 26.3 Million
Vermont Gas	74.8 miles	—	$ 34.8 Million
TOTAL	1,125.0 miles	47,369	$1,430.5 Million

This pipeline may be compared with facilities proposed in both the Iroquois/Tennessee and Champlain Pipeline projects (the Two Pipeline Alternative) and their costs as summarized below:

Total Proposed Pipeline	Total Proposed Compressor Horsepower	Estimated Cost
844.7 miles	25,685	$1,208.0 Million

This analysis shows that the existing system expansion alternative would require the construction of 280.3 miles more pipeline and 21,684 horsepower more compression than the Iroquois/Tennessee and Champlain Pipeline projects, and would cost approximately $222.5 million more than the projects.

While about 75 percent of this alternative would involve looping (which, in general, results in less land clearing if a portion of the existing right-of-way is utilized during construction) the construction of the loops adjacent to existing mainline facilities required by this alternative would likely affect more wetlands and more heavily developed residential areas because of the 33 percent greater length than the proposed projects. Because of the great amount of additional facilities and costs required to implement this alternative, and considering that a significant intent of the proposed projects is to provide a large increase in gas deliverability within a relatively short period of time, we believe that this alternative presents no significant environmental advantages over the proposed projects. Therefore, no further analysis of this alternative is presented.

1.2.2 Iroquois Mainline Single Pipeline Alternative

The Iroquois Mainline Single Pipeline Alternative (see figure 1.2-2) was analyzed to determine the impact associated with a system using the route of the Iroquois Mainline and facilities of Tennessee, Algonquin and Vermont Gas to serve both Iroquois/Tennessee and

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1 See FERC Order issued January 12, 1989: Order Finding Niagara Import Point Projects Discrete. Environmental review of the Niagara Import Point Project is currently under underway.

Champlain customers. This single pipeline alternative would require the construction of approximately 677.7 miles of pipeline.

The following is a summary of the facilities required to implement this single pipeline transmission system alternative and estimated costs:

Company	Required Pipeline Facilities	Required Compressor Horsepower	Estimated Cost
Unspecified	369.4 miles	—	$ 626.5 Million
Tennessee	152.1 miles	—	$ 152.9 Million
Algonquin	81.4 miles	—	$ 210.1 Million
Vermont Gas	74.8 miles	—	$ 34.8 Million
TOTAL	677.7 miles	—	$1,024.3 Million

This may be compared with facilities proposed in both the Iroquois/Tennessee and Champlain Pipeline projects and their costs as summarized below:

Total Proposed Pipeline	Total Proposed Compressor Horsepower	Estimated Cost
844.7 miles	25,685	$1,208.0 Million

This analysis shows that a single pipeline alternative using the proposed Iroquois Mainline to its greatest extent, together with expansion of Tennessee, Algonquin and Vermont Gas facilities, would require the construction of 167.0 miles less pipeline and 25,685 horsepower less compression than the proposed Iroquois/Tennessee and Champlain Pipeline projects. In addition, it would cost approximately $183.7 million less than the proposed projects.

This alternative is viable because it would require fewer miles of pipeline and would cost less than the combined proposed projects. However, we did not study the Iroquois Mainline Single Pipeline Alternative in greater detail in this EIS. We felt that the Iroquois/GNE Single Pipeline Alternative described in section 1.2.3 would also be reasonable, as it would accomplish the same objectives as the Iroquois Mainline Single Pipeline alternative and provide greater flexibility in terms of possible future expansion to areas currently unserved by a major pipeline.

However, while delivery to Central Hudson's Roseton Plant is technically feasible for all the single pipeline alternatives, it does not appear to be economically justified using the Iroquois/GNE Single Pipeline Alternative or Champlain-based Single Pipeline Alternative. This delivery would be economic with the Iroquois Mainline Single Pipeline Alternative because the connection of the Roseton Plant would be much shorter.

1.2.3 Iroquois/GNE Single Pipeline Alternative

The Iroquois/GNE Single Pipeline Alternative (see figure 2.2-1) would include the northernmost 171.0 miles and the southernmost 97.8 miles of the proposed Iroquois Mainline; 197.1 miles of the Greater Northeast and Algonquin New North Line (jointly referred to as the Greater Northeast or GNE Mainline); and portions of the proposed Champlain Pipeline. The Iroquois/GNE Single Pipeline Alternative would require the construction of approx-

imately 646.1 miles of pipeline to serve almost all of the proposed customers of the Iroquois/Tennessee and Champlain Pipeline projects.

The following is a summary of the facilities required to implement the Iroquois/GNE Single Pipeline Alternative and estimated costs:

Company	Required Pipeline Facilities	Required Compressor Horsepower	Estimated Cost
Unspecified	368.1 miles	—	$676.9 Million
Tennessee	90.8 miles	—	65.5 Million
Algonquin	112.4 miles	—	144.8 Million
Vermont Gas	74.8 miles	—	34.8 Million
TOTAL	646.1 miles	—	$922.0 Million

This may be compared with facilities proposed in both the Iroquois/Tennessee and Champlain Pipeline projects and their costs, as summarized below:

Total Proposed Pipeline	Total Proposed Compressor Horsepower	Estimated Cost
844.7 miles	25,685	$1,208 Million

This analysis shows that this alternative would required the construction of 198.6 miles less pipeline and 25,685 horsepower less compression than the Iroquois/Tennessee and Champlain Pipeline projects, and would cost approximately 286.0 million dollars less than the proposed pipeline projects.

This single pipeline alternative is addressed in more detail in section 2.2 of this volume.

1.2.4 Champlain-based Single Pipeline Alternative

The Champlain-based Single Pipeline Alternative (see figure 2.3-1) would maximize the use of the route proposed for the Champlain Pipeline Project and would serve Iroquois/Tennessee customers through the Tennessee and Algonquin systems. This single pipeline system would require the construction of 421.4 miles of pipeline to serve almost all of the proposed customers of the Iroquois/Tennessee and Champlain Pipeline projects.

The following is a summary of the facilities required to implement the Champlain-based Single Pipeline Alternative and estimated costs:

Company	Required Pipeline Facilities	Required Compressor Horsepower	Estimated Cost
Unspecified	278.9 miles	—	$446.4 Million
Tennessee	30.1 miles	—	37.3 Million
Algonquin	112.4 miles	—	144.8 Million
TOTAL	421.4 miles	—	$628.5 Million

This may be compared with facilities proposed in both the Iroquois/Tennessee and Champlain Pipeline projects and their costs as summarized below:

Total Proposed Pipeline	Total Proposed Compressor Horsepower	Estimated Cost
844.7 miles	25,685	$1,208 Million

This analysis shows that the Champlain-based Single Pipeline alternative would require the construction of 423.3 miles less pipeline and 25,685 horsepower less compression than the Iroquois/Tennessee and Champlain Pipeline projects and would cost approximately $579.5 million less than the proposed projects.

This single pipeline alternative is addressed in more detail in section 2.3 of this volume.

1.3 ASSUMPTIONS OF ALTERNATIVES ANALYSIS

1.3.1 Capacity of TransCanada to Deliver at Either Import Point

The delivery capacity of TransCanada is currently insufficient to add a new increment of 964,000 Mcfd for either of the single pipeline systems. TransCanada's transportation system would have to be expanded by extensive looping and additional compression.

The difference in Canadian environmental impacts, installation costs, and transport tariffs between the two single pipeline alternatives are not part of this evaluation. Those issues are already a part of the proceedings underway in Canada.

1.3.2 Sponsorship of the Single Pipeline Alternatives

The two single pipeline alternatives addressed in this volume were not a part of the Open Season Settlement process, and, therefore, do not have a pipeline company sponsor or a group of applicants who have formulated a single pipeline approach. (Although portions of the routes proposed by Iroquois, Champlain, and GNE have been used for these alternatives, none of these companies sponsored all facilities needed for a single pipeline alternative project.) Therefore, the viability of either of these possible single pipeline alternatives depends on their adoption by one or more proponents who would formally apply to the Commission for a Certificate of Public Convenience and Necessity and the Commission's determination that such an alternative could meet the requirements for a Certificate of Public Convenience and Necessity.

2.0 DESCRIPTION OF ALTERNATIVES

2.1 TWO PIPELINE ALTERNATIVE

2.1.1 Iroquois/Tennessee Pipeline Project

Iroquois proposes in its application, Docket No. CP89-634-000, to construct pipeline facilities and transport up to 533,900 Mcfd of natural gas received from TransCanada. The gas would be delivered to LDCs and cogeneration customers in New York, New Jersey and Connecticut. Iroquois would also deliver gas to Tennessee near Wright, New York and Stratford, Connecticut, and to Algonquin near Brookfield, Connecticut for redelivery to certain LDCs, cogeneration and power generation customers in Connecticut, Massachusetts, New Hampshire, and Rhode Island.

Tennessee proposes in its application, Docket No. CP89-629-000, to transport 243,195 Mcfd of Canadian gas received from Iroquois for delivery to certain LDCs and cogeneration customers in Massachusetts, Connecticut, New Hampshire, New York and Rhode Island, and 74,547 Mcfd of domestic gas for New England Power Company (NEP) and 2,000 Mcfd for Essex County Gas Company, a customer of Champlain.

The Iroquois/Tennessee Pipeline Project as shown in figure 2.1-1 consists of two integrated pipeline systems. The first system, proposed by Iroquois, would entail construction of a new, 369.4-mile-long, 30- and 24-inch-diameter pipeline. It would begin at the U.S./Canada border near Waddington, New York, and extend through New York and Connecticut, cross Long Island Sound and terminate at facilities of the Long Island Lighting Company (LILCO) near South Commack, New York. The second system, proposed by Tennessee, would entail construction of 117.6 miles of mainline loop, 23.5 miles of lateral loops and replacement pipe, 13.7 miles of new pipeline extensions and 9,900 horsepower of compression in Pennsylvania, New Hampshire, New Jersey, New York, Rhode Island and Massachusetts on its existing mainline system. Table 2.1-1 includes the location, diameter and length of each proposed section of pipeline in the Iroquois/Tennessee Pipeline Project. For a more detailed description of facilities, see the Iroquois/Tennessee EIS, Volume I.

2.1.2 Champlain Pipeline Project

Champlain proposes to construct a total of 278.9 miles of new pipeline extending from the U.S./Canada border through Vermont and southwestern New Hampshire to eastern Massachusetts; and to construct a new 4,000 horsepower compressor station near Middlebury, Vermont. Champlain's pipeline system would consist of a 248.5-mile, 24-inch-diameter mainline, the 27.7-mile, 10-inch-diameter Pelham Branch, and one smaller branch pipeline, the 2.7-mile, 8-inch-diameter Nashua Branch. Champlain would interconnect with Tennessee near Upton, Massachusetts, and with Algonquin near West Medway, Massachusetts. The facilities would be used to transport up to 430,600 Mcfd of Canadian natural gas to LDCs, cogeneration and power generation customers in Vermont, New Hampshire, Rhode Island, and Massachusetts.

Concurrently, Algonquin proposed in its application, Docket CP89-661-000, to construct and operate, as part of the Champlain Pipeline Project, facilities to be added to its

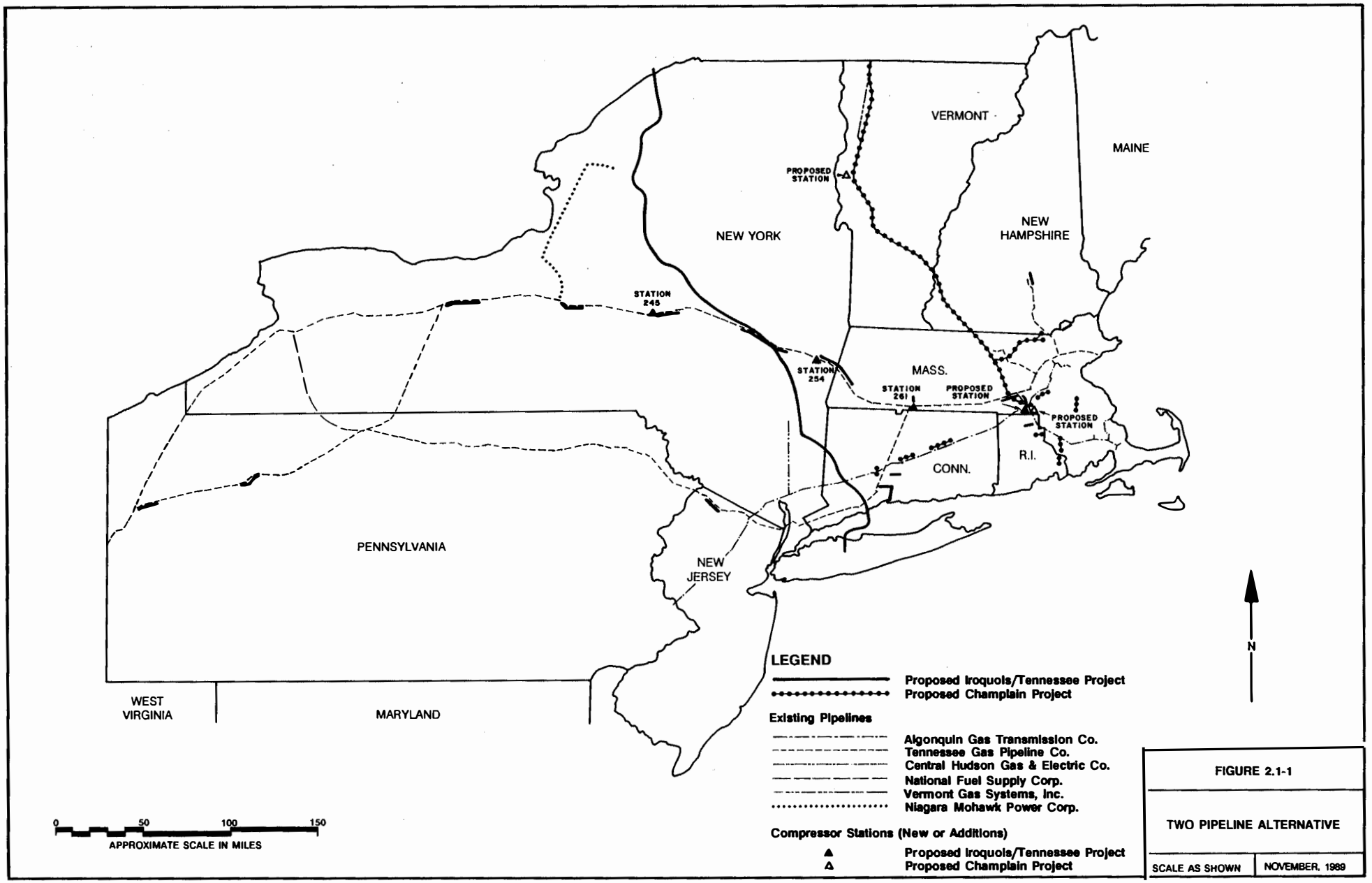

FIGURE 2.1-1

TWO PIPELINE ALTERNATIVE

SCALE AS SHOWN | NOVEMBER, 1989

TABLE 2.1-1

Two Pipeline Alternative
Pipeline Facility Locations

Proposed Facilities	Pipe Diameter (Inches)	Approximate Length (Miles) a/	State	County	Cities or Towns
IROQUOIS					
Mainline	30	52.8	NY	St. Lawrence	Waddington, Lisbon, Canton, Dekalb, Hermon, Edwards, Pitcairn
Mainline	30	54.5	NY	Lewis	Diana, Harrisville, Croghan, New Bremen, Watson, Grieg, Turin, West Turin, Lyons Falls, Leyden
Mainline	30	18.3	NY	Oneida	Boonville, Steuben, Remsen, Trenton
Mainline	30	33.9	NY	Herkimer	Russia, Newport, Norway, Fairfield, Salisbury, Manheim, Danube
Mainline	30	23.9	NY	Montgomery	Minden, Canajoharie, Root, Charleston
Mainline	30/24	11.7	NY	Schoharie	Carlisle, Esperance, Schoharie, Wright
Mainline	24	2.0	NY	Schenectady	Duanesburg
Mainline	24	18.8	NY	Albany	Knox, Berne, Westerlo
Mainline	24	16.3	NY	Greene	Greenville, New Baltimore, Coxsackie, Athens
Mainline	24	15.5	NY	Columbia	Greenport, Livingston, Clermont
Mainline	24	38.9	NY	Dutchess	Milan, Clinton, Pleasant Valley, Lagrange, Union Vale, Dover
Mainline	24	8.8	NY	Suffolk	Huntington, Smithtown
Mainline	24	10.9	CT	Litchfield	New Milford
Mainline	24	33.5	CT	Fairfield	Sherman, Brookfield, Newtown, Monroe, Shelton, Stratford
Mainline	24	2.9	CT	New Haven	Milford
Mainline	24	26.7	CT, NY		Long Island Sound
		369.4			
TENNESSEE					
Mercer Loop	36	13.8	PA	Mercer	Jefferson, Cool Spring, Jackson, Worth
Clarion/Forest Loop	36	11.9	PA	Forest	Jenks, Howe, Kingsley
Ontario/Seneca Loop	36	18.2	NY	Ontario	Hopewell, Phelps
			NY	Seneca	Waterloo, Seneca Falls
Onondaga Loop	36	11.0	NY	Onondaga	Lafayette, Pompey
Herkimer/Otsego Loop	36	9.0	NY	Herkimer	Winfield, Columbia, Warren
			NY	Otsego	Richfield
Schoharie/Albany Loop	36	16.4	NY	Schoharie	Schoharie, Wright, Knox
			NY	Albany	Berne, New Scotland

TABLE 2.1-1 (cont'd)

Proposed Facilities	Pipe Diameter (Inches)	Approximate Length (Miles) a/	State	County	Cities or Towns
TENNESSEE (cont'd)					
Columbia/Berkshire Loop	36	25.1	NY	Columbia	Chatham, New Lebanon, Canaan
			MA	Berkshire	Richmond, Stockbridge, Lee, Tyringham
Worcester Loop	30	10.1	MA	Worcester	Sutton, Northbridge, Grafton, Upton
Sussex Loop	30	2.1	NJ	Sussex	Wantage, Montague
		117.6			
Blackstone Lateral	24 b/	9.6	MA	Worcester	Upton, Hopedale, Mendon
Concord Lateral	12	4.5	NH	Merrimack	Allenstown, Pembroke, Concord
Haverhill Lateral	12	6.1	MA	Essex	Methuen, Haverhill
Wallingford Lateral	12 b/	3.2	CT	New Haven	Cheshire
Springfield Lateral	10 b/	0.1	MA	Hampden	Agawam
		23.5			
North Haven Extension	16	11.4	CT	New Haven	Hamden, Cheshire, Wallingford, North Haven
Lincoln Extension	10	2.3	RI	Providence	Lincoln, Smithfield
		13.7			
Iroquois/Tennessee SUBTOTAL		524.2			
CHAMPLAIN					
Mainline	24	27.4	VT	Franklin	Highgate, Swanton, St. Albans, Fairfield, Fairfax
Mainline	24	27.9	VT	Chittenden	Westford, Essex, Williston, St. George, Hinesburg
Mainline	24	30.7	VT	Addison	Monkton, New Haven, Middlebury, Salisbury, Leicester
Mainline	24	38.3	VT	Rutland	Brandon, Pittsford, Rutland, Clarendon, Shrewsbury, Mt. Holly
Mainline	24	21.7	VT	Windsor	Ludlow, Cavendish, Chester, Springfield
Mainline	24	2.6	VT	Windham	Rockingham
Mainline	24	5.2	NH	Sullivan	Charlestown, Langdon
Mainline	24	36.4	NH	Cheshire	Walpole, Alstead, Surry, Gilsum, Keene, Roxbury, Swanzey, Marlboro, Troy, Fitzwilliam, Rindge
Mainline	24	56.7	MA	Worcester	Winchendon, Ashburnham, Westminster, Fitchburg, Leominster, Sterling, Lancaster, Bolton, Berlin, Northborough, Shrewsbury, Westborough, Grafton, Upton, Milford
Mainline	24	1.6	MA	Norfolk	Medway
		248.5			

TABLE 2.1-1 (cont'd)

Proposed Facilities	Pipe Diameter (Inches)	Approximate Length (Miles) a/	State	County	Cities or Towns
CHAMPLAIN (cont'd)					
Pelham Branch	10	5.7	MA	Worcester	Sterling, Lancaster
Pelham Branch	10	22.0	NH	Middlesex	Shirley, Groton, Pepperell, Dunstable, Tyngsborough, Ayer
		27.7			
Nashua Branch	8	2.6	MA	Middlesex	Dunstable
		0.1	NH	Hillsborough	Nashua
		2.7			
ALGONQUIN					
Waterbury Loop	12	0.9	CT	New Haven	Waterbury, Naugatuck
Cromwell Loop	36	6.1	CT	Middlesex	Middletown, Cromwell
			CT	Hartford	Berlin
Andover Loop	36	8.4	CT	Tolland	Coventry, Andover, Hebron
			CT	Hartford	Glastonbury
Manchester St. Lateral	24	3.6	RI	Providence	East Providence, Providence
Tiverton Loop	16	2.1	RI	Newport	Tiverton
Brayton Point Lateral	20	11.0	MA	Bristol	Dighton, Rehoboth, Swansea, Somerset
Brockton Loop	16	2.0	MA	Plymouth	Brockton
			MA	Norfolk	Avon
Medfield Loop	36	7.5	MA	Norfolk	Medway, Medfield, Millis
			MA	Middlesex	Holliston, Sherborn
		41.6			
Champlain SUBTOTAL		320.5			
TOTAL		844.7			

a/ Scaled from U.S. Geological Survey 7.5-minute-series topographic maps. Actual length of pipeline to be installed would be slightly larger due to terrain relief.

b/ Replacement pipeline

existing pipeline system to permit transportation of up to 455,037 Mcfd of natural gas received from Champlain, Iroquois/Tennessee, and ANR to various delivery points along its system. These facilities would include a new 12,600 horsepower compressor station in Mendon, Massachusetts, and a total of 41.6 miles of 12- through 36-inch-diameter pipeline loops and laterals at various points along Algonquin's system in Connecticut, Rhode Island and Massachusetts.

Figure 2.1-1 shows the location of the Champlain and Algonquin facilities. Table 2.1-1 includes the location, diameter and length of each pipeline segment in the Champlain Pipeline Project.

2.1.3 Aboveground Facilities

The Iroquois system would require 22 mainline valve assemblies, five pig launchers/receivers (which would be sited at valve assembly locations), and seven sales-meter stations along the pipeline route. No compressor stations would be required. The Tennessee system would require one new compressor station, compression additions at three existing stations, and 15 new or modified meter stations.

The Champlain system would require a new compressor station, 28 block-valve assemblies, three pig launchers, three pig receivers, one purchase-meter station, and 16 sales-meter stations. The Algonquin system would require one new compressor station and three metering stations.

The locations of compressor facilities are summarized in table 2.1-2.

2.1.4 Related Nonjurisdictional Facilities

The EIS assessment of significant environmental impacts must extend to nonjurisdictional facilities when, as a practical matter, construction and operation of the nonjurisdictional facilities would not take place without implementation of the jurisdictional project. The significant impacts of related nonjurisdictional facilities for the Iroquois/Tennessee and Champlain Pipeline projects are described in greater detail in their respective EIS, Volume I. The related nonjurisdictional facilities, the respective shipper/customer and the amount of gas that would be delivered for both projects are summarized in table 1.1-1 of the respective EIS, Volume I.

2.2 IROQUOIS/GNE SINGLE PIPELINE ALTERNATIVE

The Iroquois/GNE Single Pipeline Alternative would transport 961,800 Mcfd of natural gas received from TransCanada. The gas would be delivered to LDCs, cogeneration and power customers in New York, New Jersey, Connecticut, Massachusetts, Rhode Island, New Hampshire, and Vermont. It would serve almost all of the proposed customers of the Iroquois/Tennessee and Champlain Pipeline projects . As discussed under the Existing Systems Expansion Alternative, deliveries to Champlain's North Springfield, Springfield, and Keene customers totaling 2,700 Mcfd could not be made without unreasonably long laterals (approximately 73 miles) and therefore, were not included as part of this alternative.

TABLE 2.1-2

Two Pipeline Alternative
Compressor Facility Locations

Proposed Facilities	State	County	Cites or Towns
TENNESSEE			
Station 245-2100 hp Compressor Addition	NY	Herkimer	Winfield
Station 254-3500 hp Compressor Addition	NY	Columbia	Nassau
Station 261-3300 hp Compressor Addition (1650 hp is replacement)	MA	Hampden	Agawam
New Compressor Station - 1000 hp	MA	Worcester	Mendon
CHAMPLAIN			
Middlebury Station 4000 hp of new compression	VT	Addison	Middlebury
ALGONQUIN			
Mendon Station 12,600 hp Compressor Addition	MA	Worcester	Mendon

A total of 646.1 miles of pipeline would be constructed for this alternative (figure 2.2-1). Major segments of this alternative would include: the northernmost 171 miles and southernmost 97.8 miles of the Iroquois Mainline proposed in Docket No. CP89-634-000; 197.1 miles of the GNE Mainline proposed in Docket Nos. CP88-191-000 and CP88-192-000; and portions of the proposed Champlain Pipeline Project. New lateral and mainline loops and lateral extensions would also be required. No new compression would be necessary. Table 2.2-1 lists the location, diameter and length of each of the following pipeline segments in the Iroquois/GNE Single Pipeline Alternative.

2.2.1 Iroquois Mainline

The Iroquois Mainline portion of this alternative would differ for that proposed in Docket No. CP89-634-000, in that the pipe size would be increased from 30- to 36-inch diameter. It would be 171.0 miles in length from the TransCanada facilities at the U.S./Canada border in Waddington, New York, south to Canajoharie, New York. Approximately five miles of pipeline would be adjacent to existing electric transmission or railroad rights-of-way. In Canajoharie the Iroquois pipeline would interconnect with the GNE Mainline (Iroquois/Tennessee EIS, Volume I, figure A-1, sheets 1 to 28).

2.2.2 GNE Mainline

The 36-inch-diameter GNE Mainline portion of the Iroquois/GNE Single Pipeline Alternative would begin at milepost (MP) 171.0 of the proposed Iroquois Pipeline and extend 197.1 miles east to connect with Algonquin's existing mainline system in Mendon, Massachusetts. The GNE Mainline would be located adjacent to existing rights-of-way for 174.6 miles. These rights-of-way include: CNG's pipeline from Canajoharie, New York to Albany, New York; Niagara Mohawk powerline from Albany, New York to the Massachusetts border; Northeast Utilities (Northeast) powerline from the Massachusetts border to the Deerfield River; New England Electric System's (NEES) powerline rights-of-way from the Deerfield River to Uxbridge, Massachusetts; and Algonquin's pipeline rights-of-way from Uxbridge to its termination point. It deviates from existing rights-of-way to avoid several sensitive resource areas (Volume II, figure A-1, sheets 1 to 33).

2.2.3 Rutland Extension

The Rutland Extension would be constructed to deliver gas to customers in Burlington, (2,000 Mcfd); Hinesburg, (200 Mcfd); New Haven Junction (200 Mcfd); Middlebury (900 Mcfd); Brandon (200 Mcfd); Florence (600 Mcfd), and Rutland (2,600 Mcfd). It would comprise the following components: 1) two VGS Loops; 2) the Rutland Connector; and 3) the Rutland Lateral.

VGS would require two 5-mile loops of 10-inch-diameter pipeline between Highgate and St. Albans, Vermont. The facilities would loop the VGS pipeline currently serving Burlington and Essex Junction, Vermont (Volume II, figure A-2, sheets 1 to 3).

The Rutland Connector would comprise 1.9 miles of 10-inch-diameter pipeline on new right-of-way. This would extend the existing VGS pipeline to MP 42.2 of the proposed Champlain Pipeline (Volume II, figure A-3, sheet 1).

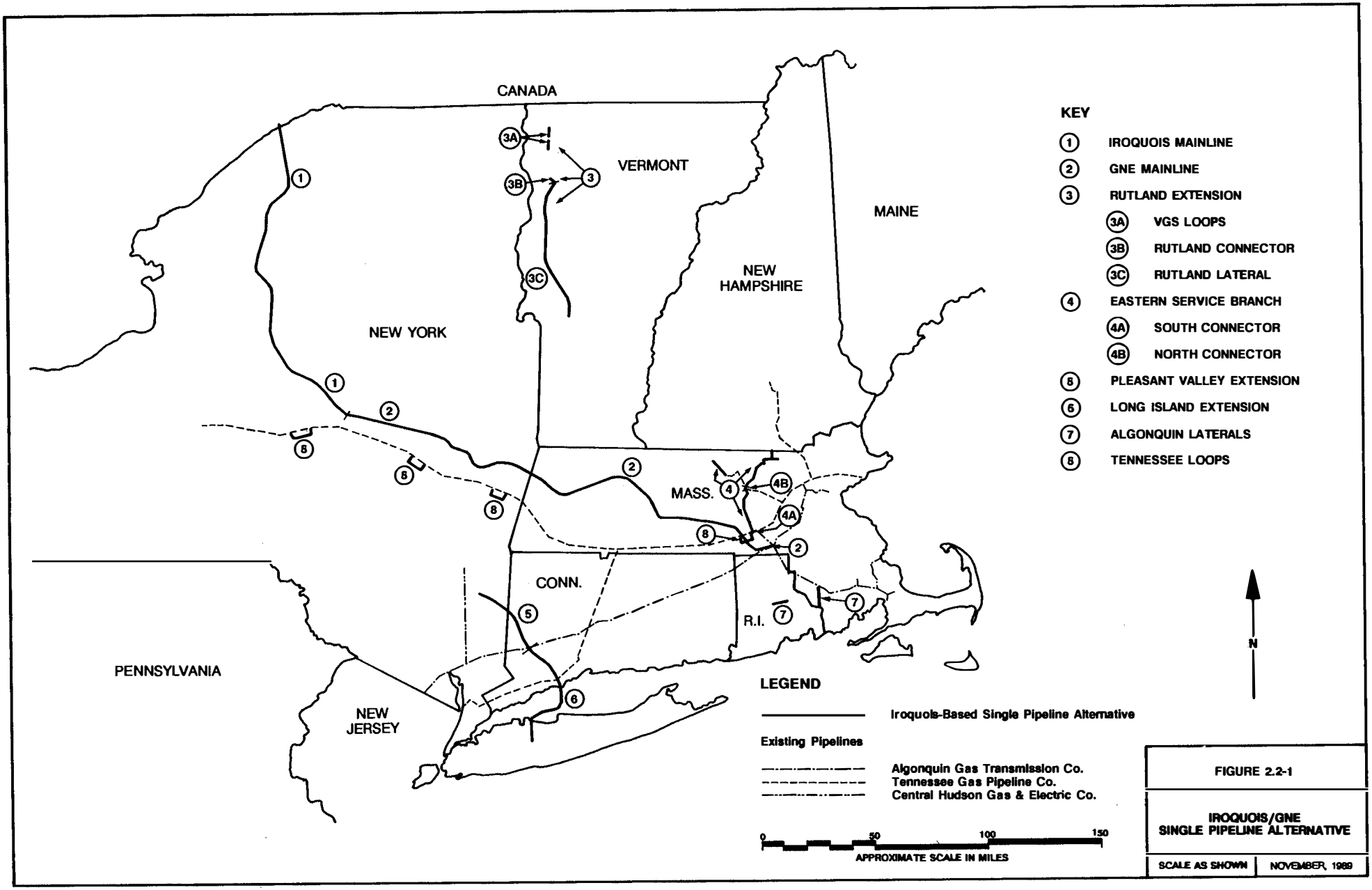

FIGURE 2.2-1

IROQUOIS/GNE
SINGLE PIPELINE ALTERNATIVE

SCALE AS SHOWN | NOVEMBER, 1989

TABLE 2.2-1

Iroquois/GNE Single Pipeline Facility Locations

Proposed Facilities	Pipe Diameter (Inches)	Approximate Length (Miles) a/	State	County	Cities or Towns
IROQUOIS					
Mainline	36	52.8	NY	St. Lawrence	Waddington, Lisbon, Canton, Dekalb, Hermon, Edwards, Pitcairn
Mainline	36	54.5	NY	Lewis	Diana, Harrisville, Croghan, New Bremen, Watson, Grieg, Turin, West Turin, Lyons Falls, Leyden
Mainline	36	18.3	NY	Oneida	Boonville, Steuben, Remsen, Trenton
Mainline	36	33.9	NY	Herkimer	Russia, Newport, Norway, Fairfield, Salisbury, Manheim, Danube
Mainline	36	11.5	NY	Montgomery	Minden, Canajoharie
		171.0			
GREATER NORTHEAST					
Mainline	36	20.6	NY	Montgomery	Canajoharie, Charleston, Florida, Glen, Root
Mainline	36	14.2	NY	Schenectady	Duanesburg, Princeton, Rotterdam
Mainline	36	24.3	NY	Rensselaer	East Greenbush, Nassau, North Greenbush, Sand Lake, Stephentown
Mainline	36	21.0	NY	Albany	Albany, Bethlehem, Guilderland, New Scotland
Mainline	36	21.4	MA	Berkshire	Cheshire, Dalton, Hancock, Hinsdale, Lanesborough, Peru, Windsor
Mainline	36	26.7	MA	Franklin	Ashfield, Conway, Deerfield, Leverett, Shutesbury, Sunderland
Mainline	36	24.5	MA	Hampshire	Plainfield, Belchertown, Pelham, Ware
Mainline	36	44.4	MA	Worcester	Auburn, Blackstone, East Brookfield, Leicester, Mendon, Millbury, Millville, Northbridge, North Brookfield, Spencer, Sutton, Uxbridge, West Brookfield
		197.1			
RUTLAND EXTENSION					
VGS Loop	10	10.0	VT	Franklin	Highgate, Swanton, St. Albans
Rutland Connector	10	1.9	VT	Chittenden	Essex, Williston
Rutland Lateral	10	13.3	VT	Chittenden	Williston, St. George, Hinesburg
Rutland Lateral	10	30.7	VT	Addison	Monkton, New Haven, Middlebury, Salisbury, Leicester
Rutland Lateral	10	18.9	VT	Rutland	Brandon, Pittsford, Rutland, Clarendon, Shrewsbury
		74.8			
EASTERN SERVICE BRANCH					
South Connector	12	0.5	MA	Worcester	Grafton, Upton
Eastern Service Lateral	12	22.8	MA	Worcester	Grafton, Upton, Westborough, Northboro, Berlin, Shrewsbury, Bolton, Lancaster

TABLE 2.2-1 (cont'd)

Proposed Facilities	Pipe Diameter (Inches)	Approximate Length (Miles) a/	State	County	Cities or Towns
EASTERN SERVICE BRANCH (cont'd)					
North Connector	12	2.0	MA	Worcester	Lancaster
Pelham Branch	12/10	3.9	MA	Worcester	Lancaster
	10	21.9	MA	Middlesex	Shirley, Groton, Ayer, Pepperell, Dunstable, Tyngsborough
Pepperell Branch	10	.5			
Nashua Branch	8	2.6	MA	Middlesex	Dunstable
Nashua Branch	8	0.1	NH	Hillsborough	Nashua
Ashburnham Lateral	6	6.4	MA	Worcester	Fitchburg, Westminster, Ashburnham
		60.7			
PLEASANT VALLEY EXTENSION					
Pleasant Valley Lateral	12	7.9	CT	Fairfield	Broadfield, Sherman
Pleasant Valley Lateral	12	10.9	CT	Litchfield	New Medford
Pleasant Valley Lateral	12	15.1	NY	Dutchess	Dover, Union Vale, La Grange
		33.9			
LONG ISLAND EXTENSION					
Mainline	24	25.5	CT	Fairfield	Brookfield, Newton, Monroe, Shelton, Stratford
Mainline	24	2.9	CT	New Haven	Milford
Mainline	24	26.7	CT, NY	---	Long Island Sound
Mainline	24	8.8	NY	Suffolk	Huntington, Smithtown
		63.9			
ALGONQUIN LATERALS					
Manchester Street	24	3.6	RI	Providence	East Providence, Providence
Brayton Point	20	11.0	MA	Bristol	Dighton, Swansea, Somerset
		14.6			
TENNESSEE LOOPS					
Herkimer/Ostego Loop	36	2.0	NY	Herkimer	Winfield
	36	5.7	NY	Otsego	Richfield
Schoharie/Albany Loop	36	5.0	NY	Schoharie	Schoharie, Wright
	36	7.0	NY	Albany	Knox, Berne
Columbia Loop	36	4.1	NY	Columbia	Chatham, New Lebanon
Worcester Loop	36	6.3	MA	Worcester	Sutton, Northbridge
		30.1			
TOTAL LENGTH		646.1			

a/ Scaled from U.S. Geological Survey 7.5-minute-series topographic maps. Actual length of pipeline to be installed would be slightly larger due to terrain relief.

The Rutland Lateral would comprise 62.9 miles of 10-inch-diameter pipeline between MP 42.2 and MP 104.9 of the proposed Champlain Pipeline. The Rutland Connector and the Rutland Lateral would extend the existing VGS pipeline 64.8 miles from Essex Junction to Rutland, Vermont. Of this distance, 41.7 miles would be adjacent to existing electric transmission rights-of-way (Champlain EIS, Volume I, figure A-1, sheets 8 to 21).

2.2.4 Eastern Service Branch

The Eastern Service Branch would be constructed to deliver gas to customers in Clinton (4,000 Mcfd), Ayer (4,000 Mcfd), Pepperell (9,400 Mcfd), Flints Corners (2,000 Mcfd), Ashburnham (1,000 Mcfd), and Leominster, Massachusetts (7,000 Mcfd) and Energy-North in Nashua, New Hampshire (5,000 Mcfd).

The Eastern Service Branch would comprise seven segments: 1) the South Connector; 2) the Eastern Service Lateral; 3) the North Connector; 4) the Pelham Branch; 5) the Pepperell Branch; 6) the Nashua Branch; and 7) the Ashburnham Lateral.

The South Connector would comprise 0.5 miles of 12-inch-diameter pipeline between a connection with the Tennessee Mainline at mainline valve (MLV) 266+1.2 in Upton, Massachusetts and a connection with the Eastern Service Lateral, also in Upton (Volume II, figure A-4, sheet 1).

The Eastern Service Lateral would comprise 22.8 miles of 12-inch-diameter pipeline extending north between Champlain MP 237.9 in Upton and Champlain MP 215.2 in Clinton, Massachusetts. Gas would be delivered to Clinton at Champlain MP 216.37 (Champlain EIS, Volume III, figure A-1, sheet 42 to 46).

The North Connector would comprise 2.0 miles of 12-inch-diameter pipeline extending north between the northern end of the Eastern Service Lateral and MP 1.9 of the Pelham Branch of the proposed Champlain pipeline in Lancaster, Massachusetts (Volume II, figure A-5, sheet 1).

The Pelham Branch would comprise 25.8 miles of 10- and 12-inch-diameter pipeline between extending to the northeast between MP 1.9 and MP 27.7 of the Pelham Branch of the proposed Champlain pipeline. Gas would be delivered to Ayer at MP 12.4.

The Pepperell Branch would comprise 0.5 miles of 10-inch-diameter pipeline extending north from MP 19.9 of the Pelham Branch for deliveries to Pepperell Power.

The Nashua Branch would comprise 2.7 miles of 8-inch-diameter pipeline extending north from MP 23.8 of the Pelham Branch for deliveries to EnergyNorth. Gas would be delivered to Flints Corners at MP 27.7 (Champlain EIS, Volume III, figure A-1, sheet 53).

The Ashburnham Lateral would comprise 6.4 miles of 6-inch-diameter pipeline between MP 204.8 (in Fitchburg, Massachusetts) and MP 198.4 (in Ashburnham, Massachusetts) of the proposed Champlain pipeline route (Champlain EIS, Volume III, figure A-1, sheets 39 to 40). The Ashburnham Lateral would be an extension of the existing Tennessee Fitchburg Lateral which connects with the Eastern Service Branch at MP 3.3 of the Pelham

Branch. Gas would be delivered to Leominster by this existing pipeline; new facilities would not be required.

The total length of the segments of the Eastern Service Branch would be 60.7 miles. Of this mileage, 30.8 miles would be adjacent to existing electric transmission and railroad rights-of-way.

2.2.5 Long Island Extension

The Long Island Extension would provide gas to Iroquois/Tennessee customers in Connecticut and Long Island. It would originate at MP 305.5 of the proposed Iroquois Mainline in Brookfield, Connecticut at the point where that mainline would intersect Algonquin's mainline. From this point a 24-inch-diameter pipeline would extend south through Connecticut, cross Long Island Sound and terminate at South Commack, New York. This 63.9-mile extension would parallel 15.8 miles of existing electric transmission and pipeline rights-of-way and would follow the proposed Iroquois pipeline route for its entirety (Iroquois/Tennessee EIS, Volume III, figure A-1, sheets 50 to 57).

2.2.6 Pleasant Valley Extension

The Pleasant Valley Extension would provide 20,000 Mcfd of natural gas to Central Hudson Gas & Electric Corporation (Central Hudson) for system supply and 100,000 Mcfd of intermittent gas during summer months for operation of its Roseton Generation Station. The extension would involve three segments originating at Algonquin's mainline at MP 305.5 of the proposed Iroquois Mainline at the point where the proposed Iroquois Mainline would intersect Algonquin's mainline. From this point a 12-inch-diameter pipeline would extend north 33.9 miles to La Grange, New York following the proposed Iroquois Mainline route between MP 305.5 and MP 271.6 (Iroquois/Tennessee EIS, Volume III, figure A-1, sheets 45 to 50). At this point the Pleasant Valley Extension would connect with a nonjurisdictional pipeline to the Central Hudson Roseton Generating Plant. This nonjurisdictional pipeline is addressed in section 2.1.4.1.3 of the Iroquois/Tennessee EIS, Volume I.

2.2.7 Algonquin Laterals

Gas for NEP's Brayton Point and Manchester Street generation stations would be delivered to Algonquin at Mendon, Massachusetts through the Iroquois and GNE mainlines.

2.2.7.1 Manchester Street Lateral

The Manchester Street Lateral would be a 24-inch-diameter pipeline lateral in Providence County, Rhode Island. It would extend 3.6 miles from the Dey Street Meter Station in East Providence to the Manchester Street Station in Providence. It would cross the Providence and Seekonk rivers and be located primarily in or adjacent to city streets (Champlain EIS, Volume III, figure A-2, sheet 5).

2.2.7.2 Brayton Point Lateral

Algonquin would deliver natural gas directly to the Brayton Point Generation Station by constructing a 20-inch-diameter 11.0-mile pipeline lateral in Bristol County, Massachusetts. It would connect with Algonquin's G system in Dighton, Massachusetts and terminate at the generation station in Somerset, Massachusetts. It would parallel existing electric transmission rights-of-way for its entire length (Champlain EIS, Volume III, figure A-2, sheets 7 to 8).

2.2.8 Tennessee Loops

For Tennessee to receive natural gas for redelivery to its customers, four loops totaling 30.1 miles would be required on its mainline system in New York and Massachusetts. Each loop is part of a longer loop described in detail in the Iroquois/Tennessee EIS, Volume III. Loop names are the same in Volumes I, II, and III.

2.2.8.1 Herkimer/Otsego Loop

The Herkimer/Otsego Loop would be a 36-inch-diameter mainline loop in Herkimer and Otsego Counties, New York. It would extend 7.7 miles from MLV 245 to MLV 245 + 7.7 (Iroquois/Tennessee EIS, Volume III, figure A-2-5, sheets 1 to 2).

2.2.8.2 Schoharie/Albany Loop

The Schoharie/Albany Loop would be a 36-inch diameter mainline loop in Schoharie and Albany Counties, New York. It would extend 12.0 miles from MLV 249-2A to MP 250-2 + 3.2 (Iroquois/Tennessee EIS, Volume III, figure A-2-6, sheet 1).

2.2.8.3 Columbia Loop

The Columbia Loop would be a 36-inch-diameter mainline loop in Columbia County, New York and Berkshire County, Massachusetts. It would extend 4.1 miles from MLV 254 to MP 254 + 4.1 (Iroquois/Tennessee EIS, Volume III, figure A-2-7, sheets 1 to 2).

2.2.8.4 Worcester Loop

The Worcester Loop would be a 36-inch-diameter mainline loop in Worcester County, Massachusetts. It would extend 6.3 miles from MP 265 + 0.80 to MP 265 + 7.1. (Iroquois/ Tennessee EIS, Volume III, figure A-2-8, sheets 1 to 2).

2.2.9 Aboveground Facilities

Operation of the Iroquois/GNE Single Pipeline Alternative would not require any compression facilities but would require other aboveground facilities such as block valve assemblies, pig launchers and receivers, meter stations, maintenance bases and communication sites. These facilities, although fewer in number, would be similar to those required for the Two Pipeline Alternative.

2.2.10 Related Nonjurisdictional Facilities

Nonjurisdictional facilities related to the Iroquois/GNE Single Pipeline Alternative would be the same as those for the Two Pipeline Alternative (see table 2.1-2), except that lateral pipelines required to deliver gas to North Springfield, Springfield, and Keene customers would not be constructed. These facilities are described in sections 2.1.4 and 5.2 of the respective EIS, Volume I.

2.3 CHAMPLAIN-BASED SINGLE PIPELINE ALTERNATIVE

The Champlain-based Single Pipeline Alternative would transport 964,500 Mcfd of natural gas from TransCanada. This alternative involves expanding the capacity of the proposed Champlain system to 952,800 Mcfd and moving the Iroquois/Tennessee volumes to the indicated shippers by displacement through the Tennessee and Algonquin systems. It would serve all the proposed customers of the Iroquois/Tennessee and Champlain Pipeline projects.

A total of 421.4 miles of pipeline would be constructed for this alternative (figure 2.3-1). Major segments would include the 278.9 miles of pipeline facilities proposed by the Champlain Pipeline Company in Docket No. CP89-646-000, and the southernmost 97.8 miles of the proposed Iroquois Mainline. New lateral and mainline loops and lateral extensions would also be required. No new compression would be necessary. Table 2.3-1 lists the location, diameter and length of each of the pipeline segments in the Champlain-based Single Pipeline Alternative. Several segments are the same for both single-pipeline alternatives. Those common segments are discussed in section 2.2. These include: 1) the Pleasant Valley Extension; 2) the Long Island Extension; 3) the Algonquin Laterals; and 4) the Tennessee Loops.

2.3.1 Champlain Mainline and Branches

The Champlain Mainline required for this alternative would differ from that proposed in Docket No. CP89-646-000 in that the pipe diameter would be increased from 24 inches with compression to 36 inches without compression. Champlain Branch pipelines would not change in size. The pipeline locations would be the same as that described in section 2.1 for the Two Pipeline Alternative.

2.3.2 Aboveground Facilities

Aboveground facilities for the Champlain-based Single Pipeline Alternative would be similar to those required for the Two Pipeline Alternative and Iroquois/GNE Single Pipeline Alternative. The Champlain-based Single Pipeline Alternative would have fewer associated aboveground facilities because of its shorter length.

2.3.3 Related Nonjurisdictional Facilities

Nonjurisdictional facilities related to the Champlain-based Single Pipeline Alternative would be the same as those for the Two Pipeline Alternative with the exception of new loop and lateral pipelines associated with gas deliveries to L & J Energy Systems, Inc. (L & J Energy) cogeneration plant proposed to be located in Lowville, New York. These pipelines

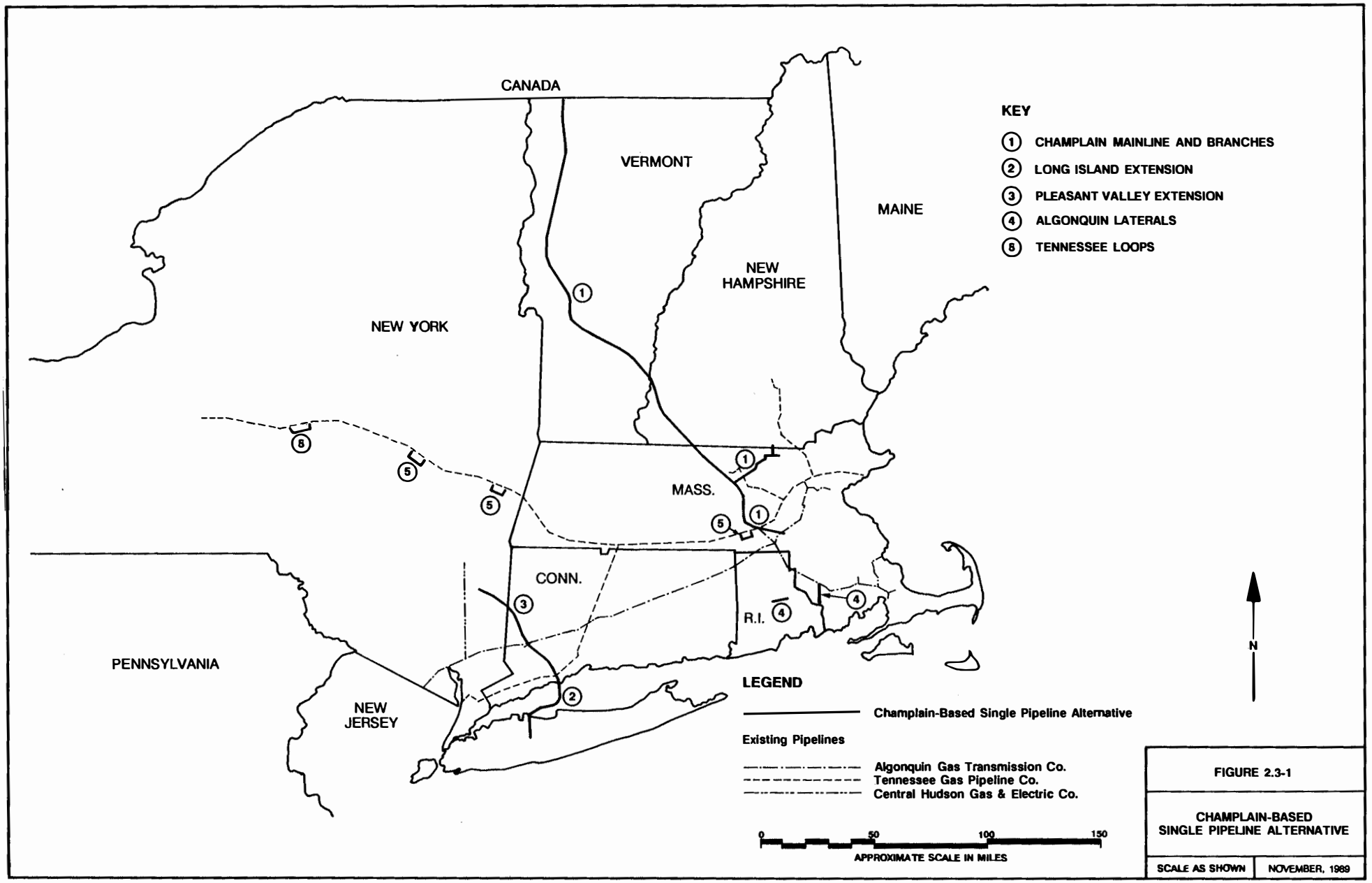

FIGURE 2.3-1

CHAMPLAIN-BASED SINGLE PIPELINE ALTERNATIVE

SCALE AS SHOWN | NOVEMBER, 1989

TABLE 2.3-1

Champlain-based Single Pipeline Facility Locations

Proposed Facilities	Pipe Diameter (Inches)	Approximate Length (Miles) a/	State	County	Cities or Towns
CHAMPLAIN					
Mainline	36	27.4	VT	Franklin	Highgate, Swanton, St. Albans, Fairfield, Fairfax
Mainline	36	27.9	VT	Chittenden	Westford, Essex, Williston, St. George, Hinesburg
Mainline	36	30.7	VT	Addison	Monkton, New Haven, Middlebury, Salisbury, Leicester
Mainline	36	38.3	VT	Rutland	Brandon, Pittsford, Rutland, Clarendon, Shrewsbury, Mt. Holly
Mainline	36	21.7	VT	Windsor	Ludlow, Cavendish, Chester, Springfield
Mainline	36	2.6	VT	Windham	Rockingham
Mainline	36	5.2	NH	Sullivan	Charlestown, Langdon
Mainline	36	36.4	NH	Cheshire	Walpole, Alstead, Surry, Gilsum, Keene, Roxbury, Swanzey, Marlboro, Troy, Fitzwilliam, Rindge
Mainline	36	56.7	MA	Worcester	Winchendon, Ashburnham, Westminster, Fitchburg, Leominster, Sterling, Lancaster, Bolton, Berlin, Northborough, Shrewsbury, Westborough, Grafton, Upton, Milford
Mainline	36	1.6	MA	Norfolk	Medway
		248.5			
Pelham Branch	10	5.7	MA	Worcester	Sterling, Lancaster
Pelham Branch	10	22.0	MA	Middlesex	Shirley, Groton, Pepperell, Dunstable, Tyngsborough, Ayer
		27.7			
Nashua Branch	8	2.6	MA	Middlesex	Dunstable
Nashua Branch	8	0.1	NH	Hillsborough	Nashua
		2.7			
LONG ISLAND EXTENSION					
Mainline	24	25.5	CT	Fairfield	Brookfield, Newton, Monroe, Shelton, Stratford
Mainline	24	2.9	CT	New Haven	Milford
Mainline	24	26.7	CT,NY	---	Long Island Sound
Mainline	24	8.8	NY	Suffolk	Huntington, Smithtown
		63.9			

TABLE 2.3-1 (cont'd)

Proposed Facilities	Pipe Diameter (Inches)	Approximate Length (Miles) a/	State	County	Cities or Towns
PLEASANT VALLEY EXTENSION					
Pleasant Valley Lateral	12	7.9	CT	Fairfield	Broadfield, Sherman
Pleasant Valley Lateral	12	10.9	CT	Litchfield	New Medford
Pleasant Valley Lateral	12	15.1	NY	Dutchess	Dover, Union Vale, La Grange
		33.9			
ALGONQUIN LATERALS					
Manchester Street	24	3.6	RI	Providence	East Providence, Providence
Brayton Point	20	11.0	MA	Bristol	Dighton, Swansea, Somerset
		14.6			
TENNESSEE LOOPS					
Herkimer/Otsego Loop	36	2.0	NY	Herkimer	Winfield
	36	5.7	NY	Otsego	Richfield
Schoharie/Albany Loop	36	5.0	NY	Schoharie	Schoharie, Wright
	36	7.0	NY	Albany	Knox, Berne
Columbia Loop	36	4.1	NY	Columbia	Chatham, New Lebanon
Worcester Loop	36	6.3	MA	Worcester	Sutton, Northbridge
		30.1			
TOTAL LENGTH		421.4			

a/ Scaled from U.S. Geological Survey 7.5-minute-series topographic maps. Actual length of pipeline to be installed would be slightly larger due to terrain relief.

would provide the same service as the lateral proposed between the Iroquois Mainline and Lowville. All facilities but the L & J Energy loop and lateral pipelines are described in detail in sections 2.1.3 and 5.2 of the Champlain EIS, Volume I.

The L & J Energy loop and lateral pipelines would deliver gas to L & J Energy in Lowville (11,700 Mcfd). The 12-inch-diameter loop would originate near Pulaski, New York. From Pulaski, it would loop Niagara Mohawk's existing 10-inch-diameter pipeline in a north and northeasterly direction for 44 miles to Carthage, New York. From Carthage, a 10-inch-diameter lateral would extend south for 17.1 miles on new right-of-way generally adjacent to State Route 26. The location of the new lateral is shown on figure A-6, sheets 1 to 5.

3.0 AFFECTED ENVIRONMENT

3.1 TWO PIPELINE ALTERNATIVE

The Two Pipeline Alternative comprises the proposed Iroquois/Tennessee pipeline system (as addressed in the Iroquois/Tennessee EIS, Volume I) and the proposed Champlain pipeline system (as addressed in the Champlain EIS, Volume I). The affected environment of each is addressed in the respective EIS, Volume I, and is not reiterated herein. Included herein are tabular data (taken from the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I) to characterize selected resource factors for the complete Two Pipeline Alternative. Table 3.1-1 includes a list of locations in the general vicinity of the two proposed projects where copies of the EISs are available for review.

TABLE 3.1-1

List of Information Repositories

VERMONT

Addison County
Isley Library
Main Street
Middlebury, VT 05753

Chittenden County
Essex Free Public Library
Essex Junction, VT 05452

Franklin County
St. Albans Free Public Library
Maiden Lane
St. Albans, VT 05478

Rutland County
Rutland Public Library
Court Street
Rutland, VT 05701

Windham/Windsor County
Springfield Library
Main Street
Springfield, VT 05056

NEW HAMPSHIRE

Cheshire County
Keene Public Library
60 Winter Street
Keene, NH 03431

Hillsborough County
The Nashua Public Library
Court Street
Nashua, NH 03061

Merrimack County
Concord Public Library
45 Green Street
Concord, NH 03301

Sullivan County
The Silsby Free Library
P.O. Box 385
Charlestown, NH 03603

MASSACHUSETTS

Berkshire County
Stockbridge Library Assoc.
Main Street
Stockbridge, MA 01262

Bristol County
The Fall River Public Library
104 North Main Street
Fall River, MA 02720

Essex County
Haverhill Public Library
Summer Street
Haverhill, MA 01830

Franklin County
Belding Memorial Library
Main Street
Ashfield, MA 01330

Hampden County
Agawam Public Library
750 Cooper Street
Agawam, MA 01001

Hampshire County
Youngmens Library Assoc.
Main Street
Ware, MA 01082

Middlesex County
The Pepperell Public Library
Main Street
Pepperell, MA 01403

Norfolk County
The Medway Public Library
26 High Street
Medway, MA 02053

Plymouth County
The Brockton Public Library
304 Main Street
Brockton, MA 02401

Worcester Co.
The Lancaster Public Library
Main Street
Lancaster, MA 01523

NEW YORK

Albany County
Berni Free Library
Main Street
Berne, NY 12023

Columbia County
Chatham Public Library
Woodbridge Avenue
Chatham, NY 12037

Dutchess County
La Grange Assoc. Library
Suite 109
22 Freedom Plains Rd. Rte. 55
Poughkeepsie, NY 12603

Greene County
Heermance Library
One Ely Street
Coxsackie, NY 12051

Herkimer County
Newport Free Library
South Main Street
New Port, NY 13416

Lewis County
Lowville Free Library
Dayan Street
Lowville, NY 13367

Montgomery County
Canajoharie Library
Eric Blvd.
Canajoharie, NY 13317

Oneida County
Didimus Thomas Library
Main Street
Renvon, NY 13438

Onondaga County
Lafayette Public Library
Route 11
Lafayette, NY 13084

Ontario County
Wood Library
Main Street
Canandaigua, NY 14424

Rensselaer County
Sand Lake Public Library
P.O. Box 363
West Sand Lake, NY 12196

St. Lawrence County
Canton Free Library
Benton Memorial Bldg.
6 Park Street, Box 150
Canton, NY 13617

Schoharie/Scheneclady County
Cobleskill Public Library
Union Street
Cobleskill, NY 12043

Seneca County
Mynderse Library
31 Falls Street
Seneca Falls, NY 13148

Suffolk County
Huntington Library
338 Main Street
Huntington, NY 11743

CONNECTICUT

Fairfield Count
Brookfield Library
182 Whiskonier Road
Brookfield, CT 06804

Hartford County
The Wells - Turner Library
2407 Main Street
Glastonbury, CT 06033

Litchfield County
Burham Library
Main Street
Bridgewater, CT 06752

Middlesex County
The Cromwell Beldon Library
41 West Street
Cromwell, CT 06416

TABLE 3.1-1 (cont'd)

CONNECTICUT (cont'd)

New Haven County
Milford Public Library
57 New Haven Avenue
Milford, CT 06460

Tolland County
The Douglas Library
22 Main Street
Helsron, CT 06248

NEW JERSEY

Sussex County
Sussex County Library
County Route 655
Frankford Township, RD 3
Newton, NJ 07860

PENNSYLVANIA

Forest County
Lioneston Public Library
Elm Street
Lionesta, PA 16353

Mercer County
Greenville Library
Main Street
Greenville, PA 16125

RHODE ISLAND

Greenville Public Library
513 Putnam Pike
Smithfield, RI 02828

Newport County
Lydia Essex Public Library
238 Highland Road
Tiverton, RI 02878

Providence County
The Providence Public Library
225 Washington Street
Providence, RI 02903

TABLE 3.1.2-1

Miles of Soil Groups Crossed by the Two Pipeline Alternative a/

Pipeline Segment	Group 1 Gently Sloping to Steep Stony Soils (depth to bedrock <60") b/	Group 2 Level to Sloping Wet Soils c/	Group 3 Gently Sloping to Steep Fertile Soils d/	Group 4 Level, Gentle Sloping, Sandy Soils e/	Group 5 Level, Wet, Organic Soils f/	Group 6 Urban Land g/
IROQUOIS						
Mainline	175.3	87.1	33.3	39.6	1.3	0.0
TENNESSEE						
Mercer Loop	---	12.8	---	1.1	---	---
Clarion/Forest Loop	3.7	8.2	---	---	---	---
Ontario/Seneca Loop	---	7.5	9.1	1.6	---	---
Onandaga Loop	1.3	0.6	9.1	---	---	---
Herkimer/Otsego Loop	4.5	---	4.5	---	---	---
Schoharie/Albany Loop	0.4	7.3	8.7	---	---	---
Columbia/Berkshire Loop	10.8	0.5	13.2	---	0.1	---
Worcester Loop	4.3	0.4	4.7	0.7	---	---
Sussex Loop	1.3	0.8	---	---	---	---
Blackstone Lateral	4.1	0.3	4.5	---	---	---
Concord Lateral	---	1.5	0.5	2.5	---	---
Haverhill Lateral	---	1.6	4.5	---	---	---
North Haven Extension	5.4	3.5	2.5	---	---	---
Wallingford Lateral	1.8	0.7	0.7	---	---	---
Lincoln Extension	---	---	1.4	---	0.4	0.5
Springfield Lateral	---	0.1	---	---	---	---
Subtotal	37.6	45.8	63.4	5.9	0.5	0.5
CHAMPLAIN						
Mainline	92.5	64.2	56.9	33.6	5.3	---
Pelham Branch	2.0	2.9	3.1	17.3	2.0	0.4
Nashua Branch	---	---	---	2.7	---	---
Subtotal	94.5	67.1	60.0	53.6	7.3	0.4
ALGONQUIN						
Westbury Loop	0.6	---	---	0.3	---	---
Cromwell Loop	0.3	0.4	5.4	---	---	---
Andover Loop	0.9	---	5.0	2.5	---	---
Manchester Street Lateral	---	---	---	---	---	3.4
Tiverton Loop	0.5	0.1	---	---	0.6	0.6
Brayton Point Lateral	---	5.1	4.4	---	0.7	0.8
Brockton Loop	0.8	0.8	---	---	---	0.4
Subtotal	3.1	6.4	14.8	2.8	1.3	5.2
TOTAL	310.5	206.4	172.5	103.7	10.4	6.1

TABLE 3.1.2-1 (cont'd)

N.B. Values are preliminary and subject to change.

a/ Overall and individual segment mileage totals do not equal proposed length due to rounding and mapping errors.
b/ Dystrochrepts, Eutrochrepts, Haplorthods. Soil group 1 consists of acid, stony, infertile soils on sloping land.
c/ Haplaquepts, Haplaquents, Fragiaquepts, Fragiorthods, Orchraqualfs, Fluvaquents, Udifluvents. Soil group 2 consists of wet soils on floodplains and uplands.
d/ Hapludalfs. Soil group 3 consists of well drained, fertile, nearly level soils.
e/ Udipsamments, Udorthents, Haplorthods, Dystrochrepts. Soil group 4 consists of sandy, acid, excessively drained soils.
f/ Histosols.
g/ Udorthents, areas disturbed by large-scale, urban development.

TABLE 3.1.3-1

Public Groundwater Supplies Located
Near the Two Pipeline Alternative

Pipeline Segment	Town, State	Milepost	Water Supply	Approx. Distance from Pipeline (mi)
IROQUOIS				
Mainline	Canton, NY	21.5	Peter's Park	0.8
	Hermon, NY	27.7	Hermon Village	0.4
	Diana, NY	53.8	Harrisville Village	0.2
	Greig, NY	93.8	Higby Trailer Park	0.2
	Lyonsdale, NY	106.7	Maple Lane Mobile Home Park	1.2
	Remsen, NY	124.0	Remsen Village	0.7
	Trenton, NY	126.0	Barneveld Village	1.2
		125.5	Prospect Village	0.5
	Manheim, NY	153.5	Kuyrkendall Court Mobile Homes	0.2
		153.5	Homestead Trailer Park and Sales	0.7
	Esperance, NY	190.5	Oak Hill Mobile Home Park	0.2
		192.0	Scoharie Village	1.5
	Westerlo, NY	209.7	Northside Water Dist.	0.7
		215.4	Mapletree Apartments	0.5
	Athens, NY	228.4	Twin Ponds Apartments	0.2
	Greenport, NY	235.0	Greenport Water Dist. #1	0.5
		240.8	Adventist Nursing Home	0.3
		235.0	Stone Bridge Farms Mobile Manor	0.8
		234.0	Nack Trailer Park	0.8
	Livingston, NY	243.2	Livingston Mobile Home Park	0.3
		243.0	Maple Lane Mobile Estates	0.1
	Clinton, NY	257.3	Rhinebeck Lodge	0.1
	Pleasant Valley, NY	267.5	Cedar Hollow Mobile Home Park	1.2
		267.5	Maynard's Mobile	1.2
		267.5	Lake Lodges Apartments	0.9
		269.0	Palmer Apartments	0.2
	Union Vale, NY	272.5	Parkway Apartments	1.0
	Dover, NY	283.6	Schreiber Water Works	0.5
		283.0	Cedar Lane Mobile Home Parks #2	0.6
		285.0	Lake Ellis Mobile Home Park	1.3
		285.4	East Mountain Trail Park	1.5
	New Milford, CT	291.5	West Falls Mobile Homes	0.3
		294.0	Forest Hills Estate	0.5
		291.5	Lord's Mobile Home	0.3
		293.4	River View Court Assoc.	0.5
		294.0	New Milford Heights	0.9
		294.9	Sunny Valley Farms	0.2, 0.7
		295.0	Candlewood Spring Association	0.7
		295.8	Birch Grove Assoc.	0.6
		296.1	Candlewood Trails Assoc.	0.6
		296.1	Lone Oaks Water Company	0.3
		296.2	Mill Brook Water Company	0.3
		296.6	Hi-Vu Water Company	0.4

TABLE 3.1.3-1 (cont'd)

Pipeline Segment	Town, State	Milepost	Water Supply	Approx. Distance from Pipeline (mi)
	New Milford, CT (cont'd)	296.6	Harrybrooke Condominiums	0.6
		297.8	Candlewood Lake Condominiums	0.6
		296.2	Indian Ridge Water Company	1.5
		299.0	Candle Terrace Estates	1.1
	Brookfield, CT	300.6	Brookfield Elderly	0.4
		301.9	Rural Water Co., Inc., Brook Acres	0.3
		302.1	Silvermine Manor	0.7
		302.1	Candlewood Acres Holding Corporation	1.2
		302.3	Newbury Crossing	0.8
		302.6	Ledgewood Association	0.7
		303.4	Dancon Corporation Brookwood	0.6
		303.6	Dancon Corporation Butternut Ridge	1.0
		303.7	Rollingwood Condominiums	0.2
		304.1	Sandy Lane Village	0.5
		304.6	Brookfield Hills Condominiums	1.05
		301.3	Rural Water Co., In Brookfield Division	1.0
		305.0	Stony Hill Village	1.2
		306.1	Cedarbrook Apartments	0.8
	Newton, CT	306.2	Greenridge Inc., Water Division	0.3
		310.6	Newtown Water Co.	0.8
		311.5	Fairfield Hills Hospital	1.2
		313.2	Olmstead Water Supply Co., Inc.	0.6
			Lake Zoar	1.1
	Shelton, CT	323.9	Ansonia Derby Water Co.	1.2
TENNESSEE				
Mercer Loop	Mercer, PA	Whole Length	Various	<1.0
Ontario/Seneca Loop	Seneca, NY	237 + 5.48	Phelps Village	0.6
		237 + 6.35	Fort Hill Development Corp.	0.8
		237 + 7.57	Country Side Park	0.6
Onandaga Loop		241 + 3.1	Green Valley Mobile	0.5
		241 + 2.67	East Syracuse Village	1.1
Herkimer/Otsego Loop		246 + 0.0	Folts Trailer Park	1.0
Columbia/Berkshire Loop		255 + 0.0	Berkshire Farm Center	0.1
		255 + 2.8	Gilchrist Spring	0.3
	Richmond, MA	256 + 2.22	Richmond	0.9
	Stockbridge, MA	256 + 4.1	Stockbridge	0.9
		256 + 6.0	Stockbridge	0.5
		256 + 7.26	Stockbridge	0.7
	Lee, MA	256 + 9.1	Town of Lee	0.4
		257 + 0.9	Town of Lee	0.4
		257 + 1.64	Town of Lee (Mitchel Spring/Wells)	0.6
		257 + 1.69	Town of Lee (Cold Spring Wells)	1.0

TABLE 3.1.3-1 (cont'd)

Pipeline Segment	Town, State	Milepost	Water Supply	Approx. Distance from Pipeline (mi)
Worcester Loop	Grafton, MA	265 + 7.0	Town of Grafton	0.3
	Upton, MA	266 + 1.68	Town of Upton	0.9
Sussex Loop		324 + 16.95	Ridge Rumas Gun Club	0.2
			Dairy Research CE, Private	
		324 + 16.95	Private	0.5
		324 + 16.95	Private	0.9
Concord Lateral	Merrimack, NH	Whole Length	Merrimack County	<1.0
New Haven Extension	Hamden, CT	344 + 10.12	Town of Hamden	0.3
		344 + 10.3	South Central Connecticut Regional Water Authority	0.1
	Hamden, CT	344 + 10.38	Country Club/Town of Hamden	0.9
	Wallingford, CT	344 + 14.4	Trailer Park/Town of Wallingford	0.02
	Wallingford, CT	344 + 16.42	Town of Wallingford	0.8
Wallingford Lateral	Cheshire, CT	345 - 201 + 1.3	Town of Cheshire	0.5
	Cheshire, CT	345A - 201 + 1.4	Town of Cheshire	0.4
	Cheshire, CT	345A - 201 + 1.4	Mansion House Apartments	1.4
CHAMPLAIN				
Mainline	Swanton, VT	11.5 - 12.4	Homestead Acres Trailer Park	.34
	Fairfax, VT	18.9 - 19.3	Windtop Water Works	.53
	Westford, VT	32.8 - 33.6	Rolling Acres Trailer Park	.42
	St. George, VT	48.3 - 49.8	St. George Estates	.2
	Procton, VT	100.4 - 101.5	Oakcrest Water System	1.4
	Rutland, VT	104.8 - 105.8	Green Acres Development	.38
	Rutland, VT	106.5 - 106.9	Killington Estates	.04
	Clarendon, VT	111.7 - 112.9	Whispering Pines Trailer Park	.45
	Shrewsbury, VT	115.3 - 116.3	Cuttingsville Fire District	0.1
	Winchendon, MA	192.0	Town of Winchendon	.39
	Lancaster, MA	217.3 - 217.4	Town of Lancaster	.04
	Westborough, MA	230.5 - 231.0	Town of Westborough	.9
	Westborough, MA	231.1 - 231.2	Town of Westborough	.9
Pelham	Lancaster/ Leominster, MA	0.6 - 0.8	Town of Lancaster	.06
	Shirley, MA	7.4 - 7.5	Town of Shirley	.02
ALGONQUIN				
Brayton Pt.	Swansea, MA	5.7 - 6.2	Town of Swansea	.08

TABLE 3.1.3-2

Summary of Perennial Water Bodies Crossed by the Two-Pipeline Alternative

Pipeline Segment	Number of Waterbodies Crossed
IROQUOIS	
Mainline	316
TENNESSEE	
Mercer Loop	11
Clarion/Forest Loop	2
Ontario/Seneca Loop	18
Onondaga Loop	7
Herkimer/Otsego Loop	7
Scoharie/Albany Loop	22
Columbia/Berkshire Loop	16
Worcester Loop	7
Sussex Loop	4
Blackstone Lateral	8
Concord Lateral	4
Haverhill Lateral	9
New Haven Lateral	10
Wallingford Lateral	2
Lincoln Lateral	3
Subtotal	130
CHAMPLAIN	
Mainline	209
Pelham Branch	37
Nashua Branch	4
Subtotal	250
ALGONQUIN	
Waterbury Loop	1
Brockton Loop	1
Manchester St. Lateral	2
Medfield Loop	2
Cromwell Loop	7
Andover Loop	6
Brayton Pt. Lateral	7
Subtotal	26
TOTAL	722

TABLE 3.1.4-1

Significant Fishery Resources
Crossed by the Two Pipeline Alternative

Pipeline Segment	Milepost	Waterbodies Crossed	Crossing Width (ft.) a/	Fishery Type b/	Fishery Issue c/
IROQUOIS					
Mainline	0.0	St. Lawrence River	3100	W	1,2
	3.20	Sucker Brook	20	W	2
	10.55	Brandy Brook	10	W	2
	15.55, 18.10	Grass River	150	W	1,2
	27.85	Elm Creek		C-S	2
	41.35	Oswegatchie River	200	W	2
	48.25	W. Branch Oswegatchie River	100	W	2
	51.25	Clear Creek	5	C	2
	65.05	Indian River	2	C	2
	76.80	Beaver River		W	2
	79.55	Murmur Creek	15	C	2
	80.75	Black Creek	10	C-S	2
	87.40	Crystal Creek	25	C	2
	91.05	Independence River	54	C-S	2
	92.10	Otter Creek	20-40	C-S	2
	94.75	Black River		W	2
	106.75	Sugar River	40	C-S	2
	108.35	Mill Creek	15-20	C	2
	111.35	West Kent Creek	13	C	2
	113.05	East Kent Creek	15	C	2
	115.60	Alder Creek		C-S	2
	123.10	Cady Brook	5	C	2
	125.60	West Canada Creek	45	C-S	2
	136.20	Hurricane Brook		C-S	2
	137.60	Factory Brook	5	C	2
	139.05, 139.10	Big Bill Brook	12	C	2
	139.15	Big Bill Brook	12	C-S	2
	140.10	Wolf Hollow Creek	1	C	2
	145.60	Ransom Creek	12	C-S	2
	150.15	Crum Creek	7	C-S	2
	154.20	Mohawk River	200	W	2,3
	161.30	Ostquago Creek		C-S	2
	170.8	Canajoharie Creek		C-S	2
	187.5	Schoharie Creek		W	2
	203.95	Switz Kill		C-S	2
	213.15	Basic Creek	6-12	C-S	2
	224.20	Potic Creek	15	C-S	2
	231.90	Hudson River	2500	W	2,3
	245.00	Roeliff Jansen Kill	30	C-S	2
	257.95	Little Wappinger Creek		C-S	2
	265.45, 266.25	Wappinger Creek	40-60	W, C-S	2
	272.55	Sprout Creek	1	C-S	2
	279.90	Coopertown Brook	1-10	C-S	2
	281.70	Swamp River	12-30	W	2
	284.20	Tenmile River		W, C-S	2
	286.25	Deuel Hollow Brook	4-12	C-S	2
	287.80	Wimisink Brook		C-S	2
	289.15	Morrissey Brook		C-S	2
	291.70	Bullymuck Brook		C-S	2
	292.85	Rocky River		C-S	2
	306.45	Pond Brook		C-S	2
	311.20	Pootatuck River		C-S	2
	327.20	Farmill River		C-S	2,3
	330.85	Housatonic River		E	2,3

TABLE 3.1.4-1 (cont'd)

Pipeline Segment	Milepost	Waterbodies Crossed	Crossing Width (ft.) a/	Fishery Type b/	Fishery Issue c/
CHAMPLAIN					
Mainline	6.2	Missisquoi River	200	C-S	1
	7.0	Hungerford Brook	30	W	1
	25.7	Lamoille River	200	W, C-S	2,3
	28.9	Browns River	40	C-S	2,3
	40.5	Winooski River	150	W, C-S	2
	51.5	La Platte River	10	W, C-S	1
	54.6	Lewis Creek	35	C-S	2,3
	70.2	New Haven River	50	C-S	2,3
	77.2	Middlebury River	50	C-S	2
	97.7	Furnace Brook	20	C	2,3
	148.8	Connecticut River	750	W, C-S	1
	153.6	Great Brook	25	C-S	1
	154.0	Cold River	50	C-S	1,2
	163.9	Ashuelot River	50	W, C-S	1
	193.9	Millers River	50	W, C-S	2
	213.1	Wekepeke Brook	15	W, C	2
Pelham Branch	9.6	Mulpus Brook	10	W,C-S	2,3
	21.8	Unkety Brook	10	C-S	2,3

a/ Some data provided by applicants. Missing data are unavailable.

b/ Fishery Type Codes:

W = warm-water
C = cold-water
C-S = cold-water stocked
E = estuarine

c/ Fisheries Issue:

1 = contains federally or state-listed or proposed endangered, threatened or special concernaquatic species.
2 = either designated as exceptional cold-water fishery or has special fishery regulations, or given high priority by the state.
3 = good salmonid spawning habitat.

TABLE 3.1.4-2

Deer Wintering Areas Crossed by the Two Pipeline Alternative

Applicant Segment/State	Beginning Milepost	Length of Crossing (ft)	Amount of Vegetation Cleared (acres) a/	New (N) or Existing (E) Right-of-Way/Width(Ft)b/
IROQUOIS				
Mainline/NY	18.1	1,200	2.8	N/100
	50.7	2,500	5.7	N/100
	56.9	5,200	11.9	N/100
	204.0	2,000	4.6	N/100
	226.4	2,900	6.7	N/100
	276.6	4,000	9.2	N/100
TENNESSEE				
Loop 4/NY	241 + 10.25	2,750	3.2	E/50
CHAMPLAIN				
Mainline/VT	7.2	3,600	6.2	E/150
	23.2	3,800	6.5	E/80
	41.5	1,500	2.6	N
	60.5	2,700	4.6	E/130
	78.5	5,400	9.3	E/150
	106.9	1,600	0.0	E/300
	110.7	15,100	26.0	E/250
	117.5	6,400	11.0	E/250
	130.3	1,500	2.6	E/150
	133.7	2,500	4.3	E/10
	134.2	1,100	1.9	E/10
	134.9	7,400	12.9	E/80
Mainline/NH c/	149.9	2,400	4.1	N
	152.6	2,400	4.1	N
	153.7	2,600	4.5	N
	154.5	1,600	2.8	N
	161.2	1,800	3.1	E/150
	163.9	10,300	17.7	E/150
	168.8	800	1.4	E/150
	171.6	400	0.7	E/150
	174.3	2,400	4.1	E/150
	175.1	10,900	18.8	E/150
	179.0	3,200	5.5	E/250
Mainline/MA	223.4	3,600	6.2	N
	228.3	4,900	8.4	N
	233.9	2,100	3.6	N
	234.9	7,900	13.6	N
	237.6	3,500	6.0	N
	238.9	5,400	9.3	E/250
ALGONQUIN	No deer wintering areas crossed			
TOTALS		145,800	248.2	

Source: New York State DEC, Vermont FWD, New Hampshire FGD, Massachusetts DFW.

a/ Amount of vegetation cleared was determined by multiplying length of crossing by the width of construction right-of-way (ROW) (75 or 100 feet), then dividing by square feet per acre (43,560).

b/ Indicates whether proposed pipeline at each deer wintering area (DWA) crossing is new ROW or parallel and adjacent to existing ROW. If adjacent to existing ROW, width of the existing ROW is indicated.

c/ DWA maps have been completed for 10 of the 13 towns crossed by the Mainline in New Hampshire.

TABLE 3.1.5-1

Endangered and Threatened Species that Potentially Occur in the Vicinity of the Two Pipeline Alternative

Species	Status a/	County/State
IROQUOIS		
Bald eagle	F/E, NY/E, CT/E	Albany, NY Greene, NY Fairfield, CT
Shortnose sturgeon	F/E, NY/E, CT/E	Greene, NY New Haven, CT
Kemp's Ridley sea turtle	F/E, NY/E	Huntington, NY
Slender marsh bluegrass	F/C2, NY/E	Lewis, NY
Heartleaf plantain	F/C2, NY/T	Columbia, NY
Parker's pipewort	F/C2	Columbia, NY
Bog turtle	F/C2, NY/E	Columbia, NY Dutchess, NY
Panic grass	NY/T	St. Lawrence, NY
Ram's head lady's slipper	NY/T	St. Lawrence, NY
Swamp birch	NY/R	St. Lawrence, NY
Schweinitz sedge	NY/R	Oneida, NY
White lady's slipper	NY/E	Oneida, NY
Kidney-leaf mud plantain	NY/R	Greene, NY
Swamp beggar's tick	NY/T	Columbia, NY
Green milkweed	NY/R	Columbia, NY
Blandings turtle	NY/T	Dutchess, NY
Timber rattlesnake	NY/T	Dutchess, NY
Side-oats grama grass	C/R	Litchfield, CT
Lizard's tail	C/R	Fairfield, CT
Sickle-leaved golden aster	C/R	New Haven, CT
Beach needle grass	C/R	New Haven, CT
TENNESSEE		
Mercer Loop		
Schweinitz's flat sedge	PA/T	Mercer, PA
Square-stemmed spikerush	PA/R	Mercer, PA
Eastern massauga	PA/E	Mercer, PA
Bog turtle	F/C2, PA/E	Mercer, PA
Henslow's sparrow	PA/T	Mercer, PA
Least bittern	PA/T	Mercer, PA
Marsh wren	PA/SC	Mercer, PA
Red-headed woodpecker	PA/SC	Mercer, PA
Great blue heron	PA/SC	Mercer, PA
Ontario/Seneca Loop		
Bog turtle	F/C2, NY/E	Seneca, NY
Schoharie/Albany Loop		
Ram's head lady's slipper	NY/T	Seneca, NY
Columbia/Berkshire Loop		
Hill's pondweed	NY/T, M/R	Columbia, NY Berkshire, MA
Drooping bulrush	M/R	Berkshire, MA
Fringed gentian	M/R	Berkshire, MA
Worcester Loop		
Wood turtle	M/R	Worcester, MA
Sussex Loop		
Cooper's hawk	NJ/E	Sussex, NJ
Barred owl	NJ/T	Sussex, NJ
Red-headed woodpecker	NJ/T	Sussex, NJ
Concord Lateral		
Bald eagle	F/E, N/E	Merrimack, NH

TABLE 3.1.5-1 (cont'd)

Species	Status a/	County/State
CHAMPLAIN		
Peregrine falcon b/	F/E, V/E	Rutland, VT Windsor, VT
Dwarf wedge mussel	F/P, N/E	Cheshire, NH Sullivan, NH
Barbed bulrush	F/C2, V/T	Windham, VT
Muskellunge	V/U	Franklin, VT
Garber's sedge	V/T	Franklin, VT
Meadow horsetail	V/SC	Franklin, VT
American brook lamprey	V/T	Franklin, VT
Hairy sedge	V/SC	Franklin, VT
Stone cat	V/SC	Chittenden, VT
Fairy slipper b/	V/T	Addison, VT
Swamp fly-honeysuckle	V/SC	Addison, VT
Eastern jacob's ladder	V/T	Addison, VT
Ram's-head lady's-slipper	V/T	Addison, VT
Showy lady's-slipper	V/SC	Addison, VT
White adder's-mouth	V/T	Addison, VT
Marsh horsetail b/	V/T	Addison, VT
Green dragon	V/T, M/T	Rutland, VT Franklin, MA
Massachusetts fern	V/SC	Windsor, VT
Flowering Dogwood	V/T	Windham, VT
Prostrate tick-trefoil	V/T	Windham, VT
Three-birds orchid	V/T	Windham, VT
Cutleaf toothwort	N/E	Cheshire, VT
Slender-flowered muhlenbergia	N/T	Cheshire, VT
Blue-gray gnatcatcher	N/T	Cheshire, NH
Fringed gentian	N/T	Cheshire, NH
Cooper's hawk	M/SC	Worcester, MA
Blue-spotted salamander c/	M/SC	Worcester, MA
Spotted turtle c/	M/SC	Worcester, MA
Northern hairstreak butterfly	M/SC	Worcester, MA
Barren strawberry	M/SC	Franklin, MA
ALGONQUIN		
No known occurrences		

a/ Codes for status:

F - Federal
V - Vermont
N - New Hampshire
M - Massachusetts
C - Connecticut
R - Rhode Island
NY - New York
NJ - New Jersey
PA - Pennsylvania

E - Endangered
T - Threatened
SC - Special Concern
C2 - Status 2 Candidate
U - Under Consideration
P - Proposed Endangered
R - Rare

b/ Historic record only.

c/ Wetland species whose habitat is protected by Massachusetts Wetland Protection Act.

Source: U.S. Fish and Wildlife Service; National Marine Fisheries Service; New York Natural Heritage Program; Vermont Natural Heritage Program; New Hampshire Natural Heritage Inventory; Massachusetts Natural Heritage Program; Connecticut Natural Diversity Data Base; and Rhode Island Division of Fish and Wildlife.

TABLE 3.1.7-1

Summary of Wetlands Crossed by the Two Pipeline Alternative a/

Pipeline Segment	Number of Wetlands Crossed	Total Length of Crossing (ft.)	
IROQUOIS			
Mainline	232	93,900	
TENNESSEE			
Mercer Loop	3	2,850	
Forest Loop	0	0	
Ontario/Seneca Loop	4	2,150	
Onondaga Loop	8	4,900	
Herkimer/Otsego Loop	6	1,550	
Scoharie/Albany Loop	4	1,000	
Columbia/Berkshire Loop	22	8,250	
Worcester Loop	8	1,650	
Sussex Loop	4	1,200	
Blackstone Lateral	9	2,250	
Concord Lateral	2	1,050	
Haverhill Lateral	12	5,600	
New Haven Lateral	16	3,550	
Wallingford Lateral	4	900	
Lincoln Lateral	6	1,200	
Springfield Lateral	0	0	
Subtotal	108	37,100	
CHAMPLAIN			
Mainline	165	79,100	
Pelham Branch	48	16,750	
Nashua Branch	3	1,350	
Subtotal	216	97,200	
ALGONQUIN			
Waterbury Loop	0	0	
Tiverton Loop	3	2,950	
Brockton Loop	3	650	
Manchester St. Lateral	0	0	
Medfield Loop	14	6,300	
Cromwell Loop	11	4,150	
Andover Loop	14	2,200	
Brayton Pt. Lateral	18	7,450	
Subtotal	63	23,700	
TOTAL	619	251,900	(47.7 miles)

a/ Does not include riverine and lacustrine wetlands listed in table 4.1.7-1 of the Iroquois/Tennessee EIS, Volume I. These were omitted to provide a consistent comparison with the Champlain project, and because river and lake crossings are addressed in section 3.3.3 of this volume.

TABLE 3.1.7-2

Wetland Types Crossed by the Two Pipeline Alternative

Pipeline Segment	NWI Classification a/	Number of Crossing Locations b/	Wetland Area Affected During Construction (acres) c/
IROQUOIS			
Mainline	E1OW	2	3.9
	E2BB	2	0.5
	E2FL	3	4.4
	PFO1	140	118.7
	PFO1/5	1	0.2
	PFO4	6	5.8
	PFO4/6	1	1.3
	PFO5	1	0.1
	PFO6/4	1	2.1
	PFO5/SS1	1	1.0
	PFO/SS1	14	15.4
	PFO1/EM	1	0.1
	PFO5/OW	1	0.9
	PSS1	70	54.7
	PSS1/5	1	2.4
	PSS1/EM	23	15.7
	PSS5/OW	1	0.2
	POW	9	5.7
	PEM	36	19.0
	PFLA	2	2.3
	Subtotals	316	254.4
TENNESSEE			
Mercer	PSS1	3	3.3
Forest	No wetlands crossed.		
Ontario/Seneca	PFO1	3	2.2
	PFO1/4	1	0.3
	Subtotals	4	2.5
Onodaga	PFO1/PFO4/PEM	3	1.9
	PFO1/PFO4/PSS	1	0.3
	PFO/PSS	1	0.2
	PSS/PEM	2	1.7
	PSS/PFO1/PFO4	1	1.5
	Subtotals	8	5.6
Herkimer/Otsego	PFO4/PSS/PEM/PAB4	1	0.2
	PSS/PFO1/PEM	4	1.2
	PSS/PFO4	1	0.4
	Subtotals	6	1.8
Schoharie/Albany	PFO1	2	0.3
	PFO1/PSS/POW	1	0.2
	PSS5/PEM/POW	1	0.6
	Subtotals	4	1.1
Columbia/Berkshire	PFO1	5	0.6
	PFO4/5	1	0.5
	PFO6	1	0.5
	PFO/SS1	5	3.2
	PSS1	4	1.2
	PSS1/EM	2	3.3
	POW	3	0.5
	Subtotals	21	9.8
Worcester	PFO1	4	1.2
	PFO/SS1	1	0.2
	PSS1	2	0.8
	POW	1	0.2
	Subtotals	8	2.4
Sussex	PFO1	2	0.6
	PFO5/EM	1	0.7
	POW	1	0.2
	Subtotals	4	1.5

TABLE 3.1.7-2 (cont'd)

Pipeline Segment	NWI Classification a/	Number of Crossing Locations b/	Wetland Area Affected During Construction (acres) c/
Blackstone Worcester	PFO1	3	0.4
	PFO/SS1	2	0.3
	POW	1	0.1
	PSS1	2	0.2
	PSS1/EM	1	0.3
	Subtotals	9	1.3
Concord Lateral	PFO	2	0.6
	Subtotals	2	0.6
Haverhill Lateral	PEM	3	0.5
	PFO/SS1	2	0.4
	PSS1/EM	7	2.3
	Subtotals	12	3.2
New Haven Extension	PEM	3	1.7
	PFO1	5	1.4
	PFO4	1	<0.1
	PFO/SS1	1	0.5
	POW	2	0.4
	PSS1	2	0.4
	PSS1/EM	2	0.1
	Subtotals	16	4.5
Wallingford Lateral	PEM	1	<0.1
	PFO/EM	1	0.5
	PSS1	2	<0.1
	Subtotals	4	0.5
Springfield Lateral	PFO1	1	<0.1
	Subtotals	1	<0.1
Lincoln Extension	PFO1	6	0.7
	Subtotals	6	0.7
CHAMPLAIN			
Mainline	PFO1	58	40.8
	PFO1/4	3	5.5
	PFO4	7	4.1
	PFO4/1	1	0.9
	PFO6/7	2	1.9
	PFO1/SS1	10	9.7
	PFO4/SS1	4	7.0
	PFO1/EM	2	1.5
	PFO5/EM	1	0.4
	PFO5/OW	2	4.3
	PSS1	22	23.8
	PSS1/EM	24	15.5
	PEM	25	19.4
	POW	4	1.4
	Subtotals	165	136.2
Pelham Branch	PFO1	25	12.6
	PFO4	1	0.1
	PFO1/4	1	0.4
	PFO1/SS1	5	4.3
	PSS1	7	2.9
	PSS1/EM	3	3.4
	PEM	3	1.5
	POW	3	3.2
	Subtotals	48	28.4
Nashua Branch	PFO1/SS1	1	1.5
	PSS1	2	0.9
	Subtotals	3	2.4

TABLE 3.1.7-2 (cont'd)

Pipeline Segment	NWI Classification a/		Number of Crossing Locations b/	Wetland Area Affected During Construction (acres) c/
ALGONQUIN				
Waterbury Loop	No wetlands crossed.			
Tiverton Loop	PF01		2	2.4
	PFO1/SS1		1	0.3
		Subtotals	3	2.7
Brockton Loop	PFO1/SS1		2	0.6
	PSS1/EM		1	0.2
		Subtotals	3	0.8
Manchester St. Lateral	No wetlands crossed.			
Medfield Loop	PFO1		11	6.2
	PSS1		3	1.2
		Subtotals	14	7.4
Cromwell Loop	PFO1		7	3.0
	PSS1		3	1.1
	POW		1	0.1
		Subtotals	11	4.2
Andover Loop	PFO1		10	0.8
	PFO5		1	0.5
	PSS1		1	0.5
	POW		2	0.5
		Subtotals	14	2.3
Brayton Pt. Lateral	PFO1		10	5.9
	PFO1/4		1	1.1
	PFO1/SS1		5	3.9
	PSS1/EM		1	1.4
	PEM		1	0.5
		Subtotals	18	12.8
TOTAL			703	490.4

a/ NWI Wetland Types:

PALUSTRINE

Forested:
- PF01 - Broad-leaved deciduos
- PF03 - Broad-leaved evergreen
- PF04 - Needle-leaved evergreen
- PF05 - Dead
- PF06 - Deciduous

Scrub/shrub:
- PSS1 - Broad-leaved deciduous
- PSS3 - Broad-leaved evergreen
- PSS5 - Dead

Emergent:
- PEM - Emergent marsh or wet meadow

Open Water:
- POW - Small pond or standing water

ESTUARINE
- E10W - Subtidal open water
- E2FL - Intertidal flat

b/ Wetland cover types crossed were determined from FWS NWI maps or NYS wetland maps.

c/ Wetland area in the construction right-of-way (ROW) was estimated by multiplying crossing lengths (from table 3.2.7-1) by the affected ROW widths (50-100 feet), then dividing by square feet per acre (43,560).

TABLE 3.1.9-1

Land Use Characteristics of the Two Pipeline Alternative

Pipeline Segment	Length Adj. to Existing ROW a/ Miles	%	Woodland b/ Miles	%	Agriculture c/ Miles	%	Residential d/ Miles	%	Commercial/ Industrial e/ Miles	%	Water Related f/ Miles	%	Other g/ Miles	%	Total Miles	Homes w/in 50 ft of proposed ROW
IROQUOIS/TENNESSEE																
New York	58.8	19.9	108.4	36.7	164.8	55.8	16.1	5.5	4.0	1.4	2.1	0.7	0.0	0.0	295.4	35
Connecticut	14.2	30.1	29.0	61.4	10.8	22.9	6.6	14.0	0.6	1.3	0.2	0.4	0.0	0.0	47.2	46
Long Island Sound	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.7	100.0	0.0	0.0	26.7	0
Iroquois Subtotal	73.0	19.8	137.4	37.2	175.6	47.5	22.7	6.1	4.6	1.2	29.0	7.9	0.0	0.0	369.3	81
Tennessee Subtotal	152.0	98.1	77.7	50.2	59.9	38.7	12.5	8.1	4.1	2.6	0.7	0.5	0.0	0.0	154.9	139
TOTAL: Iroquois/Tennessee	225.0	42.9	215.1	41.0	235.5	44.9	35.2	6.7	8.7	1.7	29.7	5.7	0.0	0.0	524.2	220
CHAMPLAIN/ALGONQUIN																
Vermont	77.4	52.4	63.2	42.8	71.4	48.3	0.8	0.5	0.8	0.5	6.0	4.1	5.6	3.8	147.8	21
New Hampshire	32.9	79.1	35.0	84.1	3.0	7.2	0.1	0.2	0.3	0.7	2.4	5.8	0.8	1.9	41.6	13
Massachusetts	59.5	66.9	65.7	73.9	5.2	5.8	1.9	2.1	1.3	1.5	7.6	8.5	7.2	8.1	88.9	56
Champlain Subtotal	169.8	61.0	163.9	58.9	79.6	28.6	2.8	1.0	2.4	0.9	16	5.7	13.6	4.9	278.3	90
Algonquin Subtotal	40.0	96.2	23.4	56.3	4.2	10.1	4.5	10.8	3.6	8.7	3.1	7.5	2.8	6.7	41.6	169
TOTAL: Champlain/Algonquin	209.8	65.6	187.3	58.5	83.8	26.2	7.3	2.3	6.0	1.9	19.1	6.0	16.4	5.1	319.9	259
TOTAL: Two Pipeline	434.8	51.5	402.4	47.7	319.3	37.8	42.5	5.0	14.7	1.7	48.8	5.8	16.4	1.9	844.1	479

a/ Pipeline right-of-way adjoining existing utility (eg. electric transmission, abandoned RR, roadways, gas pipeline, telephone) rights-of-way.
b/ Includes discrete, mature, deciduous or coniferous stands of at least one-half acre.
c/ Includes pasture, cropland, orchards and nurseries.
d/ Includes single- or multi-family residences, yards and wooded lots between houses.
e/ Includes retail/wholesale areas, manufacturing, transmission line substations and quarries.
f/ Includes waterbodies, wetlands and flood plains.
g/ Includes institutional (golf courses, municipal properties), recreational land, and open space.

3.2 IROQUOIS/GNE SINGLE PIPELINE ALTERNATIVE

As described in Section 2.0, the Iroquois/GNE Single Pipeline Alternative comprises a number of pipeline segments that are a part of the proposed Iroquois/Tennessee pipeline system and the proposed Champlain pipeline system, and which were addressed in their respective EISs. Table 3.2-1 identifies the components of the Iroquois/GNE Single Pipeline Alternative and the EIS (Iroquois/Tennessee or Champlain) in which they are discussed.

The description herein of the affected environment includes tabular data for the complete Iroquois/GNE Single Pipeline Alternative, including those segments addressed in the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I. Only those pipeline segments which are unique to this alternative are discussed herein. These unique segments include: 1) GNE Mainline; 2) Rutland Connector; 3) VGS Loops; 4) Eastern Service Branch South Connector; and 5) Eastern Service Branch North Connector.

3.2.1 Geology

3.2.1.1 Physiography

Geological features crossed by segments of the Iroquois/GNE Single Pipeline Alternative that are common to either the Iroquois/Tennessee Pipeline Project or the Champlain Pipeline Project are addressed in the Iroquois/Tennessee EIS, Volume I, and the Champlain EIS, Volume I.

Geology of the area, which includes the Rutland Connector and VGS Loops, is detailed in Champlain EIS, Volume I, section 4.1.1.1. Geology of the area, which includes the Eastern Service Branch, is covered in the Champlain EIS, Volume I, section 4.1.1.1 and section 4.1.1.3.

The GNE Mainline would be a 197.1-mile pipeline segment from MP 171 of the Iroquois Mainline to Mendon, Massachusetts. From the divergence from the Iroquois Mainline, the route would continue through the Hudson-Mohawk lowlands, roughly paralleling the Mohawk River until it enters the Hudson River Valley and crosses the Hudson River just south of Albany at MP 55.

After crossing the Hudson River, the GNE Mainline would ascend the Taconic and then Berkshire mountains. The terrain of these mountains is characterized by north-south-tending ridges and valleys. Bedrock is sedimentary and meta-sedimentary rock, becoming more metamorphosed to the east. Rock units are folded and faulted. Slopes are gentle to moderate with short stretches of steep slopes ranging from 15 to 25 degrees containing numerous bedrock exposures. Here relief is greater than in any other section of the GNE Mainline. Elevations rise to 2000 feet at several locations before gradually decreasing at MP 97. Terrain remains rugged as the route continues east, and at MP 117 follows the Deerfield River into the Connecticut River Valley. At MP 122 the route crosses the Pocumtuck Range and the Connecticut River just prior to MP 125. Bedrock in the Connecticut River Valley is composed primarily of sedimentary rocks.

After crossing the Connecticut River, the GNE Mainline enters the Central Highlands region. The hilly terrain is characteristic of a glaciated environment. Hills are round and

TABLE 3.2-1

EIS Volumes in Which Facilities Are Addressed

Pipeline Segment	Iroquois/Tenn. EIS, Vol. I	Champlain EIS, Vol.I	Vol. II
IROQUOIS/GNE SINGLE PIPELINE			
Iroquois Mainline	X		
Greater Northeast (GNE) Mainline			X
Rutland Extension			
VGS Loops			X
Rutland Connector			X
Rutland Lateral		X	
Eastern Service Branch			
South Connector			X
Eastern Service Lateral		X	
North Connector			X
Pelham Branch		X	
Pepperell Branch		X	
Nashua Branch		X	
Ashburnham Lateral		X	
Long Island Extension	X		
Pleasant Valley Extension	X		
Algonquin Laterals			
Manchester Street		X	
Brayton Point		X	
Tennessee Loops			
Herkimer/Ostego Loop	X		
Schoharie/Albany Loop	X		
Columbia Loop	X		
Worcester Loop	X		
CHAMPLAIN-BASED SINGLE PIPELINE			
Champlain Mainline		X	
Pelham Branch		X	
Nashua Branch		X	
Long Island Extension	X		
Pleasant Valley Extension	X		
Algonquin Laterals			
Manchester Street		X	
Brayton Point		X	
Tennessee Loops			
Herkimer/Ostego Loop	X		
Schoharie/Albany Loop	X		
Columbia Loop	X		
Worcester Loop	X		
NONJURISDICTIONAL FACILITIES			
L & J Energy Lateral			X
Other Nonjurisdictional Facilities	X	X	

smooth, glacial landforms such as drumlins, kame terraces, and moraines, mark the landscape. Further east, elevations continue to decrease until the route terminates at MP 197.1.

3.2.1.2 Mineral Resources

Various types of mineral resources are found in proximity to the route of the Iroquois/GNE Single Pipeline Alternative. The most prevalent is exploitable deposits of sand and gravel. Bedrock quarries, though less common, are also present in isolated localities.

3.2.1.3 Geologic Hazards

No unique geologic hazards would be encountered by the Iroquois/GNE Single Pipeline Alternative that have not been detailed in the Iroquois/Tennessee EIS, Volume I, and the Champlain EIS, Volume I. Landslide hazards could develop in the Hudson River Valley where Fickies and Robak (1983) have defined areas prone to landslides on the basis of the presence of fine-grained Lake Albany sediments with relief in excess of 40 feet and slopes in excess of 12 degrees.

At MP 49 of the GNE Mainline, a landslide has been documented along the Normans Kill. A repeat of this event could impact pipeline operation. If the pipeline were to pass through this area, special design considerations would have to be taken.

Pleistocene clays in the Connecticut River Valley are subject to moderate-to-high landslide incidence (1.5 to 15 percent or more of underlying rock or earth material is involved in sliding), and high landslide susceptibility (sliding of greater than 15 percent of the slopes may be caused by undercutting or excessive precipitation) (Radbruch-Hall, et al., 1976.) Nevertheless, no deep-seated landslide areas are known along the GNE route which represent a significant hazard to the proposed facilities.

3.2.2 Soils

3.2.2.1 General Soil Conditions

The general soil conditions in the vicinity of the Iroquois/GNE Single Pipeline Alternative are characterized in section 4.1.2.1 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

3.2.2.2 Soil Groups

Soil types in the project area can be grouped into six broad categories based upon terrain, origin, fertility, drainage, stoniness, depth, pH, and land use. Each soil group contains minor amounts of other taxonomic categories that have the general characteristics of the group. Table 3.2.2-1 identifies the number of miles of each group that would be crossed by this single pipeline alternative.

The first group of soils comprises the Dystrochrepts; lithic, dystric, and aquic Eutrochrepts, and Haplorthods. These represent the largest group of soils that would be affected by this alternative, accounting for about 45 percent of the total soils crossed. These highly acidic (except for the Eutrochrepts), infertile soils developed from glacial outwash in

TABLE 3.2.2-1

Miles of Soil Groups Crossed by the Iroquois/GNE Single Pipeline Alternative a/

Pipeline Counties	Group 1 Level to steep, stony soils c/ (depth to bedrock <60")	Group 2 Level to steep, wet soils b/	Group 3 Level to nearly level fertile soils d/	Group 4 Level, gentle sloping, sandy soils e/	Group 5 Level, wet organic soils f/	Group 6 Urban soils g/
St. Lawrence, NY	37.7	8.6	-	6.5	-	-
Lewis	24.7	3.8	5.7	19.7	0.6	-
Oneida	7.2	-	11.2	-	-	-
Herkimer	10.5	15.5	1.4	6.3	-	-
Otsego	2.8	0.2	2.7	-	-	-
Schoharie	1.1	1.7	2.2	-	-	-
Montgomery	6.0	24.9	1.2	-	-	-
Schenectady	0.5	12.0	-	1.7	-	-
Albany	5.8	4.7	16.2	-	-	1.3
Rensselaer	18.9	0.9	1.0	3.6	-	-
Columbia	1.7	0.4	1.9	-	0.1	-
Dutchess	11.9	0.5	2.7	-	-	-
Suffolk	5.9	1.9	-	1.0	-	-
Berkshire, MA	18.0	-	-	3.3	-	-
Franklin	14.3	-	3.1	9.3	-	-
Hampshire	NOT AVAILABLE					
Worcester	43.1	2.9	32.2	8.1	-	-
Middlesex	1.9	2.9	3.9	13.9	2.0	0.4
Bristol	-	5.1	4.4	-	0.7	0.8
Chittenden, VT	0.7	12.5	1.1	0.9	-	-
Addison	9.1	9.1	12.5	-	-	-
Rutland	10.8	2.2	1.7	4.1	-	-
Franklin	0.3	1.8	2.0	5.5	0.4	-
Hillsborough, NH	-	-	-	0.1	-	-
Litchfield, CT	5.1	0.7	-	5.1	-	-
Fairfield	26.7	3.0	1.8	1.1	0.8	-
New Haven	1.6	0.5	0.5	0.3	-	-
Providence, RI	0.4	-	2.1	0.2	0.4	0.5
TOTALS:	268.7	113.8	113.4	90.9	4.5	3.0

a/ Overall and individual segment mileage totals from general soils maps do not equal proposed length due to the effects of rounding and measurement accuracy.
b/ Haplaquepts, Haplaquents, Fragiaquepts, Fragiorthods, Orchraqualfs, Fluvaquents, Udifluvents. Soil group 2 consists of wet soils on floodplains and uplands.
c/ Dystrochrepts, Eutrochrepts, Haplorthods. Soil group 1 consists of acid, stony, infertile soils on sloping land.
d/ Hapludalfs, Dystrochrepts. Soil group 3 consists of well drained, fertile, nearly level soils.
e/ Udipsamments, Udorthents, Haplorthods, Dystrochrepts. Soil group 4 consists of sandy, acid, excessively drained soils.
f/ Histosols.
g/ Udorthents, areas disturbed by large-scale, urban development.

gently sloping areas and from ground moraine deposited on bedrock in steep uplands. The depth to bedrock is generally less than 5 feet and outcrops are common in steep areas. These soils predominantly support woodland vegetation cover types. Soils in this group which are in level- to gently sloping areas and are not too stony are sometimes used for pasture and hay. They are found throughout the area, but are most common along the proposed route in east-central New York and western Massachusetts. The erosion hazard is severe where these soils are on steep slopes.

The second group of soils includes the Haplaquepts, Haplaquents, Fragiaquepts, Fragiorthods, Ochraqualfs, Fluvaquents and Udifluvents. They account for about 19 percent of soils that would be crossed. These level- to steep soils developed from lacustrine sediments in some valleys, ground moraine in upland areas, and recent alluvium in active floodplains. They are wet most of the growing season because of a high water table at or within 1 foot of the surface. This limits their use primarily to pasture, hay crops, and woodland. Where the local ground slope allows drainage structures to be installed, these soils are used for annual crops.

The third group of soils comprises Hapludalfs and Dystrochrepts. These account for about 19 percent of all soils that would be crossed by the Iroquois/GNE Single Pipeline Alternative. The Hapludalfs are generally well drained, fertile, nearly level soils derived from ground moraine. They typically have gravelly subsoil but a low gravel content within the topsoil. The water table can range from 1 to more than 5 feet from September through May, but does not pose a severe limitation to cultivation during the growing season. Drainage tile and other drainage measures are often used where these soils are cultivated. Most of the cultivated soils that would be crossed by the proposed pipelines are within this group and are found mostly in central Massachusetts and parts of Connecticut.

The fourth group of soils, which accounts for 15 percent of all soils crossed, is made up of sandy, strongly acidic, excessively drained soils that are primarily Udipsamments, Udorthents, some Haplorthods, and some Dystrochrepts. These soils developed primarily from glacial outwash. Udipsamments are mostly sandy soils, while the other soils have substantial gravel content. They are found on level- to gently sloping terrain. Because they are typically very dry, their use is limited to pasture or forest, unless they are located on floodplains where the high water table keeps them moist. These soils are subject to wind erosion when the vegetative cover is removed.

Organic soils, the fifth group of soils, make up approximately 1 percent of all soils that would be crossed. Small amounts of these soils are found throughout the project area in low-lying wet areas. However, these areas are too small to have been mapped in the soil surveys used in this analysis. These soils are saturated most of the year, have a low bearing capacity, and subside when drained.

The sixth group of soils, accounting for less than 1 percent of the alignments, are soils that have been drastically altered by urban development. These soils are most common in Massachusetts, Connecticut, and New York but can be found in all states affected by pipeline construction. The urban soils have lost their original horizonation and structural characteristics but are suitable for pipeline construction because of generally good drainage and a bedrock depth of more than 5 feet.

3.2.3 Water Resources

3.2.3.1 Groundwater

Groundwater resources that would be crossed by segments of the Iroquois/GNE Single Pipeline Alternative which are common to either the Iroquois/Tennessee Pipeline Project or the Champlain Pipeline Project are addressed in section 4.1.3.1 of the Iroquois/ Tennessee EIS, Volume I, and the Champlain EIS, Volume I.

The New England states traversed by the Iroquois/GNE Single Pipeline Alternative have developed policies to protect groundwater resources from the threat of contamination. Protection zones are designated around municipal and community supply wells in order to provide control over land uses that might impact water quality. Generally, sources of pollution that could cause contamination of the groundwater, such as septic systems, sewer lines and hazardous chemical storage areas, are prohibited in well protection zones. State-specific well protection zones are discussed in the following paragraphs.

Public supply wells located near the Iroquois/GNE Single Pipeline Alternative are listed by milepost and segment in table 3.2.3-1. The following paragraphs discuss public wells located near the GNE Mainline, Rutland Connector, VGS Loops, and Eastern Service Branch North and South Connectors.

The State of New York requires water purveyors to own or control a 200-foot protective radius around all public supply wells. The Iroquois/GNE Single Pipeline Alternative would not cross any such protection zones in New York.

The Massachusetts Division of Water Supply designates a 400-foot Zone I protective radius around all public wells and a more extensive 0.5-mile or a site-specific protective radius (Zone II) in which land uses are typically controlled through zoning. The GNE Mainline would cross the Zone II areas of 21 public supply wells (based on a general 0.5-mile protection radius where a site-specific Zone II was not designated). No Zone I areas would be crossed by the GNE Mainline segment.

The Vermont Department of Public Health specifies that public supply wells be protected by a 3,000-foot radius or a designated site-specific protection area. The VGS Loops would cross two wellhead protection areas at MP 7.5 and 8.6.

3.2.3.2 Surface Waters

The Iroquois/GNE Single Pipeline Alternative would cross rivers, streams, lakes, and ponds in New York, Vermont, Massachusetts, New Hampshire, Connecticut, and Rhode Island. Major river and coastal drainage systems in New England and New York that would be crossed by the route are listed below. A general description of surface water resources can be found in section 4.1.3.2 the Iroquois/Tennessee Volume I, and Champlain EIS, Volume I.

TABLE 3.2.3-1

Public Groundwater Supplies Located Near the Iroquois/GNE Single Pipeline

Pipeline Segment	Town, State	Milepost	Water Supply	Approx. Distance from Pipeline (mi)
IROQUOIS				
Mainline	Canton, NY	21.5	Peter's Park	0.8
	Hermon, NY	27.7	Hermon Village	0.4
	Diana, NY	53.8	Harrisville Village	0.2
	Greig, NY	93.8	Higby Trailer Park	0.2
	Lyonsdale, NY	106.7	Maple Lane Mobile Home Park	1.2
	Remsen, NY	124.0	Remsen Village	0.7
	Trenton, NY	126.0	Barneveld Village	1.2
		125.5	Prospect Village	0.5
	Manheim, NY	153.5	Kuyrkendall Court Mobile Homes	0.2
		153.5	Homestead Trailer Park and Sales	0.7
GREATER NORTHEAST				
Mainline/NY	Rotterdam, NY	30.0	West Hill Water Co.	0.5
		31.0	Rotterdam Water District	1.5
	Schenectady, NY	32.5	Schenectady City	1.0
	Guilderland, NY	35.9	Watervliet City	0.5
		41.5	Guilderland Center	0.6
	Voorheesville, NY	44.2	Voorheesville Village	0.4
	Sand Lake, NY	65.5	Bon Acre Trailer Park	1.4
	Stephentown, NY	78.0	Sykes Trailer Park	0.5
Mainline/MA	Lanesborough, MA	86.0	Lanesborough Water District	0.2
	Ashfield, MA	110.0	Ashfield Water District	0.2
	Deerfield, MA	120.4	Deerfield Fire District	0.3
		120.5	Deerfield Fire District	0.4
		120.9	Deerfield Fire District	0.1
		121.0	Deerfield Fire District	0.5
		121.7	Deerfield Fire District	0.4
		122.3	Deerfield Fire District	0.3
	Sunderland, MA	128.0	Sunderland Water District	2.0
	Belchertown, MA	143.9	Belchertown Water District	0.8
	N. Brookfield, MA	161.5	E. Brookfield Water Dept.	0.8
	Spencer, MA	163.5	Spencer Water Department	0.8
	Leicester, MA	168.3	Hillcrest Water	0.4
		168.3	Hillcrest Water	0.5
		168.8	Hillcrest Country Club	0.5

TABLE 3.2.3-1 (cont'd)

Pipeline Segment	Town, State	Milepost	Water Supply	Approx. Distance from Pipeline (mi)
Mainline/MA	Auburn, MA	172.6	Auburn Water District	0.2
		173.2	Auburn Water District	0.6
		173.2	Auburn Water District	1.0
		173.2	Auburn Water District	1.0
	Millbury, MA	176.2	MA-American Water Co.	0.6
		176.3	MA-American Water Co.	0.5
	Sutton, MA	179.5	Wilkinsonville Water District	0.2
		182.4	Purgatory Chasm State Park	0.2
RUTLAND EXTENSION				
	St. George, VT	48.3 - 49.8	St. Georges Estates	0.2
	Proctor, VT	100.4 - 101.5	Oak Crest Water System	1.4
	Rutland, VT	104.8 - 105.8	Green Ares Development	0.4
VGS LOOP				
	Swanton, VT	7.5	Bouchard Water System	0.12
		8.6	Joyville Motor Home Park	0.17
		9.6	Homestead Acres	1.8
EASTERN SERVICE BRANCH				
Eastern Service	Lancaster, MA	217.3 - 217.4	Town of Lancaster	0.04
Lateral	Westborough, MA	230.5 - 231.0	Town of Westborough	0.9
		231.1 - 231.2	Town of Westborough	0.9
Pelham Branch	Shirley, MA	7.4 - 7.5	Town of Shirley	0.02
LONG ISLAND EXTENSION				
	Brookfield, CT	306.1	Cedarbrook Apartments	0.8
	Newton, CT	306.2	Greenridge Inc., Water Division	0.3
			Newton Water Co.	0.8
		311.5	Fairfield Hills Hospital	1.2
		313.2	Olmstead Water Supply	0.6
			Lake Zoar	1.1
	Shelton, CT	323.9	Ansonia Derby Water	1.0
PLEASANT VALLEY LATERAL				
	Union Vale, NY	272.5	Parkway Apartments	1.0
	Dover, NY	283.6	Schreiber Water Works	0.5
		283.0	Cedar Lane Mobile Home Parks #2	0.6
		285.0	Lake Ellis Mobile Home Park	1.3
		285.4	East Mountain Trail Park	1.5

TABLE 3.2.3-1 (cont'd)

Pipeline Segment	Town, State	Milepost	Water Supply	Approx. Distance from Pipeline (mi)
	Northport, CT	361.0	Crab Meadow Beach	0.4
		362.0	Suffolk County Waste Authority	0.2-0.8
		363.7	Northport VA Hospital	0.6
	Greenlawn, CT	366.0	Greenlawn Water District	0.1-1.3
	New Milford, CT	291.3	West Falls Mobile Homes	0.3
		294.0	Forest Hills Estate	0.5
		291.5	Lord's Mobile Home	0.3
		293.4	River View Court	0.5
		294.0	New Milford Heights	0.9
		294.9	Sunny Valley Farms	0.2
		295.0	Candlewood Spring Association	0.7
		295.8	Birch Grove Association	0.6
		296.1	Candlewood Trails Association, Inc.	0.7
		296.1	Lone Oaks Water Company	0.3
		296.2	Mill Brook Water Company	0.3
		296.6	Hi-Vu Water Company	0.4
		296.6	Harrybrook Condominiums	0.6
		297.8	Candlewood Lake Condominiums	0.6
		296.2	Indian Ridge Water	1.5
		299.0	Candle Terrace Estates	1.1
	Brookfield, CT	300.6	Brookfield Elderly Housing	0.4
		301.9	Rural Water Co., Inc., Brook Acres	0.3
		302.1	Silvermine Manor	0.7
		302.1	Candlewood Acres	1.2
		302.3	Newbury Crossing	0.8
		302.6	Ledgewood Association	0.7
		303.4	Dancon Corporation Brookwood	0.6
		303.6	Dancon Corporation Butternut Ridge	1.0
		303.7	Rollingwood Condominiums	0.2
		304.1	Sandy Lane Village	0.5
		304.6	Brookfield Hills Condominiums	1.05
		301.3	Rural Water Co., Inc., Brookfield Div.	1.0
		305.0	Stony Hill Village	1.2
ALGONQUIN LATERALS				
Brayton Pt.	Swansea, MA	5.7	Town of Swansea	0.08
TENNESSEE LOOPS				
Worcester Loop	Worcester, MA	265 + 7.0	Town of Grafton, MA	0.31

Segment	Drainage System
Iroquois Mainline	St. Lawrence
	Black
	Mohawk
GNE Mainline	Mohawk
	Lower Hudson
	Hudson
	Housatonic
	Connecticut
	Thames
	Narragansett Bay
Rutland Extension	St. Lawrence
Vermont Gas Loops	St. Lawrence
Eastern Service Branch	Narragansett Bay
	Merrimack
Pleasant Valley Extension	Lower Hudson
	Housatonic
Long Island Extension	Housatonic
Algonquin Laterals	Mount Hope Bay
	Narragansett Bay
Tennessee Loops	Mohawk
	Lower Hudson
	Narragansett Bay
	Narragansett Bay

Most of the states crossed by the Iroquois/GNE Single Pipeline Alternative use an alphabetic classification system to denote water quality for each water body. A summary of these classification systems is presented in table 3.2.3-2.

Surface waters that would be crossed by the Iroquois/GNE Single Pipeline Alternative are listed in table B-1 by the route milepost at which they would be crossed. The table also presents the surface water quality classification, type of fishery, and, where data are available, width of proposed major crossings. The proposed facilities would cross 618 water bodies. This number includes any multiple crossings of lakes, ponds, and water bodies.

Surface water resources for route segments not described in section 4.1.3.2 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I are summarized below.

GNE Mainline

The GNE Mainline segment would cross a total of 243 surface water bodies in New York and Massachusetts. Of these, 147 or approximately 61 percent are Class B, which denotes water bodies appropriate for primary and secondary contact recreation and protection and propagation of aquatic life. Fifteen (6.0 percent) of the streams that would be crossed are high quality Class A surface waters. Public surface water supplies are located downstream of 13 proposed pipeline crossings and are listed in table 3.2.3-3. Twenty-seven streams (11 percent) are classified C and are suitable for secondary contact recreation. Approximately 21 percent (51) of the streams are classified D by New York state, which indicates the waters are suitable for secondary contact recreation but not for fisheries. Streams that are too small to support a fishery are designated Class D; therefore, this classification does not always indicate poor water quality. One percent of the streams crossed by the GNE Mainline route are unclassified.

TABLE 3.2.3-2

Summary of State Surface Water Quality Classifications
In Single Pipeline Alternative Project Area

State	Classification	Description
Vermont	A	High quality waters that have significant ecological value and quality of a uniformly excellent character. A source of public water supply with disinfection when necessary and, when compatible, used for the enjoyment of water in its natural condition.
	B	Water that has good aesthetic value and provides high-quality habitat for aquatic biota, fish, and wildlife. Public water supply with filtration and disinfection; irrigation and other agricultural uses; swimming and recreation.
	C	Habitat suitable for aquatic biota, fish, and wildlife. Recreational boating and other water uses in which contact with the water is minimal and where ingestion of the water is not probable; irrigation of crops not used for human consumption without cooking; compatible industrial uses.
New Hampshire	A	Potentially acceptable for water supply uses after disinfection. No discharge of sewage, wastes, or other polluting substances into waters of this classification. Quality uniformly excellent.
	B	Acceptable for swimming and other recreation, for fish habitat, and, after adequate treatment, for water supplies. No disposal of sewage or wastes unless adequately treated. High aesthetic value.
	C	Acceptable for recreational boating, fishing, and industrial water supply with or without treatment, depending on individual requirements.
		Classes for Inland Waters
Massachusetts	A	Waters in this class are designated as a source of public water supply.
	B	Waters in this class are used for protection and propagation of fish, other aquatic life, and wildlife; and for primary and secondary contact recreation.
	C	Waters in this class are used for protection and propagation of fish, other aquatic life, and wildlife; and for secondary contact recreation.
		Classes for Coastal and Marine Waters
	SA	Waters in this class are used for protection and propagation of fish, other aquatic life, and wildlife; for primary and secondary contact recreation; and for shellfish harvesting without depuration in approved areas.
	SB	Waters in this class are designated for protection and propagation of fish, other aquatic life, and wildlife; for primary and secondary contact recreation; and for shellfish harvesting without depuration (restricted shellfish areas).
	SC	Waters in this class are designated for the protection and propagation of fish, other aquatic life, and wildlife; and for secondary contact recreation.

TABLE 3.2.3-2 (cont'd)

State	Classification	Description
New York	AA	Suitable for drinking, culinary or food processing, treatment may be necessary.
	A	Similar to AA, may require more extensive treatment than AA water.
	B	Primary and secondary contact recreation.
	C	Secondary contact recreation. (i.e., fishing, boating)
	D	Secondary contact recreation. Not conducive to fisheries propagation.
	SA	Commercial shellfishing; primary and secondary contact recreation.
	SB	Primary and secondary contact recreation.
	SC	Secondary contact recreation.
	SD	Limited recreational use.
	(T)(Suffix)	Suitable trout habitat.
	(S)(Suffix)	Suitable habitat for trout spawning.
Connecticut	AA	Known or presumed to meet water quality criteria that support existing or potential public drinking water supply, fish and wildlife habitat, recreational use, agricultural and industrial supply, and other purposes. Recreational uses may be restricted.
	A	Known or presumed to meet water quality criteria that support potential drinking water supply, fish and wildlife habitat, recreational use, agricultural and industrial supply, and other legitimate uses, including navigation.
	B/A	May not meet Class A water quality criteria in one or more designated areas. The goal is Class A.
	B	Known or presumed to meet water quality standards that support recreational use, fish and wildlife habitat, agricultural and industrial supply, and other uses, including navigation.
	C/B	Presently does not meet Class B water quality criteria for one or more designated uses. The goal is Class B.
		Freshwater
Rhode Island	A	Drinking water supply.
	B	Public water supply with appropriate treatment, agricultural uses, bathing, other primary contact recreational activities, fish and wildlife habitat.
	C	Boating, other secondary contact recreational activities, fish and wildlife habitat, industrial processes, and cooling.
	D	Migration of fish; good aesthetic value.
	E	Nuisance conditions; uses limited to certain industrial processes and cooling, power, and navigation.

TABLE 3.2.3-2 (cont'd)

State	Classification	Description
Rhode Island (cont'd)	SA	Bathing and contact recreation; shellfish harvesting for direct human consumption, fish and wildlife habitat.
	SB	Shellfish harvesting for human consumption after depuration; bathing and other primary contact recreational activities; fish and wildlife habitat.
	SC	Boating and other secondary contact recreational activities; fish and wildlife habitat; industrial cooling. Good aesthetic value.

SOURCES:

Vermont Water Quality Standards, effective January 8, 1987. State of Vermont Water Resources Board, Montpelier, VT.
State of New Hampshire RSA 149: 3, I, II, III, IV.
Commonwealth of Massachusetts 314 CMR: 4.03.
Water Quality Standards, State of Connecticut Department of Environmental Protection, Water Compliance Unit, February 1987.
Rhode Island Water Quality Regulations for Water Pollution Control, Section 6 - Water Quality Standards, Adopted December 20, 1984, effective January 5, 1985.
Rhode Island Department of Environmental Management, Division of Water Resources.
New York Water Classifications and Quality Standards, NYCRR, Division of Water Resources, Article 2, Part 609 and Parts 700-704.

TABLE 3.2.3-3

Municipal Surface Water Supplies
Located Downstream of Iroquois/GNE Single Pipeline Alternative

Segment/State	Milepost	Stream Crossing	Surface Water Supply	Water Purveyor	Approximate Distance to Water Supply (mi)
Iroquois Mainline/NY	144.1	Beaver Creek Tribs. (2)*	Beaver Creek Reservoir	Little Falls City	1.0
Iroquois Mainline/CT	321.7	Means Brook Tribs. (7)	Means Brook Reservoir	Bridgeport Hydraulic Co.	1.0
	324.3	Shelton Reservoir Tribs. (3)	Shelton Reservoir	Bridgeport Hydraulic Co.	0.4
	332.6	Beaver Brook	Beaver Brook Reservoir	SCCRWA	0.3
GNE Mainline/NY	34.5	Normans Kill and 2 tribs.	Watervliet Reservoir	Watervliet City	2.1
GNE Mainline/MA	95	Cady Brook	Windsor Reservoir	Dalton Fire District	1.75
	132.2	Nurse Brook	Atkins Reservoir	Amherst DPW	1.0
	132.5	Nurse Brook Trib.	Atkins Reservoir	Amherst DPW	1.3
	133.0	Dean Brook	Atkins Reservoir	Amherst DPW	1.3
	135.3	Amethyst Brook	Hill Reservoir	Amherst DPW	1.0
	136.0	Dunlop Brook	Hill Reservoir	Amherst DPW	1.0
	139.1 139.2	Cadwell Creek (2) and Cadwell Creek Trib.	Quabbin Reservoir	MA MDC	1.5, 1.3 1.3
	141.2	Unnamed trib. to Quabbin	Quabbin Reservoir	MA MDC	0.9
TENNESSEE					
Worcester/MA	265+4.80	Unnamed Creek	Carpenter Reservoir	Northbridge	1.97

* Indicates the number of crossings upstream of the water supply.

Rutland Connector

The Rutland Connector would traverse one surface water body, the Winooski River at milepost 1.3. This river is designated Class C by the State of Vermont.

VGS Loops

The VGS Loops would cross 10 surface water bodies, all of which are Class B with the exception of Stevens Brook (MP 9.9), which is Class C.

Eastern Service Branch

No surface water bodies would be crossed by the Eastern Service Branch South Connector. The North Connector would cross one stream, a tributary to the North Nashua River at MP 1.7. This stream is classified B.

Major River Crossings

The Iroquois/GNE Single Pipeline Alternative would cross 20 water bodies greater than 100 feet in width (see table B-1). Six of these rivers are greater than 300 feet in width at the crossing point and the proposed Long Island Sound crossing would be 26.3 miles. These are listed below with the milepost and width at crossing. The width and depth of these crossings may necessitate the use of construction procedures that differ from those used at smaller river crossings.

Segment/State	Milepost	River	Width (ft)
Iroquois/Tennessee Mainline	0.0	St. Lawrence River	3,100
Long Island Ext./CT	330.9	Housatonic River	745
	334.0	Long Island Sound	26.3 miles
GNE Mainline/NY	55.8	Hudson River	1,000
GNE Mainline/MA	124.8	Connecticut River	700
Algonquin Lateral/RI	2.7	Providence River	700
	3.5	Seekonk River	400

The pipeline crossings of the St. Lawrence, Housatonic, Providence and Seekonk rivers and Long Island Sound were discussed in section 4.1.3.2 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I. The following paragraphs discuss proposed major river crossings not previously described.

The Hudson River would be crossed at MP 55.8 by the GNE Mainline, with a crossing width of approximately 1,000 feet. The Hudson River is classified by the U.S. Army Corps of Engineers (COE) as a navigable river. The present water quality classification of the river is C. Toxic contaminants are known to exist in river sediments as a result of historical releases of PCBs from the General Electric Corporation (GE) plants in Fort Edward and Hudson Falls, New York. However, the New York State Department of Environmental Conservation (NYSDEC) has indicated that PCB levels in Hudson River sediments do not reach hazardous levels downstream of the Troy Dam, which is over 40 miles upstream of the pipeline crossing (Warrinder, 1989).

The Connecticut River would be crossed by the GNE Mainline segment at MP 124.8, southwest of North Sunderland, Massachusetts, and approximately 8 miles south of the confluence of the Connecticut and Fall rivers at Turner Falls. The river is approximately 700

feet wide at the crossing location and has a B classification. Water quality in the upper Connecticut Basin has been reported as good with studies indicating low levels of metals and organic compounds (GNE Resource Report, No. 2; Docket No. CP88-191-000).

The pipeline crossings of the St. Lawrence, Housatonic, Providence and Seekonk rivers and Long Island Sound were discussed in section 4.1.3.2 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I. The following paragraphs discuss proposed major river crossings not previously described.

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The Connecticut River would be crossed by the GNE Mainline segment at MP 124.8, southwest of North Sunderland, Massachusetts, and approximately 8 miles south of the confluence of the Connecticut and Fall rivers at Turner Falls. The river is approximately 700 feet wide at the crossing location and has a B classification. Water quality in the upper Connecticut Basin has been reported as good with studies indicating low levels of metals and organic compounds (GNE Resource Report, No. 2; Docket No. CP88-191-000).

Municipal Surface Water Supplies

Municipal surface water supplies are located downstream of 27 proposed Iroquois/ GNE Single Pipeline Alternative stream crossings, which are listed in table B-1 by milepost of crossing. Municipal surface water supplies crossed by segments of the Iroquois/GNE Single Pipeline Alternative not previously discussed in section 4.1.3.2 of the Iroquois/ Tennessee EIS, Volume I and the Champlain EIS, Volume I are described below.

Municipal surface water supplies in New York are protected by state law. The regulations stipulate that owners may make their own rules, which are enforced by the state. The GNE Mainline would traverse Normans Kill (MP 34.5) and two tributaries approximately 2.1 miles upstream of Watervliet Reservoir, the water source for the city of Watervliet and Westmere Water District. The Watervliet Reservoir was listed on the NYSDEC 1988 Priority Water Problem list because of nutrient enrichment (GNE Resource Report, No. 2; Docket No. CP88-191-000).

The GNE Mainline route would cross ten streams less than three miles upstream of municipal surface water supplies in Massachusetts. The pipeline crossings range from 0.90 to 1.75 miles upstream from the municipal supplies. The Quabbin Reservoir, operated by the Commonwealth of Massachusetts Metropolitan District Commission (MDC), is located approximately 0.9 miles downstream of the proposed pipeline crossing of an unnamed tributary at MP 141.2. In addition, the GNE Mainline would cross Cadwell Creek twice and

a tributary approximately 1.5, 1.3 and 1.3 miles, respectively, upstream of the Quabbin Reservoir.

Under Massachusetts Regulations 310 CMR 22.21, a 400-foot protective radius is designated around public surface water supplies. In order to undertake construction within this area, a project must be evaluated by the chief water supply engineer of the regional Massachusetts Department of Environmental Quality Engineering Office. The GNE Mainline route would traverse Cheshire Reservoir, which is located in the Town of Lanesborough and is operated by the Adams Fire Department, as well as the 400-foot protection zone around the reservoir. The pipeline route would cross the reservoir via Ingalls Crossing, a land bridge located at approximately MP 87.5. The pipeline route would be less than 100 feet from the reservoir for a distance of approximately 900 feet.

The GNE Mainline would traverse portions of the Quabbin Reservoir Reservation, which is located in the Chicopee River basin and is owned and operated by the MDC. The route enters the Reservation west of the Quabbin Reservoir at MP 137.7, where it follows an existing transmission line southeast to MP 139.3. Here the route leaves the transmission right-of-way and follows an existing unimproved road south to MP 142.1, the boundary of the Reservation. The route reenters the Reservation at MP 144.2 and runs east, crossing the boundary of the Reservation several times south of the Reservoir, to MP 148.1. The route passes within 700 feet of the Quabbin Reservoir at its closest point, southwest of Windsor Dam. A total of approximately 7.85 miles of the state-owned Reservation would be crossed by the GNE Mainline route. In 1988, the MDC provided an average of 324.56 million gallons per day of Quabbin Reservoir water to the Massachusetts Water Resource Authority (MWRA) which distributes the water to its customers (Beaver, 1989). Metropolitan Boston is the major consumer of Quabbin Reservoir water.

Although the GNE Mainline would enter only two state-regulated surface water protection zones in Massachusetts (Quabbin and Cheshire Reservoirs), the GNE route and other segments of the Iroquois/GNE Single Pipeline Alternative may traverse municipal watershed areas that are protected by town bylaws (e.g., Cleveland Brook Reservoir - Pittsfield Watershed Area).

3.2.4 Fish and Wildlife

3.2.4.1 Fishery Resources

Table B-1 summarizes water bodies that would be crossed by the Iroquois/GNE Single Pipeline Alternative, and includes fishery classifications for water bodies that have been classified by respective state agencies. Table 3.2.4-1 lists significant fishery resources that would be crossed by the Iroquois/GNE Single Pipeline Alternative. Fishery resources crossed by segments of the Alternative that are common to either the Iroquois/Tennessee or Champlain pipeline project are addressed in section 4.1.4.1 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I. The discussions in Volumes I of general fishery types and typical species present for the areas traversed by the Iroquois/Tennessee and Champlain projects also apply to the new Alternative segments.

TABLE 3.2.4-1

Significant Fishery Resources Crossed by the Iroquois/GNE Single Pipeline Alternative

Pipeline Segment	Milepost	Water Body	Crossing Width (ft)	Fishery Type a/	Fishery Issue b/
IROQUOIS	0.0	St. Lawrence River	3100	W	1,2
Mainline	3.20	Sucker Brook	20	W	2
	10.55	Brandy Brook	10	W	2
	15.55, 18.10	Grass River	150	W	1,2
	27.85	Elm Creek		C-S	2
	41.35	Oswegatchie River	200	W	2
	48.25	W. Branch Oswegatchie River	100	W	2
	51.25	Clear Creek	5	C	2
	65.05	Indian River	2	C	2
	76.80	Beaver River		W	2
	79.55	Murmur Creek	15	C	2
	80.75	Black Creek	10	C	2
	87.40	Crystal Creek	25	C	2
	91.05	Independence River	54	C-S	2
	92.10	Otter Creek	20-40	C-S	2
	94.75	Black River		W	2
	106.45	Sugar River	40	C-S	2
	108.35	Mill Creek	15	C	2
	111.35	West Kent Creek	13	C	2
	113.05	East Kent Creek	15	C	2
	115.60	Alder Creek		C-S	2
	123.10	Cady Brook	5	C	2
	125.60	West Canada Creek	45	C-S	2
	136.20	Hurricane Brook		C-S	2
	137.60	Factory Brook	5	C	2
	139.05, 139.10 139.15	Big Bill Brook	12	C	2
	140.10	Wolf Hollow Creek	1	C	2
	145.60	Ransom Creek	12	C-S	2
	150.15	Crum Creek	7	C-S	2
	154.20	Mohawk River	200	W	2,3
	161.30	Ostquago Creek		C-S	2
	170.8	Canajoharie Creek		C-S	2
GNE Mainline	55.8	Hudson River		W,E	1,2,3
	56.3	Papscanee Creek		W	3
	72.1	Tackawasick Creek		C	2
	76.0	Black River		C	2
	77.9	West Brook		C	2
	78.1	East Brook		C	2
	98.5	Westfield Brook		C	1
	99.7	Shaw Brook		C	1
	124.8	Connecticut River		W	1,2,3
	196.2	Mill River Trib.		C	1
	196.4	Mill River		C	1
RUTLAND EXTENSION					
Rutland Lateral	51.4	La Platte River	7	W,C-S	1
	54.6	Lewis Creek	35	C-S	2,3
	70.3	New Haven River	50	C-S	2,3
	77.2	Middlebury River	50	C-S	2
Rutland Connector	0.7	Winooski River		C,W	2,3

TABLE 3.2.4-1 (cont'd)

Pipeline Segment	Milepost	Water Body	Crossing Width (ft)	Fishery Type a/	Fishery Issue b/
Pleasant Valley Extension	272.55	Sprout Creek	1	C-S	2
	279.90	Coopertown Brook	1-10	C-S	2
	281.70	Swamp River	12-30	W	2
	284.20	Tenmile River		C-S	2
	286.25	Deuel Hollow Brook	4-12	C-S	2
	287.80	Wimisink Brook		C-S	2
	289.15	Morrissey Brook		C-S	2
	291.70	Bullymuch Brook		C-S	2
	292.85	Rocky River		C-S	2
Long Island Extension	306.45	Pond Brook		C-S	2
	311.20	Pootatuck River		C-S	2
	327.20	Farmill River		C-S	2,3
	330.85	Housatonic River		C-S	2,3

a/ Fishery Type Codes:
- W - Warm-water
- C - Cold-water
- C-S - Cold-water stocked
- E - Estuarine

b/ Fisheries Issue Codes:
- 1 Protected Species
- 2 Significant Recreational Fishery
- 3 Anadromous Fishery

GNE Mainline

The GNE Mainline would cross 246 water bodies, 87 of which have state-designated fishery classifications. The majority of the classified water bodies (74) are cold-water fisheries. Of the water bodies that would be crossed and do not have state-designated fishery classification, many may have warm-water fisheries. Others may support cold-water fisheries, or in the case of smaller headwater streams, may be utilized for spawning. This discussion will address only those waterbodies that have been given fishery classifications. The majority of impacted water bodies with state-designated fisheries would be less than 10 feet wide. Of the 74 water bodies with cold-water fisheries, 53 are 10 feet or less in width, 17 are between 10 and 30 feet wide and three are wider than 30 feet. All of the warm-water fisheries are wider than 10 feet.

Not all water bodies that have fishery classifications are significant fisheries; therefore, not all water bodies addressed in the remainder of this section appear in table 3.2.4-1. The cold-water streams greater than 30 feet in width that would be crossed by the GNE Mainline are Flat Creek (MP 2.8), Vly Creek (MP 45.8), and the Swift River (MP 145.8). All contain trout, and Vly Creek contains a population of wild brown trout. The Swift River fishery is supported by a stocking program. Eleven of the 17 streams between 10 and 30 feet in width are stocked. The others, South Chuctanunda Creek (MP 20.2), Black River (MP 76.0), East Brook (MP 78.1), Westfield Brook (MP 98.5), Westfield River (MP 100.9), and Fivemile River (MP 161.7), contain naturally reproducing trout populations.

Many of the streams less than 10 feet wide are also stocked. The streams in this category are usually first- or second-order streams near the headwaters of their respective watersheds.

The warm-water fisheries that would be crossed by the GNE Mainline are found in both rivers and lakes. Most feature black bass (largemouth bass and/or smallmouth bass). The widest crossings would be at the Hudson River (MP 55.8, 1000 feet) and the Connecticut River (MP 124.8, 700 feet). Both rivers have unique fisheries. The shortnose sturgeon, a federally listed endangered species, migrates seasonally past the crossing site on the Hudson, and the Atlantic salmon is a species of intense interest that migrates up the Connecticut River. The Normans Kill would be crossed in several locations within a five-mile reach (MP 49.7, MP 50.5, MP 50.8, MP 51.0, MP 51.3, MP 52.3) near its confluence with the Hudson River. It contains smallmouth bass and rockbass. Schoharie Creek (MP 16.5) is over 150 feet wide at the GNE Mainline crossing location; it supports populations of smallmouth bass and walleye. Other water bodies crossed which support warm-water fisheries include two bodies of standing water, Burden Lake (MP 67.4, 700 feet at crossing) and Cheshire Reservoir (MP 87.6, 400 feet at crossing), and three rivers, Ware River (MP 152.5, 80 feet at crossing), Blackstone River Tributary (MP 174.7, 15 feet at crossing), and the Blackstone River (MP 190.8, 25 feet at crossing). Each of these support populations of smallmouth bass and/or largemouth bass along with assorted panfish.

Rutland Connector

The Rutland Connector would cross one waterbody, the Winooski River (MP 0.7). The Winooski River contains significant warm-water and cold-water fisheries. Atlantic salmon and steelhead are stocked in the reach of stream that would be affected by this

pipeline segment. However, after the stocked juveniles migrate downstream, they or the adult fish are unable to return due to two dams on the river.

VGS Loops

There are no state-designated fisheries that would be crossed by the VGS Loops.

Eastern Service Branch South Connector and North Connector

There are no state-designated fisheries that would be crossed by either of these two pipeline segments.

3.2.4.2 Wildlife Resources

Wildlife species in the area of the Iroquois/GNE Single Pipeline Alternative are typical of forest and agricultural areas of the Northeast. Wildlife adapted to the urban and suburban areas are present as well. Endangered and threatened species that may occur in this area are discussed in section 3.2.5.

With the exception of the GNE Mainline, the Iroquois/GNE Single Pipeline Alternative would be in the same area, and would affect similar wildlife habitats as described in the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I. The wildlife species that would be affected by the Alternative are, therefore, expected to be similar to those described in section 4.1.4.2 the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I. Following is a discussion of wildlife and habitats along the GNE Mainline.

GNE Mainline

The GNE Mainline would cross agricultural lands, northern and transitional hardwood forest, wetlands, and residential habitats. In general, the same wildlife species would be expected to occur as would occur in similar habitats described for the Iroquois/Tennessee and Champlain projects. This segment would cross predominantly agricultural and forest lands between MP O and MP 32, and agricultural, forest and residential areas between MP 32 and MP 59. Between MP 59 and MP 155 the route would cross predominantly forested areas, with some agricultural and residential areas. The Taconic and Berkshire ranges would be crossed in this area and wildlife species typical of more remote habitats (black bear, bobcat, fisher) are likely to be more abundant in this area. The remainder of the GNE Mainline from MP 155 and MP 197 would cross mixed forest, agricultural and residential habitats. Wetland habitats would be crossed at various locations along the entire length of this segment.

Several significant wildlife habitats would be crossed by the GNE Mainline. At MP 56.4 the route would cross approximately 1,200 feet of Papscanee Marsh, a New York state-designated significant coastal fish and wildlife habitat. Papscanee Marsh is within the Hudson River floodplain and is an important resting and feeding areas for migratory waterfowl. Other areas that would be crossed by the GNE Mainline that are significant waterfowl habitats include Chard Pond (MP 125.0) and Lackey Pond (MP 185.3)

The GNE Mainline would cross six state-recognized deer wintering areas (DWAs), all within Massachusetts. All DWAs that would be crossed by the Iroquois/GNE Single Pipeline Alternative are listed in table 3.2.4-2. Refer to sections 4.1.4.2 and 5.1.4.2 of the Iroquois/Tennessee EIS, Volume I for general discussion of DWAs.

The GNE Mainline would cross what is considered the primary range for Black Bear in Massachusetts and eastern New York between approximately MP 65 and MP 124. Several habitat types may be limiting factors for black bear populations in this region, including fall feeding areas (mast-producing stands of mature oak and American beech trees) and spring feeding areas (shrub and herbaceous wetlands). No areas have been specifically identified in this region as being critical bear feeding areas. However, the GNE Mainline would cross 15 shrub or herbaceous wetlands in this region that are potential black bear spring feeding areas.

3.2.5 Endangered and Threatened Species

3.2.5.1 Fish and Wildlife

3.2.5.1.1 Fish

Federally or state-listed endangered or threatened fish species that may occur in the vicinity of the Iroquois/GNE Single Pipeline Alternative are listed in table 3.2.5-1. One federally listed endangered species (shortnose sturgeon) occurs in three water bodies that would be crossed by the Alternative - the Housatonic, Hudson, and Connecticut rivers. This anadromous species occurs in the vicinity of the crossing locations during seasonal movements to and from summer and wintering areas.

Two state-listed fish species (lake sturgeon and stonecat) occur in water bodies that would be crossed by segments of the Alternative. These species are discussed in section 4.1.5 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

3.2.5.1.2 Wildlife

Federally or state-listed endangered or threatened wildlife and invertebrate species that may occur in the vicinity of the Iroquois/GNE Single Pipeline Alternative are listed in table 3.2.5.1. Eleven wildlife species and one invertebrate species potentially occur in the project area. Species that occur along the pipeline segments included in the Iroquois and Champlain projects have been previously described in section 4.1.4 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I. Four endangered and threatened wildlife and invertebrate species that are not described in the Iroquois/Tennessee EIS, Volume I or the Champlain EIS, Volume I, occur along segments of the Iroquois/GNE Single Pipeline Alternative. These species are located in the vicinity of the GNE Mainline, discussed below. All other pertinent endangered or threatened species are addressed in the Iroquois/ Tennessee EIS, Volume I and the Champlain EIS, Volume I.

GNE Mainline

The GNE Mainline would cross two locations where the bald eagle, a federally and state-listed endangered species, may occur. An area known to be used by wintering bald

TABLE 3.2.4-2

Deer Wintering Areas Crossed by the Iroquois/GNE Single Pipeline Alternative

Pipeline Segment	Beginning Milepost	Length of Crossing (ft)	Amount of Vegetation Cleared (acres) a/	New (N) or Existing (E) Right-of-Way/Width (ft) b/
Iroquois Mainline	18.1	1,200	2.8	N
	50.7	2,500	5.7	N
	56.9	5,200	11.9	N
GNE Mainline c/	92.9	2,400	4.1	N
	141.6	4,500	7.7	N
	143.9	3,100	5.3	N
	145.2	3,200	5.5	N
	148.8	1,000	1.7	E/100
	186.8	2,900	5.0	E/100
Rutland Lateral	60.5	2,700	4.6	E/130
	78.5	5,400	9.3	E/150
Eastern Service Lateral c/	223.4	3,600	6.2	N
	228.3	4,900	8.4	N
	233.9	2,100	3.6	N
	234.9	7,900	13.6	N
	237.6	1,900	3.3	N
Pleasant Valley Lateral	276.6	4,000	9.2	N

Source: New York State DEC, Vermont FWD, Massachusetts DFW.

a/ Amount of vegetation cleared was determined by multiplying length of crossing by the width of construction right-of-way (ROW) (75 feet), then dividing by square feet per acre (43,560).

b/ Indicates whether proposed pipeline at each DWA crossing is new ROW or parallel and adjacent to existing ROW. If adjacent to existing ROW, width of the existing ROW is indicated.

c/ The Massachusetts DFW data base includes general locations of DWAs, but boundaries are not delineated or mapped. Length of crossing of these DWAs was estimated from interpretation of aerial photographs and topographic maps.

TABLE 3.2.5-1

Endangered and Threatened Species that May Occur in the Vicinity of the Iroquois/GNE Single Pipeline Alternative

Species	Status a/	County/State
Bald Eagle	F/E	Fairfield, CT, Hampshire, MA, Franklin, MA
Peregrine Falcon b/	F/E	Rutland, VT
Kemp's Ridley Sea Turtle	F/E	Huntington, NY
Shortnose Sturgeon	F/E	New Haven, CT, and Franklin, MA
Bog Turtle	F/C2, N/E	Dutchess, NY
Slender Marsh Bluegrass	F/C2, N/E	Lewis, NY
Lake Sturgeon	N/T	St. Lawrence, NY
Panic Grass	N/T	St. Lawrence, NY
Ram's-Head Lady's Slipper	N/T	St. Lawrence, NY, and Addison, VT
Swamp Birch	N/R	St. Lawrence, NY
Schweinitz Sedge	N/R	Oneida, NY
White Lady's Slipper	N/E	Oneida, NY
Northern Wild Comfrey	N/T	Schenectady, NY
Green Rock-Cress	N/P	Albany, NY
Rhodora	N/P	Rensselaer, NY
Swamp Red Currant	M/SC	Berkshire, MA
Bristly Black Currant	M/SC	Berkshire, MA
Giant St. Johns-Wort	M/SC	Franklin, MA
Yellow Lamp Mussel	M/E	Franklin, MA
Adder's Tongue Fern	M/T	Franklin, MA
Pale Green Orchids	M/T	Franklin, MA
Spotted Turtle c/	M/SC	Franklin, MA
Northern Spring Salamander c/	M/SC	Franklin, MA
Stonecat	V/SC	Chittenden, VT
Fairy Slipper b/	V/T	Addison, VT
Swamp Fly-Honeysuckle	V/SC	Addison, VT
Eastern Jacob's Ladder	V/T	Addison, VT
Showy Lady's-Slipper	V/SC	Addison, VT
White Adder's-Mouth	V/T	Addison, VT
Marsh Horsetail b/	V/T	Addison, VT
Green Dragon	V/T	Rutland, VT
Cooper's Hawk	M/SC	Worcester, MA
Blue-Spotted Salamander c/	M/SC	Worcester, MA
Timber Rattlesnake	N/T	Dutchess, NY
Side-Oats Grama Grass	C/R	Litchfield, CT
Lizard's Tail	C/R	Litchfield, CT
Sickle-Leaved Golden Aster	C/R	New Haven, CT
Beach Needle Grass	C/R	New Haven, CT
Wood Turtle	M/SC	Worcester, MA

Source: U.S. Fish and Wildlife Service, National Marine Fisheries Service; Vermont Natural Heritage Program; Massachusetts Natural Heritage and Endangered Species Program; Connecticut Natural Diversity Data Base.

a/ Codes for status.

F - Federal	E - Endangered
V - Vermont	T - Threatened
N - New York	SC - Special Concern
M - Massachusetts	C2 - Status 2 Candidate
C - Connecticut	R - Rare

b/ Historic record only.

c/ Wetland species whose habitat is protected by Massachusetts Wetland Protection Act.

eagles would be crossed in Franklin County, Massachusetts. This route would also pass near, but would not cross, an area in Hampshire County, Massachusetts that is used by overwintering eagles and is the site of the only active bald eagle nests in the state.

The yellow lamp mussel, a Massachusetts-listed endangered species, has been found in a river in the general vicinity of the GNE Mainline crossing in Franklin County, Massachusetts.

The spotted turtle and northern spring salamander, Massachusetts-listed special concern species, occur in wetland habitats in the vicinity of the GNE Mainline in Franklin County, Massachusetts.

3.2.5.2 Plants

Federally or state-listed endangered or threatened plant species that may occur in the vicinity of the Iroquois/GNE Single Pipeline Alternative are listed in table 3.2.5-1. Twenty-five listed plant species are known or suspected to occur in the vicinity of the Alternative. Species that occur along the pipeline segments included in the Iroquois and Champlain projects have been previously described in section 4.1.4 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I, respectively. Eight listed plant species may occur along the GNE Mainline segment, discussed below. All other pertinent endangered or threatened plant species are included in the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

GNE Mainline

Three state-listed plant species may occur along the New York portion of the GNE Mainline, although there have been no recent sightings of these plants along the route. The northern wild Comfrey, a threatened species last observed in 1949, may occur in the vicinity of this segment in Schenectady County. The rhodora, last observed in 1964, and green rock-cress, last observed in 1921, are state-listed rare species that may occur in the vicinity of the GNE Mainline in Albany and Rensselaer Counties, respectively.

Five Massachusetts-listed plant species may occur along the GNE Mainline route in Massachusetts. The swamp red currant and the bristly black currant are state-listed special concern species that are known to occur in wetlands adjacent to the pipeline route in Berkshire County. A population of giant St. John's-wort was recently discovered in a wetland area on the existing right-of-way that this pipeline segment would follow in Franklin County. This population is one of only two known occurrences of this plant in the state. The adder's tongue fern and the pale green orchid are threatened species also occurring on the existing right-of-way that the GNE Mainline would follow in Franklin County.

3.2.6 Vegetation

The Iroquois/GNE Single Pipeline Alternative is located within four general forest cover type zones: northern hardwoods, central hardwoods, transitional hardwoods and spruce-fir. Refer to section 4.1.6 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I for a description of these forest types and other non-forest vegetation associated with these types. Vegetation that would be affected by segments of the Alternative that are

included in the Iroquois and Champlain projects is described in section 4.1.6 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I, respectively. A discussion of vegetation affected by the new pipeline segments follows.

With the exception of the GNE Mainline, all of the Alternative segments that are not addressed in the Iroquois/Tennessee EIS, Volume I or the Champlain EIS, Volume I are relatively small and are located within only one general forest zone. The Rutland Connector and VGS Loops in northern Vermont are within the northern hardwoods zone. Vegetation that would be affected includes mature and young forest, active and abandoned agriculture and wetlands. The Eastern Service Branch South Connector and the North Connector in Massachusetts are located within the transitional hardwoods zone. Other vegetation that would be affected includes active and abandoned agricultural lands, wetlands, and existing rights-of-way and residential areas.

The 197.1-mile GNE Mainline would pass through four general forest type zones. Boundaries between the zones are not distinct, but in general the eastern half of this segment, located in central New York and the Berkshire region of western Massachusetts (from MP 0 to approximately MP 124), would be within the northern hardwoods zone. Within this area a second forest zone, spruce-fir, would be crossed where the GNE Mainline traverses the higher elevations in the Berkshire range (from approximately MP 95 to MP 115). From the general area of the Connecticut River crossing (MP 124) to approximately MP 170, the GNE Mainline would pass through the transitional hardwoods zone. From this point to the end of this pipeline segment (MP 197), the route would be within the central hardwoods zone. In addition to early and late successional forest vegetation, this route would affect active and abandoned agricultural lands, maintained rights-of-way, wetland vegetation and residential areas.

3.2.7 Wetlands

The wetlands that would be affected by the Iroquois/GNE Single Pipeline Alternative include inland freshwater, estuarine and coastal wetland types. The definition and general description of these wetland types are included in section 4.1.7 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I. The wetlands that would be affected by the Alternative are identified based on review of U.S. Fish and Wildlife Service (FWS) National Wetland Inventory (NWI) maps, New York State Freshwater Wetlands (NYSFW) maps, aerial photography, consultation with state agency personnel, and field reconnaissance. Refer to section 4.1.6 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I for a description of existing wetland databases for the states that would be affected by the Alternative.

Table B-3 lists all wetlands that would be affected by the Alternative. Table 3.2.7-1 summarizes by cover type the wetlands that would be affected. Wetlands that would be affected by pipeline segments common to the Iroquois/Tennessee Project or the Champlain Project are described in section 4.1.7 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I. Wetlands affected by pipeline segments not included in Iroquois/ Tennessee EIS, Volume I and the Champlain EIS, Volume I are discussed below.

TABLE 3.2.7-1

Wetland Types Crossed by the Iroquois/GNE Single Pipeline Alternative

Pipeline Segment	NWI Classification a/		Number of Crossing Locations b/	Wetland Area Affected During Construction (acres) c/
IROQUOIS				
Mainline d/	PFO1		57	31.8
	PFO3		1	0.1
	PFO4		4	2.8
	PFO1/5		1	0.1
	PFO4/6		1	0.7
	PFO6/4		1	0.7
	PFO1/SS1		7	3.0
	PFO5/SS1		1	0.5
	PFO5/OW		1	0.4
	PSS1		47	17.9
	PSS1/EM		13	4.8
	PEM		25	7.2
	POW		1	1.6
		SUBTOTAL	160	71.6
GREATER NORTHEAST				
Mainline	PFO1		45	12.2
	PFO4		3	0.7
	PFO1/4		1	0.2
	PFO1/SS1		18	14.5
	PFO1/EM		1	0.6
	PFO5/EM		2	1.4
	PFO5/OW		2	0.6
	PSS1		24	10.6
	PSS1/EM		20	12.1
	PEM		15	5.3
	POW		6	1.6
	PSS3		1	1.1
	PSS1/OW		1	0.3
	PEM/OW		2	0.6
		SUBTOTAL	141	61.8
RUTLAND EXTENSION				
Rutland Connector	PFO1		1	0.2
		SUBTOTAL	1	0.2
VGS Loops	PFO1		2	1.1
	PFO4/1		1	1.4
	PFO1/SS1		1	0.8
	PSS1/EM		1	0.3
	POW		1	0.2
		SUBTOTAL	6	3.8
Rutland Lateral	PFO1		10	9.3
	PFO4/1		1	0.6
	PFO1/SS1		1	0.3
	PFO4/SS1		2	1.0
	PFO1/EM		1	0.7
	PSS1		6	8.9
	PSS1/EM		5	2.1
	PEM		14	9.3
	POW		1	0.1
		SUBTOTAL	41	32.3

TABLE 3.2.7-1 (cont'd)

Pipeline Segment	NWI Classification a/	Number of Crossing Locations b/	Wetland Area Affected During Construction (acres) c/
EASTERN SERVICE BRANCH			
South Connector	No wetlands crossed.		
Eastern Service Lateral	PFO1	11	3.7
	PFO1/SS1	3	1.5
	PSS1	1	0.2
	PEM	1	0.1
	SUBTOTAL	16	5.5
North Connector	No wetlands crossed.		
Pelham Branch	PFO1	21	8.2
	PFO4	1	0.1
	PFO1/4	1	0.3
	PFO1/SS1	5	2.8
	PSS1	8	2.0
	PSS1/EM	3	2.2
	PEM	2	1.0
	POW	3	2.4
	SUBTOTAL	44	29.1
Pepperell Branch	No wetlands crossed.		
Nashua Branch	PFO1/SS1	1	1.0
	PSS1	2	0.6
	SUBTOTAL	3	1.6
Ashburnham Lateral	PFO1	2	0.4
	PFO1/SS1	1	0.6
	PSS1	1	0.1
	SUBTOTAL	4	1.1
LONG ISLAND EXTENSION d/			
	PFO1	37	9.7
	PFO4	2	0.1
	PFO1/SS1	3	2.4
	PFO1/EM	1	0.6
	PSS1	6	1.8
	PSS1/EM	7	0.7
	PSS5/OW	1	0.1
	PEM	10	3.5
	POW	4	0.6
	PFLA	2	1.2
	E10W	2	1.9
	E2FL	5	2.4
	SUBTOTAL	80	25.0
PLEASANT VALLEY LATERAL d/			
	PFO1	10	1.4
	PFO1/SS1	1	0.4
	PSS1	2	0.7
	PSS1/EM	1	0.1
	PEM	1	0.1
	POW	4	0.7
	SUBTOTAL	19	3.4

TABLE 3.2.7-1 (cont'd)

Pipeline Segment	NWI Classification a/	Number of Crossing Locations b/	Wetland Area Affected During Construction (acres) c/
ALGONQUIN LATERALS			
Manchester St.	No wetlands crossed.		
Brayton Pt. Lateral	PFO1	10	5.9
	PFO1/4	1	1.1
	PFO1/SS1	5	3.9
	PSS1/EM	1	1.4
	PEM	1	0.5
	SUBTOTAL	18	12.8
TENNESSEE LOOPS d/			
Herkimer-Otsego	PSS/PFO1/PEM	4	1.2
	PSS/PFO4	1	0.4
	PFO4/PSS/PEM	1	0.2
	SUBTOTAL	6	1.8
Scoharie-Albany	PFO1	2	0.3
	PFO1/PSS/POW	1	0.2
	PSS5/PEM/POW	1	0.6
	SUBTOTAL	4	1.1
Columbia	PFO1	1	<0.1
	PFO1/SS1	2	1.8
	PSS1	1	0.2
	SUBTOTAL	4	2.0
Worcester	PFO1	3	1.0
	PFO1/SS1	1	0.1
	PSS1	2	0.7
	POW	1	0.1
	SUBTOTAL	7	1.9
TOTAL		554	255

a/ NWI wetland types:

Palustrine
Forested:
- PFO1 – Broad-leaved deciduous
- PFO3 – Broad-leaved evergreen
- PFO4 – Needle-leaved evergreen
- PFO5 – Dead
- PFO6 – Deciduous

Scrub/shrub:
- PSS1 – Broad-leaved deciduous
- PSS3 – Broad-leaved evergreen
- PSS5 – Dead

Emergent:
- PEM – Emergent marsh or wet meadow

Open Water:
- POW – Small pond or standing water

Flat:
- PFLA – Temporary flat

Estuarine
- E10W – Subtidal open water
- E2FL – Intertidal flat

b/ Wetland cover types crossed were determined from USFWS NWI maps or NYS wetland maps and field sheets.

c/ Wetland area in the construction right-of-way (ROW) was estimated by multiplying crossing lengths (from Table 3.2.7-1) by the affected ROW widths (50 feet), then dividing by square feet per acre (43,560).

d/ Does not include riverine and lacustrine wetlands listed in table 4.1.7-1 of the Iroquois/Tennessee EIS, Volume I. These were omitted to provide a consistent comparison with segments of the Champlain project, and because river and lake crossings are addressed in section 3.3.3 of this volume.

GNE Mainline

The GNE Mainline would cross NWI- or NYSFW-mapped freshwater wetlands at 98 locations. No estuarine or marine wetlands would be affected. The most common types that would be crossed are broad-leaved deciduous forested (PF01), deciduous scrub-shrub (PSS1) and mixed deciduous forested/scrub-shrub wetlands. The largest of these wetland types would be crossed at MP 8.1, MP 41.1, MP 65.9, MP 73.6, MP 138.9, MP 158.2, MP 162.9, MP 184.6, and MP 196.3. Emergent marsh (PEM) and mixed scrub-shrub/emergent marsh wetlands are the next most frequent wetland type that would be crossed by this pipeline segment. The largest of these wetland types would be crossed at MP 7.4, MP 54.9, MP 121.8, MP 130.4, MP 163.7, and MP 176.5. The above wetland types make up the majority (87 percent) of the wetlands that would be affected by this segment.

Other wetland types that would be traversed include coniferous forested (MP 94.9, MP 156.0, MP 196.8) and mixed deciduous/coniferous forested (MP 144.4) wetlands, mixed deciduous forested/emergent marsh wetlands (MP 7.0) and mixed dead forested/emergent marsh (MP 107.1, MP 145.2), and dead forested/open water (MP 109.0, MP 109.5) wetlands. Evergreen scrub-shrub (MP 183.9) and mixed deciduous scrub-shrub/open water (MP 147.3) wetlands, and mixed emergent marsh/open water wetlands (MP 138.9, MP 147.9) would also be affected. Finally, six open water wetlands (MP 105.9, MP 125.1, MP 164.4, MP 167.8, MP 173.2, and MP 178.0) would be crossed.

The GNE Mainline would cross 12 New York state-mapped and regulated wetlands. Two wetlands, Black Creek Marsh (MP 41.1 and MP 43.4) and Papscanee Marsh (MP 56.3 and MP 56.5) are NYS Class I wetlands. Nine of the remaining regulated wetlands are class II and one is class III. Refer to section 4.1.7 of the Iroquois/Tennessee EIS, Volume I for discussion of the NYS wetland classification system.

Rutland Connector

The Rutland Connector would cross one NWI-mapped wetland; a deciduous forested wetland (MP 0.7) associated with the Winooski River. No other mapped wetlands would be crossed by this pipeline segment.

VGS Loops

The VGS Loops would cross six NWI-mapped wetlands. Wetland cover types that would be crossed include deciduous forested (MP 0.3, MP 2.3), mixed deciduous forested/ scrub-shrub (MP 4.4), mixed coniferous/deciduous forested (MP 5.5), mixed scrub-shrub/emergent marsh (MP 1.7) and open water (MP 3.4). None of the wetlands that would be affected are included in Vermont's preliminary list of Class I wetlands.

Eastern Service Branch South and North Connectors

No NWI-mapped wetlands would be crossed by either of these two pipeline segments.

3.2.8 Air Quality and Noise

3.2.8.1 Air Quality

During pipeline construction a temporary reduction in local ambient air quality may result due to fugitive emissions generated by construction equipment. These effects are localized and of limited duration. No compressor stations would be required as part of this alternative.

The discussion of air quality in section 4.1.8.1 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I adequately characterizes the areas traversed by the Iroquois/GNE Single Pipeline Alternative.

3.2.8.2 Noise

Noise associated with pipeline construction activities would be intermittent and brief at any single location. Neighbors may sometimes hear the construction noise, but the overall effect would be temporary. Therefore, it is unnecessary to provide an analysis of the existing ambient sound levels along the Iroquois/GNE Single Pipeline Alternative rights-of-way.

During project operation there would be no significant noise impact since no compressor stations are required as part of this alternative.

3.2.9 Land Use, Recreation, and Visual Resources

3.2.9.1 Land Use

Table 3.2.9-1 identifies the predominant land uses crossed by and the number of homes within 50 feet of the Iroquois/GNE Single Pipeline Alternative. Table 3.2.9-2 presents the acreages of each land use that would be affected by construction and operation of this alternative based on construction and operation right-of-way requirements. Residential developments proposed along the length of the Iroquois/GNE Single Pipeline Alternative are identified in table 3.2.9-3. Land uses and proposed residential developments crossed by segments of the Iroquois/GNE Single Pipeline Alternative which are common to either the Iroquois/Tennessee Pipeline Project or the Champlain Pipeline Project are addressed in section 4.1.9.1 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

GNE Mainline

The 197.1 mile-long GNE Mainline would traverse a total of 125.9 miles (63.9 percent) of primarily wooded land. Approximately 182.7 miles (92.7 percent) would be constructed adjacent to existing utility rights-of-way. Agricultural land use is greater for the New York portion of the GNE Mainline (41.1 percent) than for Massachusetts portion (16.5 percent) where woodland (73.2 percent) predominates. Commercial/industrial land uses comprise 0.7 percent of the land uses in New York and 1.3 percent of the land uses in Massachusetts. Residential development comprises 2.6 percent of the land uses in New York with 55 homes within 50 feet of the GNE Mainline. In Massachusetts, 3.5 percent of the land use is residential with 99 homes located within 50 feet of the mainline.

TABLE 3.2.9-1
Land Use Characteristics of the Iroquois/GNE Single Pipeline Alternative

Existing ROW a/ Pipeline Segment State/County	Length Adj. to Woodland b/ Miles	%	Agriculture c/ Miles	%	Residential d/ Miles	%	Industrial e/ Miles	%	Commercial/ Related f/ Miles	%	Water Other g Miles	%	Miles	%	Total Miles	Homes w/in 50 ft. of Proposed ROW
IROQUOIS																
Mainline/NY	6.0	3.5	67.3	39.4	99.3	58.1	2.6	1.5	0.4	0.2	1.4	0.8	0.0	0.0	171.0	16
St. Lawrence	2.5	4.7	23.2	43.9	28.6	54.2	0.3	0.6	0.0	0.0	0.7	1.3	0.0	0.0	52.8	2
Lewis	3.5	6.4	28.1	51.6	25.6	47.0	0.5	0.9	0.0	0.0	0.3	0.6	0.0	0.0	54.5	10
Oneida	0.0	0.0	6.6	36.1	11.3	61.7	0.3	1.6	0.0	0.0	0.1	0.5	0.0	0.0	18.3	2
Herkimer	0.0	0.0	6.8	20.1	26.0	76.7	0.5	1.5	0.4	1.2	0.2	0.6	0.0	0.0	33.9	2
Montgomery	0.0	0.0	2.6	22.6	7.8	67.8	1.0	8.7	0.0	0.0	0.1	0.9	0.0	0.0	11.5	0
GREATER NORTHEAST																
Mainline/NY	78.4	97.9	40.3	50.3	32.9	41.1	2.1	2.6	0.6	0.7	3.0	3.7	1.2	1.5	80.1	55
Montgomery	20.6	100.0	8.4	40.8	12.2	59.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.6	3
Schenectady	13.6	95.8	8.2	57.7	4.7	33.1	0.7	4.9	0.0	0.0	0.6	4.2	0.0	0.0	14.2	8
Rensselaer	23.2	95.5	17.8	73.3	3.7	15.2	1.1	4.5	0.1	0.4	1.1	4.5	0.5	2.1	24.3	17
Albany	21.0	100.0	5.9	28.1	12.3	58.6	0.3	1.4	0.5	2.4	1.3	6.2	0.7	3.3	21.0	27
Mainline/MA	104.3	89.1	85.6	73.2	19.3	16.5	4.1	3.5	1.5	1.3	2.5	2.1	4.0	3.4	117.0	99
Berkshire	21.4	100.0	15.0	70.1	5.8	27.1	0.0	0.0	0.0	0.0	0.4	1.9	0.2	0.9	21.4	0
Franklin	26.7	100.0	21.4	80.1	4.1	15.4	0.2	0.7	0.4	1.5	0.3	1.1	0.3	1.1	26.7	4
Hampshire	17.4	71.0	20.8	84.9	3.4	13.9	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.2	24.5	15
Worcester	39.9	87.4	28.4	64.0	6.0	13.5	3.9	8.8	1.1	2.5	1.8	4.1	3.2	7.2	44.4	80
RUTLAND EXTENSION																
Rutland/VT	52.6	70.3	22.4	29.9	43.8	58.6	0.4	0.5	0.9	1.2	4.3	5.7	3.0	4.0	74.8	11
Franklin (VGS)	10.0	100.0	3.8	38.0	5.3	53.0	0.1	1.0	0.0	0.0	0.1	1.0	0.7	7.0	10.0	3
Chittenden (Con.)	0.0	0.0	0.7	36.8	0.6	31.6	0.2	10.5	0.3	15.8	0.1	5.3	0.0	0.0	1.9	1
Chittenden (Lat.)	10.7	80.5	4.5	33.8	8.5	63.9	0.0	0.0	0.0	0.0	0.1	0.8	0.2	1.5	13.3	1
Addison (Lateral)	26.6	86.6	7.9	25.7	20.1	65.5	0.0	0.0	0.0	0.0	2.3	7.5	0.4	1.3	30.7	2
Rutland (Lateral)	5.3	28.0	5.5	29.1	9.3	49.2	0.1	0.5	0.6	3.2	1.7	9.0	1.7	9.0	18.9	4
EASTERN SERVICE BRANCH																
Massachusetts	51.4	84.8	43.3	71.5	3.9	6.4	1.1	1.8	0.9	1.5	4.2	6.9	7.2	11.9	60.6	54
Worcester (S. Con.)	0.0	0.0	0.5	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0
Worcester (Lat.)	22.4	98.2	18.9	82.9	2.5	11.0	0.2	0.9	0.3	1.3	0.5	2.2	0.4	1.8	22.8	9
Worcester (N.Con.)	0.0	0.0	2.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0
Worcester (Pelham)	3.9	100.0	3.0	76.9	0.3	7.7	0.1	2.6	0.1	2.6	0.3	7.7	0.1	2.6	3.9	0
Middlesex (Pelham)	17.6	80.4	12.1	55.3	0.8	3.7	0.7	3.2	0.2	0.9	2.5	11.4	5.6	25.6	21.9	30
Middlesex (Pepper)	0.2	40.0	0.1	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	20.0	0.3	60.0	0.5	0
Middlesex (Nashua)	2.3	88.5	1.9	73.1	0.2	7.7	0.1	3.8	0.2	7.7	0.1	3.8	0.1	3.8	2.6	0
Worcester (Ashbur)	5.0	78.1	4.8	75.0	0.1	1.6	0.0	0.0	0.1	1.6	0.7	10.9	0.7	10.9	6.4	15

TABLE 3.2.9-1 (cont'd)

Existing ROW a/ Pipeline Segment State/County	Length Adj. to Woodland b/ Miles	%	Agriculture c/ Miles	%	Residential d/ Miles	%	Industrial e/ Miles	%	Commercial/ Related f/ Miles	%	Water Other g Miles	%	Miles	%	Total Miles	Homes w/in 50 ft. of Proposed ROW
New Hampshire	0.1	100.0	0.1	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0
Hillsborough	0.1	100.0	0.1	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0
LONG ISLAND EXTENSION																
Connecticut	8.2	28.9	17.8	62.7	5.7	20.1	4.3	15.1	0.3	1.1	0.2	0.7	0.1	0.4	28.4	27
Fairfield	8.2	32.2	16.6	65.1	4.7	18.4	4.0	15.7	0.1	0.4	0.1	0.4	0.0	0.0	25.5	25
New Haven	0.0	0.0	1.2	41.4	1.0	34.5	0.3	10.3	0.2	6.9	0.1	3.4	0.1	3.4	2.9	2
Long Island Sound	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.7	100.0	0.0	0.0	26.7	0
New York	8.8	100.0	1.0	11.4	2.7	30.7	4.0	45.5	1.0	11.4	0.1	1.1	0.0	0.0	8.8	0
Suffolk	8.8	100.0	1.0	11.4	2.7	30.7	4.0	45.5	1.0	11.4	0.1	1.1	0.0	0.0	8.8	1
PLEASANT VALLEY EXTENSION																
Connecticut	9.6	51.1	11.2	59.6	5.0	26.6	2.3	12.2	0.3	1.6	0.0	0.0	0.0	0.0	18.8	19
Fairfield	5.6	70.9	5.1	64.6	1.5	19.0	1.3	16.5	0.0	0.0	0.0	0.0	0.0	0.0	7.9	4
Litchfield	4.0	36.7	6.1	56.0	3.5	32.1	1.0	9.2	0.3	2.8	0.0	0.0	0.0	0.0	10.9	15
New York	0.0	0.0	7.1	47.0	5.9	39.1	1.6	10.6	0.5	3.3	0.0	0.0	0.0	0.0	15.1	4
Dutchess	0.0	0.0	7.1	47.0	5.9	39.1	1.6	10.6	0.5	3.3	0.0	0.0	0.0	0.0	15.1	4
ALGONQUIN LATERALS																
Manchester St/RI	3.6	100.0	0.0	0.0	0.0	0.0	1.3	36.1	1.5	41.7	0.2	5.6	0.6	16.7	3.6	123
Providence	3.6	10.00	0.0	0.0	0.0	0.0	1.3	36.1	1.5	41.7	0.2	5.6	0.6	16.7	3.6	123
Brayton Point/MA	11.0	100.0	9.0	81.8	0.6	5.5	0.6	5.5	0.2	1.8	0.6	5.5	0.0	0.0	11.0	2
Bristol	11.0	100.0	9.0	81.8	0.6	5.5	0.6	5.5	0.2	1.8	0.6	5.5	0.0	0.0	11.0	2
TENNESSEE LOOPS																
Herkimer/ Otsego Loop/NY	7.7	100.0	1.4	18.2	4.7	61.0	0.0	0.0	0.4	5.2	0.0	0.0	1.2	15.6	7.7	0
Herkimer	2.0	100.0	0.4	20.0	1.2	60.0	0.0	0.0	0.1	5.0	0.0	0.0	0.3	15.0	2.0	0
Otsego	5.7	100.0	1.0	17.5	3.5	61.4	0.0	0.0	0.3	5.3	0.0	0.0	0.9	15.8	5.7	0

TABLE 3.2.9-1 (cont'd)

Existing ROW a/ Pipeline Segment State/County	Length Adj. to Woodland b/ Miles	%	Agriculture c/ Miles	%	Residential d/ Miles	%	Industrial e/ Miles	%	Commercial/ Related f/ Miles	%	Water Other g Miles	%	Miles	%	Total Miles	Homes w/in 50 ft. of Proposed ROW
Schoharie/ Albany Loop/NY	12.0	100.0	3.1	25.8	7.3	60.8	0.2	1.7	0.0	0.0	0.0	0.0	1.4	11.7	12.0	2
Schoharie	5.0	100.0	1.3	26.0	3.0	60.0	0.1	2.0	0.0	0.0	0.0	0.0	0.6	12.0	5.0	2
Albany	7.0	100.0	1.8	25.7	4.3	61.4	0.1	1.4	0.0	0.0	0.0	0.0	0.8	11.4	7.0	0
Columbia Loop/NY	4.1	100.0	3.4	82.9	0.3	7.3	0.0	0.0	0.1	2.4	0.0	0.0	0.3	7.3	4.1	2
Albany	4.1	100.0	3.4	82.9	0.3	7.3	0.0	0.0	0.1	2.4	0.0	0.0	0.3	7.3	4.1	2
Worcester Loop/MA	6.3	100.0	4.3	68.3	0.8	12.7	0.5	7.9	0.0	0.0	0.0	0.0	0.7	11.1	6.3	1
Worcester	6.3	100.0	4.3	68.3	0.8	12.7	0.5	7.9	0.0	0.0	0.0	0.0	0.7	11.1	6.3	1
TOTAL	**364.1**	**56.4**	**317.3**	**49.1**	**232.2**	**35.9**	**25.1**	**3.9**	**8.6**	**1.3**	**43.2**	**6.7**	**19.7**	**3.0**	**646.1**	**415**

a/ Pipeline right-of-way adjoining existing utility (eg. electric transmission, abandoned RR, roadways, gas pipeline, telephone) rights-of-way.
b/ Includes discrete, mature, deciduous or coniferous stands of at least one-half acre.
c/ Includes pasture, cropland, orchards and nurseries.
d/ Includes single- or multi-family residences, yards and wooded lots between houses.
e/ Includes retail/wholesale areas, manufacturing, transmission line substations and quarries.
f/ Includes waterbodies, wetlands and flood plains.
g/ Includes institutional (golf courses, municipal properties), recreational land, and open space.

TABLE 3.2.9-2

Land Use Affected by the Iroquois/GNE Single Pipeline Alternative h/

Pipeline Segment/ State/County	Woodland		Agriculture		Residential		Commercial/ Industrial		Water Related		Other		TOTAL	
	Const.	Opera.	Const.	Opera.	Const.	Opera.	Const.	Opera.	Const.	Opera.	Const.	Opera.	Const.	Opera.
IROQUOIS														
Mainline/NY	815.8	489.5	1203.6	722.2	31.5	18.9	4.8	2.9	17.0	10.2	0.0	0.0	2072.7	1243.6
St. Lawrence	281.2	168.7	346.7	208.0	3.6	2.2	0.0	0.0	8.5	5.1	0.0	0.0	640.0	384.0
Lewis	340.6	204.4	310.3	186.2	6.1	3.6	0.0	0.0	3.6	2.2	0.0	0.0	660.6	396.4
Oneida	80.0	48.0	137.0	82.2	3.6	2.2	0.0	0.0	1.2	0.7	0.0	0.0	221.8	133.1
Herkimer	82.4	49.5	315.2	189.1	6.1	3.6	4.8	2.9	2.4	1.5	0.0	0.0	410.9	246.5
Montgomery	31.5	18.9	94.5	56.7	12.1	7.3	0.0	0.0	1.2	0.7	0.0	0.0	139.4	83.6
GREATER NORTHEAST														
Mainline/NY	366.4	244.2	299.1	199.4	19.1	12.7	5.5	3.6	27.3	18.2	10.9	7.3	728.2	485.5
Montgomery	76.4	50.9	110.9	73.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	187.3	124.8
Schenectady	74.5	49.7	42.7	28.5	6.4	4.2	0.0	0.0	5.5	3.6	0.0	0.0	129.1	86.1
Rensselaer	161.8	107.9	33.6	22.4	10.0	6.7	0.9	0.6	10.0	6.7	4.5	3.0	220.9	147.3
Albany	53.6	35.8	111.8	74.5	2.7	1.8	4.5	3.0	11.8	7.9	6.4	4.2	190.9	127.3
Mainline/MA	778.2	518.8	175.5	117.0	37.3	24.8	13.6	9.1	22.7	15.2	36.4	24.2	1063.6	709.1
Berkshire	136.4	90.9	52.7	35.2	0.0	0.0	0.0	0.0	3.6	2.4	1.8	1.2	194.5	129.7
Franklin	194.5	129.7	37.3	24.8	1.8	1.2	3.6	2.4	2.7	1.8	2.7	1.8	242.7	161.8
Hampshire	189.1	126.1	30.9	20.6	0.0	0.0	0.0	0.0	0.0	0.0	2.7	1.8	222.7	148.5
Worcester	258.2	172.1	54.5	36.4	35.5	23.6	10.0	6.7	16.4	10.9	29.1	19.4	403.6	269.1
RUTLAND EXTENSION														
Rutland/MA	203.6	135.8	398.2	265.5	3.6	2.4	8.2	5.5	39.1	26.1	27.3	18.2	680.0	453.3
Franklin (VGS)	34.5	23.0	48.2	32.1	0.9	0.6	0.0	0.0	0.9	0.6	6.4	4.2	90.9	60.6
Chittenden (Connec)	6.4	4.2	5.5	3.6	1.8	1.2	2.7	1.8	0.9	0.6	0.0	0.0	17.3	11.5
Chittenden (Lateral)	40.9	27.3	77.3	51.5	0.0	0.0	0.0	0.0	0.9	0.6	1.8	1.2	120.9	80.6
Addison (Lateral)	71.8	47.9	182.7	121.8	0.0	0.0	0.0	0.0	20.9	13.9	3.6	2.4	279.1	186.1
Rutland (Lateral)	50.0	33.3	84.5	56.4	0.9	0.6	5.5	3.6	15.5	10.3	15.5	10.3	171.8	114.5

h/ Areas shown in acres.

TABLE 3.2.9-2 (cont'd)

Pipeline Segment/ State/County	Woodland		Agriculture		Residential		Commercial/ Industrial		Water Related		Other		TOTAL	
	Const.	Opera.	Const.	Opera.	Const.	Opera.	Const.	Opera.	Const.	Opera.	Const.	Opera.	Const.	Opera.
EASTERN SERVICE BRANCH														
Massachusetts	393.6	262.4	35.5	23.6	10.0	6.7	8.2	5.5	38.2	25.5	65.5	43.6	550.9	367.3
Worcester (S. Con.)	4.5	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	3.0
Worcester (Lat.)	171.8	114.5	22.7	15.2	1.8	1.2	2.7	1.8	4.5	3.0	3.6	2.4	207.3	138.2
Worcester (N. Con.)	18.2	12.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.2	12.1
Worcester (Pelham)	27.3	18.2	2.7	1.8	0.9	0.6	0.9	0.6	2.7	1.8	0.9	0.6	35.5	23.6
Middlesex (Pelham)	110.0	73.3	7.3	4.8	6.4	4.2	1.8	1.2	22.7	15.2	50.9	33.9	199.1	132.7
Middlesex (Pepper.)	0.9	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.6	2.7	1.8	4.5	3.0
Middlesex (Nashua)	17.3	11.5	1.8	1.2	0.9	0.6	1.8	1.2	0.9	0.6	0.9	0.6	23.6	15.8
Worcester (Ashbur.)	43.6	29.1	0.9	0.6	0.0	0.0	0.9	0.6	6.4	4.2	6.4	4.2	58.2	38.8
New Hampshire	0.9	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.6
Hillsborough (Nashua)	0.9	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.6
LONG ISLAND EXTENSION														
Connecticut	215.8	129.5	69.1	41.5	52.1	31.3	3.6	2.2	2.4	1.5	1.2	0.7	344.2	206.5
Fairfield	201.2	120.7	57.0	34.2	48.5	29.1	1.2	0.7	1.2	0.7	0.0	0.0	309.1	185.5
New Haven	14.5	8.7	12.1	7.3	3.6	2.2	2.4	1.5	1.2	0.7	1.2	0.7	35.2	21.1
Long Island Sound	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
New York	12.1	7.3	32.7	19.6	48.5	29.1	12.1	7.3	1.2	0.7	0.0	0.0	106.7	64.0
Suffolk	12.1	7.3	32.7	19.6	48.5	29.1	12.1	7.3	1.2	0.7	0.0	0.0	106.7	64.0
PLEASANT VALLEY EXTENSION														
Connecticut	135.8	81.5	60.6	36.4	27.9	16.7	3.6	2.2	0.0	0.0	0.0	0.0	227.9	136.7
Fairfield	61.8	37.1	18.2	10.9	15.8	9.5	0.0	0.0	0.0	0.0	0.0	0.0	95.8	57.5
Litchfield	73.9	44.4	42.4	25.5	12.1	7.3	3.6	2.2	0.0	0.0	0.0	0.0	132.1	79.3
New York	86.1	51.6	71.5	42.9	19.4	11.6	6.1	3.6	0.0	0.0	0.0	0.0	183.0	109.8
Dutchess	86.1	51.6	71.5	42.9	19.4	11.6	6.1	3.6	0.0	0.0	0.0	0.0	183.0	109.8

TABLE 3.2.9-2 (cont'd)

Pipeline Segment/ State/County	Woodland		Agriculture		Residential		Commercial/ Industrial		Water Related		Other		TOTAL	
	Const.	Opera.	Const.	Opera.	Const.	Opera.	Const.	Opera.	Const.	Opera.	Const.	Opera.	Const.	Opera.
ALGONQUIN LATERALS														
Manchester Street/RI	0.0	0.0	0.0	0.0	11.8	7.9	13.6	9.1	1.8	1.2	5.5	3.6	32.7	21.8
Providence	0.0	0.0	0.0	0.0	11.8	7.9	13.6	9.1	1.8	1.2	5.5	3.6	32.7	21.8
Brayton Point/MA	81.8	54.5	5.5	3.6	5.5	3.6	1.8	1.2	5.5	3.6	0.0	0.0	100.0	66.7
Bristol	81.8	54.5	5.5	3.6	5.5	3.6	1.8	1.2	5.5	3.6	0.0	0.0	100.0	66.7
TENNESSEE LOOPS														
Herkimer/ Otsego Loop/NY	12.7	4.2	42.7	14.2	0.0	0.0	3.6	1.2	0.0	0.0	10.9	3.6	70.0	23.3
Herkimer	3.6	1.2	10.9	3.6	0.0	0.0	0.9	0.3	0.0	0.0	2.7	0.9	18.2	6.1
Otsego	9.1	3.0	31.8	10.6	0.0	0.0	2.7	0.9	0.0	0.0	8.2	2.7	51.8	17.3
Schoharie/ Albany Loop/NY	28.2	9.4	66.4	22.1	1.8	0.6	0.0	0.0	0.0	0.0	12.7	4.2	109.1	36.4
Schoharie	11.8	3.9	27.3	9.1	0.9	0.3	0.0	0.0	0.0	0.0	5.5	1.8	45.5	15.2
Albany	16.4	5.5	39.1	13.0	0.9	0.3	0.0	0.0	0.0	0.0	7.3	2.4	63.6	21.2
Columbia Loop/NY	30.9	10.3	2.7	0.9	0.0	0.0	0.9	0.3	0.0	0.0	2.7	0.9	37.3	12.4
Albany	30.9	10.3	2.7	0.9	0.0	0.0	0.9	0.3	0.0	0.0	2.7	0.9	37.3	12.4
Worcester Loop/MA	39.1	18.2	7.3	3.4	4.5	2.1	0.0	0.0	0.0	0.0	6.4	3.0	57.3	26.7
Worcester	39.1	18.2	7.3	3.4	4.5	2.1	0.0	0.0	0.0	0.0	6.4	3.0	57.3	26.7
TOTAL	**3200.0**	**2017.2**	**2470.3**	**1512.3**	**273.0**	**168.5**	**85.8**	**53.6**	**155.2**	**102.1**	**179.4**	**109.5**	**6363.6**	**3963.2**

TABLE 3.2.9-3

Proposed Residential Developments Crossed by the Iroquois/GNE Single Pipeline Alternative

PIPELINE SEGMENT	APPROX. MP	COUNTY	TOWN	TYPE	STATUS
IROQUOIS					
Mainline, NY	0.3	St. Lawrence	Waddington	"Whitehouse Bay"	Planning phase
GREATER NORTHEAST					
Mainline, NY	33.5	Schenectady	Rotterdam	"Caroline Manor"	
				Phase I - 13 units	Completed
				Phase II - 72 units	Permitting process
	48.5	Albany	Bethlehem	"Bethlehem Village" 140 townhouses	Planning process
		Rensselaer	East Greenbush	"Empire Village" townhouses	Permitting process
Mainline, MA	143.5	Hampshire	Belchertown	"Deer Run" 30+ single-family homes	Under construction
	165.0	Worcester	Spencer	"Country Hill Estates" 40 single-family homes	Permitting process
EASTERN SERVICE BRANCH					
MA	215.5	Worcester	Lancaster	"Lancaster Woods/Old County Estates" (80 units)	Permitting process
	218.1	Worcester	Clinton	"Fox Run Meadows" (43 single family units)	Permitting process
	233.0	Worcester	Grafton	"Glenwood" (6 single family units)	Under construction
	233.3	Worcester	Grafton	"Woods View Acres" (24 single family units)	Under construction
LONG ISLAND EXTENSION					
CT	309.0	Fairfield	Newtown	"Old Farm Hill"	Permit approved
	309.2	Fairfield	Newtown	"Teachers Ridge"	Permitting process
	312.9	Fairfield	Newtown	"Feather Meadow"	Permit approved
	313.3	Fairfield	Newtown	"Deer Ridge"	Phase 1 approved
	313.7	Fairfield	Newtown	"Cobbler's Hill"	Permitting process -Phase 2
	313.8	Fairfield	Newtown	"Mountain Manor"	Planning phase
	314.5	Fairfield	Newtown	Bernard Green Trustee	Planning phase
	315.0	Fairfield	Newtown	"Sutherland Woods"	Planning phase
	315.4	Fairfield	Newtown	"Osbourne Hill Estates"	Planning phase

TABLE 3.2.9-3 (cont'd)

PIPELINE SEGMENT	APPROX. MP	COUNTY	TOWN	TYPE	STATUS
LONG ISLAND EXTENSION (cont'd)					
	316.0	Fairfield	Newtown	"Forest"	Planning phase
	317.1	Fairfield	Monroe	"Whispering Pines Estates"	Permit approved
	317.5	Fairfield	Monroe	"Buckhill Estates"	Permitting process
	317.7	Fairfield	Monroe	Subwood Dev. Co.	Permitting process
	320.0	Fairfield	Shelton	Monty Blakeman	Permitting process
	321.0	Fairfield	Shelton	Land Trust	Planning phase
	322.8	Fairfield	Shelton	"Rock Ridge"	Planning phase
	323.7	Fairfield	Shelton	Subdivision Addition	Planning phase
	329.0	Fairfield	Stratford	"Oronoque West"	Permitting process
	330.5	Fairfield	Stratford	"Pin Oak" Subdivision	Permit approved
RUTLAND EXTENSION VT	43.5	Chittenden	Williston	"South Ridge" (160 single family units)	Under construction - planned around pipeline
PLEASANT VALLEY EXTENSION					
CT	287.3	Fairfield	Sherman	"Smoke Ridge Farm"	Permit approved
	296.8	Litchfield	New Milford	Properties Investors	Planning phase

NOTE: Information presented in this table is based on field observations and discussions with town and county planning officials.

Five proposed developments were identified along the length of the GNE Mainline; three in New York and two in Massachusetts. Of the five, one is under construction, two are in the permitting process, one is in the planning process, and one has a portion completed and a second portion in the permitting process.

Rutland Connector

The Rutland Connector would require approximately 1.9 miles of new right-of-way and would primarily traverse woodland (36.8 percent) and agricultural land (31.6 percent). Commercial/industrial land would comprise 15.8 percent and residential land 10.4 percent of the remaining land uses. No proposed residential developments have been identified along the Rutland Connector.

VGS Loops

The VGS Loops would total approximately 10.0 miles and would parallel existing railroad and pipeline rights-of-way for their entire length. Land uses crossed would primarily include agriculture (53.0 percent), woodland (38.0 percent), and residential (1.0 percent). No proposed residential developments have been identified along the VGS Loops.

Eastern Service Branch South Connector and North Connector

The Eastern Service Branch South and North Connectors would total approximately 2.5 miles of new right-of-way located entirely within woodlands. No proposed residential developments have been identified along either connector.

3.2.9.2 Recreation and Public Interest Areas

Table 3.2.9-4 identifies recreation and public interest areas located along the length of the Iroquois/GNE Single Pipeline Alternative. Recreation and public interest areas located along segments of this alternative which are common to the Iroquois/Tennessee Pipeline Project and the Champlain Pipeline Project are addressed in section 4.1.9.2 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I, respectively.

GNE Mainline

Federal and State Lands

The GNE Mainline would cross four state forests in Massachusetts: 0.6 mile of the Pittsfield State Forest, 0.9 mile of the Caldwell Memorial Forest, 0.6 miles of the West Brookfield State Forest, and 0.1 mile of the Sutton State Forest. All forests are owned and operated by the Massachusetts Department of Environmental Management (MADEM) for recreational purposes. All forests are crossed by the GNE Mainline in a configuration adjacent to electric transmission powerline rights-of-way.

The GNE Mainline would also cross several areas of the Quabbin Reservoir Reservation. The reservation is owned by the Commonwealth of Massachusetts and operated by the Metropolitan District Commission for public water supply. Reservation lands are open to the public for recreation and access is provided via controlled gate entry and a system of

TABLE 3.2.9-4

Recreation and Public Interest Areas Near or Crossed by the Iroquois/GNE Single Pipeline Alternative

PIPELINE SEGMENT	APPROX. MP	DESCRIPTION
IROQUOIS		
Mainline		
	0.0	St. Lawrence River - scenic area
	1.2	Seaway Trail/Route 37 - scenic area
	15.5	Grass River
	41.4	Oswegatchie River
	48.3	West Branch Oswegatchie River - National Rivers Inventory (NRI)
	65.1	Indian River - NRI
	91.0	Independence River
	92.0	Otter Creek
	93.9	Black River
	108.5	North Country Trail (proposed hiking trail)
	134.5	Rose Valley landfill - DEC suspected hazardous waste site (closed 1986)
	125.6	West Canada Creek
	152.0	Mohawk River
GREATER NORTHEAST		
Mainline/NY		
	16.5	Schoharie Creek
	28.0	Plotter Creek Park
	36.0	Watervliet Reservoir (not crossed)
	49.7	Normans Kill - proposed for scenic preservation
	50.8	Albany Municipal golf course
	51.0	Normanside Country Club - golf course
	55.8	Hudson River - boating
	67.4	Burden Lake
Mainline/MA		
	81.9	Pittsfield State Forest - camping, hiking, picnicking, hunting, snowmobiling, skiing
	87.6	Cheshire Reservoir/Hoosic River
	89.8	Appalachian Trail
	117.3	South River State Forest (not crossed)
	117.4 - 120.0	Deerfield River (not crossed)
	124.8	Connecticut River
	136.8	Caldwell Memorial Forest
	138.0 - 148.0	Quabbin Reservoir Reservation, Swift River fly fishing area
	155.8	West Brookfield State Forest
	161.8	Lake Lashaway
	162.0	East Brookfield sand and gravel pit
	164.0	O'Gara Park - town athletic fields
	164.5	Spencer Fish and Game Club Pond
	173.2	Pakachoag Road - local scenic road
	178.0	South Main Street - Proposed historic district
	181.9	Sutton State Forest
	185.6	Lackey Pond
	190.8	Blackstone River
RUTLAND EXTENSION		
Rutland Lateral		
	49.1	Rock Ridge Golf Course
	54.6	Lewis Creek - fishing
	70.5	New Haven River - boating, whitewater rafting, fishing
	77.2	Middlebury River - fishing
	93.2	Otter Creek - boating, fishing
Rutland Connector	0.7	Winooski River - boating, fishing

TABLE 3.2.9-4 (cont'd)

PIPELINE SEGMENT	APPROX. MP	DESCRIPTION
EASTERN SERVICE BRANCH		
	216.5	Rowlandson Garrison and Middle/Old Settlers Cemeteries - archaeologic/historic local significance
	216.8	Nashua River - boating, fishing
	232.9	Adams Road - locally designated scenic road
LONG ISLAND EXTENSION		
	315.1	Paugussett State Forest (borders)
	318.2	Boys Halfway River Caves - Limestone caves
	319.3	Shelton land Trust/Means Brook Valley
	320.8	Hill & Harbor Tourist District - mixed forest and farms
	329.1	Roosevelt Forest
	330.8	Housatonic River
	331.2	City of Milford Open Space/Mondo Ponds
	333.5	Silver Sands State Park Reserve
PLEASANT VALLEY EXTENSION		
NY	280.0	West Mountain
	282.3	Dover/Walter Vincent landfill - DEC listed hazardous waste site
CT	286.7	Appalachian Trial
	287.7	Naromi Land Trust/Wimisink Brook
	288.0	Weantinoge Land Trust
	289.5	Stillson Road Scenic Area
	291.8	Housatonic Range Trail
	292.9	Candlewood Mountain/Pine Knob
	293.8	Lynn Deming Park - swimming, picnicking
	296.0	Hill and Plain School
	297.1	Candlewood Valley Country Club - golf course
	299.5	Still Water Nature Preserve (part of Weantinoge Land Trust)
TENNESSEE		
Columbia-Berkshire Loop	256 + 6.7	Immaculate Conception Navitiate
	257 + 0.3	Housatonic River - local wild and scenic river
Worcester Loop	265 + 7.0	Blackstone River
	266 + 2.1	Upton State Forest

gravel and dirt roads and foot trails. South of Windsor Dam (MP 145.9), the GNE Mainline would cross a developed fly fishing area on the Swift River.

The GNE Mainline would cross the Appalachian Trail in Dalton, Massachusetts adjacent to an existing electric transmission line. The trail is managed by the National Park Service and the local club of the Appalachian Trail Conference.

Recreational Water Bodies

A total of nine recreational water bodies would be crossed by the GNE Mainline, four in New York and five in Massachusetts. In New York, Schoharie Creek would be crossed at MP 16.5, Normans Kill at MP 49.7, the Hudson River at MP 55.8 and Burden Lake at MP 67.4. Normans Kill, which forms the border between the towns of Albany and Bethlehem, is currently under study by the Bethlehem Land Use Management Advisory Committee for scenic preservation. The GNE Mainline would cross Normans Kill several times, once in an area of relatively dense residential development and twice through two golf courses located on both sides of the Kill. The Hudson River would be crossed approximately three miles further south in a commercial/industrial area.

In Massachusetts, the GNE Mainline would cross the Cheshire Reservoir at MP 87.6, the Connecticut River at MP 124.8, Fivemile River (Lake Lashaway) at MP 161.8, Lackey Pond at MP 185.6 and the Blackstone River at MP 190.8. The Hoosic River (which flows to Chesire Reservoir) has been designated by MADEM as a "local scenic river" from Lanesboro to the Vermont border. The Blackstone River currently has no official designation although it is being studied by a commission organized by the National Park Service for its suitability for designation as a National Heritage Corridor.

Landfills/Hazardous Waste Sites

No hazardous waste sites or landfills would be crossed by the GNE Mainline.

Other Public Interest Areas

One sand and gravel operation would be crossed by the GNE Mainline at MP 162.0 in East Brookfield, Massachusetts. Two golf courses, the Albany Municipal Golf Course and the Normanside Country Club, would be crossed at MP 51.0 along Normans Kill in New York. Other recreational areas crossed by the GNE Mainline include: Plotter Creek Park at MP 28.0 in Rotterdam, New York; the O'Gara Park athletic fields at MP 164.0; and the Spencer Fish & Game Club Pond at MP 164.5 in Spencer, Massachusetts.

Rutland Connector

The Rutland Connector would cross the Winooski River at MP 0.7 in Essex Vermont which is used for boating and fishing. No other areas of recreation or public interest have been identified along this segment.

VGS Loops

No areas of recreation or public interest have been identified along these loops.

Eastern Service Branch South Connector and North Connector

No areas of recreation or public interest have been identified along these loops.

3.2.9.3 Visual Resources

With the exception of the GNE Mainline. The visual character of the landscape traversed by the Iroquois/GNE Single Pipeline Alternative would be similar to that described in section 4.1.9.3 of the Iroquois/Tennessee EIS, Volume I or the Champlain EIS, Volume I.

GNE Mainline

The GNE Mainline crosses three characteristic landscapes. The westerly 29 mile segment crosses an area of rolling agricultural land with scattered woodlands. Small communities and rural residences are common. The Schoharie Creek Valley is the major landscape feature crossed. The landscape quality is noteworthy. The second distinct characteristic landscape occurs between MP 31 to MP 60 in the developing Schenectady/Albany, New York area and between MP 171 and MP 180 in the Auburn and Millbury, Massachusetts area. These areas are characterized by extensive urban/suburban developments. The landscape quality is common. The remaining characteristic landscape is between MP 60 and MP 171 which includes eastern New York and Western Massachusetts. This area is primarily wooded and in places mountainous with little development. Distinctive landforms occur at the crossings of the Taconic and Holyoke Range mountains. Distinctive water features include the Deerfield and Connecticut rivers and Quabbin Reservoir. Overall the landscape is noteworthy to distinctive.

3.2.10 Socioeconomics

Existing socioeconomic conditions for the Iroquois/GNE Single Pipeline Alternative are shown on table 3.2.10-1. The Iroquois/Tennessee EIS, Volume 1, and the Champlain EIS, Volume 1, contain discussion of the affected counties. Three counties not included in the referenced EIS's are located along the GNE Mainline in New York and Massachusetts. Rensselaer County has the fourth largest population of the affected New York counties, Franklin County has the smallest, and Hampshire County the third smallest population of the affected counties in Massachusetts.

3.2.11 Cultural Resources

Section 106 of the National Historic Preservation Act (NHPA) of 1966, requires the FERC to take into account the potential effect of a proposed project on any prehistoric or historic sites, buildings, districts, or objects listed in or eligible for listing in the National Register of Historic Places (NRHP), and to afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the undertaking. To comply with NRHP regulations, if the Iroquois/GNE Single Pipeline alternative becomes a preferred plan

TABLE 3.2.10-1

Iroquois/GNE Single Pipeline Alternative
Existing Socioeconomic Conditions

State/ County	Estimated 1980 Population a/	1980-1986 1986 Population a/	1980 Percent Change a/	1985 Pop. Density per sq. mile b/	1988 Per Capita Income* a/	1988 Civilian Labor Force c/	Unemployment Rate c/
NEW YORK	17,588,165	17,772,000	1.0	370.6		8,522,000	4.2
Albany	285,909	283,800	0.7	542.6	15,482	150,200	2.7
Columbia	59,487	60,600	1.9	97.2	14,001	30,300	3.0
Dutchess	245,055	255,800	4.4	319.1	16,036	129,100	2.6
Herkimer	66,714	66,900	0.2	47.5	10,734	29,900	5.7
Lewis	25,035	25,100	0.0	19.4	9,560	10,100	7.1
Montgomery	53,439	51,700	- 3.3	131.4	11,564	26,100	8.0
Oneida	253,466	247,200	- 2.5	207.8	12,422	106,000	4.5
Otsego	59,075	58,900	- 0.2	58.5	11,151	28,800	3.9
Rensselaer	151,966	150,800	- 0.8	230.7	12,645	73,300	3.6
St. Lawrence	114,347	111,500	- 2.5	41.6	9,569	43,400	7.7
Schenectady	149,946	150,100	3.8	728.8	15,018	73,600	3.3
Schoharie	29,710	29,500	- 0.7	49.3	10,333	14,200	5.3
Suffolk	1,284,231	1,308,300	1.9	1,449.0	16,529	674,300	3.6
MASSACHUSETTS	5,737,093	5,832,000	1.7	733.3	12,510	3,143,974	3.3
Berkshire	145,110	141,300	- 2.6	152.4	11,198	71,200	4.4
Bristol	474,641	484,900	2.2	852.1	9,961	245,389	4.7
Franklin	64,317	66,000	2.5	91.6	10,554	36,488	3.4
Hampshire	138,813	141,500	1.9	267.9	10,381	76,562	2.7
Middlesex	1,367,034	1,367,000	0.0	1,663.1	14,697	791,713	2.6
Worcester	646,352	661,100	2.3	426.9	11,386	341,497	3.4
CONNECTICUT	3,107,564	3,189,000	2.6	637.8	14,090	1,746,000	3.0
Fairfield	807,143	824,100	2.1	1,323.8	17,708	347,800**	5.7**
Litchfield	156,769	161,300	2.9	175.3	13,381	52,600**	3.3**
New Haven	761,325	778,900	2.3	1,248.1	12,426	407,700	3.1
VERMONT	511,456	541,000	5.8	55.2	9,619	298,000	2.8
Addison	29,406	31,400	6.9	38.0	8,709	16,900	3.2
Chittenden	115,534	124,800	8.0	214.0	11,205	74,850	1.9
Rutland	58,347	60,000	2.8	62.6	9,537	33,650	2.6
Franklin	34,788	37,200	6.9	53.6	8,472	17,250	4.2
RHODE ISLAND	947,154	975,000	2.9	897.8	10,892	526,000	3.0
Providence	571,349	581,700	1.8	1,373.4	10,335	309,993	3.3
NEW HAMPSHIRE	920,610	1,027,000	11.5	102.4	11,659	596,900	3.9
Hillsborough	267,608	314,300	13.6	315.8	12,765	189,000	3.7

* By place of residence.
** Data is by labor market area, not by county.

TABLE 3.2.10-1 (cont'd)

Sources:

a/ U.S. Department of Commerce, Bureau of Census, 1986 Population and 1985 Per Capita Income Estimates for Counties and Incorporated Places. 1988.

b/ U.S. Department of Commerce. Bureau of Census, Number of Inhabitants. April 1983.

c/ State of Vermont: Vermont Department of Employment and Training. January 1989.
State of New Hampshire: New Hampshire Department of Employment Security, 1988. Labor Market Projections. June 1987.
State of Massachusetts: Department of Employment and Training. March 1989.
State of Rhode Island: Department of Employment Security. February 1989.
State of Connecticut: Department of Employment Security. 1989.
State of New York: Department of Employment Security. 1989.

for construction, the applicant will need to consult the State Historic Preservation Officers (SHPOs) within the affected states of New York, Connecticut, Massachusetts, Vermont, and Rhode Island regarding the potential effects of the project on NRHP-listed or -eligible cultural resources.

Because much of the Alternative would follow portions of the routes of both the Iroquois/Tennessee and the Champlain pipeline projects and based upon data from prior research in the vicinity of those proposed projects, we expect that the SHPO from each affected state would comment that construction of the single pipeline alternative would have a high probability of impacting identified and yet-to-be identified archeological resources and would recommend implementation of Phase 1 cultural resources studies (identification). If, during these identification studies, potential NRHP-eligible or possibly eligible resources were to be identified, it would then become necessary to carry out Phase 2 studies (evaluation of eligibility and potential impacts). Additionally, the SHPOs' concerns regarding potential short- and long-term effects to NRHP-listed or -eligible structural resources within the viewshed would have to be addressed by the applicant.

The Iroquois/GNE Single Pipeline Alternative would pass through an array of natural and cultural environmental zones in New York, Massachusetts, Connecticut, Vermont, and Rhode Island of archaeological significance that date from PaleoIndian times (approximately 12,000 years ago). The route would cross three major river drainages in New York (St. Lawrence, Mohawk, and Hudson); equally well-documented prehistoric occupation zones in the Housatonic drainage in Connecticut; and every major drainage in Massachusetts (except in the easternmost portion of the state) known to contain numerous archeological sites from every prehistoric and historic period and major structural historic districts. The Long Island Sound coastal area of New York and Connecticut also contains numerous historic and prehistoric sites.

Based upon information developed from prior research in the immediate vicinity of the Alternative route, it is expected that archeological sites from all phases of the prehistoric, contact and historic periods, including a broad range of functional types (from small single function activity areas to major multicomponent occupation sites), may be found within the area of direct impact. A number of 17th through 20th century historic districts, structures, sites and multiple resource areas are near the route of the Alternative.

The longest segment of the Alternative not discussed in Volume I of either EIS is the GNE Mainline. This 197.1-mile segment would cross a high frequency of known prehistoric and historic sites ranging from late Archaic campsites to Contact Period trails to mid-19th century schoolhouses. Known cultural resources in proximity to the route include 24 prehistoric sites and 54 historic sites based on literative search, site file search, and aerial reconnaissance (ERT, 1988). No field reconnaissance has been undertaken along this route segment. The Rutland Connector (1.9 miles immediately east of Lake Champlain) in Vermont has the potential for directly impacting major prehistoric and early Colonial, Revolutionary, and National period sites. Prior to selecting a final corridor for this route segment, an applicant would be required to gather information on the locations of known archeological resources and sensitive areas in this portion of Vermont in order to avoid major routing conflicts with important cultural resources. No studies of this route segment, the VGS Loops, or the North and South Eastern Service Branch Connectors have been undertaken.

3.3 CHAMPLAIN-BASED SINGLE PIPELINE ALTERNATIVE

The Champlain-based Single Pipeline Alternative comprises route segments addressed in the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I, and in a discussion of the L & J Energy Lateral, a nonjurisdictional facility, in section 4.3.2 of this volume. Table 3.2-1 identifies the individual components of this single-pipeline alternative and the EIS volumes in which each is addressed.

The description herein includes tabular data for selected resource factors for the Champlain-based Single Pipeline Alternative. A discussion of the affected environment for the jurisdictional facilities is included in the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

3.3.1 Geology

Geologic resources near the Champlain-based Single Pipeline Alternative are addressed in the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

3.3.2 Soils

Table 3.3.2-1 summarizes soil groups that would be traversed by the Champlain-based Single Pipeline Alternative.

3.3.3 Water Resources

3.3.3.1 Groundwater

The Champlain-based Single Pipeline Alternative would traverse groundwater resources similar to those described in section 4.1.3.1 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS Volume I. Public supply wells and protection areas located near the Champlain-based Single Pipeline Alternative are listed in table 3.3.3-1 and are described in the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

3.3.3.2 Surface Water

The Champlain-based Single Pipeline Alternative would traverse portions of five New England states (including Vermont, New Hampshire, Massachusetts, Connecticut, and Rhode Island) as well as New York state. A general description of drainage system features can be found in section 4.1.3.2 of the Iroquois/Tennessee EIS, Volume I, and the Champlain EIS, Volume I.

Surface waters that would be crossed by the Champlain-based Single Pipeline Alternative are listed in table B-2 by the route milepost at which they would be crossed. The table also presents the surface water classification, type of fishery, and width of proposed major crossings. A description of surface water resources is presented in section 4.1.3.2 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

Generally, surface waters are classified by each state according to the most sensitive beneficial uses for which the water will be protected. A description of the surface water

TABLE 3.3.2-1

Miles of Soil Groups Crossed by the Champlain-based Single Pipeline Alternative a/

Pipeline Counties	Group 1 Level to steep, stony soils c/ (depth to bedrock <60")	Group 2 Level to nearly level fertile soils d/	Group 3 Level to steep wet soils b/	Group 4 Level, gentle sloping, sandy soils e/	Group 5 Level, wet organic soils f/	Group 6 Urban soils g/
Franklin, VT	3.0	-	19.6	2.0	2.9	-
Chittenden	4.8	6.8	13.3	2.9	-	-
Addison	9.1	12.5	9.1	-	-	-
Rutland	20.7	3.3	5.5	8.8	-	-
Windsor	13.6	4.3	3.7	-	0.3	-
Windham	2.0	-	-	0.6	-	-
Sullivan, NH	0.7	1.7	0.5	2.3	-	-
Cheshire	22.3	10.1	0.3	3.4	-	-
Hillsborough	-	-	-	0.1	-	-
Worcester	15.2	22.5	12.8	15.1	3.0	-
Middlesex	2.0	3.5	2.5	14.3	2.0	0.4
Norfolk	-	0.6	1.0	-	-	-
Bristol	-	4.4	5.1	-	0.7	0.8
Providence, RI	-	-	-	-	-	3.6
Litchfield, CT	5.1	-	0.7	5.1	-	-
Fairfield	28.7	1.5	2.0	0.6	0.6	-
New Haven	1.7	0.5	0.4	0.3	-	-
Herkimer	1.0	1.0	-	-	-	-
Otsego	2.9	2.8	-	-	-	-
Schoharie	0.4	2.5	2.1	-	-	-
Albany	0.2	3.9	2.9	-	-	-
Columbia	2.0	2.1	-	-	-	-
Dutchess	11.9	2.7	0.5	-	-	-
Suffolk	5.9	-	1.9	1.0	-	-
TOTALS:	153.2	86.7	83.9	56.5	9.5	4.8

a/ Overall and individual segment mileage totals do not equal proposed length due to rounding and mapping errors.
b/ Haplaquepts, Haplaquents, Fragiaquepts, Fragiorthods, Orchraqualfs, Fluvaquents, Udifluvents. Soil group 3 consists of wet soils on floodplains and uplands.
c/ Dystrochrepts, Eutrochrepts, Haplorthods. Soil group 1 consists of acid, stony, infertile soils on sloping land.
d/ Hapludalfs. Soil group 2 consists of well drained, fertile, nearly level soils.
e/ Udipsamments, Udorthents, Haplorthods, Dystrochrepts. Soil group 4 consists of sandy, acid, excessively drained soils.
f/ Histosols.
g/ Udorthents, areas disturbed by large-scale, urban development.

TABLE 3.3.3-1

Public Groundwater Supplies Located Near the Champlain-based Single Pipeline

Pipeline Segment	Town, State	Milepost	Water Supply	Approx. Distance from Pipeline (mi)
CHAMPLAIN				
Mainline	Swanton, VT	11.5 - 12.4	Homestead Acres Trailer Park	0.34
	Fairfax, VT	18.9 - 19.3	Windtop Water Works	0.53
	Westford, VT	32.8 - 33.6	Rolling Acres Trailer Park	0.42
	St. George, VT	48.3 - 49.8	St. George Estates	0.2
	Procton, VT	100.4 - 101.5	Oakcrest Water System	1.4
	Rutland, VT	104.8 - 105.8	Green Acres Development	0.38
	Rutland, VT	106.5 - 106.9	Killington Estates	0.04
	Clarendon, VT	111.7 - 112.9	Whispering Pines Trailer Park	0.45
	Shrewsbury, VT	115.3 - 116.3	Cuttingsville Fire District	<0.1
	Winchendon, MA	192.0	Town of Winchendon	0.39
	Lancaster, MA	217.3 - 217.4	Town of Lancaster	0.04
	Westborough, MA	230.5 - 231.0	Town of Westborough	0.9
	Westborough, MA	231.1 - 231.2	Town of Westborough	0.9
Pelham Branch	Lancaster/Leominster, MA	0.6 - 0.8	Town of Lancaster	0.06
	Shirley, MA	7.4 - 7.5	Town of Shirley	0.02
LONG ISLAND EXTENSION				
			Stony Hill Village	0.3
	Newton, CT	305.5 - 334.0	Greenridge Inc., Water	0.3, 1.4
			Eagle Hill Rehabilitation	0.75
			Fairfield Hills Hospital	1.5
			Olmstead Water Supply	0.7
			Lake Zoar	1.5
	Shelton, CT		Bridgeport Hydraulic	1.5
			Ansonia Derby Water	1.0
	Southbury, CT		Lakeside Water Co.	1.5
	Oxford, CT		Hawk Stone Terrace	1.0
	Northport, NY	361.0	Crab Meadow Beach	0.4
		362.0	Suffolk County Water Authority	0.2-0.8
		363.7	Northport VA Hospital	0.6
	Greenlawn, NY	366.0	Greenlawn Water District	0.1-1.3

TABLE 3.3.3-1 (cont'd)

Pipeline Segment	Town, State	Milepost	Water Supply	Approx. Distance from Pipeline (mi)
PLEASANT VALLEY LATERAL				
	Union Vale, NY	272.5	Parkway Apartments	1.0
	Dover, NY	283.6	Schreiber Water Works	0.5
		283.0	Cedar Lane Mobile Home Parks #2	0.6
		285.0	Lake Ellis Mobile Home Park	1.3
		285.4	East Mountain Trail Park	1.5
	New Milford, CT	293.0 - 300.0	West Falls Mobile Home	0.2
			Forest Hills Estate	0.5
			Lord's Mobile Home	1.0
			River View Court As	0.1
			New Milford Heights	0.3
			Sunny Valley Farms	0.1
			Birch Grove Associa	0.4
			Candlewood Trails A	0.4
			Lone Oaks Water Company	0.1
			Mill Brook Water Company	0.3
			Hi-Vu Water Company	0.2
			Candlewood Lake Con	0.3
			Indian Ridge Water	1.5
			Candle Terrace Estate	1.4
	Brookfield, CT	300.0 - 305.5	Brookfield Elderly	0.3
			Rural Water Co., Inc., Brook Acres	0.1
			Silvermine Manor	0.3
			Newbury Crossing	0.2
			Ledgewood Association	0.1
			Dancon Corporation Brookwood	0.6
			Dancon Corporation Butternut Ridge	0.4
			Rollingwood Condominiums	0.3
			Sandy Lane Village	0.4
			Brookfield Hills Co.	0.3
			Lake Lillianoah Shores	1.4
			Rural Water Co., Inc., Brookfield Div.	1.2
			Stony Hill Village	0.3
ALGONQUIN LATERALS				
Brayton Pt.	Swansea, MA	5.7	Town of Swansea	0.08
TENNESSEE LOOPS				
Worcester	Grafton, MA	265 + 7.0	Town of Grafton	0.31

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quality classifications for the states crossed by the Champlain-based Single Pipeline Alternative is presented in table B-2.

Major River Crossings

The Champlain-based Single Pipeline Alternative would cross 16 waterbodies greater than 100 feet in width (see table B-2). Five of these rivers are greater than 300 feet in width at the crossing point and the proposed Long Island Sound crossing would be 26.3 miles. Information regarding the pipeline crossings of these rivers and the Long Island Sound can be found in section 4.1.3.2 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

Municipal Surface Water Supplies

Municipal surface water supplies are located downstream from five Champlain-based Single Pipeline Alternative stream crossings. In addition, the proposed route would traverse the 400-foot state-designated (310 CMR 22.21) radius of two public surface water supplies. These are addressed in section 4.1.3.2 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I. The proposed alternative route may also traverse municipal watershed areas protected by town bylaws.

3.3.4 Fish and Wildlife

3.3.4.1 Fish

Table B-2 summarizes waterbodies that would be crossed by all segments of the Champlain-based Single Pipeline Alternative, and includes fishery classifications for those waterbodies classified by respective state agencies. Table 3.3.4-1 lists significant fishery resources that would be affected by the Champlain-based Single Pipeline Alternative. Fishery resources that would be affected by the Champlain and Iroquois segments of the are described in section 4.1.4.1 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

3.3.4.2 Wildlife

Wildlife species and habitats that would be affected by the Champlain and Iroquois segments of the Champlain-based Single Pipeline Alternative are described in sections 4.1.4.2 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I. DWAs that would be crossed by the Alternative are listed in table 3.3.4-2 .

3.3.5 Endangered and Threatened Species

3.3.5.1 Fish and Wildlife

3.3.5.1.1 Fish

Endangered and threatened fish species which potentially occur in the vicinity of the Champlain and Iroquois segments of the Champlain-based Single Pipeline Alternative are

TABLE 3.3.4-1

Significant Fishery Resources
Crossed by the Champlain-Based Single Pipeline Alternative

Pipeline Segment	MP	Waterbody	Crossing Width (ft)	Fishery Type	Fishery Issue
CHAMPLAIN MAINLINE	6.2	Missisiquoi River	250	C-S	1
	7.0	Hungerford Brook	30	W	1
	25.7	Lamoille River	200	W,C-S	2,3
	28.9	Browns River	100	C-S	2,3
	40.5	Winooski River	150	W,C-S	2
	51.5	La Platte River	100	W,C-S	1
	54.6	Lewis Creek	50	C-S	2,3
	70.2	Hew Haven River	50	C-S	2,3
	77.2	Middlebury River	50	C-S	2,3
	97.7	Furnace Brook		C	2,3
	148.8	Connecticut River	750	W,C-S	1
	153.6	Great Brook	25	C-S	3
	154.0	Cold River	100	C-S	2
	163.9	Ashuelot River	50	W,C-S	1
	193.9	Millers River	50	W,C-S	2
	213.1	Wekepeke Brook	15	W,C	2
CHAMPLAIN PELHAM	9.6	Mulpus Brook		W,C-S	2,3
	21.8	Unkety Brook		C-S	2,3
PLEASANT VALLEY EXTENSION	272.6	Sprout Creek	1	C-S	2
	279.9	Coopertown Brook	1-10	C-S	2
	281.7	Swamp River	12-30	W	2
	284.2	Tenmile River		C-S	2
	286.3	Deuel Hollow Brook	4-12	C-S	2
	287.8	Wimisink Brook		C-S	2
	289.2	Morrissey Brook		C-S	2
	291.7	Bullymuch Brook		C-S	2
	292.9	Rocky River		C-S	2
LONG ISLAND EXTENSION	306.5	Pond Brook		C-S	2
	311.2	Pootatuck River		C-S	2
	327.2	Farmill River		C-S	2,3
	330.9	Housatonic River		E	2,3

a/ Fishery Type Codes:

W = Warmwater
C = Coldwater
C-S = Coldwater Stocked
E = Estuarine

b/ Fishery Issue Codes:

1 = Contains state or federal existing or proposed endangered, threatened, or special concern aquatic species.
2 = Either designated as exceptional cold-water fishery, or has special fishery regulations, or is given high priority by the state.
3 = Good salmonid spawning habitat.

TABLE 3.3.4-2

Deer Wintering Areas Crossed by the Champlain-based Single Pipeline Alternative

Pipeline Segment/State	Beginning Milepost	Length of Crossing (ft)	Amount of Vegetation Cleared (Acres) a/	New (N) or Existing (E) ROW Width (ft) b/
Champlain				
Mainline/VT	7.2	3,600	6.2	E/150
	23.2	3,800	6.5	E/80
	41.5	1,500	2.6	N
	60.5	2,700	4.6	E/130
	78.5	5,400	9.3	E/150
	106.9	1,600	0.0	E/300
	110.7	15,100	26.0	E/250
	117.5	6,400	11.0	E/250
	130.3	1,500	2.6	E/150
	133.7	2,500	4.3	E/10
	134.2	1,100	1.9	E/10
	134.9	7,400	12.9	E/80
Mainline/NH c/	149.9	2,400	4.1	N
	152.6	2,400	4.1	N
	153.7	2,600	4.5	N
	154.5	1,600	2.8	N
	161.2	1,800	3.1	E/150
	163.9	10,300	17.7	E/150
	168.8	800	1.4	E/150
	171.6	400	0.7	E/150
	174.3	2,400	4.1	E/150
	175.1	10,900	18.8	E/150
	179.0	3,200	5.5	E/250
Mainline/MA	223.4	3,600	6.2	N
	228.3	4,900	8.4	N
	233.9	2,100	3.6	N
	234.9	7,900	13.6	N
	237.6	3,500	6.0	N
	238.9	5,400	9.3	E/250
Pleasant Valley Lateral/NY	276.6	4,000	9.2	N

Source: Vermont FWD, New Hampshire FGD, Massachusetts DFW, Champlain Pipeline Co., New York State DEC

a/ Amount of vegetation cleared was determined by multiplying length of crossing by the width of construction right-of-way (ROW) (75 feet), then dividing by square feet per acre (43,560).

b/ Indicates whether proposed pipeline at each DWA crossing is new ROW or parallel and adjacent to existing ROW. If adjacent to existing ROW, width of the existing ROW is indicated.

c/ DWA maps have been completed for 10 of the 13 towns crossed by the Mainline in New Hampshire.

described in sections 4.1.5.1 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I, and are listed in table 3.3.5-1.

3.3.5.2.2 Wildlife

Table 3.3.5-1 summarizes endangered and threatened wildlife species that possibly occur in the vicinity of all segments of the Champlain-based Single Pipeline Alternative. Endangered and threatened wildlife species that potentially occur in the vicinity of the Champlain and Iroquois segments of the Alternative are described in section 4.1.5 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

3.3.5.2 Plants

Table 3.3.5-1 summarizes endangered and threatened plant species that possibly occur in the vicinity of all segments of the Champlain-based Single Pipeline Alternative. Endangered and threatened plant species that occur in the vicinity of the Champlain and Iroquois segments of the Alternative are described in section 4.1.5 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

3.3.6 Vegetation

Vegetation types affected by the construction of the Champlain and Iroquois segments of the Champlain-based Single Pipeline Alternative are described in section 4.1.6 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

3.3.7 Wetlands

Table B-4 lists all wetlands that would be affected by the Champlain-based Single Pipeline Alternative. Table 3.3.7-1 summarizes by cover type the wetlands that would be crossed. A description of wetland types affected by the Champlain and Iroquois segments of the Alternative may be found in section 4.1.7 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

3.3.8 Air Quality and Noise

3.3.8.1 Air Quality

Air quality and considerations related to air quality in the vicinity of the Champlain-based Single Pipeline Alternative are addressed in section 4.1.8.1 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

3.3.8.2 Noise

The issue of noise in the vicinity of the Alternative is addressed in section 4.1.8.2 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

TABLE 3.3.5-1

Endangered And Threatened Species that Potentially Occur in the Vicinity of the Champlain-based Single Pipeline Alternative

SPECIES	STATUS a/	COUNTY/STATE
CHAMPLAIN		
Peregrine falcon b/	F/E, V/E	Rutland, VT; Windsor, VT
Bald eagle	F/E, C/E	Fairfield, CT
Kemp's Ridley sea turtle	F/E, NY/E	Suffolk, NY
Shortnose sturgeon	F/E, NY/E, C/E	Dutchess, NY
Dwarf wedge mussel	F/P, N/E	Cheshire, NH; Sullivan, NH
Bog turtle	F/C2, NY/E	Dutchess, NY
Barbed bulrush	F/C2, V/T	Windham, VT
Muskellunge	V/U	Franklin, VT
Garber's sedge	V/T	Franklin, VT
Meadow horsetail	V/SC	Franklin, VT
American brook lamprey	V/T	Franklin, VT
Hairy sedge	V/SC	Franklin, VT
Stonecat	V/SC	Chittenden, VT
Fairy slipper b/	V/T	Addison, VT
Swamp fly-honeysuckle	V/SC	Addison, VT
Eastern jacob's ladder	V/T	Addison, VT
Ram's-head lady's-slipper	V/T	Addison, VT
Showy lady's-slipper	V/SC	Addison, VT
White Adder's-mouth	V/T	Addison, VT
Marsh horsetail b/	V/T	Addison, VT
Green dragon	V/T, M/T	Rutland, VT; Franklin, MA
Massachusetts fern	V/SC	Windsor, VT
Flowering dogwood	V/T	Windham, VT
Prostrate tick-trefoil	V/T	Windham, VT
Three-birds orchid	V/T	Windham, VT
Cutleaf toothwort	N/E	Cheshire, VT
Slender-flowered muhlenbergia	N/T	Cheshire, VT
Blue-gray gnatcatcher	N/T	Cheshire, NH
Fringed gentian	N/T	Cheshire, NH
Cooper's hawk	M/SC	Worcester, MA
Blue-spotted salamander c/	M/SC	Worcester, MA
Spotted turtle c/	M/SC	Worcester, MA
Northern hairstreak butterfly	M/SC	Worcester, MA
Wood turtle	M/SC	Worcester, MA
Barren strawberry	M/SC	Franklin, MA
Blandings turtle	NY/T	Dutchess, NY
Timber rattlesnake	NY/T, C/T	Dutchess, NY

a/ Codes for status.

F - Federal	E - Endangered
V - Vermont	T - Threatened
N - New Hampshire	SC - Special Concern
M - Massachusetts	C2 - Status 2 Candidate
C - Connecticut	U - Under Consideration
R - Rhode Island	P - Proposed Endangered
NY - New York	

b/ Historic record only.

c/ Wetland species whose habitat is protected by Massachusetts Wetland Protection Act.

Source: US Fish and Wildlife Service, National Marine Fisheries Service, Vermont Natural Heritage Program, New Hampshire Natural Heritage Inventory, Massachusetts Natural Heritage Program, Connecticut Natural Diversity Data Base, Rhode Island Division of Fish and Wildlife, and New York Natural Heritage Program.

TABLE 3.3.7-1

Wetland Types Crossed by the Champlain-based Single Pipeline Alternative

Pipeline Segment	NWI Classification a/	Number of Crossing Locations b/	Wetland Area Affected During Construction (acres) c/
CHAMPLAIN			
Mainline	PF01	58	40.8
	PF01/4	3	5.5
	PF04	7	4.1
	PF04/1	1	0.9
	PF06/7	2	1.9
	PF01/SS1	10	9.7
	PF04/SS1	4	7.0
	PF01/EM	2	1.5
	PF05/EM	1	0.4
	PF05/OW	2	4.3
	PSS1	22	23.8
	PSS1/EM	24	15.5
	PEM	25	19.4
	POW	4	1.4
	Subtotal	165	136.2
Pelham Branch	PF01	25	12.6
	PF04	1	0.1
	PF01/4	1	0.4
	PF01/SS1	5	4.3
	PSS1	7	2.9
	PSS1/EM	3	3.4
	PEM	3	1.5
	POW	3	3.2
	Subtotal	48	28.4
Nashua Branch	PF01/SS1	1	1.5
	PSS1	2	0.9
	Subtotal	3	2.4
LONG ISLAND EXTENSION			
	PF01	37	9.7
	PF04	2	0.1
	PF01/SS1	3	2.4
	PF01/EM	1	0.6
	PSS1	6	1.8
	PSS1/EM	7	0.7
	PSS5/OW	1	0.1
	PEM	10	3.5
	POW	4	0.6
	PFLA	2	1.2
	E10W	2	1.9
	E2FL	5	2.4
	Subtotal	80	25.0
PLEASANT VALLEY LATERAL			
	PF01	10	1.4
	PF01/SS1	1	0.4
	PSS1	2	0.7
	PSS1/EM	1	0.1
	PEM	1	0.1
	POW	4	0.7
	Subtotal	19	3.4

TABLE 3.3.7-1 (cont'd)

Pipeline Segment	NWI Classification a/	Number of Crossing Locations b/	Wetland Area Affected During Construction (acres) c/
ALGONQUIN LATERALS			
Manchester Street Lateral	No wetlands crossed		
Brayton Point Lateral	PF01	10	5.9
	PF01/4	1	1.1
	PF01/SS1	5	3.9
	PSS1/EM	1	1.4
	PEM	1	0.5
	Subtotal	18	12.8
TENNESSEE LOOPS			
Herkimer-Otsego	PSS/PF01/PEM	4	1.2
	PSS/PF04	1	0.4
	PF04/PSS/PEM	1	0.2
	Subtotal	6	1.8
Schoharie-Albany	PF01	2	0.3
	PF01/SS1	1	0.2
	PSS	1	0.6
	Subtotal	4	1.1
Columbia	PF01	1	<0.1
	PF01/SS1	2	1.8
	PSS1	1	0.2
	Subtotal	4	2.0
Worcester	PF01	3	1.0
	PF01/SS1	1	0.1
	PSS1	2	0.7
	POW	1	0.1
	Subtotal	7	1.9
	TOTAL	354	215

a/ NWI Wetland Types:

PALUSTRINE

Forested:

- PF01 - Broad-leaved deciduous (hardwood)
- PF03 - Borad-leaved evergreen
- PF04 - Needle-leaved evergreen (soft wood)
- PF05 - Dead
- PF06 - Deciduous

Scrub/shrub:

- PSS1 - Broad-leaved deciduous
- PSS3 - Broad-leaved evergreen
- PSS5 - Dead

Emergent:

- PEM - Emergent marsh or wet meadow

Open Water:

- POW - Small pond or standing water

ESTUARINE

- E10W - Subtidal open water
- E2FL - Intertidal flat

b/ Wetland cover types crossed were determined from FWS NWI maps.

c/ Wetland area in the construction right-of-way (ROW) was estimated by multiplying crossing lengths (from table B-4) by the affected ROW widths (50-100 feet), then dividing by square feet per acre (43,560).

3.3.9 Land Use, Recreation, and Visual Resources

The following tables identify the resources affected by the Champlain-based Single Pipeline Alternative. Table 3.3.9-1 identifies land uses crossed by this and the number of homes within 50 feet of 421.4 mile-long alternative. Table 3.3.9-2 tabulates acreage of land uses affected by construction and operation of this alternative. Table 3.3.9-3 identifies residential developments proposed along the length of this alternative. Table 3.3.9-4 identifies recreation and public interest areas that would be affected by this alternative.

Discussion of those segments of the Champlain and Iroquois pipelines which are part of the Champlain-based Single Pipeline Alternative is contained in section 4.1.9 of the Champlain EIS, Volume I and the Iroquois/Tennessee EIS, Volume I.

3.3.10 Socioeconomics

Existing socioeconomic conditions for the Champlain-based Single Pipeline Alternative are shown on Table 3.3.10-1. Discussion of the affected counties is contained in Section 4.1.10 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

3.3.11 Cultural Resources

Cultural resources in the vicinity of the Champlain-based Single Pipeline Alternative are addressed in section 4.1.11 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

TABLE 3.3.9-1

Land Use Characteristics of the Champlain-based Single Pipeline Alternative

Pipeline Segment/ State/County	Length Adj. to Existing ROW a/ Miles	%	Woodland b/ Miles	%	Agriculture c/ Miles	%	Residential d/ Miles	%	Commercial/ Industrial e/ Miles	%	Water Related f/ Miles	%	Other g/ Miles	%	Total Miles	Homes w/in 50 ft of Proposed ROW
CHAMPLAIN																
Mainline/VT	77.3	51.9	64.0	43.0	71.2	47.8	0.9	0.6	0.7	0.5	6.1	4.1	5.9	4.0	148.8	21
Franklin	3.5	12.7	7.0	25.5	19.0	69.1	0.0	0.0	0.0	0.0	0.4	1.5	1.1	4.0	27.5	2
Chittenden	12.8	46.0	8.7	31.3	17.6	63.3	0.1	0.4	0.0	0.0	0.6	2.2	0.8	2.9	27.8	1
Addison	26.6	86.6	7.9	25.7	20.1	65.5	0.0	0.0	0.0	0.0	2.3	7.5	0.4	1.3	30.7	2
Rutland	23.4	61.1	19.6	51.2	12.3	32.1	0.2	0.5	0.7	1.8	2.2	5.7	3.3	8.6	38.3	5
Windsor	11.0	50.2	18.6	84.9	2.1	9.6	0.6	2.7	0.0	0.0	0.4	1.8	0.2	0.9	21.9	11
Windham	0.0	0.0	2.2	84.6	0.1	3.8	0.0	0.0	0.0	0.0	0.2	7.7	0.1	3.8	2.6	0
Mainline/NH	32.9	79.7	34.6	83.8	3.0	7.3	0.1	0.2	0.3	0.7	2.5	6.1	0.8	1.9	41.3	13
Sullivan	0.0	0.0	3.7	71.2	1.3	25.0	0.0	0.0	0.0	0.0	0.2	3.8	0.0	0.0	5.2	2
Cheshire	32.9	91.1	30.9	85.6	1.7	4.7	0.1	0.3	0.3	0.8	2.3	6.4	0.8	2.2	36.1	11
Mainline/MA	33.1	56.7	47.0	80.5	3.8	6.5	1.0	1.7	0.8	1.4	4.5	7.7	1.3	2.2	58.4	15
Worcester	31.5	55.5	46.0	81.0	3.6	6.3	1.0	1.8	0.8	1.4	4.2	7.4	1.2	2.1	56.8	15
Norfolk	1.6	100.0	1.0	62.5	0.2	12.5	0.0	0.0	0.0	0.0	0.3	18.8	0.1	6.3	1.6	0
Pelham Branch/MA	24.1	87.0	16.6	59.9	1.2	4.3	0.8	2.9	0.3	1.1	3.0	10.8	5.8	20.9	27.7	33
Worcester	5.9	105.4	4.5	80.4	0.4	7.1	0.1	1.8	0.1	1.8	0.4	7.1	0.1	1.8	5.6	3
Middlesex	18.2	82.4	12.1	54.8	0.8	3.6	0.7	3.2	0.2	0.9	2.6	11.8	5.7	25.8	22.1	30
Nashua Branch/MA	2.3	88.5	1.9	73.1	0.2	7.7	0.1	3.8	0.2	7.7	0.1	3.8	0.1	3.8	2.6	0
Middlesex	2.3	88.5	1.9	73.1	0.2	7.7	0.1	3.8	0.2	7.7	0.1	3.8	0.1	3.8	2.6	0
Nashua Branch/NH	0.1	100.0	0.1	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0
Hillsborough	0.1	100.0	0.1	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0

TABLE 3.3.9-1 (cont'd)

Pipeline Segment/ State/County	Length Adj. to Existing ROW a/ Miles	%	Woodland b/ Miles	%	Agriculture c/ Miles	%	Residential d/ Miles	%	Commercial/ Industrial e/ Miles	%	Water Related f/ Miles	%	Other g/ Miles	%	Total Miles	Homes w/in 50 ft of Proposed ROW
LONG ISLAND EXTENSION																
Connecticut	8.2	28.9	17.8	62.7	5.7	20.1	4.3	15.1	0.3	1.1	0.2	0.7	0.1	0.4	28.4	27
Fairfield	8.2	32.2	16.6	65.1	4.7	18.4	4.0	15.7	0.1	0.4	0.1	0.4	0.0	0.0	25.5	25
New Haven	0.0	0.0	1.2	41.4	1.0	34.5	0.3	10.3	0.2	6.9	0.1	3.4	0.1	3.4	2.9	2
Long Island Sound	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.7	100.0	0.0	0.0	26.7	0
New York	8.8	100.0	1.0	11.4	2.7	30.7	4.0	45.5	1.0	11.4	0.1	1.1	0.0	0.0	8.8	1
Suffolk	8.8	100.0	1.0	11.4	2.7	30.7	4.0	45.5	1.0	11.4	0.1	1.1	0.0	0.0	8.8	1
PLEASANT VALLEY EXTENSION																
Connecticut	9.6	51.1	11.2	59.6	5.0	26.6	2.3	12.2	0.3	1.6	0.0	0.0	0.0	0.0	18.8	19
Fairfield	5.6	70.9	5.1	64.6	1.5	19.0	1.3	16.5	0.0	0.0	0.0	0.0	0.0	0.0	7.9	4
Litchfield	4.0	36.7	6.1	56.0	3.5	32.1	1.0	9.2	0.3	2.8	0.0	0.0	0.0	0.0	10.9	15
New York	0.0	0.0	7.1	47.0	5.9	39.1	1.6	10.6	0.5	3.3	0.0	0.0	0.0	0.0	15.1	4
Dutchess	0.0	0.0	7.1	47.0	5.9	39.1	1.6	10.6	0.5	3.3	0.0	0.0	0.0	0.0	15.1	4
ALGONQUIN LATERALS																
Manchester St/RI	3.6	100.0	0.0	0.0	0.0	0.0	1.3	36.1	1.5	41.7	0.2	5.6	0.6	16.7	3.6	123
Providence	3.6	10.00	0.0	0.0	0.0	0.0	1.3	36.1	1.5	41.7	0.2	5.6	0.6	16.7	3.6	123
Brayton Point/MA	11.0	100.0	9.0	81.8	0.6	5.5	0.6	5.5	0.2	1.8	0.6	5.5	0.0	0.0	11.0	2
Bristol	11.0	100.0	9.0	81.8	0.6	5.5	0.6	5.5	0.2	1.8	0.6	5.5	0.0	0.0	11.0	2
TENNESSEE LOOPS																
Herkimer/ Otsego Loop/NY	7.7	100.0	1.4	18.2	4.7	61.0	0.0	0.0	0.4	5.2	0.0	0.0	1.2	15.6	7.7	0
Herkimer	2.0	100.0	0.4	20.0	1.2	60.0	0.0	0.0	0.1	5.0	0.0	0.0	0.3	15.0	2.0	0
Otsego	5.7	100.0	1.0	17.5	3.5	61.4	0.0	0.0	0.3	5.3	0.0	0.0	0.9	15.8	5.7	0

TABLE 3.3.9-1 (cont'd)

Pipeline Segment/ State/County	Length Adj. to Existing ROW a/ Miles	%	Woodland b/ Miles	%	Agriculture c/ Miles	%	Residential d/ Miles	%	Commercial/ Industrial e/ Miles	%	Water Related f/ Miles	%	Other g/ Miles	%	Total Miles	Homes w/in 50 ft of Proposed ROW
TENNESSEE LOOPS (cont'd)																
Schoharie/ Albany Loop/NY	12.0	100.0	3.1	25.8	7.3	60.8	0.2	1.7	0.0	0.0	0.0	0.0	1.4	11.7	12.0	2
Schoharie	5.0	100.0	1.3	26.0	3.0	60.0	0.1	2.0	0.0	0.0	0.0	0.0	0.6	12.0	5.0	2
Albany	7.0	100.0	1.8	25.7	4.3	61.4	0.1	1.4	0.0	0.0	0.0	0.0	0.8	11.4	7.0	0
Columbia Loop/NY	4.1	100.0	3.4	82.9	0.3	7.3	0.0	0.0	0.1	2.4	0.0	0.0	0.3	7.3	4.1	2
Albany	4.1	100.0	3.4	82.9	0.3	7.3	0.0	0.0	0.1	2.4	0.0	0.0	0.3	7.3	4.1	2
Worcester Loop/MA	6.3	100.0	4.3	68.3	0.8	12.7	0.5	7.9	0.0	0.0	0.0	0.0	0.7	11.1	6.3	1
Worcester	6.3	100.0	4.3	68.3	0.8	12.7	0.5	7.9	0.0	0.0	0.0	0.0	0.7	11.1	6.3	1
TOTAL	**241.1**	**57.2**	**222.5**	**52.8**	**112.4**	**26.7**	**17.7**	**4.2**	**6.6**	**1.6**	**44.0**	**10.4**	**18.2**	**4.3**	**421.4**	**263**

TABLE 3.3.9-2

Land Use Affected by the Champlain-based Single Pipeline Alternative i/

Pipeline Segment/ State/County	Woodland		Agriculture		Residential		Commercial/ Industrial		Water Related		Other		TOTAL	
	Const.	Opera.	Const.	Opera.	Const.	Opera.	Const.	Opera.	Const.	Opera.	Const.	Opera.	Const.	Opera.
CHAMPLAIN														
Mainline/VT	581.8	387.9	647.3	431.5	8.2	5.5	6.4	4.2	55.5	37.0	53.6	35.8	1352.7	901.8
Franklin	63.6	42.4	172.7	115.2	0.0	0.0	0.0	0.0	3.6	2.4	10.0	6.7	250.0	166.7
Chittenden	79.1	52.7	160.0	106.7	0.9	0.6	0.0	0.0	5.5	3.6	7.3	4.8	252.7	168.5
Addison	71.8	47.9	182.7	121.8	0.0	0.0	0.0	0.0	20.9	13.9	3.6	2.4	279.1	186.1
Rutland	178.2	118.8	111.8	74.5	1.8	1.2	6.4	4.2	20.0	13.3	30.0	20.0	348.2	232.1
Windsor	169.1	112.7	19.1	12.7	5.5	3.6	0.0	0.0	3.6	2.4	1.8	1.2	199.1	132.7
Windham	20.0	13.3	0.9	0.6	0.0	0.0	0.0	0.0	1.8	1.2	0.9	0.6	23.6	15.8
Mainline/NH	314.5	209.7	27.3	18.2	0.9	0.6	2.7	1.8	22.7	15.2	7.3	4.8	375.5	250.3
Sullivan	33.6	22.4	11.8	7.9	0.0	0.0	0.0	0.0	1.8	1.2	0.0	0.0	47.3	31.5
Cheshire	280.9	187.3	15.5	10.3	0.9	0.6	2.7	1.8	20.9	13.9	7.3	4.8	328.2	218.8
Mainline/MA	427.3	284.8	34.5	23.0	9.1	6.1	7.3	4.8	40.9	27.3	11.8	7.9	530.9	353.9
Worcester	418.2	278.8	32.7	21.8	9.1	6.1	7.3	4.8	38.2	25.5	10.9	7.3	516.4	344.2
Norfolk	9.1	6.1	1.8	1.2	0.0	0.0	0.0	0.0	2.7	1.8	0.9	0.6	14.5	9.7
Pelham Branch/MA	150.9	100.6	10.9	7.3	7.3	4.8	2.7	1.8	27.3	18.2	52.7	35.2	251.8	167.9
Worcester	40.9	27.3	3.6	2.4	0.9	0.6	0.9	0.6	3.6	2.4	0.9	0.6	50.9	33.9
Middlesex	110.0	73.3	7.3	4.8	6.4	4.2	1.8	1.2	23.6	15.8	51.8	34.5	200.9	133.9
Nashua Branch/MA	17.3	11.5	1.8	1.2	0.9	0.6	1.8	1.2	0.9	0.6	0.9	0.6	23.6	15.8
Middlesex	17.3	11.5	1.8	1.2	0.9	0.6	1.8	1.2	0.9	0.6	0.9	0.6	23.6	15.8
Nashua Branch/NH	0.9	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.6
Hillsborough	0.9	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.6

i/ Areas shown in acres.

TABLE 3.3.9-2 (cont'd)

Pipeline Segment/ State/County	Woodland		Agriculture		Residential		Commercial/ Industrial		Water Related		Other		TOTAL	
	Const.	Opera.	Const.	Opera.	Const.	Opera.	Const.	Opera.	Const.	Opera.	Const.	Opera.	Const.	Opera.
LONG ISLAND EXTENSION														
Connecticut	215.8	129.5	69.1	41.5	52.1	31.3	3.6	2.2	2.4	1.5	1.2	0.7	344.2	206.5
Fairfield	201.2	120.7	57.0	34.2	48.5	29.1	1.2	0.7	1.2	0.7	0.0	0.0	309.1	185.5
New Haven	14.5	8.7	12.1	7.3	3.6	2.2	2.4	1.5	1.2	0.7	1.2	0.7	35.2	21.1
Long Island Sound	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
New York	12.1	7.3	32.7	19.6	48.5	29.1	12.1	7.3	1.2	0.7	0.0	0.0	106.7	64.0
Suffolk	12.1	7.3	32.7	19.6	48.5	29.1	12.1	7.3	1.2	0.7	0.0	0.0	106.7	64.0
PLEASANT VALLEY EXTENSION														
Connecticut	135.8	81.5	60.6	36.4	27.9	16.7	3.6	2.2	0.0	0.0	0.0	0.0	227.9	136.7
Fairfield	61.8	37.1	18.2	10.9	15.8	9.5	0.0	0.0	0.0	0.0	0.0	0.0	95.8	57.5
Litchfield	73.9	44.4	42.4	25.5	12.1	7.3	3.6	2.2	0.0	0.0	0.0	0.0	132.1	79.3
New York	86.1	51.6	71.5	42.9	19.4	11.6	6.1	3.6	0.0	0.0	0.0	0.0	183.0	109.8
Dutchess	86.1	51.6	71.5	42.9	19.4	11.6	6.1	3.6	0.0	0.0	0.0	0.0	183.0	109.8
ALGONQUIN LATERALS														
Manchester Street/RI	0.0	0.0	0.0	0.0	11.8	7.9	13.6	9.1	1.8	1.2	5.5	3.6	32.7	21.8
Providence	0.0	0.0	0.0	0.0	11.8	7.9	13.6	9.1	1.8	1.2	5.5	3.6	32.7	21.8
Brayton Point/MA	81.8	54.5	5.5	3.6	5.5	3.6	1.8	1.2	5.5	3.6	0.0	0.0	100.0	66.7
Bristol	81.8	54.5	5.5	3.6	5.5	3.6	1.8	1.2	5.5	3.6	0.0	0.0	100.0	66.7

TABLE 3.3.9-2 (cont'd)

Pipeline Segment	Woodland		Agriculture		Residential		Commercial/ Industrial		Water Related		Other		TOTAL	
	Const.	Opera.	Const.	Opera.	Const.	Opera.	Const.	Opera.	Const.	Opera.	Const.	Opera.	Const.	Opera.
TENNESSEE LOOPS														
Herkimer/ Otsego Loop/NY	12.7	4.2	42.7	14.2	0.0	0.0	3.6	1.2	0.0	0.0	10.9	3.6	70.0	23.3
Herkimer	3.6	1.2	10.9	3.6	0.0	0.0	0.9	0.3	0.0	0.0	2.7	0.9	18.2	6.1
Otsego	9.1	3.0	31.8	10.6	0.0	0.0	2.7	0.9	0.0	0.0	8.2	2.7	51.8	17.3
Schoharie/ Albany Loop/NY	28.2	9.4	66.4	22.1	1.8	0.6	0.0	0.0	0.0	0.0	12.7	4.2	109.1	36.4
Schoharie	11.8	3.9	27.3	9.1	0.9	0.3	0.0	0.0	0.0	0.0	5.5	1.8	45.5	15.2
Albany	16.4	5.5	39.1	13.0	0.9	0.3	0.0	0.0	0.0	0.0	7.3	2.4	63.6	21.2
Columbia Loop/NY	30.9	10.3	2.7	0.9	0.0	0.0	0.9	0.3	0.0	0.0	2.7	0.9	37.3	12.4
Albany	30.9	10.3	2.7	0.9	0.0	0.0	0.9	0.3	0.0	0.0	2.7	0.9	37.3	12.4
Worcester Loop/MA	39.1	13.0	7.3	2.4	4.5	1.5	0.0	0.0	0.0	0.0	6.4	2.1	57.3	19.1
Worcester	39.1	13.0	7.3	2.4	4.5	1.5	0.0	0.0	0.0	0.0	6.4	2.1	57.3	19.1
TOTAL	**2135.2**	**1356.5**	**1080.3**	**664.9**	**197.9**	**119.9**	**66.4**	**41.0**	**158.2**	**105.2**	**165.8**	**99.5**	**3803.6**	**2387.1**

TABLE 3.3.9-3

Proposed Residential Developments Crossed by the Champlain-based Single Pipeline Alternative

PIPELINE SEGMENT	APPROX. MP	COUNTY	TOWN	TYPE	STATUS
CHAMPLAIN					
Mainline/VT	43.5	Chittenden	Williston	"South Ridge" (160 single family units)	Under construction - planned around pipeline
	125.3	Rutland	Ludlow	"Farm Ridge" (38 single family units)	Under construction
Mainline/NH	----------	----------	----------	NONE ----------	----------
Mainline/MA	211.0	Worcester	Leominster	Residential (150 single family units)	Planning phase
	215.5	Worcester	Lancaster	"Lancaster Woods/Old County Estates" (80 units)	Permitting process
	218.1	Worcester	Clinton	"Fox Run Meadows" (43 single family units)	Permitting process
	233.0	Worcester	Grafton	"Glenwood" (6 single family units)	Under construction
	233.3	Worcester	Grafton	"Woods View Acres" (24 single family units)	Under construction
	242.2	Worcester	Milford	"Eagle Brook Farm" (36 units)	Under construction
	242.8	Worcester	Milford	"Peck Meadows" (6 single family units)	Under construction
	246.7	Worcester	Milford	"Trettel Estates" (11 single family units)	Permitting process
				"Rocky Hill Acres" - Residential (49 units)	Permitting process
PELHAM BRANCH					
Massachusetts	4.8	Worcester	Lancaster	"Stage Coach Commons" (2 single family units)	Permitting process
	26.7	Middlesex	Tyngsborough	"Red Gate Road Village" (166 multiple family units)	Permitted, waiting for financing
IROQUOIS					
Mainline/NY	0.3	St. Lawrence	Waddington	"Whitehouse Bay"	Planning phase

TABLE 3.3.9-3 (cont'd)

PIPELINE SEGMENT	APPROX. MP	COUNTY	TOWN	TYPE	STATUS
LONG ISLAND EXTENSION					
Connecticut	309.0	Fairfield	Newtown	"Old Farm Hill"	Permit approved
	309.2	Fairfield	Newtown	"Teachers Ridge"	Permitting process
	312.9	Fairfield	Newtown	"Feather Meadow"	Permit approved
	313.3	Fairfield	Newtown	"Deer Ridge"	Phase 1 approved
	313.7	Fairfield	Newtown	"Cobbler's Hill"	Permitting process -Phase 2
	313.8	Fairfield	Newtown	"Mountain Manor"	Planning phase
	314.5	Fairfield	Newtown	Bernard Green Trustee	Planning phase
	315.0	Fairfield	Newtown	"Sutherland Woods"	Planning phase
	315.4	Fairfield	Newtown	"Osbourne Hill Estates"	Planning phase
	316.0	Fairfield	Newtown	"Forest"	Planning phase
	317.1	Fairfield	Monroe	"Whispering Pines Estates"	Permit approved
	317.5	Fairfield	Monroe	"Buckhill Estates"	Permitting process
	317.7	Fairfield	Monroe	Subwood Dev. Co.	Permitting process
	320.0	Fairfield	Shelton	Monty Blakeman	Permitting process
	321.0	Fairfield	Shelton	Land Trust	Planning phase
	322.8	Fairfield	Shelton	"Rock Ridge"	Planning phase
	323.7	Fairfield	Shelton	Subdivision Addition	Planning phase
	329.0	Fairfield	Stratford	"Oronoque West"	Permitting process
	330.5	Fairfield	Stratford	"Pin Oak" Subdivision	Permit approved
PLEASANT VALLEY EXTENSION					
Connecticut	287.3	Fairfield	Sherman	"Smoke Ridge Farm"	Permit approved
	296.8	Litchfield	New Milford	Properties Investors	Planning phase

NOTE: Information presented in this table is based on field observations and discussions with town and county planning officials.

TABLE 3.3.9-4

Recreation and Public Interest Areas
Near or Crossed by the Champlain-based Single Pipeline Alternative

PIPELINE SEGMENT	APPROX. MP	DESCRIPTION
CHAMPLAIN		
Mainline/VT	6.2	Missisquoi River
	25.6	Lamoille River - boating, fishing
	28.8	Browns River - fishing
	38.8	Essex Junction Village Forest - snowmobiling, x-country skiing
	40.4	Winooski River - boating, fishing
	49.1	Rock Ridge Golf Course
	54.6	Lewis Creek - fishing
	70.5	New Haven River - boating, whitewater rafting, fishing
	77.2	Middlebury River - fishing
	93.2	Otter Creek - boating, fishing
	113.2	National Park Service - Appalachian Trail Vermont Agency of National Resources - Long Trail
	125.9	Black River - limited boating
	145.2	Parker Hill Historic District (proposed for National Register)
Mainline/NH	148.8	Connecticut River - boating, fishing
	153.8	Cold River - boating, fishing
	154.6	Drewsville Village
	163.9	U.S. Army Corps of Engineers - Surry Mountain Lake Ashuelot River - boating, fishing, hunting
	171.2	Otter Brook - boating, fishing
Mainline/MA	193.9	Millers River - fishing
	216.5	Rowlandson Garrison and Middle/Old Settlers Cemeteries - archaeologic/historic local significance
	216.8	Nashua River - boating, fishing
	232.9	Adams Road - locally designated scenic road
	239.0	Upton State Forest - trails
Pelham Branch/MA	2.8	Cook Conservation Land
	2.9	North Nashua River Greenway & Town Conservation land - boating, fishing, trails
	3.2	Lancaster Landfill
	3.3	Fort Devens Military Reservation
	10.9	Nashua River - boating, fishing
	11.0	Ayer State Game Farm
	12.4 - 20.8	MA DEM Abandoned Railbed
	24.5	Massapoag Pond - boating, fishing
Nashua Branch/MA	2.6	Salmon Brook - fishing
IROQUOIS		
Pleasant Valley Extension, NY	280.0	West Mountain
	282.3	Dover/Walter Vincent landfill - DEC listed hazardous waste site
Pleasant Valley Extension, CT	286.7	Appalachian Trail
	287.7	Naromi Land Trust/Wimisink Brook
	288.0	Weantinoge Land Trust
	289.5	Stillson Road Scenic Area
	291.8	Housatonic Range Trail
	292.9	Candlewood Mountain/Pine Knob
	293.8	Lynn Deming Park - swimming, picnicing
	296.0	Hill and Plain School
	297.1	Candlewood Valley Country Club - golf course
	299.5	Still Water Nature Preserve (part of Weantinoge Land Trust)

TABLE 3.3.9-4 (cont'd)

PIPELINE SEGMENT	APPROX. MP	DESCRIPTION
Long Island Extension, CT	315.1	Paugussett State Forest (borders)
	318.2	Boys Halfway River Caves - Limestone caves
	319.3	Shelton land Trust/Means Brook Valley
	320.8	Hill & Harbor Tourist District - mixed forest and farms
	329.1	Roosevelt Forest
	330.8	Housatonic River
	331.2	City of Milford Open Space/Mondo Ponds
	333.5	Silver Sands State Park Reserve
TENNESSEE		
Columbia - Berkshire	256 + 6.7	Immaculate Conception Navitiate
Loop, NY	257 + 0.3	Housatonic River - local wild and scenic river
Worcester Loop, NJ	265 + 7.0	Blackstone River
	266 + 2.1	Upton State Forest

TABLE 3.3.10-1

Champlain-based Single Pipeline Alternative
Existing Socioeconomic Conditions

State/ County	1980 Population a/	Estimated 1986 Population a/	1980-1986 Percent Change a/	1980 Pop. Density per sq. mile b/	1985 Per Capita Income* a/	1988 Civilian Labor Force c/	1988 Unemployment Rate c/
VERMONT	511,456	541,000	5.8	55.2	$ 9,619	298,000	2.8
Addison	29,406	31,400	6.9	38.0	8,709	16,900	3.2
Chittenden	115,534	124,800	8.0	214.0	11,205	74,850	1.9
Franklin	34,788	37,200	6.9	53.6	8,472	17,250	4.2
Rutland	58,347	60,000	2.8	62.6	9,537	33,650	2.6
Windham	36,933	39,900	8.0	46.9	9,715	23,050	2.2
Windsor	51,030	53,700	5.1	52.5	10,264	29,200	2.1
MASSACHUSETTS	5,737,093	5,832,000	1.7	733.3	12,510	3,143,974	3.3
Bristol	474,641	484,900	2.2	870.6	9,961	245,389	4.7
Middlesex	1,367,034	1,367,000	0.0	1,671.2	14,697	791,713	2.6
Norfolk	606,587	602,500	-0.7	1,516.5	15,169	339,557	2.7
Worcester	646,352	661,100	2.3	426.9	11,386	341,497	3.4
NEW HAMPSHIRE	920,610	1,027,000	11.5	102.4	11,659	596,900	3.9
Cheshire	62,116	66,900	7.8	87.4	10,493	38,000	3.1
Hillsborough	267,608	314,300	13.6	315.8	12,765	189,000	3.7
Sullivan	36,063	37,800	4.9	66.8	9,575	21,400	3.5
CONNECTICUT	3,107,564	3,189,000	2.6	637.8	14,090	1,746,000	3.0
Fairfield	807,143	824,100	2.1	1,323.8	17,708	347,800**	5.7**
Litchfield	156,769	161,300	2.9	175.3	13,381	52,600**	3.3**
New Haven	761,325	778,900	2.3	1,248.1	12,426	407,700	3.1
RHODE ISLAND	947,154	975,000	2.9	897.8	10,892	526,000	3.0
Providence	571,349	581,700	1.8	1,373.4	10,335	309,993	3.3
NEW YORK							
Albany	285,909	283,800	0.0	542.6	15,482	150,200	2.7
Columbia	59,487	60,600	1.9	97.2	14,001	30,300	3.0
Dutchess	245,055	255,800	4.4	319.1	16,036	129,100	2.6
Herkimer	66,714	66,900	0.2	47.5	10,734	29,900	5.7
Otsego	59,075	58,900	0.0	58.5	11,151	28,800	3.9
Schoharie	29,710	29,500	0.0	49.3	10,333		
Suffolk	1,284,231	1,308,300	1.9	1,449.0	16,529		

* By place of residence.
** Data is labor market area, not by county.

TABLE 3.3.10-1 (cont'd)

Sources:

a/ U.S. Department of Commerce, Bureau of Census, 1986 Population and 1985 Per Capita Income Estimates for counties and Incorporated Places. 1988.

b/ U.S. Department of commerce. Bureau of Census, Number of Inhabitants. April 1983.

c/ State of Vermont: Vermont Department of Employment and Training. January 1989.
State of New Hampshire: New Hampshire Department of Employment Security, 1988. Jabsor Market Projections. June 1987.
State of Massachusetts: Department of Employment and Training. March 1989.
State of Rhode Island: Department of Employment Security. February 1989.
State of Connecticut: Department of Employment Security. 1989.
State of New York: Department of Employment Security. 1989.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 TWO PIPELINE ALTERNATIVE

The Two Pipeline Alternative is comprised of the Iroquois/Tennessee pipeline system (as addressed in Iroquois/Tennessee EIS, Volume I) and the Champlain pipeline system (as addressed in Champlain EIS, Volume I). The environmental consequences of each of those two proposed projects is addressed in the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I, and is not reiterated herein.

4.2 IROQUOIS/GNE SINGLE PIPELINE ALTERNATIVE

As with the discussion of the affected environment in section 3.2 of this volume, the environmental consequences discussed here in refer only to the pipeline segments unique to the Iroquois/GNE Single Pipeline Alternative. Pipeline segments which are a part of the single pipeline alternative, but which are common to either the proposed Iroquois/Tennessee pipeline system or the proposed Champlain pipeline system, are addressed in the respective Environmental Impact Statement.

4.2.1 Geology

4.2.1.1 General Construction and Operational Impacts

General construction and operational impacts to geologic resources are addressed in the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

4.2.1.2 Site-Specific Impacts

Since most of the proposed GNE Mainline would follow existing rights-of-way, pipeline construction and operation should not impact exploitable mineral resources. Mineral resources currently mined consist mainly of sand and gravel. There are no known underground mining operations near the Iroquois/GNE Single Pipeline Alternative.

Bedrock exposures along the GNE Mainline route are common in the uplands of the Taconic and Berkshire Mountains. Approximately 30 percent of the route is expected to require rock excavation to obtain the proper trench depth. The majority of the blasting will take place in the rough terrain of the western part of the route. Bedrock depths vary through-out the route with deep glacial and fluvial deposits covering bedrock in valleys and floodplains. Rock types range from softer limestone and shale in the west, to more resistant marble, schist, gneiss and quartzite. Segments of the Iroquois/GNE Single Pipeline Alternative not discussed in the Iroquois/Tennessee EIS, Volume I or the Champlain EIS, Volume I, would only require isolated spot blasting.

The only identified geologic hazard which may be encountered along the Iroquois/GNE Single Pipeline Alternative is related to slope stability. Sections of the pipeline crossing deposits of glacial lake clays and the Helderberg escarpment near the Hudson River display reliefs of 40 feet and potentially unstable slopes in excess of 15 degrees. These units might be susceptible to high rates of erosion during pipeline construction and would require special techniques to help ensure slope stability.

A recent landslide has been documented near MP 49 of the GNE Mainline of this alternative pipeline. If a similar event reoccurred, it is possible that a portion of the pipeline would be in jeopardy.

4.2.2 Soils

4.2.2.1 General Construction and Operational Impacts

The potential impacts to the soil resources of the Iroquois/GNE Single Pipeline Alternative are similar to those discussed in section 5.1.2.1 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I. Contained within the above-referenced section is also a discussion of the necessary mitigative measures we have recommended to adequately reduce the short- and long-term impacts of the pipeline construction to the soils resource and related subjects.

4.2.2.2 Site-Specific Impacts

Soil resources crossed by segments of the Iroquois/GNE Single Pipeline Alternative which are common to either the Iroquois/Tennessee Pipeline Project on the Champlain Pipeline Project are addressed in section 5.1.2.2 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I. Route segments not addressed above are herein discussed. Many of the comments included are site-specific comments which we received from state representatives, congressmen, town officials, environmental groups and/or private citizens during the public comment period.

GNE Mainline

The GNE Mainline segment of the Iroquois/GNE Single Pipeline Alternative traverses 197.1 miles of soil in east-central New York and Massachusetts. No occurrences of large tracts of wet organic soils have been identified by our evaluations along this alignment. Approximately 22.1 miles of this route would traverse large areas of potentially wind erodible, excessively drained, sandy soils. These areas should be delineated in detail in the field by a qualified soil scientist and the appropriate erosion and sedimentation control measures applied as discussed previously in the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I. The rough terrain the proposed route would cross includes about 144.9 miles of at least moderately steep slopes with greater than 6 percent grades which in turn contains about 79.5 miles of steep areas which have greater than 15 percent grades due to the generally perpendicular alignment of the proposed route in relation to the regional strikes of mountains ranges and ridges.

Rutland Connector

The proposed Rutland Connector would traverse 1.9 miles of soil in Chittenden County, Vermont. Proper mitigation of the temporary impacts to soils would insure that the construction and operation of the Rutland Connector would have a negligible impact to the soils resources of the area. One mile southeast of Essex Junction there has been identified 0.9 mile of sandy, excessively drained, potentially wind erodible soils. There would be

minimal impacts associated with the crossing either of wet, organic soils or moderately and highly sloping terrain along this alternative.

VGS Loops

The VGS Loops would cross 10.0 miles of soil in western Franklin County, Vermont. Approximately 0.5 mile of wet, organic soils would be crossed by this sequent. Nearly 4.5 miles of excessively drained, potentially wind erodible, sandy soils would be impacted by construction and should be mitigated with the recommendations stated previously in the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I. Minimal impacts would be associated with moderate and highly steep slopes along the alignment of the VGS Loops.

Eastern Service Branch South Connector

The Eastern Service Branch South Connector would cross 0.5 miles of soil in Worcester County, Massachusetts. Approximately 0.1 mile of this alignment would have a grade of at least 15 percent on the south side of George Hill which is one mile northwest of the community of West Upton. There would be minimal impacts associated wind erodible, wet-organic, and moderately steep soils relative to the soil resources along this connector.

Eastern Service Branch North Connector

No recognized potential impacts to wet-organic, wind erodible, or moderately to highly steep slopes would be associated with the 2.0-mile-long connector route in Worcester County Massachusetts.

4.2.3 Water Resources

4.2.3.1 Groundwater

4.2.3.1.1 General Construction and Operational Impacts

A description of general construction and operational impacts on groundwater resources can be found in sections 5.1.3.1.1 of the Iroquois/Tennessee EIS, Volume I and Champlain EIS Volume I. The following section describes potential site-specific impacts on groundwater resources that may result from construction and operational activities of the Iroquois/GNE Single Pipeline Alternative and procedures that would be employed to avoid or mitigate impacts.

4.2.3.1.2 Site-Specific Impacts

Site-specific groundwater impacts and mitigation measures for pipeline segments common to both the Iroquois/Tennessee and Champlain Pipeline Projects and the Iroquois/GNE Single Pipeline Alternative are described in section 5.1.3.1.2 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

In order to protect groundwater resources which supply public and private well systems, we would recommend that a groundwater monitoring program be submitted by an

applicant for the FERC staff's review and approval prior to construction. The plan would be of sufficient detail to provide a program for identification of community and private supply wells and springs located near the route. The plan would also be required to provide documentation of pre- and post-construction well and spring water quality and yields and would be of adequate detail to determine with relative certainty whether the pipeline construction activities are responsible for any adverse impact on any groundwater uses. In the unlikely event that groundwater supply systems were impacted as a result of the construction activities, an applicant would supply an emergency portable water source and the necessary repairs, replacement and/or relocation of the impacted facilities would be provided as required to restore the supply system to its former capacity.

The GNE Mainline would traverse the Zone II protection areas of 21 public supply wells or wellfields in Massachusetts. The VGS Loops would cross the 3,000-foot protection area of two public wells located in Swanton, Vermont (see table 3.2.3-1). In order to avoid potential contamination of these supply aquifers, refueling of all vehicles and storage of potentially hazardous material would be prohibited within all designated well protection areas and within a 200-foot radius of all private wells identified prior to construction as a part of the groundwater monitoring plan described previously in this section. In addition, if this alternative is found to be environmentally preferred alternative we will recommend that a spill prevention and containment plan specific to pre-identified equipment maintenance and storage areas be submitted for review and approval prior to construction. This plan would provide detailed actions that would be taken to clean up and dispose of any accidental discharges of hazardous substances. These precautions would eliminate and/or reduce this potential impact to supply aquifers.

Potential blasting impacts on bedrock wells identified as part of the recommended groundwater monitoring plan would be minimized by the use of multiple delays, reduced charges, and by substituting rock saws and pneumatic hammers where possible. As indicated in the monitoring plan described above, supply wells damaged as a result of construction activities would be repaired, replaced and/or possibly relocated to restore the system to the original capacity. The well owner would be supplied with an emergency source of potable water in the interim.

4.2.3.2 Surface Water

4.2.3.2.1 General Construction and Operational Impacts

Construction activities associated with installation of a natural gas pipeline may impact surface water resources located within or near the right-of-way route. Impacts to streams, rivers, lakes and ponds may be temporary, occurring primarily during construction activities, or long-term. A description of general construction and operational impacts on surface water and recommended construction procedures can be found in section 5.1.3.2.1 of the Iroquois/Tennessee EIS, Volume I and Champlain EIS, Volume I.

4.2.3.2.2 Site-Specific Impacts

The majority of surface waters traversed by the Iroquois/GNE Single Pipeline Alternative are designated as having good to excellent quality water (refer to section 3.2.3.2). In order to mitigate potential adverse impacts to these surface waters, we recommend the procedures described in the Champlain EIS, Volume I Appendix D be followed during construction across streams, ponds, and lakes if this alternative is determined to be environmentally preferable. The following paragraphs describe site-specific impacts to surface waters associated with the Iroquois/GNE Single Pipeline Alternative which are not discussed in the Iroquois/Tennessee EIS, Volume I and Champlain EIS, Volume I. Potential impacts to fisheries are discussed in section 4.3.4.

The GNE Mainline would cross 13 streams upstream from municipal surface water supplies in New York and Massachusetts (see table 3.2.3-4). The public surface water supplies are located from 0.9 to 1.75 miles downstream from the crossing location. In order to protect municipal supplies and mitigate sedimentation impacts to these and other Class A streams, we would recommend that dry crossing techniques, such as a flumed crossing, be utilized on streams less than ten feet wide and two feet in average depth. In some cases, it may be possible to construct dry crossings on larger streams. We would recommend that the crossing location of these streams be surveyed and a plan detailing specific crossing methods and locations of staging areas be submitted to the FERC for review and approval. The applicant would be required to contact the municipal supply authorities prior to submitting the detailed stream crossing plan to the FERC.

Four stream crossings would be located from 0.9 to 1.5 miles upstream of the state-owned Quabbin Reservoir which provides water to metropolitan Boston and other communities. Although potential impacts to these streams and the Quabbin Reservoir could be mitigated by the procedures described above, the Massachusetts MDC has indicated that the proposed route through the Quabbin Reservoir Reservation is environmentally unacceptable. The proposed GNE Mainline route through this area is discussed in further detail below.

Long-term erosion and sedimentation impacts could potentially degrade the quality of municipal surface water supplies located downstream of pipeline crossings or in watersheds traversed by the route. We would recommend a detailed erosion and sedimentation control plan be submitted to the FERC for review and approval prior to construction in the Quabbin Reservoir Reservation. The plan would provide site specific measures to be taken to stabilize stream banks and adjacent right-of-ways. In addition to these requirements, the applicant would be required to contact all authorities of municipal watersheds traversed by the route and to follow the procedures presented in the Champlain EIS, Volume I, Appendix C.

The GNE Mainline would traverse approximately 7.85 miles of the state-owned Quabbin Reservoir Reservation. The Massachusetts MDC has reported that the root and soil retention system of the watershed area is currently in a threatened state as a result of overbrowsing by deer (McGinn, 1989). The GNE route would traverse steep slopes on the western side of the Reservation area and the MDC is very concerned about potential erosion impacts to the watershed. An applicant would need an easement from the Commonwealth of Massachusetts to construct the route through the Reservation. In order to address these

issues, we would recommend that an additional study be conducted by the applicant on this portion of the GNE Mainline, focusing on potential routing of the pipeline into a less environmentally sensitive area.

The Cheshire Reservoir would be crossed by the GNE Mainline at MP 87.5 via a land bridge known as Ingall's Crossing. The Adams Water District owns approximately 390 acres around the Reservoir. According to the District, water from the Reservoir enters a culvert-type intake between Route 8 and West Road, flows into a holding reservoir, and is not treated prior to distribution. Mr. Richard Pizani, Superintendent of the Adams Water District, indicated that he was not aware of any restrictions regarding natural gas pipelines in the Reservoir area, but that the District would require an applicant to submit construction and erosion and sedimentation control plans for District review prior to approval of the construction (Pizani, 1989).

The Hudson River would be crossed by the GNE Mainline at MP 55.8 where the river is approximately 1,000 feet wide. Although the NYDEC has indicated that PCB levels in sediments south of Troy Dam do not reach hazardous levels, the COE would require that the applicant conduct testing of river sediments for the presence of toxic contaminants at the GNE crossing location as a part of the section 404/10 permit application process. We would require that the applicant comply with all federal, state and local regulations regarding release of contaminants during construction. In addition, we would recommend that a study be conducted to investigate the feasibility of using directional drilling methods to construct the Hudson River crossing. This method would avoid most of the impacts associated with open-cut trenching.

The Connecticut River would be crossed by the GNE Mainline at MP 124.8 where the river is approximately 700 feet wide. We would recommend that the applicant provide detailed construction procedures to the FERC for review and approval as described above. We would also recommend that a study be conducted to determine the feasibility of using directional drilling techniques at the crossing location.

We would recommend that all sources and volumes of hydrostatic test waters to be identified prior to construction, that no public surface water supply would be used as a test water source, and test waters would be reused as often as possible. We also recommend that the applicant would be required to apply for state and local withdrawal and discharge permits as appropriate, and to follow the FERC guidelines for hydrostatic testing presented in the Procedures in Champlain EIS, Volume I, Appendix D.

4.2.4 Fish and Wildlife

4.2.4.1 Fishery Resources

4.2.4.1.1 General Construction and Operational Impacts

General construction and operational impacts to fishery resources associated with construction and operation of a natural gas pipeline are addressed in section 5.1.4.1.4 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

4.2.4.1.2 Site-Specific Impacts

Site-specific impacts to the fishery resources affected by segments of the Iroquois/ GNE Single Pipeline Alternative which are common to either the Iroquois/Tennessee Pipeline Project or the Champlain Pipeline Project are addressed in section 5.1.4.1.2 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I. Other pipeline segments are discussed below.

GNE Mainline

As discussed in section 5.1.4.1.4 of Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I, the consequences of a pipeline crossing a stream 10 feet or less in width are minor and short-term. The potential for adverse consequences increases with stream width and the increased time required for construction. Potential impacts to cold-water fisheries are the greatest, particularly during the spawning season, as sediment may be deposited over and within the interstitial spaces of spawning gravels. To mitigate this potential impact, we would recommend all stream crossings be constructed in accordance with our Stream and Wetland Construction and Mitigation Procedures (Volume 1, Appendix D).

For wide streams or rivers such as the Hudson River and Connecticut River, we would recommend that the feasibility of directional drilling beneath the river beds will be investigated. Results of these studies should be submitted to us prior to construction activity.

The potential impact of pipeline construction on warm-water fisheries is less of a problem than with cold-water fisheries. Longer crossings, such as Burden Lake (700 feet at crossing) and the multiple crossing at Normans Kill are the locations of greatest potential impact. Outside of temporary disruptions, no adverse consequences are expected.

Rutland Connector

The impact of crossing the Winooski River is expected to be minimal. The species of special interest, Atlantic salmon and steelhead trout, are stocked, negating any potential problems with siltation of spawning gravels.

VGS Loops and Eastern Service Branch North and South Connectors

There would be no state-designated fisheries crossed by the VGS Loops or the Eastern Service Branch North and South Connectors.

4.2.4.2 Wildlife

4.2.4.2.1 General Construction and Operational Impacts

General construction and operational impacts to wildlife associated with construction and operation of a natural gas pipeline are addressed in section 5.1.4.2.1 of the Iroquois/ Tennessee EIS, Volume I and the Champlain EIS, Volume I.

4.2.4.2.2 Site-Specific Impacts

Site-specific impacts to wildlife resources affected by segments of the Iroquois/GNE Single Pipeline Alternative which are common to either the Iroquois/Tennessee Pipeline Project or the Champlain Pipeline Project are addressed in section 5.1.4.2.2 of the Iroquois/Tennessee EIS, Volume I, and the Champlain EIS, Volume I. With the exception of the GNE Mainline, no site-specific impacts beyond what have been addressed for general impacts would occur to segments of the Iroquois/GNE Single Pipeline Alternative not addressed in Volume I. Following is a discussion of site-specific impacts along the GNE Mainline.

GNE Mainline

Construction of the GNE Mainline would result in the permanent clearing of approximately 763.0 acres of forested habitat. An additional 381.6 acres of forested habitat would be temporarily cleared and allowed to revegetate. The pipeline segment would pass through extensive forested areas in Berkshire, Hampshire and Franklin Counties in Massachusetts. The route would be adjacent to existing natural gas pipeline or electric transmission line rights-of-way for nearly the entire length through these forested areas, with the exception of the area between MP 139.3 and MP 146.4, where the route would parallel a secondary road or be new right-of-way. Clearing of the forest habitat in these areas would reduce the amount of habitat available to wildlife, but would not create a new opening or access for humans where none previously existed. Impacts associated with the creation of linear edge habitat, or a linear forest opening, or an increase in human access through these large forested areas would therefore be minimal.

The crossing of Papscanee Marsh and Creek in New York would have a minimal short-term impact on waterfowl using the area. Some waterfowl habitat would be lost during the one to two years following construction while the shrub and herbaceous wetland vegetation would revegetate. Since the pipeline crossing of this area would be at its northernmost edge, the right-of-way would not bisect the marsh or potentially isolate an area during the time the right-of-way was revegetating following construction. By following the Stream and Wetland Construction and Mitigation Procedures, impacts to water quality and vegetation in this significant habitat area would be minimal and short-term.

Impacts to waterfowl habitat at Chard Pond and Lackey Pond in Massachusetts would be minimal and short-term. Some habitat would be temporarily destroyed during the crossing of these ponds; this habitat would revegetate within one to two years. Some temporary disturbance to nesting waterfowl may also occur during crossing. No long-term impacts to these areas would result.

The GNE Mainline would cross six known DWAs in Massachusetts. Approximately 29.3 acres of forest vegetation within these DWAs would be cleared for construction of the pipeline; of this, approximately 9.7 areas would be maintained as permanent right-of-way. In general, the clearing of forest vegetation for a linear right-of-way through a DWA would not have significant impacts on the deer population using the DWA. Mitigation measures are generally not necessary, but may include reduced construction right-of-way width or conifer planting on the temporary construction right-of-way to accelerate regeneration of winter

cover. We recommend that the project applicant, with supervision from Massachusetts Division of Fisheries and Wildlife (DFW) biologists, conduct pre-construction winter surveys of the six DWAs that would be crossed, to determine the intensity of use for each DWA, and determine whether mitigation measures should be implemented. Results of these surveys and a mitigation plan (if appropriate) must be submitted to the FERC for review and approval.

No known critical black bear habitats would be crossed by the GNE Mainline. This pipeline would, however, cross 15 wetlands in known black bear range which are potential spring feeding areas. If any of these wetlands were used as spring feeding areas, pipeline construction would destroy some of the available food source (shrub and herbaceous wetland vegetation). Since herbaceous wetland vegetation generally revegetate within one to two seasons and shrub vegetation within one to five seasons following pipeline construction, impacts to black bear using these areas would be short-term.

4.2.5 Endangered and Threatened Species

Section 7 of the Endangered Species Act, as amended (50 CFR Part 402), requires Federal agencies such as the FERC to determine if a proposed project would jeopardize the continued existence of any Federally listed or proposed endangered or threatened species, or result in the destruction or adverse modification of a species' designated critical habitat. The FERC's responsibilities under Section 7 apply to jurisdictional and related nonjurisdictional facilities.

To comply with our Section 7 requirements, the FERC or project applicants have requested information from the U.S. Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS) regarding the presence of Federal-listed or proposed species in the area of the Iroquois/GNE Single Pipeline Alternative. Based on informal consultations with the FWS and NMFS, we have determined that no Federal-listed or proposed endangered or threatened species, or their critical habitats, would be affected by the Iroquois/GNE Single Pipeline Alternative. A summary of the basis for our determinations follows in section 4.2.5.2.

4.2.5.1 General Construction and Operational Impacts

General construction and operational impacts associated with construction and operation of a natural gas pipeline are addressed in section 5.1.5.1 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

4.2.5.2 Site-Specific Impacts

Site-specific impacts to endangered and threatened species affected by segments of the Iroquois/GNE Single Pipeline Alternative which are common to either the Iroquois/ Tennessee Pipeline Project or the Champlain Pipeline Project are addressed in section 5.1.5.2 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I. Other pipeline segments are discussed below.

GNE Mainline

Bald Eagle (Federal--Endangered)

The GNE Mainline would cross or pass near two areas used by bald eagles for winter roosting habitat. No direct impact to the bald eagle would occur, as no construction or maintenance activities would occur during the time when eagles would utilize this winter habitat (December-March). Indirect impacts may include loss of roosting trees. We would recommend that the applicant submit a specific surveyed route in these areas to the FERC for review and approval. One of the bald eagle wintering areas, the Quabbin Reservoir, is also the site of the only active bald eagle nests in Massachusetts. The GNE Mainline would pass within 800 feet of the southern-most tip of the Reservoir, where wintering eagles may occur. The pipeline segment would be at least two miles from active nests and would not impact the nest sites. The FERC staff has determined, through informal consultation with the FWS, that the bald eagle would not be affected by construction or operation of the GNE Mainline.

Shortnose Sturgeon (Federal--Endangered)

The GNE Mainline would cross two water bodies in which the shortnose sturgeon may occur. The crossing of the Hudson River (MP 55.8) would be approximately 40 miles downriver of the Troy Dam, the upstream limit of this anadromous species. This location is, therefore, within the reach of river considered important adult spawning and juvenile feeding habitat. Spawning occurs between mid-April to late May, and juveniles congregate in this area between May to September. The NMFS, which has jurisdiction over this species, has indicated that an open-cut river crossing conducted between October and March would not adversely impact this species (Gorski, 1989). Therefore, we recommend that this river crossing be conducted between October 1 and March 31 to avoid adverse impact to this species.

The GNE Mainline crossing location of the Connecticut River (MP 124.8) is within a reach of river where shortnose sturgeon is occasionally found. However, this location is upriver of the Holyoke Dam and fishway, through which few shortnose sturgeon actually pass. Suitable spawning or juvenile feeding habitat is also limited or non-existent above the dam (Ludwig, 1989). The GNE Mainline crossing of the Connecticut River would not adversely impact the shortnose sturgeon (Gorski, 1989).

Swamp Red Currant and Bristly Black Currant (MA--Special Concern)

These two plant species occur in wetlands that would be adjacent to the GNE Mainline. The new right-of-way would pass through the northern-most edge of both wetlands. Some of these plants would be destroyed during construction. Plants on the temporary construction right-of-way may resprout from root stock, although resprouting would be limited. The number of plants destroyed during construction would not have long-term adverse effects on these plant populations.

Giant St. Johns-Wort (MA–Special Concern)

A population of this species occurs at one location on the GNE Mainline right-of-way. This population is one of only two known occurrences of this plant in Massachusetts. We recommend that prior to any construction or surveying activity, the applicant, in consultation with the MNHP, conduct field surveys of this site to determine the extent of the population. A mitigation plan should then be submitted to us for review and approval.

Yellow Lamp Mussel (MA–Endangered)

This freshwater mussel is known to occur in a river system within the reach that would be crossed by the GNE Mainline. This species is sensitive to elevated levels of suspended sediments and siltation. Pipeline construction in the immediate vicinity of mussel beds would directly impact mussels at the construction site or immediately downstream. Excessive levels of sediment released during construction may impact mussels for several miles downstream. We recommend that the feasibility of directional drilling at this site be studied should this alternative become preferred, and that this river crossing technique be utilized if feasible. If directional drilling is not feasible, we recommend that, prior to any instream activity, that applicant proposing to construct this alternative, in consultation with the MNHP, conduct a survey of this reach of river to determine the extent of the yellow lamp mussel population. A river crossing and mitigation plan should then be submitted to us for review and approval.

Adder's Tongue Fern and Pale Green Orchis (MA–Threatened)

These two plant species are known to occur on the existing right-of-way which the GNE Mainline would parallel. Use of the existing right-of-way for temporary construction right-of-way would destroy a portion of these plant populations. We recommend that the applicant, in consultation with the MNHP, conduct field surveys of these sites prior to any surveying or construction activity to determine the extent of these populations. A mitigation plan must then be submitted to us for review and approval.

Spotted Turtle and Northern Spring Salamander (MA–Special Concern)

The spotted turtle and northern spring salamander have been found in wetland and stream habitats, respectively, in the vicinity of the GNE Mainline. These species have not been found directly on what would be the right-of-way for the GNE Mainline. However, we recommend that the applicant have a qualified biologist conduct a survey for these species immediately prior to construction of these two sites, and move any individuals found off of the construction right-of-way. This would minimize direct impact to the species. Use of recommended Stream and Wetland Construction and Mitigation Procedures would minimize habitat alteration and long-term impacts.

4.2.6 Vegetation

4.2.6.1 General Construction and Operational Impacts

General construction and operational impacts associated with construction and operation of a natural gas pipeline are addressed in section 5.1.6.1 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

4.2.6.2 Site-Specific Impacts

Site-specific impacts to vegetation that would be affected by segments of the Iroquois/GNE Single Pipeline Alternative which are common to either the Iroquois/ Tennessee Pipeline or the Champlain Pipeline Project are addressed in section 5.1.6.2 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I. Other pipeline segments are discussed below.

GNE Mainline

Approximately 1,144.6 acres of upland and wetland forest would be cleared for construction of the GNE Mainline; 763.0 acres would be maintained free of woody vegetation. The majority (a minimum of 1,013.7 acres) of forest cleared for construction would be adjacent to existing rights-of-way. The largest forest areas would be traversed between MP 59 and MP 155 in eastern New York and Western Massachusetts. The GNE Mainline would cross several pine plantations, where construction of the right-of-way would require clearing of trees. These plantations are located at the edge of existing utility rights-of-way at MP 8.4 and MP 138.0 and where the pipeline segment would require new right-of-way at MP 134.3 and between MP 139.5 and MP 141.0.

The GNE Mainline would not traverse forested areas that are known to contain old growth timber (greater than 120 years old) or are used for maple sugar production (maple sugarbushes). It is likely, however, that there are old growth timber or active maple sugarbushes along the pipeline route that have not been identified. We recommend that any applicant proposing to construct this alternative consult with all landowners that would be affected by this pipeline segment in order to identify these forest types. Appropriate mitigation measures (constriction of the right-of-way, minor realignment, flagging specimen trees) should be applied where these areas would be traversed.

VGS Loops

Approximately 34.5 acres of upland and wetland forest would be cleared for construction of the VGS Loops; 23.0 acres would be maintained free of woody vegetation. All forest clearing would be adjacent to existing natural gas pipeline right-of-way; no new forest openings would be created. Forested areas that would require clearing are portions of relatively small woodlots and not large forest tracts.

No known locations of old growth timber or active maple sugar operations would be traversed by the VGS Loops. Refer to the above discussion of the GNE Mainline for our recommendations regarding old growth forests and maple sugarbushes.

Eastern Service Branch South and North Connectors

Approximately 22.7 acres of upland forest would be cleared for construction of these pipeline segments; 15.1 acres would be maintained free of woody vegetation. The 0.5 miles-long South Connector would be entirely new right-of-way, and forest clearing required for construction would create a new forest opening. The 2.0 mile-long North Connector would roughly follow an existing secondary road, but an entirely new right-of-way would have to be cleared of any forest vegetation. No old growth timber or active maple sugar operations are known to occur along these pipeline segments.

4.2.7 Wetlands

4.2.7.1 General Construction and Operational Impacts

General construction and operational impacts associated with construction and operation of a natural gas pipeline are addressed in section 5.1.7.1 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

4.2.7.2 Construction and Mitigation Procedures

Construction and mitigation procedures that we would require the applicant to comply with, as well as permits that would be required, are addressed in section 5.1.7.2 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

4.2.7.3 Site-Specific Impacts

Table 3.2.7.1 lists the areas of each wetland cover type that would be affected by construction of the Iroquois/GNE Single Pipeline Alternative; they total approximately 255 acres. Site-specific impacts to wetlands that would be affected by segments of the Iroquois/GNE Single Pipeline Alternative which are common to either the Iroquois/ Tennessee Pipeline Project or the Champlain Pipeline Project are addressed in section 5.1.7.2 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I. Other pipeline segments are discussed below.

GNE Mainline

Construction of the GNE Mainline would require the clearing of approximately 54.3 acres of forested and scrub-shrub wetlands. Approximately 5.9 acres of herbaceous wetlands would also be affected. The impacts to most of these wetlands would be as described in section 5.1.7.1 of Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I. However, several high quality or significant wetlands areas would also be affected.

Two New York State Class I wetlands, Black Creek Marsh (crossed at MP 41.1 and MP 43.4) and Papscanee Marsh (crossed at MP 56.3 and MP 56.5) would be traversed. Approximately 7.1 acres of forested and scrub-shrub wetland vegetation would be impacted during the crossing of Black Creek Marsh. The crossing of this wetland would be on a new right-of-way, although two existing rights-of-way currently traverse this wetlands. We recommend that the route be modified through this area to parallel existing rights-of-way. This would reduce the amount of vegetation cleared and would not create a new cleared

corridor through this wetland. The wetland construction and mitigation procedures that we would require would minimize long-term impacts to the water quality and the functional values of this wetland.

Approximately 0.6 acres of wetland scrub-shrub vegetation and 0.2 acres of wetland herbaceous vegetation would be impacted by construction across Papscanee Marsh. The new right-of-way would be at the northern-most edge of this wetland and would be adjacent to an existing right-of-way. Impacts to this wetland would be minimized by following the wetland construction and mitigation procedures that we would require. Refer to section 3.2.4.2 for additional discussion of impacts to this wetland.

Several wetlands in Massachusetts have been identified by the Massachusetts Natural Heritage and Endangered Species Program (MNHESP) as habitats of state-listed rare plant and wildlife species. Impacts to these wetlands are of particular concern because of the limited size or distribution of the populations of rare species. Destruction of wetland habitats or of individuals of these rare species may have significant effects on the local population of a rare species. We have recommended that the applicant consult closely with the MNHESP prior to any activity in these wetlands, and that mitigation plans be submitted to the FERC for review and approval. Refer to section 3.2.5 for additional discussion of impacts to these wetlands.

VGS Loops

Construction of the VGS Loops would require the clearing of approximately 3.6 acres of forested and scrub-shrub wetlands. No significant wetlands have been identified that would be affected by construction of these pipeline segments. The wetland construction and mitigation procedures that we would require would minimize long-term impacts to these wetlands.

Eastern Service Branch South and North Connectors

No wetlands would be traversed or impacted by these pipeline segments.

4.2.8 Air Quality and Noise

4.2.8.1 Air Quality

Construction of the Iroquois/GNE Single Pipeline Alternative would cause a temporary reduction in local ambient air quality as a result of fugitive dust and emissions generated by construction equipment. The extent of dust generated would depend on the level of construction activity and on soil composition and dryness. If proper dust suppression techniques were not employed, dry and windy weather could create a nuisance for nearby residents. The emissions from construction vehicles and equipment should have an insignificant impact on air quality of the region. However, under certain meteorological conditions, there might be high concentrations of pollutants in the vicinity of construction.

Air quality affects will be minimal during operations since no compressor stations are required as part of this alternative.

4.2.8.2 Noise

Impact on the local noise environment along segments of the Iroquois/GNE Single Pipeline Alternative would occur during construction. Pipeline construction would proceed at rates of from several hundred feet up to one-half mile per day. Construction activities would occur progressively down the right-of-way, with the open-trench phase of construction in rural areas lasting approximately 3 to 5 weeks. Construction equipment would be operated on a random, as-needed basis during this period. Consequently, although individuals in the immediate vicinity of the work could experience temporary annoyance, the duration of the impact on the noise environment at any specific location along the route would be short-term. Nighttime noise levels normally would be unaffected, since most construction would be limited to daylight hours.

Operational noise impacts are primarily associated with compressor stations. No compressor stations are required as part of this alternative.

4.2.9 Land Use, Recreation, and Visual Resources

4.2.9.1 Land Use

4.2.9.1.1 General Construction and Operational Impacts

General construction and operational impacts to land uses along the Iroquois/GNE Single Pipeline Alternative are identified in section 5.1.9.1.1 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

4.2.9.1.2 Site-Specific Impacts

Land uses affected by the Iroquois/GNE Single Pipeline Alternative are tabulated on table 3.2.9-2. Impacts associated with segments which are common to either the Iroquois/ Tennessee Pipeline Project or the Champlain Pipeline Project are addressed in section 5.1.9.1.2 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

GNE Mainline

As discussed in section 5.1.9.1.2 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I, route variations would be recommended to avoid known stands of actively tapped sugar maples although no stands have been currently identified along the GNE Mainline. Additionally, suitable construction techniques would be required when traversing agricultural areas. No orchards or nurseries have been identified along the GNE Mainline.

As recommended in section 5.1.9.1.2 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS Volume I, we would recommend that the GNE Mainline utilize a greater portion of existing powerline rights-of-way. Table 4.2.9-1 contains our recommendation for locations where the powerline right-of-way would be used for all of the 50-foot permanent

TABLE 4.2.9-1

Recommended Iroquois/GNE Single Pipeline Alternative Locations
When Adjacent to Powerline Rights-of-way

Segment/State	Powerline Parallel Segments			FERC Recommendations
	Approx. MP		Miles	
	From	To		
GNE MAINLINE	1.8	28.4	26.6	Adjacent
New York	30.9	35.9	5.0	Adjacent
	39.7	41.0	0.3	Adjacent
	48.8	53.8	5.0	Adjacent
	54.1	56.0	1.9	Adjacent
	58.3	67.2	8.9	Place permanent and construction right-of-way within partially abandoned right-of-way
	68.2	85.3	17.1	Place permanent and construction right-of-way within partially abandoned right-of-way
Massachusetts	85.3	87.2	1.9	Place within right-of-way (up to 25' of new clearing allowed)
	88.3	110.0	21.7	Place within right-of-way (up to 25' of new clearing allowed)
	110.0	110.4	0.4	Adjacent
	110.4	113.2	2.8	Place within right-of-way (up to 25' of new clearing allowed)
	113.2	113.8	0.6	Adjacent
	113.8	115.9	2.1	Place within right-of-way (up to 25' of new clearing allowed)
	115.9	116.7	0.8	Adjacent
	116.7	127.5	10.8	Place within right-of-way (up to 25' of new clearing allowed)
	125.5	128.3	2.8	Adjacent
	128.3	128.5	0.2	Place within right-of-way (up to 25' of new clearing allowed)
	128.5	129.7	1.2	Adjacent
	129.7	132.3	2.6	Place within right-of-way (up to 25' of new clearing allowed)
	132.3	133.9	1.6	Adjacent
	133.9	137.0	3.1	Place within right-of-way (up to 25' of new clearing allowed)
	137.0	137.4	0.4	Place within right-of-way (up to 25' of new clearing allowed)

TABLE 4.2.9-1 (cont'd)

Segment/State	Powerline Parallel Segments			FERC Recommendations
	Approx. MP		Miles	
	From	To		
	137.4	139.4	2.0	Adjacent
	146.5	150.8	4.3	Place within right-of-way (up to 25' of new clearing allowed)
	150.8	150.9	0.1	Route Variation
	150.9	152.6	1.7	Place within right-of-way (up to 25' of new clearing allowed)
	152.6	154.2	1.6	Adjacent
	154.2	169.5	15.3	Place within right-of-way (up to 25' of new clearing allowed)
	169.5	170.5	1.0	Adjacent
	170.5	172.8	2.3	Place within right-of-way (up to 25' of new clearing allowed)
	174.4	177.8	3.4	Place within right-of-way (up to 25' of new clearing allowed)
	179.9	197.1	17.2	Place within right-of-way (up to 25' of new clearing allowed)

pipeline right-of-way and clearing would be limited to 25 feet for the construction right-of-way. Between MP 58.2 and MP 67.2 and between MP 68.2 and MP 85.3 one and sometimes two transmission lines appear to be de-energized and abandoned in-place. In these locations we recommend that the entire permanent and construction pipeline right-of-way be placed within the existing powerline right-of-way.

Table 4.2.9-2 identifies our recommended residential mitigation techniques which include: route variations (Type A); joint use of the powerline right-of-way (Type B); and use of residential construction techniques (Type C). Table 4.2.9-3 identifies by milepost those residences requiring mitigation and the type of mitigation recommended.

TABLE 4.2.9-2

Types of Residential Mitigation Techniques Applicable to Pipeline Construction

Type	Name	Description
Type A	Route variation	See section 4.2.9.1.2 for description of route variation.
Type B	Use of electric transmission right-of-way (ROW) for pipeline ROW	See table 4.2.9-1 for FERC recommendations.
Type C	Residential construction techniques	Residential construction techniques would include one or more of the following: • Reduce working space to 35 feet on one side instead of the normal 50 feet. • Reduce working crew. • Use drag-line construction technique: pipe joints are welded into sections in a staging area as the trench is excavated just ahead of the pipe-laying operation, the pipe sections are lowered into the trench, welded to the previously-installed pipe, and the trench is backfilled immediately. • Use stovepipe or sewerpipe construction technique: same as drag-line construction, except that no staging area is available and the pipe is laid one or two joints at a time. • Pad and work over existing pipeline ROW to limit temporary construction requirements. • Snow fence the working area. • Avoid removal of trees wherever possible.

In reviewing the GNE Mainline, several areas were identified where we would recommend route variations be considered to minimize potential impacts or to avoid known resources. These proposed route variations are listed below and would require further study and evaluation to determine their suitability.

TABLE 4.2.9-3

Proposed Mitigation Techniques for Residential Areas That Would Be Crossed
By the Iroquois/GNE Single Pipeline Alternative

Applicant Segment/State	Location	MP	No. Residences Affected	Type of Mitigation a/	Comment
GREATER NORTHEAST					
Mainline					
New York	Root, NY	5.5	1	C	Reduce separation from existing pipeline
	Charleston, NY	16.5	1	C	Reduce separation from existing pipeline
	Princetown, NY	26.3	1	C	Reduce separation from existing pipeline
	Rotterdam, NY	31.8	2	C	Reduce separation from existing pipeline
		32.5	2	C	Reduce separation from existing pipeline
		34.0	1	C	Reduce separation from existing pipeline
	Guilderland, NY	41.0	1	C	Reduce separation from existing pipeline
		44.5	1	C	Reduce separation from existing pipeline
	New Scotland, NY	47.3	1	C	Reduce separation from existing pipeline
	Bethlehem, NY	48.3	1	C	Reduce separation from existing pipeline
		49.8	6	C	Reduce separation from existing pipeline
		52.3	1	C	Reduce separation from existing pipeline
		54.9	1	C	Reduce separation from existing pipeline
	East Greenbush, NY	61.8	1	B	
	Sand Lake, NY	64.8	1	B	
		67.3-67.7	12	C	Burden Lake - place pipeline in causeway
		69.0	2	B	
		69.2	1	B	
	Nassau, NY	70.1	1	B	
		70.6	1	B	
		71.9	1	B	
	Stephentown, NY	76.1	1	B	
Massachusetts	Ashfield, MA	110.0	2	C	Use dragline construction technique
	Leverett, MA	131.0	1	B	
	Ware, MA	150.8	4	A	Congested residential area
		151.7	1	B	
	West Brookfield, MA	153.9	2	C	Use dragline construction technique
		154.3	1	B	
		155.0	1	B	
		155.3	1	B	
		157.2	1	B	

a/ Refer to table 4.2.9-2 for description of mitigation techniques.

TABLE 4.2.9-3 cont'd

Applicant Segment/State	Location	MP	No. Residences Affected	Type of Mitigation a/	Comment
Massachusetts cont'd	North Brookfield, MA	160.0	2	B	
		162.7	2	B	
	Spencer, MA	164.3	1	B	
		164.9	3	B	
		165.6	1	B	
		166.8	6	B	
	Leicester, MA	167.6	1	B	
		168.5	1	B	
		169.1	5	B	
	Auburn, MA	170.8	3	B	Bore 300 feet past homes
		172.3	3	B	
	Millbury, MA	175.9-176.0	2	B	Use dragline construction technique
		176.6-176.8	4	B	Use stovepipe construction technique
		177.1-177.6	12	B	
	Sulton, MA	180.2	1	B	
		180.9	1	B	
		181.5	1	B	
		185.3	3	B	
	Uxbridge, MA	187.9	2	B	
		188.5	1	B	
		190.2	1	B	
	Millville, MA	193.2	2	B	

Watervliet Reservoir Route Variation (MP 35.9 to 39.7)

The alignment of the GNE Mainline in this area would leave an existing powerline right-of-way at MP 36.0, proceed west to MP 37.9 crossing a second existing powerline right-of-way at MP 35.9, and proceed east rejoining the second existing powerline at MP 39.7. The alignment would then continue in a southeasterly direction.

To minimize the unnecessary westward alignment while maintaining distance from the Watervliet Reservoir, we would recommend that further study be given to aligning the pipeline adjacent to the second existing powerline right-of-way from MP 35.9 to MP 39.7.

Normans Kill Route Variation (MP 49.5 to MP 52.4)

The alignment of the GNE Mainline in this area would cross Normans Kill several times, first in a densely developed residential area, several times along the edges of two golf courses located on both banks and finally in a relatively undeveloped area.

Since the pipeline alignment would require multiple crossings of Normans Kill, which is under study for scenic preservation, we would recommend a route variation which departs from the original GNE Mainline alignment at MP 49.5 and would proceed eastward to MP 52.4, thus remaining south of and avoiding all crossings of Normans Kill. This proposed alignment would require crossing of the Normanside County Club golf course fairways and of "Normansgate", a residential development of 30 single-family homes which is presently under construction southeast of the County Club. Coordination with the developer of the latter would be required. This area is also an area of unstable soils which required realignment of the existing Consolidated Gas pipeline.

Hudson River Crossing (MP 56.0 to MP 57.9)

The pipeline alignment crosses the Hudson River adjacent to existing overhead transmission lines. On the east bank the pipeline would deviate from the existing rights-of-way for a distance of about two miles. We recommend that more study be given to locating the pipeline adjacent to the existing transmission line in this area to avoid creating a third corridor.

Quabbin Reservoir (MP 138.0 to MP 146.1)

The alignment of the GNE Mainline in this area would depart from an existing powerline right-of-way at MP 139.3, would follow Juckett Hill Road southward within the Quabbin Reservoir Reservation, would turn east at MP 144.0, and would proceed on new right-of-way until rejoining the powerline right-of-way at MP 146.5. A dense residential development at the intersection of Jabish Street at MP 143.4 would be traversed.

To avoid Quabbin Reservoir Reservation lands, we would recommend further study be given to a route variation which would depart from the powerline at MP 38.0, would follow U.S. 202 south to State Route 9/Ware Road, and would then proceed east along State Route 9/Ware Road to rejoin the original pipeline alignment at MP 146.1. Preliminary study determined that either side of U.S. 202 would be feasible for the pipeline location and that the northern side of State Route 9/Ware Road is generally less developed. Dense

residential/commercial development does occur at the intersection of U.S. 202 and State Route 9/Ware Road and residential development is heavy on both sides of the western portion of State Route 9/Ware Road. Comments received on this alignment from the Belchertown planning official indicated that this alignment may be preferable to the Juckett Hill Road alignment in this area.

Auburn Route Variation (MP 168.5 to MP 182.0)

The pipeline alignment in this area would pass through the town centers of Auburn and Millbury, would parallel the Blackstone River and cross South Main Street (under study as an historic district) in Millbury, and would cross the Sutton State Forest. In both Auburn and Millbury the pipeline would follow a low voltage transmission line which crosses through older well established neighborhoods. In these locations the pipeline would be adjacent to homes and would disrupt residential uses which now abut and, in some cases, extend into the existing transmission right-of-way.

We looked at alternatives which avoid these areas and believe several exist. By deviating from the GNE Mainline route at MP 168.5, a route could be located so as to follow a combination of NEP powerlines for 3.5 miles and Tennessee Mainline for 3.9 miles. Total length of such an alternative would be 13.2 miles. We recommend alternatives to the pipeline route in this area be studied in detail if further consideration is given to a Iroquois/GNE Single Pipeline Alternative.

Rutland Connector

No significant land use impacts have been identified along this segment.

VGS Loops

No significant land use impacts have been identified along these segments.

Eastern Service Branch North and South Connectors

No significant land use impacts have been identified along these segments.

4.2.9.2 Recreation and Public Interest Areas

4.2.9.2.1 General Construction and Operational Impacts

General construction and operational impacts to recreation and public interest areas are addressed in section 5.1.9.2.1 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

4.2.9.2.2 Site-Specific Impacts

Site-specific impacts to recreation and public interest areas for segments of the Iroquois/GNE Single Pipeline Alternative which are common to either the Iroquois/

Tennessee Pipeline Project or the Champlain Pipeline Project are addressed in Section 5.1.9.2.2 the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

GNE Mainline

Federal and State Lands

Approximately 20 acres would be cleared in four state forests owned by the Massachusetts Department of Environmental Management (MADEM). All state forest crossings would be adjacent to existing powerline rights-of-way. Approximately 67 acres would be cleared in the Quabbin Reservoir Reservation. By locating the pipeline adjacent to Juckett Hill Road, would be reduce the amount of land to be cleared in this area.

The NPS is aware that the alternative would cross the Appalachian Trail in Dalton, Massachusetts; however, they have not developed a position on its acceptability. We have recommended that the permanent right-of-way be located wholly within the existing transmission line right-of-way in this area (table 4.2.9-1). Consideration should be given to prohibiting any additional clearing. Follow-up consultation with the NPS is also necessary.

Recreational Water Bodies

Crossings of Burden Lake, the Cheshire Reservoir, Lake Lashaway and Lackey Pond would be on existing causeways and no significant impacts to the recreational resource would be expected. The Hudson River would be crossed in a commercial/industrial area. At the Connecticut River crossing, we would recommend that the staging area be placed on the west bank in a presently cleared open area and that clearing be minimized on the east bank. At Schoharie Creek, Normans Kill, and the Blackstone River, we would recommend that staging areas be located away from existing vegetation on the banks, that additional clearing be minimized, and that the area be revegetated following construction.

Other Public Interest Areas

A route variation is recommended for the crossing of the East Brookfield sand and gravel operation. The present pipeline alignment through the Albany Municipal Golf Course and the Normanside Country Club would be along the edge of the fairways which should limit potential impacts to the operators and users of these golf courses. We would recommend that officials in Rotterdam, New York be contacted to identify effective mitigation and restoration measures for the Plotter Creek Park. The pipeline alignment through O'Gara Park in Spencer, Massachusetts would avoid the stadium and pass through a large open field. We would recommend that the appropriate town officials in Spencer be contacted to identify additional constraints associated with this crossing and appropriate mitigation measures. A route variation around the Spencer Fish & Game Club Pond may be recommended following discussion with Club officials.

Rutland Connector

The Winooski River would be crossed in an industrial area. No additional impacts to recreational resources would be expected.

4.2.9.3 Visual Resources

4.2.9.3.1 General Construction and Operational Impacts

General construction and operational impacts to visual resources resulting from pipeline construction are addressed in section 5.1.9.3.1 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

4.2.9.3.2 Site-Specific Impacts

Site-specific visual impacts associated with the segments of the Iroquois/GNE Single Pipeline Alternative common to the Iroquois/Tennessee Pipeline Project and the Champlain Pipeline Project are addressed in section 5.1.9.3.2 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I.

GNE Mainline

Since the majority (92.7 percent) of GNE Mainline would be constructed adjacent to existing rights-of-way, visual impacts would be minimal. Two areas were identified as potentially visually sensitive: Pakachoag Road in Auburn, Massachusetts (a locally designated scenic road); and South Main Street in Millbury, Massachusetts (under study for designation as an historic district). The Pakachoag Road would be crossed in an industrial area of Auburn in close proximity to the Worcester Central railroad. Visual impact would be expected to be negligible. Where the GNE Mainline would cross South Main Street, visual impacts would be negligible to low since the pipeline would be placed adjacent to a existing powerline right-of-way in the less residentially developed portion of South Main Street. Below South Main Street, the GNE Mainline would parallel the Blackstone River for approximately 1.2 miles along the west side of the Worcester Central railroad. Land use along this segment includes a sewage treatment plant, electric transmission line rights-of-way, State Route 122A, and the railroad. The landscape slopes westward and is generally cleared of forest vegetation. Visual impact of the pipeline in this area would be minimal.

Rutland Connector

Although The Rutland Connector would be constructed on new right-of-way, one-third of the construction would occur within agricultural areas where visual impact would be negligible. In those areas where the pipeline would be constructed through woodland, visual impacts would be limited due to the relatively few viewers present along the pipeline right-of-way. The remainder of the pipeline construction would occur in generally commercial/industrial areas. No significant visual impacts would be expected.

VGS Loops

The VGS Loops would be adjacent to existing railroad and pipeline rights-of-way. Visual impacts associated with pipeline construction clearing would be expected to be low.

Eastern Service Branch South and North Connectors

The South Connector would be constructed on new right-of-way in an uninhabited area between two existing pipelines. Potential views of the pipeline right-of-way would occur from Old Grafton Road which is crossed in the same area by existing pipeline right-of-way. Visual impacts would be negligible to low.

The North Connector would be constructed along an old county road with no residential viewers and few mobile viewers. Visual impacts would be expected to be negligible to low.

4.2.10 Socioeconomics

Socioeconomic impacts associated with the construction and operation of the Iroquois/GNE Single Pipeline Alternative are expected to be minimal. This is primarily due to the relatively short construction period and the relatively rapid rate construction crews would pass through one area. Population influx as a result of construction would occur over the length of the pipeline route which would limit local impacts to housing, town infrastructure services (fire, medical, education, police) and transportation. Some beneficial economic impacts would be realized through local and non-local construction payroll expenditures, purchases of construction goods and materials, and the increased property tax base generated by the project.

4.2.11 Cultural Resources

In practice, the National Historic Preservation Act (NHPA) (Section 106) requires field analysis, generally including subsurface testing of archeological sites, in order to determine if a cultural resource meets the National Register of Historic Places (NRHP) criteria. All effects to NRHP-listed or -eligible cultural resources, whether direct or indirect, must be considered significant, as set forth in the ACHP's regulations, 36 CFR Part 800.3. Assessment of effects requires substantive information on the nature or criteria used for evaluating each cultural resource within the right-of-way; that is, until a cultural resource's historic values have been identified and assessed, it is not possible to determine how these values will be impacted by construction and operation of the single pipeline alternative.

In accordance with the FERC's general operating policy, every effort would be required to avoid adverse effects by relocation of loops and new laterals, or by completion of adequate mitigation measures (data recovery) so that the final determination would be "no adverse effect" (see 36 CFR Part 800.5).

No Phase 1 or Phase 2 cultural resources identification and evaluation studies and analyses, required under FERC's July 26, 1988 order, Docket No. CP87-451-006, have been completed; thus, it is not possible to accurately estimate the number or density of NRHP-listed or -eligible properties that will be affected by construction and operation of this alternative. No Phase 1 literature search has been conducted for the GNE Mainline, VGS Loops, Rutland Connector, and Eastern Service Branch North and South Connectors. However, based upon information developed from prior project-specific field studies, literature research, and contacts with the SHPOs concerning the potential for finding NRHP eligible cultural resources in the vicinity of the related Iroquois/Tennessee and

Champlain/Algonquin rights-of-way, we conclude that the alternative, if certificated by the Commission, would significantly affect the quality of the historic and cultural environment.

If this alternative were selected, the applicants would be required to agree to defer construction of any facilities that must be certificated until: 1) the FERC staff reviewed and approved all Phase 1 and Phase 2 cultural resource survey reports and Phase 3 mitigation plans and reports, if required; 2) the FERC staff considered any comments of the SHPOs and the ACHP; and 3) the Director of OPPR informed an applicant that construction could begin.

4.3 CHAMPLAIN-BASED SINGLE PIPELINE ALTERNATIVE

4.3.1 Environmental Consequences Addressed in Volume 1

The Champlain-based Single Pipeline Alternative is comprised of route segments which are addressed in the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I. Table 3.2-1 identifies the individual components of this single pipeline alternative and the EIS volumes in which each is addressed.

The environmental consequences of all components of the Champlain-based Single Pipeline Alternative and, consequently, of the complete alternative, are addressed in other sections of this EIS. Therefore, no further analysis is included herein for the environmental consequences of this single pipeline alternative.

4.3.2 Related Nonjurisdictional Facilities

The environmental consequences of the Champlain-based Single Pipeline Alternative nonjurisdictional facilities are described in sections 5.2 of the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I, except that the 49 MW L & J Energy cogeneration plant would be served by a lateral from Carthage, New York to Lowville, New York, rather than a lateral directly from the Iroquois Mainline. In addition to the new lateral, 44 miles of loop would be required on Niagara Mohawk's 10-inch-diameter pipeline between Pulaski and Carthage, New York. The environmental consequences of the cogeneration plant are discussed in the Iroquois/Tennessee EIS, Volume I, section 5.2.

4.3.2.1 L & J Energy Lateral and Loop

4.3.2.1.1 Environmental Setting

To provide service to L & J Energy a new 17.1-mile-long lateral would originate at an existing pipeline serving Carthage, New York. From a point on the existing pipeline, a 10-inch-diameter pipeline would extend along the streets in the Village in Carthage, turn south across the Black River, and then parallel State Route 26 on new right-of-way.

It would traverse flat to rolling terrain which is primarily in agricultural use. Bedrock is at an average depth of greater than five feet. About 12 acres of forest and 0.8 acre of wetland would be disturbed during construction. An extensive forested wetland would be bordered between MP 12.0 and MP 14.3. The lateral would cross 16 waterbodies, including the Black River. The Black River (MP 1.8) is a warmwater fishery in the area of the lateral

crossing. It is not considered a high quality fishery, but supports high recreational use. The remaining waterbodies that would be crossed do not contain significant fisheries. Approximately 37 homes would be within 50 feet of the new permanent right-of-way. Most of these would be in the Village of Carthage where the pipeline would be located in city streets.

No federally or state-listed endangered or threatened fish species are known occur in the vicinity of this lateral. No historic or prehistoric properties listed in the SHPO's files were identified in proximity to the lateral pipeline.

4.3.2.1.2 Potential for Significant Environmental Effects

Based on our review of the resources potentially affected by the L & J Energy Lateral, we feel the potential for significant environmental impact is minimal. Therefore, we believe that if the Champlain-based Single Pipeline Alternative was determined to be preferred and considered for construction no further NEPA review of the L & J Energy Lateral would be required. We have not evaluated in detail the new looping required on Niagara Mohawk's system between Pulaski and Carthage, New York. This would require further study and evaluation to determine its suitability. However, given the general rural character of the area traversed and application of the types of mitigation measures described in Volume I of either EIS, we feel the potential for significant environmental impact is minimal.

5.0 COMPARISON OF ALTERNATIVES

In this section the three regional system alternatives are compared relative to the environmental factors discussed in section 3.0 and section 4.0. Each environmental factor is addressed with respect to its significance as an evaluation factor, the relative differences between the three system alternatives, and the relative ranking of each system alternative relative to potential impacts to that resource factor resulting from the construction and operation of the individual alternative system.

Table 5-1 presents the comparative data for the evaluation factors for the three system alternatives. Non-quantitative factors are also discussed for certain resource factors, although they are not included in the table. Other considerations pertinent to comparing alternatives, such as cost and customers served, are discussed in section 5.2.

5.1 EVALUATION OF RESOURCE FACTORS

5.1.1 Geology

The following factors represent potential threats to the structural and operational integrity of pipelines and could result in potential safety concerns. Each of the three alternatives were reviewed with respect to these factors, with the results discussed below.

Active Faults

None of the pipeline alternatives would cross active faults.

Seismic Liquefaction

Areas where soils might liquefy given a large enough earthquake are limited to recent alluvial deposits and isolated areas of glacial-fluvial sands and silts (especially loess deposits) with high water tables. Since these soils comprise a very small portion of the three pipeline alternatives and large scale earthquakes in the northeastern United States are rare, no discernible difference exists between the three pipeline alternatives relative to seismic liquefaction.

Karst Terrain

Karst terrain exists along a six-mile segment of the Iroquois Mainline portion of the Two Pipeline Alternative. If construction and operation practices detailed in the Iroquois/ Tennessee EIS Volume I are followed, this factor would be considered negligible.

Landslide Potential

A landslide area along the Iroquois/GNE Single Pipeline Alternative has been documented just south of Albany, New York. Prehistoric Lake Albany sediments are prone to landsliding along steep slopes. Pliestocene clay in the Champlain lowlands and Connecticut River Valley where the Champlain-based Single Pipeline Alternative and Champlain Mainline would cross are also susceptible to landslides.

TABLE 5-1

Comparison of Environmental Factors
For The Two Pipeline and Single Pipeline Alternatives

Environmental Factor	Unit	Two Pipeline Alternative	Iroquois/GNE Single Pipeline Alternative	Champlain-based Single Pipeline Alternative
General Characteristics				
Total Length	Mi	844.7	646.1	421.4
Miles New ROW	Mi	409.3	282.0	180.3
Miles Parallel to Existing ROWs	Mi	434.8	364.1	241.1
Total Temporary and Permanent Clearing	Ac	8,144	6,364	3,804
Total Permanent Clearing	Ac	3,866	3,963	2,387
New Compressor Stations	No	3	0	0
Compressor Station Additions	No	3	0	0
New and Added Compression	hp.	25,685	0	0
Geology				
Active Faults Crossed	No	0	0	0
Karst Terrain	Mi	6	0	0
Soils				
Highly Erodible Soils	Mi	78.7	65.3	53.5
Moderately Erodible Soils	Mi	138.9	90.9	91.4
Wind Erodible Soils Crossed	Mi	100.3	73.6	61.9
Hydric Soils Crossed	Mi	10.0	1.8	8.9
Water Resources				
Water Bodies Crossed	No	722	617	325
High Quality Water Bodies Crossed				
Class A	No	69	53	42
Class B	No	315	280	239
Water Bodies Crossed < 3 miles Upstream of Public Surface Water Supplies	No	11	27	5
Water Bodies Crossed With Toxic Sediments Potentially Present	No	11	10	7
State-designated Well Protection Areas Crossed	No	17	32	17
Fish and Wildlife				
Significant Fisheries Crossed	No	66	60	31
Cold-water Fisheries Crossed	No	53	48	28
Significant Wildlife Habitat Crossed	Ac	360	155	316
National or State Wildlife Refuges Crossed	Ac	9.2	9.2	0
Endangered and Threatened Species				
Federally-Listed or Proposed Species in Project Vicinity	No	5	4	5
Critical Habitats of Federally-Listed or Proposed Species Affected	Ac	0	0	0
State-Listed Species Potentially in Project Vicinity	No	60	36	35
Vegetation				
Forest Temporarily Cleared	Ac	1,513	1,040	663
Forest Permanently Cleared	Ac	1,947	1,946	1,298

TABLE 5-1 (cont'd)

Environmental Factor	Unit	Two Pipeline Alternative	Iroquois/GNE Single Pipeline Alternative	Champlain-based Single Pipeline Alternative
Wetlands				
Forested and Scrub-Shrub Wetlands Cleared	Ac	420.2	214.6	174.4
Herbaceous Wetlands Cleared	Ac	41.0	27.6	23.4
Air Quality and Noise				
Compressor Stations Considered A Major Source of Pollutants	No	4	0	0
Annual No_x Emissions based on continuous operation	Tons	182	0	0
Compressor Stations with Ldn Levels 55 dBA or Greater at NSRs a/	No	0	0	0
NSR Within 500 Feet of Compressor Stations b/	No	1	0	0
Land Use, Recreational, and Visual Resources				
Land Uses Not Listed Elsewhere				
Agricultural Areas Disturbed	Ac	3,376	2,470	1,080
Residential Areas Crossed	Ac	429	273	198
Commercial/Industrial Areas Crossed	Ac	103	86	66
Residential Areas				
Existing Residences Within 50 feet of New ROW	No	479	415	263
Proposed Residential Developments Crossed	No	39	31	34
Residences Relocated	No	0	0	0
Residences Requiring Mitigation	No	465	317	328
Recreation and Public Interest				
Federal and State Parks Crossed	No	10	6	5
Other State Lands Crossed Not Listed Elsewhere	No	10	8	10
Other Recreational Areas Crossed	No	13	10	6
National and State Trails Crossed	No	6	4	3
Recreational Water Bodies Crossed	No	38	26	20
National Rivers Inventory	No	3	2	0
State/Local Designated Rivers	No	8	2	4
Landfills or Hazardous Waste Sites Crossed	No	3	3	2
Schools within 200 Feet	No	1	1	1
Visually Sensitive Areas Nearby or Crossed	No	11	8	8

a/ Based on new noise impacts which may result in noise levels exceeding an Ldn of 55 dBA. In some instances existing stations have noise levels which already exceed an Ldn of 55 dBA.

b/ NSR = Noise Sensitive Receptors; based on proposed location of the Mendon Compressor Station.

It would be misleading to quantify total feet of area susceptible to landslides since landslide potential is strongly influenced by precipitation and construction practices. However, landslide occurrence is minimal and usually limited to small-scale flows along river banks and rock falls in upland areas. The hazards are minimal to pipeline construction and operation.

In summary, the geology traversed by the three alternatives is similar and is largely the result of glaciation and the evolution of post-glacial drainage systems and subsequent weathering. Impact to the geologic resources of the area would be similar for the three alternatives. None of the three alternatives represents appreciable advantages or disadvantages.

5.1.2 Soils

Soils of High or Moderate Erosion Potential

Standard erosion and sedimentation control procedures are of limited effectiveness in controlling soil erosion in extreme conditions. One important component in assessing the threat of erosion to the soil resource is the slope of the ground surface. Generally, soils present on slopes greater than 15 percent grade are highly erodible when vegetative cover is modified or removed. Soils on slopes that have grades between 6 and 15 percent are classified as moderately erodible when vegetative cover is modified or removed. These erodibility factors provide a basis for comparing the three system alternatives with respect to difficulty in controlling erosion and sedimentation in the construction and early post-construction phases.

The Champlain-based Single Pipeline Alternative would cross 53.5 miles of highly erodible soils, the least of the three alternatives. The Two Pipeline Alternative would cross 78.7 miles of highly erodible soils, or 47 percent more than the Champlain-based Single Pipeline Alternative. The Iroquois/GNE Single Pipeline Alternative would cross 65.3 miles of highly erodible soils, or 22 percent more than the Champlain-based Single Pipeline Alternative.

The Champlain-based Single Pipeline Alternative would cross 91.4 miles of moderately erodible soils. The Two Pipeline Alternative would cross 138.9 miles of moderately erodible soils, or 52 percent more than the Champlain-based Single Pipeline Alternative. The Iroquois/GNE Single Pipeline Alternative would cross 90.9 miles of moderately erodible soils or nearly the same as the Champlain-based Single Pipeline Alternative.

The Two Pipeline Alternative would clearly have the most effect on potentially erodible soil. Proper mitigation procedures would reduce but not eliminate the impacts of pipeline construction to the soil resources.

Wind Erodible Soils

Soils that are both sandy and excessively drained present unique difficulties in applying erosion and sedimentation control practices in that disturbed areas become potentially wind erodible in dry conditions. Consequently, revegetation of these soils when dry conditions prevail is both important and difficult, and requires special measures.

The Champlain-based Single Pipeline Alternative would cross 61.9 miles of dry, sandy soils, the least of the three alternatives. The Two Pipeline Alternative would cross 100.3 miles of dry, sandy soils, or 62 percent more than the Champlain-based Single Pipeline Alternative. The Iroquois/GNE Single Pipeline Alternative would cross 73.6 miles of dry, sandy soils, or 47 percent more than the Champlain-based Single Pipeline Alternative.

The total mileage of sandy, dry soils crossed would be greatest for the Two Pipeline Alternative. Properly identified and correctly applied erosion and sedimentation control measures would reduce and limit the duration of the impact of wind erosion to soil resources.

Wet, Organic Soils

Soils that are wet most of the year and consist of primarily organic materials are subject to a wide variety of impacts from the construction of a pipeline. Investigation of this soil-related factor for each pipeline alternative allows the comparison of potential soil impacts including soil structure damage, soil compaction, and drainage problems. This comparison also yields information about the ease of construction, impacts due to possible subsidence, and the low bearing capacity of these soils.

The Champlain-based Single Pipeline Alternative would cross 8.9 miles of wet, organic soils. The Two Pipeline Alternative would cross 10.0 miles of wet, organic soils, or 12 percent more than the Champlain-based Single Pipeline Alternative. The Iroquois/GNE Single Pipeline Alternative would cross 1.8 miles of wet, organic soils, or 80 percent less than the Champlain-based Single Pipeline Alternative.

Even though the Two Pipeline Alternative and the Champlain-based Single Pipeline Alternative cross more wet, organic soils than the Iroquois/GNE Single Pipeline Alternative, this soil group represents a minor component of the overall soil resources. Proper mitigation procedures can minimize the overall construction-related impacts to the soils resource for any of the pipeline alternatives.

In summary, of the three pipeline alternatives, the Champlain-based Single Pipeline Alternative would result in the fewest impacts to soil resources. This alternative would cross the least highly erodible soils, and potentially wind erodible soils. The Iroquois/GNE Single Pipeline Alternative would also have significantly less impact on soil resources than the Two Pipeline Alternative.

5.1.3 Water Resources

Water Bodies Crossed

The total number of water bodies that would be crossed by the systems alternatives under consideration is indicative of the total potential impacts resulting from erosion of streambanks and streambeds, sedimentation and turbidity, temporary destruction of benthic habitat, and blasting impacts on aquatic organisms and stream dimensions. A higher number of water bodies crossed represents a higher potential impact to the overall environment.

As shown in table 5-1, the Two Pipeline Alternative would traverse a total of 722 surface waters, as compared to 617 and 325 for the Iroquois/GNE and the Champlain-based

Single Pipeline Alternatives, respectively. The Champlain-based Single Pipeline Alternative clearly represents the least potential impact to water bodies, as the number of surface waters crossed is approximately half that of the other alternatives. Potential surface water impacts resulting from pipeline installation are temporary, occurring primarily during construction activities, and the application of appropriate construction and erosion/sedimentation control techniques would reduce but not eliminate these potential impacts.

High Quality Surface Waters Crossed

Generally, surface waters are classified by states according to the most beneficial uses for which they will be protected. The classifications of the water bodies that would be crossed by the alternatives give an indication of the overall quality of surface waters that would be affected by pipeline construction for each alternative. Construction impacts to high quality waters which have a greater recreational and economic value are considered more significant than impacts to lower quality surface waters which have been degraded by urbanization. Therefore, a greater number of high quality water bodies crossed represents a greater potential impact to the overall environment.

The Two Pipeline Alternative would cross 484 and the Iroquois/GNE Single Pipeline Alternative would cross 333 Class A and B surface waters suitable for primary and secondary recreational uses and for use as public drinking water supplies with or without treatment. Both of these alternatives would cross water bodies in the State of New York. The State of New York designates streams too small to support fisheries as Class D, although the water quality in these streams may actually be higher. Therefore, the percentage of high quality streams crossed by these alternatives may actually be greater than the numbers indicate. (New York is in the process of reclassifying D streams by drainage basin.) Of the surface waters crossed by the Champlain-based Single Pipeline Alternative, 281 (or 86 percent) are classified A and B. The Two Pipeline Alternative would potentially impact 69 Class A surface waters, compared to 53 and 42 for the Iroquois/GNE and Champlain-based Single Pipeline Alternatives, respectively.

Crossings Less than Three Miles Upstream of Public Surface Water Supplies

Improperly conducted in-stream construction activities may result in the release of large volumes of sediment, which could be carried for significant distances downstream of the crossing location. Sediment transport is dependent upon many factors, including the particle size and weight of the suspended sediments, the magnitude of the load, depth of the stream and its flow rate. Surface water supplies located more than three miles downstream of a pipeline crossing would generally experience minimal or no degradation of water quality. The number of surface water supplies located less than three miles downstream of a pipeline crossing represents potential impact to the quality of public supplies and to consumers of the water. The release of large volumes of sediment into a surface water supply could potentially cause major disruptions to a community's water distribution system.

The Two Pipeline Alternative would traverse a total of 12 streams less than three miles upstream from public surface water supply intakes. The Iroquois/GNE Single Pipeline Alternative would cross 27 streams upstream of public supplies, 13 of which are located on the GNE Mainline route. Included in these 13 are four tributaries of the Quabbin Reservoir,

the water supply for Metropolitan Boston. The Champlain-based Single Pipeline Alternative would cross five streams less than three miles from public surface water supply intakes.

The Champlain-based Single Pipeline Alternative represents the least potential impact to public surface water supplies. However, the application of our recommended mitigation procedures would minimize potential impacts to community water supplies for any of the alternatives.

Potential Toxic Sediments at Water body Crossings

Although the quality of the surface waters that would be crossed by the alternatives is generally good, toxic sediments could be present at some locations as a result of historical and recent toxic spills and waste disposal practices. Potential impacts associated with the resuspension of toxic sediments during pipeline construction include possibly acute and chronic toxic effects on workers, downstream users, and aquatic organisms. A greater number of crossings that could potentially contain toxic contaminants in bottom sediments indicates a greater potential impact to possible receptors of the contamination.

The Two Pipeline Alternative would traverse 11 rivers that could potentially contain toxic sediments at the proposed crossing locations compared to 10 and 7 for the Iroquois/ GNE Single Pipeline Alternative and the Champlain-based Single Pipeline Alternative, respectively. The potential impacts associated with the release of contaminants from sediments would be avoided by conducting sampling and analysis as required by the COE, routing the pipeline to avoid contaminated areas, or using special construction procedures. The release of contaminants could also be avoided by the use of directional drilling methods at these river crossings. Potential impacts could be mitigated by the use of special sedimentation control devices and modified construction procedures. With the application of these mitigation measures, the three alternatives are approximately equal with respect to potential impact from toxic sediments.

Designated Public Well Protection Areas Traversed

In order to protect public groundwater supplies from potential contamination and other impacts, states have designated specified protection areas around wellheads. These protection zones represent areas where certain land uses such as the storage or transport of hazardous substances are prohibited. The most significant potential impact to these protected aquifers would be contamination resulting from the releases of hazardous substances (primarily fuels and lubricants) during pipeline installation. Construction activities could also impact wellfield structures and distribution facilities. A greater number of protection areas traversed by an alternative represents a greater potential impact to community groundwater supplies.

The Two Pipeline Alternative and Champlain-based Single Pipeline Alternative would each traverse 17 designated well protection areas compared to 32 for the Iroquois/GNE Single Pipeline Alternative. Of the three alternatives, the Iroquois/GNE Single-Pipeline Alternative represents the greatest potential impact to public groundwater supplies, particularly on the GNE Mainline segment in Massachusetts. Potential impacts to groundwater supplies could be avoided by prohibiting refueling and storage of hazardous substances in well protection areas. Damage to wellfield facilities as a result of construction

activities is not expected. It is likely that municipal authorities would require certain conditions to be followed during pipeline construction. The application of these mitigation measures would adequately minimize potential impacts to groundwater supplies for any of the three alternatives.

In summary, the Champlain-based Single Pipeline Alternative represents the fewest potential impacts of the three pipeline alternatives to water resources of the project area. This alternative would cross the fewest number of surface waters and would impact the fewest public surface water supplies, resulting in the lowest overall impact to the environment. The Two Pipeline Alternative and the Iroquois/GNE Single Pipeline Alternative would represent similar impacts to water resources with respect to the comparison factors. However, the Iroquois/GNE Single Pipeline Alternative would impact a greater number of designated public well protection areas and public surface water supplies, particularly on the GNE Mainline segment in Massachusetts. In addition, the GNE Mainline would traverse the Quabbin Reservoir Reservation, a state-owned watershed protection area that is currently in an environmentally sensitive state with respect to erosion potential. These factors make the Iroquois/GNE Single Pipeline Alternative the least attractive alternative regarding potential impacts to water resources.

5.1.4 Fish and Wildlife

5.1.4.1 Fishery Resources

Significant Fisheries Crossed

Significant fisheries are cold-water fisheries, warm-water fisheries with high recreational value, and water bodies that contain fish species of special concern. The respective state agencies have identified these fisheries as those with the highest management priority.

The Two Pipeline Alternative would cross 66 significant fisheries, as compared to 60 and 31 for the Iroquois/GNE and Champlain-based Single Pipeline Alternatives, respectively. The Champlain-based Single Pipeline Alternative would, therefore, impact approximately 53 percent and 48 percent fewer significant fisheries than the Two Pipeline Alternative and the Iroquois/GNE Single Pipeline Alternative, respectively, and would result in the least impact to this resource.

Cold-water Fisheries Crossed

Cold-water fisheries are water bodies that contain naturally reproducing populations of trout, which are important recreational species. Trout are also much more sensitive to water temperature fluctuations and increases in suspended sediments than warm-water fish species. Cold-water fisheries are, therefore, the most susceptible to potential disturbances created by in-stream pipeline construction.

The Two Pipeline Alternative would cross 53 cold-water fisheries, as compared to 48 and 28 for the Iroquois/GNE and Champlain-based Single Pipeline Alternatives. The Champlain-based Single Pipeline Alternative would therefore impact approximately 47 percent and 42 percent fewer cold-water fisheries than the Two Pipeline Alternative and the

Iroquois/GNE Single Pipeline Alternative, respectively, and would result in the least impact to this resource.

5.1.4.2 Wildlife Resources

Significant Wildlife Habitat Affected

Significant wildlife habitats are specific habitat types that may be critical to a species' survival, population size or health. The primary significant habitat included in our analysis is deer wintering areas, although black bear feeding areas, waterfowl production or staging areas, and shellfish beds are also of concern. The acres of significant wildlife habitats affected is a measure of impact to the areas where the effect on wildlife is potentially the greatest.

The Two Pipeline Alternative would impact approximately 360 acres of significant wildlife habitat, or 132 percent more than the Iroquois/GNE Single Pipeline Alternative, with 155 acres and 14 percent more than the Champlain-based Single Pipeline Alternative, at 316 acres of habitat. Of the three alternatives, therefore, the Two Pipeline Alternative would result in the greatest impact to significant wildlife habitats, although only marginally more so than the Champlain-based Single Pipeline Alternative.

National or State Wildlife Refuges or Wildlife Management Areas Affected

Wildlife refuges or management areas are publicly owned lands managed specifically for the protection or enhancement of wildlife. Activities associated with pipeline construction may be in conflict with the habitat management practices of these areas. The acreage of these areas that would be affected is wildlife habitat that may be lost or altered from its specific purpose.

The Two Pipeline Alternative would affect approximately 9.2 acres of state wildlife management area, the same as the Iroquois/GNE Single Pipeline Alternative. The Champlain-based Single Pipeline Alternative would impact no national or state wildlife refuges or wildlife management areas.

The Two Pipeline Alternative and the Iroquois/GNE Single Pipeline Alternative would both traverse the same New York State wildlife management area. For either pipeline system a mitigation measure would be required that would make pipeline installation activities consistent with wildlife management goals, thereby minimizing impacts.

In summary, of the three pipeline alternatives considered, the Champlain-based Single Pipeline Alternative would result in the least overall impact to fish and wildlife resources. This alternative would cross the fewest significant fisheries and cold-water fisheries, and the least amount of wetland and forest wildlife habitat, wildlife refuges and management areas. However, this alternative would cross more significant wildlife habitat than the Iroquois/GNE Single Pipeline Alternative. The Two Pipeline Alternative would result in the greatest overall impact to fish and wildlife resources, making this the least desirable of the three alternatives considered with respect to fish and wildlife resources.

5.1.5 Endangered and Threatened Species

Federal-listed or Proposed Endangered and Threatened Species Potentially Affected

Federal-listed or proposed endangered or threatened species are protected by the Endangered Species Act. Destruction of an endangered or threatened species or its habitat may have significant impacts on a local population, or even the global population of that species.

Five Federal-listed or proposed species potentially occur in the vicinity of both the Two Pipeline Alternative and the Champlain-based Single Pipeline Alternative. The Iroquois/GNE Single Pipeline Alternative would potentially encounter four federally-listed species.

Through informal consultation with the US Fish and Wildlife Service and the National Marine Fisheries Service, which have jurisdiction over Federal-listed species, we have determined that none of the three alternative pipeline systems would affect any federally-listed or proposed endangered or threatened species.

Critical Habitat of Federally-listed or Proposed Endangered and Threatened Species Affected

A Federal-listed or proposed endangered or threatened species may have designated critical habitat (i.e., habitat considered critical to the survival of that species). Critical habitat is protected by the Endangered Species Act. Disruption or alteration of critical habitat may result in the decline or eventual extirpation of a local population of an endangered or threatened species.

No designated critical habitat of a Federal-listed or proposed endangered or threatened species would be affected by any of the three pipeline alternatives.

State-Listed Endangered, Threatened, and Rare Species Potentially Affected

State-listed endangered, threatened, and rare species are species that are rare, in decline and/or are threatened with extirpation from the listing state. Because they are rare on a statewide or regional level only, rather than nationally or globally, state-listed species generally are not in danger of extinction. Destruction or alteration of the habitats of a state-listed species may have significant impacts on the local or statewide population of that species.

The Two Pipeline Alternative could encounter 60 state-listed fish, wildlife, invertebrate, and plant species within its area of effect, or 67 percent more than the 36 species along the Iroquois/GNE Single Pipeline Alternative and 69 percent more than the 35 species along the Champlain-based Single Pipeline Alternative.

The number of state-listed endangered, threatened, and rare species potentially affected is greatest for the Two Pipeline Alternative. There is essentially no difference in state-listed species potentially affected between the single pipeline alternatives.

In summary, the Iroquois/GNE Single Pipeline Alternative and the Champlain-based Single Pipeline Alternative would result in the least potential impact to endangered and threatened species. The Two Pipeline Alternative would result in the greatest potential impact of the three regional system alternatives to endangered and threatened species.

5.1.6 Vegetation

Upland Forest Vegetation Temporarily Cleared

Upland forest vegetation is among the most mature vegetation type that would be cleared for pipeline construction. It would require the longest time of any upland vegetation type impacted to return to preconstruction conditions on the temporary right-of-way, and would therefore receive the most long-term impact.

The Two Pipeline Alternative would require the temporary clearing of approximately 1,513 acres of upland forest vegetation, as compared to approximately 1,040 acres and 663 acres required for the Iroquois/GNE Single Pipeline Alternative and Champlain-based Single Pipeline Alternative, respectively. The Champlain-based Single Pipeline Alternative would therefore result in the least temporary impact to upland forest vegetation.

Upland Forest Vegetation Permanently Cleared

Upland forest vegetation that would be cleared for pipeline construction and then maintained permanently free of woody vegetation would be the most drastically altered upland vegetation type. The amount of upland forest permanently cleared represents a long-term impact resulting from construction and operation.

The Two Pipeline Alternative and the Iroquois/GNE Single Pipeline Alternative would both require approximately 1,947 acres to be permanently cleared of upland forest vegetation, as compared to approximately 1,298 acres for the Champlain-based Single Pipeline Alternative. The Champlain-based Single Pipeline Alternative would, therefore, result in the least impact.

In summary, of the three alternatives considered, the Champlain-based Single Pipeline Alternative would result in the least overall impact to upland vegetation. The Two Pipeline Alternative would result in the greatest impact to upland vegetation.

5.1.7 Wetlands

Forested and Scrub-Shrub Wetlands Crossed

Wetlands provide a number of important values, including water quality maintenance, flood and erosion control, fish and wildlife habitat, and recreation and aesthetics. Forested and scrub-shrub wetlands generally contain the most mature vegetation of the wetland types that would be affected, and would, therefore, receive the greatest impact as a result of right-of-way clearing.

The Two Pipeline Alternative would require clearing of approximately 420 acres of forested and scrub-shrub wetlands, as compared to 215 acres and 174 acres for the

Iroquois/GNE and the Champlain-based Single Pipeline Alternatives, respectively. The Champlain-based Single Pipeline Alternative would therefore impact approximately 59 percent and 19 percent less forested and scrub-shrub wetlands than the Two Pipeline Alternative and the Iroquois/GNE Single Pipeline Alternative, respectively.

Herbaceous Wetlands Crossed

Herbaceous wetlands represent the remainder of the vegetated wetland types that would be affected by construction of the pipeline alternatives. Herbaceous wetlands provide similar functional values as those described under forested and scrub-shrub wetlands. Impacts to herbaceous wetlands as a result of pipeline construction would be relatively short term, as the herbaceous vegetation communities would recover within one to two growing seasons following construction.

The Two Pipeline Alternative would require clearing of approximately 41 acres of herbaceous wetlands, compared to 28 and 23 acres of clearing that would result from the Iroquois/GNE and the Champlain-based Single Pipeline Alternatives, respectively. The Champlain-based Single Pipeline Alternative would, therefore, impact approximately 44 and 18 percent less herbaceous wetland area than the Two Pipeline Alternative and the Iroquois/GNE Single Pipeline Alternative, respectively, resulting in the least overall impact to this resource.

In summary, the Champlain-based Single Pipeline Alternative would result in the least overall impact to wetland resources. The Two Pipeline Alternative would impact wetlands to a much greater degree than either of the single-based pipeline alternatives.

5.1.8 Air Quality and Noise

5.1.8.1 Air Quality

Compressor Stations Considered a Major Source of Pollutants

USEPA's Prevention of Significant Deterioration (PSD) regulations are intended to preserve the existing air quality in areas where pollutant levels are below National Ambient Air Quality Standards (NAAQS). These regulations classify any proposed facility that would emit more than 250 tons per year of NO_x as a "major emission source." Such a source or a modification to a major source which increases emissions by 40 tons per year or more, is subject to review and apply the best available control technology (BACT).

The Two Pipeline Alternative includes one compressor station which would be a new major emission source and two which are already major sources where an increase of 40 tons per year or more is proposed. At Compressor Station 261 replacement of older compressor units would reduce the overall station NO_x emission rate from 470 to 165 tons per year. In total the Two Pipeline Alternative would result in a net total increase in NO_x emission rates of 182 tons per year. Neither single pipeline alternative would require compression.

Compressor stations resulting in major sources of emission can have mitigation measures incorporated in their design and operation that prevent significant adverse effects

on air quality. Therefore, while the Two Pipeline Alternative would result in NO_x emissions, the degree of impact as compared with the single pipeline alternatives is not significant.

5.1.8.2 Noise

Compressor Stations with an Ldn Noise Level of 55 dBA or Greater at the Nearest NSR

An Ldn of 55 dBA is generally accepted as the noise impact level which, if not exceeded, protects the public from indoor and outdoor activity interference at the nearest Noise Sensitive Receptor (NSR), usually a residence. The Two Pipeline Alternative would require additional compressors at three existing stations and construction of three new stations for a total of 25,685 horsepower of additional or new compression. None of the new facilities would exceed the above noise levels. However, at Tennessee Stations 254 and 261, existing compressor station noise levels already exceed an Ldn of 55 dBA. Neither the Iroquois/GNE nor the Champlain-based Single Pipeline Alternative would require new compression, therefore, the single pipeline alternatives would have no effect on NSRs. The Two Pipeline Alternative would have a small incremental effect (assuming the Mendon Station can meet an Ldn of 55 dBA) by adding to noise levels that already exceed an Ldn of 55 dBA at two stations.

Overall, the Two Pipeline Alternative has the potential to result in only minor increases in noise levels at stations that already exceed an Ldn of 55 dBA. This conclusion assumes the Mendon Station would be relocated on site and adequate noise control would be incorporated into its design. The single pipeline alternatives require no compression and, therefore, have no potential noise effect.

NSR within 500 feet of Compressor Stations

Our previous experience in analyzing compressor stations of all sizes and varying levels of noise control has shown that it is extremely difficult to achieve an Ldn of 55 dBA at separation distances less than 500 feet.

The Two Pipeline Alternative includes a compressor station in Mendon, Massachusetts, which would be located approximately 350 feet from a NSR. The single pipeline alternatives would require no compression and, therefore, would have no NSRs within 500 feet of any station.

5.1.9 Land Use, Recreation, and Visual Resources

The following factors were used to evaluate the potential impacts of the three regional system alternatives to land use, recreation, and visual resources.

5.1.9.1 Land Use

Land Uses Crossed

Woodlands that would be crossed are discussed in section 5.1.6. The remaining types of land uses not evaluated elsewhere include agricultural, residential, and commercial/ industrial land use acreage affected by pipeline construction. Less environmental impact

would be associated with routes that affect fewer acres of agricultural and residential use. Commercial and industrial uses crossed are not usually adversely affected. The Champlain-based Single Pipeline Alternative would affect the fewest acres of agricultural and residential land use as a result of its shorter length (approximately half the length of the Two Pipeline Alternative and approximately 65 percent of the Iroquois/GNE Single Pipeline Alternative).

Residential Areas Crossed

Residential areas affected by the three regional system alternatives were evaluated because of the short-term impacts resulting from noise and ground disturbance during construction and the long-term impacts resulting from the pipeline easement encumbrance which would restrict certain types of continued residential use.

The Champlain-based Single Pipeline Alternative would affect 152 fewer homes within 50 feet of the pipeline than the Iroquois/GNE Single Pipeline Alternative and 216 fewer homes than the Two Pipeline Alternative. The Iroquois/GNE Single Pipeline Alternative would require mitigative residential construction techniques for 11 fewer homes than the Champlain-based Single Pipeline Alternative and for 148 fewer homes than the Two Pipeline Alternative. The Iroquois/GNE Single Pipeline Alternative would also cross three less proposed residential developments than the Champlain-based Single Pipeline Alternative and eight less proposed residential developments than the Two Pipeline Alternative. No residences would require relocation on any of the three regional system alternatives.

Overall, the Champlain-based Single Pipeline Alternative involves the least impact to residential property. Although the Iroquois/GNE Single Pipeline Alternative requires mitigation for 11 fewer residences and would cross 3 fewer proposed developments, the difference is not significant when compared to the additional 152 residences within 50 feet that would be impacted by construction and operation of the alternative.

5.1.9.2 Recreation and Public Interest Areas

Federal and State Lands Crossed

The Two Pipeline Alternative would cross 10 Federal or state lands, the Iroquois/GNE Single Pipeline Alternative would cross 6, and the Champlain-based Single Pipeline Alternative would cross 5. These lands include federal and state forests as well as federal lands. The U.S. Army Corps of Engineers Surry Mountain Lake area and the Fort Devens Military Reservation would be crossed by the Champlain-based Single Pipeline Alternative; the Quabbin Reservoir Reservation would be crossed by the Iroquois/GNE Single Pipeline Alternative. With the exception of the Fort Devens Military Reservation, all lands in this category are used for active and passive recreation.

Other Lands Crossed

This category includes land trusts and town conservation lands that support more limited recreational opportunities. The Two Pipeline Alternative would cross 10 lands of this category, the Iroquois/GNE Single Pipeline Alternative would cross 8, and the Champlain-based Single Pipeline Alternative would cross 10.

National and State Trails

National and state hiking trails crossed would include the National Park Service Appalachian Trail as well as existing or proposed state trails. The Two Pipeline Alternative would cross 6 trails, the Iroquois/GNE Single Pipeline Alternative would cross 4, and the Champlain-based Single Pipeline Alternative would cross 3. Each of the three regional system alternatives would cross the Appalachian Trail twice in two different states with one crossing in Connecticut common to all three alternatives.

Recreational Areas

Recreational areas crossed would include town parks, ballfields, and golf courses. The Two Pipeline Alternative would cross 13 of these areas, the Iroquois/GNE Single Pipeline Alternative would cross 10 and the Champlain-based Single Pipeline Alternative would cross 6.

Recreational Water Bodies

Recreational water bodies crossed would include rivers, lakes and ponds used for fishing and boating as well as those rivers listed on the National Rivers Inventory or designated by state or local officials. The Two Pipeline Alternative would cross 38 recreational water bodies of which 3 rivers are listed on the National Rivers Inventory and 8 are state-designated rivers. The Iroquois/GNE Single Pipeline Alternative would cross 26 recreational water bodies of which 2 rivers are listed on the National Rivers Inventory and 2 are state-designated rivers. The Champlain-based Single Pipeline would cross 29 recreational water bodies of which 4 are state-designated rivers.

Other Areas of Public Interest

Other areas of public interest would include landfills or hazardous waste areas, schools within 50 feet, and visually sensitive or public interest areas. The Two Pipeline Alternative and the Iroquois/GNE Single Pipeline Alternative would each cross three landfills; and the Champlain-based Single Pipeline Alternative would cross two landfills. All of the regional system alternatives would cross one school property in Connecticut. The Two Pipeline Alternative would cross 11 other public interest or visually sensitive areas, the Iroquois/GNE Single Pipeline Alternative and the Champlain-based Single Pipeline Alternative would each cross 8 of these areas.

Based on the information presented above, the Champlain-based Single Pipeline Alternative would affect the least overall number of recreation or public interest areas. In all categories, except the land trust/town conservation lands category, construction of the Champlain-based Single Pipeline Alternative would affect fewer, or an equal, number of resources compared to the Iroquois/GNE Single Pipeline Alternative or the Two Pipeline Alternative. The impacts associated with crossing two additional land parcels would not, however, outweigh the impacts associated with the greater number of recreational resources affected by the Iroquois/GNE Single Pipeline Alternative or the Two Pipeline Alternative.

5.1.9.3 Visual Resources

Visual resources that would be affected by the three alternatives are associated with specific land uses and public interest areas already discussed as well as the amount of new pipeline right-of-way created and extent of clearing. For each of the factors, the Champlain-based Single Pipeline Alternative would affect the fewest resources and would have less visual effect. The Two Pipeline Alternative would have the most effect.

5.1.10 Socioeconomics

The socioeconomic impacts and benefits to the states, counties, and municipalities in which the three alternatives would be constructed are comparable. However, in general terms, the Two Pipeline Alternative, the longest of the three alternatives, would affect the largest number of municipalities and the Champlain-based Single Pipeline Alternative would affect the fewest communities.

5.1.11 Cultural Resources

Based on available data, none of the three alternatives represents significantly different impacts to the cultural resources of the region. Regardless of the alternative ultimately selected as a preferred option, the State Historic Preservation Officers would have to be consulted and appropriate cultural resource surveys would have to be conducted. However, the much greater length of the Two Pipeline Alternative makes it likely to have an effect on more resources.

5.2 OTHER CONSIDERATIONS

Other considerations that are important to the overall comparison of the three regional system alternatives but that fall outside of the scope of our environmental comparison include the extent to which each alternative meets customer needs, the extent and potential for significant impact of associated nonjurisdictional facilities, and capital construction costs.

The customers who would to be served by the Two Pipeline Alternative are listed in table 1.1-1 of each Volume I. Both single pipeline alternatives serve most, but not all, of the customers served by the Two Pipeline Alternative. The Iroquois/GNE Single Pipeline Alternative realistically would not serve North Springfield, Springfield, or Keene customers because of the extensive number of miles of laterals required to deliver the small volumes of gas involved. The environmental effects of the pipeline to serve Central Hudson's Roseton Plant (Pleasant Valley Lateral) are addressed in our preceding environmental analysis. That pipeline would most likely be determined to be uneconomical to construct for either single pipeline alternative.[1]

The Champlain-based Single Pipeline Alternative could serve all of the Two Pipeline Alternative customers but has the same disadvantage as the Iroquois/GNE Single Pipeline Alternative with regard to the Roseton Plant. In addition, 61.1 miles of loop and lateral

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1 The Iroquois Mainline Single Pipeline Alternative described in section 1.2.2 but not evaluated in detail in this EIS would provide realistic and economical service to Central Hudson's Roseton Plant.

pipeline would be required to deliver gas to the L & J Energy plant. This requires significantly more miles of pipeline for this alternative to deliver gas to L & J Energy than any other alternative, and would most likely be determined to be uneconomical.

As described in each Volume I, section 5.2, the individual projects which constitute the Two Pipeline Alternative have associated nonjurisdictional facilities that were evaluated for potential significant adverse environmental impacts. Since each single pipeline alternative has only minor differences in facilities required to provide service to the same customers as the Two Pipeline Alternative, the potential for environmental impact of nonjurisdictional facilities associated with each of the three regional system alternatives is the same.

The capital construction cost of the Two Pipeline Alternative would be $1,208 million compared with $922 million for the Iroquois/GNE Single Pipeline Alternative and $629 million for the Champlain-based Single Pipeline Alternative.

One factor we did not consider that is unique to the Champlain-based Single Pipeline Alternative is the approximately 156 miles of pipeline and 66,000 horsepower of compression that would have to be constructed in Canada to deliver the necessary volume of gas to the US/Canadian border. Realistically, these facilities not only have an associated cost but also require regulatory approval in Canada.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations presented herein are those of the staff of the Federal Energy Regulatory Commission (Commission).

Information included in applications, as well as data developed from field reconnaissance, literature research, and contacts with Federal, state, and local agencies, public interest groups, and individual members of the public, indicates that construction of the Iroquois/GNE Single Pipeline Alternative or the Champlain-based Single Pipeline Alternative would result in limited adverse environmental impact particularly during the construction period. However, if constructed and operated in accordance with our recommendations, either may be environmentally preferable to the construction of both proposed projects (referred to as the Two Pipeline Alternative). Moreover, the Champlain-based Single Pipeline Alternative is the most environmentally preferred alternative. However, the Two Pipeline Alternative is also environmentally acceptable.

In addition, the Iroquois Mainline Single Pipeline Alternative, while not discussed in detail because it comprises pipeline segments studied as part of other alternatives, also is viable and may be environmentally preferable because it would also require fewer miles of pipeline and less compression than the Two Pipeline Alternative. The Champlain-based Single Pipeline Alternative would serve all the proposed customers of the Iroquois/Tennessee and Champlain Pipeline projects. The Iroquois Mainline Single Pipeline, Iroquois/GNE Single Pipeline, and Existing System Expansion alternatives would not serve 2,700 MCfd which Champlain proposed to deliver to North Springfield and Springfield, Vermont, and Keene, New Hampshire.

6.1 ENVIRONMENTAL IMPACT OF REGIONAL SYSTEM ALTERNATIVES

The primary difference among the three alternatives that were studied in detail is the length of new pipeline and new compression facilities required for each. The Two Pipeline Alternative would require more miles of pipeline and more compressor facilities (844.1 miles and 25,685 hp of compression) than either the Iroquois/GNE Single Pipeline Alternative (646.1 miles and no compression) or Champlain-based Single Pipeline Alternative (421.4 miles and no compression). The effects of greater lengths and more compression are reflected in the potential impacts to those resources which have been identified during scoping or by staff as being of greatest concern. Table 6-1 presents data for selected length-related factors.

The relationship between length and potential impact is obvious. The Two Pipeline Alternative (the longest of the three) represents the greatest potential impact, and the Champlain-based Single Pipeline Alternative (the shortest of the three) represents the least potential impact.

We feel that on environmental grounds any of these regional system alternatives could be made acceptable and that the single pipeline alternatives are environmentally preferable. This should not be construed to imply that there are no impacts or that the impacts are minimal. Accordingly, we have recommended significant mitigative measures to be incorporated into all of these alternatives. Recommendations unique to the single pipeline

TABLE 6-1

Comparison of Selected Length-Related Environmental Factors

	Two Pipeline Alternative	Iroquois/GNE Single Pipeline Alternative	Champlain-based Single Pipeline Alternative
REQUIRED FACILITIES			
Miles of Pipeline	844.7	646.1	421.4
New Compressor Stations	3	0	0
Compressor Station Additions	3	0	0
IMPACTS			
Miles of New ROW	409.3	282.0	180.3
Acres of Temporary and Permanent Clearing	8,144	6,364	3,804
Miles of Highly and Moderately Erodible Soils Crossed	217.6	155.9	144.9
Number of Water Bodies Crossed	722	617	325
Acres of Significant Wildlife Habitat crossed	360	155	316
Acres of Forested and Scrub-Shrub Wetlands Crossed	420.2	214.6	174.4
Residences Requiring Mitigation	465	317	328

alternatives are discussed in section 6.2. These measures would supplement measures we have recommended in Volume I of the Iroquois/Tennessee and Champlain EISs, respectively.

6.2 FERC STAFF RECOMMENDED MEASURES

To further mitigate the environmental impacts associated with the construction and/or operation of the single pipeline system alternatives, we recommend that the following mitigative measures as well as the applicable recommendations contained in the Iroquois/Tennessee EIS, Volume I and the Champlain EIS, Volume I be considered in processing any filings that may come before the Commission.

1. Although the NYSDEC has indicated the PCB levels in sediments south of Troy Dam do not reach hazardous levels, any applicant shall be required to conduct testing of river sediments for the presence of toxic contaminants at the GNE Mainline crossing location.

2. A study shall be conducted to investigate the feasibility of using directional drilling methods to construct the Hudson River and Connecticut River crossings.

3. Any applicant(s), in consultation with Massachusetts DFW biologists, should conduct pre-construction winter surveys of the six DWAs crossed by the GNE Mainline to determine the intensity of use and whether mitigation measures should be applied. Results of this survey and a mitigation plan (if appropriate) should be submitted to FERC for review and approval.

4. Should an open-cut river crossing technique be proposed for the GNE Mainline crossing of the Hudson River, it shall be constructed between October 1 and January 31 to avoid impact to shortnose sturgeon.

5. Any applicant, in consultation with the MNHP, should conduct field surveys of a location on the GNE Mainline where the Giant St. John's-wort, a species of concern, is known to occur to determine the extent of the population. A mitigation plan should then be submitted to the FERC for review and approval.

6. The feasibility of directional drilling at a site on the GNE Mainline where the Yellow Lamp Mussel is known to occur shall be studied. If directional drilling is not feasible, any applicant shall consult with the MNHP and conduct a survey of this reach of river to determine the extent of the Yellow Lamp Mussel population prior to any instream activity. A river crossing and mitigation plan should then be submitted to the FERC for review and approval.

7. Any applicant(s), in consultation with the MNHP, should conduct field surveys of the Adder's Tongue Fern and Pale Green Orchis at known sites on the GNE Mainline prior to any surveying or construction activity to determine the extent of these populations. A mitigation plan should then be submitted to the FERC for review and approval.

8. The Spotted Turtle and Northern Spring Salamander are known to occur at two sites in the vicinity of the GNE Mainline. Any applicant(s) should have a qualified biologist conduct a search for these species immediately prior to construction of these two sites, and move any individuals found off of the construction right-of-way.

9. Any applicant(s) shall modify the GNE Mainline route where it traverses Black Creek Marsh and Papscanee Marsh to parallel existing rights-of-way. This would reduce the amount of vegetation cleared and avoid creating a new cleared corridor through these wetlands.

10. Where the proposed pipeline facility would parallel existing powerline rights-of-way along the GNE Mainline as defined in table 4.2.9-1, the entire 50-foot permanent pipeline right-of-way should be placed within the powerline right-of-way and clearing should be limited to 25 feet for the construction right-of-way.

11. Between MP 58.2 and MP 67.2 and between MP 68.2 and MP 85.3 of the GNE Mainline, one and sometimes two transmission lines appear to be de-energized and

abandoned in place. In these locations any applicant(s) should place the entire permanent and construction pipeline right-of-way within the existing powerline right-of-way.

12. Detailed studies should be undertaken to identify alternative routes for the following GNE Mainline segments:

    - Watervliet Reservoir Route Variation (MP 35.9 to MP 39.7)
    - Normans Kill Route Variation (MP 49.5 to MP 52.4)
    - Hudson River Crossing (MP 56.0 to MP 57.9)
    - Quabbin Reservoir (MP 139.0 to MP 146.1)
    - Auburn Route Variation (MP 168.5 to MP 182.0)

13. Consideration should be given to prohibiting any additional clearing at the GNE Mainline crossing of the Appalachian Trail. Follow-up consultation with the NPS would also be necessary.

14. At the Connecticut River crossing, the staging area should be placed on the west bank in a presently cleared open area and clearing minimized on the east bank. At Schoharie Creek, Normans Kill, and the Blackstone River, the staging areas should be located away from existing vegetation on the banks, additional clearing should be minimized, and the area be revegetated following construction.

15. Any applicant(s) should consider a route variation for the crossing of the East Brookfield sand and gravel operation.

16. Any applicant(s) should contact officials in Rotterdam, New York to identify effective mitigation and restoration measures for the Plotter Creek Park.

17. Vegetative clearing shall be minimized to 75 feet at the Blackstone River crossing.

APPENDIX A

LOCATION MAPS

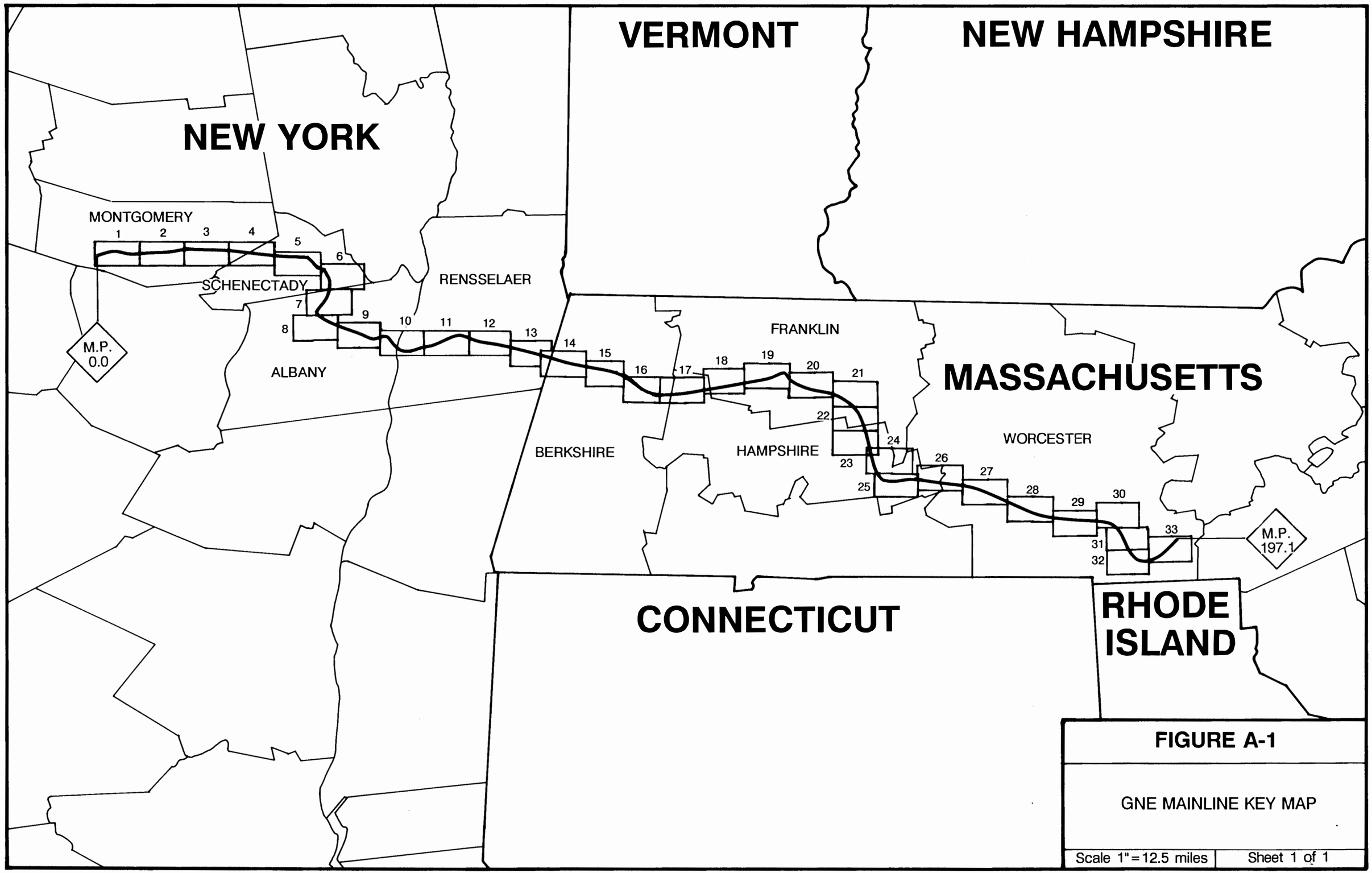


FIGURE A-1

GNE MAINLINE KEY MAP

Scale 1" = 12.5 miles | Sheet 1 of 1

Montgomery County, NY

M.P. 0.0

M.P. 5.0

Canajoharie

Root

J O H A R I E

R O O T

Canajoharie Creek

Flat Creek

Mapletown (Blaine)

Wheeler Hill

MATCHLINE SHEET 2

N

FIGURE A-1

CNE MAINLINE

Scale 1:24,000 | Sheet 1 of 35

Montgomery County, NY

M.P. 10.0

Glen

G L E N

MATCHLINE SHEET 3

M.P. 6.0

MATCHLINE SHEET 1

Currytown

School No 5

CEM

Buttermilk Falls

Yatesville

School No. 11

GOVE CEM

Rural Grove

Root

R O O T

Root Center

HAIGHT CEM

162

Hamilton School

Charleston

N

FIGURE A-1

GIS MAINLINE

Scale 1:24,000 | Sheet 2 of 39

Montgomery County, NY

Glen

Florida

Charleston

M.P. 12.0

M.P. 15.0

MATCHLINE SHEET 2

MATCHLINE SHEET 4

Voorhees Sch

Youngs Lakes

Schoharie

Lost Valley

Creek

Charleston

Davis Corners

School No 9

School No 7

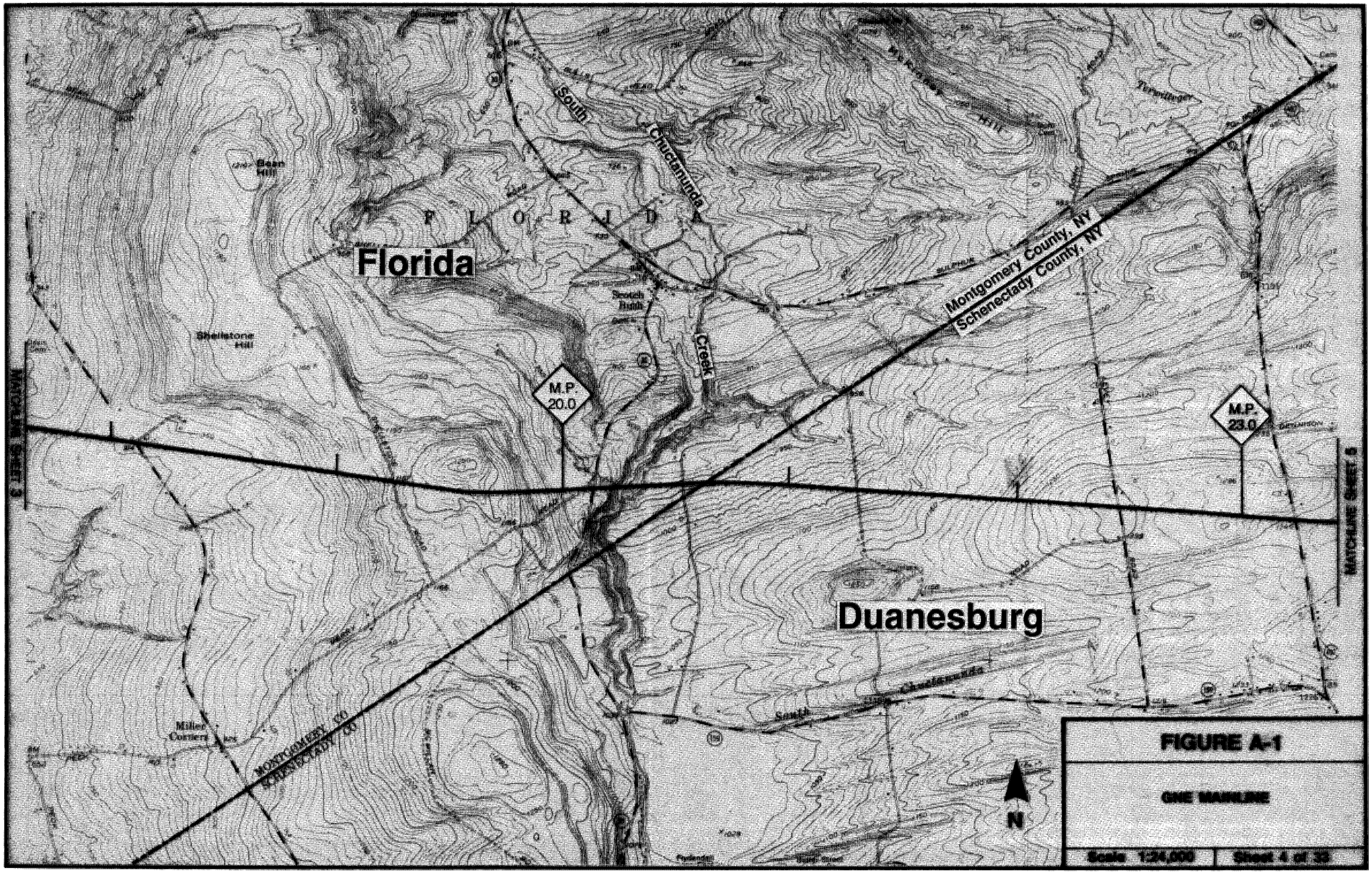
C H A R L E S T O N

N

FIGURE A-1

GNE MAINLINE

Scale 1:24,000 | Sheet 3 of 33


Florida
Duanesburg
Montgomery County, NY
Schenectady County, NY
South Chuctanunda Creek
Bean Hill
Shellstone Hill
Scotch Bush
M.P. 20.0
M.P. 23.0
MOHAWK SHEET 5
MONTGOMERY CO
SCHENECTADY CO
N
FIGURE A-1
ONE MAINLINE
Scale 1:24,000
Sheet 4 of 33

Schenectady County, NY

M.P. 25.0

Rotterdam

M.P. 29.0

Marlaville Lake

Princetown

Duanesburg

MATCHLINE Sheet 6

N

FIGURE A-1

GNE MAINLINE

Scale 1:24,000 | Sheet 5 of 20

Schenectady County, NY

Mohawk River

M.P. 30.0

Schenectady

Rotterdam

M.P. 33.0

New York State Thruway

MATCHLINE SHEET 7

FIGURE A-1

ONE MAINLINE

Scale 1:24,000 | Sheet 4 of 28

Princetown

Rotterdam

Schenectady County, NY

Albany County, NY

M.P. 35.0

Guilderland

New York State Thruway

Normans Kill

Watervliet Reservoir

Boven

M.P. 38.0

N

FIGURE A-1

ONE MAINLINE

MATCHLINE SHEET 7

Albany County, NY

M.P. 40.0

M.P. 44.0

Guilderland

Guilderland Center

McCormack Corners

Hartmans Corners

Normans Kill

Meadowdale

Black Creek Marsh Wetlands

MATCHLINE SHEET 9

FIGURE A-1

GNE MAINLINE

Scale 1:24,000 | Sheet 8 of 33

MATCHLINE SHEET 8

M.P. 45.0

Guilderland

Albany County, NY

North Bethlehem

Philadelphia Ch.

Normans Kill

SCOTLAND

Voorheesville

(BM 332)

Krum Kill

Kurisfeld

M.P. 50.0

MATCHLINE SHEET 10

New Scotland

Bethlehem

New Scotland

Slingerlands

Slingerlands

Delmar

Vly Creek

Vlomans Kill

Phillipin Kill

Beaver Dam Kill

Coeymans Creek

Bullock Creek

Delaware and Hudson

Conrail

N

FIGURE A-1

GNE MAINLINE

Scale 1:24,000 | Sheet 9 of 33

MATCHLINE SHEET 9

Albany

Rensselaer

M.P. 52.0

M.P. 55.0

Bethlehem

East Greenbush

Albany County, NY

Rensselaer County, NY

Hudson River

Normans Kill

Interstate 90

New York State Thruway

MATCHLINE SHEET 11

FIGURE A-1

GNE MAINLINE

Scale 1:24,000 | Sheet 10 of 38

Rensselaer County, NY

North Greenbush

M.P. 65.0

Elmwood Cem

Sand Lake

MATCHLINE SHEET 12

T R O Y - E A S T G R E E N B U S H

INTERCHANGE 9

M.P. 60.0

East Greenbush

T R O Y - G R E E N B U S H

Interstate 90

Luther

East Greenbush Central Sch

MATCHLINE SHEET 10

FIGURE A-1

GNE MAINLINE

Scale 1:24,000 | Sheet 11 of 33

MATCHLINE SHEET 11

M.P. 66.0

Rensselaer County, NY

Averill Park

Glass Lake

Glass Lake

Glass Lake

Sand Lake

Crooked Lake

Burden Lake

Maple Grove

Methodist Farm

M.P. 70.0

Bald Top Mtn.

Bennett Pond

Bailey Mtn.

Schodack

Nassau

YMCA Camp

Totem Lodge

Millers Corners

Donault Corners

Alps

Pikes Pond

North Nassau

MATCHLINE SHEET 13

FIGURE A-1

GNE MAINLINE

Scale 1:24,000 | Sheet 12 of 33

Rensselaer County, NY

Nassau

MATCHLINE SHEET 12

Stephentown

M.P. 75.0

M.P. 78.0

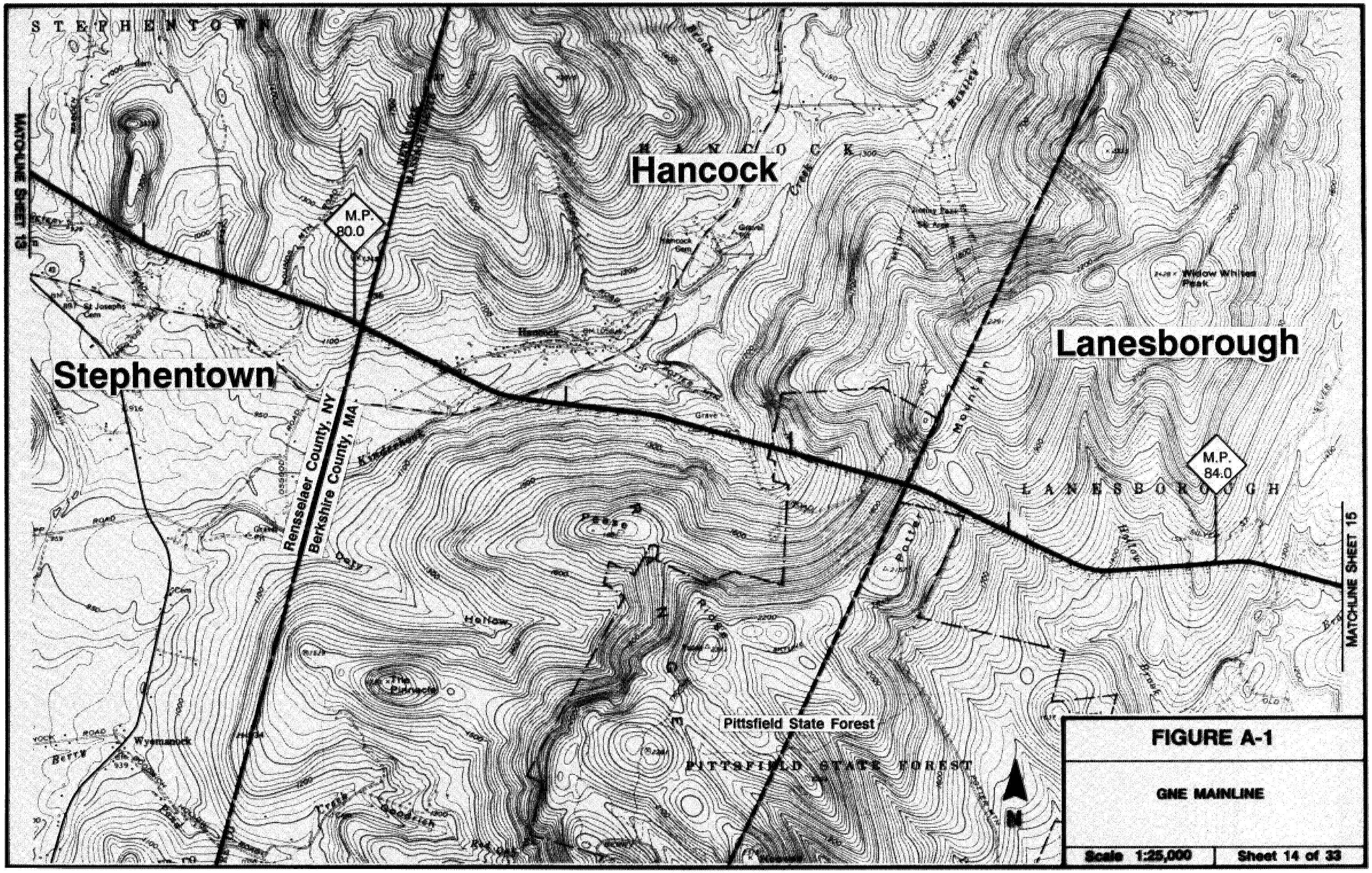
Stephentown Center

MATCHLINE SHEET 14

FIGURE A-1

GNE MAINLINE

Scale 1:24,000	Sheet 13 of 33


STEPHENTOWN
HANCOCK
LANESBOROUGH
Stephentown
Hancock
Lanesborough
MATCHLINE SHEET 13
MATCHLINE SHEET 15
M.P. 80.0
M.P. 84.0
Rensselaer County, NY
Berkshire County, MA
Pittsfield State Forest
PITTSFIELD STATE FOREST
Wyomanock
Berry
Hollow
Brook
Road
Creek
Mountain
Grave
Trails
Widow White Peak
The Pinnacle
St Joseph's Cem
Hancock Cem
Kinderhook
Basin
Ridge
Valley
Gravel
Pond
Cem
Trail
Woodrich
Waubeek
Potter Mtn
Bald Mtn
Rattlesnake Gutter
Bash Bish Falls
Bash Bish Brook
Taconic Crest Trail
Appalachian Trail
Jiggs Hollow
Jiggs Hollow Rd
Mt Ross
Mt Everett
Mt Race
Mt Darby
Mt Frissell
Mt Washington
Mt Greylock
Mt Prospect
Mt Fray
Mt Wilcox
Mt Carmel
Mt Lebanon
Mt Lebanon Cem
Mt Lebanon Rd
Mt Lebanon Trail
Mt Lebanon Trail
Mt Lebanon Trail

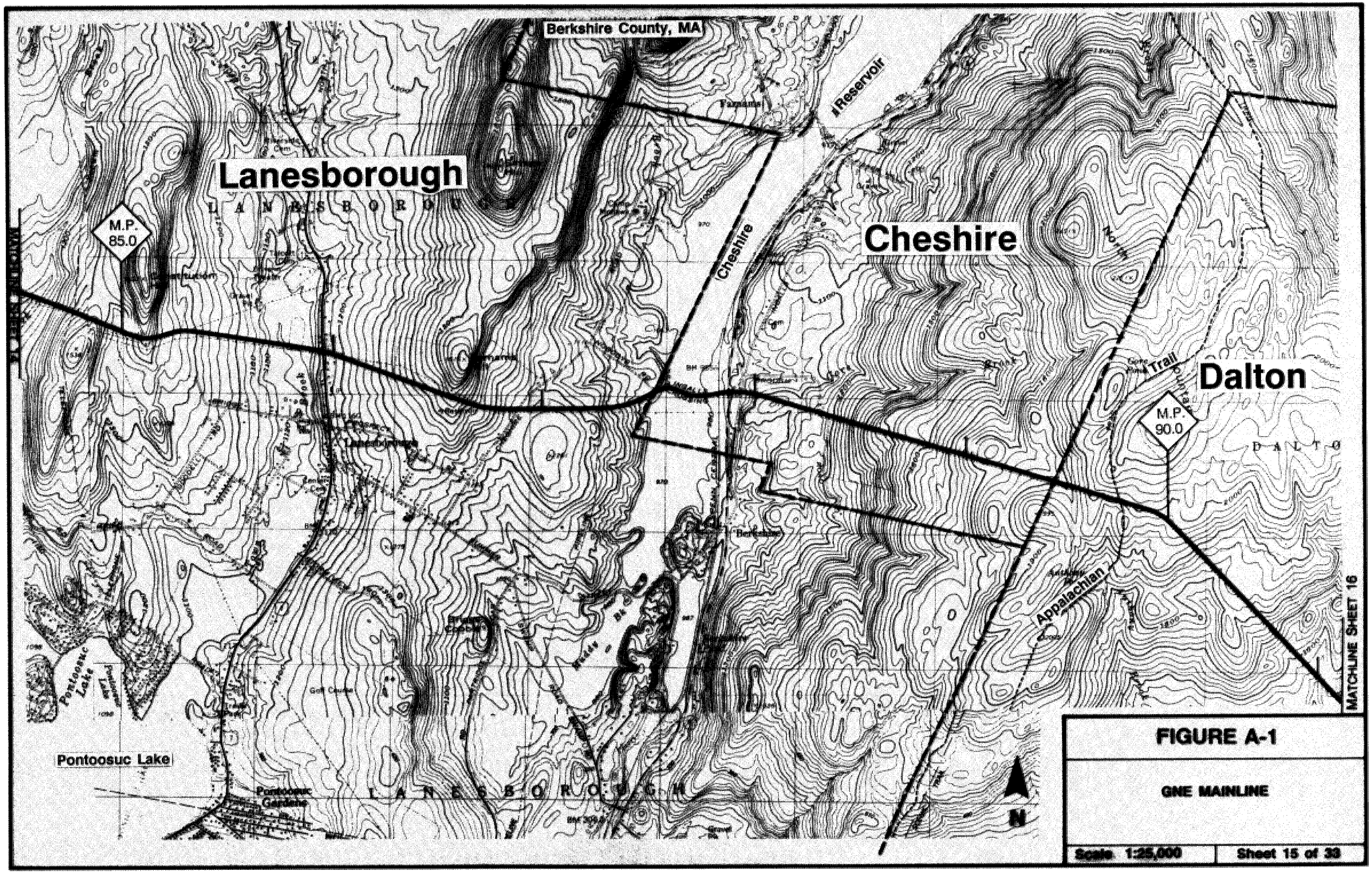


FIGURE A-1

GNE MAINLINE

Scale 1:25,000 | Sheet 15 of 33

Berkshire County, MA

Lanesborough

L A N E S B O R O U G H

Cheshire

C H E S H I R E

Dalton

D A L T O N

M.P. 85.0

M.P. 90.0

Reservoir

Trail

Appalachian

Pontoosuc Lake

Pontoosuc Gardens

Golf Course

Berkshire

MATCHLINE SHEET 16

N

FIGURE A-1

GNE MAINLINE

Scale 1:25,000 | Sheet 15 of 33

MATCHLINE SHEET 15

MATCHLINE SHEET 17

Berkshire County, MA

Windsor

Dalton

Windsor Reservoir

Cleveland Brook Reservoir

Hinsdale

Peru

M.P. 98.0

M.P. 95.0

Ashmere Lake

Camp Taconic

Camp Dantoc

PERU STATE WILDLIFE MANAGEMENT AREA

Barrett Hill

Substation

Trailer Park

Gravel Pit

St Patricks Cem

Hinsdale

Camp

FIGURE A-1

GNE MAINLINE

Scale 1:25,000 | Sheet 16 of 33

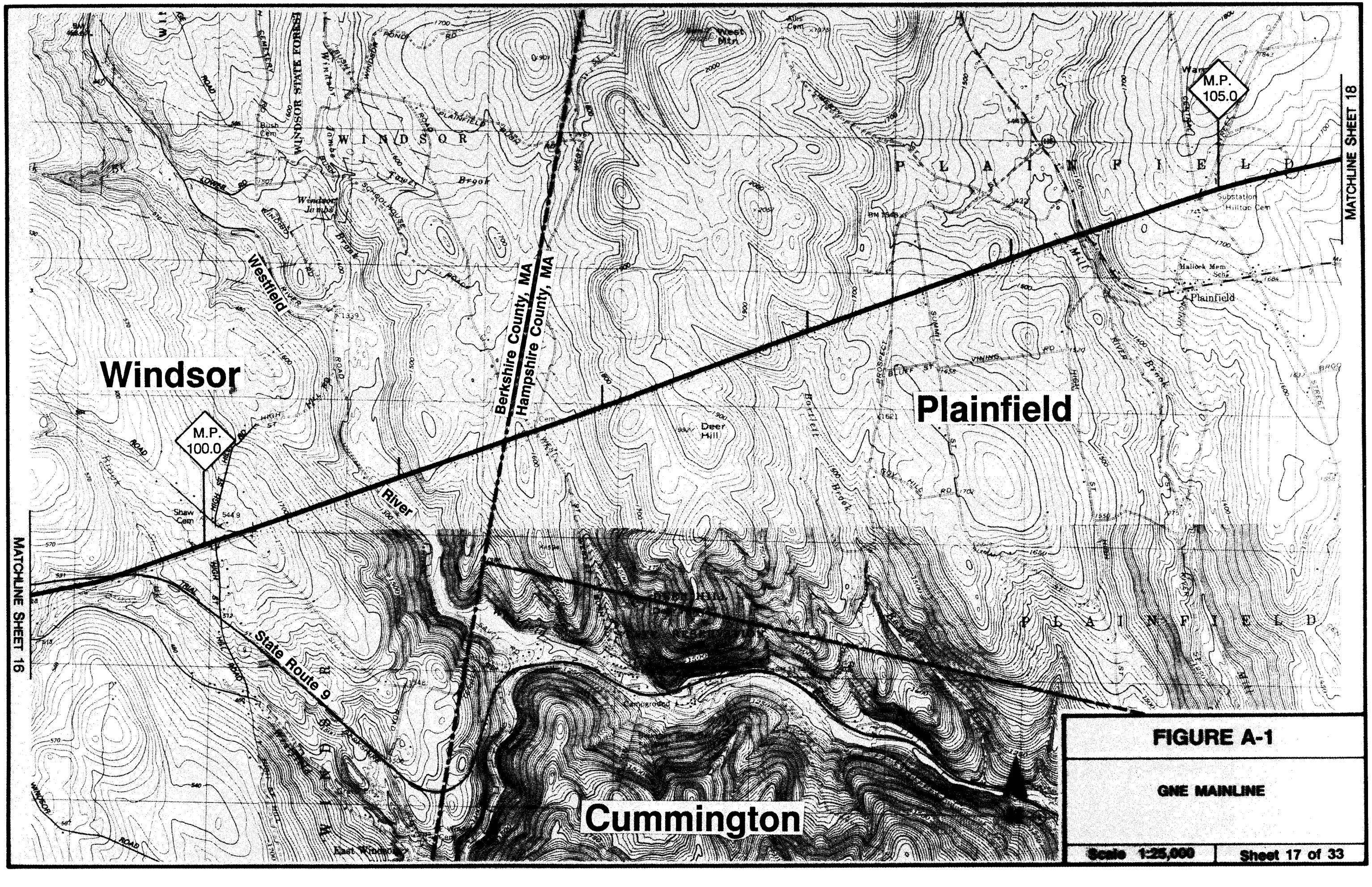


FIGURE A-1

GNE MAINLINE

Scale 1:25,000 | Sheet 17 of 33

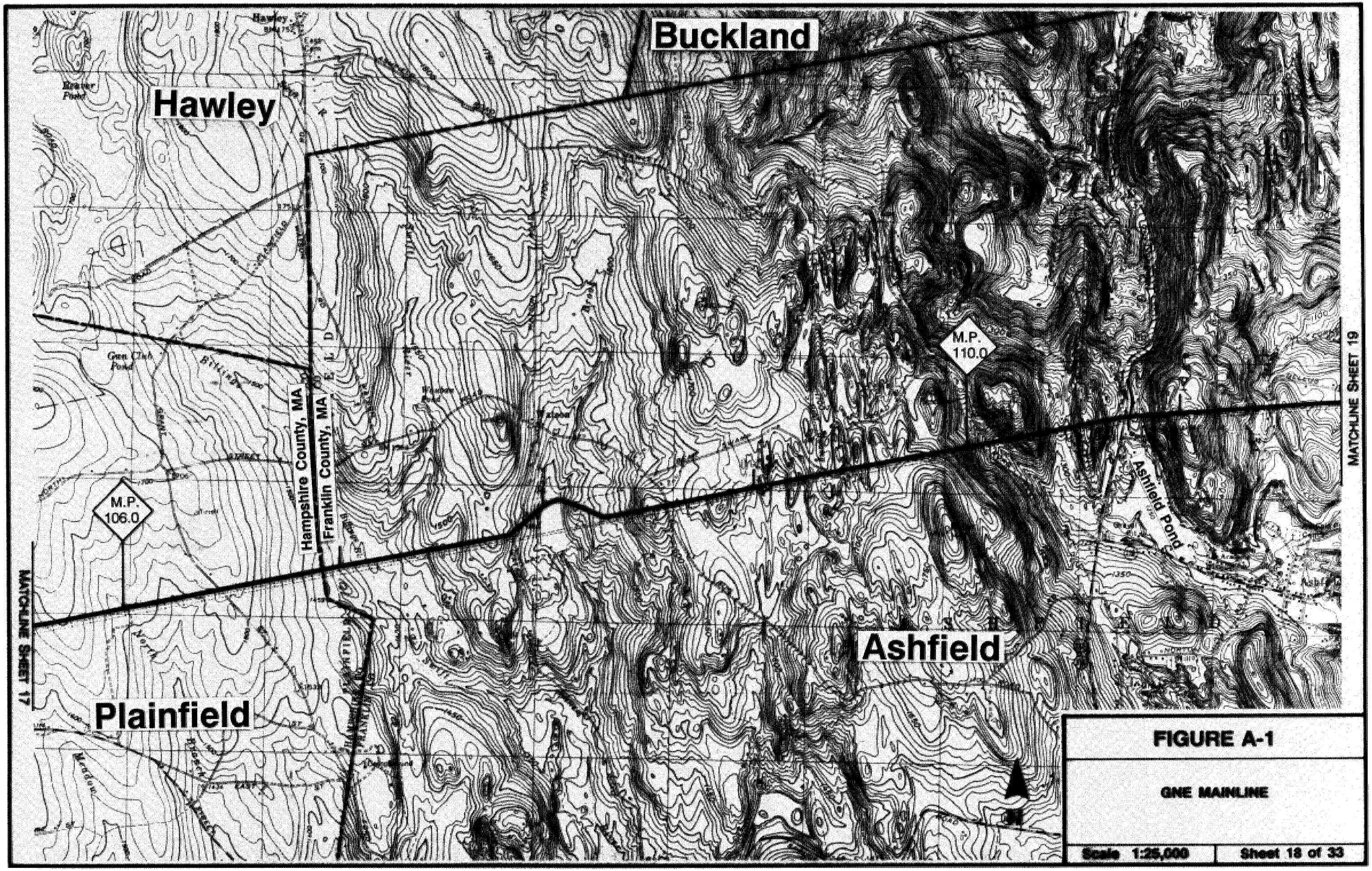


FIGURE A-1

GNE MAINLINE

Scale 1:25,000 | Sheet 18 of 33

Buckland

Franklin County, MA

Deerfield

South River
State Forest

River

M.P.
112.0

M.P.
115.0

MATCHLINE SHEET 18

MATCHLINE SHEET 20

Ashfield

Conway

N

FIGURE A-1

GNE MAINLINE

Scale 1:25,000 | Sheet 19 of 33

Franklin County, MA

MATCHLINE SHEET 19

Deerfield River

Interstate 91

M.P. 120.0

Conway

DEERFIELD River

Deerfield

South Meadows

Old Albany Rd

Deerfield

Deerfield

Connecticut River

Montague

M.P. 123.0

MATCHLINE SHEET 21

N

FIGURE A-1

GNE MAINLINE

Scale 1:25,000 | Sheet 20 of 38

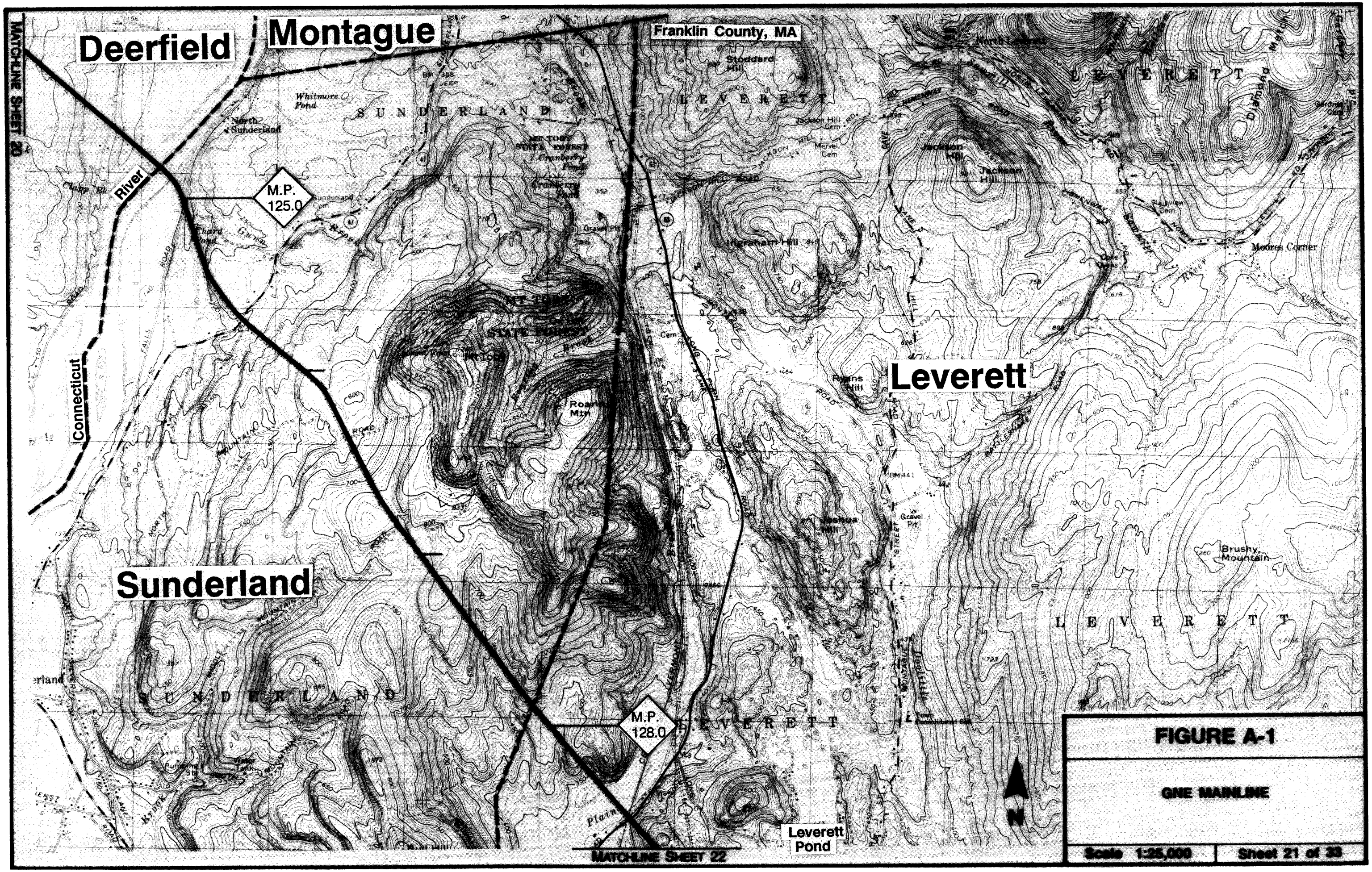


FIGURE A-1

GNE MAINLINE

Scale 1:25,000 | Sheet 21 of 33

MATCHLINE SHEET 21

Leverett Pond

M.P. 130.0

Leverett

Shutesbury

Franklin County, MA
Hampshire County, MA

Amherst

Pelham

M.P. 134.0

Franklin County, MA
Hampshire County, MA

N

MATCHLINE SHEET 23

FIGURE A-1

GNE MAINLINE

Scale 1:25,000 | Sheet 22 of 33

MATCHLINE SHEET 22

Hampshire County, MA

M.P. 135.0

Pelham

Amherst

West Pelham

Cadwell Memorial Forest

Belchertown

Knights Pond

M.P. 138.0

MATCHLINE SHEET 24

N

FIGURE A-1

GNE MAINLINE

Scale 1:25,000 | Sheet 23 of 39

MATCHLINE SHEET 23

Pelham

New Salem

Petersham

Worcester County, MA

Hampshire County, MA

Quabbin Reservoir

Quabbin Reservoir Reservation

M.P. 140.0

Belchertown

Hampshire County, MA

Franklin County, MA

FRANKLIN CO

HAMPSHIRE CO

Ware

Picnic Area

Richards Ledges

M.P. 142.0

MATCHLINE SHEET 25

FIGURE A-1

GNE MAINLINE

Scale 1:25,000 | Sheet 24 of 33

MATCHLINE SHEET 24

Hampshire County, MA

Quabbin Reservoir Reservation

Quabbin Reservoir

M.P. 145.0

M.P. 148.0

MATCHLINE SHEET 26

BELCHERTOWN

Belchertown

Ware

West Ware

Swift River

Beaver Lake

SPILLWAY ELEV 524

N

FIGURE A-1	
GNE MAINLINE	
Scale 1:25,000	Sheet 25 of 33

Hardwick

Worcester County, MA

Hampshire County, MA

New Braintree

M.P. 150.0

MATCHLINE SHEET 25

Ware

West Brookfield

Ware River

Hampshire County, MA

Worcester County, MA

M.P. 155.0

MATCHLINE SHEET 27

FIGURE A-1

GNE MAINLINE

Scale 1:25,000	Sheet 26 of 33

Worcester County, MA

M.P. 156.0

M.P. 160.0

MATCHLINE SHEET 28

MATCHLINE SHEET 28

West Brookfield

North Brookfield

Brookfield

Wickaboag Pond

Quabo River

FIGURE A-1

GNE MAINLINE

Scale 1:25,000 | Sheet 27 of 33

North Brookfield

Worcester County, MA

Leicester

Spencer

East Brookfield

M.P. 162.0

M.P. 165.0

Lake Lashaway

Burncoat Pond

Cedar Meadow Pond

Stiles Reservoir

MATCHLINE SHEET 27

MATCHLINE SHEET 29

FIGURE A-1

GNE MAINLINE

Scale 1:25,000 | Sheet 28 of 33

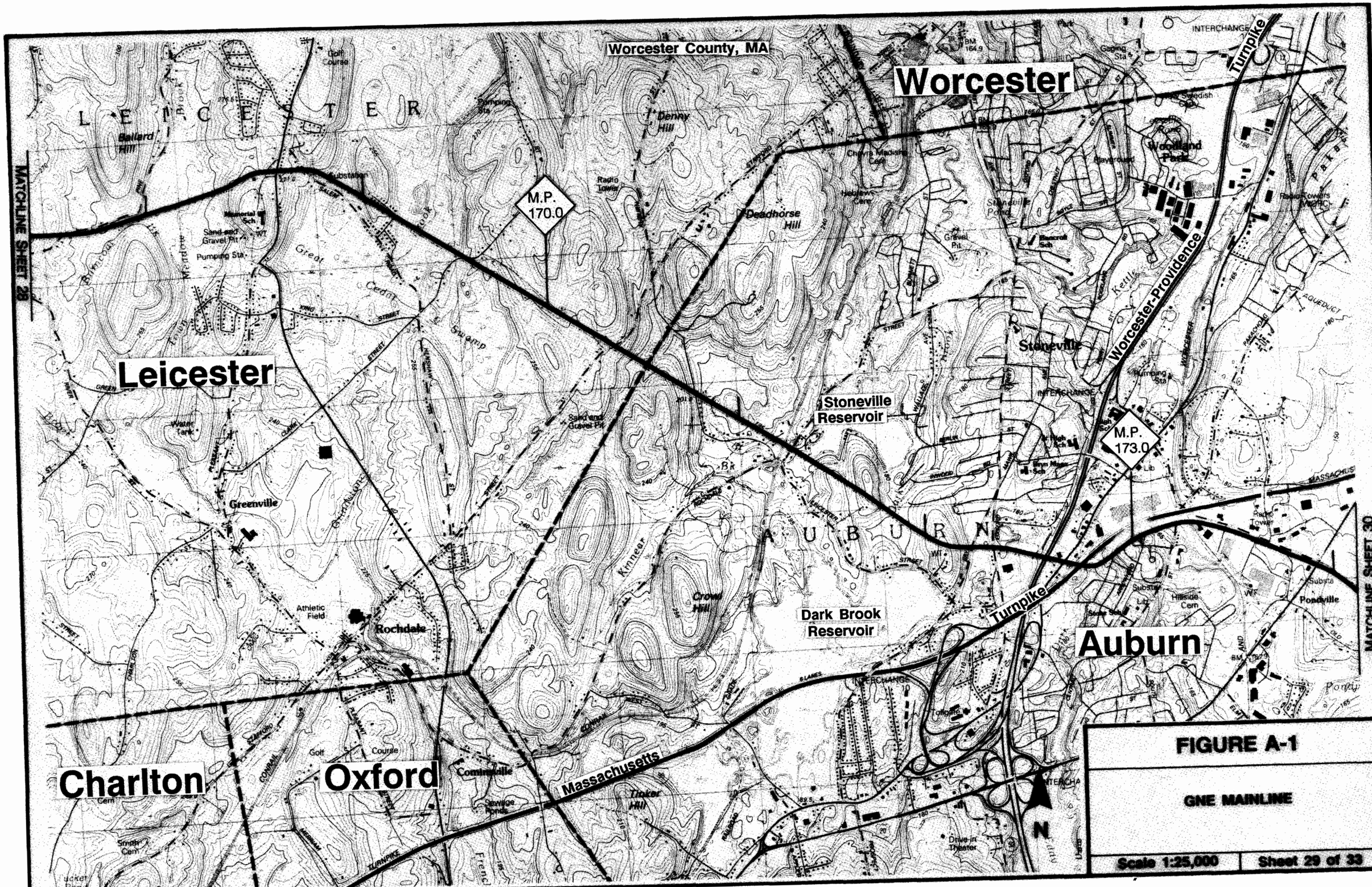


FIGURE A-1

GNE MAINLINE

Scale 1:25,000	Sheet 29 of 33

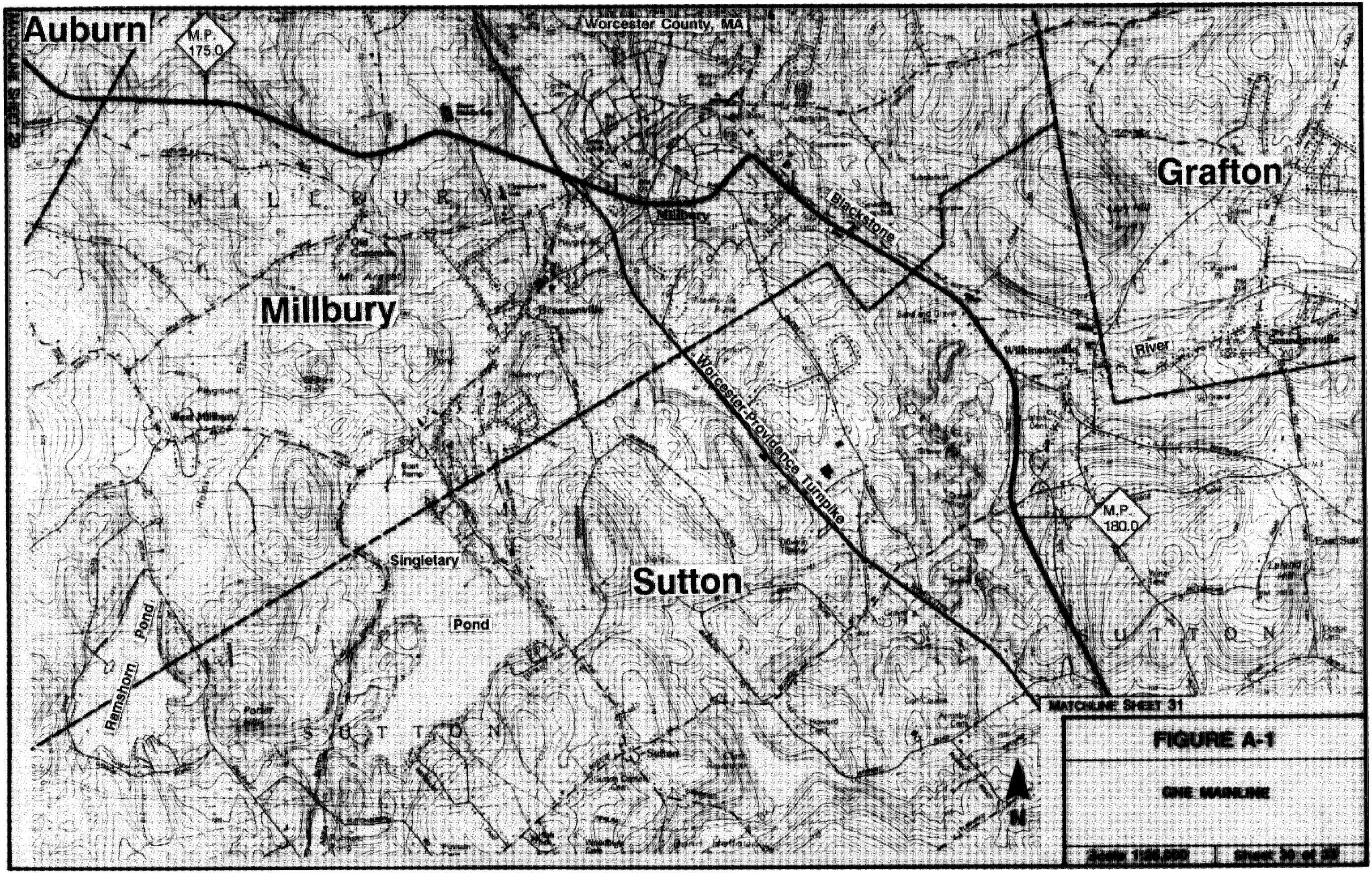


FIGURE A-1

GNE MAINLINE

Scale 1:20,000 | Sheet 30 of 35

MATCHLINE SHEET 30

Worcester County, MA

Blackstone

Upton

N O R T H B R I D G E

M.P. 182.0

Sutton State Forest

Sutton

Northbridge

River

Whitins Pond

M.P. 184.0

Uxbridge

MATCHLINE SHEET 32

FIGURE A-1

GNE MAINLINE

Scale 1:25,000 | Sheet 31 of 39

MATCHLINE SHEET 31

Sutton

Douglas

Uxbridge

Millville

Worcester County, MA

M.P. 186.0

M.P. 190.0

Worcester-Providence Turnpike

Blackstone River

MATCHLINE SHEET 33

FIGURE A-1

GNE MAINLINE

Scale 1:25,000 | Sheet 32 of 33

Worcester County, MA

Mendon

Uxbridge

Blackstone

Millville

M.P. 197.1

M.P. 195.0

MATCHLINE SHEET 32

N

FIGURE A-1

GNE MAINLINE

Scale 1:25,000 | Sheet 33 of 33

Lake Champlain

Franklin County, VT

Highgate

M.P. 0.0

M.P. 3.0

Limekin Point

Rock River

Phelps Bay

Goose Bay

Highgate Springs

Carman

Cutler Pond

Brook

COUNTY AIRPORT

MATCHLINE SHEET 2

N

FIGURE A-2

VGS LOOPS

Scale 1:24,000 | Sheet 1 of 3

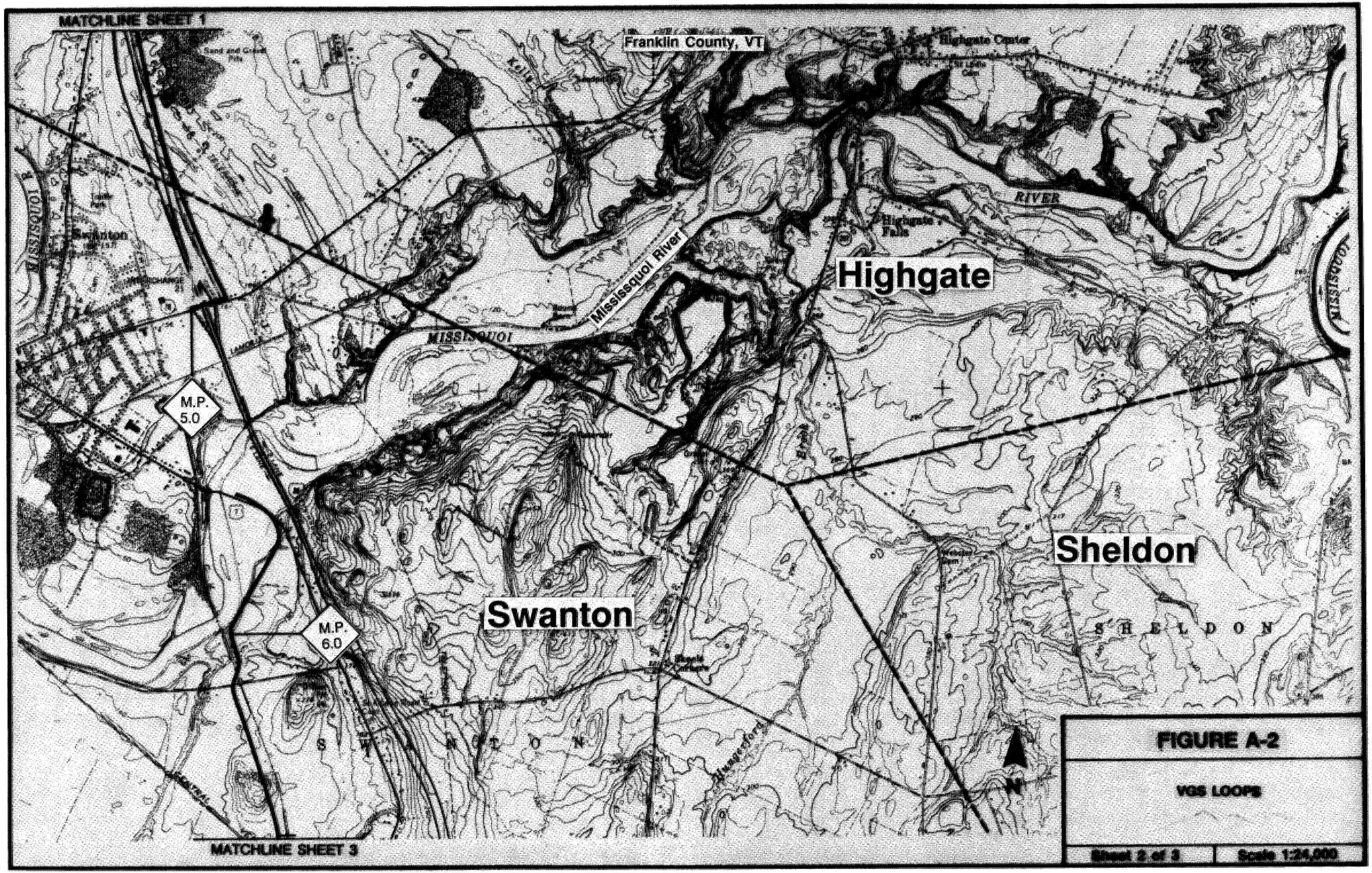


FIGURE A-2

VQS LOOPS

Sheet 2 of 3 | Scale 1:24,000

MATCHLINE SHEET 2

Franklin County, VT

Sheldon

M.P. 8.0

Swanton

S W A N T O N

M.P. 10.0

St. Albans

FIGURE A-2

VGS LOOPS

Scale 1:24,000

Sheet 3 of 3

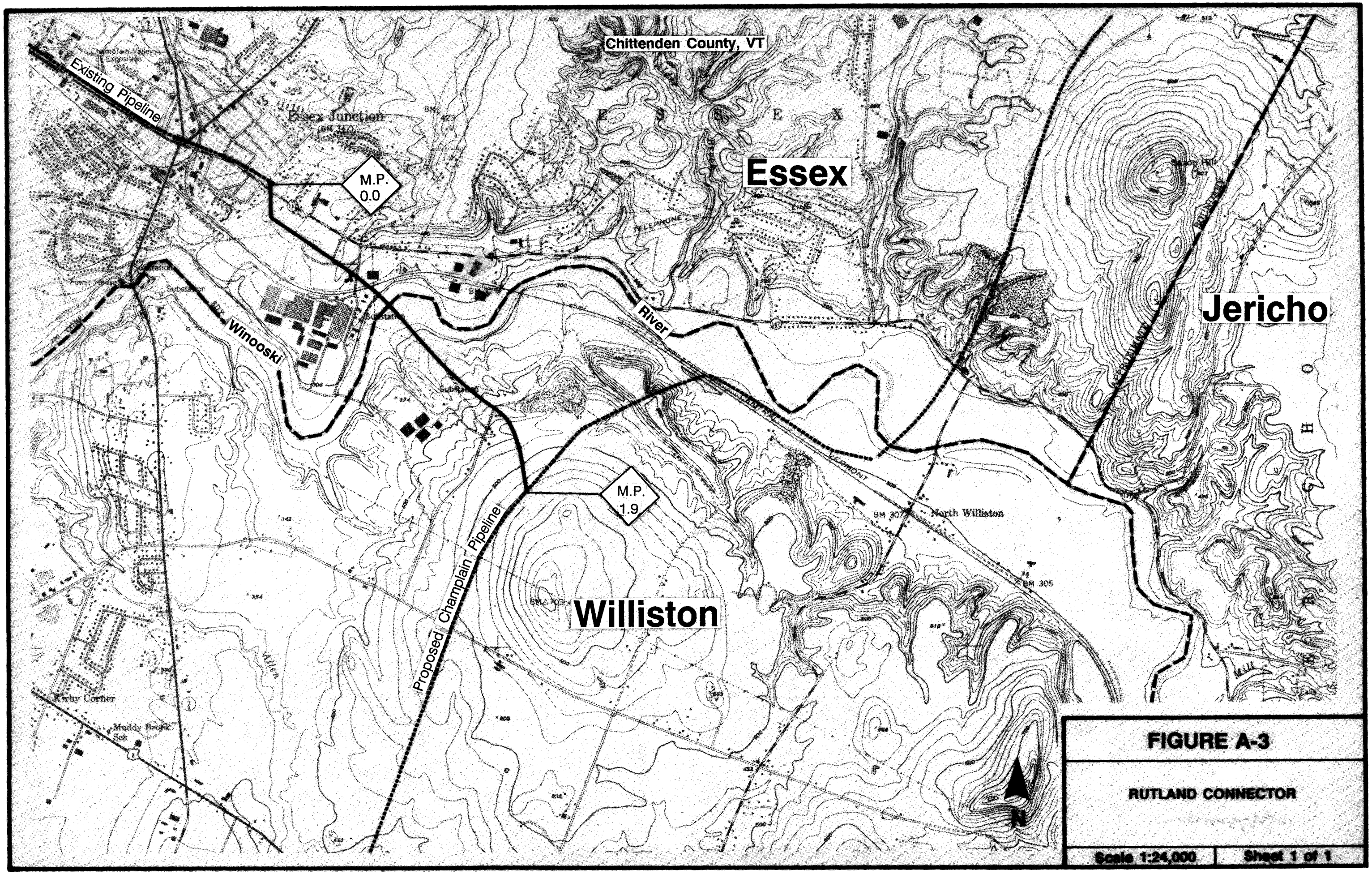


FIGURE A-3

RUTLAND CONNECTOR

Scale 1:24,000 | Sheet 1 of 1

Worcester County, MA

Grafton

Upton

Northbridge

Proposed Champlain Pipeline

Existing Pipeline

Existing Pipeline

Existing Pipeline

Existing Pipeline

Blackstone River

M.P. 0.0

M.P. 0.6

N

FIGURE A-4

EASTERN SERVICE BRANCH
SOUTH CONNECTOR

Scale 1:25,000 | Sheet 1 of 1

Worcester County, MA

Leominster

Lancaster

Sterling

Bolton

Proposed Champlain Pipeline Pelham Branch

Proposed Champlain Pipeline

Existing Pipeline

M.P. 0.0

M.P. 1.8

North Nashua River

Nashua River

Still River

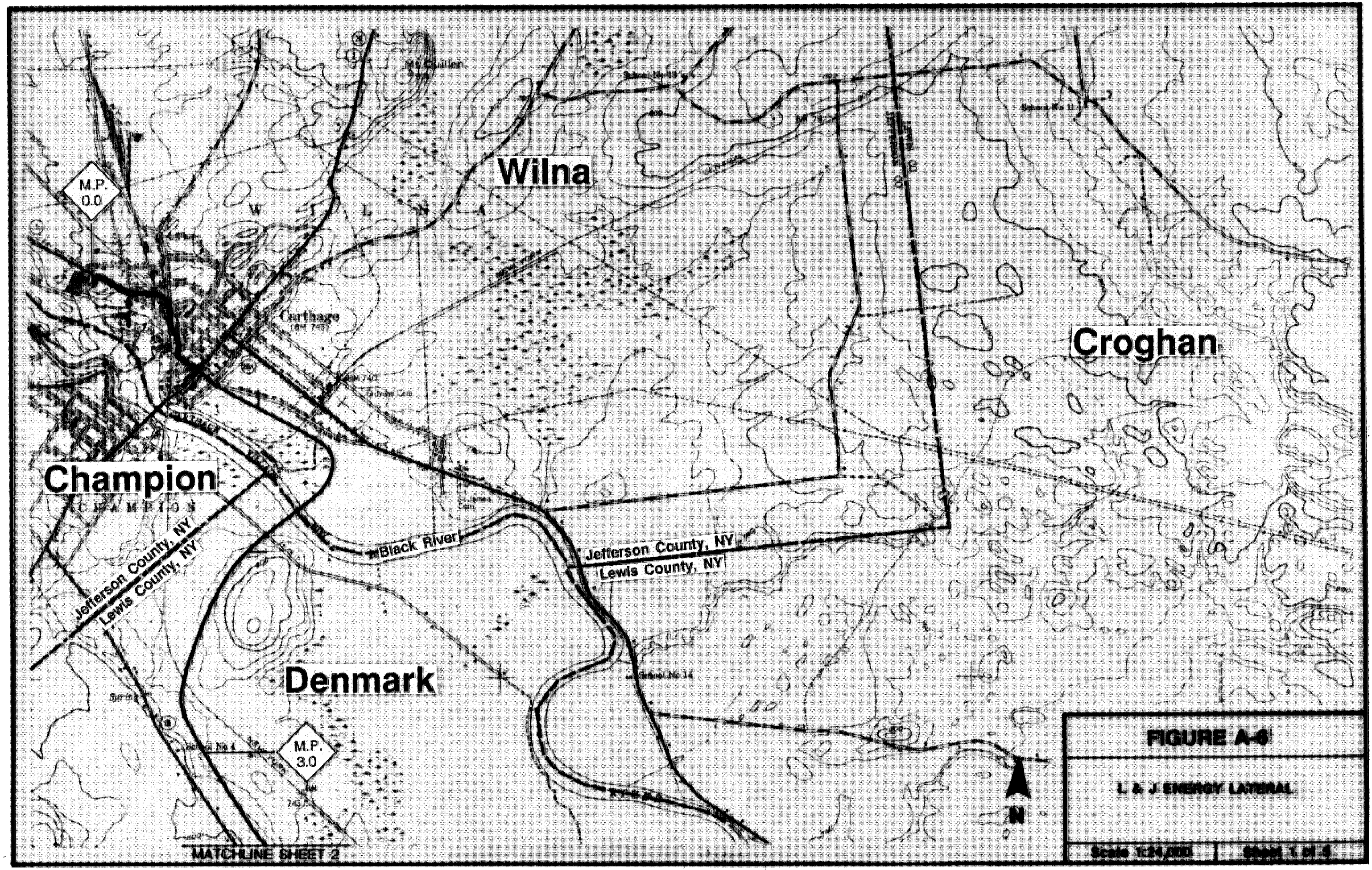
Nashua River

BOLTON FLATS WILDLIFE MANAGEMENT AREA

FIGURE A-5

EASTERN SERVICE BRANCH
NORTH CONNECTOR

Scale 1:24,000 | Sheet 1 of 1


Wilna
Croghan
Champion
Denmark
Carthage
(BM 743)
M.P.
0.0
M.P.
3.0
Black River
Jefferson County, NY
Lewis County, NY
Jefferson County, NY
Lewis County, NY
MATCHLINE SHEET 2
N
FIGURE A-6
L & J ENERGY LATERAL
Scale 1:24,000
Sheet 1 of 6

MATCHLINE SHEET 1

Lewis County, NY

C R O G H A N

Croghan

M.P. 5.0

Deer River

Deer River

Stillwater Cem.

Cameron Cemetery

Denmark

D E N M A R K

Stone

Denmark

M.P. 7.0

Black River

New York

MATCHLINE SHEET 3

N

FIGURE A-6

L & J ENERGY LATERAL

Scale 1:24,000 | Sheet 2 of 5

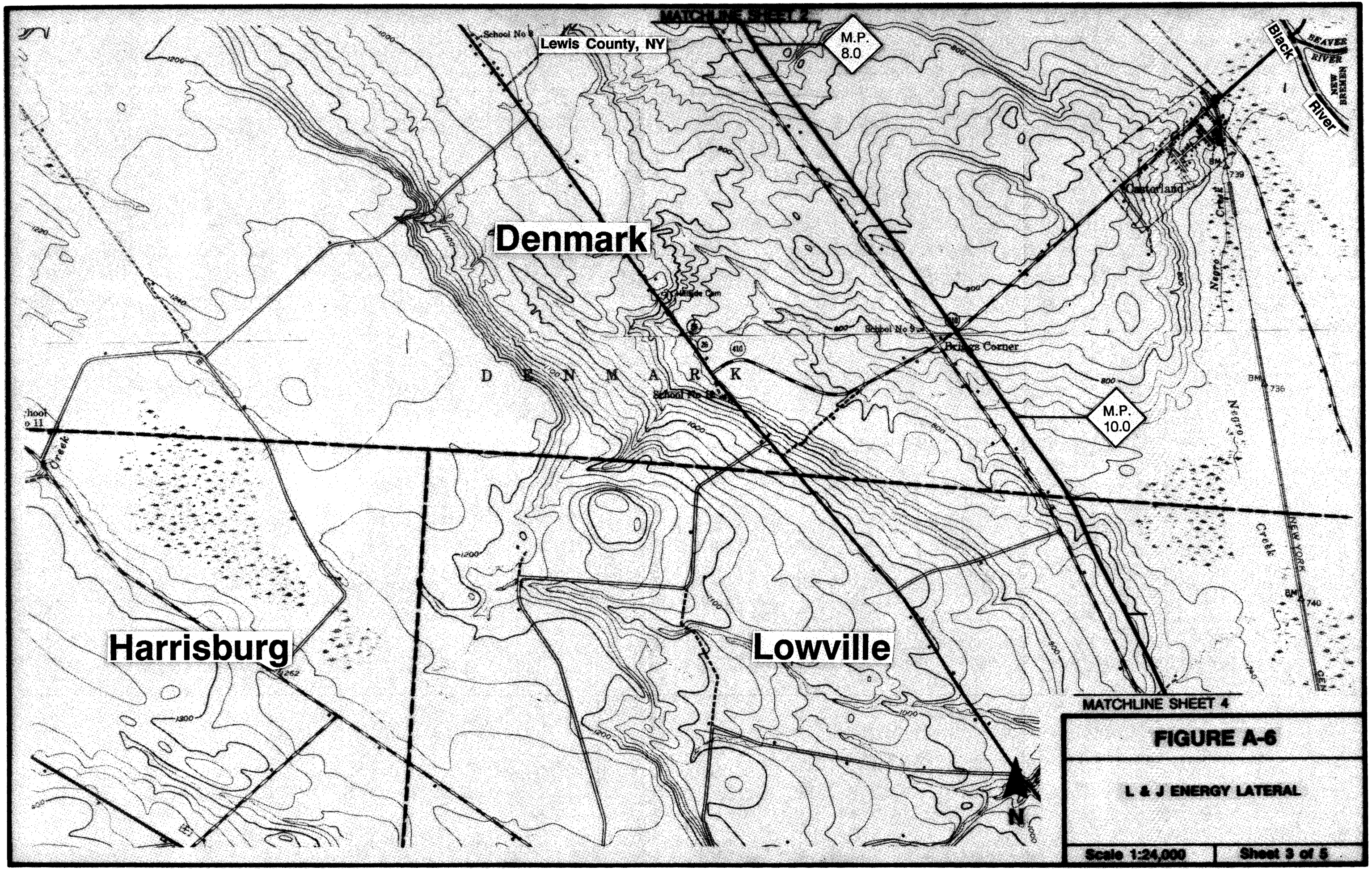


FIGURE A-6

L & J ENERGY LATERAL

Scale 1:24,000 | Sheet 3 of 5

MATCHLINE SHEET 3

Lewis County, NY

M.P. 12.0

Lowville

Black River

Crystal Creek

New Bremen

Watson

M.P. 15.0

MATCHLINE SHEET 5

FIGURE A-6

L & J ENERGY LATERAL

Scale 1:24,000 | Sheet 4 of 5

MATCHLINE SHEET 4

Lowville

Lowville

Lewis County, NY

Watson

Creek

Mill

M.P.
17.0

M.P.
17.2

Black

River

Martinsburg

M A R T I N S B U R G

N

FIGURE A-6

L. J ENERGY LATERAL

APPENDIX B

PERENNIAL WATER BODIES AND WETLANDS
CROSSED BY THE SINGLE PIPELINE ALTERNATIVES

TABLE B-1

Perennial Water Bodies Crossed by the Iroquois/GNE Single Pipeline Alternative

Applicant Segment/ State	Milepost a/	Water Body	State Water Quality Classification b/	Fishery Classification c/	Width of Crossing d/ (ft)
IROQUOIS					
Mainline/NY	0.00	St. Lawrence	A	C	3100
	3.20	Sucker Brook	C	C	20
	5.20	Little Sucker Brook	D		
	5.80	Little Sucker Brook	D		
	10.55	Brandy Brook	D	C	10
	14.55	Line Creek	D		10
	15.55	Grass River	B	C	100-200
	18.10	Grass River	B	C	150
	18.85	Unnamed stream into Upper and Lower Lakes State Wildlife Management Area	--		
	19.55	Unnamed stream into Upper and Lower Lakes State Wildlife Management Area	D		
	21.50	Church Brook	D		
	27.85	Elm Creek	C	C-S	
	30.10	Tanner Creek Trib.	--		
	33.85	Brandy Brook	--		
	35.25	Tanner Creek Trib.	--		
	35.50	Tanner Creek Trib.	--		
	36.35	Tanner Creek Trib.	--		
	37.25	Unnamed	--		
	37.35	Unnamed	--		
	38.05	Unnamed	--		
	38.25	Unnamed	--		
	38.55	Unnamed	--		
	38.60	Unnamed	--		
	38.85	Unnamed	--		
	39.45	Unnamed	--		
	40.10	Unnamed	--		
	40.25	Unnamed	--		
	40.60	Oswegatchie River Trib.	D		
	41.35	Oswegatchie River	C	C	200
	42.80	Pork Creek	D		10
	43.00	Pork Creek Trib.	D		
	43.40	Pork Creek Trib.	D		

TABLE B-1 (cont'd)

Applicant Segment/ State	Milepost a/	Water Body	State Water Quality Classification b/	Fishery Classification c/	Width of Crossing d/ (ft)
Mainline/NY	43.95	W. Branch Oswegatchie River Trib.	D		
(cont'd)	44.75	W. Branch Oswegatchie River Trib.	D		2
	45.10	W. Branch Oswegatchie River Trib.	C(T)		2
	45.30	W. Branch Oswegatchie River Trib.	C(T)		
	45.65	W. Branch Oswegatchie River Trib.	C(T)		
	46.55	Bennett Brook	C(T)		5
	48.25	W. Branch Oswegatchie River	C		100
	49.10	W. Branch Oswegatchie River Trib.	C(T)		3
	50.30	Black Creek Trib.	C(T)		3
	50.90	Black Creek	C(T)		2
	51.25	Clear Creek	C(T,S)	C	5
	51.80	W. Branch Oswegatchie River Trib.	C(T)		
	52.50	W. Branch Oswegatchie River Trib.	D		
	53.55	W. Branch Oswegatchie River Trib.	D		
	54.50	W. Branch Oswegatchie River Trib.	D		
	60.95	Hogsback Creek Trib.	D		
	61.40	Hogsback Creek	C(T)		
	61.95	Blanchard Creek Trib.	D		
	63.00	Blanchard Creek Trib.	D		
	63.30	Blanchard Creek Trib.	D		
	63.70	Blanchard Creek	C(T)		
	65.05	Indian River	C(T)	C	2
	66.05	Black Ash Swamp Trib.	D		
	66.25	Black Ash Swamp Trib.	D		
	66.60	Weatherhead Creek	C(T)		
	66.95	Indian River Trib.	C(T)		
	68.75	Pine Creek	C(T)		3
	70.70	Alder Creek	D		
	71.20	Indian River Trib.	D		
	71.60	Indian River Trib.	C(T)		
	72.10	Indian River Trib.	C(T)		
	74.50	Indian River Trib.	D		
	75.65	Balsam Creek	C(T)		5
	76.80	Beaver River	C(T)	C	
	78.25	Murmur Creek Trib.	C(T,S)		
	79.55	Murmur Creek	C(T)	C	15
	80.75	Black Creek	C(T)	C	9.5

TABLE B-1 (cont'd)

Applicant Segment/ State	Milepost a/	Water Body	State Water Quality Classification b/	Fishery Classification c/	Width of Crossing d/ (ft)
Mainline/NY	81.25	Black Creek Trib.	C(T,S)		1
(cont'd)	82.10	Black Creek Trib.	D		
	83.70	Crystal Creek Trib.	D		
	84.40	Crystal Creek	C(T)	C	25
	84.70	South Branch Creek	C(T)		
	87.00	Harvey Creek	C(T)		3
	88.85	Black River Trib.	C(T)		6
	89.80	Independence River Trib.	C(T,S)		7
	91.05	Independence River	C(T)	C-S	54
	92.10	Otter Creek	C(T)	C-S	20-40
	93.95	Black River Trib.	C(T)	C-S	6
	94.75	Black River	C	C	
	95.05	Douglass Creek	C(T)		10
	96.00	Black River Trib.	C(T)		2-
	97.00	Black River Trib.	C(T)		2-5
	98.25	Mill Creek	C(T)		4
	99.05	Black River Trib.	C(T)		2
	103.15	Black River Trib.	C(T)		3
	106.45	Sugar River	C(T)	C-S,	40
	108.35	Hill Creek	D	C	15-20
	108.70	Black River Canal	D		
	111.35	West Kent Creek	C(T)	C	13
	112.10	Kent Creek Trib.	C(T)		
	112.40	Kent Creek Trib.	C(T)		
	113.05	East Kent Creek	C(T,S)	C	15
	114.85	Black River Canal Feeder Trib.	C(T)		
	115.30	Alder Pond Trib.	C(T)		12
	115.60	Alder Creek	C(T,S)	C	
	116.25	Kayuta Lake (Black River) Trib.	D		
	116.30	Kayuta Lake (Black River) Trib.	D		
	116.65	Kayuta Lake (Black River) Trib.	D		
	117.60	Black River Trib.	D		
	118.00	Black River Trib.	D		
	118.40	Black River Trib.	D		
	118.85	Black River Trib.	D		4
	122.55	Frank Jones Brook	C(T)		20
	123.10	Cady Brook	D	C	5

TABLE B-1 (cont'd)

Applicant Segment/ State	Milepost a/	Water Body	State Water Quality Classification b/	Fishery Classification c/	Width of Crossing d/ (ft)
Mainline/NY	124.70	Cady Brook Trib.	D		
(cont'd)	125.60	West Canada Creek	C(T)	C	45
	125.65	West Canada Creek Trib.	C(T)		6
	127.10	West Canada Creek Trib.	D		
	127.45	West Canada Creek Trib.	C(T)		4
	129.35	Mill Creek	C(T)		5
	129.70	West Canada Creek Trib.	C(T,S)		3
	130.35	West Canada Creek Trib.	D		
	130.65	West Canada Creek Trib.	D		
	131.20	West Canada Creek Trib.	D		
	131.45	West Canada Creek Trib.	D		
	131.65	West Canada Creek Trib.	D		
	131.75	West Canada Creek Trib.	D		
	132.10	West Canada Creek Trib.	D		
	132.55	West Canada Creek Trib.	C		
	132.75	Cold Brook	C(T)		
	133.05	Cold Brook Trib.	C(T)		
	133.25	Cold Brook Trib.	C		
	133.35	Cold Brook Trib.	C		
	135.60	Hurricane Brook Trib.	--		
	136.20	Hurricane Brook	C(T,S)	C-S	
	136.55	Hurricane Brook Trib.	C(T,S)	C-S	
	136.80	Factory Brook Trib.	C(T,S)	C	
	137.10	Factory Brook Trib.	D		
	137.60	Factory Brook	C(T,S)	C	5
	138.15	Big Bill Brook Trib.	C(T)	C	4
	138.50	Big Bill Brook Trib.	C(T)	C	6
	139.05	Big Bill Brook	C(T,S)	C	12
	139.10	Big Bill Brook	C(T,S)	C	10
	139.15	Big Bill Brook	C(T,S)	C	12
	140.10	Wolf Hollow Creek	C(T,S)	C	1
	143.70	Beaver Creek Trib.	AA(T)	C	
	144.05	Beaver Creek Trib.	AA		
	144.45	Ransom Creek Trib.	D		
	145.05	Ransom Creek Trib.	D		
	145.60	Ransom Creek Trib.	C(T)	C	12
	146.25	Ransom Creek Trib.	D		

TABLE B-1 (cont'd)

Applicant Segment/ State	Milepost a/	Water Body	State Water Quality Classification b/	Fishery Classification c/	Width of Crossing d/ (ft)
Mainline/NY	146.70	Ransom Creek Trib.	D		
(cont'd)	148.25	Crum Creek Trib.	--		
	150.15	Crum Creek	C(T)	C	7
	150.35	Crum Creek Trib.	D		
	151.45	Crum Creek Trib.	D		
	151.60	Mohawk River Trib.	D		
	151.95	Mohawk River Trib.	C		
	154.20	Mohawk River	C	C,W	200
	154.45	Mohawk River Trib.	D		
	154.50	Mohawk River Trib.	D		
	154.70	Mohawk River Trib.	D		
	154.85	Mohawk River Trib.	D		
	155.65	Mowadaga Creek	C		40
	157.70	Mowadaga Creek Trib.	D		
	158.35	Otsquago Creek Trib.	D		
	159.20	Otsquago Creek Trib.	D		
	161.30	Otsquago Creek	C(T)	C-S	
	162.35	Otsquago Creek Trib.	D		
	162.80	Otsquago Creek Trib.	D		
	163.35	Otsquago Creek Trib.	D		
	164.00	Otsquago Creek Trib.	D		
	165.35	Otsquago Creek Trib.	D		
	166.00	Otsquago Creek Trib.	D		
	166.60	Otsquago Creek Trib.	D		
	169.75	Canajoharie Creek Trib.	D		
	170.50	Canajoharie Creek Trib.	D		
	170.80	Canajoharie Creek Trib.	C	C-S	
GREATER NORTHEAST					
Mainline/NY	1.1	Canajahorie Trib.	D		
	1.6	Canajahorie Trib.	D		
	2.8	Flat Creek	C		40
	3.1	Flat Creek Trib.	D		10
	3.3	Flat Creek Trib.	D		
	3.6	Flat Creek Trib.	D		
	4.0	Flat Creek Trib.	D		
	5.2	Lasher Creek Trib.	D		
	6.3	Lasher Creek Trib.	D		

TABLE B-1 (cont'd)

Applicant Segment/ State	Milepost a/	Water Body	State Water Quality Classification b/	Fishery Classification c/	Width of Crossing d/ (ft)
Mainline/NY	7.3	Yatesville Creek Trib.	C		<5
(cont'd)	7.6	Yatesville Creek Trib.	D		
	9.9	Unnamed stream	D		10
	10.7	Unnamed stream	D		<5
	11.1	Unnamed stream	D		<5
	12.8	Unnamed stream	D		15
	13.2	Unnamed stream	D		<5
	14.6	Schoharie Creek Trib.	D		<5
	16.2	Schoharie Creek Trib.	D		50
	16.5	Schoharie Creek	C	W	150-200
	20.2	S. Chuctanunda Creek	C	C	30
	25.2	Un. strm. to Mariaville Lake	C		<5
	26.5	Plotter Kill Trib.	D		
	28.4	Plotter Kill	D		15
	30.0	Poentic Kill Trib.	D		
	30.8	Poentic Kill Trib.	D		<5
	31.4	Poentic Kill Trib.	D		<5
	31.45	Poentic Kill	B		15
	33.2	Becker Brook Trib.	D	C	<10
	33.5	Becker Brook Trib.	C(T)	C	<10
	34.4	Normans Kill Trib.	D		20
	34.5	Normans Kill	A		50
	35.3	Normans Kill Trib.	D		
	35.6	Indian House Creek	D		10
	36.4	Bozen Kill Trib.	D		10
	36.7	Bozen Kill Trib.	D		<5
	38.9	Bozen Kill	C		15
	42.0	Black Creek Trib.	C		
	43.4	Black Creek	C		25
	44.5	Vly Creek Trib.	D		
	44.7	Vly Creek Trib.	D		
	45.0	Vly Creek Trib.	D		
	45.2	Vly Creek Trib.	D		
	45.8	Vly Creek	C(T)	C	125
	46.6	Normans Kill Trib.	C		<5
	47.8	Normans Kill Trib.	C		15
	47.9	Unnamed	C		

TABLE B-1 (cont'd)

Applicant Segment/ State	Milepost a/	Water Body	State Water Quality Classification b/	Fishery Classification c/	Width of Crossing d/ (ft)
Mainline/NY	49.5	Normans Kill Trib.	D		
(cont'd)	49.7	Normans Kill	B	W	35
	50.5	Normans Kill	B	W	40
	50.8	Normans Kill	B	W	40
	51.0	Normans Kill	B	W	50
	51.3	Normans Kill	B	W	50
	52.3	Normans Kill	B	W	50
	53.7	Normans Kill Trib.	D		
	54.6	Island Creek Trib.	D		
	54.9	Island Creek Trib.	D		
	55.8	Hudson River	C	W,A	1,000
	56.3	Papscanee Creek	C		
	56.4	Unnamed stream	D		
	56.45	Papscanee Creek Trib.	D		
	56.6	Papscanee Creek Trib.	D		
	56.7	Papscanee Creek Trib.	D		
	57.8	Papscanec Creek Trib.	C(T)	C	<5
	58.6	Mill Creek Trib.	D		
	59.0	Mill Creek Trib.	D		
	60.7	Mill Creek Trib.	D		
	62.0	Mill Creek Trib.	D		
	62.8	Mill Creek Trib.	D		
	63.8	North Branch Moordener Kill Trib.	C(T)	C	<5
	64.5	North Branch Moordener Kill	D		<5
	64.8	North Branch Moordener Kill	C		<5
	65.9	Wynants Kill Trib.	D		
	65.95	Wynants Kill Trib.	D		
	66.6	Unnamed pond	--		
	67.2	Wynants Kill Trib.	--		
	67.4	Burden Lake	B	W	700
	71.4	Tackawasick Trib.	D		
	71.6	Tackawasick Trib.	D		
	72.1	Tackawasick Creek	C(TS)	C	10
	72.5	Tackawasick Trib.	C(T)	C	<10
	73.8	Roaring Brook	B		
	74.95	Roaring Brook Trib.	--		
	76.0	Black River	C(TS)	C	15

TABLE B-1 (cont'd)

Applicant Segment/ State	Milepost a/	Water Body	State Water Quality Classification b/	Fishery Classification c/	Width of Crossing d/ (ft)
Mainline/NY	76.8	Kinderhook Creek Trib.	C(T)	C	<10
(cont'd)	77.8	Kinderhook Creek Trib.	C(T)	C	<10
	77.85	Kinderhook Creek Trib.	C(T)	C	<10
	77.9	West Brook	C(TS)	C	10
	78.1	East Brook	C(TS)	C	15
	79.2	East Creek	D		
	79.8	East Creek	D		
Mainline/MA	80.6	Kinderhook Creek	B	C-S	20
	82.1	Unnamed stream	B		
	82.7	Unnamed pond	B		
	82.8	Hollow Brook Trib.	B		
	83.2	Hollow Brook Trib.	B		
	83.6	Hollow Brook	B	C	10
	84.5	Secum Brook	B	C-S	2-8
	85.8	Town Brook	B	C-S	15
	87.6	Cheshire Reservoir	B	W-S	900
	90.3	Anthony Brook Trib.	B	C	<10
	91.0	Waconah Falls Trib.	B		
	92.3	Waconah Falls Brook	C	C	5-10
	92.4	Waconah Falls Brook	B	C	5-10
	95	Cady Brook	A	C	10
	98.5	Westfield Brook	B	C	30
	98.9	Westfield Brook Trib.	B	C	<10
	99.3	Westfield Brook Trib.	B		
	99.7	Shaw Brook	B	C-S	5-8
	100.9	Westfield River	B	C	30
	101.4	Westfield Trib.	B		
	102.7	Bartlett Brook Trib.	B	C	5-10
	102.9	Bartlett Brook	B	C	10
	104.3	Mill Brook	B	C-S	15
	105.5	Meadow Brook	B	C-S	10
	105.9	North Branch Swift River	B	C-S	10
	107.1	Unnamed pond	B		
	108.1	Ford Pond Trib.	B	C	10
	110.1	Ashfield Pond Trib.	B		
	112.4	Bear River	B	C-S	10
	112.5	Bear River	B	C-S	15

TABLE B-1 (cont'd)

Applicant Segment/ State	Milepost a/	Water Body	State Water Quality Classification b/	Fishery Classification c/	Width of Crossing d/ (ft)
Mainline/MA	113.1	Bear River	B	C-S	15
(cont'd)	113.3	Bear River	B	C-S	15-25
	114.6	Prakes Brook	B		
	114.8	Pea Brook	B	C	3-5
	115.1	Pea Brook Trib.	B		
	116.5	South River Trib.	B		
	116.8	Deerfield River Trib.	B		5-10
	116.9	Deerfield River Trib.	B		5-10
	117.4	Deerfield River Trib.	B		5-10
	117.8	Unnamed Deerfield Trib.	B		
	118.3	Unnamed Deerfield Trib.	B		
	118.6	South River	B	C-S	<5
	119.2	Unnamed Deerfield Trib.	B		
	119.6	Unnamed Deerfield Trib.	B		
	119.9	Unnamed Deerfield Trib.	B		
	121.9	Eastern Branch Deerfield Trib.	B		
	122.3	Fuller Swamp Brook	B	C	<5
	122.7	Fuller Swamp Brook	B	C	<5
	123.1	Bloody Brook	B		
	123.5	Clapp Brook	B		
	123.7	Clapp Brook	B		
	124.8	Connecticut River	B	W,A	700
	125.1	Chard Pond	B		200
	125.6	Unnamed trib. to Chard Pond	B		
	125.9	Unnamed trib. to Chard Pond	B		
	127.5	Long Plain Brook Trib.	B		
	127.6	Long Plain Brook Trib.	B		
	128.1	Long Plain Brook Trib.	B		
	128.3	Long Plain Brook Trib.	B		
	128.5	Long Plain Brook	B		
	129.1	Unnamed stream to swamp	B		
	130.5	Doolittle Brook	B	C-S	10
	131.1	Roaring Brook	A	C-S	10
	132.2	Nurse Brook	A		
	132.5	Nurse Brook Trib.	A	C-S	5-10
	133.0	Dean Brook	A	C-S	5-10
	134.3	Buffum Brook	B		

TABLE B-1 (cont'd)

Applicant Segment/ State	Milepost a/	Water Body	State Water Quality Classification b/	Fishery Classification c/	Width of Crossing d/ (ft)
Mainline/MA	135.3	Amethyst Brook	A	C-S	5-10
(cont'd)	136.0	Dunlop Brook	A		6
	137.6	North Branch Knights Pond Trib.	A		
	137.8	North Branch Knights Pond Trib.	A		
	139.1	Cadwell Creek	A		
	139.2	Cadwell Creek	A		
	139.4	Unnamed trib. to Cadwell Creek	A		
	141.2	Unnamed trib. to Quabbin Res	A		
	142.5	Jabish Brook Trib.	B		
	142.6	Jabish Brook Trib.	B		
	142.9	Jabish Brook Trib.	B		
	143.2	Jabish Brook Trib.	B		
	144.4	Unnamed stream	B		
	145.8	Swift River	B	C-S	150
	145.9	Swift River Trib.	B		
	147.4	Peppers Mill Pond Trib.	B		
	148.0	Peppers Mill Pond	B		300
	149.0	Flat Brook Trib.	B	C	5
	149.5	Flat Brook	B	C-S	5-8
	151.1	Muddy Brook	B	C-S	10-15
	151.2	Unnamed stream	B		
	151.8	Unnamed stream	B		
	152.1	Ware River Trib.	B		
	152.3	Ware River Trib.	B		
	152.5	Ware River	B	W	80
	152.9	Ware River Trib.	B		
	154.0	Un. strm. to Brookhaven Lake	B		
	154.4	Lamberton Brook	B	C-S	10
	154.6	Lamberton Brook Trib.	B		
	155.5	Mill Brook	B	C-S	10-15
	156.1	Sucker Brook	B	C-S	10-15
	157.5	Unnamed stream	B		
	158.3	Coys Brook	B	C-S	15-20
	158.5	Coys Brook Trib.	B	C-S	10-15
	159.9	Forget-Me-Not Brook	B		<5
	160.1	Dunn Brook	B	C	<5
	160.9	Perry Pond Trib.	B	C	<5

TABLE B-1 (cont'd)

Applicant Segment/ State	Milepost a/	Water Body	State Water Quality Classification b/	Fishery Classification c/	Width of Crossing d/ (ft)
Mainline/MA	161.1	Perry Pond Trib.	B		<5
(cont'd)	161.7	Fivemile River	B	C	20
	162.1	Gravel pit pond	B		
	162.2	Lake Lashaway Trib.	B		<5
	163.2	Sevenmile River	B	C-S	8-10
	163.3	Unnamed pond	B		
	163.8	Unnamed stream	B		
	164.5	Unnamed pond	B		<20
	164.9	Cranberry River Trib.	B		<3
	165.1	Unnamed stream	B		<5
	167.3	Cedar Meadow Pond Trib.	B		10-15
	167.8	Burncoat Brook Trib.	B	C	3
	167.9	Burncoat Brook	B	C	<5
	168.0	Burncoat Brook	B	C	<5
	168.1	Town Meadow Brook	B	C	10
	169.3	Grindstone Brook	A		
	170.9	Chapin Brook	B		10
	171.4	W. Branch Trib. to Stoneville Res.	B		5-10
	171.45	E. Branch Trib. to Stoneville Res.	B		<5
	171.9	Dark Brook	B		<5
	172.6	Dark Brook	B		<5
	173.3	Dark Brook	B		<5
	174.7	Blackstone River Trib.	B	W	
	175.5	Blackstone River Trib.	B		
	176.6	Pond Trib.	B		
	176.7	Unnamed lake	B		<30
	176.8	Unnamed lake	B		<30
	177.1	Singletary Brook	B		<5
	177.2	Singletary Brook Trib.	B		
	178	Slaughterhouse Pond Trib.	B		
	179.2	Fish Hatchery stream	B		
	179.3	Spring Brook	B	C	10
	183.3	Purgatory Brook	B	C	5-10
	183.6	Cook Allen Brook	B	C	5-10
	185.6	Lackey Pond	B		500
	187.8	Cold Spring Brook Trib.	B		
	187.9	Cold Spring Brook	B	C	<10

TABLE B-1 (cont'd)

Applicant Segment/ State	Milepost a/	Water Body	State Water Quality Classification b/	Fishery Classification c/	Width of Crossing d/ (ft)
Mainline/MA	188.2	Cold Spring Brook Trib.	B		
(cont'd)	189.2	unnamed pond	B		
	190.5	Emerson Brook	B	C	10
	190.6	Emerson Brook	B	C	10
	190.8	Blackstone River	B	W	20-30
	193.2	Fox Brook Trib.	B		
	193.5	Fox Brook	B		
	194.4	Crane Pond Trib.	B		
	194.9	Hop Brook	B	C	10
	195.7	Mill River Trib.	B	C	5-10
	196.2	Mill River Trib.	B	C	5-10
	196.4	Mill River	B	C	10
VGS LOOP	0.3	Carmen Brook	B		
	1.3	Lake Champlain Trib.	B		
	2.1	Youngerman Brook Trib.	B		
	2.5	Youngerman Brook	B		
	4.8	Missisquois River Trib.	B		
	4.9	Missisquois River Trib.	B		
	5.6	Missisquois River Trib.	B		
	5.9	Missisquois River Trib.	B		
	7.8	Unnamed pond	B		
	9.9	Stevens Brook	C		
RUTLAND EXTENSION					
Connector/VT	1.3	Winooski River	C	C,W-S	
Lateral/VT	43.9	Allen Brook	B	W	
	44.3	Allen Brook Trib.	B		
	46.7	Sucker Brook	B		
	47.2	Sucker Brook Trib.	B		
	49.3	La Platte River Trib.	B		
	50.6	La Platte River Trib.	B		
	51.5	La Platte River	C	C,W-S	100
	52.5	La Platte River Trib.	B		
	54.2	Lewis Creek Trib.	B		
	54.6	Lewis Creek	B	C-S	50
	54.8	Lewis Creek Trib.	B		

TABLE B-1 (cont'd)

Applicant Segment/ State	Milepost a/	Water Body	State Water Quality Classification b/	Fishery Classification c/	Width of Crossing d/ (ft)
Lateral/VT (cont'd)	56.1	Lewis Creek Trib.	B		
	58.1	Unnamed	B		
	59.0	Little Otter Creek Trib.	B		
	60.7	Little Otter Creek Trib.	B		
	60.8	Little Otter Creek Trib.	B		
	62.1	Little Otter Creek Trib.	B		
	63.5	Little Otter Creek	B	W	
	66.8	Little Otter Creek Trib.	B		
	67.7	Little Otter Creek Trib.	B		
	70.2	New Haven River	C	C-S	50
	72.0	New Haven River Trib.	B		
	72.2	New Haven River Trib.	B		
	72.4	New Haven River Trib.	B		
	72.5	New Haven River Trib.	B		
	72.6	New Haven River Trib.	B		
	73.1	New Haven River Trib.	B		
	76.9	Beaver Brook	B		
	77.2	Middlebury River	B	C-S	
	78.3	Halnon Brook	B	C	
	78.7	Halnon Brook	B	C	
	82.1	Leicester River Trib.	B		
	82.7	Leicester River	B	C,W	50
	84.7	Seymour Brook Trib.	B		
	84.8	Seymour Brook	B		
	90.2	Neshobe River	B	C	
	91.1	Jones Brook Trib.	B		
	91.2	Jones Brook	B		
	91.6	Otter Creek Trib.	B		
	93.2	Otter Creek	C	W-S	50
	93.5	Otter Creek	C	W-S	50
	95.3	Otter Creek Trib.	B		
	97.6	Sugar Hollow Brook	B		
	97.7	Furnace Brook	B	C	
	99.3	Otter Creek Trib.	B		
	100.7	Otter Creek Trib.	B		
	102.6	East Creek	B	C,W-S	
	104.3	Tenney Brook	B	C	

TABLE B-1 (cont'd)

Applicant Segment/ State	Milepost a/	Water Body	State Water Quality Classification b/	Fishery Classification c/	Width of Crossing d/ (ft)
EASTERN SERVICE BRANCH					
North Connector/MA	1.7	North Nashua River Trib.	B		
Eastern Service Lateral/MA	216.3	North Nashua River Trib.	B		
	216.5	North Nashua River Trib.	B		
	216.8	Nashua River	B	W	100
	217.1	Nashua River Trib.	B		
	217.2	Nashua River Trib.	B		
	218.1	Nashua River Trib.	B		
	218.7	North Brook Trib.	B		
	219.1	North Brook Trib.	B		
	219.6	North Brook Trib.	B		
	220.1	North Brook	B	C	
	220.3	North Brook	B	C	
	220.4	North Brook Trib.	B		
	220.5	North Brook Trib.	B		
	221.5	Clamshell Pond Trib.	B	C,W	
	221.6	Clamshell Pond Trib.	B	C,W	
	224.2	Howard Brook Trib.	B		
	225.7	Cold Harbor Brook	B	C,W	
	227.8	Hop Brook Trib.	B		
	228.0	Hop Brook	B	C,W	
	228.4	Hop Brook Trib.	B		
	229.2	Smith Pond Trib.	B		
	229.4	Little Bonnet Brook	B		
Pelham/MA	2.4	North Nashua River Trib.	B		
	2.9	North Nashua River	B	W	
	3.6	Spectacle Brook	B	C	
	3.9	Spectacle Brook Trib.	B		
	4.1	Oak Hill Pond	B		
	5.7	Bow Brook Trib.	B		
	6.8	Bow Brook	B		
	6.9	Catacoonamug Brook	B	W	
	7.6	Trout Brook	B	C	
	9.0	Walker Brook	B	W	
	9.7	Mulpus Brook	B	C,W-S	

TABLE B-1 (cont'd)

Applicant Segment/ State	Milepost a/	Water Body	State Water Quality Classification b/	Fishery Classification c/	Width of Crossing d/ (ft)
Pelham/MA	10.8	Nashua River	B	W	
(cont'd)	12.2	James Brook	B		
	12.9	James Brook	B		
	13.1	James Brook Trib.	B		
	14.5	James Brook	B		
	14.7	James Brook	B		
	16.4	Nod Brook	B		
	16.9	Nashua River Trib.	B		
	17.5	Nashua River Trib.	B		
	17.9	Nashua River Trib.	B		
	20.1	Reedy Meadow Brook	B		
	21.3	Unkety Brook Trib.	B		
	21.8	Unkety Brook	B	C-S	
	24.1	Lower Massapoag Pond Trib.	B		
	24.3	Salmon Brook	B	C-S	
	25.0	Black Brook Trib.	B		
	25.2	Black Brook Trib.	B		
	26.9	Bridge Meadow Brook Trib.	B	C-S	
	27.6	Bridge Meadow Brook	B	C-S	
	27.7	Bridge Meadow Brook	B	C-S	
Nashua/MA	0.7	Hauk Brook	B	W	
	1.5	Joint Grass Brook	B	C,W	
	1.6	Salmon Brook Trib.	B		
	2.6	Salmon Brook	B	C-S	
Pepperell/MA	0.04	Nashua River	B		
Ashburnham Lateral/MA	199.5	Whitmanville Reservoir Trib.	B		
	200.0	Whitmanville Reservoir Trib.	B		
	200.1	Whitmanville Reservoir Trib.	B		
	200.8	Whitman River Trib.	B	C	
	201.3	Unnamed	B		
	202.4	Crocker Pond Trib.	B		
	203.9	Snows Millpond	B		

TABLE B-1 (cont'd)

Applicant Segment/ State	Milepost a/	Water Body	State Water Quality Classification b/	Fishery Classification c/	Width of Crossing d/ (ft)
PLEASANT VALLEY EXTENSION					
Iroquois/NY	270.35	Wappinger Creek Trib.	B		
	271.30	Sprout Creek Trib.	C		1-3
	272.20	Sprout Creek Trib.	C(T)	C	1-3
	272.55	Sprout Creek	C(T)	C	1-3
	276.10	Clove Brook Trib.	D	C	6
	277.05	Seeley Creek Trib.	C		
	278.10	Seeley Creek Trib.	C		
	279.90	Coopertown Brook	C(T)	C	1-10
	281.40	Swamp River Trib.	C		
	281.70	Swamp River	C	C,W	12-30
	284.20	Tenmile River	C(T)	C,W	
	284.75	Tenmile River Trib.	C		84
	285.25	Tenmile River	C(T)	C,W	
	286.25	Deull Hollow Brook	C	C	4-12
Iroquois/CT	287.80	Wimisink Brook	A	C	
	288.90	Morrissey Brook Trib.	A		
	289.15	Morrissey Brook	A	C-S	
	289.85	Morrissey Brook Trib.	A		
	291.70	Bullymuck Brook	A	C	
	292.85	Rocky River	C/B		
	297.50	Still River Trib.	C/B		
	304.85	Unnamed marsh trib.	A		
LONG ISLAND EXTENSION					
Iroquois/CT	305.10	Unnamed marsh Trib.	A		
	306.10	Unnamed marsh Trib.	A		
	306.45	Pond Brook	A	C-S	
	308.75	Cavanaugh Pond Trib.	A		
	311.20	Pootatuck River	B	C-S	
	312.55	Pole Bridge Brook	A		
	312.70	Pole Bridge Brook	A		
	313.45	Housatonic River Trib.	A		
	314.00	Housatonic River Trib.	A		
	314.15	Housatonic River Trib.	A		
	314.95	Housatonic River Trib.	A		

TABLE B-1 (cont'd)

Applicant Segment/ State	Milepost a/	Water Body	State Water Quality Classification b/	Fishery Classification c/	Width of Crossing d/ (ft)
Iroquois/CT	315.95	Halfway River	B/A		
(cont'd)	318.40	Boys Halfway River	A		
	318.85	Hurds Brook	A		
	319.35	Means Brook Trib.	AA		
	319.40	Means Brook Trib.	AA		
	320.15	Means Brook Trib.	AA		
	320.80	Means Brook Trib.	AA		
	321.25	Means Brook Trib.	AA		
	321.70	Means Brook Trib.	AA		
	323.75	Shelton Reservoir Trib.	AA		
	324.15	Shelton Reservoir Trib.	AA		
	324.25	Shelton Reservoir Trib.	AA		
	326.30	Farmill River Trib.	A		
	326.65	Farmill River Trib.	A		
	326.90	Farmill River Trib.	A		
	327.20	Farmill River	SC/SB	C-S	
	329.25	Cemetery Pond Brook	A		
	329.50	Cemetery Pond Brook	A		
	329.60	Pumpkin Ground Brook	--		
	329.70	Pumpkin Ground Brook	--		
	329.80	Pumpkin Ground Brook	--		
	329.85	Pumpkin Ground Brook	--		
	330.40	Pecks Mill Pond Trib.	A		
	330.85	Housatonic River	SC/SB	E	745
	332.60	Beaver Brook	A		
ALGONQUIN LATERALS					
Manchester/RI	0.00	Providence River	SC	E	700
	0.1	Seekonk River	SC	E	400
Brayton Pt./RI	6.0	Cole River	B	C,W-S	15
	6.9	Lewin Brook	B	C,W-S	12
	7.0	Lewin Brook Trib	B		
	8.4	Lees River Trib.	B		
	8.6	Lees River Trib.	B		
	8.7	Lees River Trib.	B		
	9.0	Lees River Trib.	B	C,W	5

TABLE B-1 (cont'd)

Applicant Segment/ State	Milepost a/	Water Body	State Water Quality Classification b/	Fishery Classification c/	Width of Crossing d/ (ft)
TENNESSEE LOOPS					
Herkimer-Otsego					
(NY/5)	245 + 1.05	Unadilla River Trib.	D		
	245 + 2.70	Unadilla River Trib.	D		
	245 + 3.16	Wharton Creek Trib.	D		
Scoharie-Albany					
(NY/6)	249-2A + 0.54	Louise Kill	D		
	249-2A + 1.98	King Creek	C (TS)	C	
	249-2A + 2.44	King Creek	D		
	249-2A + 4.37	Fox Creek Trib.	D		
	249-2A + 4.90	Fox Creek Trib.	D		
Columbia-Berkshire					
(NY/7)	254 + 1.61	Green Brook	C (TS)	C	
	254 + 3.41	Cotter Brook	D		
Worcester					
(MA/8)	265 + 2.30	Casey Brook	B		
	265 + 4.80	Unnamed Creek	A		
	265 + 7.08	Blackstone Canal	B		

a/ Approximate milepost of pipeline crossing.

b/ See Table 3.2.3-2 for description of classifications. Unclassified waters are designated "--".

c/ C = Has either been classed by the state as containing cold water fishing, or designated as having trout present.

W = Either designated as having warm-water fishery (e.g. yellow perch, smallmouth bass, largemouth bass, panfish), or has cool- and warm-water recreational species listed as the main species present.

C,W = Has a combination of above.

-S = Indicates, stocked with trout (usually eastern brook, brown, or rainbow trout).

E = Water resource in estuary with potential for marine fisheries

A = Anadromous fishery

d/ Some data provided by applicants. Missing data is unavailable.

SOURCES:

Champlain Pipeline Company, Part I Resource Report, Volume I, May 1989.
Algonquin Revised Resource Report, No. 2, May 1989.
Iroquois Gas Transmission System, Resource Report No. 2, Sept. 1988.
ERT, Inc., Resource Report No. 2, Docket Nos. CP88-191, -192.
USGS Quadrangle Maps of Proposed Routes, 7.5 minute series.

TABLE B-2

Perennial Water Bodies Crossed by the Champlain-based Single Pipeline Alternative

Applicant Segment/ State	Milepost a/	Waterbody	State Water Quality Classification b/	Fishery Classification c/	Crossing	Width of (ft)
CHAMPLAIN						
Mainline/VT	0.3	Rock River	B			
	1.6	Trib. from Proper Pond	B			
	1.9	Saxe Brook	B			
	3.5	Saxe Brook	B			
	6.2	Missisiquoi River	C W-S		250	
	7.0	Hungerford Brook	B	W		30
	7.2	Hungerford Brook Trib.	B			
	9.0	Hungerford Brook Trib.	B			
	10.8	Hungerford Brook Trib.	B			
	13.7	Hungerford Brook	B W		25	
	13.86	Hungerford Brook Trib.	B			
	13.87	Hungerford Brook Trib.	B			
	14.2	Hungerford Brook	B	W		25
	18.3	Unnamed	B			
	24.8	Swift Brook	B			
	24.9	Swift Brook	B			
	25.5	Tracy Brook	B	C		
	25.7	Lamoille River	C	C,W-S		200
	25.8	Lamoille River Trib.	B			
	26.1	Lamoille River Trib.	B			
	27.2	Browns River Trib.	B			
	27.9	Browns River Trib.	B			
	28.6	Browns River Trib.	B			
	28.7	Browns River Trib.	B			
	28.9	Browns River	B	C-S		100
	29.2	Browns River Trib.	B			
	29.4	Browns River Trib.	B			
	29.6	Browns River Trib.	B			
	30.5	Browns River Trib.	B			
	32.3	Browns River	B	C-S		
	33.4	Browns River Trib.	B			
	34.2	Browns River Trib.	B			
	34.6	Browns River Trib.	B			
	35.0	Browns River	B	C-S		
	39.5	Winooski River Trib.	B			
	39.9	Winooski River Trib.	B			
	40.0	Winooski River Trib.	B			
	40.5	Winooski River	C	C,W-S		150
	41.1	Winooski River Trib.	B			
	41.7	Winooski River Trib.	B			
	43.9	Allen Brook	B	W		
	44.3	Allen Brook Trib.	B			
	46.7	Sucker Brook	B			
	47.2	Sucker Brook Trib.	B			
	49.3	La Platte River Trib.	B			
	50.6	La Platte River Trib.	B			
	51.5	La Platte River	C	C,W-S		10
	52.5	La Platte River Trib.	B			
	54.2	Lewis Creek Trib.	B			
	54.6	Lewis Creek	B	C-S		50
	54.8	Lewis Creek Trib.	B			
	56.1	Lewis Creek Trib.	B			
	58.1	Unnamed	B			

TABLE B-2 (cont'd)

Applicant Segment/ State	Milepost a/	Waterbody		State Water Quality Classification b/	Fishery Classification c/	Crossing Width of (ft)
Mainline/VT (cont'd)	59.0	Little Otter Creek Trib.		B		
	60.7	Little Otter Creek Trib.		B		
	60.8	Little Otter Creek Trib.		B		
	62.1	Little Otter Creek Trib.		B		
	63.5	Little Otter Creek	B	W-S		
	66.8	Little Otter Creek Trib.		B		
	67.7	Little Otter Creek Trib.		B		
	70.2	New Haven River		C	C-S	50
	72.0	New Haven River Trib.		B		
	72.2	New Haven River Trib.		B		
	72.4	New Haven River Trib.		B		
	72.5	New Haven River Trib.		B		
	72.6	New Haven River Trib.		B		
	73.1	New Haven River Trib.		B		
	76.9	Beaver Brook		B		
	77.2	Middlebury River		B	C-S	
	78.3	Halnon Brook		B	C	
	78.7	Halnon Brook		B	C	
	82.1	Leicester River Trib.		B		
	82.7	Leicester River		B	C,W	50
	84.7	Seymour Brook Trib.		B		
	84.8	Seymour Brook		B		
	90.2	Neshobe River		B	C	
	91.1	Jones Brook Trib.	B			
	91.2	Jones Brook		B	C	
	91.6	Otter Creek Trib.	B			
	93.2	Otter Creek		C	W-S	50
	93.5	Otter Creek		C	W-S	50
	95.3	Otter Creek Trib.	B			
	97.6	Sugar Hollow Brook		B		
	97.7	Furnace Brook		B	C	
	99.3	Otter Creek Trib.	B			
	100.7	Otter Creek Trib.	B			
	102.6	East Creek		B	C,W	
	104.3	Tenney Brook		B	C	
	104.9	Tenney Brook Trib.	A			
	105.7	Moon Brook		B	C	
	109.5	Cold River		B	C-S	35
	114.6	Mill River Trib.		B		
	115.8	Mill River Trib.		B		
	117.7	Freeman Brook		B	C-S	10-20
	118.7	Russell Brook		B	C	
	120.2	Mill River Trib.		B		
	125.9	Black River/Lake Pauline		C	C, W-S	375
	128.9	Whitney Brook		B	C	
	130.7	Black River		C	C, W-S	50
	132.3	Unnamed		B		
	134.2	Williams River		C	C,W	
	134.5	Williams River		C	C,W	
	135.0	Great Brook		B	C	20
	135.1	Great Brook Trib.	B			
	135.4	Great Brook		B	C	20
	135.8	Great Brook		B	C	20
	137.5	Great Brook		B	C	20
	138.9	Black River Trib.	B			
	140.9	Black River Trib.	B			
	141.0	Black River Trib.	B			

TABLE B-2 (cont'd)

Applicant Segment/ State	Milepost a/	Waterbody		State Water Quality Classification b/	Fishery Classification c/	Crossing	Width of (ft)
Mainline/VT (cont'd)	143.4	Seavers Brook		B	C		
	143.5	Seavers Brook Trib.	B				
	143.6	Seavers Brook Trib.	B				
	145.4	Commissary Brook Trib.		B			
	145.5	Commissary Brook Trib.		B			
	146.4	Commissary Brook Trib.		B			
	147.3	Little Commissary Brook		B	C		
Mainline/NH	148.8	Connecticut River	B	C,W-S		750	
	150.2	Hackett Brook		B	C		15
	151.2	Jabes Meadow Brook		B			
	152.8	Jewett Brook		B			
	153.6	Great Brook		B	C-S		25
	154.0	Cold River		B	C-S		100
	156.1	Blanchard Brook		B			
	163.2	Fuller Brook		B			
	163.9	Ashuelot River		B	C,W-S		50
	165.9	Sturtevant Brook Trib.		B			
	166.2	Sturtevant Brook	B				
	166.9	Trib. to Goose Pond		B			
	168.9	Beaver Brook		B			50
	171.2	Otter Brook		B	C-S		50
	172.1	Minnewawa Brook		B			30
	176.8	Shaker Brook		B	C-S		20
	177.5	Brandy Brook		B			25
	179.3	Quarry Brook		B			
	180.4	S. Branch Ashuelot Riv. Trib.	B				
	181.0	Bowker Pond Trib.	B				
	183.0	Scott Pond		B	W		1000
	183.5	Scott Brook		B			20
	186.4	Tarbell Brook (Pond)		B	W		200
	187.0	Damon Reservoir Trib.		B			
	187.2	Damon Reservoir Trib.		B			
	187.3	Damon Reservoir Trib.		B			
	188.7	Robbins Pond Trib.	B				
	189.2	Robbins Pond Trib.	B				
	189.9	Lake Monomonac Trib.		B			
	190.8	Lake Monomonac		B	W		500
	191.7	Whites Mill Pond		B			300
	193.9	Millers River		B	C,W-S		50
	195.3	Unnamed		B			
	195.7	Unnamed		B			
	198.3	Whitmanville Reservoir Trib.	B				
	199.5	Whitmanville Reservoir Trib.	B				
	200.0	Whitmanville Reservoir Trib.	B				
	200.1	Whitmanville Reservoir Trib.	B				
	200.8	Whitman River Trib.		B	C		
	201.3	Unnamed		B			
Mainline/MA	202.4	Crocker Pond Trib.	B				
	203.9	Snows Millpond		B			450
	204.9	Pond connected to Sawmill Pond		B			150
	206.0	Notown Reservoir Trib.		A			
	206.3	Stream from Notown Reservoir		A			
	206.7	Notown Reservoir Trib.		A			
	208.4	Stream from Haynes Reservoir		A	C		
	210.1	Fall Brook		A	C		
	210.8	Lake Samoset Trib.	A				
	210.9	Lake Samoset Trib.	A				

TABLE B-2 (cont'd)

Applicant Segment/ State	Milepost a/	Waterbody		State Water Quality Classification b/	Fishery Classification c/	Crossing	Width of (ft)
Mainline/MA (cont'd)	212.3	Wekepeke Brook Trib.		B			
	213.1	Wekepeke Brook		B	C,W		
	213.2	Wekepeke Brook Trib.		B			
	213.9	Wekepeke Brook Trib.		B			
	214.3	Bartlett Pond Trib.	B				
	216.3	North Nashua River Trib.		B			
	216.5	North Nashua River Trib.		B			
	216.8	Nashua River		B	W		100
	217.1	Nashua River Trib.	B				
	217.2	Nashua River Trib.	B				
	218.1	Nashua River Trib.	B				
	218.7	North Brook Trib.	B				
	219.1	North Brook Trib.	B				
	219.6	North Brook Trib.	B				
	220.1	North Brook		B	C		
	220.3	North Brook		B	C		
	220.4	North Brook Trib.	B				
	220.5	North Brook Trib.	B				
	221.5	Clamshell Pond Trib.		B	C,W		
	221.6	Clamshell Pond Trib.		B	C,W		
	224.2	Howard Brook Trib.		B			
	225.7	Cold Harbor Brook	B	C,W			
	227.8	Hop Brook Trib.		B			
	228.0	Hop Brook		B	C,W		
	228.4	Hop Brook Trib.		B			
	229.2	Smith Pond Trib.		B			
	229.4	Little Bonnet Brook	B				
	238.6	Warren Brook		B	C,W-S		
	240.5	Stream b/t Dean & Pratt Ponds		B			
	240.8	Unnamed		B	C,W		
	241.1	Unnamed		B			
	241.5	Unnamed		B			
	242.1	Mill River		B	C,W-S		15
	242.4	Mill River		B	C,W-S		
	242.5	Mill River		B	C,W-S		
	243.3	Huckleberry Brook Trib.		B	C,W		
	244.0	Huckleberry Brook	B				
	244.9	Charles River		B			
	247.7	Hopping Brook		B	C,W		10
	248.0	Hopping Brook Trib.		B			
	248.1	Hopping Brook Trib.		B			
	248.2	Hopping Brook Trib.		B			
Pelham/MA	0.3	Wekepeke Brook Trib.		B			
	0.5	Wekepeke Brook Trib.		B			
	1.1	Wekepeke Brook		B	C-S		
	1.5	Wekepeke Brook Trib.		B			
	2.4	North Nashua River Trib.		B			
	2.9	North Nashua River	B	W			
	3.6	Spectacle Brook		B	C		
	3.9	Spectacle Brook Trib.		B			
	4.1	Oak Hill Pond		B			
	5.7	Bow Brook Trib.		B			
	6.8	Bow Brook		B			
	6.9	Catacoonamug		B	W		
	7.6	Trout Brook		B	C		
	9.0	Walker Brook		B	W		

TABLE B-2 (cont'd)

Applicant Segment/ State	Milepost a/	Waterbody		State Water Quality Classification b/	Fishery Classification c/	Crossing	Width of (ft)
Pelham/MA (cont'd)	9.7	Mulpus Brook		B	C,W-S		
	10.8	Nashua River		B	W		
	12.1	James Brook		B			
	12.9	James Brook		B			
	13.1	James Brook Trib.	B				
	14.5	James Brook		B			
	14.7	James Brook		B			
	16.4	Nod Brook		B			
	16.9	Nashua River Trib.	B				
	17.5	Nashua River Trib.	B				
	17.9	Nashua River Trib.	B				
	19.9	Nashua River		B	W		
	20.1	Reedy Meadow Brook		B			
	21.3	Unkety Brook Trib.	B				
	21.8	Unkety Brook		B	C-S		
	24.1	Lower Massapoag Pond Trib.	B				
	24.3	Salmon Brook		B	C-S		
	25.0	Black Brook Trib.	B				
	25.2	Black Brook Trib.	B				
	26.9	Bridge Meadow Brook Trib.	B	C-S			
	27.6	Bridge Meadow Brook		B	C-S		
	27.7	Bridge Meadow Brook		B	C-S		
Nashua/MA	0.7	Hauk Brook		B	W		
	1.5	Joint Grass Brook	B	C,W			
	1.6	Salmon Brook Trib.	B				
	2.6	Salmon Brook		B	C-S		
LONG ISLAND EXTENSION							
Iroquois/CT	305.10	Unnamed marsh trib.		A			
	306.10	Unnamed marsh trib.		A			
	306.45	Pond Brook		A	C-S		
	308.75	Cavanaugh Pond Trib.		A			
	311.20	Pootatuck River		B	C-S		
	312.55	Pole Bridge Brook		A			
	312.70	Pole Bridge Brook		A			
	313.45	Housatonic River Trib.		A			
	314.00	Housatonic River Trib.		A			
	314.15	Housatonic River Trib.		A			
	314.95	Housatonic River Trib.		A			
	315.95	Halfway River		B/A			
	318.40	Boys Halfway River		A			
	318.85	Hurds Brook		A			
	319.35	Means Brook Trib.		AA			
	319.40	Means Brook Trib.		AA			
	320.15	Means Brook Trib.		AA			
	320.80	Means Brook Trib.		AA			
	321.25	Means Brook Trib.		AA			
	321.70	Means Brook Trib.		AA			
	323.75	Shelton Reservoir Trib.		AA			
	324.15	Shelton Reservoir Trib.		AA			
	324.25	Shelton Reservoir Trib.		AA			
	326.30	Farmill River Trib.		A			
	326.65	Farmill River Trib.		A			
	326.90	Farmill River Trib.		A			
	327.20	Farmill River		Sc/SB	C-S		

TABLE B-2 (cont'd)

Applicant Segment/ State	Milepost a/	Waterbody	State Water Quality Classification b/	Fishery Classification c/	Crossing Width of (ft)
Iroquois/CT	329.25	Cemetery Pond Brook	A		
	329.50	Cemetery Pond Brook	A		
	329.60	Pumpkin Ground Brook	--		
	329.70	Pumpkin Ground Brook	--		
	329.80	Pumpkin Ground Brook	--		
	329.85	Pumpkin Ground Brook	--		
	330.40	Pecks Mill Pond Trib.	A		
	330.85	Housatonic River	Sc/SB	E	745
	332.60	Beaver Brook	A		
PLEASANT VALLEY EXTENSION					
Iroquois/NY	270.35	Wappinger Creek Trib.	B		
	271.30	Sprout Creek Trib.	C		1-3
	272.20	Sprout Creek Trib.	C(T)	C	1-3
	272.55	Sprout Creek	C(T)	C	1-3
	276.10	Clove Brook Trib.	D	C	6
	277.05	Seeley Creek Trib.	C		
	278.10	Seeley Creek Trib.	C		
	279.90	Coopertown Brook	C(T)	C	1-10
	281.40	Swamp River Trib.	C		
	281.70	Swamp River	C	C,W	12-30
	284.20	Tenmile River	C(T)	C,W	
	284.75	Tenmile River Trib.	C		84
	285.25	Tenmile River	C(T)	C,W	
	286.25	Deull Hollow Brook	C	C	4-12
Iroquois/CT	287.80	Wimisink Brook	A	C	
	288.90	Morrissey Brook Trib.	A		
	289.15	Morrissey Brook	A	C-S	
	289.85	Morrissey Brook Trib.	A		
	291.70	Bullymuck Brook	A	C	
	292.85	Rocky River	C/B		
	297.50	Still River Trib.	C/B		
	304.85	Unnamed marsh trib.	A		
ALGONQUIN					
Manchester/RI	2.7	Seekonk River	SC	E	400
	3.5	Providence River	SC	E	700
Brayton/MA	6.0	Cole River	B	C,W-S	15
	6.9	Lewin Brook	B	C,W-S	12
	7.0	Lewin Brook Trib.	B		
	8.4	Lee River Trib.	B		
	8.6	Lee River Trib.	B		
	8.7	Lee River Trib.	B		
	9.0	Lee River Trib.	B	C,W	5
TENNESSEE LOOPS					
Herkimer-Otsego (NY)	245 + 1.05	Unadilla River Trib.	D		
	245 + 2.70	Unadilla River Trib.	D		
	245 + 3.16	Wharton Creek Trib.	D		

TABLE B-2 (cont'd)

Applicant Segment/ State	Milepost a/	Waterbody	State Water Quality Classification b/	Fishery Classification c/	Crossing Width of (ft)
Schoharie-Albany (NY)	249-2A + 0.54	Louise Kill	D		
	249-2A + 1.98	King Creek	C(TS)	C	
	249-2A + 2.44	King Creek	D		
	249-2A + 4.37	Fox Creek Trib.	D		
	249-2A + 8.18	Fox Creek Trib.	D		
Columbia-Berkshire (NY)	254 + 1.61	Green Brook	C(TS)	C	
	254 + 3.41	Cotter Brook	D		
Worcester (MA)	265 + 2.30	Casey Brook	B		
	265 + 4.80	Unnamed creek	A		
	265 + 7.08	Blackstone Canal	B		

a/ Approximate milepost of pipeline crossing.

b/ See Table 3.2.3-2 for description of classifications. Unclassified surface waters are designated "--".

c/ C = Has either been classed by the state as containing cold-water fishing, or designated as having trout present.
W = Either designated as having warm-water fishery (e.g. yellow perch, smallmouth bass, largemouth bass, panfish), or has cool- and warm-water recreational species listed as the main species present.
C,W = Has a combination of above.
-S = Stocked with trout (usually eastern brook, brown, or rainbow trout).
E = Water resources in estuary with potential for marine fisheries.
A = Anadromous fishery.

SOURCES:

Champlain Pipeline Company, Part I Resource Report, Volume I, May 1989.
Algonquin Revised Resource Report, No. 2, May 1989.
Iroquois Gas Transmission System, Resource Report No. 2, Sept. 1988.
USGS Quadrangle Maps of Proposed Routes, 7.5 minute series.

TABLE B-3

Wetlands Crossed by the Iroquois/GNE Single Pipeline Alternative

Pipeline Segment	Beginning Milepost	NWI Classification a/	Length of Crossing (ft)	New (N) or Existing (E) Right-of-Way b/
IROQUOIS				
Mainline c/	0.81	PF01	1,637	N
	4.40	PEM	53	N
	5.21	PEM	158	N
	5.80	PSS1	158	N
	5.86	PEM	53	N
	8.42	PF01	1,162	N
	8.65	PF01	845	N
	10.53	PSS1	528	N
	10.76	PSS1	370	N
	11.71	PF01	317	N
	12.06	PF01	581	N
	12.31	PSS1	2,059	N
	12.70	PF01	739	N
	12.84	PF01	1,901	N
	13.75	PSS1	106	N
	14.10	PF01	422	N
	14.45	PEM	739	N
	15.70	PF01	475	N
	16.96	PSS1	264	N
	17.90	PSS1	211	N
	18.42	PEM	53	N
	18.50	PF01	317	N
	21.40	POW	1,373	N
	21.96	PEM	106	N
	22.05	PEM	106	N
	22.29	PEM	106	N
	22.35	PEM	370	N
	23.50	PEM	158	N
	23.85	PEM	1,214	N
	24.16	PF01	158	N
	25.07	PF01	475	N
	25.60	PF01	475	N
	27.78	PEM	158	N
	28.42	PEM	53	N
	28.65	PEM	475	N
	29.99	PEM	106	N
	30.10	PSS1/EM	106	N
	30.19	PEM	158	N
	30.40	PEM	53	N
	32.50	PF01	422	N
	32.93	PFO/SS1	686	N
	33.83	PFO5/OW	370	N
	34.80	PSS1/EM	158	N
	35.10	PSS1/EM	634	N
	36.15	PEM	158	N
	36.33	PEM	211	N
	37.64	PF01	317	N
	37.75	PF01	792	N
	38.00	PF01	422	N
	38.55	PF05	53	N
	38.59	PF01	158	N
	38.70	PF01	211	N
	38.76	PF01	475	N
	39.41	PF01/5	106	N
	39.64	PF01	158	N
	41.01	PEM	106	N
	43.08	PSS1/EM	158	N
	43.25	PSS1/EM	317	N

TABLE B-3 (cont'd)

Pipeline Segment	Beginning Milepost	NWI Classification a/	Length of Crossing (ft)	New (N) or Existing (E) Right-of-Way b/
IROQUOIS				
Mainline (cont'd)				
	43.40	PFO/SS1	475	N
	44.06	PSS1	739	N
	46.50	PFO5/SS1	422	N
	48.00	PFO4	211	N
	48.15	PSS1	53	N
	49.10	PSS1/EM	158	N
	50.31	PFO1	53	N
	50.90	PSS1/EM	158	N
	51.30	PSS1/EM	370	N
	51.80	PFO/SS1	53	N
	52.51	PEM	53	N
	52.61	PFO4	950	N
	53.55	PSS1	158	N
	54.01	PFO/SS1	475	N
	54.46	PSS1/EM	158	N
	55.02	PSS1	106	N
	55.21	PSS1	53	N
	55.30	PFO1	475	N
	55.80	PSS1	370	N
	56.15	PF06/4	898	N
	56.21	PSS1	475	N
	56.50	PEM	317	N
	57.10	PFO4	792	N
	57.55	PFO1	475	N
	58.98	PSS1	475	N
	60.25	PFO1	106	N
	60.36	PFO1	950	N
	60.94	PSS1	422	N
	61.31	PFO1	370	N
	61.65	PFO1	158	N
	63.36	PFO4	475	N
	63.59	PSS1	528	N
	64.19	PSS1	264	N
	65.05	PSS1/EM	422	N
	66.49	PEM	739	N
	66.85	PSS1/EM	581	N
	66.86	PF04/6	581	N
	67.36	PFO1	106	N
	67.49	PFO1	53	N
	68.45	PFO1	211	N
	68.74	PFO1	158	N
	69.66	PFO1	106	N
	71.55	PSS1/EM	317	N
	73.70	PFO1	475	N
	83.75	PSS1	158	N
	87.00	PSS1	53	N
	88.10	PFO1	53	N
	89.80	PFO1	211	N
	93.53	PSS1	898	N
	94.15	PSS1	53	N
	94.45	PFO1	634	N
	94.57	PSS1	845	N
	94.78	PSS1	317	N
	95.02	PSS1	53	N
	97.12	PFO1	53	N
	97.70	PSS1	53	N
	99.07	PSS1	53	N
	99.87	PSS1	211	N

TABLE B-3 (cont'd)

Pipeline Segment	Beginning Milepost	NWI Classification a/	Length of Crossing (ft)	New (N) or Existing (E) Right-of-Way b/
IROQUOIS				
Mainline (cont'd)				
	100.90	PSS1	53	N
	101.31	PSS1	53	N
	102.01	PSS1	106	N
	106.43	PFO/SS1	158	N
	108.28	PFO1	264	N
	110.85	PFO1	2,798	N
	112.90	PSS1	211	N
	112.99	PFO/SS1	370	N
	113.31	PFO/SS1	370	N
	114.80	PSS1	422	N
	115.30	PFO1	53	N
	116.65	PSS1	211	N
	116.80	PFO1	317	N
	117.49	PSS1	950	N
	117.75	PSS1	1,373	N
	118.78	PSS1	211	N
	119.56	PFO1	1,109	N
	121.06	PFO1	1,267	N
	121.33	PFO1	1,584	N
	123.37	PFO1	370	N
	124.20	PSS1	211	N
	124.76	PFO1	528	N
	127.08	PFO1	106	N
	129.33	PFO1	264	N
	130.67	PFO1	106	N
	131.26	PSO1	211	N
	136.84	PFO1	264	N
	137.60	PFO1	53	N
	139.21	PFO1	422	N
	140.02	PFO1	370	N
	143.66	PEM1	370	N
	144.06	PFO1	53	N
	144.09	PFO1	370	N
	144.40	PSS1	264	N
	145.05	PSS1	317	N
	145.57	PSS1	370	N
	146.10	PSS1	370	N
	154.31	PSS1/EM	634	N
	161.30	PFO1	317	N
	162.35	PSS1	53	N
	164.00	PSS1	53	N
	165.30	PEM	158	N
	165.35	PSS1	53	N
	166.00	PSS1	53	N
GREATER NORTHEAST				
Mainline	4.7	PFO/SS1	50	E
	7.0	PFO1/EM	500	E
	7.3	PEM	50	E
	7.4	PEM	700	E
	8.1	PFO1/SS1	1,000	E
	41.1	PFO1/SS1	5,700	E
	43.4	PFO1/SS1	500	E
	54.9	PSS1/EM	3,300	E
	55.9	PSS1/EM	100	E
	56.1	PFO1	100	E
	56.3	PSS1	500	E
	56.5	PEM	150	E

TABLE B-3 (cont'd)

Pipeline Segment	Beginning Milepost	NWI Classification a/	Length of Crossing (ft)	New (N) or Existing (E) Right-of-Way b/
GREATER NORTHEAST				
Mainline (cont'd)				
	62.7	PFO1/SS1	200	E
	63.7	PSS1	300	E
		PEM	500	E
	64.6	PSS1/EM	400	E
	65.9	PFO1/SS1	800	E
	73.6	PFO1/SS1	1,400	E
	80.3	PSS1/EM	50	E
	81.7	PSS1/EM	50	E
	82.1	PSS1	50	E
	83.2	PFO1	50	E
	83.5	PFO1	50	E
	84.4	PSS1/EM	300	E
	84.5	PFO1	50	E
	84.9	PSS1/EM	100	E
	85.8	PFO1/SS1	50	E
	87.6	PFO1	300	N
	92.4	PFO1	50	E
	94.7	PSS1	50	E
	94.9	PFO4	50	E
	96.0	PEM	100	E
	96.9	PSS1	100	E
	98.3	PFO1	50	E
	98.5	PFO1	50	E
	100.9	PFO1	50	E
	102.6	PFO1	50	E
	104.2	PFO1/SS1	200	E
	105.9	POW	300	E
	107.1	PFO5/EM	300	E
	108.0	PEM	50	N
	108.9	PEM	200	E
	109.0	PFO5/OW	400	E
	109.5	PFO5/OW	150	E
	114.6	PFO1	50	E
	121.8	PFO1	200	E
		PSS1/EM	1,300	E
		PSS1	700	E
	122.3	PSS1	50	E
	122.4	PSS1	250	E
	122.5	PSS1	400	E
	123.4	PFO1	50	E
	123.7	PFO1	50	E
	124.6	PFO1	50	E
	124.9	PFO1	300	E
	125.1	POW	300	E
		PSS1/EM	300	E
	128.4	PSS1/EM	300	E
		PFO1/SS1	400	E
	129.1	PFO1/SS1	500	E
	130.4	PSS1/EM	600	E
	131.9	PFO1	200	E
	135.9	PFO/SS	50	E
	136.9	PFO1	450	E
	137.6	PFO1	200	E
	137.7	PFO1	800	E
	138.9	PSS1	550	E
		PEM/OW	300	E
		PSS1	700	E
	144.4	PFO1/4	150	N

TABLE B-3 (cont'd)

Pipeline Segment	Beginning Milepost	NWI Classification a/	Length of Crossing (ft)	New (N) or Existing (E) Right-of-Way b/
GREATER NORTHEAST				
Mainline (cont'd)				
	144.7	PSS1	200	N
	145.2	PFO5/EM	900	N
	146.0	PFO1/SS1	200	N
	147.3	PSS1/OW	300	E
	147.9	PEM/OW	200	E
		PFO1/SS1	250	E
	149.4	PSS1	150	E
		PEM	200	E
		PSS1	200	E
	151.1	PSS1	350	E
	152.0	PSS1	550	E
	152.2	PFO1/SS1	50	E
	152.4	PSS1	300	E
	154.4	PSS1/EM	550	E
	155.5	PFO1/SS1	500	E
	156.0	PFO4	150	E
	157.3	PFO1	200	E
	157.5	PFO1	250	E
	158.2	PSS1/EM	400	E
		PSS1	900	E
	159.9	PFO1/SS1	250	E
	161.0	PEM	200	E
	161.8	PSS1	150	E
		PSS1/EM	150	E
	162.0	PSS1/EM	400	E
	162.5	PFO1	200	E
	163.1	PFO1	250	E
	163.2	PSS1/EM	350	E
	163.7	PSS1/EM	1,000	E
	164.4	PEM	300	E
		POW	200	E
	165.1	PSS1/EM	300	E
	165.4	PFO1	150	E
	166.0	PFO1	500	E
	167.3	PFO1	50	E
	167.7	PEM	200	E
	167.8	POW	200	E
	168.0	PFO1	600	E
	168.8	PFO1	400	E
	169.2	PFO1	1,000	E
	169.8	PFO1	50	E
	171.3	PFO1	300	E
	171.8	PFO1	300	E
	172.2	PFO1	200	E
	173.2	POW	150	N
	176.5	PEM	1,250	E
	177.8	PSS1/EM	50	E
	178.0	POW	250	E
	179.1	PSS1	500	E
	179.5	PFO1	250	E
	179.8	PFO1	400	E
	181.5	PFO1	250	E
	181.8	PSS1	150	E
	181.9	PEM	150	E
	183.3	PFO1	20	E
	183.9	PSS3	950	E
	184.6	PFO1	850	E
	185.7	PEM	200	E

TABLE B-3 (cont'd)

Pipeline Segment	Beginning Milepost	NWI Classification a/	Length of Crossing (ft)	New (N) or Existing (E) Right-of-Way b/
GREATER NORTHEAST				
Mainline (cont'd)				
	186.7	PEM	350	E
	190.5	PSS1	1,100	E
	191.5	PFO1	200	E
	192.9	PFO1	350	E
	193.0	PSS1	200	E
	193.2	PFO1	50	E
	193.9	PFO1	100	E
	194.9	PFO1	200	E
	195.4	PFO1	350	E
	196.1	PSS1/EM	500	E
	196.3	PFO1/SS1	500	E
		PSS1	800	E
	196.8	PF04	400	E
RUTLAND EXTENSION				
VGS Loops	0.3	PFO1	200	E
	1.7	PSS1/EM	300	E
	2.3	PFO1	800	E
	3.4	POW	250	E
	4.4	PFO1/SS1	1,300	E
	5.5	PF04/1	1,100	E
Rutland Connector	0.7	PFO1	100	N
Rutland Lateral	49.3	PFO1/SS1	300	E
	51.2	PFO1/EM	650	E
	52.0	PSS1	50	E
	56.1	PEM	50	E
	58.9	PEM	2,300	E
	61.6	PSS1/EM	750	E
	62.2	PFO1	2,250	E
	63.3	PEM	400	E
	63.5	PSS1/EM	400	E
	67.6	PEM	1,000	E
	68.1	PEM	300	E
	69.4	POW	100	E
	72.6	PSSI/EM	200	E
	75.5	PFO1	500	E
	77.3	PFO1	550	E
	77.5	PSS1/EM	150	E
	78.2	PEM	500	E
	78.5	PSS1	4,900	E
	81.9	PEM	50	E
	82.7	PFO1	250	E
	84.1	PF04/1	550	E
	86.4	PFO1	2,000	E
	89.1	PEM	300	E
	90.2	PSS1	300	E
		PFO1	500	E
	91.1	PSS1/EM	300	N
	91.2	PEM	400	N
	91.6	PFO1	350	E
	92.3	PEM	100	N
	92.6	PEM	100	E
	93.1	PFO1	750	N
		PEM	1,200	N
		PSS1	900	N
		PEM	1,200	N

TABLE B-3 (cont'd)

Pipeline Segment	Beginning Milepost	NWI Classification a/	Length of Crossing (ft)	New (N) or Existing (E) Right-of-Way b/
RUTLAND EXTENSION				
Rutland Lateral (cont'd)				
	94.1	PEM	200	N
	100.6	PFO1	400	N
	100.8	PFO4/SS1	700	N
	101.0	PFO4/SS1	200	N
	102.5	PFO1	550	N
	103.9	PSS1	200	E
	104.1	PSS1	1,400	E
EASTERN SERVICE BRANCH				
South Connector		No wetlands crossed.		
Eastern Service Lateral				
	215.5	PEM	50	N
	216.4	PFO1	150	N
		PSS1	200	N
	217.1	PFO1/SS1	450	N
	219.1	PFO1	50	N
	219.7	PFO1	150	N
	219.8	PFO1	400	N
	220.4	PFO1	750	N
	220.9	PFO1	500	N
	221.5	PFO1	350	N
	227.5	PFO1	250	N
	228.4	PFO1	50	N
	229.4	PFO1	200	N
	231.2	PFO1/SS1	550	N
	232.1	PFO1	50	N
	232.7	PFO1/SS1	300	N
	236.4	PFO1	350	N
North Connector		No wetlands crossed.		
Pelham Branch	3.1	PSS1	200	E
	3.7	PFO1	100	E
	3.9	PSS1	450	E
	4.2	PSS1/EM	150	E
	5.0	PFO1	250	E
	5.3	PFO1	100	E
	5.7	PFO1/SS1	100	E
	6.2	PFO1	150	E
	6.9	PFO1/SS1	150	E
		PSS1	200	E
	7.4	PFO1	50	E
	7.7	PFO1	250	E
	8.2	PFO1	150	E
	8.9	PSS1/EM	250	E
	9.0	PSS1	50	E
	9.5	PSS1	400	E
	9.6	PFO1	50	E
	10.4	POW	150	E
	10.5	PFO1	200	E
	11.0	POW	800	E
	12.0	PFO1/SS1	600	E
	12.9	PFO1	700	E
	13.1	PFO1	200	E
	13.4	POW	900	E
	13.7	PFO1	1,450	E

TABLE B-3 (cont'd)

Pipeline Segment	Beginning Milepost	NWI Classification a/	Length of Crossing (ft)	New (N) or Existing (E) Right-of-Way b/
EASTERN SERVICE BRANCH				
Pelham Branch (cont'd)				
	14.1	PFO1	1,500	E
		PSS1/EM	1,550	E
		PFO1/SS1	1,350	E
	15.0	PFO1/SS1	300	E
	16.3	PFO1	150	E
	16.8	PFO1	50	E
	17.4	PFO1	1,000	E
	20.1	PFO1	250	E
	21.2	PSS1	400	E
	21.3	PFO1	50	E
	21.7	PEM	550	E
	22.7	PFO1/4	250	E
	24.9	PEM	300	E
		PFO1	200	E
	25.3	PFO4	50	E
	25.8	PFO1	50	E
	26.7	PFO1	200	E
	27.1	PFO1	250	E
	27.4	PSS1	50	E
Pepperell Branch		No wetlands crossed.		
Nashua Branch	0.6	PFO1/SS1	850	N
	1.4	PSS1	350	N
	2.6	PSS1	150	N
Ashburnham Lateral				
	198.5	PFO1	50	E
	200.0	PFO1	300	E
	201.6	PFO1/SS1	550	E
	203.8	PSS1	50	E
LONG ISLAND EXTENSION c/				
	305.60	POW	53	N
	306.16	PEM	53	N
	306.18	PEM	634	N
	306.30	PFO1	422	N
	306.68	PSS1/EM	158	N
	307.19	POW	106	N
	308.11	PSS1/EM	53	N
	308.20	PEM	106	N
	308.48	PSS1/EM	106	N
	308.68	PSS1/EM	158	N
	311.33	POW	106	N
	311.44	PEM	53	N
	312.54	PFO1	53	N
	312.72	PSS1/EM	53	N
	312.76	PEM	106	N
	313.08	PSS1	264	N
	313.40	PFO1	53	N
	313.98	PFO1	53	N
	314.17	PSS1	53	N
	314.96	PFO1	53	N
	315.05	PFO1	53	N
	315.16	PFO1	53	N
	315.50	PFO1	211	N
	318.22	PFO1	106	N

TABLE B-3 (cont'd)

Pipeline Segment	Beginning Milepost	NWI Classification a/	Length of Crossing (ft)	New (N) or Existing (E) Right-of-Way b/
LONG ISLAND EXTENSION (cont'd)				
	318.30	PFO4	53	N
	318.85	PFO1	53	N
	318.97	PFO1	53	N
	319.29	PFO1	634	N
	319.60	PFO1	581	N
	320.03	PFO1	2,218	N
	320.26	PFO1/EM	53	N
	320.76	PSS1/EM	53	N
	321.66	PFO1	53	N
	321.81	PFO1	53	N
	322.07	PFO1	53	N
	322.14	PFO1	53	N
	322.56	PSS1	53	N
	323.14	PFO1	158	N
	323.76	PFO1	53	N
	324.10	PSS1	158	N
	324.25	PSS1/EM	53	N
	324.42	PFO1	53	N
	324.53	PFO1	211	N
	324.83	PFO1	106	N
	324.87	PFO1	528	N
	325.20	PFO1	106	N
	325.35	PFO1	53	N
	325.40	PFO1	1,056	N
	325.77	PFO1	53	N
	326.27	PEM	53	N
	326.84	PFO1	53	N
	328.39	PFO1	158	N
	328.49	PFO1	475	N
	329.15	PFO/SS1	1,320	N
	329.48	PFO/SS1	53	N
	329.60	PFO1	53	N
	329.70	PFO1	53	N
	329.85	PSS1	264	N
	330.52	PFO1	53	N
	330.91	E1OWL	739	N
	332.10	PFO1	53	N
	332.62	PFO4	53	N
	332.64	PSS1/5	1,056	N
	333.55	PSS5/OW	106	N
	333.99	PEM	475	N
	334.19	E2BB	106	N
	334.21	E2FL	528	N
	360.15	E2FL	792	N
	360.30	E2FL	581	N
	360.41	E2BB	106	N
	360.50	PEM	634	N
	360.62	E1OW	950	N
	360.80	PEM	528	N
	361.25	PFO/SS1	739	N
	361.39	PEM5	370	N
	365.37	PFLA	370	N
	365.75	PFLA	634	N
PLEASANT VALLEY LATERAL c/				
	275.75	PFO1	264	N
	276.99	PFO/SS1	370	N
	279.87	PFO1	53	N

TABLE B-3 (cont'd)

Pipeline Segment	Beginning Milepost	NWI Classification a/	Length of Crossing (ft)	New (N) or Existing (E) Right-of-Way b/
PLEASANT VALLEY LATERAL (cont'd)				
	286.30	PFO1	53	N
	286.58	PSS1	370	N
	289.15	PSS1/EM	53	N
	289.87	PFO1	53	N
	291.66	PFO1	53	N
	292.95	PFO1	53	N
	297.01	PEM	53	N
	297.27	POW	53	N
	297.69	POW	106	N
	298.47	POW	211	N
	298.68	POW	211	N
	301.56	PFO1	53	N
	302.11	PFO1	53	N
	302.41	PFO1	528	N
	302.51	PSS1	264	N
	304.86	PFO1	53	N
	305.09	PFO1	53	N
	305.26	PFO1	528	N
	305.40	POW	264	N
ALGONQUIN LATERALS				
Manchester St.		No wetlands crossed.		
Brayton Point	0.6	PFO1	300	E
	1.0	PFO1	600	E
	1.5	PFO1	800	E
	2.0	PFO1	100	E
	2.1	PFO1	200	E
	2.4	PFO1	400	E
	3.8	PFO1	400	E
	4.3	PEM	300	E
	4.6	PFO1/4	650	E
		PFO1/SS1	400	E
	5.2	PFO1	100	E
	5.4	PSS1/EM	800	E
		PFO1	300	E
	6.0	PFO1	250	E
	6.9	PFO1/SS1	750	E
	7.2	PFO1/SS1	300	E
	7.4	PFO1/SS1	650	E
	7.6	PFO1/SS1	150	E
TENNESSEE LOOPS				
Herkimer-				
Otsego	MP245 + 2.92	PSS/PFO4	317	E
	MP245 + 4.41	PFO4/PSS/PEM/PAB4	211	E
	MP245 + 6.33	PSS/PFO1/PEM	264	E
	MP245 + 6.43	PSS/PFO1/PEM	106	E
	MP245 + 6.75	PSS/PFO1/PEM	317	E
	MP245 + 6.93	PSS/PFO1/PEM	370	E
Schoharie-				
Albany	MP250-2 + 0.52	PFO1	158	E
	MP250-2 + 1.26	PFO1	106	E
	MP250-2 + 1.67	PFO1/PSS/POW	211	E
	MP249-2A + 6.17	PSS5/PEM/POW	528	E
Columbia	MP254 + 3.18	PFO/SS	370	E
	MP254 + 3.77	PFO/SS1	475	E
	MP254 + 4.04	PSS1	211	E

TABLE B-3 (cont'd)

Pipeline Segment	Beginning Milepost		NWI Classification a/	Length of Crossing (ft)	New (N) or Existing (E) Right-of-Way b/
TENNESSEE LOOPS (cont'd)					
Worcester	MP265	+ 1.00	PSS1	264	E
	MP265	+ 1.35	POW	106	E
	MP265	+ 1.47	PFO1	106	E
	MP265	+ 2.26	PFO1	422	E
	MP265	+ 4.72	PFO/SS1	106	E
	MP265	+ 5.28	PFO1	317	E
	MP265	+ 7.03	PSS1	317	E

a/ NWI wetland types:

Palustrine

Forested:
- PFO1 -- Broad-leaved deciduous
- PFO3 -- Broad-leaved evergreen
- PFO4 -- Needle-leaved evergreen
- PFO5 -- Dead
- PFO6 -- Deciduous
- PFO7 -- Evergreen

Scrub/shrub:
- PSS1 -- Broad-leaved deciduous
- PSS3 -- Broad-leaved evergreen
- PSS5 -- Dead

Emergent:
- PEM -- Emergent marsh or wet meadow

Open Water:
- POW -- Small pond or standing water

Flat:
- PFLA -- Temporary flat

Estuarine
- E1OW -- Subtidal open water
- E2BB -- Intertidal beach/bar
- E2FL -- Intertidal flat

NOTE: Mixed types are indicated with predominant type first.

b/ Indicates whether proposed pipeline at wetland crossing is new right-of-way (N), or parallel and adjacent to existing right-of-way (E).

c/ Does not include riverine and lacustrine wetlands listed in table 4.1.7-1 of the Iroquois/Tennessee EIS, Volume I. These were omitted to provide a consistent comparison with segments of the Champlain project, and because river and lake crossings are addressed in section 3.3.3 of this volume.

TABLE B-4

Wetlands Crossed by the
Champlain-based Single Pipeline Alternative a/

Pipeline Segment	Beginning Milepost	NWI Classification b/	Length of Crossing (ft)	New or Existing Right-of-Way c/
CHAMPLAIN				
Mainline	3.3	PSS1	500	N
	4.7	PFO1	450	N
		PFO4	100	N
		PEM	300	N
	7.0	PFO1	350	E
	11.5	PSS1/EM	900	N
	21.3	PFO1/4	450	N
	24.4	PSS1	300	N
	24.9	PSS1	250	N
	32.3	PEM	150	N
	33.2	PEM	450	N
	33.3	PSS1/EM	550	N
	34.1	PEM	200	N
	34.6	PEM	300	N
	36.1	PFO1/SS1	2,000	N
	37.7	PSS1	150	N
		PEM	700	N
	40.0	PFO1/EM	200	N
		PFO1	200	N
	49.3	PFO1/SS1	300	E
	51.2	PFO1/EM	650	E
	52.0	PSS1	50 d/	E
	56.1	PEM	50 d/	E
	58.9	PEM	2,300	E
	61.6	PSS1/EM	750	E
	62.2	PFO1	2,250	E
	63.3	PEM	400	E
		PFO4	400	E
		PSS1/EM	700	E
	67.6	PEM	1,700	E
	68.1	PEM	300	E
	69.4	POW	100	E
	72.6	PSSI/EM	200	E
	75.5	PFO1	500	E
	77.3	PFO1	550	E
	77.5	PSS1/EM	150	E
	78.2	PEM	500	E
	78.5	PSS1	4,900	E
	81.9	PEM	50	E
	82.7 e/	PFO1	250	E
	84.1	PFO4/1	550	E
	86.4	PFO1	2,000	E
	89.1	PEM	300	E
	90.2	PSS1	300	E
		PFO1	500	E
	91.1	PSS1/EM	300	N
	91.2	PEM	400	N
	91.6	PFO1	350	E
	92.3	PEM	100	N
	92.6	PEM	100	E
	93.1	PFO1	750	N
		PEM	1,200	N
		PSS1	900	N
		PEM	1,200	N
	94.1	PEM	200	N
	97.8	PFO4	250	N
	100.6	PFO1	400	N

TABLE B-4 (cont'd)

Pipeline Segment	Beginning Milepost	NWI Classification b/	Length of Crossing (ft)	New or Existing Right-of-Way c/
CHAMPLAIN Mainline (cont'd)	100.8	PFO4/SS1	700	N
	101.1	PFO4/SS1	1,400	N
	101.9	PFO4	600	N
	102.5	PFO1	550	N
	103.9	PSS1	200	E
	104.1	PSS1	1,400	E
	107.3	PSS1/EM	700	E
	113.4	PFO1	200	E
	119.7	PSS1/EM	300	E
	130.7	PFO1/SS1	600	E
	134.0	POW	100	N
	135.7	PSS1/EM	150	E
	137.4	PSS1/EM	500	E
	137.9	PSS1/EM	200	E
	140.8	PSS1/EM	150	N
	151.2	PFO1	50 d/	N
	151.5	PFO4	600	N
	156.2	PEM	150	N
	158.1	PFO5/EM	250	E
	159.1	PFO1	500	E
	161.0	PFO1	50 d/	E
	163.4	PSS1	1,800	N
	165.8 f/	PFO1/SS1	300	E
	171.1 f/	PSS1	150	E
	176.8 f/	PSS1	400	E
	177.4 f/	PSS1/EM	200	E
	179.2 f/	PSS1/EM	350	E
	181.8 f/	PFO4/SS1	1,400	E
	182.9 f/	PFO5/OW	1,000	E
	183.5 f/	PSS1/EM	250	E
		PFO4/SS1	1,750	E
	185.9 f/	PSS1/EM	850	E
	186.3 f/	PSS1/EM	550	E
	186.8	PFO5/OW	1,500	E
		PEM	450	E
	188.0	PFO4	200	E
	188.2	PFO4	250	E
	188.6	PSS1	200	E
	189.1	PFO6/7	350	E
		PEM	200	E
	189.3	PFO6/7	750	E
	189.6	PSS1	600	E
	189.9	PSS1/EM	550	E
	191.6	PSS1	450	E
		PSS1/EM	100	E
	192.6	PFO1/4	550	E
	193.8	PFO1	600	E
	194.6	PSS1/EM	350	E
	195.0	PFO1/4	2,200	E
	195.7	PFO1	200	E
	196.7	PFO1	300	E
	196.9	PFO1	2,350	E
	198.5	PFO1	50 d/	E
	200.0	PFO1	300	E
	201.6	PFO1/SS1	550	E
	203.8	PSS1	50 d/	E
	204.9	PSS1	50 d/	E
		POW	350	E

TABLE B-4 (cont'd)

Pipeline Segment	Beginning Milepost	NWI Classification b/	Length of Crossing (ft)	New or Existing Right-of-Way c/
CHAMPLAIN Mainline (Cont'd)	205.9	PF01	50 d/	E
	206.3	PF01	250	E
	207.5	PF01	700	E
	209.4	PF01	200	E
	210.8	PF01/SS1	300	E
	211.1	PSS1/EM	50 d/	E
	211.2	PF01	50 d/	E
	211.7	PEM	50 d/	E
	212.7	PF01	150	E
	213.1	PF01	50 d/	N
	213.9	PF01	50 d/	N
	215.0	PF01	450	N
	216.4	PF01	150	N
		PSS1	200	N
	217.1	PF01/SS1	450	N
	219.1	PF01	50 d/	N
	219.7	PF01	150 d/	N
	219.8	PF01	400 d/	N
	220.4	PF01	750 d/	N
	220.9	PF01	500 d/	N
	221.5	PF01	350 d/	N
	227.5	PF01	250	N
	228.4	PF01	50 d/	N
	229.4	PF01	200	N
	231.2	PF01/SS1	550	N
	232.1	PF01	50 d/	N
	232.7	PF01/SS1	300	N
	236.4	PF01	350	N
	238.5	PF01/SS1	300	E
	240.2	PSS1	200	E
	240.6	PF01	150	E
	240.9	PF01	350	E
	241.5	PF01	50 d/	E
	242.0	PF01	50 d/	E
	242.1	PSS1/EM	50 d/	E
	242.3	PSS1/EM	150 d/	E
	242.7	PSS1	450	E
	242.8	PSS1	300	E
	243.1	PF01	500	E
	244.0	PEM	150	E
	244.2	PF01	550	E
	244.9	PF01	50 d/	E
	245.7	PF01	400	E
	246.0	PF01	300	E
	246.5	PF01	900	E
	246.8	PF01	450	E
	247.3	PF01	100	E
	247.4	PF01	750	E
	247.9	POW	100	E
	248.0	PF01	850	E
CHAMPLAIN Pelham Branch	0.2	PF01	50 d/	E
	0.5	PF01	50 d/	E
	1.1	PF01	50 d/	E
	1.4	PEM	50 d/	E
	3.1	PSS1	200	E
	3.7	PF01	100	E
	3.9	PSS1	450	E

TABLE B-4 (cont'd)

Pipeline Segment	Beginning Milepost	NWI Classification b/	Length of Crossing (ft)	New or Existing Right-of-Way c/
CHAMPLAIN	4.2	PSS1/EM	150	E
Pelham Branch	5.0	PF01	250	E
(cont'd)	5.3	PF01	100	E
	5.7	PF01/SS1	100	E
	6.2	PF01	150	E
	6.9	PF01/SS1	150	E
		PSS1	200	E
	7.4	PF01	50 d/	E
	7.7	PF01	250	E
	8.2	PF01	150	E
	8.9	PSS1/EM	250	E
	9.0	PSS1	50 d/	E
	9.5	PSS1	400	E
	9.6	PF01	50 d/	E
	10.4	POW	150	E
	10.5	PF01	200	E
	11.0	POW	800	E
	12.0	PF01/SS1	600	E
	12.9	PF01	700	E
	13.1	PF01	200	E
	13.4	POW	900	E
	13.7	PF01	1,450	E
	14.1	PF01	1,500	E
		PSS1/EM	1,550	E
		PF01/SS1	1,350	E
	15.0	PF01/SS1	300	E
	16.3	PF01	150	E
	16.8	PF01	50 d/	E
	17.4	PF01	1,000	E
	20.1	PF01	250	E
	21.2	PSS1	400	E
	21.3	PF01	50 d/	E
	21.7	PEM	550	E
	22.7	PF01/4	250	E
	24.9	PEM	300	E
		PF01	200	E
	25.3	PF04	50 d/	N
	25.8	PF01	50 d/	N
	26.7	PF01	200	N
	27.1	PF01	250	N
	27.4	PSS1	50 d/	N
CHAMPLAIN				
Nashua Branch	0.6	PF01/SS1	850	N
	1.4	PSS1	350	N
	2.6	PSS1	150	N
ALGONQUIN				
Manchester St.	No wetlands crossed.			
Brayton Point	0.6	PF01	300	E
	1.0	PF01	600	E
	1.5	PF01	800	E
	2.0	PF01	100	E
	2.1	PF01	200	E
	2.4	PF01	400	E
	3.8	PF01	400	E
	4.3	PEM	300	E
	4.6	PF01/4	650	E
		PF01/SS1	400	E

TABLE B-4 (cont'd)

Pipeline Segment	Beginning Milepost	NWI Classification b/	Length of Crossing (ft)	New or Existing Right-of-Way c/
ALGONQUIN	5.2	PF01	100	E
Brayton Point	5.4	PSS1/EM	800	E
(cont'd)		PF01	300	E
	6.0	PF01	250	E
	6.9	PF01/SS1	750	E
	7.2	PF01/SS1	300	E
	7.4	PF01/SS1	650	E
	7.6	PF01/SS1	150	E
LONG ISLAND EXTENSION				
	305.60	POW	53	N
	306.16	PEM	53	N
	306.18	PEM	634	N
	306.30	PF01	422	N
	306.68	PSS1/EM	158	N
	307.19	POW	106	N
	308.11	PSS1/EM	53	N
	308.20	PEM	106	N
	308.48	PSS1/EM	106	N
	308.68	PSS1/EM	158	N
	311.33	POW	106	N
	311.44	PEM	53	N
	312.54	PF01	53	N
	312.72	PSS1/EM	53	N
	312.76	PEM	106	N
	313.08	PSS1	264	N
	313.40	PF01	53	N
	313.98	PF01	53	N
	314.17	PSS1	53	N
	314.96	PF01	53	N
	315.05	PF01	53	N
	315.16	PF01	53	N
	315.50	PF01	211	N
	318.22	PF01	106	N
	318.30	PF04	53	N
	318.85	PF01	53	N
	318.97	PF01	53	N
	319.29	PF01	634	N
	319.60	PF01	581	N
	320.03	PF01	2218	N
	320.26	PF01/EM	53	N
	320.76	PSS1/EM	53	N
	321.66	PF01	53	N
	321.81	PF01	53	N
	322.07	PF01	53	N
	322.14	PF01	53	N
	322.56	PSS1	53	N
	323.14	PF01	158	N
	323.76	PF01	53	N
	324.10	PSS1	158	N
	324.25	PSS1/EM	53	N
	324.42	PF01	53	N
	324.53	PF01	211	N
	324.83	PF01	106	N
	324.87	PF01	528	N
	325.20	PF01	106	N
	325.35	PF01	53	N
	325.40	PF01	1056	N
	325.77	PF01	53	N

TABLE B-4 (cont'd)

Pipeline Segment	Beginning Milepost	NWI Classification b/	Length of Crossing (ft)	New or Existing Right-of-Way c/
LONG ISLAND EXTENSION (cont'd)	326.27	PEM	53	N
	326.84	PF01	53	N
	328.39	PF01	158	N
	328.49	PF01	475	N
	329.15	PFO/SS1	1320	N
	329.48	PFO/SS1	53	N
	329.60	PF01	53	N
	329.70	PF01	53	N
	329.85	PSS1	264	N
	330.52	PF01	53	N
	330.91	E1OWL	739	N
	332.10	PF01	53	N
	332.62	PF04	53	N
	332.64	PSS1/5	1056	N
	333.55	PSS5/OW	106	N
	333.99	PEM	475	N
	334.19	E2BB	106	N
	334.21	E2FL	528	N
	360.15	E2FL	792	N
	360.30	E2FL	581	N
	360.41	E2BB	106	N
	360.50	PEM	634	N
	360.62	E1OW	950	N
	360.80	PEM	528	N
	361.25	PFO/SS1	739	N
	361.39	PEM5	370	N
	365.37	PFLA	370	N
	365.75	PFLA	634	N
PLEASANT VALLEY LATERAL	275.75	PF01	264	N
	276.99	PFO/SS1	370	N
	279.87	PF01	53	N
	286.30	PF01	53	N
	286.58	PSS1	370	N
	289.15	PSS1/EM	53	N
	289.87	PF01	53	N
	291.66	PF01	53	N
	292.95	PF01	53	N
	297.01	PEM	53	N
	297.27	POW	53	N
	297.69	POW	106	N
	298.47	POW	211	N
	298.68	POW	211	N
	301.56	PF01	53	N
	302.11	PF01	53	N
	302.41	PF01	528	N
	302.51	PSS1	264	N
	304.86	PF01	53	N
	305.09	PF01	53	N
	305.26	PF01	528	N
	305.40	POW	264	N

TABLE B-4 (cont'd)

Pipeline Segment	Beginning Milepost	NWI Classification b/	Length of Crossing (ft)	New or Existing Right-of-Way c/
TENNESSEE LOOPS				
Herkimer-Otsego	MP245+ 2.92	PSS/PFO4	317	E
	MP245+ 4.41	PFO4/PSS/PEM/PAB4	211	E
	MP245+ 6.33	PSS/PFO1/PEM	264	E
	MP245+ 6.43	PSS/PFO1/PEM	106	E
	MP245+ 6.75	PSS/PFO1/PEM	317	E
	MP245+ 6.93	PSS/PFO1/PEM	370	E
Schoharie-Albany	MP250-2+ 0.52	PFO1	158	E
	MP250-2+ 1.26	PFO1	106	E
	MP250-2+ 1.67	PFO1/PSS/POW	211	E
	MP249-2+ 6.17	PSS5/PEM/POW	528	E
Columbia		MP25		

APPENDIX C

REFERENCES

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REFERENCES

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