

3.0 ALTERNATIVES

In accordance with *NEPA and Commission Policy*, we evaluated alternatives to the Millennium Project to determine whether they would be reasonable and environmentally preferable to the proposed action. These alternatives include the no action or postponed action alternative, system alternatives, major route alternatives, route variations, and aboveground facility site alternatives. The full range of alternatives considered for the Millennium Pipeline Project is discussed below.

3.1 NO ACTION OR POSTPONED ACTION

The Commission has three alternate courses of action in processing an application for a Certificate. It may: 1) grant the Certificate with or without conditions, 2) deny the Certificate, or 3) postpone action pending further study. The course of action that would best serve the public convenience and necessity will be the selected alternative.

If the Commission postpones or denies the application, the short- and long-term environmental impacts identified in this DEIS would not occur. However, potential natural gas customers would be forced either to use (or continue to use) alternative fuel sources (i.e., fuel oil, coal, wood, etc.) with higher emission rates of nitrogen oxides (NO_x) or sulfur dioxide (SO₂) than natural gas, or to make other arrangements to obtain natural gas service. In addition, Columbia's aging Line A-5 would have to remain in service and possibly undergo testing and replacement in the future.

Denial of the application could prevent a potential improvement in regional air quality. Compared with other fossil fuels, natural gas is a relatively clean-burning and efficient fuel that can reduce many pollutants. For example, a natural gas turbine cogeneration plant would require about 25 percent less input energy than a combination new coal-fired electric power plant with an oil-fired boiler producing steam. A gas-fired cogeneration plant would also emit less than 1 percent of the SO₂, 27 percent of the particulates, and 50 percent of the NO_x produced by a comparably-sized conventional coal and oil-based cogeneration plant with pollution control equipment.

If the project were postponed or denied, one or more alternative natural gas projects could be implemented to provide expanded natural gas service to the region. The implementation of alternative projects would require the construction of additional and/or new pipeline facilities in the same or other locations to transport natural gas supplies. Alternative natural gas projects would result in their own set of specific environmental impacts, which could be lesser or greater than those associated with the current proposal. In all probability, the aging Line A-5 would need to be entirely replaced over time, requiring continued construction along its 222-mile length.

It would be purely speculative and beyond the scope of this DEIS to attempt to predict what actions may be taken by policy makers or end users in response to the no-action or postponed-action alternative. Therefore, the assessment of impacts associated with these scenarios would also be speculative.

Other natural gas systems exist and natural gas projects are currently proposed in the region. We have examined the potential for these systems and projects to serve as system alternatives to the proposed project (see section 3.2).

In considering Millennium's proposal, the Commission will review both the environmental and non-environmental record, including alternatives, in deciding whether issuance of a Certificate is in the public convenience and necessity. This process will include weighing the non-environmental benefits associated with the project, such as the need to meet the growing fuel requirements in the northeast and

mid-Atlantic region with competitively priced natural gas, against the environmental impacts associated with the proposed project including the recommended mitigation and alternatives discussed in this DEIS.

3.2 PROJECT SYSTEM ALTERNATIVES

System alternatives are alternatives to the proposed action that would make use of other existing, modified, or proposed pipeline systems to meet the stated objective of the proposed project. A project system alternative would make it unnecessary to construct all or part of the proposed project, although some modifications or additions to another existing pipeline system may be required to increase its capacity, or another entirely new system may be required. Although these modifications or additions also could result in environmental impact, this impact may be less, similar to, or greater than that associated with construction of the proposed project.

The objective of identifying and evaluating system alternatives is to avoid or reduce the potential impact associated with construction and operation of the proposed facilities while still allowing the stated objective of the project to be met. Potential impact factors considered may include new right-of-way requirements, land use effects (including those associated with residences and public interest areas), stream and wetland disturbance, and effect on endangered and threatened species.

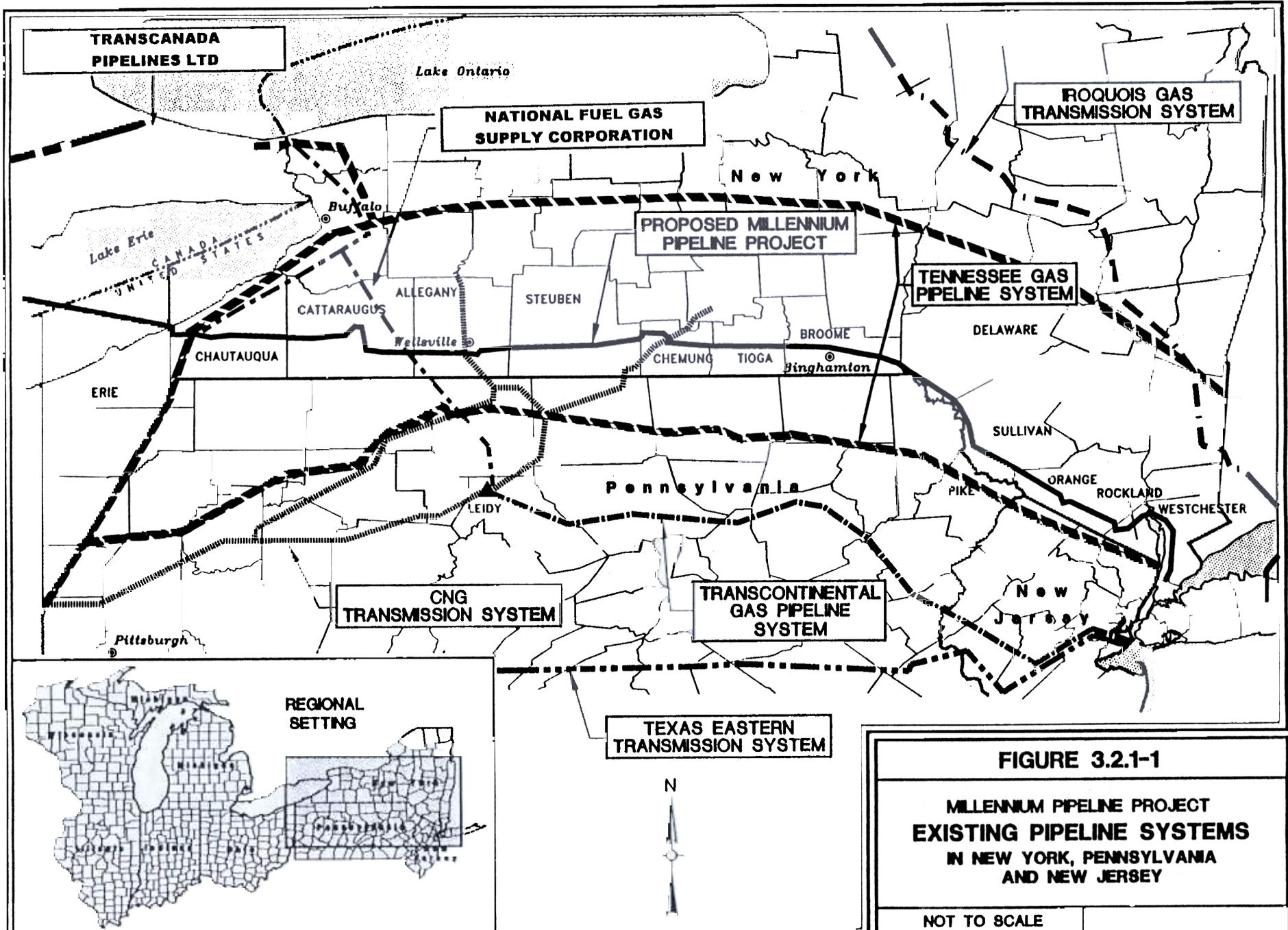
3.2.1 Existing Pipeline Systems

A number of commenters stated that other existing pipeline systems should be used to deliver Millennium's proposed natural gas volumes, including those of the Iroquois Gas Transmission System (Iroquois), Tennessee Gas Pipeline Company (Tennessee), Texas Eastern Transmission System (Texas Eastern), CNG Transmission System (CNG), Transcontinental Gas Pipe Line Corporation (Transco), and National Fuel Gas Supply Corporation (National Fuel) (see figure 3.2.1-1). These systems and their viability as an alternative to the Millennium Pipeline Project are discussed below.

The Iroquois pipeline extends in a northwest-southeast direction, across eastern New York and western Connecticut from the Canada/New York border near Iroquois, Ontario, to the New York City area near South Commack. The Iroquois system is in an entirely different geographic area from that of the Millennium Pipeline Project. Therefore, as with other systems discussed below, could not serve Columbia's customers at the existing meter stations where Millennium could deliver gas. Therefore, we did no analysis of a system alternative using the Iroquois pipeline system.

The Tennessee, Texas Eastern, and Transco pipeline systems extending through northern Pennsylvania and New Jersey, to the New York City area, are roughly parallel to the proposed Millennium pipeline, and would be between 15 and 100 miles to the south depending on the pipeline system. Of the three pipeline systems, the Tennessee system is the closest to Millennium and would be the most likely to be used as a system alternative (see figure 3.2.1-1).

Although the Tennessee system shares proximate delivery points with the proposed Millennium Pipeline Project in the New York City area, maintaining service to Columbia's existing delivery points across the State of New York that are currently served by Columbia's Line A-5 and providing service to the delivery points that would be served by the proposed Millennium pipeline would require construction of a number of significant laterals if Columbia's Line A-5 is abandoned as proposed (see figure 1.1-1 in section 1.1). These laterals would need to extend north from the existing pipelines in Pennsylvania to the delivery points in New York and as many as 30 laterals of between 15 and 50 miles each could be required, unless these customers could be served from alternate delivery points to Columbia from the Tennessee pipeline.



Assuming the laterals would be at least 15 miles long and would require a 75-foot-wide construction right-of-way, up to 450 miles of new laterals may be needed and at least 4,091 acres of land would be affected by their construction, much of it along new right-of-way. Additional land would be required for workspaces at waterbody, road, and railroad crossings and for topsoil storage and sidehill construction. This disturbance would be in addition to the land that would be required for any expansion of Tennessee's facilities to transport the Millennium gas volumes. Any new laterals that would connect an expanded Transco or Texas Eastern system would be longer since they are farther south of Line A-5 and would affect a proportionally greater amount of land.

However, Columbia could continue to operate its Line A-5 rather than abandon it as proposed, if Millennium's proposed volumes were transported via other pipeline systems. But, it is not unreasonable to assume that Columbia would have to continue to repair and replace portions of this aging pipeline as it has been doing in recent years. While Columbia's customers could continue to be served by Line A-5, two of Millennium's proposed shippers (North East Heat & Light [North East] in Erie County, Pennsylvania and International Business Machines [IBM] in Westchester County, New York), and one potential new customer at the Bowline Generating Station in Rockland County, New York could not be served. Further, any system alternative that bypasses replacement of Line A-5 negates the benefits of replacing this aging pipeline which is one objective of the proposed project. This would mean that construction eventually would be needed along Line A-5, as well as along any system alternative that would entirely replace the proposed Millennium Project.

All of the pipeline systems that could serve as a system alternative to Millennium would require construction of additional facilities which would have environmental impacts similar to those of the proposed project. For example, the expansion of the existing Tennessee and Texas Eastern systems (plus additional facilities on CNG's and National Fuel's systems) could require up to 267 miles and 185 miles of looping (plus compression and facilities on other pipeline systems), respectively, to transport the Millennium volumes in addition to their current service obligations. Of these facilities, about 40 miles of the required looping on Tennessee's system in northern New Jersey and about 39 miles of the required looping on Texas Eastern's system in central and northern New Jersey would be through developed areas which would generate numerous construction issues similar to those on Millennium. In addition, some of the pipeline looping that would be required on the Texas Eastern system in Pennsylvania would be the fifth loop of the pipeline. Finally, it is unknown if the owners of these systems would be willing either to construct and operate the needed facilities or meet Millennium's in-service date. Any such alternative proposals would require an application to be filed with the Commission for evaluation.

3.2.1.1 Lake Erie System Alternatives

The COE requested that we evaluate alternatives that would avoid the proposed Lake Erie crossing. Therefore, the Commission's engineering staff evaluated several system alternatives that would require the expansion of various combinations of existing facilities owned by National Fuel, CNG, and Tennessee. The U.S. portion of these system alternatives would originate at the Canada/U.S border north of Buffalo, New York, and would require additional pipeline construction (looping and/or new right-of-way) and compression at either existing or new compressor stations. The alternative would use Tennessee's existing Niagara Import Point at the international border. Initial transportation would be via Tennessee's facilities, which would deliver 8 million cubic feet per day (MMcf/d) to National Fuel for final delivery to North East, Millennium's shipper in Erie County, Pennsylvania. Our analysis does not include estimates of the facilities that would be required in Canada to deliver the Millennium volumes to Tennessee's Niagara Import Point nor the costs for such facilities. But up to 164 miles of alternative pipeline routing and possibly additional compression would be required in Canada between Dawn, Ontario, and the Niagara Import Point.

It should also be noted that none of the pipeline companies who own the facilities evaluated have been involved in developing these system alternatives, nor have they proposed alternative projects to transport the Millennium gas volumes. Our analysis is based on information filed with the Commission in other cases which contain data about the capacity and operation of these pipeline systems. There may be operational constraints and service requirements on these systems that might preclude developing these possible system alternatives. Further, the locations and sizes of the suggested facilities may change because of these unknown requirements. However, based on the information we have at hand, all of the systems evaluated would require construction of additional pipeline capacity and compression since the existing systems do not have sufficient available capacity to transport the Millennium gas volumes.

Niagara Spur System Alternative

FERC staff evaluated the facilities that could be needed to transport gas from the Niagara Import Point at the Niagara River to an interconnection with the proposed Millennium Pipeline in New York. This alternative would bypass Lake Erie and would replace a total of about 144 miles of the proposed Millennium project in Lake Erie and Chautauqua, Cattaraugus, and Allegany Counties (about 114.1 miles of this total would be onshore). Additional Canadian facilities which would not be built would include the 46.0-mile-long St. Clair pipeline and 60.4 miles of the Lake Erie pipeline crossing in Canadian waters that would be constructed by TransCanada. No new compression is proposed for the Millennium Project; however, any system alternative that would transport gas from the Niagara Import Point to the proposed project in Allegany County would require additional compression. We compared the estimated costs of the evaluated system alternatives with an estimated cost of about \$235,000,000 for the portion of the Millennium Project that the alternatives would replace. The alternative presented below may be economically viable.

The Niagara Spur System Alternative would require Tennessee to transport 700 dth/d from the Niagara Import Point on its Niagara Spur to an intersection with National Fuel at the East Aurora Delivery Point (East Aurora) in Erie County, New York. National Fuel would transport 8 MMcf/d to North East. The remaining Millennium gas volume of 692 dth/d would be transported by National Fuel to an interconnection with the proposed Millennium Pipeline route in Allegany County, New York. Millennium would then transport the 692 dth/d to its other shippers as proposed. The Niagara Spur System Alternative may require the construction of the following facilities on these pipeline systems:

Tennessee facilities:

- 13.7 miles of 42-inch-diameter pipeline loop extending downstream of the Niagara Import Point on the Niagara Spur in Niagara County, New York;
- an 11,000 hp compressor addition at the Lockport Compressor Station in Erie County, New York; and
- 24.8 miles of 42-inch-diameter pipeline loop extending downstream of the Lockport Compressor Station on the Niagara Spur in Erie County, New York.

National Fuel facilities:

- 55.6 miles of 42-inch-diameter pipeline loop in Erie, Cattaraugus, and Allegany Counties, New York, between East Aurora and the interconnection with Millennium in Allegany County, New York; and
- an 18,000 hp compressor addition at the existing Concord Compressor Station in Erie County, New York.

The total estimated facilities and costs, exclusive of fuel costs, for Niagara System Alternative are \$222,780,000 for 94.0 miles of 42-inch-diameter pipeline at \$2,000,000 per mile (\$187,980,000) and 29,000 hp of compression at \$1,200 per hp (\$34,800,000). This is about \$12,000,000 less than the corresponding segment of the proposed project based on preliminary analysis.

The Niagara Spur System Alternative would require construction of about 53.3 fewer miles of pipeline in the U.S. (about 20.4 fewer miles of onshore pipeline construction), but would require the expansion of two existing compressor stations, both in Erie County, New York. About 106.4 miles of proposed Canadian facilities would not go forward, however other Canadian facilities would need to be constructed for this alternative. We are not able to estimate those facilities based on available data. Based on the potential for reduced costs and fewer environmental impacts in the United States, we are requesting comments from TransCanada, Tennessee, and National Fuel about the feasibility of constructing a system alternative from the Niagara Import Point to an interconnection with Millennium's pipeline near proposed MP 143.8 in Allegany County, New York.

3.2.2 Projects Currently Under FERC Review

Three related projects are currently under review by the Commission and FERC staff in the DEIS that has been prepared for the Supply Link, Independence Pipeline, and Market Link Expansion Projects.^{1/} These projects, if constructed, would transport gas from the developing natural gas market hub in the Chicago area to the Leidy, Pennsylvania market hub and then to markets in Pennsylvania, New Jersey, the New York City metropolitan area, and the Atlantic Seaboard. These projects would extend across northern Illinois, Ohio, Pennsylvania, and New Jersey.

The first of these projects, the Supply Link Project, is proposed by ANR Pipeline Company (ANR) and would transport gas from the upper midwest in the vicinity of Chicago, Illinois, to Defiance, Ohio, where it would interconnect with the Independence Project. The Supply Link Project would consist of expansion of ANR's existing system by constructing pipeline looping and adding compression. The Independence Project, as proposed by Independence Pipeline Company (Independence), would transport natural gas from Defiance, Ohio, to the Leidy Storage Field in Leidy, Clinton County, Pennsylvania. It consists mostly of pipeline construction along new right-of-way. The third project, Transco's Market Link Project, would move the natural gas east from Leidy, Pennsylvania, to markets in New York, New Jersey, Pennsylvania, and the Atlantic Seaboard. As currently proposed, the Supply Link, Independence Pipeline, and Market Link Expansion Projects would consist of a total of about 625.3 miles of pipeline and 137,400 hp of compression at 3 new and 4 existing compressor stations.

The Vector Pipeline Project would consist of about 330 miles of 36- and 42-inch diameter pipeline extending from Joliet, Illinois to St. Clair County, Michigan.^{2/} In addition, Vector Pipeline L.P. (Vector) would construct two new compressor stations and lease a 59-mile-long pipeline segment from Michigan Consolidated Gas Company. The system would be capable of transporting up to 1 Bcf of natural gas to Dawn, Ontario, although Vector expects to deliver some gas to markets in Michigan. Vector Pipeline Limited Partnership (Vector Canada) would construct an additional 15 miles of pipeline from the Canada/U.S. border to the existing pipeline/gas storage hub at Dawn, Ontario. According to Vector, its project would give natural

^{1/} ANR Pipeline Company's Supply Link Project (Docket Number CP97-319-000), Independence Pipeline Company's Independence Pipeline Project (Docket Number CP97-315-000), and Transco's Market Link Expansion Project (Docket Number CP98-540-000).

^{2/} See FERC/EIS-0118D (September 1998) and FERC/EIS-0118F for the Vector Pipeline Project as proposed by Vector Pipeline L.P. in Docket Numbers CP98-131-000 and CP98-133-000.

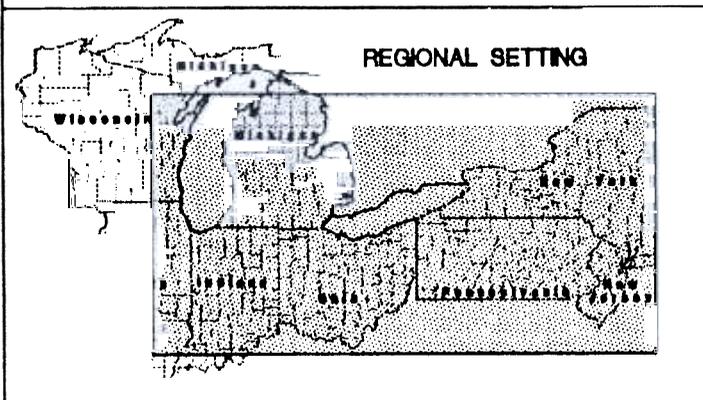
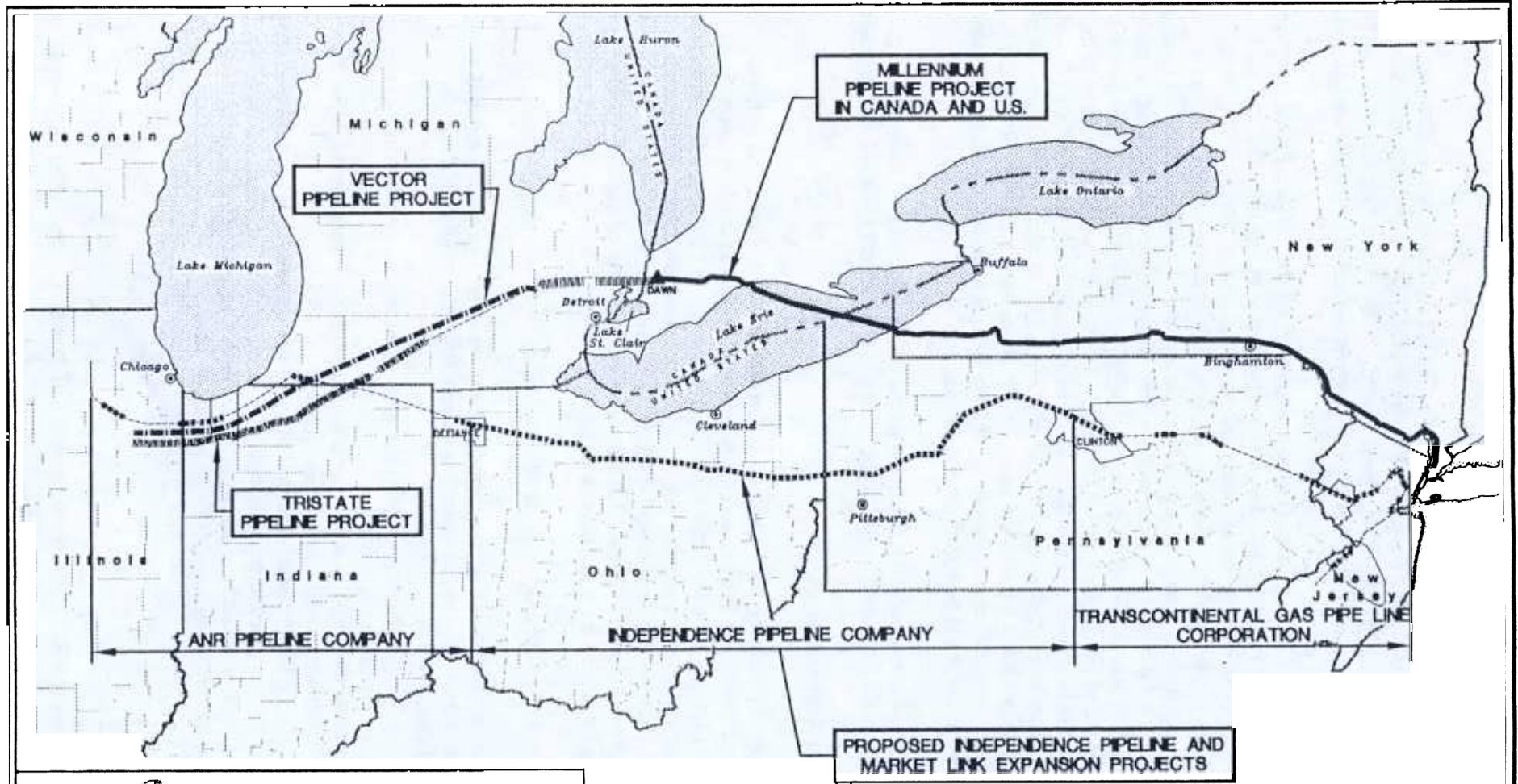


FIGURE 3.2.2-1
MILLENNIUM PIPELINE PROJECT
PROJECTS UNDER FERC
REVIEW
 NOT TO SCALE

gas shippers increased access to the Dawn hub, and markets in Canada and the eastern U.S., furthering the open flow of natural gas throughout North America. A final EIS for the Vector Pipeline Project was issued in April 1999. On October 14, 1998, the Commission issued a Preliminary Determination on Non-environmental Issues (PD) for the Vector Pipeline Project; however, a final order has not been issued.

Finally, TriState Pipeline L.L.C. (TriState) proposes to construct the TriState Pipeline Project,^{3/} which would consist of about 228.1 miles of 24-, 30-, and 36-inch-diameter pipeline (150.2 miles of new pipeline and 77.9 miles of pipeline loop) in five segments extending from Joliet, Illinois to the Canada/U.S. border near St. Clair, Michigan. In addition, TriState would lease capacity on the existing pipeline facilities of two affiliate companies, Consumers Energy Company (Consumers) and Michigan Gas Storage Company (MGS). The lease of the expanded capacity on those existing facilities would eliminate the need to construct over 123 miles of new pipeline between White Pigeon and St. Clair, Michigan. TriState's system is designed to transport up to 650 MMcf/d of natural gas from the Chicago hub. About 450 MMcf/d would be delivered to Dawn; the remainder would be delivered to Consumers in White Pigeon, Michigan. TriState's Canadian affiliate would build about 5 miles of pipeline from the Canada/U.S. border to connect with a new 10-mile-long pipeline proposed by Union Gas Ltd. that would go into the Dawn hub. A draft EIS is currently being prepared to address the environmental impacts associated with the TriState Pipeline Project, and facilities to interconnect with the Dawn hub would be constructed in Canada.

ANR/Independence, Vector, and TriState each contend that its proposed project is a hub-to-hub transportation project, and is not dependant on any of the other projects currently planned and proposed.

3.2.3 One-Pipe System Alternatives

We evaluated several possible system alternatives that would use portions or all of the proposed ANR/Independence Project, the Vector Project, and the Millennium Project in combination with existing systems to transport all of the gas volumes proposed in these projects. We evaluated the facilities that would be required on the ANR/Independence Project to also transport the proposed Millennium gas volumes and we evaluated expanding the Vector, TriState, and Millennium Projects to transport the proposed ANR/Independence volumes. Figure 3.2.3-1 shows the location of each of these projects. System alternatives using these projects is discussed below.

Several key assumptions were used in the development of these system alternatives

- each evaluated system would have to be capable of transporting both its proposed volumes and the additional volumes that would have been transported by either Millennium or ANR/Independence;
- the Vector, ANR/Independence, and Millennium projects are capable of being redesigned because they are not yet in existence;
- any redesign of the TriState project must take into account the project's dependance on existing facilities and available pipeline capacity;
- Transco's Market Link Project would still be need to be constructed to meet the need for gas in New Jersey and near Philadelphia; and
- additional facilities would be required in Canada across Ontario and Lake Erie to connect the Dawn hub and the western end of the Millennium system.

^{3/} TriState Pipeline Company's TriState Pipeline Project (Docket Nos. CP99-61-000, CP99-62-000, CP99-63-000, and CP99-64-000).

For our system alternatives analysis, we assumed that either the Vector or TriState Projects could be interconnected through Canadian facilities and the Dawn, Ontario market hub with the proposed Millennium Project as a system alternative to the ANR Supply Link and Independence Projects. It can be reasonably assumed that additional facilities would be needed in Canada to accommodate the additional gas volumes that would be transported.

3.2.2.1 TriState-Millennium System Alternative

For the combined TriState-Millennium systems to transport the additional volumes of natural gas proposed by ANR and Independence, the proposed systems would need to be substantially altered. TriState's proposed project essentially completes the looping of Consumers and MGS systems in the project area, providing Consumers and MGS with 650 MMcf/d of capacity that it would lease to TriState. Therefore, to accommodate ANR's and Independence's volumes, the capacity on the TriState/Consumers/MGS systems would need to be increased to 1.65 Bcf, or over 2.5 times the initial capacity.

About 67 percent of the transportation capacity on TriState's system is contracted for by the involved shippers. The remainder would be available for other interested parties. However, because TriState's facilities are inextricably integrated with Consumers' and MGS's systems, any new shippers would also have to arrange for capacity on those two existing systems which may not be available.

Regarding the facilities required to transport an additional 1 Bcf, it is realistic to assume that additional looping and compression would be required. In fact, because TriState is currently proposing, in effect, to loop portions of Consumers and MGS's systems, it is likely TriState would have to build essentially an entirely new system parallel to those Consumers and MGS. This would result in TriState constructing a total of 702 miles of new pipeline. Increasing the diameter of TriState's proposed pipeline is not an option because it would make the facilities incompatible with the two existing systems and decrease the engineering efficiency of the systems as a whole.

In order for Independence's volumes of about 1 Bcf per day to be delivered into the Leidy hub through the Millennium system (and still allow Millennium's customers to be served), we estimated that Millennium would need to:

- construct one 40,000-hp compressor station on the U.S. side of Lake Erie;
- increase its pipe diameter size from 36-inch to 42-inch-diameter pipe for about 144 miles from the Canada/U.S. border in Lake Erie to the interconnect with National Fuel/CNG in New York (see below);
- construct about 50 miles of new 42-inch-diameter pipeline from the National Fuel/CNG interconnect to the Leidy hub in north central Pennsylvania;
- construct one 12,000-hp compressor station at the National Fuel/CNG interconnection in Allegany County, New York; and
- construct one 10,000-hp compressor station somewhere along the new 50-mile interconnect pipeline route.

In summary, the use of the TriState-Millennium System Alternative would involve the construction of about 1,169 miles of new pipeline, 62,000 hp of new compression at three new compressor stations, and an unknown amount of compression on the TriState, Consumers, and MGS systems. This would bring the total amount of construction for the alternative, including the facilities that would be constructed for the proposed TriState and Millennium Projects to 1,169 miles of pipeline and at least 62,000 hp of compression. Comparatively, as proposed, the ANR/Independence, TriState, and Millennium Projects would involve the construction of a total of about 1,117.5 miles of new pipeline and 60,000 hp of compression at three new compressor stations. In addition, the connecting pipeline facilities in Canada would need to be modified

and/or expanded to handle the additional volumes. Clearly, the environmental impacts associated with the additional 51.5 miles of pipeline and the problems associated with the integration of the TriState's, Consumers', and MGS's systems make the TriState-Millennium System Alternative not viable or environmentally preferable to the proposed ANR/Independence and Millennium Projects.

3.2.2.2 Vector-Millennium System Alternative

The Vector-Millennium System Alternative would be similar to the TriState-Millennium System Alternative in that substantial new facilities would be required to increase the capacity of each project to accommodate the ANR/Independence volumes. Also, the facilities needed by Millennium and those required in Canada would be identical to those described above for the TriState-Millennium System Alternative. Therefore, we will only summarize Millennium's additional facilities.

Vector's project, as proposed, would transport up to 1 Bcf of gas to Dawn, Ontario. For the combined Vector-Millennium system carrying 2 Bcf, we identified two scenarios for adding the necessary facilities to Vector's system: the first, maximizing the use of looping adjacent to existing right-of-way; and the second, maximizing the use of compression in lieu of pipeline.

Vector System 1: System 1 would require Vector's facilities as proposed, with the additional construction of about 313 miles of 42-inch diameter loop; and would require an additional 58,000-hp at its two proposed compressor stations. This essentially would mean that Vector would have to loop its entire system.

Vector System 2: System 2 would require Vector to construct its currently proposed facilities, as well as about 60 miles of 42-inch diameter loop pipeline and an additional 350,000 hp. To be able to handle the additional compression, Vector would need to relocate its Springville Compressor Station, and redistribute the compression on its system between six new compressor stations.

Table 3.0 summarizes the facilities required, and compares the facilities required for the Vector-Millennium System Alternatives to those proposed by ANR, Independence, Vector, and Millennium. The Vector-Millennium System 1 facilities needed for this alternative would result in the construction of a total of about 363 additional miles of pipeline along the Vector and Millennium routes and the construction of three new compressor stations on the Millennium system as well as the construction of the proposed facilities for these projects. The total facilities needed for the Vector-Millennium System 1 Alternative would be about 1,110 miles of pipeline and 180,000 hp of compression. For comparison, the total facilities that would be constructed for the proposed Vector, Millennium, ANR, and Independence Projects would be about 1,222 miles of pipeline and 135,000 hp of compression.

The Vector-Millennium System 2 facilities would result in the construction of about 110 more miles of pipeline than the Millennium and Vector Project presently propose; and would require the construction of nine new compressor stations (six on Vector's system, three on Millennium's), in addition to the three currently proposed by Vector. A total of about 857 miles of pipeline would be required for the Vector-Millennium System 2 Alternative which includes the proposed facilities of Vector and Millennium. About 412,000 hp of compression would be required in addition to the proposed 60,000 hp of compression for the Vector Project. As stated above, for comparison, the proposed Millennium, Vector, ANR, and Independence Projects would require about 1,222 miles of pipeline and 135,000 hp of compression.

The Vector-Millennium Alternatives would require a complete expansion of the Vector system with multiple compressor stations; unknown expansion of Canadian facilities; upsizing about 144 miles of the Millennium Project; adding three compressor stations to the Millennium Project; and adding a 50-mile-long pipeline lateral from Millennium to the Leidy storage hub. Besides the significant impact in the areas affected by these expansions, is the fact that no one has proposed or is likely to propose this project.

System Components	Total Amount of Pipe (miles)		Total Additional Compression (hp)		Comments
Vector System 1 and Millennium	Vector (as proposed):	330 (new)	Vector (as proposed):	60,000 at 2 new C.S.	Millennium would also need to increase size of pipe diameter from 36" to 42" for 144 miles.
	Vector System 1:	313 (loop)	Vector System 1	58,000 at 2 C.S. above	
	Millennium (as proposed):	417 (new)	Millennium (as proposed):	None	
	Additional upgrade:	50 (new)	Additional upgrade:	62,000 at 3 new C.S.	
	TOTAL:	1,110	TOTAL:	180,000	
Vector System 2 and Millennium	Vector (as proposed):	330 (new)	Vector (as proposed):	60,000 at 2 new C.S.	** Vector would have to relocate one of its 2 proposed C.S. and redistribute volume over 6 new C.S. Millennium would also need to increase size of pipe diameter from 36" to 42" for 144 miles.
	Vector System 2:	60 (loop)	Vector System 2:	350,000 ** (6 new C.S. + 2 existing C.S.)	
	Millennium (as proposed):	417 (new)	Millennium (as proposed):	None	
	Additional upgrade:	50 (new)	Additional upgrade:	62,000 at 3 new C.S.	
	TOTAL:	857	TOTAL:	472,000	
ANR and Independence Facilities	ANR (as proposed):	74 (loop)	ANR (as proposed):	15,000 at 1 existing C.S.	
	Independence (as proposed):	401 (new)	Independence (as proposed):	60,000 at 3 new C.S.	
	TOTAL:	475	TOTAL:	75,000	

Therefore, for the reasons stated above we eliminated these two variations of the Vector-Millennium System Alternative from further consideration. and conducted no further analysis of them.

3.2.2.3 ANR/Independence-Texas Eastern Alternative for the Millennium Project

We evaluated a system alternative that would use the ANR and Independence pipeline systems to transport Millennium's gas volumes from the Chicago hub to the Leidy storage hub. From that point the analysis evaluated the use of Texas Eastern's facilities to transport gas from the Leidy hub eastward.

Modifications to the ANR System

As proposed, the ANR Project involves expanding ANR's Michigan Leg South Mainline and Tieline Mainline from Joliet, Illinois, to an interconnection with Independence in Defiance, Ohio. The additional facilities that would be required on ANR's system to enable it to also transport Millennium's 700 dth/d may include 132.5 miles of pipeline, increasing the pipeline diameter of 30.1 miles of proposed pipeline from 30 to 42 inches, and 59,250 hp of additional compression.

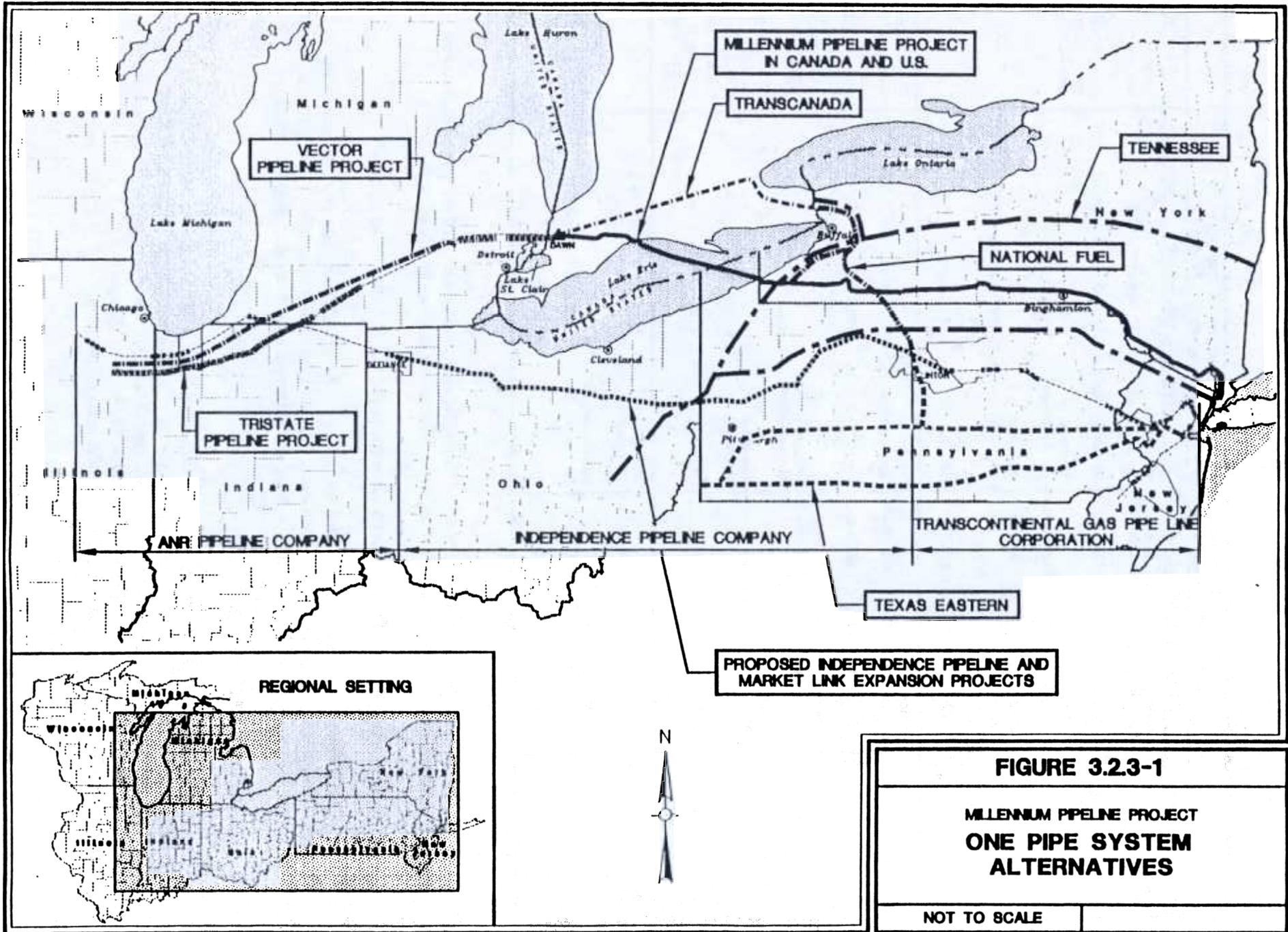


FIGURE 3.23-1
MILLENNIUM PIPELINE PROJECT
ONE PIPE SYSTEM
ALTERNATIVES
NOT TO SCALE

Modifications to the Independence System

The Independence Project, as proposed, would transport about 1 Bcf/d from the proposed interconnection with ANR in Defiance, Ohio, to an interconnection with Transco at the Leidy hub near Leidy, Pennsylvania. The additional facilities on the proposed Independence project that may be required to transport the Millennium volumes include upgrading size of the proposed 400.1 miles of 36-inch-diameter pipeline to 42-inch-diameter pipe. Also, about 47,400 hp of additional compression would be needed at three of the proposed compressor stations for the Independence Project as well as one additional new compressor station that would be needed for the alternative.

Modifications to the Texas Eastern System

Texas Eastern has not filed an application to transport any of the volumes proposed by Millennium or Independence. However, we evaluated use of its system to transport the Millennium volumes from an interconnection with the proposed Independence Project at Leidy, Pennsylvania to New York City. The alternative would have Texas Eastern deliver gas to: Columbia in Bucks County, Pennsylvania (98 dth/d); Algonquin Gas Transmission Company (Algonquin) in Hanover, New Jersey (245 dth/d); and local distribution companies in New York City (350 dth/d). This alternative would not be able to provide the 8 dth/d of proposed service to North East. The facilities that would be required on Texas Eastern's system include about 185 miles of 36-inch-diameter pipeline looping and 12,000 hp of compression.

Conclusion

Use of this alternative would require that Columbia's Line A-5 remain in service and that the proposed 8 dth/d of service to North East would not be provided. The alternative would require increases in compression at 8 compressor stations and the construction of a new compressor station. This would add about 118,650 hp of compression to the 75,000 hp of compression proposed for the ANR and Independence Projects. No new compression is proposed for the Millennium Project.

The alternative may require about 317.5 miles pipeline construction on the ANR, Independence, and Texas Eastern systems in addition to the proposed construction of 475 miles of pipeline for the ANR and Independence Projects for a total of 792.5 miles of pipeline. The proposed ANR, Independence, and Millennium Projects would require about 892 miles of pipeline construction. However, replacement of the old Line A-5 is one of the objectives of the Millennium project; and, therefore, it is anticipated that Columbia would continue to replace portions of its aging, 222-mile-long Line A-5 as it has been doing in recent years. Use of this alternative may only postpone the impact of construction of a later Line A-5 replacement and would then result in not only the impact of constructing the alternative, but the impact of constructing the Line A-5 replacement. This alternative would have greater environmental impact since it would require the addition of over twice as much new compression and could result additional workspace requirements for spoil storage along the segments of pipeline that would be upsized to 42 inches. Finally, it would not meet all of the proposed project's objectives, therefore, it was not evaluated further.

3.2.2.4 Leidy Interconnection System Alternative

This alternative would replace the about 144 miles of the western portion of the Millennium Pipeline Project and would avoid a Lake Erie crossing. It would use the alternative ANR and Independence pipeline and compressor facilities as previously described, but would require the construction of a 50-mile-long pipeline from the Leidy hub to interconnect with the proposed Millennium Pipeline in, New York, and a new 8,000 hp compressor station. In addition to the facilities proposed for the ANR and Independence Projects, this alternative would require the construction of about 182.5 additional miles of

pipeline and about 114,650 hp of additional compression. It would also require construction of about 273 miles of the proposed Millennium Project. The Leidy Interconnection System Alternative would require a total of about 980.5 miles of pipeline and 197,650 hp of compression. This alternative would have a greater environmental impact than the proposed projects since it would be about 88.5 miles longer and would require more compression, therefore, it was not evaluated further.

Planned Future Projects

Crossroads Pipeline Company (Crossroads), a subsidiary of NIPSCO Industries, Inc., in partnership with CNG, and the East Ohio Gas Company (East Ohio Gas), an affiliate of CNG, are planning a joint project (Crossroads Project) to deliver natural gas from U.S. and Canadian supply basins through the Chicago area and into expanding eastern markets. An application for 7(c) NGA authority for the Crossroads Project has not yet been filed with the Commission. According to the project sponsors, this project would maximize the use of existing facilities and require little additional construction to transport natural gas to interconnections with natural gas pipeline systems currently serving the New York City metropolitan area. As with the previous pipeline system alternatives, the Crossroads/CNG system alternative would not be able to deliver natural gas to the delivery points currently served by Columbia's Line A-5 or to delivery points that would be newly served by the Millennium Pipeline Project (see figure 1.1-1). In addition, since the project has not been filed with the Commission, we do not know the exact location of the facilities or the proposed in-service dates. We also cannot determine what additional facilities might be required or if this project could be a practical alternative to the Millennium Pipeline Project. For these reasons, we did no further analysis of this system alternative.

3.3 MAJOR ROUTE ALTERNATIVES

Geographic or major route alternatives are identified to determine if these alternatives could avoid or reduce impact on environmentally sensitive resources, such as large population centers, scenic areas, wildlife management areas, etc., that would be crossed by the proposed pipeline. Route alternatives generally do not change the origin and delivery points for natural gas along the proposed pipeline. Although route alternatives may follow routes significantly different from those proposed, they would not make use of another existing or modified pipeline system, as would a system alternative.

In accordance with Commission regulations [18 CFR, Section 2.69(1)(in)], primary consideration in identifying potential route alternatives is given to the use, enlargement, or extension of existing rights-of-way to avoid sensitive resources. In general, installation of new pipeline along or within existing, cleared rights-of-way (e.g., pipeline, powerline, road, railroad, etc.) is environmentally preferable to the clearing of new rights-of-way. The partial use of previously cleared rights-of-way can reduce construction effects by avoiding creation of new right-of-way through previously unaffected areas.

Lake Erie Alternatives

3.3.1.1 Alternative Routes Avoiding a Lake Erie Crossing

We evaluated pipeline routes that would avoid crossing Lake Erie, but would not be integrated with existing pipeline systems. They would, however, be routed to maximize use of existing pipeline rights-of-way.

Millennium's initial route selection study focused on the project's take-off and delivery points (i.e., Dawn, Ontario to New York City), as well as maximizing the use of existing pipeline corridors, including following the existing Columbia rights-of-way for most of the route to New York City. While much of

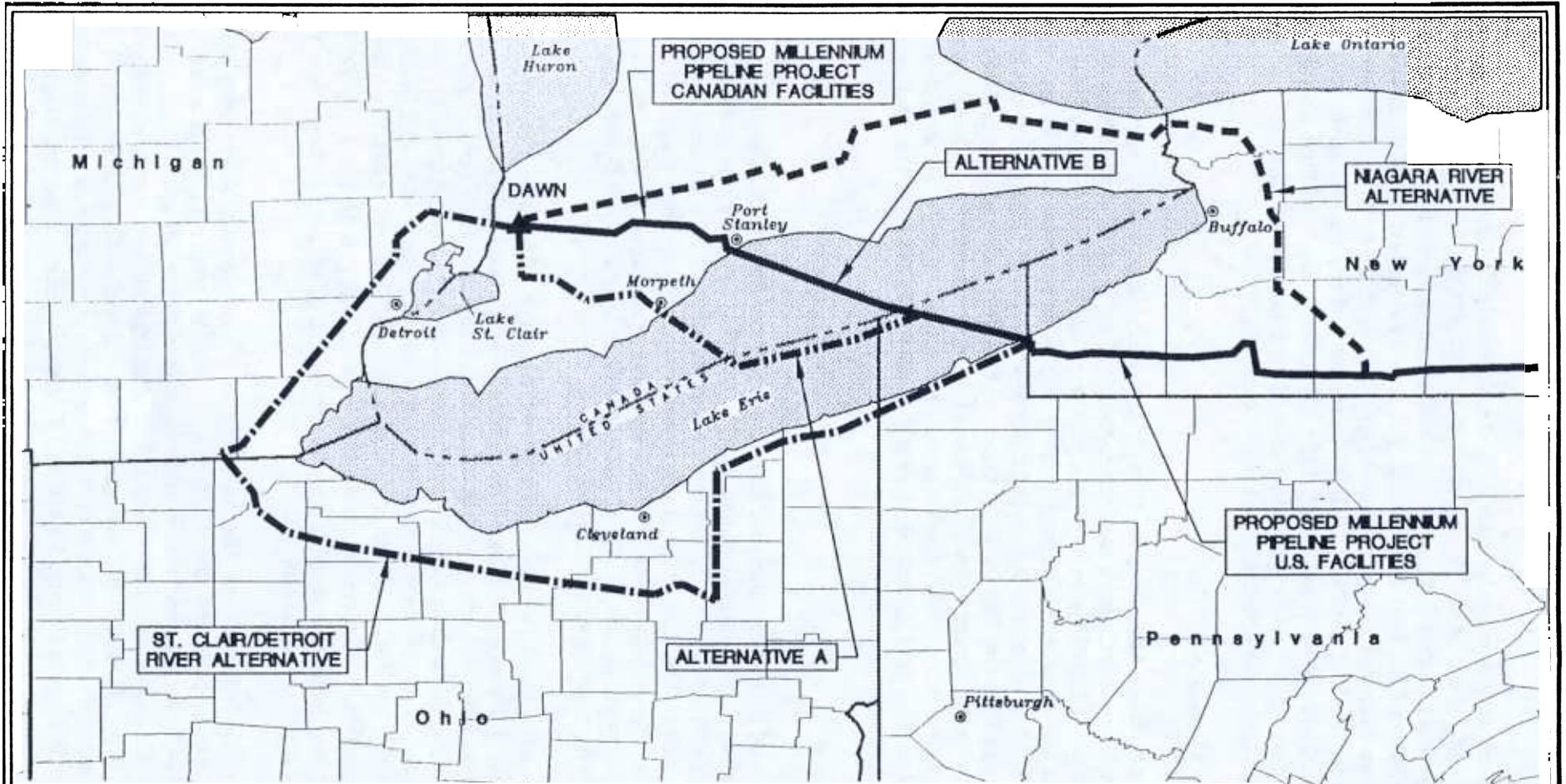


FIGURE 3.3.1-1
MILLENNIUM PIPELINE PROJECT
LAKE ERIE
ROUTE ALTERNATIVES
IN CANADA AND U.S.

NOT TO SCALE

the route across New York State was predetermined by the location of Columbia's Line A-5, several alternatives were evaluated for the portion of the route from Dawn, Ontario to an intersection with Columbia's Line A-5. Millennium identified two locations where existing pipelines cross the international border: at the St. Clair/Detroit River near Detroit, Michigan and at the Niagara River north of Buffalo, New York. Therefore, we examined two major route alternatives identified by Millennium that would avoid crossing Lake Erie: the St. Clair/Detroit River Alternative and the Niagara River Alternative. Millennium also evaluated alternative routes across Lake Erie. Our analysis of these alternatives is presented below. See figure 3.3.1-1 for the general location of these alternatives. See section 3.2 for a discussion of system alternatives that would avoid a Lake Erie crossing.

St. Clair /Detroit River Alternative

The St. Clair/Detroit River Alternative would begin at the U.S. /Canada border, either at the St. Clair or the Detroit River in St. Clair County near Detroit, Michigan, and would follow existing rights-of-way south along the west side of Lake Erie, turn east along the south side of Lake Erie through Ohio, and then north along the east side of Lake Erie through Pennsylvania to the proposed route in Ripley, New York. This alternative would be adjacent to the existing rights-of-way of ANR or Texas Eastern from St. Clair County to the Maumee Hub near Toledo, Ohio, and those of CNG or Columbia from the Maumee Hub to the intersection with the Millennium pipeline in New York. This alternative would be significantly longer (214 or 286 miles longer, respectively) than the proposed route, disturbing significantly more land, wetlands, waterbodies, etc., than the proposed route. For this reason, we did no further analysis of the St. Clair /Detroit River Alternative.

Niagara River Alternative

Millennium evaluated alternative routes that would begin at Dawn in Ontario, Canada and would follow existing rights-of-way to the Niagara or Chippewa Import Points in the vicinity of Buffalo, New York. At the Canada/U.S international border, they would cross the Niagara River adjacent to either the Tennessee or Empire pipelines. The total length of this route between Dawn, Ontario and MP 143.8 in Allegany County, New York would be between 292 and 307 miles (depending on whether the Tennessee or Empire pipeline was followed), as compared to the proposed route from Dawn to Greenwood, which would be about 250 miles (or between 42 and 57 miles shorter).

For our analysis, we evaluated a shorter route which would require Millennium to construct a new pipeline along the existing Tennessee and National Fuel rights-of-way, but would not use any of the existing pipeline facilities. The alternative would begin at the Canadian/U.S. border adjacent to Tennessee's Niagara Spur, would continue along Tennessee's pipeline to the Pekin Interconnection, and would then proceed adjacent to a National Fuel pipeline to the proposed route at MP 143.8 in Allegany County, New York. The new pipeline could deliver 8 dth/d to National Fuel at the Nash Road Delivery Point in Erie County, New York, for delivery to North East. It would transport the remaining 692 dth/d to the Millennium Project at an interconnection that could be constructed in Allegany County, New York. Gas could then be transported eastward as proposed.

The advantages of the Niagara River Alternative include the avoidance of the crossing of Lake Erie, the potentially shorter overland route in the U.S. (about 128.3 miles compared to the proposed 143.8 miles). Another advantage is that the alternative would maximize of the use of existing rights-of-way, About 93 percent of this alternative would be adjacent to existing right-of-way compared to about 78 percent of the proposed route. However, the disadvantages are that it would require about 14.1 more miles of onshore pipeline construction and would require Millennium to construct a new compressor station at the international border in Niagara County, New York. Further, we estimate that the Niagara River

Alternative would cost about \$54,780,000 more than the replaced portion of the proposed route. Since it would not be cost effective and may increase environmental impact on land both in the U.S. and Canada, we did no further analysis of the alternative.

We received several comments about the feasibility of constructing a pipeline across Lake Erie. One of the major issues identified is the possibility of damage to the pipeline from ice scour (see section 5.3.3). Millennium completed and filed an ice scour study which identifies where ice scour occurs and the trench depths that would be needed for pipeline burial. We have asked the COE, as a cooperating agency, to assist us in the evaluation of this study and the technical feasibility of constructing the Millennium Pipeline Project across Lake Erie.

3.3.1.2 Alternative Routes Across Lake Erie

Millennium based its selection of the proposed route across Lake Erie on identifying the shortest route and on the premise that potential impacts associated with land-based construction are greater than those associated with in-water construction. Originally, Millennium considered six alternative routes across Lake Erie. These were based on three landfall options on the Canadian side near the communities of Morpeth, Port Stanley and Hemlock and two landfall options on the U.S. side near the communities of Girard and North East in Pennsylvania. The landfall option near Hemlock was eliminated for commercial reasons. The landfall near Girard was also eliminated as it appeared to offer no advantages over the preferred U.S. landfall option near North East, the original (December 1997) route. Millennium later evaluated a U.S. landfall less than 4 miles north of North East at Ripley, the proposed (October 1998) route (see sections 3.4 and 6.3.1 for discussion of the Lake Erie Landfall variations).

Millennium states that two alternative crossings, Alternative A and Alternative B, were originally considered. Both originated at Dawn and extended to landfalls near Morpeth and Port Stanley, Ontario, respectively, and both extended to a landfall near North East, Pennsylvania. A number of factors, including route length, cost, scheduling, landfall location, offshore gas production areas, sediment quality, ice scour, anchor dragging, and turbidity generation and siltation were taken into consideration in evaluating Alternative A (Morpeth to North East) relative to Alternative B (Port Stanley to North East) as discussed below.

Route Length - Alternative A would be slightly longer (267 miles overall) than Alternative B (258 miles). However, the overland segment of Alternative A would be about 15.5 miles shorter. Since Alternative A would require less overland construction, Alternative A was preferred over Alternative B.

Cost - Although Alternative A would require considerably more offshore pipeline than Alternative B, costs would about the same due to the greater costs of the longer Canadian overland segment for Alternative B.

Scheduling - The additional offshore length of Alternative A would affect overall construction scheduling, since marine vessel access to and from Lake Erie is restricted to a period between early April and November. Millennium estimated that the absolute longest installation season that could be expected is seven months, or about 210 working days. Based on an average production lay rate of 100 joints/day (e.g., about 4,000 feet per day), about 143 days would be required for pipe installation on Alternative A and about 111 days would be required for Alternative B. Although innovative approaches can be used to increase production, the risk of not completing pipe installation within one construction season is far greater for Alternative A. If pipeline burial requires multiple passes, or if severe storms hinder or preclude pipe installation, then this risk

increases. Because there is a greater risk of not completing Alternative A in one season Alternative B was preferred over Alternative A.

Landfall Location - Millennium proposes to install the pipeline at the landfalls on both sides of Lake Erie by horizontal directional drill. As a result, a number of issues were considered with respect to landfall location. These included: population density in the immediate vicinity of the landfall; impact on any environmentally sensitive areas, or recreational lands or facilities; availability of sufficient land to accommodate the equipment required for the directional drill and pipe installation activities; and distance from the shore to the 23 to 26 foot depth contour. Based on these considerations, the landfall location near Morpeth (Alternative A) was slightly more advantageous than that near Port Stanley (Alternative B). The North East landfall was adequate for the proposed construction activities.

Offshore Natural Gas Development - There are a number of gas production fields along the Canadian shoreline, with some extending out as far as the international border. The pipeline collection systems for these fields have been installed on the lake bed with the wellheads protruding 5 ft above the lake bed. Alternative A would avoid the gas production areas and associated gas production facilities. Although Alternative B would also avoid most of the gas production areas, it would cross existing pipeline collection facilities at two to four locations. This would not have a major impact on the collection system although the pipe would be cut just before installation of the Millennium pipeline and then reconnected after installation was complete.

Sediment Quality - Sediment quality is an important consideration for projects involving sediment disturbance (e.g., dredging, jetting). The occurrence of contaminated sediments along a proposed route would require the development of comprehensive (and costly) removal and disposal plans or may even preclude a particular routing. Therefore, those routes that are less likely to cross areas of known contaminated sediments are preferred. Generally, concentrations of heavy metals and toxic organics have declined in Lake Erie surficial sediments due to the decrease of contaminant loadings to the lake, particularly from industrial sources along the St. Clair and Detroit River systems. However, due to historic loadings, elevated contaminant concentrations still occur in the deeper sediments of the depositional basins in the lake. Alternative A would cross the depositional central basin where elevated contaminant levels occur in the deeper sediments. Alternative B would cross the non-depositional Long Point-Erie sill.

Ice Scour - Ice scour has been documented in Lake Erie in water depths up to 82 feet. Both alternatives would cross areas with depths less than 82 feet. The potential for ice scour is generally higher along the nearshore, as well as in the western basin of Lake Erie. Alternative A was determined to have a greater susceptibility to ice scour because of its longer length, although this is likely offset by Alternative B's orientation nearer the Canadian shoreline.

Anchor Dragging - There are no officially designated anchorages for commercial vessels in the project area. During major storms, commercial vessels may drag their anchors as they seek temporary anchorage in sheltered or nearshore areas of the lake. Since the risk of pipeline damage from anchor dragging would be proportional to the length of the line in exposed locations, the preferred route would be that with the least length in commercial traffic areas of the lake. Alternative A would be longer and would parallel these commercial traffic areas for much of its length. Alternative B would cross the main commercial areas perpendicularly.

Turbidity Generation and Siltation - Although turbidity generation and siltation impacts are generally localized and short-term, overall impacts would be dependent on sediment particle size

and the length of the route. Since Alternative A would be longer and would cross the depositional Central Basin with its accumulations of fine-grained sediments, Alternative B was considered preferable from the standpoint of turbidity generation and siltation.

Conclusion - Alternative A (Morpeth to North East) would be preferable from the standpoint of overland route length, landfall location, and offshore gas development. Alternative B (Port Stanley to North East) would be preferable from the standpoint of scheduling, sediment quality, anchor dragging, and turbidity generation. Millennium states that based on this assessment, Alternative B was selected as the preferred route.

3.3.2 State Route 17 Alternatives

A number of comments (nearly all of the form letters) suggested an alternative that would place the proposed pipeline adjacent to or within the median strip of State Route 17, including, but not limited to the following segments: between the intersection of State Route 17 and the proposed pipeline at MP 111.3 (Olean) and MP 182.5 (Coopers Plains); between the intersection of State Route 17 and the proposed pipeline at MP 182.5 (Coopers Plains) and MP 287.3 (Hancock); and between the intersection of State Route 17 and the proposed pipeline near MP 287.3 (Hancock) and MP 369.6 (Tuxedo). Figure 3.3.2-1 shows the general location of each of these alternatives.

Millennium provided a preliminary environmental, engineering, and economic analysis for each of the three segments of the State Route 17 Alternative, and compared them to the corresponding segment of the proposed route. Because these routes would deviate from the existing Line A-5 corridor, construction of additional laterals would be required to maintain service to 23 existing and proposed delivery points of the Millennium pipeline or the existing Line A-5 would need to remain in service (see figure 1.1-1 and table 2.1-2).

Further, State Route 17 follows a less direct route across New York than the proposed route, and therefore would require the construction of additional pipeline to reach the ultimate delivery point in Westchester County. Cumulatively, Millennium estimates that the State Route 17 Alternative would require construction of about 159.1 miles of additional pipeline, increasing impacts on all environmental resources.

Millennium also identified preliminary routes for this alternative that would follow the south and east side of State Route 17. However, departures from the State Route 17 corridor would be common at interchanges, in urban areas, and in areas where the roadway is constructed immediately adjacent to streams, rivers, lakes, or wetlands. In many urban areas along Route 17, Millennium was unable to identify an alternative route based on existing mapping due to the current road configuration and the congested built environment. Specific areas of concern would be the towns of Cuba, Friendship, and Bath along the first segment (Olean to Coopers Plains); Corning, Horseheads, Elmira, Waverly, Endicott, Endwell, Johnson City, Binghamton, and Hancock along the second segment (Coopers Plains to Hancock); and Liberty, Monticello, and Middletown along the third segment (Hancock to Tuxedo). Further, construction practices required in urban areas would increase the amount of time required for installation of the pipeline, increasing traffic disruption and overall costs. Finally, Millennium estimates that construction of the State Route 17 Alternative (all 3 segments) would increase project costs by over \$200 million due to the construction of additional pipeline and associated construction limitations.

The current regulations and policies of the New York State Department of Transportation (NYSDOT) state that no longitudinal utility of this type may be placed in a freeway right-of-way. Since State Route 17 is classified as a freeway (i.e., a divided arterial highway with full control of access),

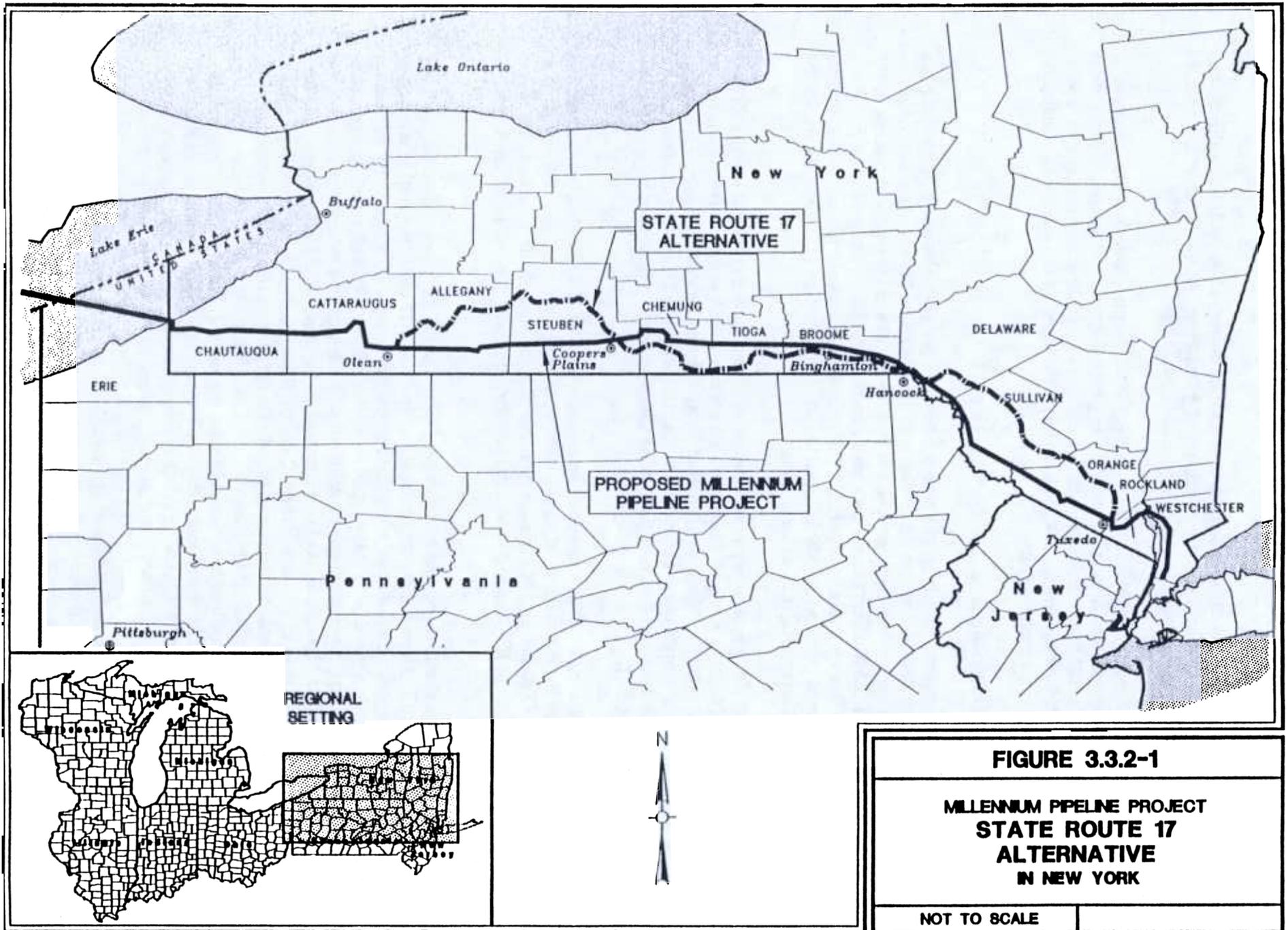


FIGURE 3.3.2-1
MILLENNIUM PIPELINE PROJECT
STATE ROUTE 17
ALTERNATIVE
IN NEW YORK

NOT TO SCALE

NYSDOT would not allow installation of the project within the State Route 17 right-of-way. Although the pipeline could be placed on private land adjacent to the highway easement, pipeline construction would be complicated by interchanges and commercial, industrial, and residential developments located along the roadway. Because of the NYSDOT's regulations, the commercial and residential development along segments of the State Route 17 corridor, and the longer length (and additional pipeline construction) required to service delivery locations and avoid congested urban areas, we eliminated this alternative from further analysis.

3.3.3 Hudson River Alternatives

The proposed Hudson River crossing would entail the dredging of 2.2 miles within the Haverstraw Bay area of the Hudson River. The bay provides habitat for waterfowl and fisheries, including the federally endangered shortnose sturgeon and the Atlantic sturgeon, a federal candidate species, and is also a designated Significant Coastal Fish and Wildlife Habitat. Millennium proposes to cross the Hudson River at this location between November 1, 1999 and January 31, 2000 to minimize fisheries impacts, including impacts on the shortnose sturgeon. However, based on information provided by the NMFS, pipeline construction across Haverstraw Bay during any time of year would still affect the shortnose sturgeon and construction could result in loss of individuals of this and other species.

Therefore, we looked at other possible locations for a pipeline crossing of the Hudson River outside of the Haverstraw Bay area. One possible location would be about 3.3 miles north of the proposed crossing where the Algonquin pipelines cross the Hudson River in the vicinity of Stony Point. We evaluated two route alternatives that would be adjacent to segments of the Algonquin pipeline and Con Ed powerline rights-of-way. These alternatives, Hudson River Alternative 1 and Alternative 2, are discussed in greater detail in section 6.2.

3.4 ROUTE VARIATIONS

Route variations differ from system or major route alternatives in that they are identified to resolve or reduce construction impacts on localized, specific resource issues, including wetlands areas, residences, landowner requests, and terrain conditions. While some variations are a number of miles in length, most are short and close to the proposed route. A number of factors are considered in identifying and evaluating route variations.

First, as described in section 3.3, Major Route Alternatives, primary consideration in identifying potential route variations is given to the use, enlargement, or extension of existing rights-of-way to avoid sensitive resources. Millennium's proposed route would be adjacent to existing rights-of-way for about 347.0 miles (90 percent of the land miles and 83 percent of its entire length). Many of the areas of new right-of-way were developed to reduce impact on specific resource areas, including agriculture, wetland and waterbody crossings. Other areas of new right-of-way would connect existing corridors along the proposed route and cannot be avoided.

Second, to comply with NEPA and Section 404(b)(1) guidelines requiring analysis of the use of practicable alternatives that would eliminate or minimize the discharge of dredged or fill material into wetlands or other waters of the U.S. (40 CFR 230.10), we reviewed the need for route variations that would avoid or minimize disturbance to wetland resources. Because about 90 percent of the pipeline route would be constructed adjacent to existing rights-of-way, the need for clearing of forested wetland vegetation would be considerably reduced compared to the use of new right-of-way. Also, since placement of the pipeline adjacent to existing rights-of-way usually allows for some overlap of the existing cleared and maintained rights-of-way, some of the wetland area that would be affected by construction of the

TABLE 3.4-1

Line Changes Incorporated into the Proposed Route

County/Line Change Description	Approximate Mileposts	Line Change Length (ft)	Original Route Length (ft)	Appendix B1 Sheet No.	Reason for Change
Chautauqua Ripley Landfall <u>a/</u>	0.0 - 36.7	<u>a/</u>	<u>a/</u>	<u>a/</u>	Residents request to avoid vineyards.
Bloomer Road	43.1 - 44.6	8,850	7,660	5,6	Avoid 2 residences on Bloomer Road.
Cattaraugus Buckeye	98.6 - 101.7	15,670	16,315	32,33	Avoid farm structures, 1 residence, and pond.
Potter	106.1 - 106.6	2,450	2,376	35	Avoid 1 residence. Improve constructability.
East Windfall Road	114.4 - 114.7	1,543	1,430	39	Avoid 4 residences on East Windfall Road.
Steuben McCormick	148.1 - 148.9	5,800	4,646	54,55	Landowner and NYSDA&M request. Reduce impact on agricultural land from 4.9 to 1.1 acres.
Ridge/Pease Road	149.5 - 149.9	2,700	2,482	55	Landowner and NYSDA&M request. Reduce impact on agricultural land from 4.3 to 1.3 acres.
Greenwood Cutoff	150.9 - 152.7	7,600	9,346	56	Landowner and NYSDA&M request. Reduce impact on agricultural land from 7.3 to 3.9 acres.
Chemung Beers Hill	195.8 - 197.	8,050	6,917	76,77	Landowner and NYSDA&M request. Reduce impact on agricultural land from 4.6 to 2.3 acres.
Tioga/Broome Union Center <u>b/</u>	232.4 - 243.5	60,720	59,136	<u>b/</u>	Landowner and resident requests to avoid construction along Line A5.
Sullivan Mongaup	325.6 - 325.8	1,400	1,214	138	NYSDEC request to avoid timber rattler habitat.
Orange Pine Island Turnpike	349.9 - 353.3	21,840	17,952	149	Reduce impact on "black dirt" agricultural area.
Rockland Bowline Point	387.4 - 390.2	13,440	14,520	163,164	Landowner request.
Westchester Westchester County	405.1 - 408.7	18,650	19,166	170,171	Planning Commission request and improved constructability.
I-287	409.3 - 410.0	3,780	3,854	171	Planning Commission request and improved constructability.
Yonkers <u>c/</u>	417.2 - 421.3	21,570	21,226	173-175	Avoid construction adjacent to the Bronx River Parkway.

a/ See discussion and maps in section 6.3.1, Lake Erie Landfall Variations.

b/ See discussion and maps in section 6.3.2, Union Center Variations.

c/ See discussion in section 6.3.5, Bronx River Parkway Variation.

Millennium pipeline are previously disturbed wetlands. As discussed in section 5.7, Wetlands, Millennium proposes to implement construction and restoration procedures that would minimize, to the extent practicable, impact on the wetlands that would be crossed. In addition, we have identified areas where minor modifications to the proposed route would minimize impact on NYSDEC-regulated wetlands (see section 5.7.3).

Third, we reviewed comment letters and the proposed route to identify other issues or concerns that warranted further analysis. As a result, we have analyzed five route variations in greater detail in section 6.3. The Lake Erie Landfall Route Variations include the State Line Variation, Millennium's original proposed route, and the Forsyth Road Variation (see section 6.3.1). The Union Center Route Variations include the Line A-5 Variation, Millennium's original proposed route, and the Bradley Creek Variation, a modification on the proposed route (see section 6.3.2). Also evaluated are the Mica and Bauer Variations in Broome and Sullivan Counties, respectively, that were identified by the NYSDA&M to minimize impact on agricultural land (see sections 6.3.3 and 6.3.4, respectively), and the Bronx River Parkway Variation, Millennium's original proposed route in Yonkers (see section 6.3.5).

During the summer of 1998, Millennium identified 16 line changes in response to landowner, NYSDEC, and NYSDA&M concerns with the location of the proposed route as filed in December 1997. These line changes were included as parts of the proposed route in the updated alignment sheets and maps filed on October 27, 1998, and are analyzed in this DEIS. Table 3.4-1 lists these line changes; the original route is shown in the maps in appendix B1 unless otherwise noted. Evaluation of one line change, the Pine Island Turnpike Variation between MPs 349.9 and 353.3, requires additional information about the site-specific plan for construction in the "black dirt" area that would be crossed (see section 5.2.2). Millennium intends to file this plan in mid-June 1999. The Ripley Landfall, Union Center, and Yonkers line changes are discussed in greater detail in section 6.3.

3.5 REPLACEMENT ALTERNATIVES

Millennium proposes to develop the Millennium Pipeline Project by: 1) installing new pipeline segments adjacent to newly abandoned segments of the Line A-5 in the central portion of New York (MPs 154.3 to 285.6 in Steuben, Chemung, Tioga, Broome, and Delaware Counties); and 2) installing new pipeline in generally the same location as the abandoned and removed Line A-5 in the eastern portion of New York (MPs 285.6 to 376.4 in Delaware, Sullivan, Orange, and Rockland Counties). We evaluated two alternatives associated with construction of that segment of the proposed route that would be constructed adjacent to Line A-5: the Same Ditch Replacement Alternative and the Pipeline Placement Alternative.

3.5.1 Same Ditch Replacement Alternative

We received a number of comment letters requesting an alternative that would require Millennium to construct the new pipeline in the same location as the Line A-5 between MPs 154.3 and 285.6, or those areas that the Line A-5 would be abandoned in-place. This "same ditch" replacement alternative would reduce impacts associated with right-of-way acquisition and expansion by minimizing clearing and grading and containing land use impacts in Steuben, Chemung, Tioga, Broome, and Delaware Counties.

Millennium states that the segment of Line A-5 that is proposed for in-place abandonment is between the Greenwood Compressor Station (MP 154.3) and Hancock Measuring Station (MP 285.6). This segment of pipeline would need to remain in service during construction of Millennium's proposed facilities to permit Columbia to continue to provide all of its certificated firm transportation and storage services for 17 Line A-5 shippers whose delivery points are on that section of the Line A-5. In addition,

Columbia states that it would retain rights to the pipeline and the right-of-way for other possible future uses or for use by others. Millennium would not acquire rights to this pipeline as part of this project. Since these facilities would need to remain in service, we did no further evaluation of this alternative. The procedures Columbia would use to abandon this segment of Line A-5 in place are described in section 2.3.2.

Pipeline Placement Alternative

Millennium originally proposed a 50-foot offset from Line A-5 between MPs 154.3 and 285.6. In response to comments received during scoping, we requested that Millennium evaluate reducing the offset of the proposed pipeline from 50 feet to 25 feet. Millennium agreed to construct this segment of the pipeline generally using a 25-foot offset, except for 56 areas that would require additional separation to avoid site-specific resources (e.g., residences) or to facilitate construction in wetlands, streams, road crossings, or along steep slopes (see table C3 in appendix C for the location by milepost). Because Millennium has committed to installing the proposed pipeline with a 25-foot offset for the majority of this section, and these limited site-specific areas account for only about 7.9 miles (6 percent) of the distance between MP 154.3 and 285.6, this alternative is now the proposed project.

3.6 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER ANALYSIS

In addition to the alternatives described above, a number of other potential major route alternatives and route variations were identified in Millennium's application or in public comments on the project. Although we reviewed each of these alternatives and variations to determine if they were viable, we concluded for various reasons that they were either impractical or offered no significant environmental advantage over the proposed route as discussed below.

Major Route Alternatives

Norfolk/Southern and CSX Railroad Alternative

A commenter in North East, Pennsylvania (Priebe) suggested that the proposed pipeline follow the existing Norfolk/Southern and CSX railroad rights-of-way along the lake plain and then east toward the ultimate delivery points. We identified a railroad right-of-way that continues north along Lake Erie to Buffalo, before turning east across northern New York, about 60 miles north of the proposed route. We also identified a number other railroad rights-of-way in the project area, but found them to be oriented in a generally north-south rather than a west-east direction which would require numerous connecting segments of new right-of-way between railroads. Since the railroads service urban areas, pipeline construction would be required in urban areas and additional pipeline miles would be required to reach the ultimate delivery point in New York City. Further, deviation from the existing Line A-5 right-of-way would require the construction of additional laterals to service Columbia's existing customers. Since the potential for environmental impacts associated with the longer length and construction through urban areas would be increased, we eliminated this alternative from further analysis.

Horseheads Alternative

A commenter in Horseheads, New York (Cullings) identified two alternative routes that would begin in the Horseheads, New York area at about MP 202.0. The first route, Horseheads Alternative A, would extend northeast along an existing pipeline corridor for about 0.8 mile, crossing the Veteran town line and State Route 13 and then turning east-southeast on new right-of-way, passing north of the town of Erin, to rejoin the proposed route at about MP 216.0. Our review indicates that the Horseheads

Alternative A would be about the same length as the proposed route, but would require about 13.2 miles of new right-of-way in previously undisturbed, mostly forested areas.

A second route, Horseheads Alternative B, was also suggested that would deviate from the proposed route at about MP 202.0 and turn south following the State Route 13 and the State Route 17 rights-of-way east of Elmira, then turning northeast at a point north of Wellsburg, and continuing northeast to rejoin the proposed route at about MP 216.0. Our review of this route indicates that the Horseheads Alternative B would be about twice as long as the corresponding segment of the proposed route (about 28 miles versus 14 miles), and would require the establishment of about 14.3 miles of new right of way in previously undisturbed, forested terrain. Although construction would be adjacent to segments of State Routes 13 and 17, the pipeline right-of-way would be on private land since the NYSDOT typically prohibits use of its right-of-way for pipelines (see section 3.3.2).

Since we identified no site-specific issues or concerns with the proposed route in this area, which would be adjacent to Columbia's existing Line A-5 right-of-way, and both alternatives would require establishment of significant new right-of-way through previously undisturbed, forested terrain, we eliminated these alternatives from further analysis.

Palisades Park Alternative

We received several comments regarding the use of route variations between approximate MPs 370.0 and 380.0 through property managed by the Palisades Interstate Park Commission, including Harriman State Park. Between MPs 370.0 and 376.4, the proposed pipeline would be installed in the Line A-5 ditch, following abandonment and removal of the existing Line A-5. Between MPs 376.4 (Ramapo Station) and 383.1 (Buena Vista Station), Millennium would acquire and use the existing Line 10338 pipeline and there would be no land disturbance. Therefore, any potential route alternatives in this area would be between MPs 370.0 and 376.4 to allow for the tie-in to the Ramapo Station and would require the creation of new right-of-way. Unless there are significant environmental resources along the proposed route that would warrant avoidance, we believe the "lift and lay" method of construction would have the least environmental impact because it would confine construction to previously disturbed areas (e.g., the existing Line A-5 right-of-way). Since no significant or unique environmental resources have been identified, we eliminated this alternative from further consideration.

Consolidated Edison Alternative

In its comments on the Millennium Pipeline Project, ConEd suggested that other routes be evaluated to avoid use of its right-of-way in Westchester County, New York. Their primary concern was the potential for power outages as a result of construction and operation of the pipeline in close proximity to the powerlines. Millennium proposes to construct a total of 21.8 miles adjacent to the ConEd powerlines in three segments between MPs 391.6 and 417.3 (see table C-1 in appendix C). Because Westchester County is densely populated, we were unable to identify an alternative route that would not increase impact on residential and commercial development in the area. In addition, we believe that the ConEd corridor offers the best route alternative since it is generally away from populated areas. Therefore, we found no alternative route for this segment of pipeline. However, we have recommended that Millennium work with ConEd to develop construction and operation procedures that would minimize the risk of power outages from installation of the pipeline (see section 5.8.1.2).

3.6.2 Route Variations

North East Landfall Variation

A commenter from Ripley, New York (Smith) suggested a variation that would make landfall in North East, Pennsylvania just south of the Lake Side Golf Course, continue across several open parcels to Interstate (I) 90, and then follow I-90 north to Shorman Road. After crossing Shorman Road, the variation would turn east, cross I-90 between the toll booth and State Route 76, cross State Route 76 and property owned by the town of Ripley, and continue east to the Forsyth Road Variation (see section 6.3.1). The variation would then follow the Forsyth Road Variation to the proposed route at MP 39.0. We believe that the proposed route and Forsyth Road Variation are preferable since they would be shorter on land and would affect fewer resources and we found no significant impact from the proposed route. Therefore, we eliminated this variation from further analysis.

Hagerdon Hill Road Variation

A commenter in Ellington, New York (Buldas-Zinner) requested a route variation using Hagerdon Hill Road to avoid a large stand of mature pine trees between the road and two residences at MP 67.7. Millennium currently proposes to deviate north from Columbia's existing pipeline right-of-way after crossing Hagerdon Road and to continue east through an agricultural field (and around the woodlot) before returning to the Line A-5 corridor at about MP 68.0. We believe that the landowner's concern has been resolved with the change to Millennium's proposed route and we eliminated this variation from further analysis.

Nichol Variation

One landowner (Nichol) commented that the pipeline would cross two parcels of his property which he states are both heavily timbered with prime hardwood timber not quite ready to harvest and are on new right-of-way (MPs 90.7 to 90.8 and 91.1 to 91.2). Of particular concern to the commenter is the presence of large natural rock formations ("Rock City" formations) with locally recognized archeological, historical, scenic, and recreational value that would be destroyed by pipeline construction. The commenter requested that a route variation be identified to avoid impact on these unique rock formations. This property is remote and can only be accessed from Little Rock City Road. Millennium states that the landowner has not granted survey permission and that aerial photography is not sufficient to verify the location of rock formations or to assess the need for mitigation which might include a route modification. Since we were unable to access these parcels or clearly determine from the air if the rock formations would be affected, we eliminated this variation from further consideration at this time. We will evaluate a route variation on this property, if appropriate, when survey permission has been granted and the results of the surveys are filed (also see recommendation in section 5.1.2).

Five Mile Road Variation

A landowner in Allegany, New York (Bryer) commented that the proposed pipeline would be close to the new Allegany-Limestone High School, which is currently under construction near MP 106.0 and suggested that the pipeline be moved further away from the school along the Niagara Mohawk powerline. Preliminary evaluation of a route variation that would deviate from the proposed route at about MP 105.2, continue east for about 1.7 miles on new right-of-way before turning south along the Niagara Mohawk powerline to rejoin the proposed route at MP 108.5 indicated that this variation would be about 0.4 mile longer than the corresponding segment of the proposed route. Based on our review of the information provided, the school would be about 0.6 mile from the proposed route, which would be more

than adequate from a public safety standpoint. Therefore, we did no further analysis of a route variation in this area at this time.

Moss Hill Road Variation

A landowner on Moss Hill Road in Horseheads, New York (Whipple) commented that several parties, including representatives from Millennium, had discussed a minor route variation that would increase the separation between the proposed pipeline and residences located on Moss Hill Road (MP 204.0). Our review of the alignment sheets indicates that the pipeline would be placed south of the existing Line A-5 and at the maximum distance from the affected residences. While Millennium has not filed any route variations in this location, minor adjustments to avoid specific property features may be made during easement negotiations with the individual landowners. Therefore, we did no further analysis of a route variation at this location at this time.

Kuzel Variation

A landowner in Union, New York (Kuzel) commented that the proposed pipeline would be about 250 feet south of his residence at MP 247.1, and proposed a variation further south across an adjacent agricultural field. He was concerned about the proximity of the pipeline to his residence because Columbia's Line A-5 had ruptured in 1993 in this area, destroying a residence on the adjacent property. We have found no environmental advantages associated with the Kuzel Variation compared with the corresponding segment of the proposed route. While we recognize the perceived safety concern of placing the pipeline near residences, we believe that the DOT standards developed for the pipeline industry, with respect to the design and operation of these facilities, provide adequate margins of safety to protect the public. Operation of a new pipeline on any route would meet all required safety standards and would ensure adequate protection for the public. Therefore, we eliminated this variation from further consideration.

Neversink River Variation

The Nature Conservancy commented that the proposed crossing of the Neversink River at about MP 340.8 in Orange County could affect known populations of the federally endangered dwarf wedge mussel. Millennium identified dwarf wedge mussel habitat between 1,000 and 1,800 feet downstream of the proposed crossing and evaluated alternate routes and alternative construction techniques to minimize impacts. Alternative routes for the crossing of the Neversink River must consider two constraints: first, because the existing Huguenot Meter Station is a point of delivery for a local distribution company, any alternative route must originate from the station or downstream of it; and second, any alternative route must pass to the south of the Neversink Road Bridge to avoid known populations of the dwarf wedge mussel.

Alternative crossings that satisfy the above siting criteria would require the construction of additional pipeline and would likely result in additional environmental impacts. These impacts would result from the crossing of an additional tributary to the Neversink River, construction disturbance in a location with high probability for the presence of cultural resources, the creation of a new right-of-way through a developed area adjacent to U.S. Route 209, and the disruption of facilities associated with the New Hope Farm Equestrian Training Center located on both sides of Neversink Road above the bridge. Finally, any newly established crossing location would require clearing of mature vegetation on both river banks.

Millennium's proposed crossing of the Neversink River (adjacent to the existing Line A-5) would minimize the amount of new permanent right-of-way, the total length of the pipeline, and land use impacts.

Further, Millennium has prepared a detailed crossing plan using dry construction (coffer dam) techniques to minimize the impact on downstream populations and habitats of the dwarf wedge mussel and would relocate any mussels in the construction work area before construction. Because we believe that the proposed crossing location and construction techniques, along with our recommended mitigation measures (see section 5.6.2) would be adequate to protect existing habitat and populations of the dwarf wedge mussel in the Neversink River, we did no further analysis of this route variation.

New City Variation

Several commenters in New City, New York (Maxton-Graham and the West Branch Conservation Association) suggested that the pipeline should follow an alternate route in the vicinity of MP 383.9 to avoid a residential district that contains homes designed by architect Henry Varnum Poor. The commenters did not identify a specific route variation. The proposed pipeline route would be within Red Rock Road or adjacent to an existing powerline in this area. In addition, Millennium has modified its construction work area in the vicinity of these residences (see additional discussion of these properties in section 5.9). Therefore, we believe construction impact would be minimized and eliminated this alternative from further analysis.

3.7 ABOVEGROUND FACILITY ALTERNATIVES

Millennium proposes to construct and operate three new measuring and regulating stations. In assessing alternatives for these stations, we considered factors such as loss of prime farmland, land use compatibility, wetland disturbance, presence of critical habitat or endangered and threatened species, and the presence of NRHP-eligible cultural resources. The Ramapo Station would be constructed on the site of an existing station, which would be removed, the Mount Vernon Station would be constructed in a parking lot, and the Wagoner Station would be constructed in a forested area adjacent to Columbia's Milford Compressor Station. These sites have been previously disturbed, or in the case of the Wagoner Station, would be adjacent to an existing industrial facility. In general, we consider the use of previously developed sites more environmentally acceptable than the development of a new site where existing land uses would be permanently altered. Since we found no significant environmental concern associated with construction at any of these sites and we received no comments about their locations, we did not consider the use of alternative sites.

A commenter in Johnson City, New York (Supa) stated that Millennium had overlooked the possibility of constructing a new metering station and tap to the Seneca Lake Natural Gas Storage field near MP 194.4 and that the existing metering and regulating stations at MPs 240.2 and 241.8 should be used rather than requiring construction of new facilities along the proposed route in the segment between MPs 232.4 and 243.5 (Union Center area). The commenter contended that these recommendations would be in agreement with the Commission's and Millennium's objectives to provide extensive and flexible service options. We have no knowledge of any proposal requesting the construction and operation of a metering station at MP 194.4 or if such construction would serve the purpose of either Millennium or the Seneca Lake Storage Project. According to the commenter, the Seneca Lake Storage Project is sponsored by NYSEG, which may be permitting the project under state rather than FERC regulations. If either NYSEG or Millennium determine that a metering station or tap should be installed at this location, the proposal would be subject to the appropriate federal and state review. See section 6.3.2 for discussion of the metering facilities in the Union Center area.