MILLENNIUM
PIPELINE

June 27, 2000

William F. Barton, Assistant Director
New York State Department of State
Division of Coastal Resources & Waterfront Revitalization
41 State Street
Albany, NY 12231-0001

Re: Millennium Pipeline Company, L.P.
Docket No. CP98-150-000

Dear Mr. Barton

Attached please find information that supplements Millennium Pipeline's prior Coastal Management Plan ("CMP") consistency submissions. This submission consolidates all the information provided to the Department of State including essential fish habitat ("EFH") and Endangered Species Act ("ESA") information and information regarding the modified route in Westchester County.

We are also sending copies of this document to all Federal and state agencies that are involved with the review of the Project, and will be filing copies in the libraries and other locations that have been maintained as public repositories for information concerning this Project.

Please feel free to contact me at (607) 773-9116 if you have any questions or comments. Please note that this submission is being made under the same terms and conditions as the October 26, 1999 supplemental response.

Very truly yours,

Richard E. Hall, Jr.
MPL Acting Facility Project Manager

cc: Millennium Pipeline Company, L.P.

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MILLENNIUM PIPELINE PROJECT

NEW YORK STATE COASTAL ZONE MANAGEMENT POLICY CONSISTENCY DETERMINATION

June 2000

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

MILLENNIUM PIPELINE PROJECT

NEW YORK STATE COASTAL ZONE MANAGEMENT POLICY CONSISTENCY DETERMINATION

1. REGULATORY AUTHORITY

The Coastal Zone Management Act (CZMA) of 1972 (16 U.S.C. § 1451 *et seq.*) was enacted by Congress to balance the competing demands of growth and development with the need to protect coastal resources. The stated policy behind this law is to ". . . preserve, protect, develop and, where possible to restore or enhance, the resources of the nation's coastal zone . . ." 16 U.S.C. § 1452(1). The primary means of achieving this balance is through coastal zone management programs adopted by the states and designed to regulate activities that could affect coastal areas. The CZMA offers incentives to encourage the coastal states and territories to exercise their full authority over coastal areas through development of coastal zone management programs, which are consistent with minimum federal standards. The Coastal Zone Act Reauthorization Amendments of 1990 strengthened the CZMA by requiring the state programs to focus on controlling land use activities and on the cumulative effect of activities in coastal zones.

In 1981, New York State adopted the Waterfront Revitalization and Coastal Resources Act (New York Executive Law § 910 *et seq.*) creating the New York State Coastal Management Program (CMP). The CMP received federal approval in 1982 [47 FR 47056 (22 October 1982)], authorizing New York to implement the federal CZMA through its CMP. The CMP embodies 44 policy statements supportive of the intent to promote a balance between economic development and coastal resource preservation and optimization. The State of New York currently administers its Federally approved CMP through the New York State Department of State (NYSDOS). Pursuant to the Federal CZMA, New York State has defined its coastal zone boundaries and the policies to be utilized in evaluating projects occurring within these designated zones.

2. DESCRIPTION OF THE MILLENNIUM PIPELINE PROJECT

Millennium Pipeline Company, L.P. (Millennium or Applicant) has applied to the Federal Energy Regulatory Commission (FERC) for a Certificate of Public Convenience and Necessity to construct, acquire, own and operate the Millennium Pipeline (the Project). The Project consists of 442 miles of pipeline extending from an interconnection in Lake Erie at the Canada/United (U.S.) border, through southern New York, to Mount Vernon, New York. Figure 1 illustrates the Project's route. In addition, Millennium requested a Presidential Permit authorizing construction, operation, and maintenance of facilities at the International Border in Lake Erie for the importation of natural gas. The Millennium Pipeline and associated pipeline facilities will follow existing utility corridors and easements for more than 86% of the pipeline route.

The Project will be an underground natural gas pipeline system consisting of 36- and 24-inch diameter pipe that will traverse the floor of Lake Erie, twelve New York State counties, and the Hudson River at Haverstraw Bay. The Project represents a $650 million capital investment in New York's energy future. The purpose of the Project is to transport up to 700,000 dekatherms of natural gas per day (dth/d) and to provide firm transportation services for at least seven shippers for natural gas service beginning on 1 November 2001. In addition, Millennium will lease 14,000 dth/d of capacity to Columbia Gas Transmission Corporation to serve many existing consumers along the southern tier of New York State. The Millennium Pipeline will be able to transport the equivalent of enough gas to supply 2.1 million homes with natural gas per year, or five large electric generating facilities on an annual basis.

2.1 Energy Demands for the Project

The Northeast corridor is one of the fastest growing natural gas markets in the U.S. According to a recent study, Northeastern gas consumption will increase 45% over current usage by the year 2015 (Gas Research Institute 1999). Additional consumption needs could be generated by the increasing number of regional nuclear power plants that are being retired and removed from service. In fact, as of May 1998, more than 75% of the 8,800 megawatts (MW) of nuclear capacity, which is projected to be taken out of service in the near future, is located in the northeastern U.S. and Canada (Washington International Energy Group 1998). While there are plentiful reserves of natural gas in the U.S. and Canada to meet this growing need, insufficient pipeline infrastructure is available to economically supply customers in the Northeastern U.S.

More specifically, Millennium's precedent agreements with several shippers show the demand for the services the Project will provide. Table 1 lists the long-term agreements that Millennium has reached.

Table 1
List of Millennium Pipeline Project Precedent Agreements

Customer	Term of Service (yrs)
CoEnergy Trading Company	20
Engage Energy (U.S.) L.P.	
International Business Machines Corp.	
North East Heat & Light Company	
PanCanadian Energy Services, Inc.	
Stand Energy Corporation	
TransCanada Gas Services - A Division of TransCanada Energy Ltd.	

Other evidence of the need for the Project is equally compelling. To begin with, the energy shortages and resulting price spikes that occurred in January 2000 -- a month characterized by normal temperature conditions -- emphasized the need for added gas supplies in New York markets both to ensure reliable service to consumers and to protect them from drastic price hikes. In addition, a study conducted by the staff of the Federal Energy Regulatory Commission at the direction of the House Appropriations Committee concluded that:

> "All projections indicate increasing demand for natural gas in the Northeastern United States over time, and the need for increased capacity to meet that demand. This leads staff to conclude that additional pipeline construction is likely to be required in the near future to meet that demand."[1]

Moreover, market developments strongly corroborate demand for the Millennium Project. The one-year forward curve for basis differentials between Dawn, Ontario and New York City -- the two hubs that would be connected by the Project -- now exceeds the gas transportation rates that have been proposed, demonstrating the economic viability of the Project.

Finally, the need for the added pipeline capacity in New York State that Millennium would provide has been recognized by key state agencies. Thus, for example, the Public Service Commission of the State of New York ("PSCNY"), in a recent letter to the FERC regarding the Millennium Project, stated that

> "The PSCNY has been on record and continues to support the construction of natural gas pipelines that will serve New York State, particularly New York City."

2.2 Air Quality and Water Quality Benefits of the Project

In recent years, under both public and governmental pressure, there has been a growing demand for clean and efficient energy. This is especially true in the Northeastern U.S., which is faced with some of the highest population densities in the country, corresponding energy demands, and elevated air pollution. In particular, New York State has indicated it will require electric generation plants to significantly reduce emissions of acid rain forming nitrogen oxides (NO_x) and sulfur dioxide (SO_2) (New York Times 14 October 1999). As a result, natural gas has become, and will continue to be, the energy source of choice for new electric utility and independent power plants in the U.S. because of its extremely low emission levels and short construction lead-times (American Gas Association 1997).

However, in many areas in the northeastern U.S. dependable and competitively priced sources of natural gas do not exist. Therefore, most electric generating facilities currently operate by burning high emitting coal or oil. These traditional fossil fuel-burning power plants contribute to air pollution problems, emitting high levels of SO_2, NO_x, carbon monoxide (CO), carbon dioxide (CO_2), and particulate matter (PM) into the atmosphere. As noted above, SO_2 and NO_x are precursors of acid rain, and NO_x is one of the two primary precursors for smog or tropospheric ozone. CO_2 has been credited as one of the chief sources of the global warming trend, and PM has received heightened attention as a source of respiratory ailments.

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[1] "FERC Staff Analysis of Natural Gas Consumption and Pipeline Capacity in New England and the Mid-Atlantic States" (December 1999), at 15.

Under the 1990 Clean Air Act Amendments [42 U.S.C. § 7511c(a)], the entire state of New York was classified as part of the Northeast Ozone Transport Region (OTR). The OTR includes the twelve northeastern-most states. The OTR was established because Congress recognized that due to the proximity and climatological interconnectedness of these states, arresting and preventing ground-level ozone was a regional problem. Accordingly, all states in the OTR must coordinate their efforts to curb ozone-producing emissions. Therefore, decreasing NO_x emissions in New York, New Jersey and Pennsylvania will benefit the entire OTR.

In addition to inclusion in the OTR, certain areas within New York have been designated as severe, moderate and marginal non-attainment areas for ozone. In particular, the greater New York City metropolitan area has been designated as severe non-attainment for ozone and non-attainment for CO with New York City designated as non-attainment for PM. Therefore, air pollution is a general statewide concern and is a particular concern for the greater New York City metropolitan area. Moreover, New York's Adirondack Mountains have been scarred by the effects of acid rain caused by regional and in-state emissions of NO_x and SO_2 (Times Union 19 September 1999).

Utilizing natural gas as an energy source will contribute to the overall reduction of air pollution in the Northeast and New York State. The United States Environmental Protection Agency (USEPA) has estimated that in 1994, 70% of the nation's total SO_2 emissions and 33% of NO_X came from fossil-fuel-fired electric generation plants (USEPA 1996).

Several of New York State's twenty-one coal-burning power plants are located along Millennium's proposed route (Environmental Advocates, NYPIRG Fund and Pace Energy Project 1998). Providing a supply of natural gas to these plants presents a tremendous opportunity to reduce their emissions either through complete retrofitting, or through selective reburn applications. Reburn involves the injection of natural gas into a coal or oil-fired boiler to produce NO_x reductions of 50 to 70%, and SO_2 reductions of 20 to 25% (American Gas Association 1997).

Moreover, many coal and oil-fired facilities must use "scrubbers" in their exhaust stacks to reduce emissions of air pollutants (American Gas Association 1997). The scrubbers result in large volumes of ash requiring proper disposal. This creates a solid waste disposal problem and increases operating costs of the electric generating plants. In contrast, natural gas-fired boilers do not need scrubbers or other add-on pollution controls (American Gas Association 1997).

2.3 Economic and Socioeconomic Benefits

The Millennium Project presents many economic and socioeconomic benefits to the State of New York, both during and after construction. Some of these benefits include the following:

- Improving the regional supply of, and access to, natural gas will help accelerate the conversion of old coal and oil-fired power plants to new cleaner gas-fired facilities.

The enhanced cost-competitive access to gas supply will produce lower energy costs for homeowners, business, and industry.

The pipeline will strengthen the region's energy infrastructure, offering competitively priced supplies of energy to current and new customers, and creating additional incentives for economic development. The presence of a new, high-volume energy delivery system in the state could also attract additional investment into the state.

The Project would reduce New York's reliance on imported oil and resulting peak period energy shortages and price spikes.

The Project would promote increased competition and enhanced operational flexibility.

Construction of the facilities will have a minimal impact on the environment since the pipeline follows existing easements and utility corridors for more than 80% of its length.

- Millennium will generate millions of dollars annually in state property taxes, which will be allocated to the counties and municipalities in which the pipeline is located. State revenue will also be created by franchise and sales taxes.

During the construction, more than 4000 union construction workers will be employed to install the pipeline. This will present an employment opportunity for New York workers, and will inject a significant amount of money into the state's services industry.

Native American lands will not be impacted by construction.

2.4 Environmental Impacts from the Proposed Project

The potential environmental impacts of the proposed project have been reviewed in accordance with the National Environmental Policy act (NEPA). A draft Environmental Impact Statement (DEIS) was issued by FERC in April 1999. The FERC Staff determined in the DEIS that the Millennium Project, if constructed and operated in accordance with the mitigation measures outlined in the DEIS, would be an environmentally acceptable project. Nevertheless, in an on-going effort to mitigate environmental impacts, Millennium has continued to refine the Project.

Due to the nature of a pipeline project, most of the environmental impacts are incurred during the construction phase. Beyond construction, environmental impacts associated with gas pipelines are virtually nonexistent. Natural gas pipelines are the nation's safest method of transporting energy. Once operational, pipelines create virtually no environmental impacts. The only physical evidence of a pipeline will be a narrow maintained right-of-way, line markers, and, if necessary, small above ground maintenance facilities.

Backed by the project sponsors' long-standing commitment to environmental safety and integrity, Millennium has committed to constructing and operating the proposed project in the most environmentally rigorous manner. Specific Project commitments include:

Stream crossing techniques and mitigation measures to minimize effects on aquatic ecosystems;

Utilizing existing utility corridors for more than 86% of its length;

Vigorous right-of-way restoration and reconstruction programs; and

- A proven track record in construction and restoration in a variety of geological formations including wetlands, watercources, and rocky terrain.

2.5 Natural Gas Pipeline Safety Issues

Pipelines provide an extremely safe means of transporting natural gas. The natural gas pipeline industry overall has a very good safety record, and incidents involving natural gas pipelines are extremely rare. Once built, the two main causes of pipeline damage are: 1) people unknowingly digging around an existing pipeline (i.e., third party damage); and 2) corrosion to the steel of the pipe itself.

Marking pipeline areas and notifying landowners, contractors and others who might be working around pipelines of the necessary precautions required when working in close proximity to natural gas pipelines are an effective means of preventing third party damage. Natural gas pipelines, transmission facilities, and rights-of-way are marked and maintained according to federal guidelines. Regular communications with landowners, contractors and others working around pipelines are maintained so that they understand the safety issues and take the proper precautions. Contractors, utilities and other underground facility operators participate in programs like the Underground Facilities Protection Organization of New York (UFPO) which notifies utilities and contractors before people begin excavating near pipeline rights-of-ways. Pipelines are monitored 24 hours per day, 365 days per year, from gas control facilities, as well as by foot and air patrols. This regular monitoring will ensure the safe operation of the delivery system.

The second major threat to pipelines is from corrosion that occurs on pipelines constructed prior to about 1970. Prior to that time, pipeline construction did not commonly involve the use of pipeline coatings and cathodic protection, two measures that are widely used today. Current pipeline coating and cathodic protection techniques have virtually eliminated the possibility of pipeline corrosion problems.

Pipeline companies continuously monitor their systems to detect leaks. They are able to detect these leaks by monitoring pressure, walking or flying over the lines looking for dead grass along the route, using automated, remote-controlled robots called "smart pigs" to run through the lines to detect corrosion, as well as a number of other measures. Pipeline leaks are generally slow developing and are easily detectable before they become serious. Moreover, natural gas is very difficult to ignite. It is only with the precise combination of air and gas that combustion will

routing in Westchester County that avoids, to the maximum extent possible, routing the pipeline in close proximity to, or across, the transmission lines. Where the pipeline will be in close proximity to the transmission lines or will cross the transmission lines, Millennium agreed to special safety precautions to resolve the concerns about reliability of the transmission lines. As is detailed in the MOU, those additional safety measures include increased pipe thickness, a periodic pigging program to verify the integrity of the pipeline, the installation of additional valves that are automatically and remotely controlled, and the use of close interval surveys and other monitoring systems to monitor pipe integrity. As a result of this process, the PSCNY no longer opposes the Millennium Project and supports the need for new gas infrastructure in New York State.

3. COASTAL ZONE POLICY CONSISTENCY

Sections of the proposed project are within the coastal zone boundary of New York State. Specifically, the Project's proposed Hudson River crossing at Haverstraw Bay and the Lake Erie Coastal zone landing at Ripley, New York, are within New York's coastal zone. Thus, the following assessment identifies the CMP policies and evaluates the Project's consistency with each. This consistency evaluation is provided to enable the NYSDOS, and other agencies required under the CZMA to consider CMP consistency, to evaluate the effect of the proposed project on New York's coastal zone resources.

3.1 Hudson River-Haverstraw Bay

3.1.1 Description of Proposed Action

The proposed route for the Millennium Pipeline Project would cross the Hudson River at Haverstraw Bay between Rockland and Westchester Counties, following a 2.1-mile route from Bowline Point on the western side of the Bay to the Veterans Administration hospital property on the eastern shore (Figure 2).

The proposed Hudson River-Haverstraw Bay route from Bowline Point to the Veterans Hospital property facilitates Millennium's plans to provide gas service to Southern Energy New York's Bowline Point Generating Station, located on the western shore of Haverstraw Bay in Haverstraw, New York. The proposed route also minimizes pipeline mileage to the proposed terminus at Mount Vernon, New York.

3.1.2 Alternative Routes Evaluated

The Millennium Project is not economically viable without a Hudson River crossing. As set forth in its FERC application, Millennium proposes to construct and operate a 442-mile pipeline system to deliver 700,000 dekatherms ("Dth") of natural gas per day to points in New York

State. Since Millennium has contracted to deliver half of that volume (350,000 Dth per day) to markets east of the Hudson River for its shippers, the Project would not make economic sense without the river crossing.

Moreover, there is no feasible alternative crossing location for the Millennium Project. In initially planning its pipeline route, Millennium recognized the sensitivity of any conventional crossing of the Hudson River and therefore investigated crossing locations upstream and downstream where a directionally-drilled crossing might be feasible or where environmental impacts otherwise could be reduced. Despite a lengthy and diligent consideration of possible options, no feasible alternative crossing location has been identified.

The FERC subsequently asked Millennium to review and evaluate two potential alternative routes across the Hudson River. "Alternative 1" would commence in Harriman State Park and cross the Hudson River north of Tomkins Cove, New York. "Alternative 2" would deviate from "Alternative 1" west of the river but would cross the river at the same location north of Tomkins Cove.

Millennium then conducted thorough field reviews of both of these routes, evaluated the associated environmental, engineering, and economic effects, and submitted its findings to the FERC on March 15, 1999. With respect to "Alternative 1," Millennium noted that it (1) would require 3.7 miles of construction and permanent ROW in Harriman State Park, which is listed on the National Register of Historic Places, including significant stretches of difficult sideling construction that would require extra work space; (2) would also require construction through extremely congested residential and commercial areas west of the Hudson River; (3) would not provide sufficient workspace for staging either a conventional or directionally drilled crossing of the Hudson River on either the western or eastern shore of the river; and (4) would require the construction of approximately 4.9 miles of additional pipeline at a cost of at least $6 million. Millennium concluded that "Alternative 2" was significantly inferior to "Alternative 1" and not a viable route, since it would cross a number of built-up residential subdivisions, requiring the condemnation of numerous houses, and would pose the same intractable river crossing problems.

In the Draft Environmental Impact Statement ("DEIS") issued relative to the Millennium Project, the FERC thoroughly evaluated and flatly rejected both of the alternative routes that it had identified. Regarding "Alternative 1," the FERC concluded as follows:

Based on the high density of residential development along Alternative 1, the increased potential for impact on cultural and historic resources, and engineering considerations that would preclude any type of crossing at the alternate Hudson River crossing, we do not believe that Hudson River Alternative 1 would be environmentally preferable to the corresponding segment of the proposed route . . . (DEIS at 6-4).

The FERC similarly rejected "Alternative 2," finding that the lack of a corridor through the residential subdivisions west of the river was a "major disadvantage." (Id. at 6-5).

Later, during a publicly-noticed site visit of alternative Hudson River crossing routes held on November 30, 1999, the FERC Staff requested Millennium to conduct additional field work and

analyses of potential alternative routes. Millennium provided the FERC with the results of those additional studies on December 17, 1999. The further review of "Alternative 1" revealed that it would require the clearing of approximately 19 acres of mature forest in Harriman State Park and the extensive grading of 44 acres in the park, would require the removal of at least 16 homes and about 20 trailers, and would not afford adequate workspace for staging a river crossing using any crossing method.

In addition, Millennium identified an "Alternative 3" along the Palisades Interstate Parkway, a National Historic Landmark. However, this route would involve approximately 7.2 miles of additional construction, require the clearing of approximately ten acres of mature trees along the Parkway, require the removal of several homes, and would still not provide an adequate staging area for the Hudson River crossing. Millennium reasonably concluded that these permanent impacts would be significantly greater than the limited and temporary impacts associated with the proposed route across Haverstraw Bay.

It is been suggested by some agencies that an alternative crossing location may exist proximate to the Tappan Zee Bridge. The speculation that a pipeline crossing near the Tappan Zee Bridge would be superior to the proposed route is not only unsupported, but also dubious on its face. A crossing at that location would not be at a narrower section of the river, as has been suggested, but would, in fact, be at a wider point, requiring a much longer crossing. In addition, the characteristics of the river at that point are substantially similar to those at the proposed crossing location, suggesting that potential impacts would not be reduced significantly. See response to Policy 7 (concluding that Haverstraw Bay, Croton Bay and Tappan Zee Bay all have similar habitat characteristics and values). Further, there is insufficient staging on the west bank of the Hudson River in that area, given the congestion in the Nyack area and the steep slopes north and south of Nyack. Similar congestion exists on the east bank. Also, routing the pipeline along that alignment could interfere with the proposed reconstruction of the Tappan Zee Bridge or subject the Millennium Pipeline to unnecessary risk during the reconstruction of the Tappan Zee Bridge.

More fundamentally, there is no way to route the pipeline to and from a river crossing in the vicinity of the Tappan Zee Bridge without significant additional overland pipeline construction through parklands and residential and recreational areas, resulting in significant, adverse environmental impacts far greater than those associated with the corresponding segment of the proposed route.

In the final analysis, Millennium, the FERC, and others have devoted their best efforts and considerable time in attempting to identify an alternative location cross the Hudson River outside of Haverstraw Bay. However, notwithstanding those best efforts and the detailed study of proposed alternate routes, there are no technically feasible alternatives to a crossing at that location.

3.1.3 Alternative Construction Techniques

Millennium evaluated three pipeline crossing techniques for the Hudson River/Haverstraw Bay crossing. The three techniques were the open-water lay-barge method, directional drilling and open-cut, bottom-pull method. A summary of each technique, including the preferred method, the lay barge technique, is presented below:

The Millennium Pipeline will be constructed across Haverstraw Bay using an innovative open-water, lay barge method, with all excavated material to eventually be used as trench backfill, stockpiled in barges. Best management practices (BMPs) will be used, as necessary, to further minimize the potential for adverse environmental impacts. The principal features of the construction plan are:

Trench Excavation: The trench will be excavated using a 6 cubic yard (CY) "environmental" or closed bucket in shallow water areas (within 500 feet of shore) and a 22 CY environmental or closed bucket will be used in deeper water areas. The trench will be excavated to a sufficient depth to provide 5 feet of cover over the pipeline outside of the navigation channel and 15 feet of cover within the navigation channel. The bottom width of the trench will be 10 feet over the entire length of the Haverstraw Bay crossing; in the non-channel areas, the top of the trench will be 70-feet wide and in the channel the top opening of the trench will be 150-feet wide.

- Dredged Material: Dredged material removed from the trench will be stockpiled in various sized bottom-dumping barges.

- Pipe Laying: A lay-barge will be used to weld and lay the 24-in pipe. (NOTE: 24-in pipe will be encased in 3-in. of concrete material.) The pipeline will be installed by floating it off the back of the lay-barge and then removing the floats to allow the pipe to settle into the trench.

  Trench Backfilling: After the pipeline has been placed in the trench, backfilling will begin. In deep water areas, a bottom-dump barge will be positioned directly over the trench (Differential Global Positioning System and sonar assisted, if necessary), silt curtains will be deployed around the barge, as necessary, and the dredged material will be placed over the pipeline. In shallow water areas, an environmental bucket will be used to remove the dredged material from the barge and place it over the pipeline. The trench will not remain open for more than two weeks in any given area. As an additional BMP, a dredging operations monitoring plan has been developed, in consultation with resource agencies, to monitor the efficacy of the BMPs and to adjust the use of the BMPs to mitigate adverse environmental impact to the extent practicable.

The entire 2.1-mile Haverstraw Bay crossing from Bowline Point on the western shore to the Veterans Hospital on the eastern-shore should be completed in 2.5 months. The anticipated commencement date for work in the Hudson River is 1 September with an expected completion date of 15 November. This window was established by Federal and state agencies. Two other pipeline construction techniques were evaluated for the Haverstraw Bay crossing; directional drilling and an open-cut bottom-pull method. The two alternative methods are discussed below:

Directional Drilling: Directional drilling involves drilling a pilot hole underneath the waterbody and then enlarging the pilot hole until the hole is large enough to accommodate the pipe. The technique requires a large staging area to permit welding of the pipe sections, completion of the outer coating, and then alignment prior to pulling the pipe through the hole. In general, hard or consolidated sediments are required to maintain the diameter of the hole prior to and during the drilling and pipe pulling procedures. At the location where the drill exits the bottom sediments, there would be a large volume (approximately 5400 CY for both drill holes) of drill muds (special bentonite clays) discharged to the waterbody under pressure.

Several problems were noted related to the use of this technique in Haverstraw Bay. First, the loose sediments will likely not maintain the hole diameter following drilling. The distance across Haverstraw Bay precludes drilling from one side to the other. Therefore, the pipe would need to be installed outward from each shore to the limit of drilling. Directional drilling from each shore would result in two separate discharges of drilling muds to Haverstraw Bay. In addition, as previously stated the technique requires a large staging area for pipe assembly. A sufficient staging area is present on the western shore (Bowline Point); however, the shore zone on the eastern shore (Veterans Hospital) is not large enough to permit pipe preparation. It was determined that directional drilling was not a viable technique for the Haverstraw Bay crossing.

Open-Cut Bottom-Pull Method: The initial technique proposed for the installation of the Millennium Pipeline across Haverstraw Bay was the open-cut, with a mechanical dredge, bottom-pull method. Because the crossing is approximately 2.1 miles in length, two dredge plants would be used to excavate the trench and install the concrete-coated pipeline. Dredged material excavated from the trench would be stockpiled in the water on either side of the trench. Due to positioning constraints and underwater resistance each dredge bucket would need to be brought to the surface prior to the bucket being repositioned and lowered to the bottom before placement along the trench. The procedure would need to be repeated for backfilling. Resource agencies expressed concerns regarding the sedimentation and turbidity that would result from; [1] the extended time period during which dredged material would be stockpiled in the water (approximately 3 months), [2] the extended time period during which the trench would remain open, and [3] the use of open-bucket dredges to excavate and backfill the trench.

Millennium evaluated the bottom-pull method, and though it is believed that this technique could be employed in an environmentally acceptable manner for the Haverstraw Bay crossing, in an effort to identify the most environmentally acceptable crossing technique, the method was changed to the lay-barge method described above.

3.1.4 Environmental Impacts Associated With Lay Barge Dredging Method in Haverstraw Bay

Installation of the pipeline would involve the construction of an open trench across Haverstraw Bay with subsequent backfilling to the approximate original bottom elevation after the pipeline is placed on the bottom of the trench. The sequential construction activities would be completed within 2 weeks in any given area over the 2.1-mile wide section of the Bay. The bottom width of the trench would be 10 feet; the top of the trench would be 70 feet wide in shallow areas and 150 ft wide in the maintained navigation channel.

The method of construction, the dredging equipment employed, the season and duration of construction and BMPs employed for dredging would all have an influence on the potential for adverse environmental impacts. The proposed project uses the best available technology to construct the crossing and will result in the least environmental impact while meeting all applicable regulation, standards and criteria. The following sections address the effects of construction on aquatic resources and the rate of recovery of the habitat after construction is completed. The completed pipeline would have no long term effect on aquatic resources.

Haverstraw Bay is a productive area of the Hudson River, which supports abundant benthic and fish communities. Among the fish community there are recreationally, commercially and ecologically important species. Numerous fish species migrate through Haverstraw Bay to upstream spawning areas where the young remain in nursery areas or emigrate through the Bay to ocean waters. The Bay is important for overwintering striped bass and sturgeon. The benthic community supports this fish community, as well as blue crabs, a commercially important invertebrate that is seasonally abundant in the Bay. Because of the importance of this estuarine habitat, Haverstraw Bay is designated as significant coastal fish and wildlife habitat by the NYSDOS.

The primary adverse impact of pipeline construction would be the disturbance to bottom habitat. There would be a temporary loss of habitat and benthic organisms in the material removed to create the trench. In addition, there would be sediment deposition in undisturbed benthic habitat adjacent to the trench caused by the general sediment disturbance of the dredge bucket contacting the bottom and pulling away from the bottom with each lift. This effect would be limited to the near vicinity of the trench in shallow water, but the effect would spread further in deeper sections and in the channel. Backfilling would also distribute sediments beyond the footprint of the trench. (Discussed in greater detail below.)

Backfilling over the pipeline would return the bottom substrate to its approximate pre-dredge contours. Because the dredging would increase the volume of the original compacted sediments, there would be a period of consolidation after the sediment was replaced over the trench. The natural processes of scour and deposition would quickly restore the substrate to its equilibrium depth in the area of the trench.

The sediments in the project area contain low levels of metals and other chemical contaminants. These contaminants are likely to be present in similar concentrations in the general vicinity of the pipeline route. Although dredging would disturb the contaminants in the sediments, the vast majority of sediments will be retained in the barges or resettle within or close to the trench. When the sediment is backfilled into the trench the resulting concentrations of contaminants

would be very similar to pre-dredge levels in the footprint of the trench and in adjacent areas which receive sediment deposition as a result of the construction. A silt curtain could be used to reduce the spread of sediments during backfilling in the channel areas, as necessary. The dredging and backfilling operations have little potential to disperse contaminants that could have an adverse effect on aquatic life.

Dredge plume modeling (conducted by GAI) was used to estimate increases in suspended solids, the extent of the visible plume, and the thickness of sediment deposition that would result from dredging and backfilling the Haverstraw Bay crossing trench. The model results were broken down into four components defined below:

- Component 1: Dredging in shallow water using a 6 CY environmental bucket

  Component 2: Backfilling in shallow water using a 6 CY environmental bucket

  Component 3: Dredging in deep water using a 22 CY environmental bucket

- Component 4: Backfilling in deep water using a bottom dump barge (without the deployment of silt curtains)

The characteristics of the resulting turbidity plumes are summarized in Table 2. The estimated steady-state visible plume resulting from the dredging operations is 60 feet wide (normal to flow) by 35 feet long (in the direction of flow) and 90 feet wide by 460 feet long for shallow water dredging (Component 1) and deep water dredging (Component 3), respectively. The visible plume associated with shallow water backfilling (Component 2) is estimated to be 90 feet wide by 170 feet long. The visible plume for the bottom dump barge discharge (component 4) is larger at 500 feet wide by 400 long, but of very short duration (30 minutes or less). The visible plume areas are approximately 2100 square feet (ft^2), 15,300 ft^2, 41,400 ft^2, and 200,000 ft^2 (per barge dump) for Components 1, 2, 3, and 4, respectively.

The plumes for Components 1 through 3 assume the dredge operates over a 50-foot length of trench before spudding forward; the plume dimension normal to flow was increased by this 50-foot width to account for the moving source. The estimates do not include an interaction between the plumes since they should be sufficiently far apart.

It is estimated that 13 days will be required to complete construction in the shallow water areas (Component 1), 16 days will be required to backfill the shallow water trench sections using the 6 CY bucket (Component 2), and 30 days will be required to excavate 9900 feet using the 22 CY environmental bucket (Component 3), with 52 barge loads of sediment re-deposited in the trench using a bottom dump barge (Component 4). The estimated construction times, sediment quantities, and distances translate to average approximate production rates of 77 feet per day for Component 1, 63 feet per day for Component 2, 330 feet per day for Component 3, and 2 barge dumps per day for Component 4.

The total area impacted by the operation on any given day includes all areas covered by a visible turbidity plume for any length of time. Using this assumption with the progress rates developed

in the paragraph above, the areas impacted by Components 1, 2, 3, and 4 are approximately 3150 ft^2/day, 19,890 ft^2/day, 273,240ft^2/day, and 400,000 ft^2/day (Table 2).

Backfilling in the shallow, near-shore areas (Component 2) results in the maximum turbidity impact (170 feet long visible plume) and dredging (Component 3) provides the largest turbidity plume (460 feet long visible plume) in the central portion of the crossing. The total area impacted by the crossing can be calculated by multiplying the length of the visible plume by the trench length for each area (1000 feet for Component 2 and 9900 feet for Component 3), then summing the two quantities. This results in a total impacted area of 4,724,000 ft^2. . Based on the map of the Haverstraw Bay significant coastal habitat boundary (NYSDOS 1990), 1.2% of the Bay bottom is estimated to be impacted over the duration of the crossing project.

Total suspended sediment concentrations are not expected to exceed 1000 mg/l above ambient conditions except within 30 feet of dredging and backfilling operations. Suspended sediments are expected to disperse to concentrations between 500 mg/l above ambient conditions and 35 mg/l above ambient conditions within the mixing zone, defined as the area within the visible plume and outside of 30 feet from the dredging operation. Concentrations less than 35 mg/l above ambient conditions are anticipated beyond the visible plume.

During dredging operations, the average thickness of redeposited sediment within Haverstraw Bay for components 1, 2, and 3 are estimated to be 0.18 feet, 0.11 feet, and 0.02 feet over the areal extent of the visible plume. Benthic species living in soft sediments, such as those found in Haverstraw Bay, are able to favorably respond to sediment deposition in this range and greater.

During bottom dumping backfilling operations (Component 4) most of the sediment would be redeposited in the trench. Sediment accumulation is estimated to be 0.25 feet, just outside the trench (150 feet from trench centerline) and deposition continues to decrease between 150 feet and 400 feet. Deposition is negligible beyond 400 feet.

The estimated total suspended solids (TSS) concentrations resulting from the discharge of stockpiled dredge material from the bottom dump barge will not exceed 1000 mg/l above ambient conditions within 300 feet of the discharge. Turbidity levels are predicted to decrease quickly with the visible plume (35 mg/l above ambient conditions) dissipating within 30 minutes of disposal operation.

The benthic community is expected to recover quickly after backfilling is completed, because there would be large areas of undisturbed habitat on either side of the trench, which would serve to provide recruitment to the disturbed area. Estuarine sediments, particularly in shallow water, are often disturbed by wind and ship generated waves, by unusually high and low tides which create higher than normal tidal currents, and by riverine flooding which creates high current velocities and carries a high sediment load. Estuarine benthic organisms are adapted to the dynamic nature of the sediments, which permits them to respond quickly to the artificial disturbance of dredging.

Dredging would cause a temporary loss of feeding areas for fish over a very small portion of the Bay. The proposed crossing would disrupt approximately 1.2% of the bottom area of

Haverstraw Bay. This temporary loss of usable habitat would be limited to one season; there would be no loss in long term productivity because the environmental factors controlling estuarine productivity would not be impacted by the project. The work would be spread out over a 2.5-month period involving a maximum of 1300 feet of the entire crossing at any given time. The benthic habitat disturbed by dredging in the first instance would be well on its way to recovery before the last section of the work was completed.

The presence of numerous migratory fish species in the Hudson River Estuary raises issues regarding the effect of dredging on migratory pathways. The pipeline crossing work is scheduled for the period from 1 September to 15 November. The staging of the work along the 2.1-mile route would ensure that the vast majority of the width of the river would be available for migration. Even within a 1300-foot work zone, the dredge and backfill operations would only disturb a very small area in the near vicinity of the dredge and barges. In the channel, a silt curtain may be deployed during backfilling. The silt curtain would be in place only during the actual release of sediment, as necessary. This short-term obstruction in a small portion of the channel would have no effect on migratory fish.

Striped bass, sturgeon, and other species overwinter in Haverstraw Bay. The channel area is likely to hold concentrations of fish from December through March. Scheduling the work during late summer and fall would avoid these overwintering concentrations. Because most species are generally inactive during cold water months any reduction in benthic productivity would not have an adverse effect on fish feeding. Wintering habitat would be fully available to the various species that congregate in this portion of the estuary, in the first winter after pipeline installation.

Best management practices (BMPs) would be applied to the dredging operation. An environmental (closed) dredge bucket would be used to minimize the loss of sediment. The lift rate of the bucket would be limited to 2 ft/sec or less to reduce water column turbidity. There would be no barge overflow because material would be retained for backfilling. These measures would ensure that the operations are at the practical limit for minimizing turbidity.

3.1.5 Impacts Of Prior Dredging Activities In Haverstraw Bay

The Federal channel through Haverstraw Bay is maintained at 32-feet below mean low water (MLW) by the US Army Corps of Engineers-New York District (USACE-NYD). The channel requires periodic maintenance dredging. In the summer of 1986, water quality was monitored during Haverstraw Bay maintenance dredging (Houston *et al.* 1992). Dredging was conducted mechanically using an open bucket with unrestricted lift speed and no silt curtains. This is a worst case example compared to state of the art dredging practices that would be used for the proposed Millennium Pipeline Haverstraw Bay crossing. Under these worst case conditions, maximum daily differences in dissolved oxygen (DO) were under 1.0 mg/l and averaged only 0.1 mg/l. The turbidity plume and suspended solids created by the dredging was greatest during flood tide. The maximum increase over ambient occurred within a radius of 500 feet, with a return to near ambient conditions between 1250 and 1500 feet from the dredge. The environmental assessment report on the Hudson River Channel maintenance-dredging program (USACE 1988) indicated that the Haverstraw Bay plume extended 750 feet from the dredge.

3.1.6 Review Of Coastal Zone Policy Consistency

1) *Restore, revitalize and redevelop deteriorated and underutilized waterfront areas for commercial, industrial, cultural, recreational and other compatible uses.*

Construction of the proposed Haverstraw Bay crossing would not involve development in deteriorated and underutilized waterfront areas, and thus this policy does not apply.

2) *Facilitate the siting of water-dependent uses and facilities on or adjacent to coastal waters.*

Construction of the proposed project crossing would not involve the siting of water-dependent uses and facilities on or adjacent to coastal waters, and thus this policy does not apply.

3) *Promote the development and use of the state's major ports as centers of commerce and industry, emphasizing the siting, in these port areas, including those under the jurisdiction of state public authorities, of land use and development which is essential to, or in support of, the waterborne transportation of cargo and people.*

Construction of the proposed Haverstraw Bay crossing would not involve development and use of any New York State major port facility. There are several public and private marinas in the general vicinity of the proposed project; however, none are involved in the transportation of people or cargo. Since no New York State major port facilities are involved with the proposed project, this policy is not applicable.

4) *Strengthen the economic base of smaller harbor areas by encouraging the development and enhancement of those traditional uses and activities, which have provided such areas with their unique maritime identity.*

Construction of the proposed Haverstraw Bay crossing would not involve development in a small harbor area, and thus this policy does not apply. It should be noted that the proposed project would not inhibit development at small harbor areas in the project area.

5) *Encourage the location of development in areas where public services and facilities essential to such development are adequate.*

Construction of the proposed river crossing would not result directly in any new development in the area. The proposed project would serve existing industrial facilities, and residential and commercial customers in developed areas where public services and facilities are adequate for such development. It should be noted that there would be adequate gas volumes in the proposed pipeline to permit future development in developed areas. The proposed project would therefore be consistent with this policy.

6) *Expedite permit procedures in order to facilitate the siting of development activities at suitable locations.*

Construction of the proposed project crossing would not involve the siting of development activities; and thus this policy does not apply.

7) *Significant coastal fish and wildlife habitats will be protected, preserved, and where practical, restored so as to maintain their viability as habitats.*

A. Habitat Designation and Project Activities

Haverstraw Bay has been designated as a significant coastal fish and wildlife habitat (NYSDOS 1987). Significant coastal fish and wildlife habitats are evaluated, designated and mapped under the authority of the Waterfront Revitalization and Coastal Resources Act. The New York State Department of Environmental Conservation (NYSDEC) evaluates the significance of coastal fish and wildlife habitat (e.g., ecosystem rarity, species vulnerability, human use) and recommends habitat designations to NYSDOS for inclusion in the CMP. The extensive shallow estuarine habitat areas; the occurrence of commercial and recreational fisheries; the use of the Bay as a nursery, feeding and/or overwintering area for marine and anadromous species; and the presence of vulnerable or sensitive species (i.e., endangered or threatened) qualifies Haverstraw Bay as a significant coastal fish and wildlife habitat under the CMP.

Haverstraw Bay is also included in the United States Fish and Wildlife Services (USFWS) "Significant Habitats and Habitat Complexes of the New York Bight Watershed" as "Lower Hudson River Estuary, Complex # 21." The Lower Hudson River was selected because it is a regionally significant nursery and wintering habitat for a number of anadromous, estuarine and marine fish species and a migratory and feeding area for birds. The USFWS program encompasses a larger area than the Significant Coastal Habitat designation, but it is a parallel designation recognizing the same significant values of Haverstraw Bay as the Significant Coastal Habitat designation.

Haverstraw Bay is also an Essential Fish Habitat (EFH) as designated under The Magnuson-Stevens Fishery Conservation and Management Act [(Section 305(b)(2)]. Haverstraw Bay is identified as a mixing zone which is contiguous with coastal waters which have been designated in the N.Y. Bight area. EFH applies to species for which there are approved management plans. National-Marine Fisheries Service, the agency which administers the EFH program, has identified Atlantic butterfish, Atlantic herring, bluefish, red hake, summer flounder, windowpane and winter flounder as species having EFH in Haverstraw Bay. Millennium has provided FERC with the information necessary for an EFH assessment. FERC has initiated the required consultation process with NMFS and is preparing the assessment. The information is provided to FERC is presented in the Attachment .

Located approximately 25 miles north of New York City, Haverstraw Bay extends from Stony Point south to Croton Point for approximately 6 miles, and varies in width from two miles to almost 4 miles. Much of the Bay is shallow, less than 15 feet deep at MLW, and is the widest

portion of the Hudson River estuary. A federal navigation channel, maintained at a depth of approximately 32 feet below MLW is located west of the center of Haverstraw Bay.

The proposed project passes through the upper reaches of Haverstraw Bay, following a 2.1-mile route from Bowline Point on the western shore of the Bay to the Veterans Administration Hospital property on the eastern shore. Construction of the proposed project would temporarily impact the aquatic and benthic community of this significant coastal fish and wildlife habitat area within the proposed pipeline crossing.

Construction activity involves trenching, pipe fabrication, installation and backfilling operations to be conducted continuously, proceeding along the route as one unit. Trench depth in the navigation channel would be about 20 feet and 10 feet in areas outside the navigation channel. Unconsolidated sediments and subsurface soils in Haverstraw Bay require a trench side slope of 3:1 to maintain open trench requirements. During construction, the open trench would be 10 feet wide at the bottom, up to 150 feet wide at the top in the navigation channel, and up to 70 feet wide at the top in areas outside the navigation channel. Construction planning requirements will limit any open trench portion of the proposed route to approximately 1300 feet at any time. Construction of any given pipeline segment, from trenching to backfilling, will be completed within approximately two weeks (see section 3.1.4).

B. Hudson River Resources

The Hudson River is approximately 315 miles in length extending from its source at Lake Tear of the Clouds in the Adirondack Mountains to the Battery at the southern end of Manhattan Island (Limburg *et al.* 1986). The lower Hudson River, defined as that section of the Hudson River between the Battery and the Federal Dam at Troy, New York, is approximately 154 miles long. The Federal Dam, constructed in 1832 as part of the New York State canal system, forms the boundary between the tidal estuarine lower Hudson River and the riverine upper Hudson River. An estuary is defined as a semienclosed coastal body of water that has a free connection with the open sea and within which seawater is measurably diluted with fresh water from land drainage (Pritchard 1967). The Hudson River estuary is a drowned river valley (i.e., bottom elevation at the Federal Dam is below sea level), with saltwater intrusion (defined as the northernmost location of 50-mg/l chloride concentration) restricted to the southern portion of the estuary. The geographical position of the salt front ranges over several kilometers during a tidal cycle.

High spring flows move the salt front down to the Tappan Zee region [mile point (MP) 27]; summer low flows allow the salt front to intrude toward Poughkeepsie (MP 71). Salinity in Haverstraw Bay generally varies between 0 and 10 parts per thousand (ppt), depending on the location of the salt front. Intrusion of salt water from the ocean brings about stratification of the estuary. Denser, more saline water follows deeper areas of the Hudson River channel. Irregularities such as sills in the river bottom or constrictions in shorelines cause changes in flow direction and velocity, resulting in mixing between fresh- and saltwater layers. The slower flows in shallow shoreline areas, often coupled with tributary inflows, bring about lower salinities in shore zones. The intrusion of salt from the ocean into the Hudson River is the primary cause of density-induced circulation in the estuary. This net nontidal movement of water seaward in the upper layer and landward in the lower

layer of the salinity-intruded river affects the transport of energy, mass, and plankton through the Hudson River.

Despite past disturbances and development, Haverstraw Bay contains considerable fish and wildlife habitat, and provides the most extensive area of shallow estuarine habitat in the lower Hudson River. Extensive areas of shallow bottom create areas of estuarine tidal marshes that contain salinity-tolerant species of submerged and emergent aquatic vegetation, such as saltwater cordgrass, saltmeadow cordgrass, and spike grass.

The shallow estuarine waters of Haverstraw Bay create favorable habitat for benthic and epibenthic fauna. The benthic macroinvertebrate infauna (organisms living within the bottom sediments) feed primarily on detritus (organic materials together with associated bacteria, fungus, and other meiofauna). The distribution of macroinvertebrate infauna on a large scale is determined by salinity with polychaete worms being most abundant in brackish water areas such as Haverstraw Bay. Epibenthic fauna live near the surface of the bottom sediments and often migrate up into the water column at night to feed where they function as part of the zooplankton community. In Haverstraw Bay, epibenthic macroinvertebrate collections are typically dominated by mysid shrimp, especially the opossum shrimp (*Neomysis americana*). These benthic and epibenthic populations serve as important food resources for larger macroinvertebrates and many important fish species.

Haverstraw Bay provides nursery habitat for numerous fish species, including striped bass, American shad, white perch, Atlantic Tomcod and Atlantic sturgeon. Other species, including anadromous blueback herring and alewife, move through Haverstraw Bay to upstream spawning areas. Certain marine species, notably bay anchovy, Atlantic menhaden and blue crab, also use Haverstraw Bay as a major nursery and feeding area.

The shortnose sturgeon occurs only along the east coast of North America and is an important component of the fish community. It is a federally listed and New York State listed endangered species. It has been recorded as occurring from central Florida to southern New Brunswick, Canada (Dadswell *et al.* 1984). The shortnose sturgeon generally occupies freshwater to brackish water reaches of its natal river and estuaries, remaining primarily in deep river channels. Shortnose sturgeon spawn in the upper Hudson River, returning downstream immediately afterward. Some adults may leave the Hudson over the summer, but the majority remain dispersed in the estuary during summer and fall, and then overwinter in either the Kingston or Haverstraw Bay region (Dovell *et al.* 1992, Geoghegan *et al.* 1992). Adults that will not spawn in the following spring congregate in a downstream section of the Hudson River in and around Haverstraw Bay. Adults that will spawn in the following spring are thought to migrate upstream and congregate near Kingston, New York.

With the arrival of spring, non-spawning adults disperse from Haverstraw Bay throughout the summer range of the species. Spawning adults ascend the river to spawn in the reach of river between the Federal Dam (Troy, New York) and Coxsackie, New York approximately at river mile 118. Spawning occurs from late April to early May in the Hudson River.

Juvenile shortnose sturgeon grow rapidly and gradually disperse downstream inestuary. By late fall, most surviving juvenile fish have moved into deeper channel portions of Haverstraw Bay. Shortnose sturgeon are benthic feeders. Adults are reported to feed on insect larvae, crustaceans, and molluscs. In winter, shortnose sturgeon generally remain in deeper waters to feed, with feeding occurring on an infrequent basis.

The Atlantic sturgeon is anadromous and dependent on coastal waters. Mature Atlantic sturgeon enter the Hudson Estuary by early April before water temperatures rise above 6.1°C, followed by the mature females several weeks later (Dovel and Berggren, 1983). Spawning begins when gravid females appear in upper Haverstraw Bay (MP 38) about mid May when temperatures are approximately 12.8°C, when the salt front is in the vicinity. Females remain in the estuary 4 to 6 weeks after spawning, while males may remain in the area up to 8 months.

During spawning season, Atlantic Sturgeon migrate to deep areas of the river where they can move back and forth across the channel (Dovel and Berggren, 1983). Males in the Hudson River reach maturity at age 12, with weights ranging from 5.4 to 47.6 kg, and lengths of 1.2 to 2.0 meters. Females are older and larger when they mature, the youngest female in the Hudson was found to be 18 or 19 years old and weighed 32.6 kg. The fish contained 3.6 kg of eggs which appeared to be ripe (Dovel and Berggren, 19983). Spawning moves upriver with the salt front as the season progresses, but no further that Catskill (MP 113). Most spawning occurs between Croton Point (MP 35) and Hyde Park (MP 76) from May to August, in water over 25 feet deep. Kahnle, et al. (1998) reported spawning migration beginning in May.

Immature Atlantic sturgeon migrate downstream in the Hudson River when water temperatures drop below 20°C. By the time the water temperature reaches 9°C, most sturgeons have reached the location where they will remain until spring. Immature Atlantic sturgeon remaining in the Hudson River Estuary over the winter months usually congregate between the Bear Mountain Bridge and the George Washington Bridge in channel holes or pockets. Other Atlantic sturgeon leave the Hudson Estuary. Emigrating fish are usually between the ages of 1 year and 6 years of age(Dovel and Berggren, 1983).

Several commercially and recreationally important fisheries occur in Haverstraw Bay, including striped bass, American shad and blue crab. Historically, oyster beds were prevalent in brackish areas of the Hudson River including Haverstraw Bay and the Tappan Zee. However, a combination of over-harvesting, habitat alteration, and pollution led to the demise of oyster beds more than a century ago.

Haverstraw Bay also provides habitat for migrating waterfowl during spring (March-April) and fall (September-November) migrations, although the actual number of waterfowl using the area is not well known.

The bald eagle (*Haliaeetus leucocephalus*), a Federal and New York State listed threatened species, utilizes areas of the lower Hudson River estuary, including Haverstraw Bay, during winter months for feeding. The Federal navigation channel is kept open throughout the winter months to allow ships and barges access to up-river ports and terminal facilities. During recent years, primarily as a result of the successful bald eagle restoration activities of NYSDEC's

Endangered Species Unit, bald eagles have occasionally been observed along the shore and on ice floes in Haverstraw Bay. Since the Haverstraw Bay pipeline crossing will be constructed during the fall months, there will be no impact to bald eagles in the Haverstraw Bay area. Potential impacts of the proposed project on the aquatic communities would be limited to the approximately 2.5 month construction period. Potential impacts during construction would include the temporary loss of benthic substrate during trenching, installation and backfilling operations, as well as potential increases in suspended sediment concentrations and turbidity.

C. Project Effects on Significant Habitat

The relationship between the size of the area affected by the pipeline crossing and the total available habitat in the estuary is an important general consideration for the following discussion of specific physical processes and ecological functions. The estuarine environment of the lower Hudson River is influenced by forces beyond the boundaries of the estuary or the designated significant habitat. These forces control the processes which maintain physical habitat and the daily variations in many of the important habitat characteristics such as water circulation, flushing rates, erosion and sedimentation, and the chemical parameters associated with water mass movements. Many of the biological characteristics of the estuary are strongly influenced by the migratory behavior of many of the most abundant species in the estuary. In addition, the designated significant habitat in Haverstraw Bay is only a portion of a larger area which includes Croton Bay and Tappan Zee south to Piermont Marsh. There is similar functional habitat throughout this larger area (Buckley 1979), thus it represents the appropriate baseline for the relationship of the pipeline effects to available habitat.

The footprint of the dredged area is 0.2% of the designated significant habitat in Haverstraw Bay and 0.08% of the contiguous functional habitat in Haverstraw Bay, Croton Bay and Tappan Zee. The total area of influence of pipeline construction includes the dredging footprint and the area which experiences increased sedimentation from dredging and backfilling. The sedimentation area is defined by the extent of the turbidity plume, which is defined as the area within which the suspended solids concentration may be increased by 35 mg/l above ambient. The total area of influence is 1.2% of the designated habitat and 0.4% of the contiguous functional habitat

Pipeline construction will have a temporary effect on very small portions of the designated habitat and the total available functional habitat. Because the construction activities occupy a very small portion of the water column and estuary bottom, and the effects are limited to temporary disturbance and subsequent restoration of the substrate, there is no mechanism which could cause a significant change in the physical, biological and chemical characteristics of Haverstraw Bay. In addition, because no structure will remain in the water after construction, there will be no long-term effects on physical, biological and chemical parameters that define the habitat.

Physical Effects

Living space includes the river bottom (substrate) and the water column. Benthic life lives buried in the substrate (infauna) or in close association with the surface of the substrate

(epibenthos). Fish occupy the water column, but are often in close association with the substrate for feeding and reproduction. Infauna use only a small depth zone, generally on the order of a few inches and remain in one location, unless natural or human induced factors cause a disturbance to the substrate. Epibenthos and fish are mobile and change their location in response to many environmental factors such as water mass movement, temperature, salinity and food density.

Living space will be unchanged in the long term by pipeline construction. During dredging and pipe placement the physical habitat will be disturbed, but the total living space will actually expand due to the deepening of the trench. Following backfilling and natural restoration of the substrate, the living space in Haverstraw Bay will be the same as before construction.

Circulation, flushing and tidal amplitude in the Hudson River estuary are controlled by river discharge and tidal flow. These water mass movements interact so that circulation, flushing rates and tidal amplitude vary in accordance with predictable changes in tidal flow and the less predictable changes in river discharge caused by climatic conditions. These physical parameters would not be affected by the pipeline because the construction would have no influence on the forces which control these parameters. During construction, the physical equipment in the river would have no more effect on water flow than a large ship. After construction is completed, there will be no structures in the river which could influence water flow.

Turbidity will be increased by dredging and backfilling operations in the Hudson River, with an attendant increase in sedimentation in the vicinity of the trench. Dredge plume modeling (conducted by GAI) was used to estimate increases in suspended solids, and the thickness of the sediment deposition that would result from dredging and backfilling the pipeline trench. The model results were presented on Page 14 and summarized in Table 2.

Water temperature will not be influenced by the pipeline because the construction will not influence the factors which determine water temperature in the estuary. Construction activities will neither add to, or extract heat from the water, nor will these activities influence water mass movements which can affect temperature distributions in the Bay.

The shape (morphology) and depth of the Bay will be altered on a temporary basis, but there will be no change in these characteristics in the long term. Dredging will temporarily deepen the Bay in the footprint of the trench and sedimentation will decrease depths slightly where there is an accumulation of material in the near vicinity of the trench. Backfilling will restore the excavated material to the trench and natural processes of scour and deposition will return the trench surface and the adjacent substrate to its original contours. The forces which control scour and deposition will not be altered by pipeline construction; thus these forces will begin to act on the minor changes to the substrate immediately after construction is completed. The shape and depth of the Bay in the pipeline corridor will return to preconstruction conditions quickly because scour and deposition work to maintain the morphology of the Bay in a long term equilibrium.

Based on analyses of core samples, substrate in the trench footprint is composed primarily of silt with some fine sand. The substrate is generally uniform along the length of the trench and there was no layering of the sediments over the depth of the trench. Excavation of the substrate will

remove the material from its existing position. The material will be stored in barges and backfilled in the trench. Because the substrate material is generally uniform over the length and depth of the trench, the substrate will be the same after construction.

The backfilling operation will create an uneven bottom at the substrate surface due to bulking of the sediments caused by the excavation and the uneven distribution of material as it redeposits in the trench. Because the sediment is fine grained and lacks cohesiveness, the sediment is expected to spread rather uniformly in the trench. Natural scour and deposition would smooth the remaining unevenness at the surface of the trench and the adjacent areas which experienced increased sedimentation. In the process of smoothing the substrate surface, there would be a sorting of sediment particles which would produce a substrate surface similar to existing conditions.

There is no rooted vegetation or physical structures along the pipeline route that would be disturbed by pipeline construction.

There would be minor, temporary, localized changes in erosion and sedimentation rates, but no long-term effects on these processes which could affect Haverstraw Bay. Because dredging and backfilling would not change the quantity of sediments already in the estuary, there would be no significant changes in sedimentation rates. Similarly, the construction activity does not introduce a mechanism to significantly modify erosion rates. Following completion of each segment of the pipeline construction, there would be a re-distribution of the sediments which did not redeposit in the trench. In a short period of time the Bay substrate would reach a new equilibrium in which the trench footprint would be indistinguishable from the surrounding substrate.

Biological Effects

The effects of pipeline construction on living resources would be a temporary reduction of benthic infauna and some epibenthos in the footprint of the trench and a temporary redistribution of epibenthos and fishes during construction. The vast majority of Haverstraw Bay and the contiguous functional habitat in Croton Bay and Tappan Zee would not experience any effects on living resources. Because the area affected is very small and because the effects are temporary, there is no mechanism for change which could alter the community structure or the relationships built on that structure. The physical habitat after recovery would be the same as pre-construction conditions. There would be no new habitats created or species lost from the community which could bring about a change in species diversity.

Food chain relationships and predator/prey relationships would not be altered because there would be no significant change in the population size of any species in Haverstraw Bay as a result of pipeline construction. The very small temporary reduction of benthic infauna and epibenthos directly due to dredging would not alter feeding relationships, which are ecosystem wide characteristics. The increase in mortality represented by dredging would be offset very quickly by an increase in survival in the benthos. Restoration of the physical habitat would begin immediately after backfilling and would renew the former benthic substrate. Because this

habitat would not have an existing benthic community, one would expect increased survival of those individuals which recolonize the area from adjacent unaffected substrate. Epibenthic organisms would return to the trench footprint soon after backfilling, providing a food resource for fish which may enter the area.

The physical characteristics (meristic features) of the living resources of Haverstraw Bay would not be altered by the pipeline project because these characteristics are not affected by minor, temporary changes to the habitat of the living resources. Changes to physical characteristics are generally brought about by major changes to the living conditions of organisms acting over a long period of time.

The behavioral and migratory patterns of the organisms living in Haverstraw Bay occur in response to a combination of innate behavior and cues from the environment. Migration and habitat selection are innate, but the timing of migration or the selection of habitat on a day by day basis is controlled by water temperature, salinity, food density and potentially many other factors. The effects of pipeline construction would not significantly alter the environmental cues to which organism respond. The habitat disturbance associated with dredging would cause fish to flee the immediate area of dredging, but the increased turbidity and the presence of displaced benthic organisms may attract fish to the periphery of the plume to take advantage of increased food density. These changes in behavior represent minor, short-term effects on behavior which would cease when the project is completed.

Migratory behavior is important for many fish, particularly during late winter and early spring. Migratory species must reach upstream spawning areas and be able to migrate downstream to complete their reproductive cycles. The construction sequence will limit dredging and backfilling to approximately 10% of the overall river width during any two week interval. This approach will provide adequate uninterrupted migratory pathways for fish during the summer and fall.

Chemical Effects

The levels of the chemical parameters such as dissolved oxygen, carbon dioxide, acidity, dissolved solids, nutrients, organics, salinity and pollutants are controlled by processes that are not specific to the project area, with the possible exception of pollutants in the sediments. The distribution of the chemical parameters are controlled by the water mass movements under the influence of river discharge and tidal flow. The pipeline construction will not alter the existing pattern of water mass movements. A tidal excursion in Haverstraw Bay is approximately four miles, thus the majority of water within the six-mile designated habitat would be exchanged during each tidal cycle. In addition, the water movement would cause extensive mixing, which limits the potential for localized water quality conditions.

The sediments were tested for the presence of contaminants to determine the potential for the release of pollutants during construction. Contaminant levels were very low and no PCBs were found over the length and depth of the trench. Disturbance of the sediments would resuspend a small portion of the contaminants in the dredged material, but the vast majority of the contaminants would be returned to the trench during backfilling. The contaminants in the

suspended sediments which are carried beyond the trench footprint would settle to the bottom in the near vicinity of the trench. Because the project will not add any chemicals to the water, the effect of pipeline construction will be limited to a localized redistribution of the contaminants which are already present in the sediments. Although the dredging and backfilling would redistribute some contaminants, it is also likely that some contaminants which are currently near the substrate/water interface will be buried by the backfilling so that they are below the zone of biological activity. On balance, it is likely that more contaminants would be redeposited below the level of biological activity in the substrate than would be redistributed by the dredging and backfilling operations.

Ecosystem Effects

In designating Haverstraw Bay as Significant Coastal Fish and Wildlife Habitat, the area was characterized as having low habitat diversity, but good quality despite extensive previous disturbances (NYSDOS 1990). Low diversity reflects the fact that there are generally uniform habitat conditions throughout this broad area of the estuary. As discussed above,, the functional habitat extends beyond the designated habitat.

The values of Haverstraw Bay were established through a variety of sampling programs on the lower Hudson River starting in the late 1960's. These programs were designed primarily to assess power plant impacts, but in order to perform these assessments an extensive sampling program throughout the estuary was needed to establish baseline conditions. These data permit a comparison among segments of the estuary, which over time has shown the importance of Haverstraw Bay as nursery and overwintering habitat. In addition, these studies provide a long term data base on the seasonal occurrence of various life stages of important fish species, which can be used to establish a dredging window. The power company sponsored studies are supplemented by many other study programs of specific areas and selected species (shortnose sturgeon for example) providing additional information to establish the importance of Haverstraw Bay.

LMS Engineers was directly involved in many of these studies beginning in the 1960's and has assimilated much of the total information base for various impact assessments. LMS' long-term experience and familiarity with and accumulated knowledge of the Hudson Estuary study programs is the basis for the evaluation of the effects of pipeline construction.

The habitat within the trench footprint and sedimentation area is typical of Haverstraw Bay. There are no unique features or functional values associated with the habitat along the pipeline route. The temporary loss of the functional value of a small percentage of this habitat would not have significant effects on the living resources of Haverstraw Bay. The sequential construction of pipeline segments over a 2.5 month interval will result in significant restoration at the initial segment before the last segment is started.

The evaluation of the significance of the effects of pipeline construction must consider the process and rate of habitat restoration. If the habitat's functional value is restored in a short time interval (relative to the life spans of the components of the biological community), then the

effects would not be significant in a short- or long-term sense. There are no mechanisms which would cause effects beyond the localized effects in the vicinity of the pipeline route. As discussed above, none of the physical, biological or chemical parameters would be altered to a degree that would bring about long-term changes to the ecology of the Hudson River. In fact, the effects that will occur will be very limited spatially and temporarily so that the physical, biological and chemical processes of the estuary would continue unaltered during and immediately after construction.

Habitat restoration following dredging has been documented for estuarine environments, such as Haverstraw Bay. Studies conducted at the Passenger Ship Terminal (PST) on the West Side of Manhattan Island have shown rapid recovery of the benthic and fish communities following dredging. PST is dredged annually to remove an accumulation of 4 to 6 ft of soft sediment. Sampling of benthos and fish before and after dredging showed that the abundance of these organism groups were as great or greater than in nearby undredged areas. These data, which showed habitat recovery in less than one year, are relevant to Haverstraw Bay because they involved a similar fine-grained substrate and similar benthic and fish species.

The former channels and existing ship channel in Haverstraw Bay are direct evidence of the restoration of habitat in the designated area. Channels extending from the shoreline to the main channel for former brick making operations and to accommodate caisson construction for the Tappan Zee Bridge have filled in and provide habitat for aquatic life equivalent to undredged areas of the Bay. The main ship channel is dredged to maintain adequate depth for shipping (last dredged in 1986). This channel is an important component of the functional value (overwintering) of the designated habitat, even though the channel is repeatedly dredged. Previous maintenance dredging of the channel, which involves a major portion of the designated area, has not adversely affected its overwintering value. The pipeline crossing would temporarily affect only a 150 ft wide segment of the channel during a non-winter period. If dredging the entire length of the channel did not adversely affect the functional value, dredging of a 150 ft wide segment will have no effects

The nursery habitat provided by Haverstraw Bay has high ecological value because the combination of a broad expanse of shallow productive substrate in a salinity zone appropriate for the juveniles of migratory marine and estuarine species occurs rarely along the Atlantic Coast. The presence of a deep channel for overwintering in this same salinity zone adds ecological value to this area. The species which depend on this habitat for all or a portion of their life cycles, have generally maintained substantial population levels despite environmental changes, pollution effects, and overfishing. The endangered and special concern species (sturgeons) which occur in this area, while experiencing reduced population levels over broad areas of their range, maintain substantial populations in the Hudson Estuary. Habitat loss in the vicinity of Haverstraw Bay is not recognized as a factor in the special status of these species.

Many of the abundant and ecologically important species of fish and invertebrates (particularly blue crab) which use the designated habitat rely on other extensive areas of habitat in the estuary and marine environment. Their population levels can be controlled by environmental factors and habitat-related effects occurring outside of the designated habitat. The current status of the

habitat in Haverstraw Bay can be characterized as good with no significant threats to the quality and quantity of habitat.

Human use of the designated habitat includes extensive recreational activity, primarily boating and fishing, industrial activities such as shipping and power plant cooling, and assimilation of municipal waste discharges. These uses will continue in the future probably at somewhat increased levels. As long as the quantity of physical habitat remains undiminished, the natural processes which created and maintain the productivity of the designated habitat can be expected to maintain the current population levels of the important living resources of the estuary.

While the designated habitat may be irreplaceable in certain respects, the functional values of the habitat will be restored after they are temporarily reduced by pipeline construction. None of the habitat will be physically destroyed. The restoration of the habitat through backfilling of the trench and natural processes which will reconstitute the substrate will assure maintenance of the existing habitat and its functional values in the long term.

As discussed previously, the area to be dredged is approximately 1.5% of the designated habitat. As discussed above, contiguous functional habitat extends well beyond Haverstraw Bay and includes Croton Bay (also designated habitat) and Tappan Zee south to Piermont Marsh (non-designated habitat). Buckley (1979) characterized similar physical habitat throughout this large area, with no significant differences which would distinguish an area the size of the trench from other areas. In fact, it is the broad expanse of similar productive habitat which is the most important factor in the designation of Haverstraw Bay as significant habitat. LMS' experience with sampling aquatic life and physical parameters in Haverstraw Bay confirms this general observation.

The distribution of important fish species in Haverstraw Bay and similar contiguous habitat is, to a great extent, determined by the seasonal movements and migrations of these species. The occurrence of important species in the area of the pipeline route is determined by the innate migratory behavior of these species and other factors such as temperature, salinity, food density and schooling behavior which control daily activity. There are no features of the pipeline route which could take precedence over these natural factors in determining distribution in Haverstraw Bay.

Benthic infauna lack mobility; thus they generally do not select habitat or make daily adjustments in location. These organisms or their early reproductive stages settle and establish themselves when they encounter suitable habitat as they are moved about by water mass movements. The physical conditions of the substrate on the pipeline route are similar to surrounding areas of the Bay. Thus the distribution and abundance of benthic infauna on the route would be similar to surrounding habitat areas.

As discussed above, innate behavior and environmental factors determine the occurrence of fish in the vicinity of the pipeline route. Many important species which use Haverstraw Bay are present on a seasonal basis that varies with the life stage of most species. Migratory species such as American shad, blueback herring, alewife, rainbow smelt, striped bass, shortnose sturgeon and Atlantic sturgeon pass through the Bay (or migrate from the Bay) from late winter through spring

enroute to upstream spawning areas. These adults return downstream through the Bay in late spring. The adults of some species such as shortnose sturgeon may remain in the Bay for much of an annual cycle. The early life stages of the fish spawned upstream will move into Haverstraw Bay throughout summer and fall.

The early life stages of striped bass enter the Bay in early summer and remain in the nursery habitat provided by the extensive shallows and shoals. Juvenile sturgeons would be present over a long period of time (years) because of their slow maturation.

Resident species which are important in the Bay include white perch, Atlantic tomcod and hogchoker. These species are abundant in the Hudson Estuary, representing a significant portion of the fish biomass. Juveniles through adults of these species are present throughout most of the year. Adults of these species move upstream of Haverstraw Bay to spawn during winter (tomcod), spring (white perch) and summer (hogchoker), and then redistribute themselves in the estuary. Early life stages of tomcod are present in spring due to the winter spawning of this species. Early life stages of white perch and hogchoker are present in summer.

The resident species and the adults and juveniles of striped bass and sturgeons overwinter in Haverstraw Bay and adjacent areas. Their distribution within Haverstraw Bay during winter can vary depending on temperature and salinity conditions. The presence of some of these species in the navigation channel is controlled primarily by innate habitat preferences.

The Millennium Pipeline construction across Haverstraw Bay has been designed to minimize effects on the significant habitat. There will be no loss of habitat quantity and only a temporary reduction of functional value during and immediately after construction. Restoration of the disturbed area through backfilling and natural processes will result in a complete restoration of the functional values of the designated habitat. The construction activities will not alter the physical, biological and chemical processes of Haverstraw Bay, thus the habitat will recover as it has from previous dredging operations which were not designed and conducted with the care of the Millennium Pipeline Project.

Measures to protect resources and mitigate potential adverse effects during construction include the use of closed 'environmental' buckets during trenching and silt curtains, as necessary, during backfilling operations in the channel. Adherence to the construction window and conditions for dredging set forth by U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS) and NYSDEC will ensure that no direct impacts occur to significant coastal habitat.

D. Endangered Species

The shortnose sturgeon (Acipenser brevirostrum) is the only Federally or state listed endangered or threatened species in the Hudson River in the vicinity of the proposed Millennium pipeline crossing. However there is mounting evidence that the Atlantic sturgeon (Acipenser oxyrinchus oxyrinchus) has experienced a significant decline in abundance in the Hudson (Kahnle et al. 1998; Peterson et al 2000). Therefore it is possible that Atlantic sturgeon could be listed in the

future. The following discussion addresses the question of taking under the Federal Endangered Species Act (ESA), but the technical rationale presented applies to both species of sturgeon in the Hudson.

Section 9 of the ESA prohibits the "taking" of any endangered species of fish and wildlife. [ESA §9(a)(1); 16 USC § 1538 (a)(1)]. The USFWS has promulgated regulations also prohibiting the "taking" of any threatened species of wildlife (50 CFR §17.31). Similarly, the NMFS promulgated a regulation that forbids the taking of any threatened species of fish or wildlife for which the ESA §9(a)(1) prohibitions have been applied by regulation. [50 CFR §222.301(b)].

The term "take" is defined in the ESA as meaning to harass, harm, pursue, hunt, shoot, kill, trap, capture, or collect, or attempt to engage in any such conduct. [ESA §3(19); 16 USC §1532(19)]. Both the USFWS and NMFS have in turn defined the word "harm", within the context of ESA Section 9, as an act which actually kills or injures fish or wildlife, including significant habitat modifications or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns including breeding, spawning, rearing, migrating, feeding, or sheltering [50 CFR §17.3, 222.102] (emphasis added). It is clear from these definitions and accompanying agency discussions, that an actual injury to a listed species must be found in order for a "talking" to have occurred under ESA Section 9 and that these regulations do not create liability for hypothetical, speculative or conjectural injury. [See 46 FR 54748 (Nov. 4, 1981); 64 FR 60729 (Nov. 8, 1999)].

To determine whether a certain act will constitute harm, the act must result in, or be reasonably certain to result in, the death or injury of listed fish or wildlife. (See 64 FR 60729). Thus, a causal link or relationship between a specific activity or series of activities and the injury or death of listed species must be demonstrated, in order for an act to raise to the level of harm. (See 64 FR 60728). To demonstrate such a causal link can be more challenging in situations where the nexus between a cause and effect are nebulous or where there is a substantial lag period between the cause and effect, as in habitat modification.

The ESA and corresponding regulations are unambiguous that habitat modification or degradation alone, is not a taking pursuant to ESA Section 9. To be subject to Section 9, the modification or degradation must be significant, must impair essential behavioral patterns and must result in actual injury to a protected species. The occurrence of a taking would depend on situation-specific conditions and can be shown through a variety of methods and types of evidence. These include, but are not limited to, field surveys and assessments, populations studies, laboratory studies, model based procedures, information and data in the scientific literature, or expert witness testimony consisting of interferences or opinions drawn from facts pertaining to a given act(s) of habitat modification or degradation (64 FR 60728).

Using these allowed methods and types of evidence the discussion below demonstrates that the construction of the Millennium Pipeline Project will not result in an ESA Section 9 take of any listed species of fish or wildlife.

The construction of the Millennium pipeline crossing in Haverstraw Bay (see p. 9 for a description of the crossing plan, Figure 2 for a location map) does not constitute a "taking'

because there would be no loss or harm to individual sturgeon, no loss of physical habitat and no long-term loss of the functional value of the habitat involved in pipeline construction. The construction equipment operating in the river will not kill or harm sturgeon and the temporary habitat disturbance related to the construction would not impair essential behavioral patterns which would cause injury to individual sturgeon. In fact, both species of sturgeon show a preference for deep channel habitats during all life stages (Bain 1997). Most of the deep channel in the Hudson is subjected to periodic maintenance dredging, thus sturgeon in the Hudson have been exposed to a repeated habitat disturbance much more extensive than the dredging and backfilling associated with pipeline installation.

There is extensive experience with dredges of the type proposed for pipeline construction (closed clamshell bucket) that shows that fish are very rarely enclosed in the bucket during dredging and subsequently dumped in the scow which will retain the dredged material. The localized disturbance caused by the dredging and the relatively slow movement of the dredge bucket allows free swimming fish to avoid capture in the bucket. Observations of the discharge of individual bucket loads of dredged material into scows shows that fish are rarely picked up by a clamshell bucket dredge. Slow moving life stages of fishes, such as eggs and larvae may be vulnerable, but sturgeon spawn well upstream of Haverstraw Bay (Bain 1997), thus their eggs and larvae would not be exposed to such dredging.

The pipeline construction will not permanently remove any habitat from use by sturgeons in the Hudson. The pipeline will be placed in a trench excavated in the bottom of the river which will be backfilled after pipeline placement with river sediment collected in barges. The backfilling in combination with natural processes of sediment scour and deposition will return the disturbed area of river bottom to its original contours and substrate type. The area of river bottom and volume of water at the construction site will be the same after construction as it was before construction. In addition, because there will be no structures remaining in the water after construction, the tidal current velocities will be the same as preconstruction conditions. This ensures that the physical and chemical water quality conditions that are controlled by water mass movements will be unchanged.

The channel portion of the proposed pipeline route serves as general living space for sturgeons, but has no known functional value that is greater than the adjacent channel areas. The channel in Haverstraw Bay is recognized as wintering habitat for juvenile and adult shortnose sturgeon and juvenile Atlantic sturgeon. Bain (1997) shows that shortnose use approximately 6 miles of channel, including Haverstraw Bay, and Atlantics approximately 31 miles of channel during winter. Adult shortnose sturgeon also use a portion of the river channel near Kingston for overwintering.

Dredging for the pipeline crossing will disturb an area of the channel bottom for approximately 900 ft long by 150 ft wide and create sediment deposition over a larger area (see p. 12 and Table 2 for the dimensions of the area affected by the turbidity plumes). The turbidity plume associated with backfilling the trench in the channel would be 500 ft wide by 400 ft long, but would last for only 30 minutes. There would be two backfilling operations per day in the channel.

The channel area disturbed for pipeline installation is a very small portion of the available channel habitat used by sturgeon in the Hudson. With construction occurring from September 1 to November 15, the work would be completed before there would be a concentration of sturgeon in Haverstraw Bay for overwintering. The disturbed area would be recovering its benthic community, but it would have still reduced food resources for sturgeon during the first winter after pipeline installation.

Shortnose sturgeon are reported to cease feeding in freshwater during winter, but to continue feeding during winter in the saline portions of estuaries (Dadswell 1979). There is little information on feeding habits in the Hudson. Overwintering sturgeon in Haverstraw Bay would be near the saltfront, which would vary in location depending on freshwater runoff conditions. The extent to which sturgeon would feed during overwintering is uncertain, but they are capable of surviving with little or no feeding for up to six months. The diminished food supply in the 150 ft swath of the channel is expected to recover to pre-dredge conditions by the end of the fall.

The effects of dredging on aquatic habitat and its use by sturgeon have been previously tested as a result of maintenance dredging of the shipping channel in the Hudson. In contrast to the pipeline installation, which will restore the bottom to its original contours with native sediment, channel maintenance dredging removes accumulated sediments, which deepens the channel and begins a cycle of sediment build-up which will continue until the next episode of maintenance dredging. The channel benthic habitat is thus maintained in a state of long-term flux. Also in contrast to the pipeline installation, maintenance dredging is a recurring habitat disturbance affecting a much longer area than the pipeline footprint. Whereas the pipeline installation is a one-time effect on a small segment of the channel (150 ft wide), maintenance dredging would affect a reach involving many miles and up to the full width of the channel each time this dredging occurs.

The fact that the shortnose sturgeon population has apparently increased since the last episode of maintenance dredging in Haverstraw Bay (see discussion below) is strong evidence that dredging in this habitat is not an adverse impact. The decline in Atlantic sturgeon is reported to be primarily the result of overfishing, and dredging has not been implicated in the decline of this species. In addition to the channel maintenance operations, the shoal habitat has been previously disturbed for the installation and use of channels which connect with the main shipping channel. These channels, some of which are no longer maintained, apparently have not adversely effected habitat use by sturgeon in the Haverstraw Bay area.

The shortnose surgeon population in the Hudson has been estimated at 38,024 adults (Bain et. al. 1995). There is no indication of a decline in this stock since intensive studies of this population began in the 1970's. In fact, the 1995 estimate suggests a 2 to 4 fold increase in the adult population. While the population is listed as an endangered species, it is not in imminent danger of extinction in the Hudson River. Activities such as dredging and backfilling for pipeline installation, while they are an intrusion into a very small portion of sturgeon habitat, do not represent a level of effect which could alter the status of this robust population.

As noted above, with regard to the Atlantic sturgeon, while the population is not listed as endangered or threatened, the observed decline in the stock is cause for concern. However, there

is substantial data which suggests strongly that this population decline is due to overfishing and not to habitat disturbance or loss. Adult Atlantics spend the bulk of their life in the sea and while in freshwater for spawning are primarily upstream of the pipeline crossing location and have completed spawning (spring) and left the river by fall. The overwintering juveniles would be present during construction, but the pipeline would only affect a 150 ft wide segment of the 31 mile overwintering reach.

Pipeline installation in the channel represents a very small, one-time physical disturbance of habitat. Based on the lack of significant effects from maintenance dredging of the main shipping channel, pipeline installation in the Hudson River does not represent a taking with regard to the ESA. The crossing of the Croton River is in a location which does not contain sturgeon habitat and the use of the directional drill method ensures that there will be no adverse impact on aquatic resources (see Section 3.2). Long-term maintenance of the sturgeon populations is not threatened by the proposed construction because there is no loss of the long-term functional value of the habitat which could harm sturgeon. There is no evidence that sturgeon have been harmed by dredging in the past and, in fact, dredging may help maintain the preferred habitat of sturgeon in the Hudson.

8) *Protect fish and wildlife resources in the coastal area from the introduction of hazardous wastes and other pollutants which bio-accumulate in the food chain or which cause significant sub-lethal or lethal effect on those resources.*

BMPs addressing shore zone and offshore construction activities will be prepared and followed during construction. The BMPs will include practices to reduce the possibility for accidental release of small amounts of wastes and materials to the river waters from the construction vessels due to poor maintenance and housekeeping practices. Proper lubrication and fuelling procedures will be followed with provisions made for leak and spill containment, and diligence will be exercised to oversee waste management practices.

Potential impacts to fish and wildlife resources may include exposure to contaminants released from sediments during trenching and backfilling operations. Sediment quality sampling conducted along the proposed pipeline-crossing route indicated that the sediments contain trace amounts of a variety of metals and semi-volatile organic compounds; however, potential impacts related to the contaminated sediments will be minimized by employing BMPs during trenching and backfilling operations. Measures to mitigate this impact include environmental-bucket dredges, and storing dredged material in barges. Additional BMPs that are applicable include the use of silt curtains, as necessary, and a dredging operations monitoring plan. The dredging operations monitoring plan will be used during construction to monitor the efficacy of the BMPs and to adjust the use of the BMPs to mitigate adverse environmental impact to the extent practicable. By employing these management measures, the proposed project would be consistent with this policy.

Predicted aqueous concentrations of chemical constituents detected in the sediment at the location of the visible plume are presented on Table 3. None of the predicted aqueous

concentrations exceed NYSDEC standards or the USEPA's Marine Acute Criteria. Therefore, exceedances of the NYSDEC standards and the USEPA Marine Acute Criteria are not expected beyond the predicted visible plume which has a maximum length dimension of 460 feet for each of the four construction components described in Section 3.1.4.

9) *Expand recreational use of fish and wildlife resources in coastal areas by increasing access to existing resources, supplementing existing stocks, and developing new resources. Recreational uses include: (1) consumptive uses such as fishing and hunting; and (2) non-consumptive uses such as wildlife photography, bird watching and nature study.*

Construction of the proposed Haverstraw Bay crossing would not preclude recreational use of fish and wildlife resources. The project would therefore be consistent with this policy.

10) *Further develop commercial finfish, shellfish and crustacean resources in the coastal area by encouraging the construction of new, or improvement of existing on-shore commercial fishing facilities, increasing marketing of the state's seafood products, maintaining adequate stocks, and expanding aquaculture facilities.*

Construction of the proposed project crossing would have no effect on commercial fishing resources or activities in the Haverstraw Bay area of the Hudson River. Therefore, the proposed project would not conflict with this policy.

11) *Buildings and other structures will be sited in the coastal area so as to minimize damage to property and the endangering of human lives caused by flooding and erosion.*

The only building to be constructed by Millennium in the coastal zone would be a 20 by 40 foot building containing gas measurement equipment that would be located within the Bowline Point Generating Station industrial complex. The location of the building will minimize property damage and threats to human lives as a result of floods, and thus the proposed project will be in compliance with this policy.

12) *Activities or development in the coastal area will be undertaken so as to minimize damage to natural resources and property from flooding and erosion by protecting natural protective features including beaches, dunes, barrier islands and bluffs.*

Construction of the proposed Haverstraw Bay project crossing would not affect beaches, dunes, barrier islands, or bluffs. Where the pipeline is constructed through the shore zone, there will be short-term disruption; however, the construction site will be immediately returned to pre-construction conditions. Therefore, the proposed project would be in compliance with this policy.

13) *The construction or reconstruction of erosion protection structures shall be undertaken only if they have a reasonable probability of controlling erosion for at least thirty years as demonstrated in design and construction standards and/or assured maintenance or replacement programs.*

Rock rip-rap or other appropriate erosion control devices will be placed along the shore in the immediate vicinity of the shoreline construction. These devices would help stabilize and protect the shoreline construction area. The placement of shore zone protective devices would be in compliance with this policy.

14) *Activities and development, including the construction or reconstruction of erosion protection structures, shall be undertaken so that there will be no measurable increase in erosion or flooding at the site of such activities or development, or at other locations.*

The proposed project includes the placement of rock rip-rap or other appropriate erosion control devices in the immediate vicinity of shoreline construction areas. The proposed shore zone protection will not result in any increase in erosion or flooding at the site or at other locations, and thus the proposed project would be in compliance with this policy.

Mining, excavation or dredging in coastal waters shall not significantly interfere with the natural coastal processes which supply beach materials to land adjacent to such waters and shall be undertaken in a manner which will not cause an increase in erosion of such land.

Dredging and excavation associated with the proposed project is projected to cover a very short time period with the construction site returned to pre-existing conditions following construction. The proposed project would not affect natural coastal processes or increase the potential of erosion from adjacent land. In addition, construction of the proposed project would not involve beaches. Therefore, the proposed project would be in compliance with this policy.

16) *Public funds shall only be used for erosion protective structures where necessary to protect human life, and new development which requires a location within or adjacent to an erosion hazard area to be able to function, or existing development; and only where the public benefits outweigh the long-term monetary and other costs including the potential for increasing erosion and adverse effects on natural protective features.*

No public funds will be used in the proposed project. Therefore, this policy does not apply.

Nonstructural measures to minimize damage to natural resources and property from flooding and erosion shall be used whenever possible.

Construction of the proposed project will include BMPs to minimize damage to natural resources in the project area. No flooding or erosion would result from the proposed project, and thus no nonstructural flood or erosion control measures will be required. Therefore, the proposed project is in compliance with this policy.

18) *To safeguard the vital economic, social and environmental interests of the state and of its citizens, proposed major actions in the coastal area must give full consideration to those interests, and to the safeguards which the state has established to protect valuable coastal resource areas.*

Construction of the proposed project would provide a source of clean-burning natural gas to a large section of New York State, providing vital energy and infrastructure to the State. The proposed Haverstraw Bay crossing is based upon the best available technology and will result in the least environmental impact while meeting all applicable regulations, standards and criteria. Safeguarding social and environmental interests of the state and its citizens is being given full consideration in this consistency evaluation and through the Federal NEPA process. The proposed project would be consistent with this policy.

> *Protect, maintain, and increase the level and types of access to public water related recreation resources and facilities.*

Construction of the proposed project would not preclude access to public water-related recreation resources and facilities. The project would therefore be consistent with this policy.

20) *Access to the publicly-owned foreshore and to lands immediately adjacent to the foreshore or the water's edge that are publicly-owned shall be provided and it shall be provided in a manner compatible with adjoining uses.*

No publicly owned foreshore will be disturbed by project construction activities. Construction of the proposed project would not preclude public access to waterfront land in the project vicinity. Therefore, the proposed project is consistent with this policy.

21 *Water-dependent and water-enhanced recreation will be encouraged and facilitated, and will be given priority over nonwater related use along the coast.*

Construction of the proposed project would not materially affect water-related recreation resources and facilities. Therefore, the project would be consistent with this policy.

> *Development, when located adjacent to the shore, will provide for water related recreation, whenever such use is compatible with reasonably anticipated demand for such activities, and is compatible with the primary purpose of the development.*

The proposed project does not include shoreline development; therefore, this policy does not apply.

23) *Protect, enhance and restore structures, districts, areas or sites that are of significance in history, architecture, archaeology or culture of the state, its communities, or the nation.*

From 10 to 14 November 1997, Ocean Surveys, Inc. (OSI) conducted a geophysical survey of the proposed gas pipeline crossing of the Hudson River between West Haverstraw, New York and the Franklin D. Roosevelt Veteran's Hospital, Westchester County, New York. The route was 12,242 feet in length and oriented in a southwest-northeast direction (OSI 1997). The investigation involved the collection of digital side scan sonar, hydrographic, seismic reflection profiles and magnetic intensity data in a 2000-foot wide corridor (OSI 1997). This geophysical survey was also used to undertake an underwater archaeological investigation of the Project

corridor. On 26 and 27 August 1998, OSI conducted a supplemental geophysical survey of the proposed Millennium route across the Hudson River between Bowline Point and the east shore landfall at the Veteran's Hospital. This survey was focussed on the Bowline Point landfall.

Based on sonar and magnetometer data analysis, there are sonar targets identified in the project area, which may represent either cultural resources, natural material or debris associated with historical to recent occupations in this section of Haverstraw Bay. Ground truthing (ground truthing is an independent in-depth investigation used to verify the cause of or to identify a remote sensing anomaly or target of interest) of these targets of interest will be completed as part of the recommended Phase II research. Nevertheless, none of the targets are thought to be significant to the State or the Nation. No buildings or structures of national or historic listing are located within the project area. Therefore, the proposed project is in compliance with this policy.

24) *Prevent impairment of scenic resources of statewide significance. This impairment would include: (a) the irreversible modification of geologic forms, the destruction or removal of structures, whenever the geologic forms, vegetation or structures are significant to the scenic quality of an identified resource; and (b) the addition of structure which, because of siting or scale will reduce identified views or which because of scale, form, or materials, will diminish the scenic quality of an identified source.*

Several portions of the Hudson River waterfront have been identified as "Statewide Areas of Scenic Significance" (SASS) due to their visual appeal, presence of scenic vistas or visible historic structures, or lack of shoreline development. Each SASS area contains a number of mapped subunits recognized for its visual and/or scenic qualities. The project site is not located within any of the NYSDOS-designated SASS areas along the Hudson River. The closest SASS area, Hudson Highlands, terminates at Stony Point (RM 40) more than two miles north of the proposed Haverstraw Bay Crossing.

The coastal zone area, by definition, extends from the shore to the horizon line. On the western side of the Hudson River and to the south of the proposed Haverstraw Bay crossing, the proposed pipeline route would traverse High Tor State Park, crossing over High Tor Ridge, which is the western horizon in the Haverstraw Bay viewshed. The pipeline would be constructed in the existing powerline right-of-way leading over the ridge line to Bowline Point. The existing right-of-way traverses the ridge at an angle, thus from most visual perspectives, the right-of-way is screened by trees and natural vegetation. No construction or cutting will occur outside the existing powerline right-of-way, thus within a growing season the area will be returned to existing conditions.

One mainline valve would be within 50 feet of the eastern shore of the Hudson River and within the grounds of the Franklin D. Roosevelt Veteran's Hospital, an NRHP-listed site. The valve will be below the viewshed of the lower levels of the Hospital; however, it will be visible from upper floors and from nearby George's Island Park. Millennium is currently completing consultation with the New York SHPO to determine if visual screening of the valve will be required. Construction of the proposed project crossing would not impair this resource of statewide significance, and thus the proposed project would be consistent with this policy.

Protect, restore or enhance natural and man-made resources which are not identified as being of statewide significance but which contribute to the overall scenic quality of the coastal area.

The proposed project would not adversely impact the overall scenic quality of the coastal area in Haverstraw Bay on either the eastern or western shores. Therefore, the proposed river crossing is in compliance with this policy.

The Haverstraw Bay shoreline is intensely developed with a power generating facility, and a mixture of industrial facilities and marinas. Residences (single family and cluster housing) are visible, to the horizon line, along much of the western shore of the Bay in the project area.

The proposed structure on the Haverstraw Bay shore will be consistent with the surrounding facilities. Visual focal points on the western shore include the trap rock crushing and loading facilities, the Bowline Point Generating Station, and a gypsum processing plant and dock. Several oil terminals and tank farms are also present and visible from the Hudson River. The one proposed building will not be a visual focal point or contrast sharply with existing waterfront uses. The equipment and vessels used for the installation process will not be out of character with the fuel barges, crushed stone barges, and freighters that use the Hudson River and are a visual component of Haverstraw Bay.

Conserve and protect agricultural lands in the state's coastal area

The proposed crossing is not located adjacent to agricultural lands. Therefore, this policy does not apply.

27) *Decisions on the siting and construction of major energy facilities in the coastal area will be based on public energy needs, compatibility of such facilities with the environment, and the facility's need for a shorefront location.*

The Millennium Pipeline Project is a major energy facility that is entitled to a preference under the CZMA. The CZMA recognizes that major energy facilities are entitled to preferential consideration because of the importance of transmitting energy, particularly natural gas, to markets that are dependent upon energy sources for growth and economic vitality. The Millennium Pipeline Project will satisfy the "public energy needs" of New York State and the Northeast U.S. region in a number of different respects. First, the Project will satisfy growing market demands, as evidenced both by executed contracts for the pipeline's capacity and the forecasts of various experts. Second, the project will supply low-cost Canadian gas supplies to one of the highest-priced gas markets in the United States -- New York. Third, the Project will improve electric power reliability and advance clean air objectives. Fourth, the Project will improve the reliability of gas service to New Yorkers by upgrading the existing natural gas infrastructure through the addition of more capacity, deliverability, delivery points, and interconnections. Fifth, the Project will provide gas producers and gas storage developers in western New York with increased access to markets. These benefits are explained in the sections that follow.

1 There Is A Clear Need For The Additional Gas Supplies That The Millennium Project Will Bring To New York State

It is common knowledge that New York and neighboring states comprise one of the fastest-growing natural gas markets in the United States. Fueled by growing use of natural gas for electric power generation, residential consumption, manufacturing processes, and industrial cogeneration, gas demand in the Northeast is growing at an accelerating rate with the expansion of our economy. Although abundant supplies of natural gas are available in Canada, there is still not enough pipeline capacity available to deliver those economical supplies to customers in New York and elsewhere in the Northeast. The Millennium Project will upgrade the existing interstate pipeline network for delivering energy to the Northeast, where it is needed. In addition, because the Millennium Project will be able to access all of the major gas-producing basins in Canada and the United States, consumers will be provided with an increased diversity of economical supply options. This cost-competitive access to gas supply will produce lower energy costs for homeowners, businesses, and industry.

Evidence of this market demand for the gas transportation services that Millennium proposes to provide along the Southern Tier of New York is most starkly presented in the long-term precedent agreements that Millennium and seven shippers have executed for the firm transportation of most of the capacity of the Millennium Pipeline Project.[1] The pipeline capacity was contracted out to the shippers following a publicly-announced "open season" for the submission of bids for capacity, the negotiation and execution of the precedent agreements, and an allocation of system capacity among the shippers after the capacity of the project was significantly oversubscribed. The precedent agreements are with well-established, respected companies in the natural gas industry [2] and are for terms of 10 to 20 years.

Evidence of market demand for the project is also provided by economic forecasts of incremental demand for natural gas in the Northeast, which show that demand is projected to increase substantially in the next few years and that currently certificated pipeline capacity will not be able to satisfy that increased demand. Indeed, projections from the Energy Information Administration of the U.S. Department of Energy, the INGAA Foundation, Inc., Cambridge Energy Research, and Foster Associates support Millennium's conviction that there will be unmet incremental demand for pipeline capacity in the Northeast that is substantially in excess of the Millennium's capacity of 700,000 dth/d. Data compiled by these experts indicate that potential unserved demand could be:

YEARS	POTENTIAL UNSERVED DEMAND
1995-2000	806 MMCFD

[2] The shippers on interstate pipeline systems are increasingly gas marketers as a result of the unbundling of the services of local distribution companies. While Millennium has executed a precedent agreement with IBM, an end-user which strongly supports the Project, most other end-users that will be served by the Project plan to contract for necessary gas services with one or more of the gas marketers that have contracted for Millennium capacity instead of contracting directly with Millennium. This is the usual industry practice.

2000-2005	938 MMCFD
2005-2010	1,658 MMCFD
1995-2010	4,196 MMCFD

According to Standard & Poor's DRI, even if the Millennium Project were built, there would still be substantial demand for additional pipeline capacity in the Northeast.

Significantly, moreover, economic conditions since these forecasts were released have improved dramatically, increasing gas demand to the upper end of the ranges forecasted. Accordingly, the forecasts referred to provide a very conservative basis for estimating gas demand. Indeed, the staff of the Federal Energy Regulatory Commission, relying on the referenced forecasts and other data, has concluded as follows:

> "All projections indicate increasing demand for natural gas in the Northeastern United States over time, and the need for increased capacity to meet that demand. This leads staff to conclude that additional pipeline construction is likely to be required in the near future to meet that demand."[3]

2. The Project Will Supply Low-Cost Gas To Consumers In New York -- One Of The Highest-Priced Gas Markets In The United States

Gas prices in New York State are already well above average. During a period of cold weather in January 2000, gas prices soared to as high as $15 per MMBtu. With a 45% increase in demand predicted, without additional supply, gas prices may further increase. In contrast, lower cost gas is abundant in western Canada. The Millennium Project will serve to deliver lower cost gas to markets all across New York State and to the New York City metropolitan area. Additional supply to New York State will foster competition regarding gas supply. Because it is predicted that approximately two thirds of the cost of energy production relates to fuel, incremental cost savings can be significant to consumers and the economy of New York State. Reduced costs will stimulate New York's economy. Gas supply at competitive pricing is vital to attracting new industry to New York State. The location of the Millennium Project, across the Southern Tier, will help stimulate economic growth, which will benefit all of New York.

3. The Project Will Improve Electric Power Reliability And Air Quality In New York

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[3] "Staff Analyses of Natural Gas Consumption and Pipeline Capacity in New England and the Mid-Atlantic States" (December 1999), at 15.

The current energy policy in New York State is dedicated to fostering competition. As a result, there has been a recent surge in the number of merchant power plants proposed to be fueled by natural gas to compete with power generated by older plants that are less energy and environmentally efficient. Once again, the most significant cost associated with operating such a facility is the cost of gas supply. Many of these facilities are being sited in areas that will depend upon Millennium and others to deliver reliable gas supply at competitive prices. Some of these facilities will be located in areas where multiple sources of gas supply will exist. Fostering competition and gas supply is consistent with New York's energy policy.

New York Governor Pataki announced an initiative to require reductions of NO_x emissions by the power generation industry. On October 21, 1999, Governor Pataki ordered the Department of Environmental Conservation to issue regulations requiring New York's electric generators to cut their nitrous oxide and sulfur dioxide emissions dramatically. Under the Governor's directive, New York's SO_2 emissions would be reduced by 130,000 tons annually and NO_x emissions by 20,000 tons annually. These reductions are intended to reduce acid rain and snow, which are threatening New York's Adirondack and other environmentally sensitive regions.

The Millennium Project could pay a major role in achieving the emissions reductions ordered by Governor Pataki since natural gas yields far fewer air pollutants than oil or coal. The combustion of 1,000 million Btu's of natural gas produces 92 pounds of nitrogen oxides, compared to 448 pounds in the combustion of fuel oil and 457 pounds in the combustion of coal. Similarly, the combustion of 1,000 million Btu's of natural gas produces 0.6 pounds of sulfur dioxide compared to 1,122 pounds for oil and 2,591 pounds for coal. Translated to an annual basis, the Millennium Project's gas supplies would reduce SO_2 emissions by more than 235,000 tons, twice the reduction sought by the Governor's directive, and NO_x emissions by more than 55,000 tons, or almost three times the Governor's objective.[4]

Significantly, the Millennium Project would advance clean air objectives in the State without adversely affecting New York's coastal zone. While the Project would provide infrastructure for economic development where deemed desirable, no gas pipeline capacity has been obtained for the development of new waterfront projects.

4. The Project Will Improve Gas Service Reliability Through Infrastructure Upgrades

More than 80% of the pipeline route will utilize existing utility corridor and easements. In addition, 223.8 miles of existing pipeline that was constructed in the 1950's will be abandoned and replaced with the Millennium Pipeline Project. This is a significant infrastructure upgrade that will be necessary at some point in time even if the Millennium Project is not constructed.

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[4] The estimated SO_2 reductions assume that the gas supplies would be used in lieu of oil and coal in equal amounts. The use of gas in lieu of just oil would reduce SO_2 emissions by about 140,000 tons, while the use of gas just in lieu of coal would reduce SO_2 emissions by about 330,000 tons. The use of gas would also improve air quality in New York by reducing particulates by as much as 350,000 tons (compared with the use of coal).

As a result of the Millennium Project, a modern, state-of-the art gas pipeline system will be installed across all of New York State, insuring gas service reliability. This will be a significant benefit to New York State, since the energy supply and price problems experienced in New York in January 2000 showed that the addition of new supplies was necessary to maintain reliable services.

5. The Project Will Provide New York Gas Producers And Gas Storage Developers With Access To Markets

The Millennium Pipeline Project will be routed across Chautauqua, Cattaraugus and Allegany counties, in Southwestern New York, which is the area of the State where there are gas production and storage facilities. Gas production facilities require infrastructure to deliver natural gas to market. By upgrading the existing pipeline system, replacing much of that system, and extending the system into these western counties, the Millennium Project would provide a reliable means to deliver gas produced in New York State to markets. Gas storage development in central and western New York State should also benefit from the market access provided by the Project and increase revenue to the citizens and the communities in which these facilities are located.

6. Conclusion

The Millennium Project, as a major energy project, is entitled to preferential consideration under the CZMA. The route from Canada to New York City necessitates a crossing of the Hudson River. Alternative crossing locations have been evaluated and ruled out as being feasible or not preferable due to increased environmental impacts associated with upland areas and increased cost. Given the significant benefits that will accrue to all of the New York State through the development of the Millennium Project and the fact that environmental impacts have been mitigated and, in many cases, eliminated, the Millennium Project is consistent with this policy.

28) *Ice management practices shall not interfere with the production of hydroelectric power, damage significant fish and wildlife and their habitats, or increase shoreline erosion or flooding.*

Construction or operation of the proposed project crossing would not require ice management; therefore, this policy is not applicable.

29) *Encourage the development of energy resources on the outer continental shelf, in Lake Erie and in other water bodies, and ensure the environmental safety of such activities.*

Construction of the proposed project crossing does not involve development of energy resources on the outer continental shelf, in Lake Erie and in other water bodies. Therefore, this policy does not apply.

Municipal, industrial, and commercial discharge of pollutants, including but not limited to, toxic and hazardous substances, into coastal waters will conform to state and national water quality standards.

All reasonable measures will be taken to prevent or minimize the discharge of contaminated dredged material, if any, during trenching and backfilling activities.

The New York State Water Classification System classifies Haverstraw Bay as SB. The NYSDEC has three narrative water quality standards for surface waters with this classification:

1 Taste-,color-, and odor-producing , toxic and other deleterious substances

- None in amounts that will adversely affect the taste, color or odor thereof, or impair the waters for their best usages.

2. Turbidity

   No increase that will cause a substantial visible contrast to natural conditions.

3. Suspended, colloidal and settleable solids

   None from sewage, industrial wastes or other wastes that will cause deposition or impair the waters for their best usage.

Based on the information presented in Section 3.1.1 and in the response to Policy 8, these narrative standards may be exceeded only in the immediate vicinity of the dredging site and within the visible plume, with the potential exceedance limited to a short period of time. The project has received its Section 401 Water Quality Certificate from NYSDEC, which finds that the pipeline installation would not degrade water quality if specified conditions and monitoring is followed. The project would comply with the applicable permitting requirements. The proposed project crossing would therefore be consistent with this policy.

State coastal area policies and management objectives of approved local waterfront revitalization programs will be considered while reviewing coastal water classifications and while modifying water quality standards; however, those waters already overburdened with contaminants will be recognized as being a development constraint.

Construction of the proposed project crossing would not affect the water classification or water quality standards in the proposed project area. Therefore, this policy does not apply.

32) *Encourage the use of alternative or innovative sanitary waste systems in small communities where the costs of conventional facilities are unreasonably high, given the size of the existing tax base of these communities.*

Construction of the proposed project would not involve sanitary waste systems; therefore, this policy does not apply.

33) *Best management practices will be used to ensure the control of stormwater runoff and combined sewer overflows draining into coastal waters.*

The proposed project would not involve stormwater runoff or construction of combined sewer overflows. Therefore, this policy does not apply.

Discharge of waste materials into coastal waters from vessels subject to state jurisdiction will be limited so as to protect significant fish and wildlife habitats, recreational areas and water supply areas.

Construction of the proposed project would not affect discharge from vessels into waters of Haverstraw Bay. Therefore, this policy does not apply.

35) *Dredging and dredge spoil disposal in coastal waters will be undertaken in a manner that meets existing state dredging permit requirements, and protects significant fish and wildlife habitats, scenic resources, natural protective features, important agricultural lands, and wetlands.*

As discussed in Section 3.1.1 and the responses to Policies 7 and 8, the dredging and backfilling operations associated with the Haverstraw Bay crossing will not require the disposal of dredged material. Since there will be no disposal of dredged material as part of the Haverstraw Bay crossing, the proposed project is in compliance with this policy.

Activities related to the shipment and storage of petroleum and other hazardous materials will be conducted in a manner that will prevent or at least minimize spills into coastal waters; all practicable efforts will be undertaken to expedite the cleanup of such discharges; and restitution for damages will be required when these spills occur.

The proposed project does not involve the shipment and storage of petroleum or other hazardous materials. Therefore, this policy does not apply.

37) *Best management practices will be utilized to minimize the non-point discharge of excess nutrients, organics and eroded soils into coastal waters.*

Construction of the proposed project does not involve the non-point discharge of nutrients, organics and eroded soils. BMPs will be used during construction and maintenance activities to minimize non-point source discharges. Thus the proposed project is in compliance with this policy.

38) *The quality and quantity of surface water and groundwater supplies will be conserved and protected particularly where such waters constitute the primary or sole source of water supply.*

The proposed project will not affect surface water or groundwater supplies Therefore, this policy does not apply.

The transport, storage, treatment and disposal of solid wastes, particularly hazardous wastes, within the coastal areas will be conducted in such a manner so as to protect groundwater and surface water supplies, significant fish and wildlife habitats, recreation areas, important agricultural land, and scenic resources.

The proposed project does not involve the transport, storage, treatment or disposal of solid wastes. Therefore, this policy does not apply.

40) *Effluent discharged from major steam electric generating and industrial facilities into coastal waters will not be unduly injurious to fish and wildlife and shall conform to state water quality standards.*

The proposed project would not result in the discharge of any effluent from generating and industrial facilities into the waters of Haverstraw Bay. Therefore, this policy does not apply.

Land use or development in the coastal area will not cause national or state air quality standards to be violated.

The proposed project would not result in the violation of any Federal, state or local air quality standards. The potential reduction in marine traffic and congestion related to the delivery of petroleum products to the Bowline Point Generating Station and other Haverstraw Bay industrial facilities would benefit overall air quality in the project area. The proposed project would therefore be consistent with this policy.

42) *Coastal management policies will be considered if the state reclassifies land areas pursuant to the prevention of significant deterioration regulations of the Federal clean air act.*

The proposed project would not affect state classifications of land areas Therefore, this policy does not apply.

43) *Land use or development in the coastal area must not cause the generation of significant amounts of acid rain precursors nitrates and sulfates.*

The proposed project would not cause the generation of significant amounts of acid rain precursors, namely, nitrates and sulfates. The proposed project will deliver a clean burning fuel that should result in the overall reduction of acid rain precursors. Therefore, this policy does not apply.

44) *Preserve and protect tidal and freshwater wetlands and preserve the benefits derived from these areas.*

No tidal or freshwater wetlands will be disturbed as a result of the proposed Haverstraw Bay crossing. The project site is north of the NYSDEC limit (the Tappan Zee Bridge) for Tidal Wetlands (Article 25) jurisdiction. There are no state or Federally-mapped freshwater wetlands in the project area.

3.2 Village of Croton-on-Hudson

Description of Proposed Action

The proposed route for the Millennium Pipeline would cross the Hudson River at Haverstraw Bay in Rockland and Westchester Counties, following a 2.1-mile route from Bowline Point on the western side of the Bay to the Veterans Administration hospital property on the eastern-shore (Figure 3). The proposed Hudson River-Haverstraw Bay route from Bowline Point to the Veterans Hospital property facilitates Millennium's plans to provide gas service to Southern Energy New York's Bowline Point Generating Station, located on the western shore of Haverstraw Bay in Haverstraw, New York. The proposed route also minimizes pipeline mileage to the proposed terminus at Mount Vernon, New York.

The proposed Route 9/9A alignment is an alternative selected to avoid concerns for the Consolidated Edison's (Con Ed) electric transmission right-of-way (ROW) which was the initial alignment in Westchester County. This alternative would make maximum use of existing corridors in Westchester County, principally public roads, utility rights-of-way, abandoned railroad grades and bike paths. Overall, approximately 86 % of the Route 9/9A alternative uses or parallels these corridors. The use of the Con Ed Row is reduced from approximately 21.9 miles to several crossing totaling approximately 1300 ft (see section 2.6 for a description of special safety issues associated with the Con Ed Row). In addition, construction along the bike path corridor presents multiple opportunities to improve specific locations along the trailway system as well as enhance the entire corridor.

Alternative Routes Evaluated

The Route 9/9A alternative includes a segment along these roadways which brings the pipeline through the Village of Croton-on-Hudson. In meetings with village officials, they stated a preference for an alignment on the west side of the Metro North tracks where the pipeline passes through the downtown area of Croton-on-Hudson. This preferred alignment brings the pipeline in close proximity to the Hudson River shoreline in Haverstraw Bay and through a village park on the shoreline. This alignment is preferred in order to avoid traffic congestion in the village and will permit enhancement of the shoreline park. This area of Haverstraw Bay is Significant Coastal Fish and Wildlife Habitat (see section 3.1). The pipeline also crosses the Croton River, which is designated Significant Coastal Fish and Wildlife Habitat as an upstream extension of Croton Bay. The designated habitat in the Croton River extends upstream to the limit of tidal influence. The area selected for crossing the Croton River utilizes an abandoned roadway which has an elevated extension across wetlands in the river. This abandoned roadway provides access to the river without encroaching into the wetlands or directly on the river bank. This location also avoids the scenic gorge upstream on the Croton River.

The pipeline route through the Croton-on-Hudson coastal zone crosses southwest under U.S. Route 9 and the Conrail/Amtrack and Metro North tracks and then proceeds along the edge of Senasqua Park along the south and west side of the Conrail ROW to a point approximately

opposite the Senasqua Road interchange with US Route 9. In this segment the work area encroaches into a small tidal pond between the Route 9 and the railroad tracks and also crosses a small tidal creek which is culverted in the crossing area. At this point, the route crosses back under the railroad tracks, through a small industrial park, through the parking lot for the Metro North Croton Railroad Station, under US Route 9, through the parking lot of a small commercial strip mall, and into the property of Van Cortlandt Manor.

In the Van Cortlandt Manor property, the route crosses an open lot used for overflow parking and recreational events and into the abandoned ROW of old NY Route 9A. The route follows this abandoned highway ROW, which, in this location, is a narrow, elevated strip of land extending out into the Croton River and a wetland area. Millennium proposes to use the directional drill technique to cross this river and wetland complex. The route then follows the old NY Route 9A ROW back to US Route 9 near the NY Route 9A interchange.

3.2.3 Review of Coastal Zone Policy Consistency

There are two coastal zone issues related to the Route 9/9A alternative, the pipeline segment which passes through the shoreline park on Haverstraw Bay and the crossing of the Croton River. The designated significant habitat in Haverstraw Bay is discussed in detail in 3.1 in relation to the effects of crossing of Haverstraw Bay. Both of these issues are addressed below in relation to the coastal zone policies of the Village of Croton-on-Hudson's Local Waterfront Revitalization Program. Millennium will apply for and comply with all local permits related to construction activities.;

1) Restore, revitalize and redevelop deteriorated and underutilized waterfront areas for commercial, industrial, cultural, recreational and other compatible uses. Insert statement saying park will be enhanced.

Insert coming on enhancements to the park

1A) *Existing planning and zoning documents should be reviewed and amended where necessary to ensure development within the community is consistent with adopted goals and policies.*

This local policy is not applicable to the pipeline project.

1B) *Redevelop and revitalize village owned land at the metro north station, including village garage and bay area. Encourage integrated development of village property to assure fulfillment of requirements relating to parking and accessory uses of metro north train station, while facilitating public access to bay area and recreational use.*

The placement of the pipeline through Croton-on-Hudson's waterfront park and adjacent to the metro north tracks is consistent with the local policy because access to the bay area and park will not be inhibited by the pipeline.

> *Every effort should be made by the municipality to encourage the mutual cooperation and exchange of information between governmental agencies involved in clean-up of Croton landfill and metro-north lagoon in order to develop commercial use of resources found in the coastal area.*

This local policy is not applicable to the pipeline project.

> *Require restoration of deteriorating structures related to railroad use and assure appropriate maintenance and screening to reduce visual impact.*

This local policy is not applicable to the pipeline project.

> *Develop the old sewage treatment plant site at the intersection of Route 9A and Municipal Place.*

This local policy is not applicable to the pipeline project.

2) *Facilitate the siting of water-dependent uses and facilities on or adjacent to coastal waters.*

The placement of the pipeline near the shore of Haverstraw Bay and across the Croton River will have no influence on the future siting of water dependent uses and facilities in Croton-on-Hudson.

2A) *Expand restrictions on the use of power boats on the Hudson River and Croton River and bay by further enforcing the parameters that regulate boat traffic such as speed, turbidity, safety, and mooring and sludge disposal. Such controls will further increase the compatibility of power boat use with other forms or recreation use within the coastal zone area.*

This local policy is not applicable to the pipeline projects.

3) *The State coastal policy regarding the development of major ports is not applicable to Croton.*

The state coastal policy is deemed not applicable to Croton by the LWRP

> *The State coastal policy regarding the strengthening of small harbors is not applicable to Croton.*

The state coastal policy is deemed not applicable to Croton by the LWRP.

5) *Encourage the location of development in areas where public services and facilities essential to such development are adequate.*

The placement of the pipeline near the shore of Haverstraw Bay and across the Croton River will have no influence on the future developments in Croton.

> *When feasible, development within the village should be directed within the current service area of existing water and sewer facilities or in close proximity to areas where distribution lines currently exist.*

This local policy is not applicable to the pipeline project.

> *The extension of water and sewer distribution lines beyond areas currently served should be undertaken cautiously and with prudent regard for village water resources and the preservation of environmental values in undeveloped areas.*

This local policy is not applicable to the pipeline project.

> *Limit proposed development within those portions of the coastal zone boundary area, where traffic impacts such as site distance and carrying capacity of the roadways are restricted, particularly along Route 9A, Albany Post Road and Route 129.*

This local policy is not applicable to the pipeline project.

6) *Expedite permit procedures in order to facilitate the siting of development activities at suitable locations.*

The placement of the pipeline within the Croton coastal zone would not involve the siting of development activities, thus this policy does not apply.

> *To expedite permit procedures, the village shall coordinate all relevant local laws into a development package for applicants proposing development activities.*

This local policy is not applicable to the pipeline project.

Construction of the proposed project crossing would not involve the siting of development activities; and thus this policy does not apply.

7) *Significant coastal fish and wildlife habitats will be protected, preserved, and where practical, restored so as to maintain their viability as habitats.*

Croton River and Bay is designated significant coastal fish and wildlife habitat and is contiguous with Havestraw Bay. This area contains extensive shallow water with marshes and mudflats, which is characterized as a productive nursery, foraging and resting area for anadromous and resident fish.

Croton River and Bay is also included in the USFWS "Significant Habitats and Habitat Complexes of the New York Bight Watershed" as "Lower Hudson River Estuary, Complex # 21." The Lower Hudson River was selected because it is a regionally significant nursery and wintering habitat for a number of anadromous, estuarine and marine fish species and a migratory and feeding area for birds. The USFWS program encompasses a larger area than the Significant Coastal Habitat designation, but it is a parallel designation recognizing the same significant values of Haverstraw Bay as the Significant Coastal Habitat designation.

Croton River and Bay is Essential Fish Habitat as designated under The Magnuson-Stevens Fishery Conservation and Management Act (Section 305(b)(2). Haverstraw Bay is identified as mixing zone which is contiguous with coastal waters which have been designated in the N.Y. Bight area. EFH applies to species for which there are approved management plans. NMFS, the agency which administers EFH, has identified Atlantic butterfish, Atlantic herring, bluefish, red hake, summer flounder, windowpane and winter flounder as species having EFH in Croton River and Bay. Information provided by Millennium to FERC for an EFH assessment is provided in the Attachment. .

Despite past disturbances and development, Croton River and Bay contains considerable fish and wildlife habitat, and provides an extensive area of shallow estuarine habitat. Extensive areas of shallow bottom create areas of estuarine tidal marshes that contain salinity-tolerant species of submerged and emergent aquatic vegetation, such as saltwater cordgrass, saltmeadow cordgrass, and spike grass.

The shallow estuarine waters create favorable habitat for benthic and epibenthic fauna. The benthic macroinvertebrate infauna (organisms living within the bottom sediments) feed primarily on detritus (organic materials together with associated bacteria, fungus, and other meiofauna). The distribution of macroinvertebrate infauna on a large scale is determined by salinity with polychaete worms being most abundant in brackish water areas such as Haverstraw Bay. Epibenthic fauna live near the surface of the bottom sediments and often migrate up into the water column at night to feed where they function as part of the zooplankton community. In Haverstraw Bay, epibenthic macroinvertebrate collections are typically dominated by mysid shrimp, especially the opossum shrimp (*Neomysis americana*). These benthic and epibenthic populations serve as important food resources for larger macroinvertebrates and many important fish species.

Haverstraw Bay provides nursery habitat for numerous fish species, including striped bass, American shad, white perch, Atlantic Tomcod and Atlantic sturgeon. Other species, including anadromous blueback herring and alewife, move through Haverstraw Bay to upstream spawning

areas. Certain marine species, notably bay anchovy, Atlantic menhaden and blue crab, also use Haverstraw Bay as a major nursery and feeding area.

The bald eagle (*Haliaeetus leucocephalus*), a Federal and New York State listed threatened species, utilizes areas of the lower Hudson River estuary, including Croton Bay, during winter months for feeding. The Federal navigation channel is kept open throughout the winter months to allow ships and barges access to up-river ports and terminal facilities. During recent years, primarily as a result of the successful bald eagle restoration activities of NYSDEC's Endangered Species Unit, bald eagles have occasionally been observed along the shore and on ice floes in Haverstraw Bay. Because the Croton Bay pipeline crossing will be constructed during the summer months, there will be no impact to bald eagles in the Croton Bay area. See the response to Policies 7B through 7G for a discussion of impact on significant habitats.

> *The quality of the Croton River and Bay significant fish and wildlife habitat and Haverstraw Bay significant fish and wildlife habitat shall be protected and improved for conservation, economic, aesthetic, recreational, and other public uses and values. Its resources shall be protected from the threat of pollution, misuse, and mismanagement.*

Placement of the pipeline near the shore of Haverstraw Bay and across the Croton River will not harm the quality of the significant fish and wildlife habitat in these two areas. The pipeline will pass close to the shore at Haverstraw Bay, but at no point will the construction encroach beyond the river bank and into the water. The work area at the inland tidal pond and the crossing of the tidal creek will create a minor habitat disturbance. Both areas will be restored following completion of construction. The crossing of the Croton River will by be directional drilling under the river and adjacent wetlands. The drilling will originate upland from the river bank and exit on the opposite shore well back from the bank. Although the pipeline will be close to existing wetlands on the north bank, all construction activity will be confined to an abandoned roadway. The project will be consistent with the local policy.

> *Materials that can degrade water quality and degrade or destroy the ecological system of the Croton River and Bay significant fish and wildlife habitat and the Haverstraw Bay significant fish and wildlife habitat shall not be disposed of or allowed to drain in, or land within, the area of influence in the significant fish and wildlife habitats.*

Directional drilling involves the use of drilling mud within the bore hole. All drilling muds will be contained during and after construction and removed from the site when the drilling is completed. A Directional Drilling Contingency Plan will be prepared for the Croton River crossing to address handling and releases of drilling mud, sealing of abandoned drill holes, and clean up of inadvertent releases. There will be no adverse impact on water quality on the ecological system of the significant coastal habitats, thus the project is consistent with this local policy.

7C) *Storage of materials that can degrade water quality and degrade or destroy the ecological system of the Croton River and Bay significant fish and wildlife habitat or Haverstraw Bay significant fish and wildlife habitat shall not be permitted within the area of influence of the habitat unless best available technology is used to prevent adverse impacts to the habitat.*

The construction of the Croton River crossing and along the Hudson shoreline will utilize best available technology to contain all materials which could degrade water quality or the ecological system.

Restoration of degraded ecological elements of the Croton River and Bay and Haverstraw Bay significant fish and wildlife habitats and shorelands shall be included in any programs for cleanup of any adjacent toxic and hazardous waste sites.

This local policy is not applicable to the pipeline project.

7E) *Runoff from public and private parking lots and from storm sewer overflows shall be effectively channeled so as to prevent oil, grease, and other contaminants from polluting surface and ground water and impact the significant fish and wildlife habitats.*

This local policy is not applicable to the pipeline project.

Construction activity of any kind must not cause a measurable increase in erosion or flooding at the site of such activity, or impact other locations. Construction activity shall be timed so that spawning of anadromous fish species and shellfish will not be adversely affected.

Construction activity will not cause erosion or flooding because best management practices that will be as stringent as those required in local regulations will be used to control site runoff. There will be no construction within the water at either location, thus the project cannot directly influence anadromous fish spawning or shellfish.

Such activities must not cause degradation of water quality or impact identified significant fish and wildlife habitats.

The pipeline project is consistent with this local policy. See policies 7A through 7F.

8) *Protect fish and wildlife resources in the coastal area from the introduction of hazardous wastes and other pollutants which bio-accumulate in the food chain or which cause significant sub-lethal or lethal effect on those resources.*

The pipeline project does not utilize materials that would become hazardous wastes which bio-accumulate in the food chain or could cause lethal effects in fish and wildlife. BMP's addressing shore zone and directional drilling construction activities will be prepared and followed during

construction. The BMP's will include practices to reduce the possibility for accidental release of small amounts of wastes and materials to the river waters from the construction activities due to poor maintenance and housekeeping practices. Proper lubrication and fueling procedures will be followed with provisions made for leak and spill containment, and diligence will be exercised to oversee waste management practices. These practices will be as stringent as those required in local regulations and will ensure consistency with this policy.

9) *Expand recreational use of fish and wildlife resources in coastal areas by increasing access to existing resources, supplementing existing stocks, and developing new resources. Recreational uses include: (1) consumptive uses such as fishing and hunting; and (2) non-consumptive uses such as wildlife photography, bird watching and nature study.*

The pipeline project will not involve activities which could expand recreational use of fish and wildlife resources in coastal areas, thus this policy is not applicable.

> *Ensure continued recreational use and public access to the rivers through village-owned land adjacent to the metro-north parking lot, at Croton point park and at Senasqua Park, along the Croton river, and at the Croton Yacht Club. Efforts should be made to encourage recreational use of the fish and wildlife resources found in these areas by increasing the opportunities for public access and enjoyment.*

The pipeline project provides an opportunity to enhance the park facilities. At a minimum the existing access and use of the park will be maintained, thus the project is consistent with this local policy.

> *Encourage passive recreational enjoyment of the wildlife in the designated significant fish and wildlife habitats, on the Audubon society sanctuaries, on other public or private lands within the village, where wildlife habitats are located. Encourage the recreational use of areas where such resources are found, as well as the protection of such resources.*

The maintenance of park access and facilities will encourage passive recreational enjoyment of the Hudson River shoreline in Croton and is thus consistent with this local policy.

10) *Further develop commercial finfish, shellfish and crustacean resources in the coastal area by encouraging the construction of new, or improvement of existing on-shore commercial fishing facilities, increasing marketing of the state's seafood products, maintaining adequate stocks, and expanding aquaculture facilities.*

Construction of the proposed pipeline project and Croton River crossing would have no effect on commercial fishing resources or activities in the Croton River or Haverstraw Bay areas of the Hudson River. Therefore, the proposed project would not conflict with this policy.

11) *Buildings and other structures will be sited in the coastal area so as to minimize damage to property and the endangering of human lives caused by flooding and erosion.*

The pipeline project does not involve the siting of buildings or other above ground structures in the coastal zone, thus this policy does not apply.

> *Erosion and sediment control measures shall be undertaken in order to safeguard persons, protect property, prevent damage to the environment, and promote the public welfare by guiding, regulating, and controlling the design, construction, use and maintenance of any development or other activity which disturbs or breaks the topsoil or results in earth movement.*

Best management practices for erosion and sediment control that are as stringent as local regulations will be applied to the construction activities, thus the project is consistent with this local policy.

12) *Activities or development in the coastal area will be undertaken so as to minimize damage to natural resources and property from flooding and erosion by protecting natural protective features including beaches, dunes, barrier islands and bluffs.*

The pipeline project will not alter any natural features which provide protection from flooding and erosion. The land along the pipeline route will be restored to its original elevation after construction is completed.

> *Every effort should be made to protect Croton Point, a natural protective barrier to Croton Bay from activities or development that would increase erosion of or flooding of the point.*

The project will have no effect on Croton Point, thus it is consistent with this local policy.

13) *The construction or reconstruction of erosion protection structures shall be undertaken only if they have a reasonable probability of controlling erosion for at least thirty years as demonstrated in design and construction standards and/or assured maintenance or replacement programs.*

The pipeline project will have no effect on any erosion protection structures, thus this policy does not apply.

> *Any bulkheads along the Hudson must be maintained in good condition and private landowners should be required to restore and maintain erosion control mechanisms along their river frontage which are designed for long term stability.*

Where the pipeline is close to the shoreline of Haverstraw Bay, the natural and manmade features of the shoreline will not be disturbed.

Activities and development, including the construction or reconstruction of erosion protection structures, shall be undertaken so that there will be no measurable increase in erosion or flooding at the site of such activities or development, or at other locations.

The use of BMP for erosion control that are as stringent as those required in local regulations will ensure that there will be no measurable increase in erosion. The project will not involve activities which could increase flooding, thus the project is consistent with this policy

15) *Mining, excavation or dredging in coastal waters shall not significantly interfere with the natural coastal processes which supply beach materials to land adjacent to such waters and shall be undertaken in a manner which will not cause an increase in erosion of such land.*

All project construction activities will be set back from the river banks so that there will be no interference with natural coastal processes, ensuring that there is consistency with this policy.

Public funds shall only be used for erosion protective structures where necessary to protect human life, and new development which requires a location within or adjacent to an erosion hazard area to be able to function, or existing development; and only where the public benefits outweigh the long-term monetary and other costs including the potential for increasing erosion and adverse effects on natural protective features.

No public funds will be used in the proposed project. Therefore, this policy does not apply.

16A) *Public funds shall be appropriated for the yearly maintenance of Senasqua Park until such time that is determined that expenditure of funds outweighs the cost of acquiring, constructing and maintaining a similar public park on Croton's waterfront.*

This local policy is not applicable to the pipeline project.

17) *Nonstructural measures to minimize damage to natural resources and property from flooding and erosion shall be used whenever possible.*

Construction of the proposed project will include BMPs to minimize damage to natural resources in the project area. No flooding or erosion would result from the proposed project, and thus no nonstructural flood or erosion control measures will be required. Therefore, the proposed project is in compliance with this policy.

17A) *Efforts to control erosion along the rivers and on the steep slopes rising from areas inland shall be of a non-structural nature, wherever possible, in consideration of the visual impact of structural measures. The retention or planting of vegetative covers will be preferred to structural measures.*

Construction of the proposed project will include BMPs to minimize damage to natural resources in the project area. No flooding or erosion would result from the proposed project, and thus no nonstructural flood or erosion control measures will be required. Therefore, the proposed project is in compliance with this policy.

18) *To safeguard the vital economic, social and environmental interests of the state and of its citizens, proposed major actions in the coastal area must give full consideration to those interests, and to the safeguards which the state has established to protect valuable coastal resource areas.*

Construction of the proposed project would provide a source of clean-burning natural gas to a large section of New York State, providing vital energy and infrastructure to the State. The proposed Haverstraw Bay and Croton River crossings are based upon the best available technology and will result in the least environmental impact while meeting all applicable regulations, standards and criteria. Safeguarding social and environmental interests of the state and its citizens is being given full consideration in this consistency evaluation and through the Federal NEPA process. The proposed project would be consistent with this policy.

19) *Protect, maintain, and increase the level and types of access to public water related recreation resources and facilities.*

The pipeline will pass through Croton's waterfront park on the east shore of Haverstraw Bay. During the anticipated 21-day construction period access to the portion of the park where construction is taking place will be restricted. Other areas of the park will remain available during this time. Following construction and restoration of park facilities, public access will be re-established to the level it was prior to construction. This route was preferred by town officials in Croton-on-Hudson to avoid impacts to traffic from an alternative route through the downtown area of the village. The project is consistent with maintaining public access to shorefront recreational facilities.

The New York State Department of State ("DOS") has raised concerns regarding whether the State Legislature's approval is needed in order to route the Millennium Pipeline Project through certain municipal parklands in the Village of Croton-on-Hudson, New York. The basis for the DOS's concern is the common law doctrine against alienation of certain municipal public lands (including parkland). The general common law rule against alienation of municipal parkland has its basis in the "public trust" doctrine - - i.e., namely that dedicated park areas in New York are impressed with a public trust and their use for other than park purposes requires the direct and specific approval of the State Legislature, plainly conferred. United States v. City of N.Y., 2000 U.S. Dist. Lexis 6512 (E.D.N.Y. May 12, 2000); Williams v. Gallatin, 229 N.Y. 248 (1920); Ackerman v. Steisel, 104 A.D.2d 940 (2d Dep't 1984), aff'd on opn below, 66 N.Y.2d 833

(1985); Stephenson v. County of Monroe, 43 A.D.2d 897 (4th Dep't 1974). Ample precedent establishes, however, that (1) under conventional state law principles, the alienation doctrine does not apply to the Millennium Pipeline Project; (2) to the extent the doctrine is deemed to apply, the State Legislature's approval is found in numerous provisions of the Transportation Corporations Law, thus satisfying the doctrine without the need for further state action; and (3) in any event, the doctrine is preempted by federal law.

First, the alienation doctrine is inapplicable on its face, given that the underground routing of the pipeline will not encroach upon, or diminish the use of, the subject lands for public park purposes. In determining whether "alienation" of parklands is implicated, New York state and federal courts have been careful to distinguish between (1) underground facilities - - which do not limit the public's use or enjoyment of the parkland and, hence, are allowable without State legislative approval, versus (2) aboveground facilities which, if geared toward non-recreational purposes, are inconsistent with public park purposes and, therefore, require authorization by the State Legislature. E.g., City of N.Y., 2000 U.S. Dist. Lexis 6512, *1-*29 (holding that construction by city of underground water filtration and disinfection facilities to be located in public park in Bronx, New York, did not constitute an alienation of parkland within the meaning of established state law, where, after construction, the land would be restored to its initial use; distinguishing cases where the subject projects included aboveground facilities geared toward non-recreational purposes); Wigand v. City of N.Y., N.Y.L.J., Sept. 25, 1967, p.21, col. 5 (Sup. Ct., Rockland County) (upholding city's authority to build two underground water storage tanks at Silver Lake Park on Staten Island, without State legislative approval; rejecting the notion that the temporary disruption of parkland by the construction project violated the alienation doctrine; also rejecting the notion that the underground use of the land was an encroachment upon the parkland or a diminution of the parkland for park purposes). Accordingly, the Millennium Pipeline Project - - which will be routed underground and, after construction, will accord the public full use of the land for park/recreational purposes - - does not involve "alienation" of parkland. See City of N.Y., 2000 U.S. Dist. Lexis 6512, *1-*29; Wigand, supra.

Secondly, to the extent (if any) that an "alienation" of parkland is deemed to occur due to the pipeline project, that alienation is permissible under numerous provisions of the New York Transportation Corporations Law. It is well-settled that state laws of general applicability may authorize the discontinuance of the use of parkland for public park purposes, and that such laws obviate the need for the municipality to obtain State legislative approval for the particular project. See Grayson v. Town of Huntington, 160 A.D.2d 835 (2d Dep't 1990) (upholding alienation of parkland for low income housing project without State Legislature's authorization, based on general authorization in Public Housing Law § 124), lv. denied, 76 N.Y.2d 714 (1990); Village Green Realty Corp. v. Glen Cove Community Dev. Agency, 95 A.D.2d 259 (2d Dep't 1983) (upholding alienation of parkland for urban renewal project without State Legislature's authorization, based on general authorization in General Municipal Law § 503-a[4]); see also City of N.Y., 2000 U.S. Dist. Lexis 6512, *26 n.4; Sierra Club v. Bd. of Educ., 127 A.D.2d 1007 (4th Dep't 1987) (construing provision of Buffalo City Charter [which empowered the city to discontinue parkland] to allow city to use part of parkland for public school, notwithstanding N.Y. General City Law § 20; stating that the Charter provision constituted ample authority for the city's approval of the use of its parkland for a public school), lv. denied, 70 N.Y.2d 612 (1987).

Here, the State Legislature's general authorization for the routing of pipelines through (i.e., in, on, over and under) municipal parkland is found in numerous provisions of the New York Transportation Corporations Law. For example, the State Legislature has granted (1) to pipeline corporations, the power of condemnation, see N.Y. Transp. Corps. Law § 83; and (2) to municipalities, the authority to convey municipally-owned lands to pipeline corporations, see N.Y. Transp. Corps. Law § 89 (asserting that "[i]f any lands owned by any county, city or town be required by such [pipeline] corporation for such purposes, the county, city or town officers having charge of such lands may grant them to the corporation upon terms and compensation agreed upon"). Additionally, gas corporations, such as Millennium Pipeline, have been granted (1) the express approval to construct pipelines "in, on, over and under * * * public parks and places in such cities, towns or villages, with the consent of the municipal authorities thereof, and in such manner, and under such reasonable regulations, as they may prescribe," N.Y. Transp. Corps. Law § 11(3); see also N.Y. Transp. Corps. Law § 10; and (2) the "power and authority to acquire such real property as may be necessary for [their] corporate purpose and the right of way through any property in the manner prescribed by the eminent domain procedure law," N.Y. Transp. Corps. Law § 11(3-a). See also N.Y. Transp. Corp. Law § 11(3-b) (stating that "[t]he construction, use and maintenance by a gas corporation of transmission, distribution and service pipes, conduits, ducts or other fixtures in, over or under any trees, highway or public place, as may be necessary for its corporate purposes, are hereby declared to be public uses and purposes"). Here, the Village of Croton-on-Hudson is willing to consider the construction of the Millennium Project on Village parkland to promote restoration of the parkland. Accordingly, these generally applicable statutory provisions authorize the Village of Croton-on-Hudson to convey an easement to Millennium Pipeline respecting the subject parklands. Compare Grayson, supra; Village Green Realty Corp., supra.

Finally, regardless of the results of the state law analysis, the alienation doctrine is indisputably preempted by the federal Natural Gas Act ("NGA"). See National Fuel Gas Supply Corp. v. Public Serv. Comm'n., 894 F.2d 571 (2d Cir. 1990), cert. denied, 497 U.S. 1004 (1990); Iroquois Gas Transmission Systems. L.P., 52 FERC P61,091, 1990 FERC Lexis 1726, *251, *254 (July 30, 1990); see also Iroquois Gas Transmission Systems, L.P., 53 FERC P61,194, 1990 FERC Lexis 2803, *228 (Nov. 14, 1990). It is well-established that, in general terms, the NGA preempts state and local agencies from regulating the construction and operation of interstate pipelines, including pipeline location. National Fuel Gas Supply Corp., 894 F.2d at 579 (stating that "[a]llowing all the sites and all the specifics to be regulated by agencies with only local constituencies would delay or prevent construction that has won approval after federal consideration of environmental factors and interstate need, with the increased costs or lack of gas to be borne by utility consumers in other states;" also stating that Congress established FERC as a federal body that can make choices in the interests of energy consumers nationally and reasoned that because FERC has authority to consider environmental issues, states may not engage in concurrent site-specific environmental review); see also Maritimes & N.E. Pipeline, L.L.C., 81 FERC P61,166, 1997 FERC Lexis 2406, *20 & *34 (Nov. 4, 1997) (stating that states may not impose conditions that conflict with the FERC's certificates; also stating that if a conflict arises, "the principles of preemption will apply and the federal authorization will preempt the State or local requirements").

Significantly, preemption under the NGA has already been held to (1) bar state law prohibitions against the alienation of publicly-held lands - - namely, State Reforestation Lands ("SRLs"); and (2) apply, notwithstanding that SRLs are accorded the highest level of protection available under state law - - i.e., SRLs are protected against alienation under the New York State Constitution (Article XIV). Iroquois Gas Transmission Systems, L.P., 1990 FERC Lexis 1726, *251 & *254 (involving a pipeline that had been routed through SRLs; noting that Article XIV of the New York State Constitution provides that SRLs "shall not be leased, sold, or exchanged, or be taken by any corporation, public or private;" stating that "[i]n this case, we find that Article 14 of the New York Constitution is undeniably a regulation of a facility used in the interstate transportation of natural gas. Such a provision would certainly delay, if not prevent, the construction [ ] of a federally approved interstate facility. Under the facts of this proceeding, we find, as did the FEIS, that the preferred route comprises the recommended route variations contained in the FEIS"); see also Iroquois Gas Transmission Systems, L.P., 1990 FERC Lexis 2803, *228 (noting that "regulation of interstate transportation [of gas] is an activity with which [FERC] is vested exclusive jurisdiction"). Accordingly, given that the NGA preempts the highest form of State law (i.e., the New York State Constitutional), it certainly must preempt the common law alienation doctrine, or any comparable alienation doctrine rooted in state statutory law.

In sum, for the multiple reasons set forth above, the common law doctrine against alienation of municipal parklands presents no impediment to Millennium Pipeline's acquiring the necessary easement from the Village of Croton-on-Hudson for the routing of the pipeline. Village officials, in recognition of the potential enhancement opportunity for the existing park, and in order to avoid potential traffic problems associated with an alternative route through the village, have consented to this route.

> *Encourage the linkage of open space along the Hudson and Croton rivers in the form of a trail or walkway system. Such systems should be provided along undeveloped and underutilized land as well as along previously developed land.*

The pipeline project does not provide an opportunity to link open space areas.

> *Increase physical access to areas that have specific value for their physical and visual access to the Hudson River or Croton River and Bay.*

The pipeline provides an opportunity to enhance park facilities. The specific enhancements will be worked out with village officials. This is consistent with the local policy.

> *Encourage the expansion of public transportation, when feasible, to areas within the coastal zone area where water dependent and water enhanced recreation activities are located.*

This local policy is not applicable to the pipeline project.

> *Increase access to Croton River and bay at the village owned land south of the village parking lots at the Croton-Harmon station.*

This local policy is not applicable to the pipeline project.

Maintain the trail, which provides access to the Croton River waterfront, in its current undeveloped condition as a pedestrian walkway.

This trail will be maintained in its existing condition, thus the pipeline project is consistent with this local policy.

20) *Access to the publicly-owned foreshore and to lands immediately adjacent to the foreshore or the water's edge that are publicly-owned shall be provided and it shall be provided in a manner compatible with adjoining uses.*

See policy statement 19

21) *Water-dependent and water-enhanced recreation will be encouraged and facilitated, and will be given priority over nonwater related use along the coast.*

Construction of the proposed project would not materially affect water-related recreation resources and facilities. Therefore, the project would be consistent with this policy.

See policy statement 19

Boating activities should be encouraged provided that they do not restrict other recreational opportunities and are undertaken in a manner compatible with existing water dependent uses.

This local policy is not applicable to the pipeline project.

22) *Development, when located adjacent to the shore, will provide for water related recreation, whenever such use is compatible with reasonably anticipated demand for such activities, and is compatible with the primary purpose of the development.*

The proposed project does not involve shoreline development which could inhibit water-related recreation. With the potential for park enhancements the project is consistent with this policy.

23) *Protect, enhance and restore structures, districts, areas or sites that are of significance in history, architecture, archaeology or culture of the state, its communities, or the nation.*

The pipeline crossing of the Croton River will be by directional drilling which terminates on the north shore of the river within the Van Cortlandt Manor National Historic Landmark. The construction work will not disturb existing historic structures and the disturbed land will be restored to pre-existing conditions. Prior to construction, activities will be coordinated with the management of the historic site to minimize construction effects on visitors to the site. This coordination has already begun.

The conclusion regarding potential effects on cultural resources is based on information provided by the staff of Historic Hudson Valley, the agency managing Van Cortlandt Manor. A full cultural resources survey is underway, following regulatory requirements for such surveys, to confirm the lack of impact. Should the survey identify currently unknown significant cultural resources, the construction plan would be modified to protect the resources, as required.

Prevent impairment of scenic resources of statewide significance. This impairment would include: (a) the irreversible modification of geologic forms, the destruction or removal of structures, whenever the geologic forms, vegetation or structures are significant to the scenic quality of an identified resource; and (b) the addition of structure which, because of siting or scale will reduce identified views or which because of scale, form, or materials, will diminish the scenic quality of an identified resource.

The pipeline will be underground throughout its route through Croton and the corridor follows existing disturbed land such as roads and railroads. After completion of construction there will be no structures remaining which could impair scenic resources of statewide significance.

Protect, restore or enhance natural and man-made resources which are not identified as being of statewide significance but which contribute to the overall scenic quality of the coastal area.

All areas disturbed by construction for pipeline installation will be restored and revegetated as necessary. The vast majority of the pipeline route through the Village of Croton-on-Hudson is on or adjacent to existing disturbed land such as roads and railroads. After construction is completed, there will be no structures which could intrude on viewscapes. The pipeline corridor will not modify the scenic quality of the coastal area, thus the project is consistent with this policy.

25A) *Protect local scenic resources by preventing: (i) The irreversible modification of geological forms, the destruction or removal of vegetation or wetlands, the destruction, or removal of structures, whenever the geological forms, vegetation or structures are significant to the scenic quality of an identified resource; and (ii) The addition of structures which because of siting scale will reduce identified views or which because of scale, form, or materials will diminish the scenic quality of an identified resource.*

The project will not alter any significant geological forms, remove any important vegetation, effect wetlands or remove structures, thus this project is consistent with this policy.

25B) *Secure the designation of the panoramic views from Croton Point as a scenic area of statewide significance.*

This local policy is not applicable to the pipeline project.

Secure the designation of Route 9 and 129 within the Croton boundaries as a scenic road. Ensure developments on or adjacent to Route 9 do not impair scenic resources or views of or from the Hudson and Croton Rivers.

The placement of the pipeline adjacent to Route 9 would not impair scenic views of or from the Hudson and Croton rivers.

Establish and protect identified viewsheds which provide visual access to the Hudson River, including but not limited to the views of the Hudson River from the western shoreline of the village, and from Prickly Pear Hill, Lounsbury Hill, and river Landing. In addition, protect viewsheds to and of the Croton River and gorge.

As discussed above, the presence of the pipeline in the ground will not impair views of the Hudson River from the village shoreline and views to and of the Croton River and Gorge.

26) *The state coastal policy regarding the protection of agricultural lands is not applicable to Croton.*

The state coastal policy is deemed not applicable to Croton by the LWRP.

27) *Decisions on the siting and construction of major energy facilities in the coastal area will be based on public energy needs, compatibility of such facilities with the environment, and the facility's need for a shorefront location.*

The Millennium Pipeline Project is a major energy facility that is entitled to a preference under the CZMA. The CZMA recognizes that major energy facilities are entitled to preferential consideration because of the importance of transmitting energy, particularly natural gas, to markets that are dependent upon energy sources for growth and economic vitality. The Millennium Pipeline Project will satisfy the "public energy needs" of New York State and the Northeast U.S. region in a number of different respects. First, the Project will satisfy growing market demands, as evidenced both by executed contracts for the pipeline's capacity and the forecasts of various experts. Second, the project will supply low-cost Canadian gas supplies to one of the highest-priced gas markets in the United States -- New York. Third, the Project will improve electric power reliability and advance clean air objectives. Fourth, the Project will improve the reliability of gas service to New Yorkers by upgrading the existing natural gas infrastructure through the addition of more capacity, deliverability, delivery points, and interconnections. Fifth, the Project will provide gas producers and gas storage developers in western New York with increased access to markets. These benefits are explained in the sections that follow. These benefits are explained in more detail in response to Policy 27 in Section 3.1.6.

Construction of the pipeline and Croton River crossing takes into consideration public need and environmental issues. The proposed project has been designed to use the best available

construction technology to result in the least environmental impact. The river crossing is necessary because some of the capacity of the proposed project is planned to be delivered to the east side of the Hudson River, south of the Croton River, at the present time. Therefore, the proposed project is in compliance with this policy.

28) *Ice management practices shall not interfere with the production of hydroelectric power, damage significant fish and wildlife and their habitats, or increase shoreline erosion or flooding.*

Construction and operation of the pipeline will not require ice management, thus this policy does not apply

28A) *Ice management practices must consider short and long term impacts on the Croton River and Bay and Haverstraw Bay significant fish and wildlife habitats.*

See above

29) *The state coastal policy regarding the development of energy resources is not applicable to Croton.*

The state coastal policy is deemed not applicable to Croton by the LWRP.

30) *Municipal, industrial, and commercial discharge of pollutants, including but not limited to, toxic and hazardous substances, into coastal waters will conform to state and national water quality standards.*

There will be no discharge of pollutants during and after the pipeline installation in the coastal zone. Millennium has amended its NYSDEC 401 water quality certificate to include the Route 9/9A alternative. All techniques used for the Route 9/9A alternative were previously approved by NYSDEC. The project is consistent with this policy.

30A) *Municipal, industrial, and commercial discharge of pollutants, including but not limited to, toxic and hazardous substances, into coastal waters will conform to state and national water quality standards.*

This local policy is not applicable to the pipeline project.

30B) *Storage and Disposal of all materials shall be monitored by the state to assure there will be no discharge or leaching of materials into coastal waters.*

This local policy is not applicable to the pipeline project.

State coastal area policies and management objectives of approved local waterfront revitalization programs will be considered while reviewing coastal water classifications and while modifying water quality standards; however, those waters already overburdened with contaminants will be recognized as being a development constraint.

This local policy is not applicable to the pipeline project.

31A) *Clean water is desired and NYSDEC should continually monitor water quality in the Hudson River and Croton Bay which have already been overburdened with pollutants. Recommendations for mitigation and upgrading water quality classifications cannot be determined without continual monitoring and testing of the waters.*

Construction of the proposed project crossing would not affect the water classification or water quality standards in the proposed project area. The Section 401 Water Quality Certification has been issued for the Haverstraw Bay crossing and is expected for the Croton River because directional drilling avoids effects on water supply.

32) *Encourage the use of alternative or innovative sanitary waste systems in small communities where the costs of conventional facilities are unreasonably high, given the size of the existing tax base of these communities.*

The project does not involve sanitary waste systems, thus this policy does not apply.

Best management practices will be used to ensure the control of stormwater runoff and combined sewer overflows draining into coastal waters.

This project does not involve stormwater runoff and combined sewer overflows, thus this policy does not apply.

33A) *Encourage new developments to retain stormwater runoff on site so as to not increase flows within the existing system or to improve existing stormwater runoff systems so that runoff from such developments does not impact coastal waters.*

This local policy is not applicable to the pipeline project.

33B) *Improve existing village stormwater discharge to control flow of pollutants from street and parking areas, etc. directly in the rivers.*

This local policy is not applicable to the pipeline project.

34) *Discharge of waste materials into coastal waters from vessels subject to state jurisdiction will be limited so as to protect significant fish and wildlife habitats, recreational areas and water supply areas.*

The project does not involve discharge from vessels, thus this policy does not apply.

> *There shall be no discharge from moored structures or marine vessels, due to shape of cove and lack of tidal flushing.*

This local policy is not applicable to the pipeline project.

35) *Dredging and dredge spoil disposal in coastal waters will be undertaken in a manner that meets existing state dredging permit requirements, and protects significant fish and wildlife habitats, scenic resources, natural protective features, important agricultural lands, and wetlands.*

The project will not conduct dredging in the Croton coastal zone, thus this policy does not apply.

36) *Activities related to the shipment and storage of petroleum and other hazardous materials will be conducted in a manner that will prevent or at least minimize spills into coastal waters; all practicable efforts will be undertaken to expedite the cleanup of such discharges; and restitution for damages will be required when these spills occur.*

The project will not involve shipments of petroleum and other hazardous materials, thus this policy does not apply.

37) *Best management practices will be utilized to minimize the non-point discharge of excess nutrients, organics and eroded soils into coastal waters.*

The project will use BMP for erosion control that will be as stringent as those required in local regulations. The non-point discharge of excess eroded soils will be controlled, thus the project is consistent with this policy.

> *Standards and specifications for the control of non-point source discharge as set forth in Westchester County's best management practice manual or other recognized reference shall be utilized during development of any site.*

The best management practices will be as stringent as those in Westchester County's manual.

> *Control of the development of hilltops, and steep slopes should be exerted in order to prevent erosion and minimize runoff and flooding from new construction.*

This local policy is not applicable to the pipeline project.

The quality and quantity of surface water and groundwater supplies will be conserved and protected particularly where such waters constitute the primary or sole source of water supply.

The project will not use surface water or groundwater supplies during construction or operation of the pipeline, thus this policy does not apply.

The transport, storage, treatment and disposal of solid wastes, particularly hazardous wastes, within the coastal areas will be conducted in such a manner so as to protect groundwater and surface water supplies, significant fish and wildlife habitats, recreation areas, important agricultural land, and scenic resources.

The project will not transport, store, treat or dispose of solid wastes of any kind, thus this policy does not apply.

39A) *Requires transporters, producers and storers of hazardous materials to inform the public or allow public access to records involving the transport, storage, treatment and disposal of hazardous materials. This is of particular concern with respect to rail transport of such materials, storage of identified materials on railroad property and uses in the waterfront area involved in the treatment, storage and disposal of such materials.*

This local policy is not applicable to the pipeline project.

39B) *In accordance with title III, section 302, emergency planning and community right-to know of the 1986 superfund reauthorization act, the local emergency planning committee and the Croton fire department shall be notified if hazardous substances exceed the established threshold planning quantity.*

The proposed project does not involve the transport, storage, treatment or disposal of solid wastes. Therefore, this policy does not apply.

40) *Effluent discharged from major steam electric generating and industrial facilities into coastal waters will not be unduly injurious to fish and wildlife and shall conform to state water quality standards.*

This project does not involve discharges from generating stations, thus this policy does not apply.

41) *Land use or development in the coastal area will not cause national or state air quality standards to be violated.*

The proposed project would not result in the violation of any Federal, state or local air quality standards. The potential reduction in marine traffic and congestion related to the delivery of petroleum products to the Bowline Point Generating Station and other industrial facilities would benefit overall air quality in the project area. The proposed project would therefore be consistent with this policy.

41A) *A NYSDEC point-source air monitoring station should be established within the Village of Croton-On-Hudson.*

This local policy is not applicable to the pipeline project.

Coastal management policies will be considered if the state reclassifies land areas pursuant to the prevention of significant deterioration regulations of the Federal clean air act.

The project would not effect state classifications of land areas, thus this policy does not apply.

Land use or development in the coastal area must not cause the generation of significant amounts of acid rain precursors nitrates and sulfates.

The proposed project would not cause the generation of significant amounts of acid rain precursors: nitrates and sulfates. In fact, the proposed project will deliver a clean burning fuel that should result in the overall reduction of acid rain precursors in this region. The project is consistent with this policy.

43A) *Encourage the use of shuttle bus service to the train station, thereby decreasing dependency on the automobile use and reduce the generation of acid rain precursors.*

This local policy is not applicable to the pipeline project.

43B) *Encourage the use of low sulphur fossil fuels for rail vehicles and encourage the development of a monitoring program to assess rail vehicle engines emissions.*

This local policy is not applicable to the pipeline project.

Preserve and protect tidal and freshwater wetlands and preserve the benefits derived from these areas.

The project will not directly effect any tidal and freshwater wetlands in the coastal zone. The project is within the buffer zone along the Hudson and Croton Rivers, but the construction activities will be controlled to minimize erosion and the upland disturbed areas will be restored

when construction is completed. The pipeline route in the buffer zones does not involve natural habitats of significant value. The pipeline corridor is through an existing park, along roads and railroads and on an abandoned roadway near the Croton River. The project is consistent with this policy.

44A) *Wetlands, water bodies and watercourses shall be protected by preventing damage from erosion or siltation, minimizing disturbance, preserving natural habitats and protecting against flood and pollution.*

See above statement.

3.3 LAKE ERIE CROSSING

Description of Proposed Action

The proposed Lake Erie crossing extends from a landfall about 14 miles west of the community of Port Stanley, Ontario, Canada, across Lake Erie, to a point in the Town of Ripley, New York (Figure 4). The crossing is about 93 miles long, with about 60 miles in Canadian waters and 33 miles in U.S. waters. This evaluation extends from the New York State landfall at Ripley, New York, to the international boarder with Canada. Millennium proposes to lay this 1.07m diameter, concrete-coated pipeline in a trench excavated in the lakebed to protect it from scouring ice keels, fishing gear and anchors.

Alternative Routes Evaluated

Several major route alternatives were examined in selecting a route for the Millennium Project across and around Lake Erie. The delineation of a number of alternative routes was based on the following primary constraints:

- Compliance with technical connections such as take-off and delivery points;
- Adherence to existing rights-of-way, if available, and where practical;
- Avoidance of recognized major physical, natural and cultural environmental constraints; and
- Minimization of system costs in terms of construction, operation and maintenance.

On the basis of these primary constraints, three principal alternative routes were identified:

- Alternative 1, involving a crossing of Lake Erie;
- Alternative 2, involving crossings of the St. Clair River or Detroit River and following existing rights-of-way along the south side of Lake Erie; and

Alternative 3, following existing rights-of-way along the north side and around the eastern end of Lake Erie, involving a crossing of the Niagara River.

For the evaluation of the alternative routes, a number of criteria were used including:

minimization of total route length;

- minimization of the number of major crossings such as highways, railways, watercourses;
- minimization of routing through urban areas, areas of high heritage resources potential, and other sensitive land uses (e.g., specialty crops, wetlands, etc.); and
- minimization of potentially affected landowners.

Based on these criteria, Alternative 1 involving the Lake Erie crossing was selected as the preferred route based on the fact that overall it is the shortest route and, furthermore, on the rationale that potential impacts associated with land-based construction are greater than those associated with in-water construction.

Originally, six sub-alternative routes were identified for the Lake Erie crossing. 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 community of Girard and the Town of 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 (due to its proximity to existing Columbia Transmission right-of-way).

As a result, two sub-alternatives of Alternative 1, i.e., Alternative 1A and 1B extending from landfalls near Morpeth and Port Stanley, respectively, to a landfall near North East were evaluated based on the following considerations: route length, cost, scheduling, landfall location, offshore natural gas development, sediment quality, ice scour potential, anchor dragging, and turbidity generation and siltation. Alternative 1A was slightly more preferable from the standpoint of Canadian overland route length, landfall location and offshore gas development, whereas Alternative 1B was preferable from the standpoint of scheduling, sediment quality, anchor dragging and turbidity generation. Based on this assessment, Alternative 1B was selected as the preferred route.

Subsequently, a new U.S. landfall was delineated about 3.1 miles west of the originally preferred landfall location. The primary reason for the U.S. landfall relocation was to realign the initial portion of the original land-based route to avoid the crossings of 12 vineyards.

At the U.S. landfall, directional drilling is the preferred mode of pipeline crossing construction to minimize or eliminate potential impacts on the nearshore environment and any future nearshore impacts on the operating pipeline. Directional drilling is less disturbing to the environment

compared to other conventional open-cut operations. Moreover, this technique will place the pipe 30 to 49 feet below the shoreline providing additional protection to the installed pipeline from the high energy, evolving shoreline. The directional drill trajectory and depth below the lake bed will be determined by local geology as well as engineering and regulatory constraints to maximize the drilled length, long-term pipeline integrity, installation safety and environmental protection. The drill exit water depth will be at least 25 feet. The duration of directional drill construction is expected to be four months.

The area immediately offshore of the anticipated pilot bore exit on the lake bed will be pre-trenched to provide a transition zone engineered to accommodate the pipe bend into the normal submarine pipeline trench. It is estimated that about 0.6 miles of the pipeline route offshore of the directional drill exit hole will have insufficient cover to permit pipeline burial in sediment. Therefore, the shale bedrock along this length must be ripped, cut or blasted before the pipeline is installed.

Further offshore, the pipeline will be laid by barge and trenched by jetting. Some trenching with a cutterhead dredge may be required at selected locations. Using water under high pressure, the mechanical jetting sled will trench the offshore pipeline to recommended trench depths ranging from 6.6 to 9.2 feet for the six zones delineated along the pipeline route in the U.S. waters of Lake Erie. A risk-based model was used to determine trench depths along these zones taking into account average water depth, average soil strength, ice scour regime and design criteria (pipeline strain and stress). The 36-inch pipeline will have two outer coatings: a fusion bonded epoxy coating to protect the steel pipe from corrosion, and a 3-inch concrete coating to add sufficient weight for stability. As an additional measure, a cathodic protection system consisting of zinc anodes will be provided to prevent corrosion of the steel pipe. The average production rate is 4,000 ft/day. Lake Erie pipeline construction will be a 24-hour, 7-day operation and will extend over a six-month period.

Natural processes will quickly backfill the trench. This is normally accomplished by natural erosion (slumping) of the trench walls due to current forces, and subsequent siltation by suspended sediments, particularly during storm events.

In response to a request from the Federal Energy Regulatory Commission, researchers at ERDC assessed Millennium's work on three topics related to the Lake Erie crossing:

The potential for pipeline damage by ice scour;

- The adequacy of the sampling program to identify contaminated sediments; and
- The adequacy of the modeling for turbidity and sediment deposition resulting from trench excavation.

This assessment focused on the pipeline zones in U.S. waters and was conducted in collaboration with Millennium, its partners, and the Pittsburgh District, Corps of Engineers.

High winds on Lake Erie can fracture and pile ice into large ridges. Ice scour occurs when the keels of these ridges drag along the lakebed. To avoid damage, a pipeline must be designed to

withstand the forces from an ice scour expected to cross the pipeline, on average, once in 100 years. The design trench depth must place the pipe crown sufficiently below the scour depth to keep pipe deformations within acceptable limits.

Determination of the 100-year ice scour depth was the only issue that required additional analyses to satisfy the concerns of the ERDC reviewers. The original analyses relied solely on data from a single survey along the pipeline route. The ERDC review resulted in two main changes: only new scours were used to determine the scour-depth probability distribution, and scour data from comprehensive surveys nearby the pipeline route were included. These changes increased the estimated 100-year scour depth by 25%, from 1.2 to 1.5 m, in pipeline zones nearest the U.S. shore (zones H, I, and J). In these zones the design trench depth increased by about 20%, from 2.8 to 3.4 m (see following table). Ice scour does not control trench depths in deep-water zones F and G, and the originally designed trench depth of 2.0 m is adequate even if it did. Additional benchmark analyses conducted during the ERDC review increase confidence in the estimated scour rates, the scour-depth distribution, and the resulting 100-year scour depths.

Table. Revised 100-year scour depths and design trench depths for Millennium pipeline zones in U.S. waters. Originally scour and trench depths are from C-CORE (1999a), although zone definitions differ slightly.

Pipeline zone	*Distance from Canadian landfall [km]*	*Start-end water depth range [m]*	*Original 100-year scour depth [m]*	*Revised 100-year scour depth [m]*	*Original design trench depth [m]*	*Revised design trench depth [m]*
F	98.0-105.0	21.0-26.7	0.8*	0.8*	2.0	2.0
G		26.7-27.4	0.8*	0.8*	2.0	2.0
H		27.4-18.4	1.2	1.5	2.8	3.4
I		18.4-16.4	1.2	1.5	2.8	3.4
J	142.2-147.3		1.2	1.5	2.8	3.4
	147.3-149.3 (DDA)					

ALF: American Landfill
DDA End of directionally drilled Pipe from American Landfall
** Assigned values based on need to protect pipeline from anchors and fishing gear. Ice scour does not control trench depths for zones F and G.*

The ERDC assessment included the pipe-soil interaction model used to determine the design trench depths given the 100-year scour depth for each zone. This finite-element model relies on results from centrifuge tests and field observations, and it represents the state of the art. A question–answer exchange resolved concerns regarding use of two-dimensional modeling, the

choice of soil-stiffness characteristics, and the response of the pipe in a partially backfilled trench. Conservative choices regarding normal incidence angle and keel-pipe load transfer through native soil increase confidence in the model results.

ERDC's assessments of Millennium's sediment-sampling program sought to resolve issues concerning the depth and intensity of sampling and the use of mercury as an indicator contaminant. A question-answer exchange, which included additional data and references, resolved these concerns. No additional sampling or analyses are needed due to increased trench depths because the extra material excavated would be uncontaminated.

ERDC's assessments of Millennium's modeling of turbidity and sediment deposition focused on the modeling methods and the choice of sediment settling velocity. Many specific issues were resolved through a question-answer exchange. Modeling by ERDC showed that the originally predicted turbidity plume is conservative. However, Millennium will need to update its results to show as much as a factor-of-three short-term increase in the expected thickness of the sediment blanket adjacent to the pipeline trench. A 20% increase in design trench depths would result in a further 10% increase in blanket thickness and a 10% increase in blanket width. The effect on the turbidity plume would depend on the trench excavation rate. Millennium agreed with the results of this review.

The design of the pipeline includes a margin of safety between the maximum tensile strain caused by the 100-year scour (2.5%) and strain needed to rupture the pipe (about 3.8%). Millennium will monitor the pipeline continuously for changes in conditions that could signal damage and would close valves at each side of the lake if a leak occurs. In addition, Millennium will conduct internal and external inspections of the pipeline at approximately three-year intervals (depending on ice conditions) to detect possible damage and to assess the design for ice scour protection. It will also establish procedures (as required by regulation) for emergency response and repair of the pipeline.

In conclusion, the ERDC assessment of Millennium Pipeline Project's Lake Erie crossing revealed the need for two revisions: a 20% increase in design trench depths in zones H, I, and J, and as much as a three-fold short-term increase in expected sediment-blanket thickness adjacent to the excavated trench. Otherwise, the analyses conducted and reports prepared by Millennium pertaining to the three topics assessed are technically sound and satisfy the request for additional information under the Corps of Engineers regulatory review process. Millennium has modified its design to comply with these recommendations.

3.3.3 Review of Coastal Zone Consistency Policy

> *Restore, revitalize and redevelop deteriorated and underutilized waterfront areas for commercial, industrial, cultural, recreational and other compatible uses.*

Construction of the proposed Lake Erie crossing would not involve development in deteriorated and underutilized waterfront areas, and thus this policy does not apply.

2) *Facilitate the siting of water-dependent uses and facilities on or adjacent to coastal waters.*

Construction of the proposed project crossing would not involve the siting of water-dependent uses and facilities on or adjacent to coastal waters, and thus this policy does not apply.

3) *Promote the development and use of the state's major ports as centers of commerce and industry, emphasizing the siting, in these port areas, including those under the jurisdiction of state public authorities, of land use and development which is essential to, or in support of, the waterborne transportation of cargo and people.*

Construction of the proposed project crossing would not involve development and use of any New York State major port facility. Therefore this policy does not apply.

4) *Strengthen the economic base of smaller harbor areas by encouraging the development and enhancement of those traditional uses and activities, which have provided such areas with their unique maritime identity.*

Construction of the proposed project crossing would not involve development in a small harbor area, and thus this policy does not apply. It should be noted that the proposed project would not inhibit development at small harbor areas in the project area.

5) *Encourage the location of development in areas where public services and facilities essential to such development are adequate.*

Construction of the proposed project crossing would not result directly in any new development in the area requiring additional public services or facilities. The proposed project would service existing industrial facilities or customers in developed urban areas where public services and facilities are adequate for such development. The proposed project would therefore be consistent with this policy.

6) *Expedite permit procedures in order to facilitate the siting of development activities at suitable locations.*

Construction of the proposed project crossing would not involve the siting of development activities; the policy, therefore, does not apply.

7) *Significant coastal fish and wildlife habitats will be protected, preserved, and where practical, restored so as to maintain their viability as habitats.*

The proposed project area has not been identified as a significant coastal fish and wildlife habitat; however, the proposed project has been designed to maintain the viability of existing habitat.

Steep bluffs and narrow cobble/gravel beaches are the predominant habitat type located along the Lake Erie shoreline at the proposed pipeline landfall. The unprotected shoreline is a high wave

energy environment that precludes the establishment of both emergent and submerged aquatic vegetation. Rocky substrate occurs in the nearshore area providing potential spawning and nursery habitat for species including lake whitefish, channel catfish, white bass, smallmouth bass, yellow perch, walleye, freshwater drum, as well as forage fish species. The nearshore also provides foraging habitat for migratory diving waterfowl, including greater scaup, common goldeneye, common merganser, bufflehead, and canvasback.

Impacts on the shoreline and the nearshore zone will be avoided by constructing the proposed Lake Erie landfall using directional drilling. Construction would involve drilling a pilot hole from onshore to exposed bedrock about 2620 feet offshore at a water depth of about 25 feet, thus avoiding coastal fish and wildlife habitats. The proposed project would therefore be consistent with this policy.

Some blasting may be required for a short distance, i.e., about 0.6 miles, at water depths of 25 to 50 feet. Blast rubble could be used for local creation/enhancement of lake trout spawning habitat. Any such habitat enhancement will be developed in consultation with the USACE and NYSDEC, and will be consistent with the CMP.

8) *Protect fish and wildlife resources in the coastal area from the introduction of hazardous wastes and other pollutants which bio-accumulate in the food chain or which cause significant sub-lethal or lethal effect on those resources.*

BMPs addressing landfall, directional drilling and offshore construction activities will be prepared and followed during construction. The BMPs will include practices to reduce the possibility for accidental release of small amounts of wastes and materials to the lake waters from the construction vessels due to poor maintenance and housekeeping practices. Proper lubrication and fuelling procedures will be followed with provisions made for leak and spill containment, and diligence will be exercised to oversee waste management practices. Consideration will be given to the Marine Contingency Plans for Spills of Oil and Other Noxious Substances developed for Lake Erie.

Sediments along the proposed pipeline route are generally uncontaminated. All of the organic contaminants were below their detection limits (with the exception of detectable levels of acetone in some samples likely due to residues from glass sample container pre-cleaning). Somewhat elevated (above sediment quality guidelines) concentrations of nutrients (phosphorus, nitrogen) and metals (arsenic, manganese) occurred in some sediment samples analyzed. It is anticipated that, during trenching, any nutrients and metals solubilized into the water column will be rapidly removed by prevalent oxidation, precipitation and coprecipitation processes. Moreover, the mixing of any localized contaminated sediments with the deeper and adjacent uncontaminated sediments will result in rapid and substantial resorption of any contaminants released to the water column by the uncontaminated suspended sediments.

Based on the relatively good sediment quality, particularly the low (non-detect) concentrations of mercury, PCBs, chlorinated pesticides and other organic contaminants, contaminant release from sediments during trenching will have negligible (non-measurable) effect on water quality or bioaccumulation potential. As a result, the proposed project will be consistent with this policy.

9) *Expand recreational use of fish and wildlife resources in coastal areas by increasing access to existing resources, supplementing existing stocks, and developing new resources. Recreational uses include: (1) consumptive uses such as fishing and hunting; and (2) non-consumptive uses such as wildlife photography, bird watching and nature study.*

Construction of the proposed project crossing would not preclude recreational use of fish and wildlife resources. The project would therefore be consistent with this policy.

10) *Further develop commercial finfish, shellfish and crustacean resources in the coastal area by encouraging the construction of new, or improvement of existing on-shore commercial fishing facilities, increasing marketing of the state's seafood products, maintaining adequate stocks, and expanding aquaculture facilities.*

Construction of the proposed project crossing would not affect commercial fishing resources. Therefore, the proposed project would not conflict with this policy.

11) *Buildings and other structures will be sited in the coastal area so as to minimize damage to property and the endangering of human lives caused by flooding and erosion.*

The proposed project crossing does not include the siting of buildings or other structures within an identified floodway or coastal erosion hazard area. All pipeline related structures within the coastal zone area will be below ground. Therefore, this policy does not apply.

Activities or development in the coastal area will be undertaken so as to minimize damage to natural resources and property from flooding and erosion by protecting natural protective features including beaches, dunes, barrier islands and bluffs.

Construction of the proposed project crossing at the Lake Erie landfall would be conducted using directional drilling techniques, thus the shoreline bluff will not be impacted. Therefore the proposed project would be in compliance with this policy.

The construction or reconstruction of erosion protection structures shall be undertaken only if they have a reasonable probability of controlling erosion for at least thirty years as demonstrated in design and construction standards and/or assured maintenance or replacement programs.

The proposed project crossing does not include the construction or reconstruction of erosion protection structures. Therefore, this policy does not apply.

14) *Activities and development, including the construction or reconstruction of erosion protection structures, shall be undertaken so that there will be no measurable increase in erosion or flooding at the site of such activities or development, or at other locations.*

The proposed project does not include the construction or reconstruction of erosion protection structures. Therefore, this policy does not apply.

15) *Mining, excavation or dredging in coastal waters shall not significantly interfere with the natural coastal processes which supply beach materials to land adjacent to such waters and shall be undertaken in a manner which will not cause an increase in erosion of such land.*

As indicated in Section 3.2.1 "Description of Proposed Action", construction impacts on the shoreline and nearshore zone will be avoided by constructing the proposed Lake Erie landfall using directional drilling. Further offshore blasting, cutting or ripping of the shale bedrock will be required for a short distance, i.e., about 0.6 miles. Trench excavation by mechanical jetting will occur at water depths in excess of 50 feet and will not affect natural coastal processes or increase the potential of erosion of adjacent land. Therefore, the proposed project will be in compliance with this policy.

Public funds shall only be used for erosion protective structures where necessary to protect human life, and new development which requires a location within or adjacent to an erosion hazard area to be able to function, or existing development; and only where the public benefits outweigh the long-term monetary and other costs including the potential for increasing erosion and adverse effects on natural protective features.

The proposed project crossing does not include the construction of erosion protection structures and no public funds will be used. Therefore, this policy does not apply.

17) *Nonstructural measures to minimize damage to natural resources and property from flooding and erosion shall be used whenever possible.*

Construction of the proposed project will not include structural flood control elements. Therefore, this policy does not apply.

18) *To safeguard the vital economic, social and environmental interests of the state and of its citizens, proposed major actions in the coastal area must give full consideration to those interests, and to the safeguards which the state has established to protect valuable coastal resource areas.*

Construction of the proposed project would provide a source of clean-burning natural gas to New York State, providing vital energy and infrastructure to the State. Safeguarding of social and environmental interests of the state and its citizens is being given full consideration through the federal NEPA process. The proposed project would be consistent with this policy.

Protect, maintain, and increase the level and types of access to public water related recreation resources and facilities.

Construction of the proposed project would not materially affect public water-related recreation resources and facilities. The project would therefore be consistent with this policy.

> *Access to the publicly-owned foreshore and to lands immediately adjacent to the foreshore or the water's edge that are publicly-owned shall be provided and it shall be provided in a manner compatible with adjoining uses.*

No publicly owned foreshore will be disturbed by project construction activities. Construction of the proposed project would not preclude access to publicly-owned lands. Therefore, the proposed project is consistent with this policy.

2 *Water-dependent and water-enhanced recreation will be encouraged and facilitated, and will be given priority over nonwater related use along the coast.*

Construction of the proposed project would not materially affect water-related recreation resources and facilities. Therefore, the proposed project would be consistent with this policy.

22) *Development, when located adjacent to the shore, will provide for water related recreation, whenever such use is compatible with reasonably anticipated demand for such activities, and is compatible with the primary purpose of the development.*

The proposed project crossing will not entail shoreline development; therefore, this policy does not apply.

> *Protect, enhance and restore structures, districts, areas or sites that are of significance in history, architecture, archaeology or culture of the state, its communities, or the nation.*

From 30 August to 12 September 1997, Racal Pelagos, Inc., conducted a marine geophysical survey of the initially proposed pipeline route between a point near Port Stanley, Ontario, and the original Millennium Project landfall near North East, Pennsylvania. The marine CRM survey involved the collection of side scan sonar, sub-bottom profiling and magnetometer data, as well as sediment samples. This geophysical survey was also used to undertake an underwater archaeological investigation of the proposed project corridor.
From 27 to 31 August 1998, Canadian Seabed Research Ltd. (CSR) conducted a supplemental marine geophysical survey for the altered pipeline route between a landfall to the west of Port Stanley, Ontario, and the new southern landfall near Ripley, New York. These route alterations involved the relocation of the drill exit on the Canadian side, the reroute around a sub-sea mound near the middle of the lake (in Canadian waters) and the relocation of the shore approach on the U.S. side near Ripley, New York. In addition, the 1998 survey also ran an offset track line along the entire primary centerline of the proposed pipeline route. The survey involved the collection of side scan sonar data, sub-bottom profiles, magnetometer traces and lake-bottom bathymetry.

Based on the analysis of the sonar and magnetometer data, there are no underwater archaeological or cultural resources located within the proposed Lake Erie crossing route and the U.S. nearshore (Ripley, New York) landfall area that would be impacted by the proposed project. No

historic or listed structures are located within the project area. Therefore, the proposed project is in compliance with this policy.

24) *Prevent impairment of scenic resources of statewide significance. This impairment would include: (a) the irreversible modification of geologic forms, the destruction or removal of structures, whenever the geologic forms, vegetation or structures are significant to the scenic quality of an identified resource; and (b) the addition of structure which, because of siting or scale will reduce identified views or which because of scale, form, or materials, will diminish the scenic quality of an identified source.*

Construction of the proposed project crossing would not impair scenic resources of statewide significance. The proposed project would therefore be consistent with this policy.

25) *Protect, restore or enhance natural and man-made resources which are not identified as being of statewide significance but which contribute to the overall scenic quality of the coastal area.*

The proposed project would not adversely impact the overall scenic quality of the coastal area. Therefore, this policy does not apply.

26) *Conserve and protect agricultural lands in the state's coastal area.*

The primary crop at the landfall location is corn. A vineyard is present to the west of the landfall of which about 200 feet will be undercrossed by the directional drill route. No tile drainage is present on these lands. The agricultural lands at the landfall will be conserved and protected by the implementation of such mitigative measures as accurate topsoil salvage and replacement; separation of topsoil and subsoil storage piles; chisel cultivation and/or subsoiling, where necessary; formulation and implementation of specific erosion control techniques; seeding and fertilizing after construction; post-construction monitoring of crop yields and soil conditions, as necessary.

27) *Decisions on the siting and construction of major energy facilities in the coastal area will be based on public energy needs, compatibility of such facilities with the environment, and the facility's need for a shorefront location.*

The Millennium Pipeline Project is a major energy facility that is entitled to a preference under the CZMA. The CZMA recognizes that major energy facilities are entitled to preferential consideration because of the importance of transmitting energy, particularly natural gas, to markets that are dependent upon energy sources for growth and economic vitality. The Millennium Pipeline Project will satisfy the "public energy needs" of New York State and the Northeast U.S. region in a number of different respects. First, the Project will satisfy growing market demands, as evidenced both by executed contracts for the pipeline's capacity and the forecasts of various experts. Second, the project will supply low-cost Canadian gas supplies to one of the highest-priced gas markets in the United States -- New York. Third, the Project will improve electric power reliability and advance clean air objectives. Fourth, the Project will improve the reliability of gas service to New Yorkers by upgrading the existing natural gas

infrastructure through the addition of more capacity, deliverability, delivery points, and interconnections. Fifth, the Project will provide gas producers and gas storage developers in western New York with increased access to markets. These benefits are explained in more detail in response to Policy 27 in Section 3.1.6.

Construction of the Lake Erie pipeline crossing takes into consideration public need and environmental issues. Therefore, the proposed project is in compliance with this policy.

> *Ice management practices shall not interfere with the production of hydroelectric power, damage significant fish and wildlife and their habitats, or increase shoreline erosion or flooding.*

Ice management practices in the nearshore zone would be avoided by constructing the proposed Lake Erie landfall using directional drilling. Construction would involve drilling a pilot hole from onshore to exposed bedrock about 2620 feet offshore at a water depth of about 25 feet, avoiding construction or need for ice management in the shore zone area. The proposed project would therefore be consistent with this policy.

29) *Encourage the development of energy resources on the outer continental shelf, in Lake Erie and in other water bodies, and ensure the environmental safety of such activities.*

Construction of the proposed Lake Erie crossing does not involve development of energy resources on the outer continental shelf, in Lake Erie and in other water bodies. Therefore, this policy does not apply.

30) *Municipal, industrial, and commercial discharge of pollutants, including but not limited to, toxic and hazardous substances, into coastal waters will conform to state and national water quality standards.*

All reasonable measures will be taken to prevent or minimize the discharge of contaminated dredged material, if any, during pipeline construction activities. Moreover, based on the low concentrations of chemical parameters in the sediment, the large dilution capacity of the project waters, and the transitionary nature of the jetting activities, little degradation of water quality due to chemical release from resuspended sediment is expected. Any chemical releases are expected to be small, their effects will be localized and temporary, and rapid dispersion by mixing and sorption processes to ambient levels is expected. Therefore, no mitigative measures are recommended at this time. The project will comply with the applicable permitting requirements. The proposed Lake Erie Crossing will therefore be consistent with this policy.

> *State coastal area policies and management objectives of approved local waterfront revitalization programs will be considered while reviewing coastal water classifications and while modifying water quality standards; however, those waters already over-burdened with contaminants will be recognized as being a development constraint.*

Construction of the proposed project crossing would not affect the water classification or water quality standards in the proposed project area. Therefore, this policy does not apply.

32) *Encourage the use of alternative or innovative sanitary waste systems in small communities where the costs of conventional facilities are unreasonably high, given the size of the existing tax base of these communities.*

Construction of the proposed project would not involve sanitary waste systems; therefore, this policy does not apply.

Best management practices will be used to ensure the control of stormwater runoff and combined sewer overflows draining into coastal waters.

The proposed project would not involve stormwater runoff or construction of combined sewer overflows. Therefore, this policy does not apply.

Discharge of waste materials into coastal waters from vessels subject to state jurisdiction will be limited so as to protect significant fish and wildlife habitats, recreational areas and water supply areas.

Construction of the proposed project would not affect discharge from vessels into waters of Lake Erie. Therefore, this policy does not apply.

35) *Dredging and dredge spoil disposal in coastal waters will be undertaken in a manner that meets existing state dredging permit requirements, and protects significant fish and wildlife habitats, scenic resources, natural protective features, important agricultural lands, and wetlands.*

As indicated in Section 3.2.1 "Description of Proposed Action", construction impacts on the shoreline and nearshore zone will be avoided by constructing the proposed Lake Erie landfall using directional drilling. Further offshore blasting, cutting or ripping of the shale bedrock will be required for a short distance, i.e., about 0.6 miles. Trench excavation by mechanical jetting will occur at water depths in excess of 50 feet and will not affect natural coastal processes or increase the potential of erosion of adjacent land. Therefore, the proposed project will be in compliance with this policy.

36) *Activities related to the shipment and storage of petroleum and other hazardous materials will be conducted in a manner that will prevent or at least minimize spills into coastal waters; all practicable efforts will be undertaken to expedite the cleanup of such discharges; and restitution for damages will be required when these spills occur.*

The proposed project does not involve the shipment and storage of petroleum or other hazardous materials. Therefore, this policy does not apply.

Best management practices will be utilized to minimize the non-point discharge of excess nutrients, organics and eroded soils into coastal waters.

A site-specific erosion and sediment control plan will be formulated and implemented at the directional drill rig site, e.g. use of straw bales as filters and mulching for interium stabilization;

restoration of a suitable land contour and drainage patterns by grading to minimize accelerated erosion; replacement of adequate topsoil; and revegetation by seeding and planting as soon as seasonal conditions permit. The proposed Lake Erie Crossing project will therefore be consistent with this policy.

38) *The quality and quantity of surface water and groundwater supplies will be conserved and protected particularly where such waters constitute the primary or sole source of water supply.*

The proposed project would not affect the surface water or groundwater supply in the area. Based on previous directional drilling construction experience, there will be no impact on groundwater quality, nor is the groundwater regime likely to be disturbed by pipeline construction. There are no known wells in close proximity to the landfall. The proposed project will therefore be consistent with this policy.

The transport, storage, treatment and disposal of solid wastes, particularly hazardous wastes, within the coastal areas will be conducted in such a manner so as to protect groundwater and surface water supplies, significant fish and wildlife habitats, recreation areas, important agricultural land, and scenic resources.

The proposed project does not involve the transport, storage, treatment or disposal of solid wastes. Therefore, this policy does not apply.

Effluent discharged from major steam electric generating and industrial facilities into coastal waters will not be unduly injurious to fish and wildlife and shall conform to state water quality standards.

The proposed project would not result in the discharge of any effluent from generating and industrial facilities into the waters of Lake Erie. Therefore, this policy does not apply.

Land use or development in the coastal area will not cause national or state air quality standards to be violated.

The proposed project would not result in the violation of any Federal, state or local air quality standards. The proposed project would therefore be consistent with this policy.

42) *Coastal management policies will be considered if the state reclassifies land areas pursuant to the prevention of significant deterioration regulations of the Federal clean air act.*

The proposed project would not affect state classifications of land areas. Therefore, this policy does not apply.

43) *Land use or development in the coastal area must not cause the generation of significant amounts of acid rain precursors nitrates and sulfates.*

The proposed project would not cause the generation of significant amounts of acid rain precursors, namely, nitrates and sulfates. The proposed project will deliver a clean burning fuel that should result in the overall reduction of acid rain precursors. Therefore, this policy does not apply.

44) *Preserve and protect tidal and freshwater wetlands and preserve the benefits derived from these areas.*

The proposed Lake Erie crossing will not affect tidal or freshwater wetlands. Construction of the pipeline crossing will use directional drilling techniques that will involve drilling a pilot hole from onshore to exposed bedrock about 2,620 feet offshore at a water depth of about 25 feet, avoiding construction in wetland or shore zone areas. The proposed project would therefore be consistent with this policy.

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CERTIFICATION

The proposed activity complies with New York State's approved Coastal Management Program, or with the applicable approved local waterfront revitalization program, and will be conducted in a manner consistent with such program.*

Applicant/Agent's Name: Millennium Pipeline Company L.P./Richard E. Hall, Jr.

Address PO Box 2002 Binghamton, NY 13902

Telephone: Area Code (607) 773-9116

Applicant/Agent's Signature: Date: 6/27/00

MPL Permitting Manager

*This certification and this submission are intended to supplement the certification provided to the New York Department of State ("DOS") on or about November 16, 1998, and the submissions made to the DOS between November of 1998 through December of 1999, and are being made with a full reservation of rights concerning the timeliness of action by the DOS and the sufficiency of the information submitted to the DOS.

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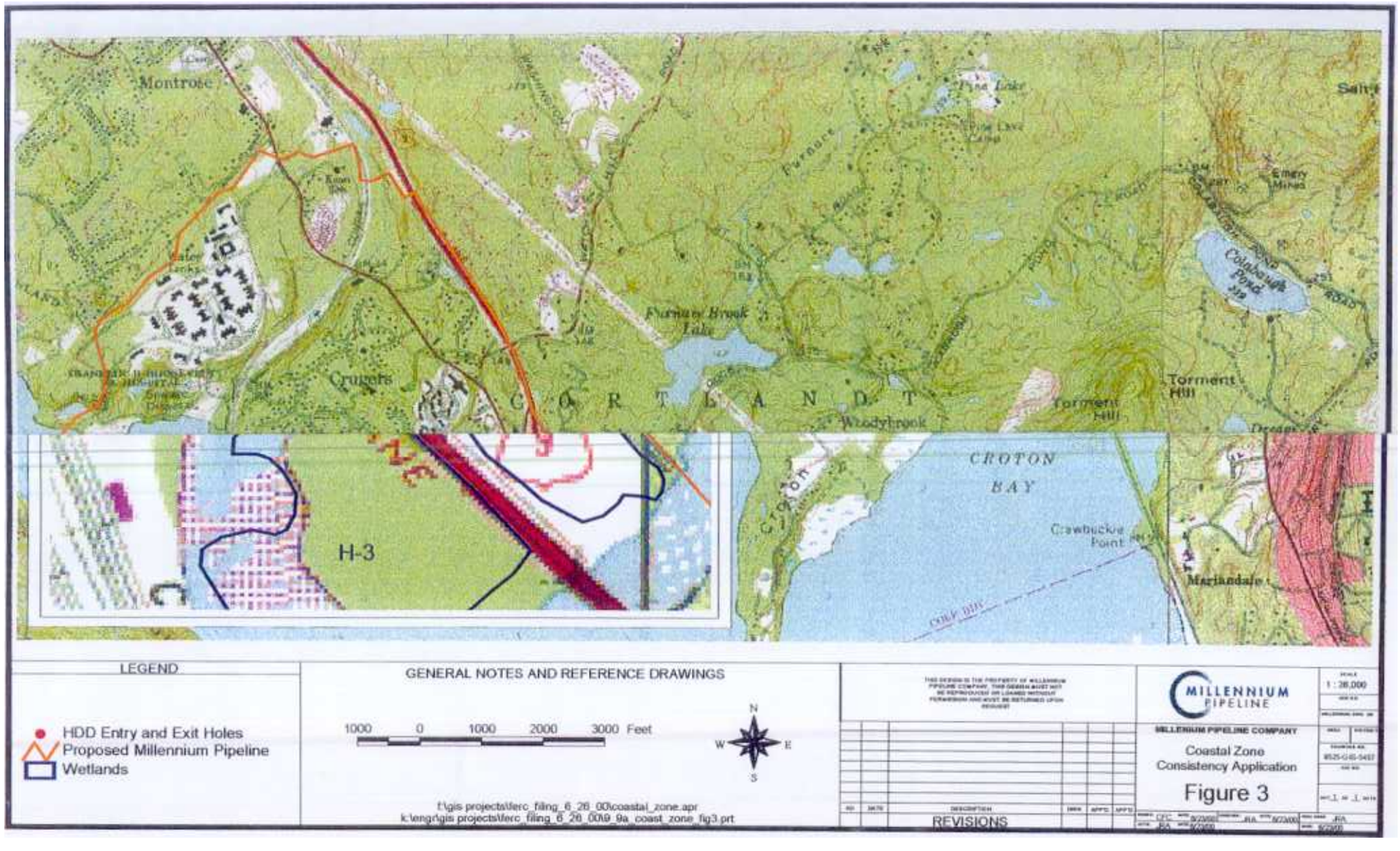
Montrose
Furnace
Pine Lake
Emery Mines
Colchester Pond
Furnace Brook Lake
Cruger's
CORTLANDT
Torment Hill
Woodybrook
CROTON BAY
Croton
Crawbuckie Point
Mariandale
H-3
LEGEND
HDD Entry and Exit Holes
Proposed Millennium Pipeline
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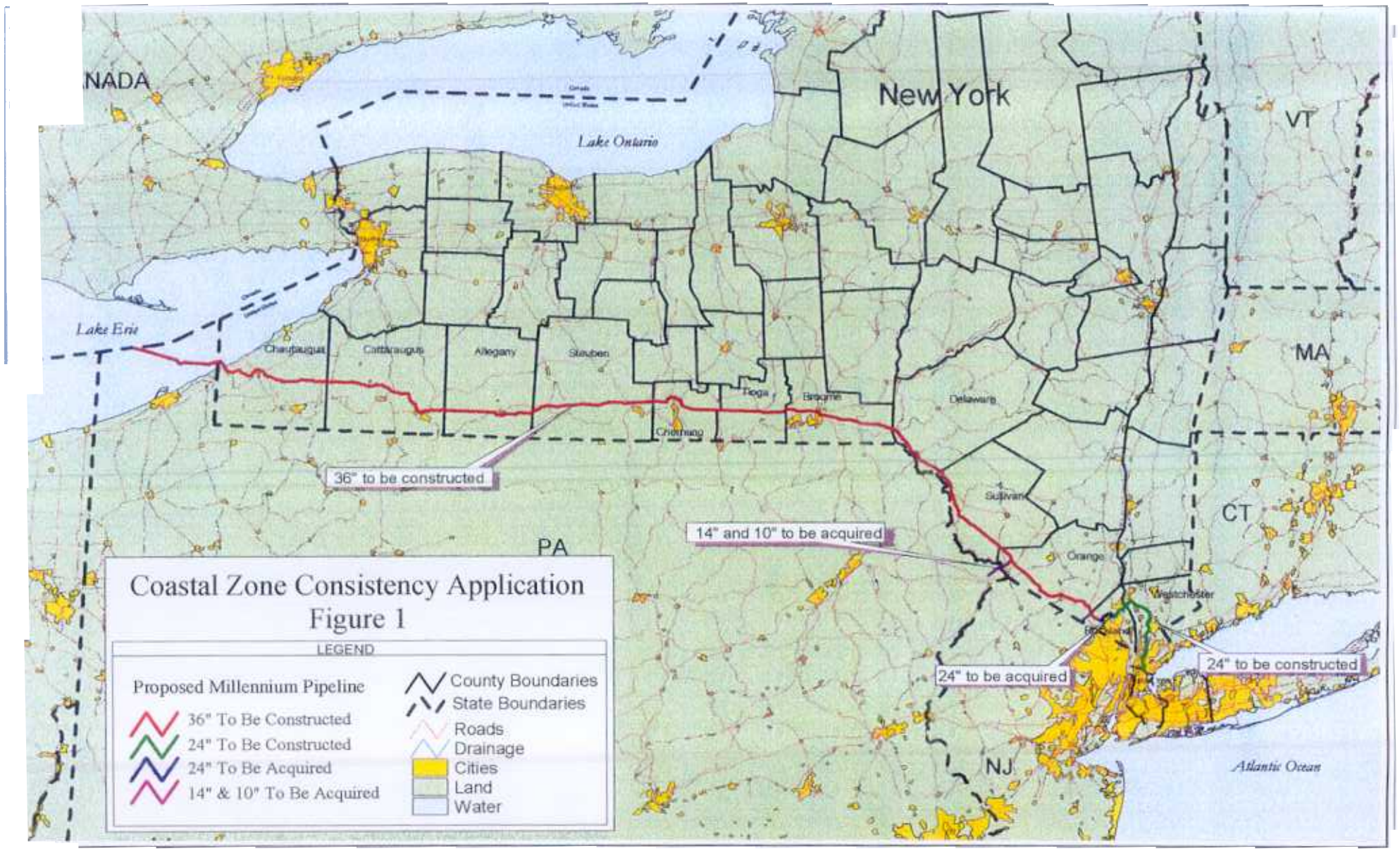
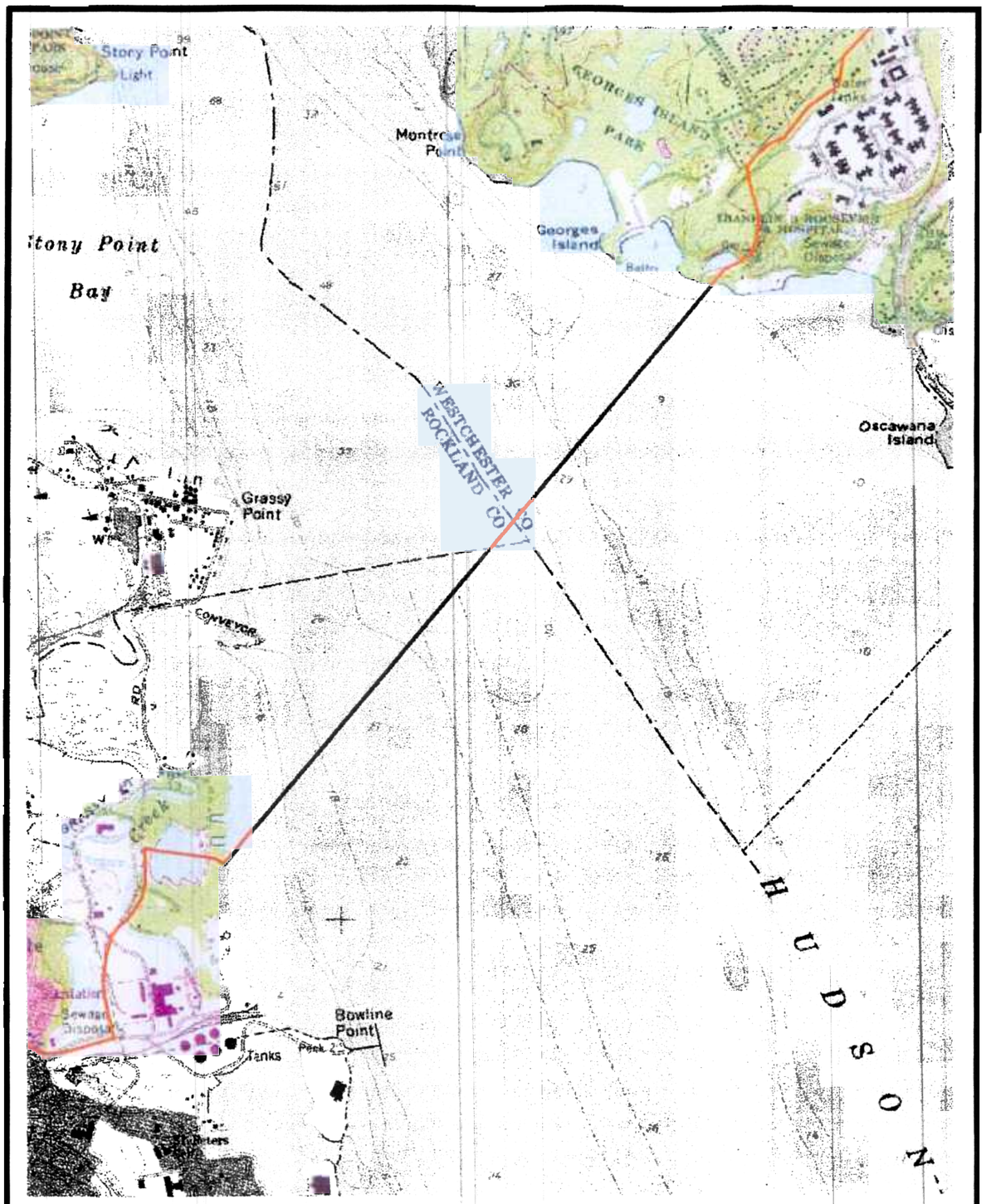
REVISIONS
MILLENNIUM PIPELINE
MILLENNIUM PIPELINE COMPANY
Coastal Zone
Consistency Application
Figure 3
1 : 26,000



Millennium Pipeline System



LEGEND

Proposed Millennium Pipeline as Filed 11/98

(MP 387.5 to MP 390.5)

NO	DATE	DESCRIPTION	DWN	APP'D	APP'D
		REVISIONS			

FLUOR DANIEL WILLIAMS BROTHERS

MILLENNIUM PIPELINE COMPANY

Coastal Zone
Consistency Application
Figure 2

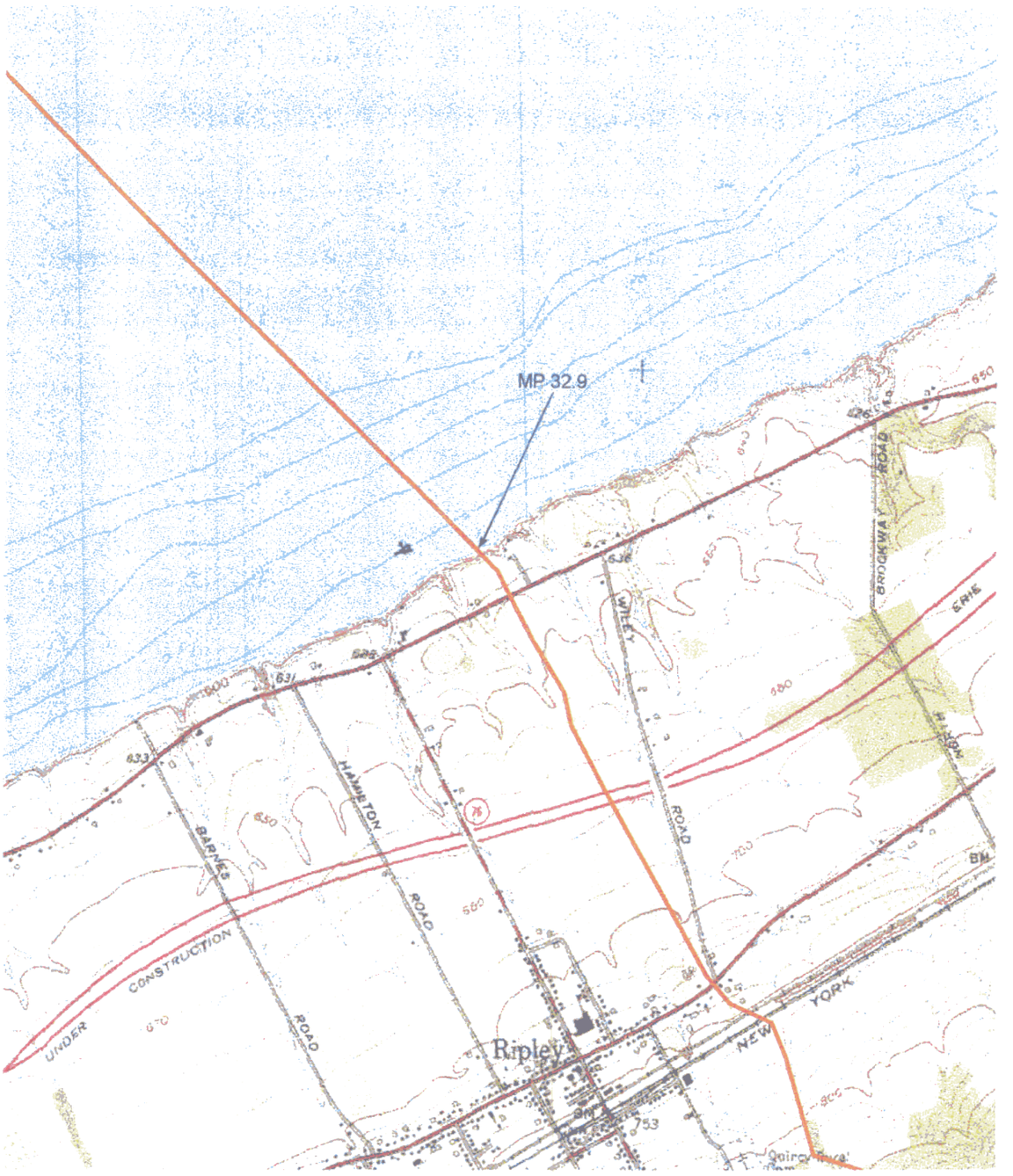
Hudson River Crossing
Haverstraw Bay

SCALE: 1 : 24,000

DRAWN: CFC DATE: 10/22/99 CHECKED: REH DATE: 10/22/99 PROJ. ENGR.: JRA

APP'D: REH DATE: 10/22/99 DATE: 10/22/99

SHT 1 OF 1 SHTS



LEGEND

Proposed Millennium Pipeline

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NO	DATE	DESCRIPTION	DWN	APPD	APPD
1	9/26/00	Change from Figure 3 to Figure 4.	CFC		

REVISIONS

MILLENNIUM PIPELINE

SCALE 1 : 24,000

FSWS JOB NO 11062800

MILLENNIUM DWG NO

MILLENNIUM PIPELINE COMPANY

AREA | DISTRICT

Coastal Zone Consistency Application

DRAWING NO 8525-GIS-5397

Figure 4

GIS NO

Lake Erie Landfall

SHT 1 OF 1 SHTS

DRAWN: CFC DATE: 10/22/99 CHECKED: REH DATE: 10/22/99 PROJ MNGR: JRA

APPD: REH DATE: 10/22/99 DATE: 9/28/00

Table 2 Hudson River Plume Data Summary (June 20, 2000)

Area/ Component[1]	Single Event Dimensions[2] Width (feet)	Length (feet)	Area (feet squared)	Trench Length[3] (feet)	Estimated Time to Complete Work on Trench Length[4]		Average Work Rate[5]		Number of Moves or Dumps per day[7] (#)	Area Impacted per Day per Component[8] (feet squared)	Area Impacted per Component[8] (%)	Total area of Haverstraw Bay Impacted by Project[9] (feet squared)	Total area of Haverstraw Bay Impacted by Project[9] (%)
Component 1	60	35	2,100	1000	13	days	77	feet/day	1.5	3,150	0.001	--	--
Component 2	90	170	15,300	1000	16	days	63	feet/day	1.3	19,890	0.006	--	--
Component 3	90	460	41,400	9900	30	days	330	feet/day	6.6	273,240	0.089	--	--
Component 4	**500**	**400**	200,000	9900	52	dumps	1.7	dumps/day	2	400,000	0.13	--	--
Haverstraw Bay	**13,940**	**22,000**	306,680,000									4,724,000	1.5

Notes

1. Haverstraw Bay values are the approximate physical dimensions of the bay.
Component 1 - Dredging shallow water using 6 cubic yard closed bucket.
Component 2 - Backfilling in shallow water using a 6 cubic yard closed bucket.
Component 3 - Dredging in deep water using a 22 cubic yard closed bucket.
Component 4 - Backfilling in deep water using a bottom dump barge.
2. Dimensions of plume created without moving equipment. For Components 1, 2, and 3 it is assumed the 50 feet can be excavated or backfilled between equipment moves.
3. The length of the trench which will be excavated or backfilled with the methods specified by the components.
4. The time required to complete the specified trench length with this component.
5. The number of barge dump cycles to fill the specified trench length with this component.
6. Trench length for each component divided by the estimated time to complete each specified operation.
7. Assumes equipment can work on a 50 foot length without moving.
8. Computed by increasing the plume width by the number of moves and then multiplying this with by the plume length.
9. Calculated as sum of length (single event plume dimensions) X length of trench for components 2 and 4.

Table 3 Predicted Concentrations and Comparison to Standards

Borehole B-1 Parameter	Average Concentration in Sediment	Predicted TSS Concentration	Predicted Aqueous Concentration	Water Quality Standards New York SB Classification	Does Predicted Aqueous Concentration Exceed the New York SB Classification ?	USEPA Marine Acute Criteria	Does Predicted Aqueous Concentration Exceed the USEPA Marine Acute Criteria ?
TOTAL	(mg/kg)	(mg/l)	(mg/l)	(mg/l)		(mg/l)	
Arsenic	6.7333	35	2.36E-04	6.30E-02	no	none	no comparison
Barium	51.5	35	1.80E-03	none	no comparison	none	no comparison
Cadmium	2.18	35	7.63E-05	7.70E-03	no	0.043	no
Chromium	97.8333	35	3.42E-03	5.40E-02	no	1.1	no
Lead	93.6667	35	3.28E-03	8.60E-03	no	0.14	no
Mercury	0.998	35	3.49E-05	none	no comparison	0.0021	no
Selenium	nd	35	nd	none	no comparison	0.41	no
Silver	1.92	35	6.72E-05	none	no comparison	0.0023	no
SEMI-VOLATILE ORGANICS	(µg/kg)	(mg/l)	(µg/l)	(µg/l)		(µg/l)	
Benzo(a)anthracene	365	35	1.28E-02	none	no comparison	300	no
Benzo(b)fluoranthene	230	35	8.05E-03	none	no comparison	300	no
Benzo(k)fluoranthene	500	35	1.75E-02	none	no comparison	300	no
Benzo(a)pyrene	346.6667	35	1.21E-02	none	no comparison	300	no
Bis(2-ethylhexyl)phthalate	780	35	2.73E-02	none	no comparison	none	no comparison
Butyl benzyl phthalate	2300	35	8.05E-02	none	no comparison	2994	no
Chrysene	413.3333	35	1.45E-02	none	no comparison	300	no
Fluoranthene	880	35	3.08E-02	none	no comparison	40	no
Phenanthrene	400	35	1.40E-02	none	no comparison	300	no
Pyrene	1010	35	3.54E-02	none	no comparison	300	no

Borehole B-8 Parameter	Maximum Concentration in Sediment	Predicted TSS Concentration	Predicted Aqueous Concentration	Water Quality Standards New York SB Classification	Does Predicted aqueous Concentration Exceed the New York SB Classification ?	USEPA Marine Acute Criteria	Does Predicted aqueous Concentration Exceed the USEPA Marine Acute Criteria ?
TOTAL	(mg/kg)	(mg/l)	(mg/l)	(mg/l)		(mg/l)	
Arsenic	6.52	35	2.28E-04	6.30E-02	no	none	no comparison
Barium	21.0833	35	7.38E-04	none	no comparison	none	no comparison
Cadmium	0.72	35	2.52E-05	7.70E-03	no	0.043	no
Chromium	33.75	35	1.18E-03	none	no comparison	1.1	no
Lead	19.4083	35	6.79E-04	8.60E+00	no	0.14	no
Mercury	1.9	35	6.65E-05	3.00E-02	no	0.0021	no
Selenium	nd	35	nd	none	no comparison	0.41	no
Silver	nd	35	nd	none	no comparison	0.0023	no
SEMI-VOLATILE ORGANICS	(µg/kg)	(mg/l)	(µg/l)	(µg/l)		(µg/l)	
Benzo(a)pyrene	390	35	1.37E-02	none	no comparison	300	no

Borehole B-16 Parameter	Maximum Concentration in Sediment	Predicted TSS Concentration	Predicted Aqueous Concentration	Water Quality Standards New York SB Classification	Does Predicted aqueous Concentration Exceed the New York SB Classification ?	USEPA Marine Acute Criteria	Does Predicted aqueous Concentration Exceed the USEPA Marine Acute Criteria ?
TOTAL	(mg/kg)	(mg/l)	(mg/l)	(mg/l)		(mg/l)	
Arsenic	nd	35	nd	6.30E-02	no	none	no comparison
Barium	21.6667	35	7.58E-04	none	no comparison	none	no comparison
Cadmium	nd	35	nd	7.70E-03	no	0.043	no
Chromium	18.3333	35	6.42E-04	5.40E-02	no	1.1	no
Lead	8.5	35	2.98E-04	8.60E-03	no	0.14	no
Mercury	0.1267	35	4.43E-06	none	no comparison	0.0021	no
Selenium	nd	35	nd	none	no comparison	0.41	no
Silver	nd	35	nd	none	no comparison	0.0023	no

ATTACHMENT

Essential Fish Habitat Assessment-Baseline Information

The National Marine Fisheries Service (NMFS) has indicated that Essential Fish Habitat (EFH) exists in Haverstraw Bay for the following species: red hake (Urophycis chuss), winter flounder (Pleuronectes americanus), windowpane flounder (Scopthalmus aquosus), bluefish (pomatomus saltatrix), Atlantic butterfish (Peprilus triacanthus), and fluke (Paralichtyus dentatus). The NMFS has also indicated that EFH for the Atlantic herring (Clupea harengus) may exist in Haverstraw Bay. The life history for each of above fish species is summarized below.

Detailed information on the effects of the pipeline construction on the habitat and fishery resources of Haverstraw Bay is presented in response to Policy #7 in Section 3.1.6. The lack of any significant effects on physical habitat of Haverstraw Bay, or the fish and invertebrate species which could be prey for EFH species is important for evaluating EFH species.

Red Hake (Urophycis chuss) – The red hake is distributed in the Atlantic from the Gulf of St. Lawrence to North Carolina and is most abundant between Georges Bank and New Jersey. Red hake undergo extensive seasonal migrations. They move into the shallower waters to spawn in the spring and summer and move offshore to winter in deep waters. Spawning occurs from May through November. Red hake feed primarily on crustaceans; however, adult red hake also feed extensively on fish. The maximum length attained by this species is approximately 20 inches. The maximum age reported is approximately 12 years, but few fish survive beyond 8 years.

Winter Flounder (Pleuronectes americanus) – The winter flounder is distributed in the Atlantic from Labrador to Georgia and is most abundant from the Gulf of St. Lawrence to Chesapeake Bay. Winter flounder make small scale migrations into estuaries, embayments and saltwater ponds in winter to spawn and subsequently move into deeper water during summer. Winter flounder feed primarily on benthic invertebrates. The maximum length attained by this species is approximately 23 inches.

Windowpane flounder (Scopthalmus aquosus) – The windowpane flounder is distributed in the Atlantic from the Gulf of St. Lawrence to Florida. This species inhabits large estuaries. Spawning occurs from April through December, with peaks in May and October.

Bluefish (Pomatomus saltatrix) – Bluefish are found in the Atlantic from Maine to Florida. They migrate northward in the spring and southward in the fall. Bluefish spawn during summer in the Middle Atlantic. Bluefish are voracious predators that feed on a wide variety of fish and invertebrates. They may attain lengths over 39 inches and weights over 31 pounds. The average life span is about 12 years.

Atlantic butterfish (Peprilus tricanthus) – The Atlantic butterfish is a small bony foodfish weighing up to 1 pound with a thin oval body and oily flesh. They are found in the Atlantic from Newfoundland to Florida, but are the most abundant from the Gulf of Maine to Cape Hatteras. During the summer Atlantic butterfish move northward and inshore to feed and spawn. Spawning occurs during June to August. Atlantic butterfish move southward and offshore in the

winter to avoid cooler waters. They are primarily pelagic and form loose schools that feed on small fish, squid and crustaceans. Atlantic butterfish are preyed upon by many species including silver hake, bluefish, swordfish and long-finned squid. Juvenile Atlantic butterfish associate with jellyfish during summer months to avoid predators. The approximate life span is 3 years.

Fluke (Paralichthyus dentatus) – Fluke occur in the Atlantic from the southern Gulf of Maine to South Carolina. Fluke concentrate in bays and estuaries from late spring through early autumn. Spawning occurs during autumn and early winter. The larvae are transported toward coastal areas by prevailing water currents. Development of post-larvae and juveniles occurs mostly in bays and estuarine areas, notably Pamlico Sound and Chesapeake Bay. Female fluke may live up to 20 years; however, males rarely live more than 7 years. Growth rates very between the sexes. Females may attain weights up to 26 pounds.

Atlantic herring (Clupea harengus) – Atlantic herring occur from Labrador to Cape Hatteras. Gulf of Maine herring migrate from summer feeding grounds along the Maine coast to southern New England and mid-Atlantic areas during winter. Spawning in the Gulf of Maine occurs in late August-October, beginning in northern locations and progressing southward. Herring eggs are demersal and are generally deposited on gravel substrates. Incubation is temperature dependent; hatching usually occurs within 7 to 10 days. Larvae metamorphose by late spring into juvenile brit herring that may form large aggregations in coastal waters during summer. Atlantic herring are not fully mature until age 4.

The construction plans for the Hudson River Haverstraw Bay crossing have been extensively studied and discussed in various documents submitted to the FERC and NYSDEC. The present construction plan was initially described in Millennium's September 17, 1999 filing. The Hudson River crossing is scheduled for September 1 through November 15.

The long-term effects of the Project on the habitat available in Haverstraw Bay will be minimal. The construction work area (CWA) does not include any identifiable structures that might provide preferred habitat for fish or invertebrate species. Thus, the dredging operation will not disrupt or dislocate any reefs, bars, or submerged objects that would be difficult to restore or replace.

Aquatic vegetation, either emergent or submergent, has not been observed at the crossing location. Thus, dredging operations will not damage or disrupt any such habitat. Similarly, wetlands do not occur along the banks of the Hudson River in or adjacent to the construction work area. Thus, the Project will not affect important wetland areas within Haverstraw Bay.

Effects on habitat within the Hudson River will be restricted to temporary, localized effects on substrate within the space occupied by dredging operations and adjacent areas and temporary, localized effects on water quality associated with construction activities. The physical disturbance of the substrate will be restricted to the trench and adjacent areas identified during the modeling of the Hudson River crossing construction method (see Section 3.1.4).

In summary, the results indicate that near-shore dredging activities will result in an average deposition of 0.18 feet of settled sediments within the area of the visible plume generated during

dredging activities. The visible plume is predicted to be approximately 60 feet wide (measured across the river) and 35 feet long (measured along the axis of river). The near-shore trench will be 70 feet wide, thus the plume would be confined to the trench much of the time and most of the sediment would redeposit in the trench.

Near-shore backfilling activities will result in an average deposition of 0.11 feet of settled sediments within the area of the visible plume. The visible plume is predicted to be approximately 90 feet wide and 170 feet long.

Deep water dredging activities will result in an average deposition of 0.02 feet of settled sediments within the area of the visible plume. The visible plume is predicted to be approximately 90 feet wide and 460 feet long.

Deep water backfilling activities will result in an average deposition of 0.25 feet of settled sediments immediately outside of the trench, with deposition decreasing with increasing distance from the trench centerline. The visible plume is predicted to be approximately 500 feet wide and 400 feet long. Deposition of settled sediments is predicted to be negligible outside of the area of the visible plume.

Haverstraw Bay covers approximately 7,040 acres. Construction activities will take place within approximately 33 acres, or less than 0.5 percent, of the bay. The total area of substrate predicted to be impacted by the Project is approximately 1.5% of the total area of Haverstraw Bay. However, the effects of the Project on the physical habitat available within the Hudson River will be temporary, since the trench will be restored as closely as possible to original contours following construction. Temporally, these effects should cease as construction activity ends at any particular location within the river crossing.

The potential effects from construction on fish are effects from direct contact with construction equipment, effects from turbidity and redistribution of sediments during construction, and effects of construction on benthic food organisms. The effects from redistribution of sediments include not only the effects on food organisms, but also the possible effects of chemical contaminants contained in sediments on local water quality.

Based on numerous observations of dredging, this is extremely rare because even slow moving fish can avoid the bucket. In addition, the general disturbance created by dredging would create an avoidance response by fish.

Review of literature pertaining to effects of construction of open cut pipeline crossings on aquatic resources indicates that adverse effects are due primarily to direct effects at the site of dredging and direct and indirect effects due to elevated levels of suspended solids. These effects have been found to be spatially limited to the immediate vicinity of the dredging location and temporally limited to days to months following completion of construction activities.

As indicated above, the effects of suspended solids for the Hudson River crossing construction should be restricted to the area of the visible plume, which varies depending on the particular phase of construction that is taking place. Total suspended solids concentrations are predicted

not to exceed 1,000 mg/l within 30 feet of dredging and backfilling operations. Total suspended solids concentrations of between 500 mg/l and 35 mg/l are predicted to occur within the area of the visible plume outside of 30 feet from dredging and backfilling operations. Elevated levels of suspended solids would cease shortly after construction ends.

The result of modeling of the effects of the Hudson River construction method indicate that the disturbance of the sediments will not result in concentration of heavy metals or organic compounds that exceed New York water quality standards or U.S. Environmental Protection Agency acute criteria for the protection of aquatic life (see Table 3). Thus, the effects of the construction on water quality will not be deleterious to fish and invertebrates in or near the CWA.

A summary of the modeling of sediment deposition associated with the Hudson River crossing construction was given above. However, studies of the long-term effects of pipeline construction have generally indicated that any sediment deposits generated during construction dissipate during the succeeding spring run-off, if not before. In the Hudson River, the processes of sediment scour and deposition would begin sorting the sediment particles and smoothing irregularities caused by the backfilling operations. Because these sediments are fine-grained and lack cohesiveness they will be redistributed by natural processes into a substrate similar to predredge conditions.

Alteration of benthic macroinvertebrate and fish distribution is reported to be a short-term effect of open cut pipeline construction. Fish have been reported to be displaced in the area of the construction site in some, but not all studies. Most fish species are thought to actively avoid turbidity. Complete recovery of the fish community to pre-construction conditions, which has been defined as a return to pre-construction composition and distribution of the fish community, occurs within 8 to 12 months. However, these studies have generally been conducted on small streams or moderate sized rivers. In the case of a large body of water, such as Haverstraw Bay, where the total disturbance for construction is predicted to be confined to a small fraction of the total area, it is expected that any disturbance to the distribution of fish in the bay will be negligible and that distributions even within the CWA itself should return to normal as construction activity ends at any particular location. Pipeline operation will have no effect on fish distribution.

In addition, benthic invertebrate communities have been found to recover rather rapidly from construction disturbance in the type of substrate found in Haverstraw Bay. Complete recovery for benthic invertebrate communities has been reported to occur within 2 to 12 months. In the case of the Hudson River, the benthic community is expected to recover quickly after backfilling is completed, since there would be large areas of undisturbed habitat on either side of the CWA which would serve to provide recruitment to the disturbed area. In addition, estuarine benthic organisms are adapted to the dynamic nature of sediments in their environment. Estuarine sediments particularly in shallow water, are often disturbed by wind and ship generated waves, by unusually high and low tides which create higher than normal tidal currents, and by riverine flooding which creates high current velocities and carries a high sediment load. Thus, benthic organisms are expected to respond quickly and favorably to the artificial disturbance of dredging. Pipeline operation will have no effect on distribution of invertebrates.

The occurrence of EFH species in Haverstraw Bay provides a basis for evaluating the importance of this reach of the Hudson River as habitat for these species. An available long-term database for determining species occurrence and relative abundance is the fish sampling associated with impact assessment studies for the Bowline Point Power Plant. Two major sampling programs were undertaken at Bowline: river sampling with conventional fishing gear at standardized sampling stations in the vicinity of the plant, and impingement monitoring of the plant intake screens.

Sampling with conventional fishing gear took place in the river proper and in Bowline Pond, a small embayment off the river used as the intake area for the power plant. Fish were sampled with surface and bottom trawls, trap nets, gill nets, and seines. Over the ten year interval from 1971 through 1980, a composite total of approximately 1500 samples were obtained with these gear types. The fish collected were identified, counted by species and measured for total length.

The conventional gear sampling showed extremely low abundance of all EFH species except bluefish, which were very low in abundance (Table 1). All EFH species were less than 1% of the total fish collected in each year.

Impingement data are available in summary form for the interval 1981 through 1990. This sampling consisted of weekly, 24 hr samples of fish impinged on the plant intake screens. The fish collected were identified, counted by species and measured for total length. The long term impingement monitoring programs at power plants throughout the country have shown that this is an effective method for monitoring the occurrence and relative abundance of fish in a waterbody in the vicinity of a plant.

With the exception of bluefish, the EFH species occurred in extremely low numbers (Table 1). Bluefish numbers were very low, representing less than 1% of the total number collected in all years. Other species were less than 0.1% of the total collections in all years.

EFH species identified by NMFS for Haverstraw Bay are not significant components of the fish community in Haverstraw Bay. The two databases on fish occurrences are consecutive 10 year intervals, thus there is a consistent pattern of very low to extremely low abundance over a 20 year period. Although six of seven EFH species occur in Haverstraw Bay, the Bay is clearly not important habitat for any of these species.

OCCURRENCE OF EFH SPECIES

EFH SPECIES	BOWLINE POINT IMPINGEMENT TOTAL NUMBER COLLECTED 10 YEARS OF SAMPLING (1981-1990)	HAVERSTRAW BAY SAMPLING TOTAL NUMBER COLLECTED 10 YEARS OF SAMPLING (1971-1980)
Atlantic Butterfish	7	2
Atlantic Herring	0	0
Bluefish	645	815
Red Hake	8	9
Summer Flounder	33	71
Windowpane	4	1
Winter Flounder	23	20

The bluefish is the only EFH designated species likely to occur in substantial numbers in the vicinity of the construction work area. The bluefish is a pelagic, open water species that has little contact with the substrate. It is a sight-feeding predator that would avoid areas with increased turbidity. In addition, bluefish spawn in offshore marine waters, thus the early life stages of this species could not be affected by the pipeline construction. All of the other EFH designated species occur infrequently and in low numbers in Haverstraw Bay. No seasonal restriction on dredging would be needed to protect these species.

Millennium supplied the following information to assist the FERC in preparing an EFH assessment.

> *Results of on-site inspection to evaluate habitat* – As mentioned above, Millennium has conducted investigations in Haverstraw Bay related to issues raised by the proposed construction of the Hudson River crossing. The results of fieldwork conducted in the bay are discussed in the report *Predicted Sediment and Contaminant Concentrations, Hudson River Millennium Pipeline Crossing, Haverstraw Bay, New York* by GAI Consultants, Inc. and in the modeling results discussed in the responses to Data Request Nos. 8, 9, and 10.

ii. *Site specific effects of the project* – As indicated in the responses to Data Request Nos. 8, 9, and 10, the turbidity plume from the project is expected to affect much less than 1 percent of Haverstraw Bay during any particular day. Thus, it will always be possible for fish species to move to unaffected areas within Haverstraw Bay to avoid turbidity. A short-term loss of benthic invertebrates will be incurred during Project construction and will affect feeding opportunities for some fish. However, this effect should be temporary and minor, since such a small portion of Haverstraw Bay will be affected during construction on any given day. Pipeline operation will have no effect on fish species.

iii. *Views of recognized experts on the habitat or species effects* – The modeling of construction impacts was performed by Dr. Donald Hayes of the University of Utah, who has authored models presently used by the U.S. Army Corps of Engineers to evaluate effects of dredging. Millennium has also used the services of LMS, Inc. to provide information relative to the Hudson River crossing. LMS, Inc. has performed ecological surveys in the Hudson River for over 20 years.

iv. *A review of the pertinent literature and related information* – Information on the life histories of the fish species of concern and essential fish habitat designations were obtained through review of the National Marine Fisheries Service internet site.

v. *An analysis of alternatives to the proposed action* – Millennium has evaluated 2 alternative routes near the Hudson River crossing and an alternative crossing location to Haverstraw Bay. Each of the alternative routes involved substantial construction on new ROW through residential subdivisions. In addition, insufficient workspace was available at the alternative Hudson River crossing location due to the presence of existing gas pipeline infrastructure and industrial development. A complete discussion of these alternatives can be found in Millennium's response to FERC's March 2, 1999 Data Request No. 12.

Millennium also studied the feasibility of crossing Haverstraw Bay via directional drill. As discussed in response to Data Request No. 12 above, it was determined that this crossing method was not feasible.