MILLENNIUM PIPELINE

December 9, 1999

Steven C. Resler, Supervisor of Consistency Review and Analysis
New York Coastal Management Program
Department of State
Division of Coastal Resources
41 State Street
Albany, New York 12231-0001

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

Dear Mr. Resler:

Attached please find information that supplements the Millennium Pipeline's prior Coastal Management Plan ("CMP") consistency submissions. This information addresses comments raised in your November 29, 1999 letter. This submission should resolve all issues concerning the Project's CMP consistency.

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, 199 supplemental response.

Very truly yours,

Richard E. Hall, Jr.
MPL Permitting Manager

cc: Millennium Pipeline Company, L.P

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November 29, 1999 letter Comment No. 1

The information and analysis leading to a full supported conclusion regarding the consistency of the proposal with Policy #7 of New York's Coastal Management program (CMP) and the State's legislative declarations of policy should include an analysis of the effects of the proposed crossing of Haverstraw Bay on:

a physical parameters such as living space, circulation, flushing rates, tidal amplitude, turbidity, water temperature, depth (including loss of littoral zone), morphology, substrate type, vegetation, structure, erosion and sedimentation rates;

b biological parameters such as community structure, food chain relationships, species diversity, predator/prey relationships, population size, mortality rates, reproductive rates, meristic features, behavioral and migratory patterns;

c chemical parameters such as dissolved oxygen, carbon dioxide, acidity dissolved solids, nutrients, organics, salinity, and pollutants (heavy metals, toxics and hazardous materials).

Response:

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 (E.H. Buckley "Mitigation of Habitat Losses in the Estuary of the Hudson River: Suggested Goals for Long Term Management." In: Mitigation Symposium, Colorado State University, July 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 and 0.08% of the contiguous functional habitat in Haverstraw Bay, Croton Bay and Tappan Zee. The total area of influence of the 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. The Modeling results reported a total effects area of 1.5% based on an assumed area of Haverstraw Bay that was less than the total designated habitat defined by the DOS as significant.

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 restoration of the substrate, there is no mechanism which could cause a significant change in the physical, biological and chemical parameters 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 Parameters

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, 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 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 shallow water using a 22 CY environmental bucket; and
- Component 4: Backfilling in deep water using a bottom dump barge.

The estimated steady-state plume resulting from the dredging operations is 60 ft wide (normal to flow) by 35 ft long (in the direction of flow) and 90 ft wide by 460 ft long for shallow water dredging (Component 1) and deep water dredging (Component 3), respectively. The plume associated with shallow water backfilling (Component 2) is estimated to be 90 ft wide by 170 ft long. The plume from the bottom dump barge (Component 4) is larger at 500 ft wide by 400 ft long, but of very short duration (30 minutes or less). The 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 that 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 16 days will be required to complete construction in the shallow water areas (Component 1), 19 days will be required to backfill the shallow water trench sections using the 6 CY bucket (Component 2) and 36 days will be required to excavate 9900 ft 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 65 ft per day for Component 1, 53 ft per day for Component 2, 275 ft per day for Component 3, and 2 barge dumps per day for Component 4.

The total area affected by the operation on any given day includes all areas covered by a turbidity plume for any length of time. Using this assumption with the progress rates developed in the paragraph above, the areas affected by Components 1, 2, 3, and 4 are approximately 2700 ft^2/day, and 400,000 ft^2/day.

Backfilling in the shallow, near-shore areas (Component 2) results in the maximum turbidity effect (170 ft long plume) and dredging (Component 3) provides the largest turbidity plume (460 ft long plume) in the central portion of the crossing. The total area affected by the crossing can be calculated by multiplying the maximum length of the visible plume by the trench length for each area (1000 ft for Component 2 and 9900 ft for Component 3), then summing the two quantities. This results in a total effected area of 4,724,000 ft^2. Assuming that Haverstraw Bay averages 13,940 ft wide and 22,000 ft long a maximum of 1.5% of the Bay bottom is estimated to be affected over the duration of the crossing project.

Total suspended sediments (TSS) concentrations would not exceed 1000 mg/l above ambient conditions except within 30 ft of dredging and backfilling operations. Suspended sediments would 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 ft from the dredging operation. Concentrations would be less than 35 mg/l above ambient conditions beyond the plume.

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 ft of the discharge. Turbidity levels are predicted to decrease quickly with the plume (35 mg/l above ambient conditions) dissipating within 30 minutes of disposal operation.

During dredging operations, the average thickness of redeposited sediment within Haverstraw Bay for components 1,2, and 3 are estimated to be 2.2 in, 1.3 in, and 0.2 in over the aerial extent of the plume. During bottom dumping backfilling operations (Component 4) most of the sediment would be redeposited in the trench. Sediment accumulation is estimated to be 0.3 ft just outside the trench (150 ft from trench centerline) and deposition would continue to decrease between 150 ft and 400 ft. Deposition would be negligible beyond 400 ft.

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 parameters 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 cause 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.

<u>Biological Parameters</u>

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 spring and fall, whichever season is selected for construction.

Chemical Parameters

The levels of the chemical parameters listed in Item c of the DOS information request 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.

November 29, 1999 letter Comment No. 2

In some instances the material provided by Millennium to DOS on October 26, 1999 includes a discussion of "potential impacts" related to the State designated Haverstraw Bay Significant Coastal Fish and Wildlife Habitat and bioaccumulation of contaminants (see narrative information relating to Policies 7 and 8 on pages 19 and 20), rather than actual effects. There is a continuing need for:

a information describing the actual effects of the proposal on the designated habitat area and its important components and their functions and values;

b Information indicating whether or not those effects would be significant or would have any significance when compared against important physical, biological, and chemical parameters (see previous information requirements regarding these parameters) of the Haverstraw Bay habitat, and when compared against:

    habitat documentation regarding ecosystem rarity, species vulnerability, human uses of the area or species dependent on it, population levels of important species, and

  2 habitat documentation indicating the habitat is irreplaceable

Response:

The response to Comment No. 1 provided an assessment of project effects on specified physical, biological and chemical parameters. This response will summarize the parameter-specific effects in terms of ecosystem effects. This assessment takes into consideration the temporal aspect of the effects and the restoration of functional values.

Dredging will cause a temporary disturbance to the Haverstraw Bay substrate in the footprint of the trench. Suspended sediment from the dredging and backfill operations will settle on the substrate adjacent to the trench and in rapidly diminishing quantities with distance from the trench (see modeling results in the response to Comment No. 1). Dredging will cause a temporary reduction of benthic infauna and some loss of epibenthos in the trench footprint. Some infauna may be buried in the near vicinity of the trench, but this area will remain usable for epibenthos and fish during construction.

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 (New York Department of State and The Nature Conservancy, 1990, "Hudson River Significant Tidal Habitats: A Guide to the Functions, Values, and Protection of the River's Natural Resources"). Low diversity refers to the fact that there are generally uniform habitat conditions throughout this broad area of the estuary. This low diversity accounts for the large amount of shallow nursery habitat, which is the primary functional value of the designated habitat. As discussed in response to Comment No. 1, 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 dredging windows. 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 three 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 in the response to Comment No. 1, 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 1987). This channel is an important component of the functional value (overwintering) of the designated area, even though the channel is repeatedly dredged. Previous maintenance dredging of the channel, which involves the entire length of the designated area, has not adversely affected its overwintering value. The pipeline crossing would temporarily affect only a 130 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 130 ft wide segment will have no effects. The channel will continue to function as overwintering habitat for striped bass, sturgeons and other species even if dredging is undertaken during winter.

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. Activities occurring in the designated habitat will not be a limiting factor for population levels of the important species.

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.

November 29, 1999 letter Comment No. 3

The information provided to DOS, including the materials provided on October 26, 1999, indicates that the proposed crossing of Haverstraw Bay, by dredging and backfilling, would be done over a period of approximately three months. This information also indicated that the crossing is expected to be started and completed between July 1 and September 30. There is a need to provide information that:

a analyzes the effect of the proposed activity upon the habitat during this ecologically sensitive time period.

Response:

The time interval for pipeline construction activities is currently an issue for discussion among the permitting agencies. The July 1 to September 30 interval represents one of a number of alternatives that has been proposed. NYSDEC identified May 1 through July 31 as their preferred interval for construction. Millennium is indifferent to the placement of the three-month interval within an annual cycle. The following discussion evaluates the interval from May 1 through September 30 in terms of effects on aquatic life, with emphasis on fish species.

The important species which migrate into the Hudson Estuary and most of the resident estuarine species spawn between April and June (see response to Comment No. 4). The vast majority of these species spawn upriver from Haverstraw Bay. Many species have pelagic eggs and/or larvae which gradually move downriver in these early life stages. For the herrings (blueback, alewife, American shad) the young fish maintain a pelagic existence, but for other species (striped bass, for example), the young fish seek bottom habitat after the larval stages.

During spawning and early life stages, a major portion of these populations are upstream of Haverstraw Bay, and thus they would not be exposed to any effects of the dredging and backfill operations. Suspended sediments, which can have an adverse effect on fish larvae when the concentrations are very high, would not be a factor for the Millennium pipeline because the vast majority of larvae are upstream of the crossing route and the fish would grow beyond the larval stage by the time they enter Haverstraw Bay. It is important to note that the suspended sediment concentrations at a dredging operation diminish very rapidly down-current from the dredge as the particles disperse in the flow and settle to the bottom. The use of a closed bucket dredge and controlled lift-rates are the best management practices which will minimize suspended sediment concentrations.

The distribution of spawning areas and early life stages upriver from Haverstraw Bay in spring is a major advantage to pipeline construction during spring. During early summer there is an important transition in the use of habitat in Haverstraw

Bay as the early juvenile fish move downriver into the Bay. Striped bass, white perch and hogchoker have a dependence on the substrate for their juvenile growth. This important phase of their life cycle continues through the fall. An additional advantage of construction in spring and early summer is the opportunity for the affected substrate to recover a major portion of its benthic community so that it is available for use by juvenile fish during fall. Although the effects of a temporary reduction in benthic life in a very small area of the Bay would be minimal at any time of the year, a dredging window from May 1 to July 31, along with the proposed lay-barge construction technique and BMPs, reduces effects to an absolute minimum.

November 29, 1999 letter Comment No. 4

At the November 19, 1999 meeting Millennium and its consultants were advised that the Department of State needs to know, based on competent scientific evidence:

a. whether or not the 1.5% of the designated habitat that would be dredged is more or less valuable or significant, or used more or less by important species, that other areas of the habitat; and

b when important species use the area

Response:

a The area to be dredged is approximately 0.2% of the designated habitat area (see response to comment No. 1). As discussed in the response to Comment No. 1, 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 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.

b. 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 of striped bass and the sturgeons overwinter in Haverstraw Bay and adjacent areas. Their distribution during winter can vary depending on temperature and salinity conditions. Their presence in the navigation channel is controlled primarily by these environmental variables rather than physical features of the channel.

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.

November 29, 1999 letter Comment No. 5

Finally, the background information in the materials submitted on October 26, 1999 indicates that Millennium's provision of natural gas would be of importance to New York and other states. However, the coastal policy analysis on pages 15 through 41 do not reflect certain important benefits of new supplies of natural gas as a source of energy. Therefore, information should be provided that indicates whether and how the natural gas supplies provided by the proposal would achieve those applicable policies.

Response:

The introductory text to the October 26, 1999 submission includes a general discussion of the benefits and needs for the project that was intended to be read in conjunction with the individual policy analyses. In particular, beginning on page 2, the document discusses the energy benefits of the project, the energy demands for the project (p. 3), the air and water quality benefits of the project (p. 3), and the environmental and socioeconomic benefits of the project (p. 4). Further information to demonstrate the consistency of the project with policies 18, 27, and other policies that contemplate projects or activities that will foster sound development in New York State, is set forth below.

The Millennium Pipeline Project is classified as 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 nine 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:

Shipper	Term of Service (Years)
CoEnergy Trading Company	20
Columbia Energy Service	15
Duke Energy Trading and Marketing, L.L.P.	15
Engage Energy (US), L.P.	10

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[1] In addition, 14,000 dth/d of capacity will be leased by Millennium to Columbia under a Capacity Lease and Exchange Agreement that will permit Columbia to continue to provide firm gas transportation services for its existing A-5 shippers.

[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 will 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.

International Business Machines Corporation	10
North East Heat & Light Co.	15
PanCanadian Energy Services Inc.	10
Stand Energy Corporation	20
TransCanada Gas Services	10

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 INGAA Foundation, Inc. ("INGAA"), Cambridge Energy Research ("EIA"), and Foster Associates ("Foster") support Millennium's conviction that there will be unmet incremental demand for pipeline capacity in the Northeast that is substantially in excess of 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
2000-2005	938 MMCFD
2005-2010	1,658 MMCFD
1995-2010	4,196 MMCFD

The projections of Northeast natural gas demand and pipeline capacity needs are set forth in more detail in Table A. 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.

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

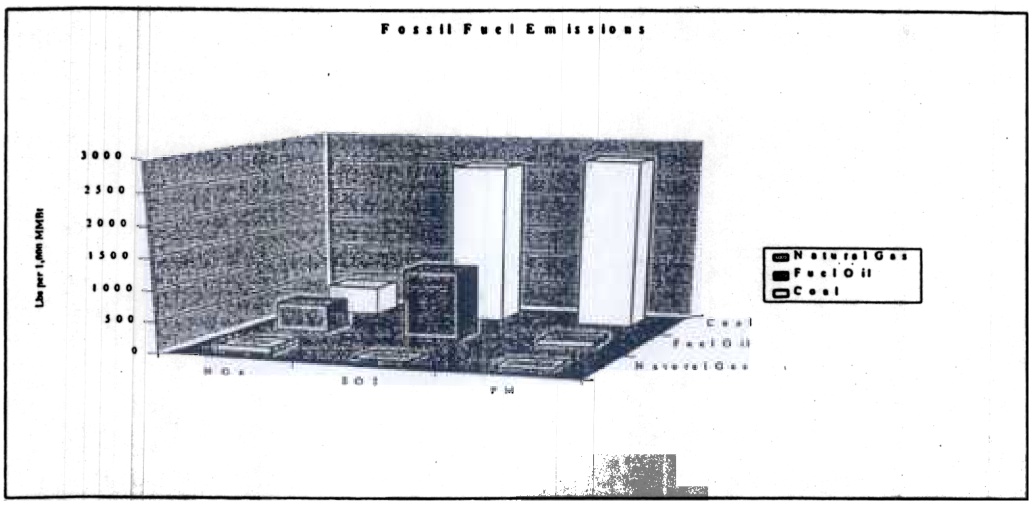
Gas prices in New York State are already well above average. With a 45% increase in demand predicted, without additional supply, gas prices may further increase. In contrast, lower cost gas is abundant in western Canada. The Millennium Project will serve to deliver lower cost gas to markets all across New York State and to the Metropolitian New York Region. 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 relate to fuel, incremental cost savings can be significant to energy costs and the economy of New York State. Reduced energy 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. <u>The Project Will Improve Electric Power Reliability And Air Quality In New York</u>

The current energy policy in New York State is dedicated to fostering competition. As a result, there has been a recent surge in the proposal of merchant power plants 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 reduction of NOx emissions from 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 NOx 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 play a major role in achieving the emissions reductions ordered by Governor Pataki, since natural gas yields far fewer air pollutants than oil or coal. As shown in the bar chart below, 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 chart shows that 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, <u>twice</u> the reduction sought by the Governor's directive, and NOx emissions by more than 55,000 tons, or almost <u>three times</u> the Governor's objective.[3]



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.

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[3] 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. As the bar chart also shows, 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).

4 The Project Will Improve Gas Service Reliability Through Infrastructure Upgrades

Approximately 84% 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. 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.

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 associated with gas production. Gas production facilities require infrastructure to deliver natural gas to the market. By upgrading the existing pipeline system, replacing much of that system and extending the system into these western counties, gas producers will be ensured of a reliable means to deliver gas produced in New York State to the markets. Gas storage development in central and western New York State should also benefit from the market access provided by the project. This furthers 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. Given the significant benefits that will accrue to all of 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 the Coastal Zone Management Plan of New York State.

TABLE A
MARKET SUPPORT FOR THE MILLENNIUM PROJECT

	(1) Incremental Increase in Northeast Natural Gas Demand	(2) Incremental Increase in Northeast Natural Gas Long-Haul Capacity Additions*	(3) Potential Unserved Demand (Range Between Columns (1) and (2))
1995-2000	FOSTER: 1,106 MMCFD AEO: 1,022 MMCFD CERA: 394-1,141 MMCFD INGAA: 407 MMCFD	CERA: 300-1,200 MMCFD EIA: 715 MMCFD	806 MMCFD
2000-2005	CERA: 609-1,238 MMCFD AEO: 1,037 MMCFD INGAA: 709 MMCFD	CERA: 300-1,000 MMCFD	938 MMCFD
2005-2010	CERA: 271-1,758 MMCFD ARO: 1,042 MMCFD	CERA: 100-1,025 MMCFD	658 MMCFD
2000-2010	FOSTER: 2,675 MMCFD	CERA: 400-2,025 MMCFD	2,275 MMCFD

*These figures may well include the capacity from the Millennium Project, in which case the potential unserved demand could be 700 MMCFD higher.

Sources

The INGAA Foundation, Inc ("INGAA"), The Outlook for Imported Natural Gas (1997).

Cambridge Energy Research Associates ("CERA")

Energy Information Administration ("EIA"), Natural Gas 1996 Issues and Trends (December 1996).

EIA, 1998 Annual Energy Outlook ("AEO") (New England only).

Foster Associates, Competitive Profile of Natural Gas Services, Volume II (December 1997)