5.0 ENVIRONMENTAL CONSEQUENCES

The environmental consequences of constructing and operating the 9/9A Proposal of the Millennium Pipeline Project are analyzed in this section. Since the impacts on environmental resources vary in duration and significance, four levels of impact duration were considered. These include temporary, short-term, long-term, and permanent impacts. Temporary impacts generally occur during the construction period and the resource would recover during or immediately after construction. Short-term impacts may last from the time of construction to about 3 years following construction. Impacts are considered long-term if the resource would require more than 3 years after construction to recover. Permanent impacts are those changes to the resource that involve aboveground structures or areas where the resource would not recover for the life of the project.

Section 5 of this SDEIS is organized to provide a description of: 1) the general construction and operational impact that could be expected for each resource, and 2) the site-specific concerns and proposed and recommended mitigation. Mitigation measures included in this section, by resource classification, are either proposed by Millennium or recommended by us based on an analysis of potential environmental impact of construction of the project. Our conclusions are based on the following assumptions:

Millennium would comply with all applicable laws and regulations;

2. the pipeline would be constructed as described in section 2.0 of this SDEIS, including the procedures contained in Millennium's ECS, and our Plan and Procedures; and

Millennium would implement the mitigation measures included in its application, supplements, and any additional staff-recommended mitigation measures that may be required by the Commission as described in this SDEIS.

5.1 GEOLOGY

Rock Excavation and Blasting

Construction and operation of the 9/9A Proposal should not materially alter the geologic conditions of the project area. The primary effects from construction would include disturbances to the natural topography along the pipeline right-of-way from grading and trenching during construction. The average depth for pipeline trenching would be 5 to 6 feet. In areas where bedrock is at or near the ground surface blasting may be necessary to excavate the pipeline trench. Shallow bedrock would commonly be encountered along ridges, steeper slopes, and river banks and bottoms. About 94 percent (21.4 miles) of the 9/9A Proposal may require blasting. Some blasting may be used in the Sprain Ridge Park (MPs 414.6 to 416.1) that is remote from other structures. In areas of consolidated rock the pipe must be buried 24 inches deep.

However, rock excavation can often be accomplished by ripping or by mechanical breakdown of relatively soft, weathered, or broken rock with the use of toothed tools in conjunction with bulldozers, trench excavators, and/or backhoes. Millennium also proposes to use specialized equipment (e.g., a rocsaw trencher) for excavation of the ditch at selected locations along the 9/9A Proposal (see section 2.3.3 and appendix G). Blasting would only be used as a last alternative in the event that hard microcrystalline rock is encountered and can not be avoided. Blasting would be performed by a licenced blasting contractor in accordance with all Federal, state, and local regulations. Title 39 of the New York State Code governs the use of explosives in New York and some municipalities may have additional codes. These regulations include limitations on size of explosive charges, safe handling, shipping and storage, and proximity of houses

and other structures. Millennium states that it would comply with all valid county and municipal construction requirements, including any requirements for blasting.

If blasting is not controlled properly, it can cause damage to structures, existing pipelines, wells, and springs. Millennium states that with the landowner's permission, it would conduct pre- and post-water quality testing on wells, and pre- and post-blasting inspections of structures, within 150 feet of the construction work area where blasting is required. Millennium has included a provision in its ECS that requires 1-week prior notice for blasting with confirming notice at least 24 hours before blasting. When notified, people may decide to leave their homes during blasting. The minimum distance from the blast area for non-construction personnel would be dependent on the size of the charge and the location, and is typically a distance of 200 feet. See discussion below and in section 5.7.4 for additional precautions that would be used where blasting is required along the 9/9A Proposal.

For protection of adjacent pipelines during blasting, Millennium would follow the procedures established by the Southwest Research Institute in studies conducted for the American Gas Association. These studies have determined the hoop stresses [1/] imposed on a pipeline by nearby blasting activities. Hoop stresses caused by blasting, in addition to the hoop stress induced by the flowing product, are required to be below the hoop stress for the maximum allowable operating pressure of the pipeline.

Temporary effects of blasting could include hazards posed by uncontrolled fly-rock, and nuisances caused by noise, increased dust, and venting of gas following blasts. Proper use of blast matting and time-delayed charges would minimize potential fly-rock hazards, while noise, dust, and gas venting would be temporary local phenomena that would not have any long term impacts. Millennium states that a qualified blasting contractor would perform all blasting to minimize the potential for damage. Blasting mats would be used to minimize fly rock and seismographs would be used, as necessary, to monitor the blasts adjacent to existing pipelines, underground utilities, or buildings near the construction work area. Some rock excavated by blasting may not be suitable for pipeline backfill and would either be stockpiled along the right-of-way, with the landowner's permission, or hauled off and disposed of. Landowners are not required to accommodate rock storage on their properties.

Mineral Resources

No mineral resources unique to the region would be crossed by the 9/9A Proposal. Potential impact on any mineral resource production adjacent to the pipeline could include a reduction in the reserves of the area, together with attendant economic losses to the owner caused by limitations on the possible future expansion of the affected quarry, pit, or mine. If a landowner feels that compensation is due for lost mineral resources, this issue would be negotiated between Millennium and the landowner during right-of-way procurement. These negotiations would also include clearance between the pipeline right-of-way and the boundary of future mining activity.

Other Utilities

Owners of existing utility lines near the construction right-of-way would be notified of work planned in the area of their facilities by Millennium through the state One-Call System (see section 5.11.2). These companies should stake their line and, if possible, witness the excavation of the pipeline trench. If the pipeline owner is not present, and a leaking line is located, Millennium would attempt to locate the owner and notify them of the problem. The pipeline owner would then be allowed to make repairs, while

1/ Hoop stress is a combination of the internal and external circumferential stress imposed on the pipeline.

Millennium's construction crews take the necessary spill precautions. Millennium would contact all utility owners before any blasting, and would request that an inspector from the company be present during construction.

Millennium would install its pipeline with a minimum of 12 inches of clearance from any other pipeline or underground structure. Where these clearances cannot be attained, suitable precautions, such as installation of protective material or casing, would be used. If, during pipeline construction, the free span of the existing line is sufficient to induce stress on the foreign pipe, it would be supported with timbers, sandbags, or similar temporary materials. If any foreign pipeline is inadvertently ruptured during pipeline construction, containment and cleanup would be performed in accordance with the procedures identified in Millennium's Spill Prevention, Containment, and Control Plan (SPCC Plan) which is included in its ECS in appendix E. These procedures include the provision that the contractor's foreman's and inspector's vehicles be equipped with spill kits containing absorbent materials for petroleum products. We believe that implementation of these procedures would allow for rapid containment and cleanup of spills. Since the pipeline would not cross active or abandoned coal mines, contaminated mine runoff would not pose a potential hazard.

Landslides, Liquefaction, and Karst Terrain

Landsliding does not pose a widespread hazard in the project area. Any impact would be related to natural processes or adverse geologic conditions that could be aggravated by pipeline construction. Artificial cutting along slopes, artificial loading by construction equipment along the proposed right-of-way, and abnormally high precipitation may increase landslide susceptibility. Landsliding in the project area is limited to shallow earth flows, soil creep, and minor debris avalanches. Earth flow hazards exist along river banks where alluvial deposits are easily eroded by river scour. Soil creep is an almost imperceptibly slow downslope mass movement that can potentially accelerate to slope slumps or slides. Soil creep would not be of short-term concern to the pipeline, but if unchecked, soil creep might bend and weaken pipeline over time. Creep would be most significant on sidehill installations in thick glaciolacustrine deposits and in thin mantles of outwash underlain by glaciolacustrine material. Proper pre- and post-construction inspections would identify areas of risk, and continued monitoring along slopes would likely identify any significant landslide hazards before they develop. Furthermore, use of the two-toning[2/] construction technique and strict adherence to the erosion control, revegetation, and right-of-way maintenance procedures (included in appendix E) would minimize any potential for mass wasting and consequent slope instability.

Severe ground vibrations in cohesionless saturated soils can cause temporary increases in pore water pressure. This phenomenon may cause soils to liquefy. Due to the small percentage of susceptible soils and the seismic history of the project area, liquefaction should not affect construction and operation of the pipeline and appurtenant facilities.

Subsidence from either karst development or underground mining could result in loss of bearing, weakening or even rupturing underground pipelines. However, geologic hazard due to subsidence is remote. Only very large rapidly forming sinkholes would be a significant concern to welded steel pipelines. Such sinkholes are not known to exist in the project area. Furthermore, sinkhole development near the surface would be identified through aerial inspections, ground patrol, and leak detection surveys. If properly filled and stabilized, any cavity at or near the surface should not pose a hazard to pipeline construction or operation.

2/ Two-toning is often used in sidehill construction and involves cutting the side slope and using the fill to establish two level workspaces on the side hill, one for equipment passage and one for the trench.

Earthquakes

Seismicity includes surface faulting, ground shaking, and earthquake-induced phenomena such as soil liquefaction. Surficial faulting poses the greatest seismic hazard to natural gas pipelines. No faults with surficial faulting within the past 10,000 years would be crossed by any segment of the pipeline (Howard et al, 1978). While numerous earthquakes resulting in slight-to-moderate ground shaking have been reported in the vicinity of the project area, no adverse impact on the pipeline would be anticipated since modern natural gas pipelines exhibit good inherent ductility. Several commenters on the DEIS were concerned that a repetition of the 1985 Ardsley earthquake in Westchester County would rupture the pipeline. Although this event was the largest earthquake in southeastern New York in the past 50 years, the mainshock had a magnitude of about 4. Underground pipelines could be damaged in an event with a magnitude of about 6, and would certainly be damaged in the highest level event with a magnitude of 7.75. Seismic hazard would be limited to a large scale catastrophic earthquake. The likelihood of such an earthquake during the design life of the pipeline facilities is remote. See section 5.11.1 for discussion of USDOT safety requirements and section 5.11.4 for discussion of frequently asked safety questions.

5.2 SOILS

The impact of construction on soils can be effectively reduced through use of appropriate erosion control and revegetation plans. Millennium would implement the procedures identified in its ECS, which incorporates our Plan as well as specific recommendations made by the NYSDA&M (see appendix E). Implementation of the ECS and our Plan would minimize the potential for erosion, soil compaction, introduction of rock into topsoil, and poor or very poor revegetation.

Pipeline construction and operation could adversely affect soils in several ways. Potential increases in soil erosion (from water and/or wind), loss of soil productivity through soil compaction, damage to soil structure, loss of soil fertility by inversion of soil horizons (i.e., mixing of topsoil and subsoil), and damage to drainage tile systems could result in poor or very poor revegetation, which is necessary for stabilization and restoration of the construction right-of-way. Most of New York's soils are glacially derived and have a thin (about 3 to 12 inches thick) layer of topsoil.

Soil Erosion

Potentially, one of the most severe impacts on soils from pipeline construction is erosion. Many stages of pipeline construction, including vegetation clearing, grading, topsoil segregation, open trenching and backfilling destabilize the soil material and make it susceptible to water and wind erosion. The most susceptible time for erosion to occur is after initial vegetative clearing and grading and before reestablishment of a vegetative cover. A soil's susceptibility to erosion varies and is a function of its characteristics, such as soil texture, structure, topography (steepness of slope), amount of surface cover (vegetative or other), and climate. Erosion potential increases the longer soils are left bare. Erosion from water primarily occurs in loose soils on moderate to steep slopes. Many glacial till subsoils are proportionally high in silt and remain better bonded than sandier subsoils when exposed. However, gullying can occur along backfilled trenches with their destabilized spoil (subsoil and substrata) materials. Wind erosion can occur in dry, sandy soils where vegetative cover is difficult to establish and maintain. Soil erosion could also result from off-road vehicle traffic, resulting in ruts and gullies on the sloped portions of the right-of-way following construction.

Soil erosion for all affected soils can be reduced with both temporary and permanent erosion control practices. These controls include temporary and permanent structures such as slope breakers, sediment barriers, and trench barriers and breakers. An erosion hazard can also be reduced by stabilizing the soil

surface with temporary and permanent planting and mulching, minimizing the time of soil disturbance, avoiding construction during periods of maximum runoff, and reestablishing contours and vegetative cover as soon as possible. Many potential impacts from soil erosion can be reduced by minimizing the duration of time between initial grading and backfilling and restoration of the right-of-way.

Soil Compaction and Damage to Soil Structure

The movement of heavy construction equipment back and forth along the construction right-of-way and access roads can result in soil compaction. This can have severe impact which can be problematic in agricultural and residential areas. Soil compaction damages soil structure and reduces pore space which impedes the movement of air and water to plant roots, resulting in loss of soil productivity and lower growth rates. Damage to soil structure makes soils more susceptible to erosion and inhibits natural drainage. When soils are wet, compaction and rutting invert or mix the fertile topsoil and the subsoil. Generally, soil is most prone to structural damage during the wettest part of the spring and fall seasons, or in areas of poor drainage. However, abundant year-round moisture in the Northeast makes the vast majority of glacial till, alluvial, and lacustrine soils prone to compaction and structural damage during and following each heavy rainstorm. Clodding and/or rutting at shallow depths complicates planting in agricultural areas and can increase the erosion potential. Mitigation measures to reduce soil compaction and soil horizon inversion begin with scheduled avoidance of heavy construction and restoration during excessively wet spring and fall periods.

Loss of Soil Fertility

Trenching and backfilling, as well as the concentrated movement of construction equipment along the construction right-of-way, can result in mixing of topsoil and subsoil and can dilute the productivity of the soil by mixing the physical and chemical properties of the topsoil with the low fertility subsoil. This is especially true in the thin, glacially derived loams of the Northeast. In addition, construction activities, including trench blasting in shallow-to-bedrock soils, could introduce rock into topsoil and interfere with the operation of agricultural equipment.

Poor Revegetation

Revegetation is necessary for the stabilization and restoration of the construction right-of-way. Revegetation potential is inhibited by soil erosion (from water and/or wind), loss of soil productivity through soil compaction, damage to soil structure, loss of soil fertility (i.e., mixing of topsoil and subsoil), damage to drainage tile systems, seeding methods, and planting conditions. The effect of construction on these factors could lead to poor or very poor revegetation potential.

Mitigation measures include soil additives and seeding requirements in accordance with written recommendations obtained from the local soil conservation authority or land management agencies. To minimize the time bare soils are exposed, Millennium is required to complete final grading within 10 calendar days of backfilling, weather and soil conditions permitting. If unsuitable soil conditions for final grading persist for more than 14 calendar days, temporary stabilization measures (including temporary seeding or mulching) would be completed. However, in no case would final grading be delayed beyond the next seeding season.

Millennium has contacted the local NRCS district office for recommendations regarding seed mix requirements, which would be included along with appropriate agency recommendations, on the construction alignment sheets. The proposed seeding mixes are listed in table 2a of the ECS (see appendix E). Additional correspondence received from agencies would be filed with the Commission.

Restoration work would be performed by personnel familiar with local horticultural and turf management practices. Post-construction monitoring would continue until revegetation is successful and would be conducted for at least 2 years to determine the need for additional restoration. Any required mitigation (e.g., importing of additional topsoil, seeding, etc.) would be done by Millennium. Routine vegetative maintenance clearing would not be done more frequently than every three years, except to facilitate periodic corrosion and leak surveys.

Potential Changes to Drainage

Trenching and sidehill (cross slope) construction grading can alter the natural, lateral drainage pathways along the subsoil horizons of many glacial tills and other affected soils. This occurs when trenching obliterates the natural planes of drainage and when concentrated points of seepage or drainage accumulation are expanded or created along the trench or the side cut. These impacts would be mitigated after the extent of damage has been monitored as part of the post-construction monitoring program.

Site-Specific Impact

About 22.4 miles (88 percent) of the 9/9A Proposal would be placed adjacent to or within U.S. Route 9, State Route 9A, other roads, or bicycle paths associated with the abandoned railroad right-of-way (North County, Briarcliff-Peekskill, and South County Trailways). Millennium's CAS and associated CAS notes would detail the placement of erosion control and other site-specific construction requirements developed in consultation with appropriate Federal and state agencies. We believe that impact on soils would be minimized with implementation of Millennium's ECS and our Plan.

5.3 WATER RESOURCES

5.3. Groundwater

General Construction and Operational Impact

Construction activities could result in impact on groundwater resources. However, most of the potential impact would be avoided or minimized by the use of both standard and specialized construction techniques.

Shallow aquifers could experience minor impact from changes in overland water flow and recharge caused by clearing and grading in the construction areas along the proposed alignment. Enhanced water infiltration provided by a well-vegetated cover would be temporarily reduced until the area is revegetated. Near surface soil compaction caused by the weight of heavy construction equipment could also reduce available pore space to transmit water to the subsurface. This impact would be short-term and would not be expected to significantly alter the groundwater resources because the construction right-of-way, in general, is a small portion of the total groundwater recharge area.

Trench dewatering may be required in areas where the proposed construction intersects groundwater. Dewatering activities may affect groundwater by decreasing water levels in the immediate area of the dewatering pumps or trenches or increasing water levels in the area where the pumped water is discharged. Because construction activities at a specific location are of relatively short duration, associated dewatering would only be a temporary activity with minimal impact. Millennium's ESC and our Procedures require that all water produced from dewatering operations be discharged into well-vegetated upland areas or into containment structures. To promote recharge to the affected aquifer via infiltration or runoff to surface water bodies, all discharges should be within the same hydrogeologic regime or sub-basin from where the

dewatering originated. Any deviations from discharging into the same hydrogeologic sub-basin would be noted on the CAS and any necessary approvals would be acquired in advance from the appropriate Federal and state agencies (see discussion in section 5.3.2 on hydrostatic testing). Use of these guidelines would result in minimal impact on the aquifer from dewatering activities.

Grade and trench blasting would be required where bedrock is exposed or less than 6 feet below the ground surface if other equipment cannot open a trench. Use of appropriate blasting procedures can minimize ground motion. This would then lessen the possibility of disrupting existing confining layers, creating new fracture openings or reducing or sealing existing fractures that would alter groundwater flow characteristics. Millennium would require its contractors to use procedures that would ensure that air blast and ground vibration limits are set at thresholds below levels at which blasting damage is likely to occur. Millennium would also identify provisions for correcting problems that may arise, including compensation for assessed damages and making provisions for repair with local contractors.

Landowners are often concerned about changes in water quality or flow of their water wells as a result of construction activities. Where water supplies are shallow, there could be some temporary and localized decreases in groundwater quality and recharge rates because of grading and trenching (which may require blasting) or near surface compaction during clearing or grading. These would be expected to be short term interruptions only and should not affect long term groundwater quality and recharge rates. Millennium would conduct pre- and post-construction water quality and quantity testing of wells and springs used for drinking water purposes within 150 feet of the construction work area where approved by landowners. Testing would include pump inspection, flow rate quantification and collection of the following water quality parameters: coliform bacteriological cultures, total and dissolved lead, nitrates, nitrites, total and dissolved iron, total and dissolved manganese, sodium, pH, hardness, alkalinity, and turbidity. Temporary fencing would also be erected around all private water supply wells identified within the construction work area to minimize any impacts. If a water well or spring is damaged as a result of Millennium's activities, Millennium would provide a temporary water source, and repair or replace the well.

Groundwater levels could also change in bedrock aquifers during construction if previously sealed fractures at the surface are exposed during trench excavation to create more flowpaths for aquifer recharge that may result in local flooding of adjoining properties. Generally, this is not a widespread problem and would be corrected during restoration when the trench is backfilled and the right-of-way restored to preconstruction contours. If the trench is not constructed with adequate trench barriers (or "plugs", as identified in our Plan), new flowpaths could be created for groundwater migration along the pipeline trench. This would be addressed during construction by installation of trench barriers and breakers at specified intervals (a requirement of the ECS and the Plan) and by followup monitoring after construction.

Refueling of vehicles and storage of fuel, oils, lubricants or other related materials during the construction phase of the pipeline could create a potential contamination hazard to aquifers. Small, localized spills of these materials could be expected to occur during construction and could affect aquifer quality. Spills may also occur if an existing pipeline is ruptured during construction. Further contamination could continue to occur for a short time thereafter as precipitation passes through the affected soil and transports more material to the aquifer.

These types of impacts can be avoided or minimized by restricting vehicle refueling areas and maintenance and storage facility locations, and requiring immediate cleanup of any spills or leaks. Millennium has developed a SPCC Plan that outlines protective measures to minimize the possibility of a spill and the response measures to be followed in the event of a spill or leak (see section V of Millennium's ECS in appendix E). These measures include designation of fuel and hazardous materials storage areas, containment requirements for fuel depots, minimum setback distances from natural resource areas for

specified refueling and maintenance activities, clean up materials that need to be on site, and spill reporting procedures. In those aquifer protection districts that have specific requirements, Millennium would follow the district-specific procedures which include prohibitions on refueling in specially designated areas, construction of silt fences and booms, or specification of the types of sorbent materials that should be available. However, the 9/9A Proposal would cross no aquifer protection areas.

SPCC Plan

In response to our recommendations in the DEIS, Millennium revised its ECS so that it includes the following: containment dikes would have capacity for at least 100 percent of the maximum storage volume; refueling areas would be located hydraulically down gradient and outside of aquifer protection areas, wherever possible, and if located within an aquifer protection area, the refueling area should be lined; all equipment would be inspected daily for leaks before work within an aquifer protection area; and all vehicles working within aquifer protection areas and public water supply watersheds would have sorbents to cleanup spills that might occur.

Site Specific Impacts

Since the 9/9A Proposal mainly follows roads, utilities, and bike paths, and since the majority of this area of Westchester County has public water and sewer systems, Millennium does not anticipate that the pipeline would cross or be near any wells. Based on discussions with local community officials and landowners, no water supply wells or springs would be within 150 feet of the 9/9A Proposal.

The 9/9A Proposal would cross 12,038 feet of the Croton Primary Aquifer beginning at MP 394.5. This aquifer underlies the Croton River and adjacent land, and is used for public water supply. One commenter noted that this aquifer supplies water to residents of Briggs Landing and Warren Roads. Based on site reconnaissance and aerial photography, Millennium found no potable water wells and no residences within 150 feet of the construction work area at this location. Based on the proposed mitigation, we expect no conflicts or significant impact.

Several commenters noted that many areas along the pipeline are subject to flooding and have a high water table. Most of the 9/9A Proposal would be in areas that are either potentially flood-prone or have a possible high water table. In areas subject to erosion via flooding, Millennium would install the pipeline at an adequate depth to prevent damage to the pipe. Construction in areas subject to flooding, those that have a high water table, and/or wetland crossings would be in accordance with Millennium's ECS and the requirements of the COE and NYSDEC. These areas would be restored to pre-existing contours to ensure that water-carrying and absorption capacity would be maintained. Millennium would also design the pipe to have sufficient negative buoyancy (typically concrete coating or set-on weights) to prevent operation or maintenance concerns.

Blasting may be required in areas where municipal water mains are crossed. Millennium is currently coordinating with the local municipalities on the location of these mains and on developing appropriate mitigation measures in these areas.

5.3.2 Surface Water

General Construction and Operational Impact

Pipeline construction and hydrostatic testing could affect surface waters in a variety of ways. Clearing and grading of stream banks, blasting, in-stream trenching, trench dewatering, and backfilling could

result in modification of aquatic habitat, increased sedimentation, turbidity, decreased dissolved oxygen concentrations, stream warming, releases of chemical and nutrient pollutants from sediments, and introduction of chemical contamination, such as fuel and lubricants.

The greatest potential impacts on surface waters would result from suspension of sediments caused by in-stream construction and by erosion of cleared stream banks and right-of-way. The extent of the impact would depend on sediment loads, stream velocity, turbulence, stream bank composition, and sediment particle size. These factors would determine the density and downstream extent of the turbid plume of sediment. Turbidity resulting from suspension of sediments due to in-stream construction or erosion of cleared right-of-way areas would reduce light penetration and the corresponding photosynthetic oxygen production. Re-suspension of deposited organic material and inorganic sediments would cause an increase in biological and chemical intake of oxygen, also resulting in a decrease of dissolved oxygen.

Clearing and grading of the stream banks would expose large areas of soil to erosional forces and would reduce riparian vegetation along the cleared section of the stream. The use of heavy equipment for construction would cause compaction of near-surface soils, an effect that could result in increased runoff into waterbodies. The increased runoff could erode stream banks, resulting in increased turbidity levels and sedimentation rates of the receiving waterbody. Impact on water temperatures would be expected to be minimal because of the limited length of stream bank canopy that would be cleared for the pipeline crossing.

Refueling of vehicles and storage of fuel, oil, or other fluids near surface waters may create a potential for contamination due to accidental release. If a spill were to occur, immediate downstream users of the water would experience a degradation in water quality. Acute and chronic toxic effects on aquatic organisms could result from such a spill. Similar adverse effects on water quality could result from the re-suspension of pollutants from previously contaminated sediments during in-stream excavation activities (Macek et al., 1977). The amount of contamination released from resuspended sediments would depend on the existing concentration and on the sorptive capacity of the surrounding sediments. The potential for spills would be reduced by implementation of the SPCC Plan (see section 5.3.1.1 and section V of Millennium's ECS). On December 8, 1999, the NYSDEC issued its section 401 Water Quality Certificate for the Millennium Pipeline Project, which would need to be amended to incorporate the 9/9A Proposal. However, the 401 Water Quality Certificate includes a project-wide condition that Millennium require all contractors involved with stream crossings to have oil booms and other sheen control devices available on site and that the contractors be trained in use of these devices (see condition 5.A and 5.B in appendix IID in Part II of this SDEIS).

Millennium would verify pipeline integrity by hydrostatic testing, which is conducted by pressurizing the pipeline with water and checking for pressure losses resulting from leakage. About 8,780,000 gallons of water would be needed for hydrostatic testing. Withdrawal of test water from streams and rivers could temporarily affect downstream users and aquatic organisms (primarily fish) if the diversion constituted a large percentage of the source's total flow. Impacts could include temporary disruption of surface water supplies, temporary loss of habitat for aquatic species, increased water temperatures, depletion of dissolved oxygen levels, and temporary interruption of spawning, depending on time of withdrawal and current downstream users. In general, these impacts would be minimized by obtaining hydrostatic test water from waterbodies with sufficient flow to supply required test volumes without significantly affecting downstream flow.

Potential impacts resulting from the discharge of hydrostatic test waters into streams and upland vegetated areas would be generally limited to erosion of soils and some subsequent degradation of water quality from increased turbidity and sedimentation. High velocity flows could cause erosion of the stream banks and stream bottom, resulting in temporary release of sediment. Continued erosion of the discharge

area could occur if the discharge area is not properly stabilized with erosion control devices. Such erosion would be minimized by the use of energy dissipation devices, control of discharge velocity, and proper location of water discharge following testing.

Waterbody Construction and Mitigation Procedures

In response to concerns raised by Federal, state, and local agencies regarding the potential environmental impact of construction of pipeline projects in general, we developed our Procedures (see the FERC website at www.ferc.fed.us) to provide a minimum level of protection for surface waters affected by pipeline projects. Applicable waterbodies include any streams or rivers with perceptible flow at the time of crossing and other permanent waterbodies, such as ponds and lakes. During development of the Procedures, we evaluated the effectiveness of various crossing methods (including open-cut and dry crossing methods) in mitigating potential impact on surface waters. The Procedures specify construction windows, in-stream construction duration constraints, sediment control procedures, and various fluming requirements to minimize potential impact from construction while providing an appropriate level of protection for a range of waterbody types. Waterbodies classified by the state as sensitive, high quality, or of exceptional value because of the presence of rare species, scenic qualities, recreational values, or important fisheries may require additional mitigation. Some of the more important aspects of the Procedures are summarized below:

Minor waterbodies (less than or equal to 10 feet wide) supporting coldwater and significant warmwater fisheries would be crossed using a "dry crossing" or flume technique. A dry crossing involves placement of sand bags or other suitable structures in the waterbody channel to funnel stream flow into a flume pipe and past the work area. Trenching is conducted in a dry streambed under the flume pipe, thereby reducing the volume of sediment available for transport. In-stream construction work (except blasting) should be completed within 24 hours.

Intermediate waterbodies (greater than 10 feet wide and less than or equal to 100 feet wide) would be crossed using either a dry crossing or a "wet crossing" (e.g., open-cut trenching) technique in which pipeline installation would be conducted in the water. If a wet crossing is used, in-stream construction work beginning with trenching should be completed within 48 hours unless blasting is required.

Detailed, site-specific construction procedures for crossing each major waterbody (greater than 100 feet wide) would be developed and filed with the Secretary of the Commission (Secretary).

Sediment barriers would be installed and maintained on stream banks immediately after initial ground disturbance adjacent to all waterbody crossings.

All construction equipment (except that used by clearing crews) would be required to cross all minor waterbodies with a state-designated fishery classification, and all intermediate waterbodies, on one of three types of temporary bridge: equipment pads and culvert(s), clean rockfill and culvert(s), or a flexi-float or portable bridge.

All stream banks would be stabilized and temporary sediment barriers would be installed immediately or, if stream bank soils are saturated, within 24 hours of completing the waterbody crossing. Sediment barriers would be maintained at all stream banks until revegetation of the right-of-way has been judged successful.

Grading of stream banks for installation of the pipeline and equipment bridges introduces large areas of disturbed earth near the waterbody that are often left exposed for long periods of time. Typically, streams are crossed using specialized tie-in construction crews that complete the crossing before or after the main pipeline crew. While equipment bridges would need to be installed across the waterbody to allow construction equipment access along the right-of-way, soil exposure can be reduced by limiting grading and clearing activities along stream banks. To minimize the amount of disturbed stream buffer areas before the actual stream crossing, Millennium would limit grading to only the area needed to install the equipment bridge and any temporary work space. Any additional grading to the water's edge would be timed so that grading immediately precedes the actual pipeline trenching and installation process.

The NYSDEC, in its section 401 Water Quality Certificate issued for the project on December 8, 1999, required that Millennium ensure that equipment bridges are constructed so that soil cannot fall into the stream through cracks in the bridge structure. Equipment bridges would be installed and removed within the timing restrictions set forth in the CAS unless a change is approved by the NYSDEC. If an equipment bridge is required at other times, it must span the waterbody. The NYSDEC also required that Millennium restore all stream crossing areas, except for the temporary access roads and at the Hudson River, to pre-existing contours and grades for a distance of 50 feet from the edge of the stream within 24 hours of backfilling the trench.

To allow us to monitor Millennium's implementation of its ECS and our Procedures, our Procedures require Millennium to prepare a schedule identifying when trenching or blasting would occur within each waterbody greater than 10 feet wide or within any coldwater fishery. Millennium has to file this schedule with the Commission. The schedule would be updated to provide at least 14 days advance notice of the crossing, with 48-hour advance notice for any changes within the 14-day period.

We believe that implementation of Millennium's CAS and its ECS, which incorporates our Procedures, would minimize impacts on waterbodies that would be crossed by the pipeline. However, because the water quality of surface waters, including surface water discharges and the dredging and filling of waters of the U.S., is regulated by the COE, EPA, and NYSDEC, further water quality protection measures have been required by the NYSDEC in its section 401 Water Quality Certificate and may be required by other agencies. While the Water Quality Certificate was not issued for the 9/9A Proposal, we expect that the general requirements of the Water Quality Certificate would also apply to it. To construct and operate the proposed facilities, Millennium would obtain all applicable permits and comply with the requirements of these permits. These requirements may include site-specific waterbody construction plans or analysis of water samples for various water quality parameters after hydrostatic testing and before discharge. Section 2.7 contains a more detailed discussion of regulatory requirements for this project.

For further discussion of waterbody construction techniques, see section 2.2.1 in Part II of this SDEIS.

Site Specific Impact

The 9/9A Proposal would cross 31 waterbodies in the Hudson River Basin. Twenty seven of these waterbodies are perennial and 4 are intermittent. In addition, 3 of these waterbodies are tidal (the pond at MP 394.22, the tributary of the Hudson River at MP 395.05, and the Croton River at MP 396.77).

Proposed crossing methods are shown in table 5.3.2-1. The Saw Mill River (MP 411.7) would be crossed using an aerial crossing (e.g., the pipeline would be attached to the existing bridge structure on the bicycle path). The tributary of the Saw Mill River at MP 411.9 would require construction within a relatively high existing embankment along the abandoned railroad right-of-way. The stream currently crosses the

railroad through a culvert at the base of the embankment. Millennium believes that there is sufficient cover over the culvert to install the pipeline entirely within the embankment without the need to disturb either the existing culvert or the waterbody. The remaining waterbody crossings would be constructed using dry ditch construction methods.

The 9/9A Proposal would cross the Saw Mill River, or its tributaries, 11 times between MPs 406.9 and 413.5. The Saw Mill River has a fish consumption advisory due to toxic organics (New York State Division of Water, 1996). The pollution is oil and grease and nonpriority organics. The source is not known but may be due to contaminated sediments. However, the Saw Mill River is not listed in the EPA National Sediment Inventory (New York State Division of Water, 1997). Millennium states that no more than one of these crossings would be under construction at any one time and that it would incorporate this requirement into its CAS.

The crossing of the Croton River (MP 396.8) would be along an abandoned section of State Route 9A, about 600 feet east of U.S. Route 9. This crossing is within the Croton River and Bay Significant Coastal Fish and Wildlife Habitat designated under the New York State Coastal Management Program, is within the FWS's Significant Habitats and Habitat Complexes of the New York Bight Watershed, and is designated EFH under the MSFCMA as part of Haverstraw Bay.

Based upon geotechnical investigations and an engineering evaluation conducted in June 2000, Millennium proposes to cross the Croton River and associated wetland using a horizontal directional drill. This would avoid disturbance of the river, its habitat, and fish and wildlife species using the habitat, and the associated NYSDEC-regulated wetlands along the river. Millennium's site-specific crossing plan shows an approximate 1,500-foot-long drill with the drill rig set up on the south bank along with bentonite storage, frac tank, and associated equipment. The pipe would be staged on the north bank, outside of the Croton River wetlands, and within a grass covered parking area for the Van Cortlandt Manor. (See section 5.10.2 for a discussion of noise associated with directional drilling.)

TABLE 5.3.2-1

Proposed Construction Methods for Waterbodies Crossed by the 9/9A Proposal

Approximate MP	Waterbody Name	Type a/	Crossing Width (feet)	Construction Window	Construction Crossing Method	Equipment Crossing Required
391.6	Trib. Hudson River	P	7	6/1 to 11/30	dam & pump	Yes
392.3	Trib. Hudson River	P	2	6/1 to 11/30	dam & pump	Yes
392.8	Furnace Brook	P	25	6/1 to 11/30	dam & pump	Yes
393.6	Trib. Hudson River	P	2	6/1 to 11/30	dam & pump	Yes
393.8	Trib. Hudson River	I	3	None	dam & pump b/	Yes
394.2	Pond	P	85	6/1 to 11/30	dam & pump	Yes
395.1	Trib. Hudson River	P	2	6/1 to 11/30	dam & pump	Yes
396.8	Croton River	P	290	6/1 to 11/30	directional drill	No
396.9	Trib. Croton River	P	5	6/1 to 11/30	dam & pump	Yes
398.3	Trib. Hudson River	P	3	6/1 to 11/30	dam & pump	Yes
399.3	Trib. Hudson River	P	6	6/1 to 11/30	dam & pump	Yes
399.4	Trib. Hudson River	P	3	6/1 to 11/30	dam & pump	Yes
399.8	Trib. Hudson River	I	9	None	dam & pump b/	Yes
401.4	Trib. Pocantico River	P	8	6/1 to 11/30	dam & pump	Yes
402.6	Pocantico River	P	25	6/1 to 11/30	dam & pump	Yes
402.7	Trib. Pocantico River	P	5	6/1 to 11/30	dam & pump	Yes
406.9	Saw Mill River	P	30	6/1 to 9/15	dam & pump	Yes
407.7	Saw Mill River	P	40	6/1 to 9/15	dam & pump	Yes
408.6	Saw Mill River	P	35	6/1 to 9/15	dam & pump	Yes
409.4	Saw Mill River	P	30	6/1 to 9/15	dam & pump	Yes
409.9	Saw Mill River	P	35	6/1 to 9/15	dam & pump	Yes
410.2	Saw Mill River	P	20	6/1 to 9/15	dam & pump	Yes
410.8	Saw Mill River	P	40	6/1 to 9/15	dam & pump	Yes
411.5	Trib. Saw Mill River	I	4	None	dam & pump b/	Yes
411.7	Saw Mill River	P	45	6/1 to 9/15	aerial	No
411.9	Trib. Saw Mill River	I	3	6/1 to 9/15	lay over culvert	Yes
412.7	Saw Mill River	P	40	6/1 to 9/15	dam & pump	Yes
413.0	Saw Mill River	P	30	6/1 to 9/15	dam & pump	Yes
413.5	Saw Mill River	P	30	6/1 to 9/15	dam & pump	Yes
414.4	Trib. Sprain Brook	P	6	6/1 to 11/30	dam & pump	Yes
414.5	Sprain Brook	P	5	6/1 to 11/30	dam & pump	Yes

a/ P = perennial; I = intermittent
b/ If stream is not flowing at the time of construction, the stream would be open cut.

Directional Drill Contingency Plans

Generally, construction specifications for directional drill construction require that the quantity of excess drilling mud be minimized. Recirculation of the drilling fluid by removal of cuttings would minimize the volume of waste material generated during the drilling operation. Collected surface returns would be processed through a solids control system which would remove spoil from the mud allowing it to be re-used. Mechanical separation would be accomplished using shale shakers, distillers, and desanders. In the drill area, storage containers (tanks) or excavated impoundments would be used for containment of drill cuttings and excess drilling mud for subsequent approved disposal.

Installing the pipeline by directional drilling would avoid direct impact on the waterbody and the associated riparian systems. However, our experience has been that a directional drill can result in the uncontrolled releases of drilling mud into the waterbody or nearby areas through previously unidentified fractures in the material underlying the riverbed. According to its site-specific plan filed for the Croton River, Millennium would install and maintain erosion control devices in accordance with our Procedures.

The environmental inspector would be notified immediately of any uncontrolled releases of drilling mud and would be responsible for completing any required cleanup.

A directional drill can fail for various reasons including failure to complete the pilot hole (the hole opening for the pipe), inability to maintain a stable open hole, loss of the hole opening tool because it becomes lodged or twists off, inability to pull the pipe back through the hole, or loss of drill head which may encounter obstacles during drilling operation that push the drill out of alignment causing it to exit into the waterbody. Millennium has not prepared a contingency open-cut plan for the Croton River. Therefore, we recommend that:

> **Millennium file with the Secretary a contingency plan for the crossing of the Croton River (MP 396.8) in the event the directional drill should be unsuccessful. This should be a site-specific plan that includes scaled drawings identifying all areas that would be disturbed by construction. Millennium should file this plan concurrent with its application to the COE and NYSDEC for a permit to construct using this plan. The Director of Office of Energy Projects (OEP) must review and approve this plan in writing before construction of the alternate crossing plan.**

Public Water Supplies

The 9/9A Proposal would cross the Grassy Sprain Reservoir watershed for approximately 750 feet. According to City of Yonkers officials, the reservoir is no longer used as a source of public drinking water. However, Millennium would install and maintain erosion control devices in this area in accordance with its ECS and our Procedures, and its SPCC Plan. The SPCC Plan includes specific procedures to be implemented in the event of a spill or if refueling must be conducted less than 100 feet from any waterbody. It also includes the requirement to follow local (if available) SPCC Plans, designation of specific equipment refueling areas within the watershed, and identification of spill prevention and response equipment to be maintained at equipment refueling sites.

No public water intakes are located within 3 miles downstream of the 9/9A Proposal (New York State Department of Health, 1982).

Aqueducts

The 9/9A Proposal would cross the Old Croton Aqueduct at MP 397.4; and the New Croton Aqueduct at MPs 401.2, 410.3, and 413.8. The Old Croton Aqueduct is within a protective berm within a stream valley at the crossing location. There is a stream culvert at its base. Millennium proposes to cross the aqueduct and berm using a site-specific crossing plan and would work with the New York SHPO to develop a crossing plan for the associated state park.

Millennium has contacted the New York City Department of Environmental Protection (NYCDEP) about the depth of the New Croton Aqueduct at the three crossing locations. According to correspondence received from the NYCDEP, the aqueduct depths are 95, 40, and 140 feet, respectively (aqueduct station numbers 322+00, 732+00, and 895+00).

Hydrostatic Testing

Millennium identified 4 waterbodies that would be used as source and/or discharge locations for hydrostatic test water. Water would be withdrawn from and discharged to the Hudson River (1,980,000 gallons), Saw Mill River (2,100,000 gallons), Croton River (1,500,000 gallons), and the Sprain Brook

Reservoir (3,200,000 gallons), with some water discharged to the Bronx River. Millennium estimates that about 8,780,000 gallons of water would be required to test the pipeline.

Withdrawal of hydrostatic test water would be done at a rate such that there would be no perceptible change in downstream water levels or flow rates. The NYSDEC section 401 Water Quality Certificate requires that withdrawal may not reduce stream flow by more than 10 percent at the time of withdrawal. Water would be returned to the originating watershed, except for water withdrawn from the Croton River (Hudson River watershed) that would be discharged into the Bronx River (Bronx River watershed). Millennium states that it would develop a plan to treat water before its release into a different watershed, if the NYSDEC determines that the water is contaminated with micro-organisms.

Discharge of Hydrostatic and/or Trench Water

In accordance with our Procedures and its ECS, Millennium would screen all intake hoses and would implement protective measures to minimize erosion during discharge of test-water. If hydrostatic test water is discharged directly into any waterbody, Millennium would acquire all necessary permits before starting this activity. Hydrostatic test water may also be discharged into well-vegetated upland areas and/or through sediment filter devices or sediment traps. In general, these discharges would not take place within 50 feet of waterbodies or wetlands. If it is necessary to discharge within 50 feet of waterbodies or wetlands due to topographic conditions, additional sediment filter devices would be used, as needed, to prevent sediment from entering waterbodies or wetlands.

No chemicals would be introduced into hydrostatic test water. However, methanol may be injected into the pipe to evaporate excess water that may remain after discharge of hydrostatic test water. Millennium states that any excess methanol would be collected and disposed in accordance with applicable state and local regulations. No methanol would be discharged into state waters.

The NYSDEC (in its comments on the DEIS) was concerned that hydrostatic test water discharge and trench dewatering may violate New York water quality standards for temperature. Millennium states that hydrostatic test water should be discharged at or very near withdrawal temperatures since the test procedure itself does not alter water temperatures. Although hydrostatic test water temperature may equilibrate to the temperature of the pipeline during the test, this temperature should be at or near subsurface temperatures at the pipeline depth of 4 to 10 feet.

Millennium's ECS requires that water impounded in the trench would not be released directly or by overland flow into any waterbody or wetland and would be discharged through sediment filter traps or devices. If hydrostatic test water or pumped water from trenches or bore bits must be discharged in such a way as to reach any waterbody or wetland either directly or by overland flow, Millennium would monitor water temperatures in the receiving body to verify that the state's water quality standards for temperature are not violated. We believe these measures would adequately protect New York waters from adverse effects associated with hydrostatic discharge and dewatering.

5.3.3 Wetlands

General Construction and Operational Impacts

The primary impact of pipeline construction and right-of-way maintenance activities on wetlands would be temporary and permanent alteration of wetland vegetation. Construction would also diminish the recreational and aesthetic value of wetlands crossed. These effects would be greatest during and immediately following construction. In emergent wetlands, the impact of construction would be relatively brief, since the

herbaceous vegetation would regenerate quickly. In forested and scrub-shrub wetlands, the impact would be long term due to the extended regeneration period of the vegetative types and maintenance of the right-of-way.

Other types of impacts associated with construction of the pipeline could include temporary changes to wetland hydrology and water quality. Failure to segregate topsoil in wetlands could result in the mixing of the topsoil with the subsoil. This could result in altered biological activities and chemical conditions in wetland soils and could impact the reestablishment of wetland plants. In addition, compaction and rutting of wetland soils could result from the temporary stockpiling of soil and the movement of heavy machinery. This could alter the hydrologic patterns of the wetlands and would result in decreased seed germination and seedling survival. During construction, surface drainage patterns and hydrology could be temporarily altered and there could be an increased potential for the trench to act as a drainage channel. Increased siltation and turbidity may result from trenching activities. Trenching could penetrate or remove impervious soil layers under the wetland and, consequently, drain perched water tables. This in turn could result in drier soil conditions which could inhibit the reestablishment of wetland vegetation. Disturbance of wetlands could minimally affect the wetland's capacity to control erosion and floods.

Wetland Construction and Mitigation Procedures

To minimize the potential environmental impact on wetlands, Millennium would implement the mitigation methods in its ECS during construction and restoration in all jurisdictional wetlands (see appendix E). The ECS incorporates our Procedures and includes the following requirements.

Hazardous materials, chemicals, fuels, and lubricating oils would not be stored within a wetland or within 100 feet of a wetland boundary.

All extra work areas would be located at least 50 feet away from wetland boundaries; if topographic conditions do not permit a 50-foot setback, extra work areas would be located at least 10 feet from the wetland's edge.

Construction equipment operating within the right-of-way would be limited to that equipment necessary for clearing, excavation, pipe installation, backfilling, and restoration activities. All non-essential equipment would use upland access roads to the maximum extent practicable.

Equipment operating within saturated wetlands would operate on wide tracks, balloon tires, timber pads, or prefabricated construction mats.

Temporary erosion controls would be installed immediately after the initial disturbance of soil and would be inspected and maintained regularly until final stabilization. Erosion controls would be installed across the construction right-of-way on any slopes leading into wetlands and along the edge of the construction right-of-way within wetland boundaries.

Vegetation would be cut at ground level, leaving existing root systems in place to promote revegetation. Stumps would only be removed from the trenchline and, if removal is required for safety concerns, along the working side of the right-of-way.

The uppermost 1 foot of wetland topsoil would be segregated from the underlying subsoil in areas disturbed by trenching, except in areas with standing water or saturated soils, or

where no topsoil layer is evident. The topsoil would be restored over the trench after construction is complete.

Within forested wetlands, native trees and shrubs would be planted to restore the temporary and non-maintained right-of-way to preconstruction conditions. See table 2c and figure 25 in the ECS.

Routine vegetative maintenance would be confined to a corridor 30 feet wide, centered over the pipeline. Millennium may selectively remove trees and shrubs within 15 feet of the pipeline that are greater than 15 feet in height. A 10-foot-wide corridor, centered over the pipeline, may be maintained in an herbaceous state. See figure 26 in the ECS.

The wetland crossing procedures in the ECS would be implemented in all jurisdictional wetlands. Construction through wetlands would also comply, at a minimum, with individual section 404 permit conditions. Section 404 of the CWA is administered by the COE for all discharges of dredged or fill material or mechanical land clearing and excavation in waters of the U.S. including wetlands, streams, and navigable waterways.

Section 404(b)(1) guidelines restrict discharges of dredged or fill material where a less environmentally damaging, practicable alternative exists. When unavoidable wetland impacts are proposed, the COE requires that all appropriate and practicable actions be taken to avoid or mitigate those impacts. In order for the COE to determine if appropriate and practicable measures have been taken, Millennium must demonstrate that it has avoided wetland impacts through the selection of the least environmentally damaging practicable alternative and has taken appropriate and practicable steps to minimize wetland impacts, including compensatory mitigation for unavoidable impacts (COE, 1990).

As part of the COE review and permitting process, Millennium may be required to develop a compensatory mitigation plan. Any restoration or compensation plans developed during the permitting process would be filed with the FERC along with agency correspondence. In addition to COE permitting requirements, Millennium has applied for and received its section 401 Water Quality Certificate from NYSDEC (see appendix IID in Part II). The certificate includes a condition that Millennium restore all wetland crossing areas, except for temporary access roads, to pre-existing contours and grades within the wetland and for a distance of 100 feet from the edge of the wetland within 48 hours of backfilling the trench. We believe that these general conditions would also be applied to wetlands affected by construction of the 9/9A Proposal.

In its comments on the DEIS, the DOI suggested that Millennium conduct topographic surveys of wetlands before construction to assist in the final restoration of affected wetlands. Millennium stated that before construction, the existing grade both within and adjacent to the construction work area would be documented. Following construction, Millennium would regrade the construction work area to match the adjacent grade and, any special features noted during the pre-construction survey would be restored. The specifications for adequate restoration require that the final grade be within 6 inches of pre-construction grade. However, we believe that in some wetlands a difference of 6 inches may be significant and could alter the original hydrologic patterns of affected wetlands. Millennium stated that, if wetland areas are not restored appropriately, it would take the necessary steps to correct any problem areas, ensure that affected wetlands are properly graded, and restore the original hydrologic patterns. However, we believe that restoring wetland hydrology during final restoration would be more efficient and potentially less damaging than making repairs later. Access to repair wetland hydrology after restoration could result in destabilizing revegetating portions of the right-of-way. Therefore, we recommend that:

Millennium employ at least one wetland specialist per construction spread. The wetland specialist should be familiar with the existing hydrologic patterns of the affected wetlands within the construction work area and should be present during final grading of these wetlands. The wetland specialist should have the authority to direct any modifications to the final grade, as necessary, to ensure that the original hydrologic patterns of affected wetlands are restored to the fullest extent practicable.

We believe that with Millennium's adherence to these measures, topographic surveys of wetlands would not be required and the hydrologic patterns of affected wetlands would be restored.

Site Specific Impact

Millennium has identified and delineated the boundaries of wetlands along the 9/9A Proposal. Construction of the 9/9A Proposal would temporarily disturb about 3.32 acres of wetlands for the construction right-of-way and extra work areas, including 2 POW wetlands (see table 5.3.3-1). Only one wetland could not be field surveyed because of no landowner access (Wetland W11WCR at MP 414.4). Operation and maintenance of the proposed pipeline would affect a total of about 2.44 acres of wetlands.

TABLE 5.3.3-1

Wetlands Affected by Construction and Operation of the 9/9A Proposal

NWI Classification a/	Number Crossed	Total Length Crossed (ft)	Acreage Affected Temporary b/	Acreage Affected Permanent
PEM	3	1,305	0.33	0.07
PFO	7 c/	2,005	2.49	2.13
POW	2	1,410	0.50	0.24
TOTAL	12	4,720	3.32	2.44

a/ Classification: PEM = palustrine emergent
PFO = palustrine forest
POW = palustrine open water

b/ Construction impacts based on a 75-foot-wide construction right-of-way and the extra work areas. Permanent impacts based on the operational right-of-way widths identified in the cross-sections in appendix C.

c/ Two wetlands are composites of other wetland classifications (see table 4.3.3-1).

All 12 of the affected wetlands would be crossed along segments of the 9/9A Proposal that are adjacent to highway, road, and/or bicycle paths. These include 4 forested wetlands (Wetlands W08WCR, 160 feet; W10WCR, 160 feet; W03WCR, 65 feet; and W11WCR, 490 feet), and 2 forested/emergent wetlands (Wetlands W06WCR, 860 feet; and W02WCR, 135 feet). Total avoidance of these wetlands would require moving construction related impacts into adjacent residential areas or upland forested areas, thus eliminating many of the advantages of partial use of existing utility and transportation corridors. Millennium states that it evaluated several alternatives for the alignment of the 9/9A Proposal in Westchester County in an attempt to avoid wetland impacts. In many cases, wetlands have formed at drainage blocks and within man-made drainageways along the various transportation corridors considered. The alignment of the 9/9A Proposal was chosen to take advantage of the existing corridors and to minimize the creation of new right-of-

way through a densely populated area. Therefore, alternatives that totally avoided wetlands while maximizing use of existing transportation corridors and avoided existing development were limited. We found no alternatives that offered a clear environmental advantage over the proposed route.

Millennium attempted to avoid locating temporary work areas (other than the construction right-of-way) within 50 feet of wetlands and waterbodies to the greatest extent possible. However, there are two locations (MPs 401.37 and 401.41) where temporary work areas would be within 50 feet of wetlands and/or waterbodies. At these locations, Millennium states that topographic conditions or existing facilities preclude moving the additional work space out of the wetlands. Millennium would minimize impacts at these locations by maintaining at least 15 feet of undisturbed vegetation adjacent to the wetland and waterbody and installing a sediment filter device at the edge of the construction work area prior to clearing. Site-specific details concerning temporary work areas would be included on the CAS.

The 9/9A Proposal would also cross the buffer zones of five NYSDEC regulated wetlands: Wetland H-3 at MP 396.3, Wetland O-18 at MP 400.0, Wetland O-24 at MP 400.5, Wetland O-16 at MPs 402.2 and 402.8, and Wetland O-9 at MP 402.5. Since these wetlands would not be affected by construction and Millennium's ECS requires that sediment barriers be installed along the edge of the construction work area as necessary to prevent sediment flow into adjacent wetlands, there would be no significant impact on these wetlands.

5.4 FISHERIES AND WILDLIFE RESOURCES

5.4.1 Fisheries Resources

General Construction and Operational Impacts

Potential impacts to streams from pipeline construction have been widely studied. These studies have generally indicated that impacts on coldwater and warmwater streams are temporary with no long term adverse effects on water temperature, pH, dissolved oxygen, benthic invertebrate populations, or fish populations (Vinikour et al, 1987, Reid and Anderson, 1998). The studies indicate that in-stream total suspended solids (TSS) concentrations increase during construction, but decrease after construction activities are completed.

Impact on fishery resources, such as sedimentation and turbidity, acoustic shock, destruction of stream cover, introduction of water pollutants, or entrainment of fish, could result from construction activities. To minimize these potential impacts, Millennium would adhere to the protective measures outlined in its ECS, which incorporates our Procedures. In addition to these protective measures, other Federal, state, or local agencies may require Millennium to follow more stringent procedures (see appendix IID, the NYSDEC's section 401 Water Quality Certificate).

Sedimentation and Turbidity

Increased sedimentation and turbidity from construction have the greatest potential to adversely affect fishery resources. However, impact on fisheries from construction-induced sedimentation and turbidity would be reduced to short-term, temporary disturbances if the measures contained in the ECS and Procedures are followed. These include the following requirements.

> Construction of stream crossings would be limited to the period of June 1 through September 30 for coldwater fisheries, unless otherwise permitted or further restricted by state agencies. In New York, the NYSDEC has recommended a June 1 through September

15 construction window for most coldwater fishery crossings. Construction of stream crossings for warmwater fisheries would be limited to the period of June 1 through November 30. This restriction would minimize sedimentation and turbidity induced by seasonal high flow volumes and avoid or limit impact on fish spawning activities that may occur at or downstream of crossing areas.

Trench spoil from minor and intermediate waterbody crossings would be stored in upland areas at least 10 feet from the streambanks and would be protected with silt fence, hay bales, or other erosion control devices that would prevent or reduce sediment runoff from entering the stream.

The use of directional drilling or dry-crossing construction techniques would eliminate most of the potential for construction activities to increase sedimentation and turbidity in waterbodies. Standard wet-crossing (open-cut) techniques could elevate the concentration of suspended solids, but the elevated levels would be relatively high for only short periods and short distances downstream of the crossing. Overall, the impact of construction on benthic macroinvertebrates and fish would be minimal and short term. Increased suspended sediment concentration levels during construction could increase invertebrate drift and reduce fish feeding for brief periods. However, Millennium is required by our Procedures to complete most in-stream work in less than 48 hours at each individual stream. Therefore, impact would be temporary, and suspended sediment concentrations would return to background levels soon after construction in each stream is completed.

Turbidity resulting from suspension of sediments during in-stream construction or erosion of cleared right-of-way areas could reduce light penetration and photosynthetic oxygen production. Additionally, resuspension of organic and inorganic materials can cause an increase in biological and chemical uptake of oxygen, resulting in a decrease in dissolved oxygen. Ponds, lakes, reservoirs, and slow-moving streams that have thick organic sediment deposits often experience a decrease in oxygen at the sediment-water interface, particularly during the summer months when bacterial respiration is high and chemical oxidation is greatest (Wetzel, 1983). Resuspension of this type of sediment could result in localized depletion of oxygen throughout the water column, which could temporarily displace fish from the affected area. As previously mentioned, warmwater fishes have survived short-term TSS concentrations of between 20,000 and 100,000 milligrams per liter.

Acoustic Shock

Some stream crossings may require blasting of bedrock, which, due to acoustic shock, could be harmful to fish in the immediate vicinity of the explosion. The degree of impact would depend on the type of explosive, blasting technique, fish species, and timing. Teleki and Chamberlain (1978) conducted experiments on the survival of various species following detonation of charges placed in bedrock or mud of a lake bottom. Based on data presented by Teleki and Chamberlain (1978), laterally compressed fish (e.g., bluegill) were the most sensitive to blast-related acoustic shock and would suffer 95 percent mortality within 213 feet of the detonation, decreasing to 10 percent mortality at 472 feet of the detonation. The least sensitive fish were those with more evenly rounded body forms (e.g., suckers, trout) which would suffer 95 percent mortality within 174 feet of the blast, dropping rapidly to 10 percent mortality at 194 feet. Teleki and Chamberlain (1978) suggest that active construction in the stream area (i.e., drilling for the blast charges) would scare most fish out of the area prior to construction.

Millennium would use scare charges in streams with important fisheries if recommended by the state. The NYSDEC, in its section 401 Water Quality Certificate, requires that blasting in any waterbody be conducted only during the time periods identified in the CAS and that all blasting be conducted using

inserted delays of a fraction of a second per hole and stemming (e.g., rock is placed into the top of the bore hole to damp the shock wave reaching the water column, thereby reducing fish mortalities from blasting). Further, the NYSDEC requires that sonar be used, where requested by the NYSDEC regional habitat protection manager, to detect the presence of fish. In these instances, either the regional habitat protection manager or a qualified fishery biologist would verify the presence or absence of fish. No blasting would be allowed during passage of schools of fish.

Cover Loss

Streambank vegetation, in-stream logs, rocks, and undercut banks provide important cover for fish. Some in-stream and shoreline cover would be altered or lost at the stream crossings and fish that normally reside in these areas would be displaced. However, these effects would be relatively minor because of the small area affected at each stream. In addition, the Procedures limit vegetation maintenance on streambanks and allow for long-term revegetation of all shoreline areas with native herbaceous and woody plant species, except for a 10-foot-wide corridor over the pipeline.

Other Impacts

Other potential effects of construction include interruption of fish migration and spawning, entrainment of fish, and mortality from toxic substance (fuel) spills. Entrainment of fish during hydrostatic testing would not likely occur during withdrawal of water, since intakes would be screened as required by the Procedures. However, fish larvae, eggs, and young-of-the-year could be entrained if present in the source water. The timing restrictions in our Procedures and those of the NYSDEC are designed to minimize this likelihood since construction activities are largely restricted to times outside of fish spawning periods.

Direct spills into streams could be toxic to fish, depending on the type, quantity, and concentration of the spill. To reduce the potential for direct surface water contamination, Millennium would refuel equipment and store fuel and other potentially toxic materials at least 100 feet from waterbodies or would implement the special precautions outlined in its SPCC Plan.

Site Specific Impact

The 9/9A Proposal would involve 11 crossings of one trout stream: the Saw Mill River and its tributaries (see table 4.3.2-1). Special largemouth and smallmouth bass regulations apply to 27 of the waterbody crossings. Millennium would use dry construction techniques (e.g., dam and pump) for these crossings and would cross warmwater streams only between June 1 and November 30 and coolwater streams between June 1 and September 15 (see table 5.3.2-1).

The 9/9A Proposal would cross the Croton River within the area designated as the Croton River and Bay Significant Coastal Fish and Wildlife Habitat by the NYDOS, as Significant Habitats and Habitat Complexes of the New York Bight Watershed by the FWS, and as a component of the Haverstraw Bay/Lower Hudson River designated EFH by the NMFS. This area is a productive year-round habitat for resident fish species and serves as a resting, foraging and nursery area for estuarine and migratory species. It is identified as an important local fishery for striped bass, and is reported as being important for largemouth bass, alewife, blueback herring, and carp. However, the Croton River and Bay have been subjected to considerable habitat disturbances, including filling of wetlands for waste disposal, discharges of stormwater runoff, and industrial and residential development. Millennium plans to cross the Croton River and tidal wetlands with a horizontal directional drill. A successful directional drill would avoid direct impacts to the river, as well as the associated EFH and tidal wetlands (see section 5.3.2).

5.4.2 Wildlife Resources

General Construction and Operational Impact

Construction and operation of the 9/9A Proposal would result in temporary and permanent alteration of wildlife habitat, as well as direct impact on wildlife including disturbance, displacement, or mortality. The clearing of right-of-way vegetation would reduce cover, nesting, and foraging habitat for some wildlife. During construction of the proposed facilities, the more mobile species would be temporarily displaced from the construction right-of-way and surrounding areas to similar habitats nearby. Some wildlife displaced by construction would return to the newly disturbed area and adjacent, undisturbed habitats soon after completion of construction. Less mobile species, such as small mammals, reptiles, and amphibians could be killed or injured by construction activities. Routine maintenance activities on the permanent right-of-way could have similar but less extensive effects on wildlife species in the area, depending on the time of year. However, the overall impact to wildlife would not be significant because of the short duration of the disturbance and availability of undisturbed similar habitats adjacent to the right-of-way from which the affected species could return and recolonize the disturbed right-of-way.

In forested areas, the principal impact on wildlife of the increased or new right-of-way clearing would be a change in species using the right-of-way from those favoring forest habitats (e.g., northern flying squirrel, barred owl, downy woodpecker) to those using edge habitats or more open areas (e.g., white-tailed deer, European starling, white-footed mouse). Many predators adapt well to this habitat reversal and may take advantage of the increased populations of small mammals that prefer open areas. The red-shouldered hawk, coyote, and gray fox commonly use utility rights-of-way for hunting.

Although the project may be advantageous for some species, it would create new cleared right-of-way or widen existing cleared rights-of-way, which may affect some forest interior species, or species that prefer large tracts of unbroken forest. The breeding success of some forest interior bird species (e.g., warblers and thrushes) has been shown to be limited by the size of available unbroken forest tracts (Robbins, 1979; Robbins, et al., 1989). For these species, additional loss of forest habitat in tracts of already marginal size could further reduce breeding success. The cleared rights-of-way may also encourage population expansion of parasitic species, such as the brown-headed cowbird which parasitize songbird species. The potential for this type of impact would be greatest where the pipeline would traverse smaller, isolated woodlots (Galli, et al., 1976). It may also encourage population expansion of exotic species, such as the house sparrow and European starling, which compete with many native species.

The loss of forest habitat and the creation of open early successional and induced edge habitats in these woodlots could decrease the quality of habitat for forest interior species for distances up to 300 feet from the right-of-way (Anderson, et al., 1977; Temple, 1986). This may reduce the density and diversity of forest interior species in a corridor much wider than the actual cleared right-of-way. It is not likely that a permanently cleared 50-foot-wide right-of-way would impede the movement of most forest interior species, although it could reduce the breeding habitat of these species. However, the proposed route would be within or adjacent to existing cleared rights-of-way for about 88 percent of its total length on land, minimizing the impact related to forest fragmentation.

Non-forested habitats that would be affected by construction and operation of the proposed facilities include agricultural areas, non-forested wetlands, open land, and open water. The impact of the proposed project on these habitats and associated wildlife species would be relatively minor and short-term. The temporary alteration of these areas would not have a significant or permanent impact on their wildlife habitat values.

Numerous wetlands and riparian systems would be crossed by the pipeline. These areas are important as year long habitats for resident wildlife species and are used seasonally as stopovers for migrating waterfowl along migratory flyway routes. Disturbance to these habitats would be minimized through implementation of our Procedures, and except for the conversion of forested riparian and wetland vegetation to herbaceous vegetation within the right-of-way, there would not be a permanent impact on these habitats.

To minimize the potential impact on migratory bird species that may use the permanent right-of-way for nesting, Millennium would limit routine vegetation maintenance of the right-of-way to once every 3 years. However, to facilitate periodic corrosion and leak surveys, a corridor not exceeding 10 feet in width centered on the pipeline may be maintained annually in a herbaceous state. In no case would routine vegetation maintenance clearing occur between April 15 and August 1 of any year.

Site Specific Impact

Short-term impacts on wildlife resources are expected to be minimal. Construction of the 9/9A Proposal would not significantly alter the urban/suburban character of the land. Long-term loss of habitat would be minimal, since construction would occur along and/or adjacent to existing corridors for 88 percent (22.4 miles) of the proposed route, and only 138.0 acres of new permanent right-of-way would be required, most of which is within paved surfaces.

Long-term impacts associated with operation of the 9/9A Proposal would include the loss of approximately 22.1 acres of upland and wetland forest habitat. Of this total, approximately 18.4 acres would be within the permanent right-of-way. The remaining 3.7 acres would be temporary work space and would be allowed to revert to forest following the completion of construction.

Since most of the 9/9A Proposal would be within or adjacent to existing right-of-way, impacts on neotropical migrant birds due to loss of forest interior habitat would be minimized. Since the Croton River and associated wetland would be directionally drilled, there would be minimal impacts on this habitat and its use by migrating waterfowl.

5.5 VEGETATION

General Construction and Operational Impact

The primary impact on vegetation would be the temporary and permanent alteration of vegetative cover on the right-of-way. Where necessary, the construction right-of-way would be cleared of vegetation and then graded to create a level and safe working surface for construction equipment. Forest vegetation in upland areas would be cut at ground level and stacked along the edge of the right-of-way (with landowner approval) or removed to an approved disposal site. Stumps would be removed as needed to maintain a level work surface and either cut flush with the ground using a stump grinder or disposed of by: burying in non-agricultural, -wetland, or -residential areas; windrowing along the construction work area, or hauling to an approved landfill (see section II.D.1 of the ECS). Slash and other vegetative debris would be disposed of in accordance with section II.C.1 of the ECS (also see section 2.3.1 of this SDEIS) and generally would be stockpiled adjacent to the construction work area (but not within 50 feet of streams, floodplains, or wetlands), burned, or chipped. Brush would be burned only if permitted by local regulations.

Following installation of the pipeline and recontouring of the rights-of-way, all disturbed areas would be reseeded. The rate of revegetation would depend on several factors, including local climate, soil type, vegetation maintenance practices, land use, and the existing and seeded vegetation.. The amount of time

required for complete recovery of vegetation to preconstruction levels would depend on these factors as well as the size and age of the preexisting vegetation when cleared. All temporary work areas would be allowed to revegetate naturally to preconstruction conditions following initial seeding. The permanent right-of-way in upland areas would be maintained free of woody vegetation for the life of the project. Wetlands would have a 10-foot-wide corridor, centered on the pipeline maintained in a herbaceous condition.

The relative impact of clearing would be greatest in forested areas since the removal of trees would result in the greatest change in the structure and environment of the vegetative community. Moreover, the effect of clearing would be of longer duration in forested areas than in other areas (e.g., open land) and, in the case of maintained (permanent) right-of-way, would be for the life of the project. In temporary work areas where forest regeneration would be allowed following construction, the reestablishment of forest to preconstruction conditions would probably take between 25 and 150 years. In contrast, the reestablishment of open land following construction would probably take 1 to 2 years.

Site Specific Impact

A total of approximately 22.1 acres of forest would be cleared for construction of the 9/9A Proposal. Of this total, about 18.4 acres of forest would be maintained clear of forest vegetation for operation of the pipeline. Millennium is presently coordinating with the Westchester County Parks Department concerning mitigation for clearing of forested areas in county parks during construction. In general, Millennium plans to preserve large trees wherever possible by working around them. In addition, Millennium plans to preserve trees that screen residences along U.S. Route 9 and State Route 9A by narrowing the construction work area (which typically extends about 23 feet beyond the edge of the pavement) as necessary to avoid extensive tree clearing (see discussion in section 5.7.5).

5.6 ENDANGERED AND THREATENED SPECIES

General Construction and Operational Impact

The general construction and operational impacts of the project as discussed in sections 5.4.1, Fishery Resources, and 5.4.2, Wildlife Resources, also apply to endangered and threatened fish and wildlife species. However, because the distribution and abundance of endangered and threatened species are limited, any impact could affect the size or viability of these populations. Habitat availability is believed to be the primary limiting factor of some endangered or threatened species. Therefore, the loss or alteration of suitable habitat could contribute to the decline of some species populations. Specific potential effects of the project on endangered and threatened species and their habitats are discussed in the following section.

Adverse impacts on federally listed species are considered significant and could require additional mitigation if project construction or operation would result in:

direct mortality of an individual of a listed species;

loss of existing or proposed critical habitat; or

temporary alteration or loss of habitat that could result in avoidance by a listed species or that could cause increased mortality or lowered reproductive success.

The applicant, as a non-Federal party, has consulted informally with the FWS and NMFS regarding the presence of federally listed or proposed species in the project area. Based on this consultation, it has been determined that four Federal or state listed endangered or threatened species could possibly occur in

the vicinity of the project area. These species are the Federal and state threatened bald eagle and endangered shortnose sturgeon, the state threatened least bittern, and the state endangered Torrey's mountain mint.

Three of these species (the bald eagle, shortnose sturgeon, and least bittern) potentially occur only in the vicinity of the Croton River. Since the Croton River and associated wetland would be directionally drilled, there would be no impact on these three species or their habitat. The fourth species (Torrey's mountain mint) is known to occur in dry, rocky woodlands and meadows over ultramafic or calcareous rock, a rock characteristically high in iron and manganese that produces a reddish cast overlying soils. Although Torrey's mountain-mint was not observed during field surveys in May and June, 2000, Millennium completed a survey by a qualified botanist for Torrey's mountain mint at appropriate locations along the 9/9A Proposal in July 2000 when the mint would be in bloom and easiest to identify. No Torrey's mountain-mint was found.

On January 17, 2001, we issued a biological assessment (BA) for the entire project to determine whether the proposed project would affect federally listed threatened or endangered species. The conclusions of the BA are incorporated herein by reference.

We believe that with implementation of the proposed mitigation, there would be no impact on Federal or state threatened or endangered species along the 9/9A Proposal.

5.7 LAND USE, RECREATION/PUBLIC INTEREST AREAS, AND VISUAL RESOURCES

5.7.1 Land Use

General Construction and Operational Impact

Land use impacts would generally result from the clearing of land for the installation of the pipeline, associated facilities (e.g., MLVs), and from the maintenance of the pipeline right-of-way and facilities. Temporary work areas would be required in areas of steep side slopes; for crossings of major rivers, streams, wetlands, roadways, and railroads. Pipe storage/contractor yards in open or industrial areas would be leased for the centralized storage of equipment and materials in areas that are convenient to the pipeline and existing rail and highway transportation routes. Access to the construction sites would be from existing paved public roads, temporary access roads, and the construction right-of-way. See section 5.7.4 for discussion of impacts on the existing transportation system.

Forest clearing and clearing on the shoulders of roads during pipeline construction would represent a long-term impact since these areas would be converted to cleared, open land. Although forest cleared within the temporary construction right-of-way would be allowed to revegetate, revegetation to preconstruction conditions could take many years depending on the type of tree cleared.

Following construction, all land used for the temporary construction right-of-way and extra work areas would revert entirely to prior use and the operational right-of-way would be maintained in a generally grassy condition, except as otherwise specified in the ECS or our Procedures (see appendix E and www.ferc.fed.us, respectively). Although most land uses would be allowed to continue within the operational right-of-way, certain types of use, such as construction of aboveground structures (e.g., house additions, garages, barns, patios, or pools) or the planting and cultivation of trees or orchards, would be prohibited. Some landowners may also consider the necessary inspection and maintenance activities to be a nuisance.

Right-of-Way Easement

An easement would be used to convey right-of-way to the pipeline company. The easement gives the company the right to construct, operate, and maintain the pipeline in the right-of-way, and in return compensates the landowner for the use of the land. The easement negotiations between the company and the landowner would also include compensation for loss of use during construction, loss of nonrenewable or other resources, damage done to property during construction, and allowable uses of the right-of-way after construction.

If an easement cannot be negotiated with the landowner and the project has been certificated by the Commission, the company may use the right of eminent domain granted to it under section 7(h) of the NGA and the procedure set forth under the Federal Rules of Civil Procedure (Rule 71A) to obtain the right-of-way and extra work areas identified in the Certificate. The company would still be required to compensate the landowner for the right-of-way, and for any damages incurred during construction. However, the level of compensation would be determined by a court according to state law once the FERC issues a certificate. In either case, Millennium would compensate landowners for the use of the land. Generally, Millennium would be acquiring right-of-way withing existing rights-of-way. Special permits would be obtained as needed for pipeline crossings of roads, railroads, and streams, as well as for pipeline right-of-way through town, state, or Federal lands.

Complaint Resolution

To monitor implementation of construction procedures and mitigation measures, we plan to require Millennium to file weekly status reports that include a description of landowner/resident complaints and how these complaints were addressed or resolved. In addition, issues or concerns can be reported directly to the FERC enforcement hotline [(877) 303-4340] for followup during FERC staff inspections. However, to ensure that all affected landowners would know who to contact when they have questions or problems with pipeline construction or restoration, we recommend that:

Prior to construction, Millennium establish an environmental mitigation complaint resolution procedure that would be in place throughout construction and restoration of the 9/9A Proposal. Millennium should send a letter to each landowner informing them about the complaint procedure. The complaint procedure should:

a. include a local Millennium contact (and telephone number) and a "hotline" contact (and toll-free telephone number);

b. indicate how long it would take after complaints/inquiries are made for Millennium to respond; and

indicate that the response will inform the caller how and when problems were or would be resolved.

Landowners should also be informed that if Millennium does not resolve reported problems, then the landowner should call the FERC Enforcement Hotline [(877) 303-4340].

Site Specific Impact

Using the typical right-of-way cross-sections shown in appendix C and the extra work areas listed in appendix D, construction of the 9/9A Proposal would affect a total of 136.2 acres of land comprising 58.0 acres of industrial/commercial land, 34.3 acres of open land, 22.1 acres of forest, 21.4 acres of other mixed land, 0.2 acre of residential land, and 0.2 acre of water. In its original application, Millennium identified one 0.5 acre site at MP 407.0 in Westchester County that would be used for a pipe storage/contractor yard. Operation would affect an estimated 138.0 acres of land, slightly more than during construction to allow for maintenance of the full 50-foot-wide permanent right-of-way in areas where the full width of the easement was not used during construction.

A number of commenters were concerned that construction or operation of the pipeline within State Route 9A would interfere with the emergency evacuation route for the Indian Point Nuclear Power Plant. The current designated evacuation route includes the southbound lanes of U.S. Route 9 and State Route 9A. We received a comment from the Program Specialist, Radiological Emergency Preparedness Branch, of the Federal Emergency Management Agency (FEMA) about the proposed construction within and adjacent to the southbound lane of State Routes 9A/100 (MPs 401.6 to 404.0). The FEMA stated that it would require detailed construction drawings to evaluate the impact of construction on the evacuation route and that a contingency plan would need to be developed with county and local governments to minimize adverse impacts on the federally approved Radiological Emergency Preparedness Plan (FEMA, 2001). In addition, any alternate routes identified in the Contingency Plan, as well as the potentially degraded capability of the established evacuation route, must be reviewed by professional traffic engineers at FEMA.

If an adequate plan for traffic flow cannot be developed because of the effect the proposed construction would have on traffic in this area, the Contingency Plan may conclude that the Indian Point Power Plant should not be operated during construction within some or all of these roadways. We recommend that:

> **Millennium should consult with and assist FEMA with the development of a Contingency Plan for the emergency evacuation route for the Indian Point Nuclear Power Plant. Prior to construction, Millennium should file with the Secretary all correspondence with FEMA and the final Contingency Plan.**

The 9/9A Proposal would be constructed adjacent to and within the northbound lane and east shoulder of U.S. Route 9 and State Route 9A between MPs 391.8 and 392.6, MPs 392.9 and 394.2, and MPs 397.0 and 401.3. Both southbound lanes of these roads would remain unaffected throughout construction except for blasting. However, Millennium would install the pipeline within and adjacent to State Routes 9A/100 for about 2.4 miles between MPs 401.6 and 404.0. While construction would include one of the southbound lanes in some areas, most construction would be along the bicycle path, thereby minimizing impact on one of the southbound lanes (see additional discussion in section 5.7.4).

Coastal Zone Management Consistency

The 9/9A Proposal would be within the coastal zone of New York, from the segment along the Hudson River in the vicinity of the Village of Croton on Hudson to about 1 mile south of the Croton River, between MPs 391.2 and 397.4. On June 27, 2000, Millennium filed a certification with the NYSDOS that the 9/9A Proposal would comply with the State's CZM Program, or the applicable approved Local Waterfront Revitalization Program, and requested a determination of consistency with the State's CZM Program. A detailed discussion of CZM consistency for the entire Millennium Pipeline Project is provided in Part II (see section 2.3) of this SDEIS, and the materials Millennium submitted with its certification filing are included

in Part II, appendix IIF. The discussion includes three areas in the coastal zone (the vicinities of the Lake Erie and Hudson River crossings, and the vicinity of the Village of Croton on Hudson for the 9/9A Proposal).

ConEd Powerline Easement

The 9/9A Proposal would require five crossings of the ConEd powerline right-of-way (MPs 402.7, 405.5, 406.9, 409.7, and 416.6). The 9/9A Proposal would also parallel the ConEd right-of-way between MPs 402.7and 405.4 where pipeline construction would be between State Routes 9A and 100 and the powerlines (MPs 402.7 to 404.0) and within the Briarcliff-Peekskill Trailway adjacent to the powerlines (MPs 404.0 to 405.4). Mitigation measures for locations where the 9/9A Proposal would be near the ConEd's facilities are included in the MOU developed between the PSCNY and Millennium (see appendix F). This MOU identifies construction and operation procedures and design specifications that Millennium would use in locations where the pipeline would be adjacent to or cross the ConEd powerline facilities and where the pipeline would be within 1,500 feet of the ConEd powerline corridor. Issues associated with construction and operation of the pipeline along the ConEd powerline corridor were central to the identification of the 9/9A Proposal and remain an issue. See section 6.1.2 for discussion of the ConEd and PSCNY concerns and our analysis of them.

5.7.2 Residential and Commercial/Industrial Areas

General Construction and Operational Impact

In residential areas, the two most significant impacts associated with construction and operation of a pipeline are disturbance during construction and the limitation on future residential or other permanent structures on the right-of-way. Since residences adjacent to the construction work areas would be most affected, we identify residences within 50 feet of the construction work areas to determine the degree of impact and the appropriate mitigation.

Temporary construction impact in residential areas could include: inconvenience caused by noise and dust generated by construction equipment, personnel, and from trenching of roads or driveways; ground disturbance of lawns; removal of trees, landscaped shrubs, or other vegetative screening between residences and/or adjacent rights-of-way; potential damage to existing septic systems or wells; and removal of aboveground structures, such as sheds or trailers, from the right-of-way.

With typical overland pipeline construction, the trench is often excavated before pipe stringing, welding, and installation. This practice results in trenches that remain open for extended periods of time, which can pose a safety hazard to nearby residents. Impacts in residential areas can be reduced by locating the pipeline at a greater distance from the residence, by using specialized construction practices, and by reducing the amount of time the trench remains open in the vicinity of residences.

Construction practices used to minimize disruption in residential areas include reducing work space requirements, reducing the size of work crews and equipment, increasing the use of temporary safety fencing, avoiding the removal of trees, and minimizing the length of time that the trench is left open. Specialized residential construction techniques include sewer-line and drag-section construction techniques (see section 2.3.2 for a description of these techniques). Either technique would limit the amount of land required for construction and the time the trench is left open in the vicinity of the affected residences.

Some commercial/industrial land would be affected by construction of the pipeline and aboveground facilities. Impact on these areas would include temporary impact during construction when activities could cause disruption, inconvenience, and loss of potential revenues, and permanent or long-term impact as a

result of the limitation of some future uses of the operational right-of-way. Temporary impact can be minimized either by providing access across the construction right-of-way during construction or by timing construction activities to avoid peak business periods. Permanent impact can be minimized by following existing rights-of-way and by locating the pipeline with consideration of future planned developments.

Site Specific Impact

Millennium identified four residences and 33 businesses that would be within 50 feet of the construction work area (see table 4.7.2-1). All four residences are adjacent to State Route 9A where the pipeline would be installed on the east edge of the roadway between MPs 399.8 and 400.8. Where possible, Millennium has reduced the construction work area or relocated the pipeline to be more than 50 feet from residences. For areas where construction would be within 50 feet of a residence, Millennium would attempt to avoid removal of mature trees and landscaping; would install temporary fencing along the edge of the construction work area within 100 feet of the residence or backfill the trench on the same day; and would restore the construction work area in the vicinity of the residence as soon as possible. There are no instances where construction would be within 25 feet of a residence. See section 5.7.5 for discussion of visual impacts and section 5.10 for discussion of air and noise impacts.

For all areas where businesses or commercial land uses would be within 50 feet of the construction work area, Millennium proposes to implement the same mitigation measures as for residential properties described above. However, several commercial landowners were concerned about the location of the pipeline on their properties in light of future development.

The 9/9A Proposal would cross the Metro North Commuter Railroad Company (Metro North) railroad at MPs 391.6, 394.3, 395.4, 420.3, and 421.1, and would parallel Metro North's facilities between MPs 394.3 and 395.4. The crossings at MPs 395.4, 420.3 and 421.1 would involve an electric rail, and the pipeline would parallel electric rail facilities between MPs 395.0 and 395.4. Metro North was concerned about the safety of its facilities. Millennium states that the safety precautions that would be used to construct beneath the electrified railroad tracks are similar to those used for "normal" railroad crossings. The principal difference is the need for increased awareness regarding worker safety and the proximity of the aboveground, electrified third rail. Millennium would erect construction fencing around the work area before construction activities begin and would post appropriate warning signs. Millennium would also comply with any relevant worker safety and other construction specifications that Metro North may have to ensure that the construction contractor is well aware of the worker safety concerns. Millennium is also in the process of working with Metro North to develop detailed crossing plans and drawings for each crossing. Millennium would file the detailed plans and design drawings with the Commission once they are completed.

Millennium met with the Coca Cola Bottling Company of New York (Coca Cola) in November 2000 to discuss alternative routes across its property (approximate MP 407.8) in conjunction with its re-evaluation of the pipeline route across the LCOR Asset Management L.P. and Eastview Holdings L.L.C. (LCOR/Eastview) property in Greenburgh (see discussion below). Millennium is currently evaluating a route variation that would accommodate LCOR/Eastview's concerns and avoid the area where Coca Cola indicates that it plans to expand its warehouse. This route variation would only affect these two properties. Coca Cola confirmed that the alternative route would not affect its planned development. Although the Town of Greenburgh engineer is aware of discussions regarding a building proposal on the Coca Cola property, to date no formal submission has been made to the planning board.

Millennium met with LCOR/Eastview officials in June 2000 regarding potential routes across their property (approximate MP 408.2) and filed the route that they recommended. Millennium met with LCOR/Eastview officials again in August and September 2000 to re-evaluate the filed route. Millennium

also consulted with the Town of Greenburgh engineer and was informed that LCOR/Eastview currently has a project under review with the planning board consisting of construction of two science buildings and a parking lot. Millennium met again with LCOR/Eastview officials in November 2000 to develop another route across this property. LCOR/Eastview officials are reviewing this route variation and will provide comments in the near future. Millennium will file the route variation with the Commission when it has been finalized.

As part of the development of route variations across the Coca Cola and LCOR/Eastview properties, Millennium contacted the NYSDOT on November 9, 2000, regarding proposed projects along State Route 9A in Westchester County. The NYSDOT has prepared a Draft Expanded Project Proposal (July 2000) that describes seven alternates to modify State Route 9A north of Elmsford (MP 409.9). Some of the alternates affect the LCOR/Eastview property and some affect the Coca Cola property. Millennium was informed that construction is currently planned for 2006, if at all. During its discussions in November 2000 with LCOR/Eastview, Millennium discussed the various routes since some of the highway routes may present an opportunity for the pipeline alignment through the area. However, since the final highway routing has not been established, it is impossible to describe exactly how these routes would affect the location of the 9/9A Proposal route at this time.

Millennium contacted Charles J. Persico on September 14, 2000, regarding potential routes across his property (approximate MP 408.7). At that time, Mr. Persico suggested a route variation along a public street adjacent to his property. Millennium has investigated this route variation and recommends that it be adopted (see discussion in section 6.2.2).

Millennium contacted Ardsley Partners on June 26, 2000, regarding potential routes across its property (approximate MP 414.2). At that time, Millennium believed that it had reached an agreement to install the pipeline along existing utility lines and along the property line at the back of the Ardsley Partners' property. Millennium met again with Ardsley Partners on November 13, 2000, and confirmed that the existing alignment is satisfactory. Millennium also confirmed that this alignment would accommodate any future development plans. At this time, Ardsley Partners does not have any new development plans on file with any agency.

Millennium was also informed by the Village of Briarcliff Manor that a possible highway ramp may be developed between State Route 9A and the Taconic Parkway (approximate MP 402.5). Based on conversations with the NYSDOT, this project has not reached a planning stage and can not be incorporated into the routing of the 9/9A Proposal. However, Millennium should consider this possible highway ramp since it may affect pipeline routing. Therefore, we recommend that:

> **Millennium coordinate with the NYSDOT as much as possible about the pipeline siting with respect to a potential ramp location near MP 402.5 and file any correspondence or plans developed with the NYSDOT with the Secretary prior to construction.**

5.7.3 Recreation and Public Interest Areas

General Construction and Operational Impact

One of the primary concerns in crossing recreational areas is the impact that pipeline construction and operation could have on recreational activities. Disruption and noise during construction could be a nuisance to hikers, bikers, and campers, and could cause disturbance to wildlife, especially in protected areas. Since pipeline construction is generally scheduled for the summer season when recreational activities are at their peak, this impact, to a large extent, is unavoidable. However, although construction would span about

a 6-month period, construction activities at any one location are intermittent and any one sequence (pipe stringing, ditching, etc.) is usually limited to 1 to 5 days, therefore limiting the duration of disturbance in areas where typical construction techniques would be used. Some additional mitigation may be possible by timing construction to avoid peak periods of recreational use on a site-specific basis.

Following construction, the affected areas would be restored and seeded, and recreational activities could resume. Revegetation of the right-of-way is generally completed within one growing season. Removal of existing forest for the construction and operation of the pipeline would have the most significant long-term impact. Although temporary work areas in forests would be allowed to revegetate, revegetation to preconstruction conditions in forested areas would take many years.

Site Specific Impact

Table 5.7.3-1 lists each identified recreation or public interest area crossed and acreage affected within each property. Except as discussed below, Millennium has not yet identified specific mitigation for these crossings and would develop mitigation during final easement negotiations.

TABLE 5.7.3-1

Recreation and Public Interest Areas Crossed

Milepost	Area Name	Crossing Length (ft)	Acreage Affected by Construction
394.3 - 395.3	Senasqua Town Park	5,544	6.8
396.5 - 396.8	Van Cortlandt Manor	1,901	2.0
397.0 - 401.3	Briarcliff-Peekskill Trailway	22,810	19.4
397.4 - 397.4	Old Croton Aqueduct State Historic Park	158	0.1
401.6 - 401.9	North County Trail	1,584	1.3
401.8 - 404.1	Briarcliff-Peekskill Trailway	11,287	9.6
404.0 - 404.1	North County Trail	317	0.4
406.8 - 406.9	Briarcliff-Peekskill Trailway	264	0.4
409.1 - 410.1	South County Trail	5,280	5.6
410.1 - 410.1	West Rumbrook Park	53	0.7
410.1 - 411.3	South County Trail	6,072	5.5
411.6 - 413.5	South County Trail	9,874	8.9
414.6 - 416.1	Sprain Ridge Park	8,078	10.7
416.6 - 416.6	Sprain Brook Parkway	370	0.6

For the bicycle paths (including the North County, South County, and Briarcliff-Peekskill Trailways), only a short segment would be affected at any one time. Millennium is discussing mitigation plans with Westchester County officials. In part, mitigation is expected to consist of installing appropriate signs, barricades and other safety devices to protect trail users as well as attempting to maintain access to all parts of existing trails during weekends. Construction would be accomplished using "stove-pipe" type methods and tree removal would be minimized to the greatest extent practicable. In addition, construction of the 9/9A Proposal may offer the opportunity to connect the two existing sections of the North County Trail and possibly also join the North County and South County Trails, where segments of the abandoned railroad have not that was converted to a trailway. The abandoned railway right-of-way and the existing trail is managed and maintained by Westchester County Department of Parks, Recreation and Conservation. Connecting incomplete sections of the trailway system would have to be co-ordinated with the NYSDOT and the Westchester County Department of Parks, Recreation, and Conservation. Restoration plans for the trailway and abandoned railroad would be completed during the easement negotiations.

The crossings of the Van Cortlandt Manor and Old Croton Aqueduct State Historic Park would be coordinated with the SHPO to identify appropriate mitigation (see section 5.8). The crossing of the ridge top in Sprain Ridge Park may also provide an opportunity to improve an existing trail in that park.

While we believe that use of the proposed mitigation would reduce short-term and long-term impact of the 9/9A Proposal on the recreational and public interest areas crossed, we must review and approve all construction and mitigation plans. Therefore, we recommend:

> **Before construction, Millennium should file with the Secretary all mitigation plans for construction of the pipeline and restoration of the construction right-of-way developed with the property owners identified on table 5.7.3-1, for review and written approval of the Director of OEP.**

Potentially Contaminated Sites

Millennium identified nine recorded sites that would be crossed by the pipeline and may contain hazardous or contaminated soils (see table 4.7.3-2). Millennium states that it would attempt to avoid all known hazardous waste sites, including contaminated soils and groundwater. If avoidance is not practical, Millennium states it would coordinate with the NYSDEC, EPA, and local county health departments to determine site-specific and appropriate mitigation through these areas. Millennium would hire a qualified contractor to handle any contaminated materials. The hazardous waste contractor would follow a site-specific health and safety plan, and standard operating procedures for working in hazardous environments in compliance with applicable regulations.

One commenter noted that the Seprieo property (owned jointly by Croton-on-Hudson and the Beaver Kill Conservancy and also known as the Senasqua Town Park) was the site of a former asphalt batching plant and has some associated contaminated soils. This property is a 30-acre site bounded on the west by the Hudson River and on the east by the Metro North/Amtrak railroad, and would be crossed between approximate MPs 394.0 and 395.0. It was formerly owned by Seprieo Associates. In 1995, the property was subdivided into two lots. Lot 1 is 16.6 acres (of which 9.7 acres are underwater) and Lot 2 is 13.4 acres (of which 6.0 acres are underwater). Lot 2 was conveyed to the Croton-on-Hudson and Lot 1 was conveyed to the Beaverkill Conservancy, Inc., a nonprofit land acquisition affiliate of the Open Space Institute. At the present time, Croton-on-Hudson manages both lots. At some time in the future, Lot 1 will be deeded to Croton-on-Hudson.

Millennium reviewed the Phase I Environmental Site Assessment (May 1994) that was prepared for Croton-on-Hudson before the town acquired the property. It indicates that soils contaminated with hydrocarbons from past commercial/industrial activity are likely to be present at the site. The report also states that the asphalt batching facility was operated on the property between the mid-1960s and the mid-1970s. Seprieo Associates operated the facility for a number of these years. According to geotechnical investigations performed in 1986, the soils are primarily fill and may have been placed there during construction of the railroad in the 19th century. Additional fill also may have been placed there in the early 1900s. Millennium states that it would test soils suspected of being contaminated before construction and, if necessary, a waste management contractor would be retained to properly characterize and dispose of the soils in accordance with Federal, state and local regulations. The waste management contractor would obtain all required permits for handling and disposing of contaminated materials.

The pipeline would be installed along the edge of the Seprieo property adjacent to Metro North's access road. Parts of this property have been cleared of brush and have been landscaped to some extent. Millennium would install the pipeline across the property with a minimum amount of mature tree clearing,

and would remove brush within the construction work area. During construction, Millennium would maintain access at all times to the Croton Yacht Club and the balance of the park. Safety would be promoted by posting warning signs, erecting safety fencing, and constructing and completing restoration through the area quickly. Millennium would notify responsible officials at least 1 week in advance of commencing construction activities for coordination. Additionally, the trench would not be opened until the pipe is ready to be installed and the trench would be backfilled the same day. The trench would not be left open overnight. Millennium expects to complete construction through this area within 4.5 weeks.

During restoration, disturbed landscaping can be replaced, and a restoration plan would be developed during easement negotiations (see condition above). Once restoration is complete, the pipeline should not affect park use or operations other than a restriction on structures within the permanent right-of-way. Vehicle access crossings would be taken into account and the pipeline would be installed with adequate depth and/or other protection measures to ensure safe operation.

5.7.4 Transportation and Traffic

General Construction and Operational Impact

Generally, impact on the transportation network would result from the pipeline crossings of roads and highways, and the movement of construction equipment, materials, and personnel from the pipe storage/contractor yards to the construction work area. High volume public roads and railroads would be crossed by boring (and casing, if required) under the road or railway, and traffic flow would be unaffected. Lower-volume roads would be crossed by open-cut. Although there would be impact on the transportation network from pipeline crossings of railroads, highways, and county roads, and the movement of construction equipment, materials, and workers to the work sites, none of these effects would be expected to be significant.

However, the 9/9A Proposal would require that the construction work area be placed within one of the northbound lanes of U.S. Route 9 (2.1 miles between MPs 391.8 and 394.2), one of the northbound lanes of State Route 9A (4.3 miles between MPs 397.0 and 401.3), and one of the southbound lanes of State Routes 9A/100 (2.4 miles between MPs 401.3 and 404.0). Depending on location, the pipeline would be installed between 0 and 23 feet from the painted lane line separating the travel lane from the paved shoulder. Traffic impacts would be more significant since construction within these roads would result in traffic delays for the duration of construction (about 3 months).

Millennium states that it would comply with NYSDOT and local highway department requirements regarding public notification of construction activities. Millennium anticipates that notification would include highway information signs, publications in the local newspapers, and coordination with local authorities. Millennium would keep at least one lane of traffic open at all road crossings. All traffic control would be in accordance with plans developed with the NYSDOT before the start of construction.

Site Specific Impact

To assess the traffic impacts of the 9/9A Proposal, we asked the BSC Group, Inc. to conduct a traffic impact study (BSC , 2001) (see "RIMS" link on www.ferc.fed.us using Docket Number CP98-150). This study was based on information provided by Millennium in its 9/9A Proposal, traffic volumes and accident data from the NYSDOT, a site visit of the affected roadways, and modeling using methods defined in the 1997 Highway Capacity Manual. The study focused on potential impacts on the affected road segments and traffic patterns. It included consideration of construction impacts on lane closures, ramp closures, roads proposed for open-cut crossings, signalized intersections, as well as impacts associated with blasting.

Table 5.7.4-1 summarizes the existing conditions and anticipated impacts associated with construction of the 9/9A Proposal within the designated roadways.

TABLE 5.7.4-1

Summary of Traffic Conditions Along U.S. Route 9, State Route 9A, and State Routes 9A/100

Traffic Aspect	U.S. Route 9 MPs 391.8 to 394.2 (northbound)	State Route 9A MPs 397.0 to 401.3 (northbound)	State Routes 9A/100 MPs 401.3 to 404.0 (southbound)
Length in Roadway	2.1 miles	4.3 miles	2.4 miles
Road Characteristics	4-lane divided highway with limited access. No at-grade crossings. Acceleration/ deceleration lanes at exit and entrance points. Full breakdown lane. Generally characterized as long tangent sections with gentle curves	4-lane divided state highway. At-grade crossings controlled by traffic signals or STOP-sign, some have additional lane. Acceleration and deceleration lanes at grade separated interhanges. Narrow 2-foot-wide shoulder with no breakdown lane. Generally characterized as rolling and winding with very few level areas.	4-lane divided state highway with limited access. No at-grade crossings. Narrow 2-foot-wide shoulder with no breakdown lane. Generally characterized as straight with some gentle curves.
NYSDOT Functional Classification	Urban Principal Arterial Expressway	Urban Principal Arterial Street	Urban Principal Arterial Street
Posted Speed Limit	55 mph	40 to 45 mph, with lower advisory speeds posted for sharp curves or steep grades.	55 mph
Directional Traffic volumes (AADT)	15,100 to 19,200	15,000 to 17,300	20,000 to 22,000
Average Calculated Accident Rate	0.65	2.26	1.80
NYSDOT Average Accident Rate (compiled from accident data complied in 1997 and 1998) for similar state highways.	1.42 (urban divided 4-lane state highway with controlled access)	1.99 (urban divided 4-lane state highway with partial control of access)	1.99 (urban divided 4-lane state highway with partial control of access)
Predicted Queues due to Lane Closures:			
Duration of queue	7 to 8:45 pm	None	10 - 11:45 am / 3 - 8:15 pm
Maximum queue length	2,500 feet	None	1,700 feet / 8,900-10,800 ft
Approximate delay a/	6 minutes	None	5 minutes / 20 to 25 minutes
Potential Ramp Closures	On ramp (State Route 9A) MP392.7	On and Off ramps (Cedar Lane) MP 397.8 On and Off ramps State Route 133 MP 399.9	Off ramp (State Route 100) MP 401.3 On ramp (State Route 117) MP403.4

TABLE 5.7.4-1 (cont'd)

Traffic Aspect	U.S. Route 9 MPs 391.8 to 394.2 (northbound)	State Route 9A MPs 397.0 to 401.3 (northbound)	State Routes 9A/100 MPs 401.3 to 404.0 (southbound)
Proposed Open-Cut Road Crossings	Furnace Dock Road MP 392.9	Old Albany Post Road MP 397.0 Quaker Bridge Road MP 397.2 Cedar Lane MP 397.8 State Route 134 MP 398.6 State Route 133 on ramp MP 399.9 State Route 133 off ramp MP 399.9	State Route 100 off-ramp MP 401.3
Signalized Intersections	None	State Route 134 MP 398.6 Chappaqua Road MP 400.4 North State Road MP 401.1	None
Potential for Blasting	Moderate	High	Low
Overpass Crossings	Watch Hill Road MP 392.3 Warren Road MP 393.3	Hawkes Avenue MP 398.4 Ryder Road MP 399.6	Pleasantville Road MP 401.7 State Route 117 MP 403.4

a/ Assumes a travel speed of 5 mph

Traffic Volumes

Existing daily traffic volumes were obtained from the NYSDOT Highway Data Service Bureau as measured by automatic traffic recorders placed at various locations along U.S. Route 9, State Route 9A, and State Routes 9A/100. These daily volumes were collected on different dates during 1999 and 2000 and represent the latest available data. The 1999 annual average daily traffic (AADT) for the individual segments of these roads are developed by calculating the average of a number of vehicle counts and applying adjustment factors to account for variations that may have occurred during the counting period. Thus, AADT values are statistically significant representations of the traffic volume expected during a 24-hour day. For analysis purposes, it was assumed that traffic volumes in the area increased by 1 percent per year.

The functional classification of U.S. Route 9, as classified by the NYSDOT, is Urban Principal Arterial Expressway. It has a northbound AADT of 15,000 vehicles north of the State Route 9A interchange (MPs 391.8 to 392.7), with a higher AADT south (19,200) and the highest AADT (22,000) south of where the pipeline would leave U.S. Route 9 (MP 394.2).

The functional classification of State Route 9A and State Routes 9A/100 is Urban Principal Arterial Street. State Route 9A has a northbound AADT ranging between 15,000 and 17,300 vehicles (MPs 397.0 to 401.3). The lowest AADT (15,000) is between State Routes 134 and 133 (MPs 398.6 and 399.9), with a higher AADT (15,600) north of MP 398.6 and the highest AADT (17,300) south of MP 399.9. State Routes 9A/100 has a southbound AADT ranging from 20,000 to 22,000 vehicles (MPs 401.3 to 404.5). The highest AADT (22,000) is south of State Route 117 (MP 403.4).

In general, for all of the studied locations, the peak hour accounts for about 11.5 percent of the daily traffic, with the peak direction (southbound in the morning and northbound in the evening) accounting for 2.5 times the volume of the opposite flow. The only exception is on the south section of State Routes 9A/100 (MPs 402.5 to 404.5) in the evening peak period when the traffic volumes are almost equal.

Accident Data

Accident rates quantify the number of accidents per million vehicle-miles. Accident data were obtained from the NYSDOT and identified the location of each reported accident during a 3-year period from 1996 to 1999. These data were used to compile accident rates (e.g., the average accident occurrences) for the road segments under study. Accidents with no location information were excluded from the calculated accident rates. Based on accident data compiled in 1997 and 1998, the NYSDOT has determined that the average accident rate for urban divided four-lane state highways with controlled access (such as U.S. Route 9) is 1.42; and the average accident rate for urban divided four-lane state highways with partial control of access (such as State Route 9A and State Route 9A/100) is 1.99.

On U.S. Route 9 northbound, between Welcher Avenue (about 1.8 miles north of MP 391.8) and Croton Point Avenue (MP 396.2), the average accident rate is 0.65, well below the state average of 1.42. North of the State Route 9A ramps in Cortlandt (MP 392.7), the average accident rate is 1.02; south of the State Route 9A ramps in Cortlandt, the average rate is 0.38.

On State Route 9A northbound, the entire segment of State Route 9A between the junction of U.S. Route 9 and State Route 9A and the junction of State Routes 9A and 100 (MPs 397.0 to 401.3) has an average accident rate of 2.26, well above the state average of 1.99.

On State Routes 9A/100 southbound, between the junction of State Route 9A/100 (MP 401.3) to the Saw Mill River Parkway (about 0.5 mile south of MP 404.0), the average accident rate is 1.80, slightly

below the state average of 1.99. The section with the highest average accident rate (2.10) is between the junction of State Routes 9A/100 and the Briarcliff Manor area (MPs 401.3 to 402.5).

Predicted Traffic Flow

To determine the impact on traffic flow from closing one lane of U.S. Route 9, State Route 9A, and State Routes 9A/100, an analysis was conducted to determine if queues would develop (e.g., if cumulative demand exceeds capacity, then queues are likely to form). Queuing can be defined as a line of vehicles waiting to pass through a bottleneck point. The rate of flow at the front of the queue determines the average speed within the queue. Slow moving vehicles and vehicles joining the end of the queue are considered part of the queue. The analysis was conducted using methods defined in the 1997 Highway Capacity Manual (Transportation Research Board Special Report 209, 1997) for freeway work zones, using the estimated vehicle carrying capacity (e.g., the number of vehicles that can be processed over a specified period of time) for a two-lane road reduced to one lane (e.g., 1,275 vehicles per hour per lane). The analysis compares the reduced capacity of the road with the demand experienced by it, and can estimate if queuing would occur and the number of vehicles in that queue at a given time. The analysis procedure can also estimate the duration of the queuing.

In addition, while a lane closure on one side of the highway is in place, reduced capacity could be expected on the opposite side of the highway. This is caused by vehicles moving at a slower speed because of driver curiosity about the construction activities taking place in the other direction of travel (e.g., rubbernecking). Based on the hourly count volumes, it appears that, while capacity would be somewhat reduced, the effect on the level of service of the opposing flows would not be significant. However, at signalized intersections, this "rubbernecking" effect may adversely impact the level of service of the intersection (see discussion below on signalized intersections).

On U.S. Route 9 northbound, no queues are predicted north of the State Route 9A ramps in Cortlandt (MP 392.7). South of the State Route 9A ramps (MP 392.8) to where the pipeline leaves U.S. Route 9 (MP 394.2), the model predicted a queue between 7 p.m. and 8:45 p.m.. The queue is expected to be 2,500 feet long, resulting in an approximate delay of 6 minutes. Millennium proposes to maintain both lanes open during the peak traffic period (e.g., between 3 and 7 p.m.). Delaying the start of construction to 8 p.m. could eliminate the backup. Therefore, we recommend that:

> **On U.S. Route 9 (approximate MPs 391.8 to 394.2), Millennium should avoid construction activities in the northbound lane between the hours of 3 and 8 p.m., unless otherwise approved or restricted by the NYSDOT in writing.**

On State Route 9A northbound, no queues are predicted (MPs 397.0 to 401.3). However, this segment has three signalized intersections and these intersections represent a critical capacity constraint as described below (see Construction through Signalized Intersections). This segment would also be the most likely to require blasting, which would contribute to traffic delays (see Blasting).

On State Routes 9A/100 southbound, a minimal queue is predicted between MPs 402.5 (Briarcliff Manor) and 403.4 (State Route 117) just after the proposed lane closure at 10 a.m. The queue is predicted to be less than 2,000 feet in length with an anticipated delay of 5 minutes. However, during the evening peak period (from 3 to 8:15 p.m.), a more significant backup of about 10,800 feet is predicted with an anticipated delay of 25 minutes. Millennium does not propose to stop construction during the evening peak period. Avoiding construction between the hours of 3 and 7 p.m. should eliminate the backup. Therefore, we recommend:

On State Routes 9A/100 (approximate MPs 401.3 to 404.0), Millennium should avoid construction for an additional 4 hours during the peak evening traffic period between the hours of 3 and 7 p.m., unless otherwise approved or restricted by the NYSDOT in writing.

Ramp Closures

There are instances where the pipeline would deviate from the area adjacent to the paved shoulder on U.S. Route 9, State Route 9A, and State Route 9A/100. These are at-grade separated intersections, where the state highway is bridged over another road. In these instances, the pipeline would deviate from the road shoulder, descend to the lower grade, cross the road, and then ascend back to the state highway road shoulder, effectively bypassing the bridge. Generally, this would be done by installing the pipeline adjacent to the entrance and exit ramps and would require closing of the ramps. This would also require closing of the acceleration and deceleration lanes when installing the pipeline adjacent to them.

When the ramp is closed, traffic would be detoured to alternate routes. These detours would be announced by portable changeable message signs placed before the ramp closure and traffic would be directed to follow a signed detour to alternate access points. Motorists would also be warned of ramp closures through newspaper and radio announcements. To minimize traffic impacts, ramp closures could be restricted to nights and weekends.

On U.S. Route 9, the on ramp from State Route 9A would be affected (MP 392.7). The off ramp from U.S. Route 9 to State Route 9A would not be affected since Millennium would install the pipeline adjacent to but outside of the ramp itself. It is anticipated that a detour around the closure of the on ramp would result in 5 to 8 minutes of additional travel time.

On State Route 9A, the on and off ramps at Cedar Lane (MP 397.8) and State Route 133 (MP 399.9) would be affected. Detours around the closures are anticipated to require additional travel time of less than 1 minute to 8 minutes for the on ramp at Cedar Lane, 4 to 9 minutes for the off ramp at Cedar Lane, 4 to 12 minutes for the on ramp at State Route 133, and 11 to 16 minutes for the off ramp at State Route 133.

On State Routes 9A/100, the on ramp from State Route 100 (MP 401.6) and the off ramp from State Route 117 (MP 403.4) would be affected. Millennium proposes to open cut the off ramp from State Route 100 (see discussion below on open-cut road crossings). A detour around the closure at State Route 117 is anticipated to require between 9 and 10 minutes.

Because of the additional travel time required to detour around ramp closures, we recommend that:

Prior to construction, Millennium should file a traffic management plan for each ramp closure with the Secretary for review and written approval by the Director of OEP. The traffic management plan should identify the hours of closure, the method of advance notification, the detour route, and signing, as needed. The plan should discuss the feasibility of using weekends for construction. Millennium should consult with the NYSDOT and file its comments and/or approval of the plan.

Open-Cut Road Crossings

There are two methods for crossing roads: 1) boring under the road, or 2) open cutting the road (see section 2.3.2). Table 5.7.4-2 lists each road crossed by the 9/9A Proposal and Millennium's proposed crossing method. Boring under the road would avoid any significant traffic impacts since there would be no

lane closures and traffic flow would not be affected. However, there may be some minor delays associated with construction vehicles entering and exiting the work area. Open cutting the road would have more impact since at least one lane of the road would be closed during construction. Traffic impacts would vary depending on the road use and location of the crossing. Limiting construction to off-peak hours and use of flagmen to direct traffic would avoid any significant impacts on these roads although some delays of up to 5 minutes could be expected during actual construction. Detailed crossing plans would reduce the potential for unnecessary delays. Therefore, we recommend:

> **Prior to construction, Millennium should file with the Secretary for review and written approval by the Director of OEP, a traffic management plan for each road that is proposed for an open cut. The traffic management plan should identify construction work hours, lane closures (including the duration of the closure), how traffic would be managed (i.e., signs, flagmen, etc.) and routed through construction, what provisions would be made for pedestrian traffic, and traffic detours, as needed. The traffic management plan should discuss the feasibility of using weekends for construction. Millennium should consult with the NYSDOT and file its comments and/or approval of the plan.**

Construction through Signalized Intersections

No signalized intersections are affected on the segments of the 9/9A Proposal that would be within U.S. Route 9 or States Routes 9A/100.

However, along the State Route 9A segment, the 9/9A Proposal would cross three signalized intersections (State Route 134 [MP 398.6], Chappaqua Road [MP 400.4], and North State Road [MP 401.1]) where the effects of a lane reduction at the near and far sides of a signalized intersection would have traffic impacts. In this case, in addition to reducing the roadway capacity by closure of a lane, through traffic on that single open lane of highway would be stopped on a regular basis to service the side street traffic.

To determine traffic impacts of pipeline construction at signalized intersections, capacity analyses were performed using the methods defined in the 1997 Highway Capacity Manual. The most significant result from capacity analysis is the assignment of level of service (LOS) rating to traffic facilities under various traffic flow conditions. The concept of LOS uses qualitative measures that describe operational conditions within a traffic stream and their perception by motorists. These conditions are defined in terms of different factors, such as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. There are six LOS (A through F) for each type of facility, with LOS A representing the best operating conditions and LOS F representing the worst.

For signalized intersections, the average delay per vehicle approaching an intersection is used to quantify the LOS. A level of service of A is defined as an average delay of 10 seconds or less per vehicle, B is 20 seconds, C is 35 seconds, D is 55 seconds, and E is 80 seconds. A level of service F represents an average delay of greater than 80 seconds. In an urban environment such as Route 9A, LOS D is considered the minimum acceptable level for design purposes. LOS F (any delay greater than 80 seconds) is considered acceptable for a short-term construction impact depending on the extent of the delay and the volume of traffic being delayed.

TABLE 5.7.4-2

Road and Ramp Crossings

Milepost	Name	Crossing Method	Length (ft)	Construction Duration (days)
391.2	Old Albany Post Road/State Route 9A	open cut	80	2
391.6	Conrail and water diversion channel	bore	200	7
391.8	U.S. Route 9	bore	180	5
392.7	New York and Albany Post Road/State Route 9A	bore	130	4
392.9	Furnace Dock Road	open cut	60	2
394.2	U.S. Route 9 and Conrail/Metro North	bore	430	14
395.0	Croton Yacht Club access road	open cut	90	2
395.5	Conrail/Metro North	bore	90	3
395.6	"Goodyear Bore" access road to yacht club	bore	150	5
396.2	Croton Point Avenue (including side street and ramp)	open cut	250	4
396.4	U.S. Route 9	bore	220	8
397.0	Old Albany Post Road (dead end road)	open cut	80	2
397.2	Quaker Bridge Road	open cut	60	2
397.3	Quaker Bridge Road off ramp	bore	300	10
397.8	Cedar Lane	open cut	90	2
398.6	Croton Dam Road/State Route 134	open cut	90	2
399.9	Somerstown Road/State Route 133 on ramp	open cut	90	2
399.9	Somerstown Road	bore	60	2
399.9	Somerstown Road/State Route 133 off ramp	open cut	90	2
400.4	Chappaqua Road	bore	90	3
400.9	Parkway Road	bore	90	3
401.1	North State Road	bore	130	4
401.3	State Route 100 off ramp	open cut	90	3
406.7	Saw Mill Parkway	aerial	180	3
407.0	Grasslands Road/State Route 100C	bore	110	4
407.7	Fairview Drive (part of Coca Cola parking lot bore)	bore	300	10
408.7	Vreeland Road (open cut to Tarrytown Road)	open cut	1,300	14
409.0	Tarrytown Road	bore	110	4
410.1	Saw Mill River Parkway on ramp	bore	190	7
413.2	Lawrence Street	open cut	90	2
413.5	Saw Mill River Road	bore	120	4
414.2	New York State Thruway	bore	190	7
414.5	Jackson Avenue	bore	130	5

Notes: For all open cuts, half of the road would be excavated and shored and the trench would be plated until backfilled. One lane of traffic would remain open at all times.
All bores would be uncased unless local conditions or special requirements require casings.

The results of a comparative analysis can determine what traffic control measures can be taken to mitigate the effects of the lane closure at a signalized intersection. If the LOS of a particular intersection does not deteriorate to an unacceptable level when a lane is closed on an approach, then no action would be needed to alleviate the effects of the closure. However, if the LOS does fall to an unacceptable designation, then other traffic management measures would be required to ensure that the intersection maintains an adequate LOS. This may include the limiting of the closure of the travel lane to fewer hours or the closure of the intersecting minor road, in which case alternate routes would have to be developed to minimize disruption and inconvenience to its users.

To perform a LOS analysis, vehicle turning movement counts for the hours in question, a plan of the intersection showing lane use and width, and a sequence and timing plan of the traffic signal controller for the intersection is required. The only data available were a sequence and timing diagram, and the morning and evening peak hour turning movement counts at the North State Road intersection and northbound and

southbound hourly counts for Route 9A. Using this information, assuming a 1 percent growth rate for traffic for 5 years, and making some assumptions relative to off-peak volumes, an approximate LOS analysis for the North State Road intersection was performed with the following results:

> The estimated LOS of the intersection as a whole, during the morning peak hour with both northbound lanes open to traffic (the existing condition) is F with a 165 second average delay.
>
> With the right northbound travel lane and shoulder closed during the morning peak hour (construction condition), the LOS would remain at F (there is no lower level) and the average delay would be 180 seconds, an increase of 15 seconds.
>
> The estimated LOS of the northbound through movement during the morning peak hour with both northbound lanes open to traffic (the existing condition) is B with a 10 second delay.
>
> With the right northbound travel lane and shoulder closed during the morning peak hour (construction condition), the level of service of the northbound through movement would drop to F and the average delay would increase to 85 seconds.
>
> The estimated LOS of the southbound through movement during the morning peak hour with both northbound lanes open to traffic (the existing condition) is F with a 170 second average delay.
>
> With the right northbound travel lane and shoulder closed during the morning peak hour (construction condition), the LOS of the southbound through movement is estimated to remain the same. However, the analysis does not take into consideration the fact that construction occurring just two lanes away would attract the attention of these drivers and slow them down resulting in an increase in delay for the southbound movement that is difficult to quantify.
>
> With the right northbound travel lane and shoulder closed, the LOS for the northbound through movement is D (55 seconds of delay) or better between the hours of 9 a.m. and 12 noon. LOS drops to E (60 seconds) between 12 noon and 1p.m., F (80 seconds) between 1 p.m. and 2 p.m. and continues at F (210 seconds) between 2 p.m. and 3 p.m.

The estimated increase in delay to the northbound through traffic during the weekday morning peak hour of 75 seconds would be acceptable. However, any increase in delay to the southbound direction, the commuter rush hour movement, that is estimated to be 170 seconds without construction occurring, would be a significant impact. Although no analysis was done on the State Route 134 and Chappaqua Road signalized intersections due to lack of data, the results would likely be similar to those of the LOS analysis for North State Road. Therefore, we recommend that:

> **Millennium avoid construction during the weekday morning peak period within 300 feet of signalized intersections (State Route 134 [MP 398.6], Chappaqua Road [MP 400.4], and North State Road [MP 401.1]) along State Route 9A, unless otherwise approved or restricted by the NYSDOT in writing.**

Pipeline Installed at Overpass Crossings

There are six locations where the pipeline would need to be installed under overpass bridge abutments. These include the Watch Hill and Warren Road bridge overpasses on U.S. Route 9 (MPs 392.3 and 393.3, respectively); the Hawkes Avenue and Ryder Road bridge overpasses on State Route 9A (MPs 398.4 and 399.6, respectively); and Pleasantville Road and State Route 117 overpasses on State Routes 9A/100 (MPs 401.7 and 403.4, respectively). Except for the bridges on State Routes 9A/100, the overpass bridge abutments occupy the area adjacent to the travel lane. Since the shoulder area is limited, it would be impossible to install the pipeline adjacent to the paved right shoulder and Millennium proposes to install the pipeline beneath the right travel lane of the highway.

Because the pipeline would be under the right travel lane, trenching would be within this lane and much closer to traffic passing in the single adjacent lane. When construction is halted during the traffic peak hours, steel plates would be placed over the trench. The NYSDOT would likely require that steel plates be recessed and bolted into the pavement, if steel plates are allowed at all. The alternative would be to bore under the bridge abutment and avoid disturbance to the outside lane. However, adequate workspace for borepits would have to be available (see section 2.3.1 for a description of a bored road crossing). Therefore, we recommend that:

> **Prior to construction, Millennium should file with the Secretary for review and written approval by the Director of OEP, a traffic management plan for installation of the pipeline at bridge overpasses. The traffic management plan should identify construction work hours, lane closures (including the duration of the closure), how traffic would be managed (i.e., signs, flagmen, etc.) and routed around construction, and should discuss the feasibility of using weekends for construction. Millennium should consult with the NYSDOT and file its comments and/or approval of the plan.**

Blasting

Millennium indicated that blasting to excavate the trench would only be used in remote areas where the specialized trench digging equipment (e.g., rocsaw trencher) would be ineffective. The manufacturer claims that this unit can cut through concrete and soft rock but not all types of rock. Exposed ledge is visible in some areas along the edge of U.S. Route 9 and State Route 9A, and depending on its composition, may require something other than the rocsaw trencher to excavate the trench. If blasting is used to break up the subsurface rock, both directions of the roadways would need to be closed for at least 5 to 8 minutes and possibly more. If blasting is used to clear a rock outcrop, the roadways would need to be closed for about 20 minutes. All blasting would have to be limited to periods of the lowest traffic volumes and during daylight hours. Depending on the length of the closure, blasting could have a significant impact on traffic operations, as queues would be begin to develop the instant the traffic is stopped.

Based on field observations, ledge was observed along that section of State Route 9A between Chappaqua and North State Roads (MPs 400.4 to 401.1) and this section was selected for estimating the possible effects of a closure due to blasting operations. The analysis used to estimate queues resulting from a road closure was similar to that employed to predict traffic flow (e.g., an examination of the available capacity and demand). Average weekday hourly volumes from the NYSDOT were used (with a 1 percent growth factor). Using these data and all possible daylight hours during which blasting could occur, the lowest total hourly volume (1,646 vehicles in both directions) occurred between 11 a.m. and 12 noon.

Two blasting scenarios were examined, one in which two lanes of State Route 9A northbound were open before and immediately after blasting (Scenario 1) and one in which the right lane of State Route 9A

northbound was closed before and immediately after blasting (Scenario 2). In both scenarios, the two southbound lanes of Route 9A remained open before blasting, but all traffic flow in both the southbound and northbound direction was stopped during blasting. The capacity of two lanes of highway was estimated at 1,700 vehicles per hour per lane, based on vehicles moving from a stop condition, such as from an intersection signal. The capacity of a single lane of highway was estimated at 1,275 vehicles per hour per lane. The results of the analysis are shown below:

	Northbound		Southbound	
Duration of Road Closure		Duration of Queue	Maximum Queue (vehicles per lane)	Duration of Queue
Scenario 1: No lane closures on State Route 9A				
5 minutes	32	7 minutes	36	7 minutes
8 minutes	54	11 minutes	59	11 minutes
20 minutes	136	26 minutes	142	27 minutes
Scenario 2: Right lane closed in northbound direction only				
5 minutes	63	13 minutes	36	7 minutes
8 minutes	108	20 minutes	59	11 minutes
20 minutes	271	52 minutes	142	27 minutes

The maximum queue would occur immediately before the highway is re-opened to traffic, as the queue builds while traffic flow is stopped. The duration of queue is the length of time from the point at which traffic is stopped for the blasting operation, until queuing ceases. Because the queue builds up while the road is closed, queuing would continue for a period after the highway is reopened. Thus, the duration of the queue encompasses the time from when the road is closed to the time when the road opens and the queuing ends.

In Scenario 1, where all of the lanes remain open on State Route 9A before and after blasting, the maximum queue experienced and the duration of queue in both directions would be similar because the volumes in both directions are similar. An 8-minute closure would result in a maximum of 59 vehicles queuing in the travel lanes for 11 minutes. In Scenario 2, where one northbound lane is closed before and after the blasting operation, queuing becomes more significant. An 8-minute closure would result in a maximum of 108 vehicles queuing in the northbound lane for 20 minutes.

Millennium would consult with the NYSDOT regarding the appropriate timing for blasting and road shutdowns. Since blasting could be required elsewhere and closure of one lane during blasting would double the number of vehicles and the time in the queue, we recommend that:

> **Before construction, Millennium should file with the Secretary for review and written approval by the Director of OEP, a blasting plan that identifies the locations by milepost where blasting is necessary during construction along U.S. Route 9, State Route 9A, and State Routes 9A/100, how blasting would be conducted, and how traffic would be managed. The plan should be developed in consultation with the NYSDOT and include any necessary restrictions to avoid lane reductions (to accommodate work areas) before and after any blasting operation and until any traffic backups have ceased. Millennium should file the NYSDOT comments and/or approval of the plan.**

Staff spoke with a representative of NYSDOT on September 11, 2000, about the 9/9A Proposal (NYSDOT, 2000). We were informed that the pipeline, being a utility, can be constructed in the U.S. Route 9, State Route 9A, and State Route 9A/100 rights-of-way, but that it needs to comply with all NYSDOT permitting requirements. These requirements include detailed plans of how the project would be constructed and restored, and conformance with local construction regulations (i.e., for night time work, noise, etc.). We discussed possible impacts on traffic and were informed that construction would have to occur during off-peak hours, and that construction within roads may only stop traffic for 5 minutes at a time. This time period may be expanded, however, if blasting is involved. For example, a road construction project that is currently underway is allowed to stop traffic for 15 minutes when blasting is required. Also, as part of the permitting process, Millennium would have to develop a plan which explains how it would react during pipeline construction in the event of an emergency at the Indian Point Nuclear Power Plant. That is, Millennium would need to explain how it would remove its construction equipment and button down its operation during such a contingency. Millennium has filed the procedures it would follow to stop its construction activities and remove construction equipment from work areas along these highways if such an emergency were to occur.

5.7.5 Visual Resources

Potential impact on visual resources associated with construction of pipeline facilities is primarily of two types: that resulting from alteration of terrain and vegetative patterns due to pipeline construction and right-of-way maintenance, and that resulting from the construction of aboveground facilities.

Generally, visual impact resulting from construction of the pipeline would be temporary and confined to the construction period. Only minor impact on visual resources would be associated with operation of the pipeline through non-forested areas, which account for about 80 percent of the land use along the proposed route. In these areas, visual impact would generally be confined to the clearing of hedgerows and trees along streambanks and roads. In areas where a new right-of-way corridor would be introduced in forested areas, visual impact would be most noticeable at the crossings of roadways and other access areas where the pipeline right-of-way would introduce a newly cleared corridor within forestland. However, 88 percent of the pipeline would be constructed adjacent to existing cleared rights-of-way, significantly reducing the introduction of new cleared corridors. This impact would also be reduced at streams and riverbanks, where native vegetation would be allowed to re-establish across the right-of-way except for a 10-foot-wide inspection access strip over the pipeline.

Expansion of existing corridors may result in visual impacts, particularly in areas where existing vegetation provides screening of transportation and utility corridors from nearby residences. This loss of tree screening was a frequently cited concern about the 9/9A Proposal where residences abut many segments of U.S. Route 9 and State Route 9A where the pipeline would be installed. The construction right-of-way would extend no more than 23 feet from the edge of the white line on the road surface into the adjacent shoulder except at exit ramps.

Table H1 in appendix H identifies trees that might be removed near residential areas (e.g., any location within approximately 100 feet of residential buildings or associated landscaped yards) from within the limits of the construction work areas along U.S. Route 9 and State Route 9A. In general, the construction work area includes the outer lane of the highway and approximately 23 feet adjacent to the highway. Most of the trees in table H1 screen residential yards or landscaped common areas within apartment or condominium complexes. However, some screen residences. Most of the trees are deciduous and function poorly as visual barriers between late fall and late spring due to the loss of leaves. The evergreens that were identified along highways were all white pine and were generally larger trees (> 12 inches dbh) with few

branches lower than 10 feet above the ground surface. Thus, the trees along the highway portion of the route are not optimal visual barriers.

Millennium states it has discussed tree removal within the construction work area with individual landowners. In many cases, identification of the limited width of the construction work area along the highway was sufficient to address the concerns. Landowners in this group believed that the construction work area was going to be much wider (and encroach much farther into their property) than is the case.

In various locations, Millennium has discussed preservation of specific trees with landowners and has reduced the construction work area in some locations with the specific purpose of preserving trees adjacent to State Route 9A where residences are close to the highway. For example, between MPs 400.6 and 401.13, the construction work area would be 15 feet wide. Based on these discussions and site inspections, Millennium believes it can preserve at least 90 percent of the 99 mature trees (e.g., greater than 6 inches dbh) listed in table G1. Millennium states that it would continue these discussions through the negotiation of the right-of-way for the 9/9A Proposal. Depending on the location of specific trees, Millennium may further reduce construction work area at specific locations to protect individual trees or may mark and fence off identified trees and work around them. Just before construction, Millennium would mark the trees to be preserved to confirm the agreements with the landowners and to ensure that the trees are not removed.

However, there would be four locations where the clearing of the 35-foot-wide construction work area would remove all trees between the highway and residential areas: MPs 397.16, 398.3, 398.52, and 400.08. In all of these locations, trees are presently sparse and do not provide an effective visual screen barrier. Millennium proposes to replant fast growing native species to replace trees at these locations. The selection of the types of replacement trees that would be planted would be part of the easement agreements.

At MP 397.16, the four trees within the construction work area are adjacent to a relatively long stretch where there are no trees adjacent to State Route 9A. The removal of the four trees would add approximately 25 feet to the 125-foot-long stretch that presently lacks trees. The four trees that would be removed screen the back corner of a residential yard.

At MP 398.3, the three trees within the construction work area are the only trees between State Route 9A and an adjacent apartment complex. The trees are between the highway and a maintenance shed. The removal of these trees would leave an approximately 20-foot-long opening along Route 9A. The trees are widely spaced (greater than 7 feet).

At MP 398.52, the eight trees within the construction work area are the only trees between State Route 9A and a privacy fence surrounding an apartment complex. Removal of these trees would leave a gap of approximately 65 feet along the highway with no substantial vegetation. As at MP 398.3, these trees are generally relatively small and widely spaced.

At MP 400.08, the nine trees are the only trees between State Route 9A and a residential property. The removal of these trees would leave a gap of approximately 175 feet along the highway with no woody vegetation. These trees are generally small and widely spaced.

Millennium has discussed vegetative screening replacement requirements with NYSDOT personnel. Based on those discussions, Millennium believes that NYSDOT typically requires that vegetative screening that is removed be replaced with the same species and number of plants, but not necessarily the same size plant. NYSDOT further requires that a site-specific plan be developed for restoring vegetative screening near residences. This plan must be included in the overall NYSDOT permit application, along with other design and construction details for NYSDOT's review and approval. Millennium would develop a tree screening

plan based on the above and in conjunction with affected landowners, and would include it in the NYSDOT permit application.

To ensure that tree screening is preserved or restored wherever possible, we recommend that:

> **Millennium should file with the Secretary, prior to the close of the SDEIS comment period, the site-specific plan developed for NYSDOT to restore vegetative screening or to install screening fences near residences, and all final plans developed with landowners to protect or replace specific trees.**

5.8 CULTURAL RESOURCES

General Construction and Operational Impact

Construction and operation of the pipeline and associated facilities could potentially affect historic, archeological, and/or architectural properties that are listed on, or that meet the criteria for listing on, the NRHP. Project impacts could include: the physical disturbance during construction of archeological sites located within the work area (e.g., the right-of-way, areas of pipe staging/storage, and temporary access roads); the destruction, demolition, or alteration of historic or architecturally significant structures; and the introduction or removal of visual elements (e.g., meter stations, and right-of-way through forested areas) that could alter the settings associated with historic properties.

In accordance with ACHP procedures for implementing section 106 of the NHPA, for each NRHP-listed property, or each property meeting the NRHP listing criteria, that lies within the project's area of potential effect, the Commission, in consultation with the New York SHPO, would determine if the property would be affected. Mitigation measures to avoid or minimize these impacts may include:

route variation to avoid historic properties;

data recovery (e.g., scientific excavation of archeological sites);

photographic and architectural recording of standing structures; and

use of landscaping techniques to screen, reduce, or eliminate adverse visual impact or auditory effects on historic structures.

The Commission has also discussed executing a programmatic agreement (PA) with the New York SHPO and ACHP to fulfill the Commission's obligations under section 106. The parties are in favor of a PA and those discussions are continuing.

Site Specific Impact

The 9/9A Proposal would cross two properties that are National Historic Landmarks: Van Cortlandt Manor and the Old Croton Aqueduct. We received several comments expressing concern regarding the potential effects of the proposed project to these two properties. Millennium has prepared draft work plans which will be reviewed by the FERC, the SHPO and the applicable land managers to assess and minimize effects to Van Cortlandt Manor and the Old Croton Aqueduct. Additional cultural resources investigations are required for the properties and locations listed in table 4.8-1.

To ensure that the Commission's responsibility under section 106 of the NHPA and its implementing regulations are met, and that Millennium completes all necessary surveys and other investigations to identify NRHP-listed or -eligible properties in the area of potential effect, we recommend that:

Millennium defer construction of facilities, and use of all staging, storage, and temporary work areas, and new or to-be-improved access roads until:

a. Millennium files with the Secretary all additional cultural resources surveys and evaluation reports, and any required treatment plans, and the appropriate SHPO's comments on the reports and plans;

b. the ACHP has been given the opportunity to comment on the project; and

c. the Director of OEP reviews and approves all cultural resources reports and plans, and notifies Millennium in writing that construction may proceed.

All material filed with the Commission containing location, character, and ownership information about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: "CONTAINS PRIVILEGED INFORMATION -- DO NOT RELEASE."

Unanticipated Discovery Plan

Millennium filed a revised Unanticipated Discovery Plan, which incorporates comments from the New York SHPO and the FERC. We find the plan to be acceptable.

Native American Consultation

No traditional properties have been identified to date. Any traditional cultural properties that may be identified would be treated in accordance with section 106 requirements (36 CFR 800). Millennium has consulted with the New York SHPO and has contacted the Seneca, Ramapo, and Delaware tribes. To date, none has responded.

5.9 SOCIOECONOMICS

Most of the socioeconomic impact associated with construction of Route 9/9Awould be short term and localized. This is primarily because of the relatively short construction period and the rapid rate at which construction crews would pass through any one area. Population influx as a result of construction would occur over the entire length of the pipeline route, which would limit the local impact on housing, town infrastructure services (fire, medical, education, police), and transportation. Some beneficial economic impact would be realized during the construction period through local and non-local construction payroll expenditures and purchases of construction goods and materials. Long-term beneficial economic impact would be realized primarily through increased tax revenues in the municipalities that would be crossed by the proposed pipeline.

Construction Worker In-Migration

As currently proposed, construction of the 9/9A Proposal would occur between April and November 1, 2002, the proposed in-service date. However, restoration would continue beyond November 1, 2002, until revegetation of the right-of-way is complete.

Millennium proposes to use one construction spread, consisting of several smaller crews. Between 190 and 530 workers would be distributed over the length of the pipeline route in Westchester County and would install the pipeline simultaneously. Generally, between 25 and 50 percent of the construction workforce would be hired locally depending on union agreements and how work is subcontracted by the pipeline contractor. Local contractors are often hired for clearing, revegetation, road bores, and hydrostatic testing. The remainder of the workforce would be pipeline construction specialty workers and supervisory personnel who would relocate into the project area during construction. Millennium indicates that 2 workers would be permanently hired to operate the pipeline in Westchester County.

The effect on population in the project area is expected to be minimal since the construction period is relatively short (6 to 8 months) and construction crews are dispersed over the entire length of the pipeline route. The total temporary change in population would be equal to the total number of non-local construction workers, plus any family members accompanying them. Although most workers would not bring their families into the project area because of the short term of construction, we conservatively estimate that about 8 family members per 10 workers may move into the project area.

Assuming that 48 percent of the work force would be hired from the local labor force and that the work force would peak at about 530 workers, about 276 workers could move into the project area. Assuming 8 family members accompany every 10 construction workers, an additional 220 individuals may accompany the non-local work force, resulting in a total in-migration of 496 persons during 2002. The remaining 254 workers would be expected to be hired locally. The impact of the in-migration of 496 workers and family members into the project area would be insignificant given the high population density in Westchester County (893,412 persons in 1995).

Since the construction period would be relatively short, most workers prefer temporary quarters, typically hotels/motels (60 percent), trailers (30 percent), and campgrounds or rental housing (10 percent). Because the 9/9A Proposal would be within a developed urbanized area, there is adequate temporary lodging for the construction work force.

For the same reasons noted above, impact on locally provided public services such as police, fire protection, medical services, schools, etc., would be expected to be minimal. The communities in the project area have adequate infrastructure to accommodate the temporary construction workforce and their families.

Property Values

Landowners are typically concerned about devaluation of their property once the property is encumbered by a pipeline easement and we received a number of comments on this issue. Appraisal methods used to value land are based on objective characteristics of the property and any improvements to the property. The impact a pipeline may have on the value of a tract of land depends on many factors including the size of the tract in relationship to the pipeline easement, existence of other pipeline and utility corridors, the current value of the land, and current land use. Subjective valuation is generally not considered in appraisals. This is not to say that the pipeline could not impact resale values. A potential purchaser of property would make a decision to purchase based on his/her planned use, such as agricultural, future subdivision, or second home, of the property in question. If the presence of a pipeline renders the planned

use infeasible or undesirable, it is possible that a potential purchaser would decide not to purchase the property. However, each potential purchaser has a different agenda and differing capabilities to purchase land.

We have reviewed studies that indicate that the pipeline easement, in and of itself, would not create a measurable loss in value to the property. These studies have been done by The Real Estate Counseling Group of Connecticut, Inc. and include studies of a number of pipelines in differing regional areas. In addition, several studies have been completed by individual appraisal groups in various parts of the country. Therefore, the effect that an easement may have on property value is a damage-related issue and should be negotiated between the parties during the easement acquisition process or would be determined during condemnation proceedings. The issue of compensation is beyond the scope of the Commission's jurisdiction.

Millennium would compensate landowners for any damage to property including temporary loss of crops and pastures, or permanent loss of timber or mineral resources. In the event a landowner observes damage after restoration is complete, Millennium would work with the landowner to correct the situation and pay compensation where owed. Unresolved issues would be settled in appropriate legal proceedings.

Property taxes for a piece of property are generally based on the actual use of the land. Construction of the pipeline would not change the general use of the land, but it would preclude the construction of aboveground structures on the permanent right-of-way. If a landowner feels that the presence of a pipeline easement reduces the value of his/her land, resulting in an overpayment of property taxes, he/she may appeal the issue of the assessment and subsequent property taxation to the local property taxation agency.

Economy and Tax Revenues

During construction, some portion of the construction payroll would be spent locally for the purchase of housing, food, gasoline, entertainment, and luxury items. The dollar amount would depend on the number of construction workers in a given area and the duration of their stay. It is also likely that some portion of construction materials would be purchased locally. However, these purchases would probably be limited to smaller tools and equipment, emergency repair services, and miscellaneous materials such as haybales. These direct payroll and materials expenditures would have a positive impact on local economies and would stimulate indirect expenditures within the region as inventories are restocked or new workers are hired to meet construction demands. Sales tax would also be paid on all goods and services purchased with payroll monies or for construction materials.

Based on its original projection of pipeline construction in Westchester County, Millennium estimates that about $200 million would be spent in contractor labor wages for the entire project. Of that total, Millennium estimates that about $95.2 million would be spent in local worker wages assuming about 48 percent of the work force is hired locally (common laborers, truck drivers, and semi-skilled workers). Another $18.9 million would be spent in local material purchases. Estimated tax revenues during construction, as provided by Millennium, for Westchester County are shown on table 5.9-1.

Following construction, the pipeline would be subject to state, county, and local property taxes. The local tax rate is levied against that part of the assessed value of the pipeline which crosses each municipality and is based on estimated future costs and revenues for each town for the entire year. It is determined by town officials according to estimated budget needs at the beginning of each year. Tax revenues are used to support road and bridge programs, school districts, safety, and general county administration.

TABLE 5.9-1

Estimated Tax Revenues During Construction in Westchester County

	Dollars	Tax Rate
Estimated sales taxes from construction worker purchases	$514,080	6%
Estimated taxes from construction materials expendables	$97,900	6%
Estimated taxes from major materials purchases	$881,100	6%
Estimated taxes from worker motel rooms	$67,500	3%
Total	$1,560,580	

Secondary Growth

Since the 9/9A Proposal would provide additional supplies of natural gas in the region, there may be other indirect socioeconomic impacts. These may include new local distribution companies that may form to move natural gas to domestic and other end users, the conversion of existing industrial facilities from other fuels to natural gas, and the construction of new industrial or commercial facilities which would use natural gas. These types of secondary or induced impacts could be considered beneficial since they would stimulate regional economies and provide new jobs and economic growth. We are not aware of any proposals to bring natural gas service from the 9/9A Proposal to new domestic and commercial customers. Although we cannot predict the ultimate use of the natural gas that would be provided by the project, any new pipeline facilities (including taps for delivery service) would be subject to the Commission's or the state's environmental regulations, and would be given appropriate NEPA review when and if any are proposed.

Environmental Justice

Our mailing distribution list for this SDEIS was initiated when the NOI of the proposed project was first issued, and has been continually updated during the EIS process. The mailing list includes all property owners without any distinction based on minority or income status. Section 1.3 describes the public notification and participation process. Sections 4.8 and 5.8 describe contacts with Native American tribes that traditionally occupied, or currently occupy, the project area.

We require that an applicant initially identify all residences within 50 feet of the construction work area. From this information, we analyze the pipeline route with respect to: 1) how close in feet the proposed right-of-way is to the residence; and 2) other engineering constraints that may affect construction and the safety and welfare of the residents. Special construction procedures, techniques, and/or site-specific mitigation measures are then identified to minimize impact on any residences affected by construction, regardless of the income or minority status of the resident. A total of 4 residences have been identified within 50 feet of the 9/9A Proposal construction work area. Mitigation has been proposed to minimize construction impact on all residences.

The 9/9A Proposal is part of a larger project that would supply natural gas to specific customers. A practical and economic route design minimizes the length of pipeline after consideration of all engineering and environmental effects. We have not identified any disproportionately high and adverse human health or environmental effects on minority and low-income communities or Native American groups.

5.10 AIR QUALITY AND NOISE

5.10.1 Air Quality

Construction of the proposed facilities would cause a temporary reduction in local ambient air quality as a result of fugitive dust and emissions generated by construction equipment. The extent of dust generated would depend on the level of construction activity and on soil composition and dryness. If proper dust suppression techniques were not employed, dry and windy weather could create a nuisance for nearby residents. The emissions for construction vehicles and equipment should have an insignificant effect on air quality of the region. However, under certain meteorological conditions, there might be high temporary concentrations of pollutants in the vicinity of construction. No significant impact on air quality would occur during operation of the proposed pipeline.

Millennium states that work along U.S. Route 9, State Route 9A, and State Routes 9A/100 would typically be completed during two 10-hour workshifts. There would be no construction during the 4-hour peak traffic periods (3 to 7 p.m. for construction along northbound lanes, and 6 to 10 a.m. for construction along southbound lanes). As work progresses, different pieces of equipment would be operating for varying periods of time, often intermittently. Overall, Millennium estimates that during each workday, each piece of equipment would be operated for approximately 53 percent of the workday.

The emissions from construction equipment was modeled using the EPA Nonroad Engine Emissions Modeling emissions factor data. The emissions factor for the hourly amount of exhaust in the form of total hydrocarbons (HC), carbon monoxide (CO), and NO_x for each piece of equipment that would be used on each construction spread is in table 5.10.1-1.

Millennium estimated the emissions from normal traffic using U.S. Route 9 and State Route 9A using the EPA Highway Mobile Source Emissions Factors used in the MOBILE 5 model. These emissions factors were based on a MOBILE 5 model output for a 55 miles per hour highway in 1996. Traffic data for this evaluation were obtained from the State of New York Department of Transportation "1997 Highway Sufficiency Ratings – Region 8." These modeling results were:

	Total (pounds/mile/day)
Total volatile organic compounds (VOC)	163.89
Total CO	1,154.36
Total NO_x	325.90

To compare the results of the construction emissions with highway traffic emissions it is necessary to standardize the distance over which emissions are occurring, which is 400 feet per day. The comparison of emission from construction activity with highway traffic for any one day period follows:

	Construction Emissions (pounds/400 ft/day)	Highway Traffic Emissions (pounds/400 ft/day)
Total VOC	0.57	12.42
Total CO	2.09	87.45
Total NO_x	5.47	24.69

TABLE 5.10.1-1

Estimated Construction Equipment Air Emissions per Hour of Operation

Typical Equipment	HC (g/hp-hr)	CO (g/hp-hr)	NO_x (g/hp-hr)
1 - D7 dozer	0.68	2.70	8.38
2 - 996 side dump loaders	0.68	2.70	8.38
2 - "Dozer D10, Rocsaw "	0.68	2.70	8.38
1 - Truck Tractor	0.68	2.70	8.38
1 - 225 Backhoe with rock pick and bucket	0.68	2.70	8.38
4 - 10 cubic yard dump trucks	0.68	2.70	8.38
1 - Mechanics rig	0.68	2.70	8.38
2 - Pickup trucks	0.68	2.70	8.38
2 - 3-ton flatbed trucks	0.68	2.70	8.38
1 - Air compressor, 250 cfm	0.99	3.49	8.30
1 - Fuel/lube truck	0.68	2.70	8.38
1 - 26-passenger bus	0.68	2.70	8.38
1 - Compactor - single drum	0.99	3.49	8.30
2 - "Sideboom, 572 or 966 Loader"	0.68	2.70	8.38
1 - Hydracrane, 35-ton	0.68	2.70	8.38
1 - Air compressor, 280 cfm	0.99	3.49	8.30
1 - FBE Coating Machine (100 kW Generator)	0.68	2.70	8.38
3 - Concrete Ready MixTruck, 8 cubic yards	0.68	2.70	8.38
6 - Light plants	1.50	5.00	10.00
1 - Street Sweeper (1)	0.99	3.49	8.30
1 - Bending machine	–	–	–
1 - Welding rig with two 300-amp welding machines	–	–	–
4 - Welding rig with one 300-amp welding machines	–	–	–

NOTES:
1. Emissions factors obtained from Exhaust Emission Factors for Nonroad Engine Modeling - Compression - Ignition, Report No. NR-009A, Feb. 13, 1998, "
2. Horsepowers for equipment engines obtained from Caterpillar (handbook and web page) and public sources (internet).
3. Bending machine and welding machines were considered as de minimis and were not included in the modeling.

g/hp-hr = grams per horsepower-hour
cfm = cubic feet per minute
kW = kilowatt

From a risk-based or receptor basis the emissions should be compared on an annualized basis. Assuming a receptor in a fixed location, exposure to emissions from construction activity would occur only during one 24 hour period, while exposure to emissions from highway traffic would occur daily. The comparison of emissions from construction activity with highway traffic on an annualized basis follows:

	Construction Emissions (pounds/400ft/year)	Highway Traffic Emissions (pounds/400 ft/year)
Total VOC	0.57	4,533.3
Total CO	2.09	31,919.25
Total NO_x	5.47	9,011.85

Based on the above analysis, construction of the 9/9A Proposal would not contribute significantly to air emissions in the project area and to nearby residences on an annual basis. However, there would be one-day increases in pollution due to construction activity, ranging from a 2 percent increase in total CO to a 22 percent in total NO_x. This estimate also does not include emissions from vehicles that may be slowed down by pipeline construction that may result in traffic delays. However, these increases would be a

localized one-day increase that would move with the construction spread. So, this affect would be not be expected to be significant.

5.10.2 Noise

Pipeline construction activities would proceed along the proposed rights-of-way at average rates of several hundred to several thousand feet per day. Generally, construction noise would be intermittent and would vary from hour to hour at any single location depending on the equipment in use and the operations being performed. The noise associated with pipeline construction is similar to the noise produced during excavation and grading at many other small construction sites, but its duration at any specific area would be relatively brief. Neighbors might hear the construction noise at times, but the overall impact would be temporary and would not be expected to be significant. All construction activities, including controlled rock blasting, would comply with federal, state and local regulations.

Millennium provided an estimate for noise produced by the various pieces of construction equipment expected to be utilized along U.S. Route 9 and State Route 9A (see table 5.10.2-1). Equipment that would not present a significant noise source and would not be used for extensive periods of time during a workshift was not included in the noise modeling.

TABLE 5.10.2-1

Typical Construction Equipment Emission Noise Levels

Equipment	Noise Level at 50 feet	Data Source
D7 dozer	86	(1)
966 loader, side dump	83	(1)
Rocksaw, D10	91.5	(1)
Truck tractor	Not significant	--
Bending machine	Not significant	--
225 backhoe w/rock pick & bucket	77	(1)
Welding rig w/2-300 amp welding machines	76	(2)
Welding rig w/1-300 amp welding machines	76	(2)
10 yd dump trucks	88	(2)
Mechanics rig	Not significant	--
Pickups	Not significant	--
3t flatbed truck	Not significant	--
Compressor, 250 cfm	81	(2)
Compressor, 280 cfm	81	(2)
Fuel/lube truck	Not significant	--
Bus, 26 passenger	Not significant	--
Compactor, single drum	74	(2)
Sideboom, 572 or 966 loader w/sideboom attachment	77	(1)
Hydra crane, 35 ton	83	(2)
FBE coating machine (100 kw generator)	81	--
Concrete ready mix truck, 8 cyde	88	(2)
Light plants, 4 lite	81	(2)
Street sweeper	74	(2)

Data Source: 1) SAE J88 Test Data from personal correspondence with K. Meitl of Caterpillar Corp. (November 10, 2000).
2) Transit Noise and Vibration Impact," Federal Transit Administration, U.S. Department of Transportation, DOT-T-95-16, April 1995.

Millennium estimated noise levels for construction work during any 20-hour workday using the modeling techniques established by the Federal Transit Administration (FTA), as detailed in its "Transit Noise and Vibration Impact" guidance manual (USDOT-T-95-16, April 1995). This estimate assumed that:

> along U.S. Route 9, State Route 9A, and State Routes 9A/100work would be conducted in a constantly moving area of two 400-foot per shift work zones over a 20-hour workday;
> conservative estimates for the time of operation for each piece of equipment during the workshift;
> equipment would be operating at full power during all periods of operation; and
> the nearest receptor was 50 feet from the centerline of the work area.

On this basis, it was estimated that the overall noise level from construction activities would yield an "L_{dn}" of 86.4 dBA. This value represents a receiver's cumulative noise exposure or dose from all events in a 24-hour period, as opposed to an instantaneous noise level for any one period of time. The potential impact from the noise levels estimated for this construction activity are effectively mitigated because the duration of noise exposure at any receptor is limited to one 24-hour period during the entire duration of construction along the roadway. In other words, since construction would progress at approximately 400 feet per day, stationary noise receptors would only be exposed to construction noise for a short period of time.

The noise level from traffic using U.S. Route 9 and State Route 9A was estimated using the STAMINA computer model under the FTA guidelines ("Transit Noise and Vibration Impact" guidance manual, DOT-T-95-16, April 1995). Traffic data for this evaluation were obtained from the NYSDOT "1997 Highway Sufficiency Ratings – Region 8." The results of this analysis show that the L_{dn}, the cumulative noise exposure from U.S. Route 9 and State Route 9A traffic at a receiver 50 feet away from the highway, during the daily construction period of 20 hours would be 76.4 dBA. This is the noise exposure that would be received each day from U.S. Route 9 and State Route 9A traffic noise during a 20-hour period, corresponding to the time period of a two 10-hour shift construction work day.

These noise levels during construction would be locally significant. Normally, pipeline construction occurs during the daylight hours (i.e., 7 a.m. to 7 p.m.) and as such occurs when residents are awake and active. However, for the 9/9A Proposal, there will be a 20-hour workday. During a 20-hour work day, these projected noise levels could create a disturbance to nearby residents. For example, if the rocsaw (D-10) was the only equipment operating during the construction phase, the construction noise level could exceed the cumulative traffic noise of 76.4 dBA up to a distance of about 284 feet. People with greater noise sensitivity may be annoyed by the noise levels when the construction spread is nearby and active at night. However, this disturbance would last only for a few days during construction and operationally there would be no impact.

At the directional drill sites, drilling equipment would typically operate 24 hours a day until the pipe is installed. This would result in noise impacts on residents in the immediate vicinity of the drilling rig. The degree of impact would depend on site-specific factors such as the presence or absence of screening vegetation, existing topography at the site, the distance between the residence and the drilling rig, and the existing ambient noise at the site.

Millennium proposes to directionally drill the Croton River (MP 396.8). There are no residences in the immediate vicinity of the drill site on the south side of the river although there are residences on nearby streets within 500 feet of the site. Standard directional drill equipment will produce approximately 85 decibels at 200 feet. Millennium expects that mufflers, baffles and/or other noise attenuation devices would be used by the contractor and would include these mitigation measures in the bid package. These measures

would be enforced during directional drilling activities. To minimize noise impact at residences that may be affected by noise from the drilling rig, we recommend that:

> **Millennium file a site-specific plan identifying how it would reduce construction noise during a directional drill. The plan should include projected daytime and nighttime noise levels at nearby residences and mitigation measures that would be used to minimize noise at these residences if the noise level would exceed an L_{dn} of 55 dBA at any residence. The plan should be filed with the Secretary for review and written approval by the Director of OEP before construction.**

RELIABILITY AND SAFETY

The transportation of natural gas by pipeline involves some risk to the public in the event of an accident and subsequent release of gas. The greatest hazard is a fire or explosion following a major pipeline rupture.

Methane, the primary component of natural gas, is colorless, odorless, and tasteless. It is not toxic, but is classified as a simple asphyxiate, possessing a slight inhalation hazard. If breathed in high concentration, oxygen deficiency can result in serious injury or death. Mercaptan is added to natural gas for safety so that it can be detected by smell.

Methane has an ignition temperature of 1,000 degrees Fahrenheit and is flammable at concentrations between 5.0 percent and 15.0 percent in air. Unconfined mixtures of methane in air are not explosive. However, a flammable concentration within an enclosed space in the presence of an ignition source can explode. It is buoyant at atmospheric temperatures and disperses rapidly in air.

Safety Standards

The USDOT is mandated to provide pipeline safety under Title 49, U.S.C. Chapter 601. The Research and Special Programs Administration's (RSPA), Office of Pipeline Safety, administers the national regulatory program to ensure the safe transportation of natural gas and other hazardous materials by pipeline. It develops safety regulations and other approaches to risk management that ensure safety in the design, construction, testing, operation, maintenance, and emergency response of pipeline facilities. Many of the regulations are written as performance standards which set the level of safety to be attained and allow the pipeline operator to use various technologies to achieve safety. RSPA ensures that people and the environment are protected from the risk of pipeline incidents. This work is shared with state agency partners and others at the Federal, state, and local level. Section 5(a) of the Natural Gas Pipeline Safety Act provides for a state agency to assume all aspects of the safety program for intrastate facilities by adopting and enforcing the Federal standards, while section 5(b) permits a state agency that does not qualify under section 5(a) to perform certain inspection and monitoring functions. A state may also act as USDOT's agent to inspect interstate facilities within its boundaries; however, the USDOT is responsible for enforcement action. The majority of the states have either 5(a) certifications or 5(b) agreements, while nine states act as interstate agents. The NYSDOT acts as an interstate agent in New York.

The USDOT pipeline standards are published in Parts 190-199 of Title 49 of the CFR. Part 192 of 49 CFR specifically addresses natural gas pipeline safety issues. It does not, however, address other issues like siting and routing, bond issues, etc. These items, in part, are a matter of private negotiation between pipeline companies, landowners, and/or local government zoning boards. The Federal statutes which govern USDOT's authority do not authorize USDOT to regulate those activities. The FERC takes the Federal lead on issues regarding environmental impacts (which often affect siting and routing), financing, tariffs, etc.

Under a Memorandum of Understanding on Natural Gas Transportation Facilities (Memorandum) dated January 15, 1993 between the USDOT and the FERC, the USDOT has the exclusive authority to promulgate Federal safety standards used in the transportation of natural gas. Section 157.14(a)(9)(vi) of the FERC's regulations require that an applicant certify that it will design, install, inspect, test, construct, operate, replace, and maintain the facility for which a certificate is requested in accordance with Federal safety standards and plans for maintenance and inspection, or shall certify that it has been granted a waiver of the requirements of the safety standards by the USDOT in accordance with section 3(e) of the Natural Gas Pipeline Safety Act. The FERC accepts this certification and does not impose additional safety standards other than the USDOT standards. If the Commission becomes aware of an existing or potential safety problem, there is a provision in the Memorandum to promptly alert USDOT. The Memorandum also provides for referring complaints and inquiries made by state and local governments and the general public involving safety matters related to pipeline under the Commission's jurisdiction to the USDOT.

The FERC also participates as a member of the USDOT's Technical Pipeline Safety Standards Committee which determines if proposed safety regulations are reasonable, feasible, and practicable.

The pipeline and aboveground facilities associated with the 9/9A Proposal must be designed, constructed, operated, and maintained in accordance with the USDOT Minimum Federal Safety Standards in 49 CFR Part 192. The regulations are intended to ensure adequate protection for the public and to prevent natural gas facility accidents and failures. Part 192 specifies material selection and qualification, minimum design requirements, and protection from internal, external, and atmospheric corrosion.

Part 192 also defines area classifications, based on population density in the vicinity of the pipeline, and specifies more rigorous safety requirements for populated areas. The class location unit is an area that extends 220 yards on either side of the centerline of any continuous 1 mile length of pipeline. The four area classifications are defined as follows:

Class	Location with 10 or fewer buildings intended for human occupancy.
Class 2	Location with more than 10 but less than 46 buildings intended for human occupancy.
Class 3	Location with 46 or more buildings intended for human occupancy or where the pipeline lies within 100 yards of any building, or small well-defined outside area occupied by 20 or more people during normal use.
Class 4	Location where buildings with four or more stories aboveground are prevalent.

Class locations representing more populated areas require higher safety factors in pipeline design, testing, and operation. Pipelines constructed on land in Class 1 locations must be installed with a minimum depth of cover of 30 inches in normal soil and 18 inches in consolidated rock. All pipelines installed in navigable rivers, streams, and harbors must have a minimum cover of 48 inches in soil or 24 inches in consolidated rock. Offshore pipelines constructed in less than 12 feet of water, as measured from the mean low tide, must have a minimum cover of 36 inches in soil and 18 inches in consolidated rock. Offshore pipelines constructed in 12 to 200 feet of water, as measured from the mean low tide, must be installed so that the top of the pipe is below the natural bottom unless the pipeline is protected by some other means such as a heavy concrete coating.

Class 2, 3, and 4 locations, as well as drainage ditches of public roads and railroad crossings, require a minimum cover of 36 inches in normal soil and 24 inches in consolidated rock. Class locations also specify

the maximum distance to a sectionalizing block valve (e.g., 10.0 miles in Class 1, 7.5 miles in Class 2, 4.0 miles in Class 3, and 2.5 miles in Class 4). Pipe wall thickness and pipeline design pressures, hydrostatic test pressures, maximum allowable operating pressure, inspection and testing of welds, and frequency of pipeline patrols and leak surveys must also conform to higher standards in more populated areas. Preliminary class locations for the 9/9A Proposal have been developed based on the relationship of the pipeline centerline to other nearby structures and manmade features. Class 3 and 4 requirements would be used.

Part 192 prescribes the minimum standards for operating and maintaining pipeline facilities, including the requirement to establish a written plan governing these activities. Under section 192.615, each pipeline operator must also establish an emergency plan that includes procedures to minimize the hazards in a natural gas pipeline emergency. Key elements of the plan include procedures for:

receiving, identifying, and classifying emergency events, gas leakage, fires, explosions, and natural disasters;

establishing and maintaining communications with local fire, police, and public officials, and coordinating emergency response;

making personnel, equipment, tools, and materials available at the scene of an emergency;

protecting people first and then property, and making them safe from actual or potential hazards; and

emergency shutdown of system and safe restoration of service.

Part 192 requires that each operator must establish and maintain liaison with appropriate fire, police, and public officials to learn the resources and responsibilities of each organization that may respond to a natural gas pipeline emergency, and to coordinate mutual assistance. The operator must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas pipeline emergency and report it to appropriate public officials. Millennium would provide the appropriate training to local emergency service personnel before the pipeline is placed in service. No additional specialized local fire protection equipment would be required to handle pipeline emergencies.

5.11.2 Pipeline Accident Data

Since February 9, 1970, 49 CFR Part 191 has required all operators of transmission and gathering systems to notify the USDOT of any reportable incident and to submit a report on form F7100.2 within 20 days. Reportable incidents are defined as any leaks that:

caused a death or personal injury requiring hospitalization;

required taking any segment of transmission line out of service;

resulted in gas ignition;

caused estimated damage to the property of the operator, or others, or both, of a total of $5,000 or more;

required immediate repair on a transmission line;

occurred while testing with gas or another medium; or

in the judgment of the operator was significant, even though it did not meet the above criteria.

The USDOT changed reporting requirements after June 1984 to reduce the amount of data collected. Since that date, operators must only report incidents that involve property damage of more than $50,000, injury, death, release of gas, or that are otherwise considered significant by the operator. Table 5.11.2-1 presents a summary of incident data for the 1970 to 1984 period, as well as more recent incident data for 1991 through 2000, recognizing the difference in reporting requirements. The 14.5-year period from 1970 through June 1984, which provides a larger universe of data and more basic report information than subsequent years, has been subject to detailed analysis, as discussed in the following sections. [3/]

TABLE 5.11.2-1

Natural Gas Service Incidents by Cause

Cause	Incidents per 1,000 miles of Pipeline (percentage) 1970-1984	1991-2000
Outside force	0.70 (53.5)	0.10 (39.3)
Corrosion	0.22 (16.6)	0.06 (23.5)
Construction or material defect	0.27 (21.7)	0.03 (12.7)
Other	0.11 (8.2)	0.06 (24.2)
Total	1.30	0.25

During the 14.5-year period, 5,862 service incidents were reported over the more than 300,000 total miles of natural gas transmission and gathering systems nationwide. Service incidents, defined as failures that occur during pipeline operation, have remained fairly constant over this period with no clear upward or downward trend in annual totals. In addition, 2,013 test failures were reported. Correction of test failures removed defects from the pipeline before operation.

Additional insight into the nature of service incidents may be found by examining the primary factors that caused the failures. Table 5.11.2-1 provides a percentage distribution of the causal factors as well as the annual frequency of each factor per 1,000 miles of pipeline in service.

3/ Jones, D.J., G.S. Kramer, D.N. Gideon, and R.J. Eiber, 1986. "An Analysis of Reportable Incidents for Natural Gas Transportation and Gathering Lines 1970 Through June 1984." NG-18 Report No. 158, Pipeline Research Committee of the American Gas Association.

TABLE 5.11.2-2

Outside Forces Incidents by Cause (1970-1984)

Cause	Percent
Equipment operated by outside party	67.1
Equipment operated by or for operator	7.3
Earth movement	13.3
Weather	10.8
Other	1.5

The dominant incident cause is outside forces, constituting 53.5 percent of all service incidents. Outside forces incidents result from the encroachment of mechanical equipment such as bulldozers and backhoes; from earth movements due to soil settlement, washouts, or geologic hazards; from weather effects such as winds, storms, and thermal strains; and from willful damage. The breakdown of outside forces incidents in table 5.11.2-2 shows that human error in equipment usage was responsible for approximately 75 percent of outside forces incidents. Since April 1982, operators have been required to participate in "One Call" public utility programs in populated areas to minimize unauthorized excavation activities in the vicinity of pipelines. The "One Call" program is a service used by public utilities and some private sector companies (e.g., oil pipelines and cable television) to provide preconstruction information to contractors or other maintenance workers on the underground location of pipes, cables, and culverts. The 1991 through 2000 data show that the portion of incidents caused by outside forces has decreased to 39.3 percent.

The pipelines included in the data set in table 5.11.2-1 vary widely in terms of age, pipe diameter, and level of corrosion control. Each variable influences the incident frequency that may be expected for a specific segment of pipeline.

The frequency of service incidents is strongly dependent on pipeline age. While pipelines installed since 1950 exhibit a fairly constant level of service incident frequency, pipelines installed before that time have a significantly higher rate, partially due to corrosion. Older pipelines have a higher frequency of corrosion incidents, since corrosion is a time-dependent process. Further, new pipe generally uses more advanced coatings and cathodic protection to reduce corrosion potential.

Older pipelines have a higher frequency of outside forces incidents partly because their location may be less well known and less well marked than newer lines. In addition, the older pipelines contain a disproportionate number of smaller diameter pipelines, which have a greater rate of outside forces incidents. Small diameter pipelines are more easily crushed or broken by mechanical equipment or earth movements.

Table 5.11.2-3 clearly demonstrates the effectiveness of corrosion control in reducing the incidence of failures caused by external corrosion. The use of both an external protective coating and a cathodic protection system, required on all pipelines installed after July 1971, significantly reduces the rate of failure compared to unprotected or partially protected pipe. The data shows that bare, cathodically protected pipe actually has a higher corrosion rate than unprotected pipe. This anomaly reflects the retrofitting of cathodic protection to actively corroding spots on pipes.

TABLE 5.11.2-3

External Corrosion by Level of Control (1970-1984)

Corrosion Control	Incidents per 1,000 miles per Year
None-bare pipe	0.42
Cathodic protection only	0.97
Coated only	0.40
Coated and cathodic protection	0.11

We have received comments from individuals who are concerned about potential health hazards resulting from cathodic protection systems similar to those that have been reported from the electromagnetic fields (EMF) generated by electric transmission lines. We are not aware of, nor anticipate, (per the discussion below on direct-current) any health hazards from the low-power, direct current output of cathodic systems. We are aware of media reports regarding the health effects of EMF which relate to alternating-current power transmission systems, not direct-current systems. Electric power transmission lines transmit alternating current. The transmission of alternating current generates fluctuating electromagnetic fields. Direct-current systems do not generate fluctuating electromagnetic fields. Also, the elements (ground beds and rectifiers) of the cathodic protection system would be designed and located to control the cathodic protection direct-current so that the effect on any other buried metallic structures would be negligible.

5.11.3 Impact on Public Safety

The service incident data summarized in table 5.11.2-1 include pipeline failures of all magnitudes with widely varying consequences. Approximately two-thirds of the incidents were classified as leaks, and the remaining third classified as ruptures, implying a more serious failure. Fatalities or injuries occurred in 4 percent of the service incidents reported in the 14.5-year period from 1970 through June 1984.

Table 5.11.3-1 presents the average annual fatalities that occurred on natural gas transmission and gathering lines from 1970 to 2000. Fatalities between 1970 and June 1984 have been separated into employees and nonemployees, to better identify a fatality rate experienced by the general public. Of the total 5.0 nationwide average, fatalities among the public averaged 2.6 per year over this period. The simplified reporting requirements in effect after June 1984 do not differentiate between employees and nonemployees. However, the data show that the total annual average for the period 1984 through 2000 decreased to 4.2 fatalities per year. Subtracting two major offshore incidents in 1989, which do not reflect the risk to the onshore public, yields a total annual rate of 3.4 fatalities per year for this period.

The nationwide totals of accidental fatalities from various manmade and natural hazards are listed in table 5.11.3-2 in order to provide a relative measure of the industry-wide safety of natural gas pipelines. Direct comparisons between accident categories should be made cautiously since individual exposures to hazards are not uniform among all categories. Nevertheless, the average 3.1 public fatalities per year is relatively small considering the more than 300,000 miles of transmission and gathering lines in service nationwide. Furthermore, the fatality rate is approximately two orders of magnitude (100 times) lower than the fatalities from natural hazards such as lightning, tornados, floods, earthquakes, etc.

TABLE 5.11.3-1

Annual Average Fatalities - Natural Gas Transmission and Gathering Systems a/, b/

Year	Employees	Nonemployees	Total
1970-June 1984	2.4	2.6	5.0
1984-2000 c/	-	-	4.2
1984-2000 c/	-	-	3.1 d/

a/ 1970 through June 1984 - American Gas Association, 1986.
b/ USDOT Hazardous Materials Information System.
c/ Employee/nonemployee breakdown not available after June 1984.
d/ Without 18 offshore fatalities occurring in 1989 -- 11 fatalities resulted from a fishing vessel striking an offshore pipeline and 7 fatalities resulted from explosion on an offshore production platform.

TABLE 5.11.3-2

Nationwide Accidental Deaths a/

Type of Accident	Fatalities
All accidents	90,523
Motor vehicles	43,649
Falls	14,985
Drowning	3,488
Poisoning	9,510
Fires and burns	3,791
Suffocation by ingested object	3,206
Tornado, flood, earthquake, etc. (1984-93 average)	181
All liquid and gas pipelines (1978-87 average) b/	27
Gas transmission and gathering lines Nonemployees only (1970-84 average) c/	2.6

a/ All data, unless otherwise noted, reflects 1996 statistics from the U.S. Department of Commerce, Bureau of the Census, "Statistical Abstract of the United States 118th Edition."
b/ U.S. Department of Transportation, "Annual Report on Pipeline Safety - Calendar Year 1987."
c/ American Gas Association, 1986.

The available data show that natural gas pipelines continue to be a safe, reliable means of energy transportation. Based on approximately 311,000 miles in service, the rate of public fatalities for the nationwide mix of transmission and gathering lines in service is 0.01 per year per 1,000 miles of pipeline. Using this rate, the 9/9A Proposal might result in a public fatality every 4,400 plus years. This would represent a slight increase in risk to the nearby public.

5.11.4 Frequently Asked Pipeline Safety Questions

In a letter dated December 10, 1998, the USDOT staff responded to a November 19, 1998 letter from Mr. John Diacsuk of Pen Argyl, Pennsylvania regarding construction of the Market Link Project. Both letters are in the FERC's public file in Docket No. CP98-540-000. Mr. Diacsuk's questions reflect concerns that have also been expressed in comments filed on the 9/9A Proposal. Since his questions and the USDOT's

responses apply to pipeline projects in general and are not project-specific, we have included them as they provide additional information from the USDOT.

> When natural gas is not being pumped, what inert gas is used to prevent internal pipe corrosion and related stress corrosion cracking?

Natural gas pipelines remain under a dry methane atmosphere, even when gas is not actively being "pumped". Pipelines are normally only purged for some maintenance activities.

Stress corrosion cracking (SCC) in pipelines is a complex process that is not completely understood. In some forms, the process is electrochemical, similar to general corrosion. SCC typically occurs at breaks in the coating or at regions where the coating is disbonded. Soil conditions and temperature of the pipe and the surrounding media are other factors that contribute to SCC. The presence of inert gas or corrosion inhibitors, however, are not factors that contribute to stress corrosion cracking. To date, failure due to SCC in natural gas pipelines in the eastern United States has not been a major problem.

2 Where is the weld inspection and documentation data maintained?

The requirements for welding of steel in pipelines is contained in Subpart E of 49 CFR Part 192. This subpart documents the procedures companies have to follow for the qualifications of welders (section 192.227), inspection and testing of welds (section 192.241), and nondestructive testing (section 192.243). The code does not specifically address the location where the weld inspection and documentation are retained. By choice, most companies prefer to retain all the weld related information in a central repository.

3. What type of crack detection is provided for the pipeline?

Modern pipeline materials with their improved metallurgical and microscopic structure and innovative manufacturing processes are not prone to cracking. The steel mills are also responsible for implementing inventive quality control and quality assurance checks throughout the manufacturing process. After a pipe length is manufactured, it is subjected to a hydrostatic test to verify that it is crack-free. The pipe is also transported in accordance with RP 5Ll: Recommended Practice for Railroad Transportation of Line Pipe to prevent the formations of cracks. As stated in the specification, most purchasers also specify that the manufacturer furnishes a report on the finished pipe.

In addition, section 192.55 (e) states that *"New steel pipe that has been cold expanded must comply with the mandatory provisions of American Petroleum Institute (API) Specification 5L."* The API Specification for high-test line pipe is under the jurisdiction of the Committee on Standardization of Tubular Goods of the API and was prepared with the cooperation of the American Gas Association.

After the installation of the pipeline and before putting it into service, according to section 192.505 (a) of the CFR, *"... each segment of the steel pipeline that is to operate at a hoop stress of 30 percent or more of SMYS must be strength tested...to a test pressure of at least 125 percent of maximum operating pressure on that segment..."* and to higher levels in densely populated areas.

4. What type of inspection is provided in the event of seismic activity?

Section 192.605 specifies that *"Each operator shall prepare and follow for each pipeline, a manual of written procedures for conducting operations and maintenance activities and for emergency response."* A seismic activity is characterized as an incident requiring emergency response.

If a pipeline resides in a seismically active zone, the operator should have sufficiently detailed plans that enumerate the steps that the company will take following a seismic activity. After a major earthquake, hydrostatic testing or in-line inspection can determine if a pipeline endured damage to assure integrity.

In addition to the above-mentioned code requirement there are other regulations that natural gas transmission operators must abide by to protect the public and minimize hazardous occurrences. They are:

Section 192.103 - addresses the design requirement for line pipe;
Section 192.613 - continuing surveillance;
Section 192.615 - emergency plans;
Section 192.616 - public education; and,
Section 192.617 - investigation of failures.

5 In the area of airport approach patterns, can the pipeline withstand an aircraft crash?

Just like all engineered structures, pipelines are designed using well-established engineering principles and codes. Similar to other structures, pipelines are designed to withstand calamitous and emergency situations they are routinely subjected to. Similar to other engineered structures, pipelines cannot withstand aircraft crashes if they occur directly over the pipeline. Both USDOT and FERC are not aware of commercial aircraft crashes damaging underground pipelines.

6 In the event of rupture, what is the shutdown reaction time and does it meet USDOT specifications?

In the event of a rupture, a shutdown is achieved by closing valves in the transmission line on either side of the rupture. Section 192.179 of 49 CFR identifies the distance transmission line block valves must be placed. This distance is a function of the terrain traversed and varies from a minimum of 2.5 miles in populated areas to a maximum of 10 miles in remote areas. A blowdown valve is another appurtenance that must be installed between mainline valves to vent the transmission line as rapidly as practicable without hazard in the event of a rupture.

The valve spacing criteria are established by Class locations as referenced in section 192.5 and the valve spacing requirement is in section 192.179.

The first criteria is Class location, defined herein above in section 5 Safety Standards

'he relevant spacing is enumerated as follows

SECTION 192.179 TRANSMISSION .INE VALVES

(a) Each transmission line, other than offshore segments, must have sectionalizing block valves spaced as follows:
  (1) Each point on a pipeline in a Class 4 location must be within 2½ miles of a valve.
  (2) Each point on a pipeline in a Class 3 location must be within 4 miles of a valve.
  (3) Each point on a pipeline in a Class 2 location must be within 7½ miles of a valve.
  (4) Each point on a pipeline in a Class 1 location must be within 10 miles of a valve.

Most transmission lines are also monitored remotely through the use of telephone or radio communications by a system called Supervisory Control and Data Acquisition (SCADA). For large pipeline systems, the SCADA system is located at the operator's control center and is monitored 24 hours a day

throughout the year. A rupture which causes the loss of gas is identified by the SCADA system as a loss of pressure and is exhibited by any combination of audio visual signals called alarms. The operator routinely has a set of protocols that identify how and what has to be done by the control center to mitigate a disastrous condition.

As mentioned earlier, the USDOT regulations are written as performance standards, which set the level of safety to be attained and allow the pipeline operator to use various technologies to achieve safety. The regulations do not specify the shutdown time of a segment of a facility because of an accident. However, the operator is expected to use diligence and current industry practices to assign a reasonable shutdown time.

7. What type of disaster contingency plan is in place?

Refer to the answer to question number 4.

8. Can the pipeline be damaged during floods in flood prone areas?

Pipelines can be damaged by floods in flood prone areas. However, according to section 192.317 of 49 CFR, *"The operator must take all practicable steps to protect each transmission line or main from washouts, floods, unstable soil, landslides or other hazards that may cause the pipeline to move or to sustain abnormal loads."*

Based on published surveys of flood plains and high water marks in active waterways, companies generally use established engineering best practices to prevent their facilities from becoming undermined during floods. They commonly use casings, heavy wall pipe, and concrete coating in susceptible locations to protect the pipe. They may also install weights on the pipeline to prevent flotation and routinely vegetate the ground cover with grasses to prevent soil erosion.

Based on historical flood data, companies may also horizontally directionally drill segments of their pipelines for much greater lengths and at greater depths than required under the channel to prevent damage due to floods. Areas susceptible to floods and other natural disasters are also patrolled more often than other areas.

9. What type of over pressure protection is provided for the pipeline?

Sections 192.195, 192.199 and 192.201 of 49 CFR address over-pressure protection in natural gas transmission pipelines. The commonly used over-pressure protection devices are rupture discs, pressure relief or pressure limiting devices and control valves. The recognized methods of preventing overpressuring the downstream-carrying components of gas control equipment include the following:

Selecting equipment rated to withstand the inlet pressure on the downstream side. This is particularly important if the equipment employs internal sensing and the adjacent downstream piping is not otherwise protected;
Connecting the control or sensing line to the downstream pressure system where over-pressure protection has been provided; and
Protecting the downstream pressure carrying components by installing a relief valve, regulator, backpressure valve, or other suitable device in the control or sensing line.

10. Is a bond provided to ensure that the taxpayer and land owner are not burdened in the event of pipe line disaster or collapse of abandoned sections in future years (i.e., the coal mines

under Scranton are still collapsing and the coal company is not responsible for the repair costs)?

Bond issues and other financial instruments to compensate land owners in the event of pipeline failures are not within USDOT's or FERC's jurisdiction. However, local jurisdictions may have requirements for bonds for construction projects.

What protection is in place to insure the pipeline is not used for storage of natural gas or other gases?

If an applicant receives FERC approval to transport natural gas, that is the purpose of the pipeline. Depending on the nature of the natural gas, an operator must protect its internal surface from internal corrosion. Subpart I of 49 CFR addresses the requirements for corrosion control on natural gas pipelines. section 192.451 *"...prescribes minimum requirements for the protection of metallic pipelines from external, internal and atmospheric corrosion."*

Sections 192.475 and 192.477 address the general aspects and the monitoring for internal corrosion control, respectively. According to section 192.475 (a), *"Corrosive gas may not be transported by pipeline, unless the corrosive effect of the gas on the pipeline has been investigated and steps have been taken to minimize internal corrosion."* Even though the term "corrosive gas" is not defined in Part 192 of 49 CFR, the analogous term "corrosive material" is defined in the hazardous materials regulations under 49 CFR § 173.136. This definition, which contains criteria for determining damage to human skin or the corrosion rate on steel or aluminum, is cross-referenced in the definition of "corrosive product" in the hazardous liquid pipeline safety standards (49 CFR section 195.2).

12 What protection is in place to insure only natural gas is pumped in the pipeline?

The purpose of the proposed pipeline is to transport natural gas. The FERC certificate does not allow products other than natural gas to be transported through the pipeline.

As the gas is transported through the pipeline system, the operator samples the gas at various locations to determine the BTU content and chemical composition. The shipper of the product (local distribution company, end-user, marketer, etc.) from the transmission company also assesses the quality of the gas stream to assure it meets their standards.

As mentioned in the previous answer, if corrosive material is found in the natural gas stream, the operator must take steps to minimize internal corrosion.

13 Is the pipeline monitored twice daily to protect against terrorism as is the Alaska Pipeline?

Section 192.705 of USDOT's regulations requires that *"Each operator shall have a patrol program to observe surface conditions on and adjacent to the transmission line right-of-way for indications of leaks, construction activity, and other factors affecting safety and operation."* The frequencies of these patrols are a function of the population density adjacent to the pipeline and varies from a minimum of at least once per year to four times per year. Many operators, however, patrol the pipeline more often that the USDOT regulations specify.

14. Is the pipeline at road and railroad crossings buried deep enough so it will prevent rupture and explosion in the case of tanker explosion or terrorist activity?

According to section 192.327, *"...Each buried transmission line must be installed with a minimum cover..."* which again is a function of population density. In normal soil the cover varies from a minimum of 30-inches in sparsely populated areas to 36-inches in densely populated areas. When the pipeline crosses drainage ditches, public roads and railroads, the minimum cover is 36-inches. However, the minimum cover under railroads is generally higher than what is specified in the codes because railroad companies have their own requirements in their permit application. Also, as mentioned in the answer to question number 9, most companies use heavy wall pipe, casings, concrete coating, or a combination thereof under obstructions and areas that are heavily traveled or are subject to heavier loads.

15. Are local fire and disaster relief agencies funded and capable of handling a catastrophic pipe line accident (i.e., a backhoe punctured a pipe line in New Jersey and it took several fire companies and an evacuation to control the accident)?

The capabilities of local fire and disaster relief agencies and their funding levels can best be answered by the communities themselves. In the unlikely event of a pipeline emergency, local emergency personnel will be expected to assist in the evacuation of the public during the emergency, control traffic, and if necessary, control secondary fires. It is expected that applicants will meet with emergency personnel to coordinate emergency plans, and overall responsibilities during a pipeline emergency.

16. In the event a pipeline accident were to occur and property is damaged, would the applicant reimburse the property owner for damages? Who would be responsible for assessing damage costs?

In the unlikely result of an applicant's negligence, it would be responsible for property damage. Each applicant has stated that it will maintain adequate insurance to provide for payment for any such costs. Damage cost would be determined by negotiation among the parties, or their insurers, or, if agreement cannot be reached, by appropriate legal proceedings. If an outside third-party caused the pipeline accident, the most likely scenario would be legal proceeding to determine fault and extent of compensation.

17. What percent of failures occur where pipelines are constructed within roadbeds?

The USDOT's Office of Pipeline Safety maintains statistical information with respect to gas pipeline incidents. That information provides pipeline incident information in broad categories. One of these categories identifies incidents "under pavement." This category appears to be the most analogous to the question. While not defined, "under pavement" could include, in addition to roadbeds, parking lots, driveways, and sidewalks. Based on the statistics for this category, 1.54 percent of all gas transmission incidents occurred "under pavement."

18. What additional safety measures are required for construction under roads? Are there any additional requirements if such construction is in an urban setting?

The USDOT, the Federal agency charged with the responsibility for pipeline safety, has specific requirements for construction under 49 CFR Part 192.

In addition, the safety regulations specify certain requirements in urban settings which would include roads. These requirements are determined by population density. The relevant section of the code is as follows:

192 DESIGN FACTOR(F) FOR STEEL PIPE

(A) Except as otherwise provided in paragraphs (b), (c),and (d) of this section, the design factor to be used in the design formula in section 192.105 is determined in accordance with the following table:

Class Location	Design Factor
1	0.72
2	0.60
	0.50
4	0.40

(B) A design factor of 0.60 or less must be used in the design formula in section 192.105 for steel pipe in Class 1 locations that:

crosses the right-of-way of an unimproved road, without a casing;
(2) crosses without a casing, or makes a parallel encroachment on, the right-of-way of either a hard surfaced road, a highway, a public street, or a railroad;
(3) is supported by a vehicular, pedestrian, railroad, or pipeline bridge; or
(4) is used in a fabricated assembly, (including separators, mainline valve assemblies, cross connections, and river crossing headers) or is used within five pipe diameters, in any direction from the last fitting of a fabricated assembly, other than a transition piece or an elbow used in place of a pipe bend which is not associated with a fabricated assembly.

(C For Class 2 locations, a design factor of 0.50 or less must be used in the design formula in section 192.105 for uncased steel pipe that crosses the right-of-way of a hard surfaced road, a highway, a public street, or a railroad.

(D) For Class 1 and Class 2 locations, a design factor of 0.50 or less must be used in design formula in section 192.105 for:

(1) steel pipe in a compressor station, regulating station, or measuring station; and
(2) steel pipe, including riser pipe, on a platform located offshore or in inland navigable waters.

19. How does USDOT evaluate natural gas pipelines and enforce their safety standards?

The USDOT conducts periodic audits of pipeline companies, both during and after construction. One of the tools they use is a checklist known as an "Evaluation Report of Gas Transmission Pipeline" which can be found on the USDOT's Internet web site http://ops.usdot.gov.

5.12 CUMULATIVE IMPACT

NEPA requires the lead Federal agency to consider the cumulative impacts of proposals under its review. Cumulative impacts are the incremental impacts of the proposed action, when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time.

There is one other pipeline project that is proposed for construction in the same general region as the Millennium Pipeline Project. This project, the Iroquois Eastchester Expansion Project (Docket No CP00-232-000, as amended), would move natural gas from Northport, New York, on Long Island to Bronx, New York, and would include pipeline and compression facilities on Iroquois' system upstream of Northport. Pipeline construction of both the Eastchester Expansion Project and the Millennium Pipeline Project are proposed for 2002 (see section 3.2 for additional details). Iroquois' application and related filings can be viewed on the FERC Internet website (www.ferc.fed.us) on the "RIMS" link.

In addition to proposed projects under FERC review, we also reviewed the scoping comments to determine if other projects were identified for construction within the project area. Some information on future development plans, both residential and commercial, is discussed in section 5.7 of the SDEIS. Other highway and utility (sewer, water, etc.) upgrade projects may be planned throughout the project area, but have not been identified through the scoping process or in comment letters.

We believe the greatest potential negative cumulative impacts would primarily be the fragmentation of continuous forest and loss of mature trees, due to the long-term recovery period for restoring these impacts. Numerous species of wildlife are dependent on mature contiguous forest to sustain their evolutionary migratory and/or reproductive strategies. These species include dozens of neotropic migratory songbirds, and terrestrial carnivores that are not migratory but require large tracts of forest to support their home ranges. The effects of these impacts can be immediate and significant, since population levels for many of these species are currently low and declining further. However, about 88 percent of the 9/9A Proposal would be collocated within or adjacent to existing rights-of-way. This would minimize the impact of fragmentation of continuous forest.

Generally, we believe that cumulative impacts could result only from the construction of other projects in the same vicinity and time frame as the proposed facilities. In such a situation, although the impact associated with each project might be minor, the cumulative impact resulting from all projects being constructed in the same general area could be greater. In its January 13, 1989 Order Affirming the Administrative Law Judge's Initial Decision for the Mojave-Kern River-El Dorado Project, the Commission concluded that the general impact of building more than one pipeline would be primarily additive, and the cumulative impact may be calculated simply by adding together the impact of each individual project. Based on the available information, a total of about 154 acres (including 136 acres for the 9/9A Proposal) would be affected by the filed natural gas projects if they are approved and constructed as proposed. We do not believe it is necessary to speculate on the acreage that may be impacted by future projects since we have no control over their filed/proposed route, facilities, or if they will advance past the planning stages. However, we have identified the presently known anticipated natural gas projects in this region.