

DOCKET NO. 134 - An application of Iroquois Gas Transmission System, L.P., for a Certificate of Environmental Compatibility and Public Need to construct, operate, and maintain an Interstate Natural Gas Transmission Pipeline from Sherman to Milford and Long Island Sound.

Connecticut

Siting

Council

ORIGINAL

October 11, 1990

FINDINGS OF FACT

1. On April 17, 1990, the Iroquois Gas Transmission System L.P. (Iroquois) submitted to the Connecticut Siting Council (Siting Council) an application to construct a pipeline with the capability to transport 575.9 million cubic feet per day of natural gas through the towns of Sherman, New Milford, Brookfield, Newtown, Shelton, Monroe, Stratford, and Milford. (Iroquois IA, p.1; Record)
2. The application was accompanied by proof of service as prescribed by Connecticut General Statutes (CGS) Section 16-501(b). (Record)
3. The parties to the proceeding include the applicant and those persons and organizations whose names are listed in the Decision and Order which accompanies these Findings. (Record)
4. The Council and its staff made a public field inspection of the proposed route of the pipeline in Connecticut on June 1, 1990 and June 4, 1990. (Record)
5. Pursuant to CGS Section 16-50m, the Council, after giving due notice thereof, held public hearings on this application on June 5, 1990, beginning at 10:25 a.m. and continued at 7:05 p.m., in the New Milford Town Hall; on June 6, 1990, beginning at 10:00 a.m., in the Parsons Auditorium in Milford and continued at 7:05 p.m., on June 7, 1990, beginning at 10:00 a.m. in the Edmund Town Hall in Newtown, and continued in the Newtown High School at 7:10 p.m. the same day; on June 8, 1990, beginning at 10:00 a.m., in the Milford Town Hall; on June 11, 1990, beginning at 10:00 a.m., in the Edmund Town Hall in Newtown; on June 12, 1990, in the Brookfield Town Hall, beginning at 10:00 a.m.; and on June 19, 1990, in the Brookfield Town Hall, beginning at 10:00 a.m. (Record)

Jurisdiction

6. Iroquois applied to the Federal Energy Regulatory Commission (FERC) in May 1986 for a Certificate of Public Convenience and Necessity. On November 14, 1989, the FERC issued a Draft Environmental Impact Statement (DEIS)

on this project. On June 1, 1990, the FERC staff issued a Final Environmental Impact Statement (FEIS) on the project, and concluded that approval of the project with appropriate mitigating measures would have a limited adverse environmental impact. Iroquois has yet to receive a Certificate of Public Convenience and Necessity for the project. (FERC FEIS, Vol. I, p.ES-1, Record)

7. In a declaratory ruling by the Attorney General of Connecticut dated January 26, 1987, which was adopted by the Council on August 4, 1987, the Council and Attorney General concluded that the Council would have residual jurisdiction over the pipeline. The Council ruled that it had jurisdiction to regulate the placement of the pipeline within the FERC approved route, and that this jurisdiction would be restricted to matters of local concern which neither interfere with the federal regulatory scheme nor impose an undue burden on interstate commerce. (Iroquois 1A, Appendix A)
8. The FERC has stated that the Siting Council is free to review, approve, and enforce any mitigation measures and route alignments within its legal powers. (FERC FEIS, Vol. III, p.3-221)
9. The FEIS recommended that the FERC consider route refinements recommended by State regulatory agencies. (FEIS, Vol I, p.7-7)

Project Description

10. The operating partner of Iroquois, Trans Canada Pipelines Ltd., has constructed and operates over 6000 miles of gas transmission lines in Canada, and has direct interest in major pipelines in the northern United States. The proposed 369.4 mile pipeline would transport natural gas from Iroquois, Ontario to South Commack, Long Island, New York. The gas would be transported to local distribution companies and power generators in the States of New York, Rhode Island, Massachusetts, New Hampshire, New Jersey, and Connecticut. The initial volumes transported on the pipeline would be imported from Canada by the 21 companies which have contracted for Iroquois capacity. Three Connecticut shippers on the proposed Iroquois system, Yankee Gas Services Company, the Connecticut Natural Gas Corporation, and the Southern Connecticut Gas Company would receive 25 percent of the gas transported by Iroquois. (Iroquois 1A, p.1, p.I-1; Iroquois, Vol.II, p.11-6)
11. Approximately 17.2 percent of the pipeline would be in Connecticut, including 47.5 miles of land pipeline in the State. (Iroquois 1A, p.3)
12. Approximately 472 acres of land would be affected by the project; 127 acres would revert to the landowners, and

345 acres would be in permanent right-of-way (ROW) in Connecticut. (Iroquois 1A, p.III-1).

13. The proposed route would cross through approximately 2.7 miles of agricultural land and 29 miles of forest land in Connecticut. (Iroquois 1A, p.IV-28, p.V-35)
14. The life expectancy of a pipeline of this type is estimated to be at least 30 years. (FERC FEIS, Vol. III, p.3-16)
15. No compressor stations or communication towers are proposed for the Connecticut portion of the pipeline, and therefore the operating pressure of the pipeline would be expected to drop from north to south. (Iroquois IC, Vol. I, p.1-13, p.1-40)
16. The construction and operation of the pipeline would not require the removal of any homes. Approximately 36 homes are within 100 feet of the proposed route. The proposed route would not be closer than 50 feet to any residence. (Tr., 6/5/90, a.m. p.76; FERC FEIS, Vol. III, p.3-125; Iroquois 5, Q. 68)

The Pipe

17. The pipe used would be 24 inches in diameter with a maximum operating pressure of 1440 lbs. per square inch. The average operating pressure in Connecticut would be 800 lbs. per square inch, and approximately 500 lbs. per square inch across Long Island Sound. The pipe would be made of steel, and would be 1/2 inch thick. The pipe is available in 40-foot lengths. (Iroquois 1A, p.II-9; Tr., 6/12/90, p.17, p.21)
18. Joints on the pipe would be electric welded on-site. All of the welds of the pipe would be x-rayed to detect any cracks in the welds. (Tr., 6/7/90, a.m., p. 44; Tr., 6/8/90, p.125; Tr., 6/12/90, p.200)
19. The pipe would have an epoxy covering bonded to the pipe surface. The weld surface would be covered with urethane. (Tr., 6/8/90, p.129)
20. A cathodic protection system would provide a micro-layer of ionic charge separation at the surface of the pipe. This would prevent corrosion of the pipe. (Iroquois 5, Q. 25)

Construction

21. Construction of the pipeline would take from 6 to 12 weeks at any one location. The construction crews would advance at an average of 3000 feet per work day. (Iroquois 1A, pp.III-6 to III-9)

22. Construction would involve nine sequential operations: clearing and grading of the ROW; trenching; stringing; pipe installation; backfilling; clean-up and temporary erosion controls; hydrostatic testing; commissioning activities; and final clean-up and restoration. (Iroquois 1A, pp.III-6 to III-9)

Clearing and grading

23. Clearing and grading involves the removal of trees, large rocks, brush, and logs along the pipeline route. Excavated material would be stored alongside of the construction area. (Iroquois 1A, p.III-9)
24. Large or unique trees, known as specimen trees, as identified by landowners, would be flagged and protected along the pipeline route. (Iroquois 1A, p.III-11)
25. Merchantable timber would be cut into tree lengths or as directed by landowners. After clearing, the ROW would be graded to create a level work area. (Iroquois 1A, p.III-12)
26. Erosion control devices expected to be employed along various portions of the route would include hay mulch, jute netting, silt fences, and temporary water diversions. (Iroquois 1A, p.III-11)

Trenching

27. Trenching would be accomplished by a backhoe or a rotary wheel ditching machine. The trench would be a minimum of three feet in width. (Iroquois 1A, pp.III-13 to 15)
28. The standard depth for cover over the pipeline would be two feet in rock, three feet in soil areas, four feet in prime agricultural areas, and five feet under railroads and roadways. (Tr. 6/8/90, p.24)
29. Temporary ditch plugs would be installed to allow crossings for property owners and wildlife where required. Open ditches would usually be backfilled within several weeks. Underground utility lines crossed by the pipeline would be identified and flagged prior to construction. (Iroquois 1A, pp.III-13 to 15)
30. Open trenches would be protected and marked by fencing, warning signs, and flashing lights. In congested areas, the ditch would be open no more than five days. (Iroquois 5, Q.32)
31. Trench dewatering might be needed in areas of high groundwater. The water would be discharged by pumping. Diversion berms would be placed across the ROW on the surface to direct the water flow off to one side to prevent erosion on slopes. Trench breakers within the

trench on slopes would prevent the flow of water along the pipeline. (Iroquois 1A, pp.III-13 to 15; Tr., 6/6/90, a.m., pp.164-166)

32. During clearing and trenching, Iroquois would need to dispose of material such as brush, stumps, boulders, and trash. Brush would be chipped and scattered over the ROW. Stumps would be buried on the ROW or hauled to a storage site for later chipping. Boulders and rocks would be used as clean fill, and offered to landowners. Some excess rock might be windrowed along the ROW, trucked to a disposal site, or crushed and sold. Iroquois would equip all construction vehicles with trash disposal bags, and the ROW would be continuously policed for litter. Non-bulky solid waste would be disposed of at approved solid waste landfills. (Tr., 6/6/90, a.m., p.97; FERC FEIS, Vol.I, p.3; Iroquois, 1C, Vol. 8, p.8-108)

Stringing

33. Stringing involves the moving of pipe from storage areas into position along the ROW. The pipe would be placed along the ROW in a continuous line for bending, line-up, and welding operations. Stringing operations would be suspended during extreme wet weather or unstable ground conditions. (Iroquois 1A, p.III-16)

Pipe Installation

34. Prior to installation, the individual joints of the pipe would be bent to the desired angle in the field by a pipe-bending machine. After bending the pipe at a maximum of 21 degrees, the pipe would be lined up and the joints welded together. Side-boom tractors would then lower the pipe into the trench. If the bottom of the trench is rock, pipe supports consisting of sand bags or foam pillows would be placed in the bottom. The cathodic protection system would be installed after the pipe is laid in the trench. (Iroquois 1A, pp.III-17 to 18; Tr., 6/15/90, pm., p.73)

Backfilling

35. Backfilling would generally involve the replacement of material originally excavated from the trench. In areas where the topsoil has been segregated, the subsoil would first be placed in the trench followed by the topsoil. (Iroquois 1A, p.III-19)
36. If the trench were in rock, sand would be placed around the pipe. (Iroquois 5, Q.22)

Clean-Up and Temporary Erosion Control

37. The clean-up and restoration of the ROW would start as soon as possible after backfilling and would involve the clean-up of waste or scrap material, regrading the area to its original grades, the installation of erosion controls, including diversion berms and revegetation, the replacement of walls and fences, and the restoration of curbs and sidewalks. (Iroquois 1A, pp.III-21 to 24)
38. Reseeding the area with soil-holding grasses in areas prone to soil erosion would take place within six working days of final grading. All slopes over 30 degrees would be revegetated by sodding, seeding, matting, hydroseeding, and hydromulching. Stream and river beds crossed would be returned to their pre-construction contours, and stabilized. Stream banks would be revegetated. After the final clean-up and restoration, Iroquois would contact the individual landowners to determine their satisfaction with the ROW and temporary work space restoration. (Iroquois 1A, pp.III-21 to 24)

Hydrostatic Testing

39. Hydrostatic testing of the pipeline would be done with water instead of air for safety considerations. The pipe would be filled with water in test sections, pressurized, tested, and then dewatered, usually into a grassy area. (Tr. 6/5/90, pm, p.60; Tr. 6/7/90, p.36)
40. Testing would take place in sections of pipe from five to twenty-five miles in length. (Tr., 6/7/90, am, p.62)
41. The hydrostatic testing would take place at a pressure equal to or greater than 150 percent of the maximum allowable operating pressure of the line for 24 hours. (Iroquois 1A, pp.III-24 to 25)
42. There would be no additives to the test water, so the quality of the water discharged would remain essentially the same, except for a small amount of sedimentation. A cleaning pig, made up of a series of rubber cups with nylon brushes attached, would be run through the pipe before and after hydrostatic testing. (Tr. 6/7/90, am, pp.42-44)
43. The rate of discharge from hydrostatic testing would be about 1800 gallons per minute. A spillway apron would be used to prevent erosion. An energy defuser plate would take most of the energy out of the water flow discharge. A hay bale mat or apron would then carry the water through vegetation back to the original water source. (Tr., 6/7/90, am, pp.131-132)
44. At a proposed maximum test length, some 3,200,000 gallons of water would be withdrawn from a nearby source at a

rate of 1800 gallons per minute. This amount of water would take at least 30 hours to withdraw from the source. (Tr., 6/8/90, p.77)

45. Iroquois is considering withdrawing water from Candlewood Lake, the Still River, the Pootatuck River, the Housatonic River, and Long Island Sound for hydrostatic testing. (Iroquois 1C, Vol. 2, Table 2-7; Iroquois 5, Q.48)
46. Water intakes for hydrostatic testing would be screened with mesh 1/4-inch or smaller to reduce the entrainment of juvenile or larval fish and organic materials. (Iroquois 1A, p.V-31, p.V-46; Iroquois 5, Q-42)
47. Iroquois would apply to the Department of Environmental Protection (DEP) for a State Pollution Discharge Elimination System (SPDES) permit for the discharge of hydrostatic test water. (Iroquois 1C, Vol.1, p.40; Tr., 6/11/90, am, p.15)
48. The diversion of the large volumes of water required for hydrostatic testing could adversely effect downstream water users and/or fish populations if the diversion constituted a large percentage of the source's total flow. To avoid excessive water use, test waters could be reused from one pipe segment to the next, when technically feasible. (FERC FEIS, Vol.1, p.5-25)
49. Iroquois has told the DEP it would calculate the aquatic base flow for each location from which hydrostatic test water would be drawn. Iroquois has agreed not to take such water if such a withdrawal would cause the flow in a stream or river to go below its base flow. (Tr., 6/11/90, p.186)
50. Details on the withdrawal points, exit points, and energy defusion during hydrostatic testing would be provided to the Siting Council in the Development and Management Plan (D&M Plan) provided by the applicant. (Tr., 6/7/90, am, pp.131-133)

Commissioning Activities

51. During commissioning activities, the pipeline would be internally inspected with mechanical pigs with instrumentation to detect flaws in the line. The pipeline would then be purged of air and loaded with natural gas. (Iroquois 1A, p.III-26)

Final Restoration and Revegetation

52. The FERC staff is requiring a specific seed mixture of tall fescue, birdsfoot trefoil, redtop, and flat pea for soil stabilization after the completion of construction. After establishing this cover, Iroquois would discuss

specific planting requirements and preferences with the individual landowners. A property owner could re-establish his property or lawn with shrubs, bushes, and small trees, as long as they are not planted directly over the pipeline. (Tr., 6/11/90, p.144; FERC FEIS, Vol. I, p.c-6)

53. Revegetation plans would call for seed mixtures that are adapted to the region and could be modified by the Soil Conservation Service and local Soil Conservation Districts. (FERC FEIS, Vol.III, p.3-99)
54. Iroquois could re-establish vegetation with native perennial wildflowers, if the landowner is agreeable. Wildlife would be considered in the selection of seed mixes in non-agricultural areas. Iroquois would plant species that would provide cover and/or food for wildlife unless government agencies and Iroquois agree the planting of short-lived seed mixtures that allow native vegetation to recolonize more quickly are more beneficial. (Iroquois 5, Q.76; Iroquois IC, Vol.7, p.5-7)
55. In areas surrounded by forest, a forest stand would typically become re-established within 15 to 25 years after construction. The ROW would not be mowed annually, but would have woody vegetation cut back every five to seven years. (FERC FEIS, Vol.III, p.97; Tr., 6/7/90, am., pp.45-46)
56. For erosion control, Iroquois has agreed to reseed erosion prone areas with annual rye grass to provide thick cover. Iroquois would not consider revegetation to be complete until 70 percent of an area is covered. (Tr. 6/12/90, p.111-112)
57. Iroquois would not allow any substantial tree growth within 15 feet of either side of the pipeline itself. (Tr. 6/11/90, p.201; Tr. 6/12/90, p.16)

Construction Equipment

58. The weight of the heaviest construction equipment would be 100,000 lbs. To protect the soil, a filter cloth with gravel overlay or a geo-tech style fabric mat would be used. (Tr. 6/11/90, p.58)
59. The weight of construction equipment would be distributed over the surface of a mat 25 feet in width. This pad would remain in place up to two months before being removed. (Tr., 6/11/90, p.65, p.80, p.82)

Blasting

60. Blasting would be necessary for portions of the pipeline where bedrock lies above grade or within five feet of the ground surface. A primary concern would be the effect of the ground vibrations caused by blasting on slopes,

structures, and wells. If not properly controlled, blasting could damage nearby structures and cause local changes in groundwater flow. Other possible effects include uncontrolled fly rock, increased dust, and venting of gas. (FERC FEIS, Vol.I, pp.5-1 to 5-2)

61. During blasting, ground vibrations would be monitored at the nearest well or structure within 150 feet of the construction center line. Blasting would be halted and the blast design revised if the peak particle velocity exceeds two inches per second. Iroquois would investigate any complaints by well owners up to two years after the completion of construction. If adverse impacts to groundwater supplies were found, Iroquois would compensate the landowner for the construction of new wells and provide emergency potable water in the interim. (Iroquois 1C, Vol.2, p.2-120)
62. The State Fire Marshal regulates blasting in Connecticut. Individual towns must be notified prior to blasting. Property owners would be advised by Iroquois prior to blasting. (FERC FEIS, Vol.I, p.5-2; Tr., 6/6/90, p.195)
63. Iroquois would employ an independent blasting consultant. The consultant would follow a detailed set of blasting specifications and use matting to control fly rock. (Tr. 6/8/90, p.30)
64. Iroquois has agreed not to blast closer than 50 feet to any building. (Tr. 6/8/90, p.155)
65. All blasting would take place only during daylight hours and after 9:00 A.M. in the vicinity of residences. (Iroquois 1A, p.V-2)

Construction Schedule

66. Iroquois expects that construction of the pipeline would begin in January 1991, at the earliest, and be completed by November 1, 1991. The Iroquois shippers' authority to export natural gas from Canada will expire on October 31, 1991. (Iroquois 1A, p.I-2; Tr., 6/6/90, am, p.167; Iroquois, Q.29)
67. Construction work on the pipeline would proceed concurrently in both New York and Connecticut. Iroquois would begin work on the land portion of the pipeline in the northern part of Connecticut and proceed in a southerly direction. (Iroquois 5, Q.29)
68. Iroquois would try to clear vegetation early in the year so as to not affect songbird nesting. (Tr., 6/6/90, am, p.167)

69. The majority of construction would take place in interior sections from May to October. The marine portion would be under construction from January to May to avoid conflicts with fisheries and recreational resources in Long Island Sound. (Tr., 6/19/90, p.83; Iroquois 1A, p.III-2)
70. Connecticut law prohibits dredging in Long Island Sound between June 1 and September 30. (Iroquois 1A, p.III-2)

The Right-of-Way

71. Of the 47.5 miles of the pipeline route in Connecticut, 34 miles would have a 75-foot wide construction ROW, with a 50-foot wide permanent easement. This would include forested areas; areas of forested wetlands continuously flooded; and non-flooded, non-forested wetlands. No top soil would be stripped from these areas. (Iroquois 1A, p.4; Iroquois 32)
72. Areas with a 100-foot wide construction ROW and 50-foot wide permanent easement would include open land, and non-flooded, non-forested wetlands, where topsoil would be stripped. (Iroquois 32)
73. A 75-foot wide construction ROW is normal industry practice for a 30-inch or 24-inch diameter pipeline. The FERC staff has recommended that Iroquois reduce the entire ROW to a 75-foot wide construction work space and 50-foot wide permanent ROW. (FEIS, Vol.I, p.5; FEIS, Vol.III, p. 3-97)
74. Iroquois believes the FERC staff recommendation of a 75-foot wide construction ROW is not feasible in all areas, especially in areas of steep slopes, side slopes, stream crossings, and where the segregation of soil layers is required. Iroquois has therefore requested the FERC to modify its recommendation in this regard, and thereby provide Iroquois with the flexibility to use a 100-foot wide construction ROW in specific areas where the use of a 75-foot wide construction ROW would not be feasible, or would cause significant technical or environmental problems. (Iroquois 23, pp.10-11)
75. Iroquois has agreed to limit the ROW maintained in non-woody vegetation to 50 feet in forested areas. For safety reasons, however, Iroquois proposes to maintain permanent easement rights to a 60-foot wide ROW in forested areas. Revegetation would be permitted within all but a 50-foot wide area. Iroquois has requested that the FERC modify its recommendation and permit Iroquois to acquire easement rights to a 60-foot permanent ROW. (Iroquois 23, p.11)

76. The permanent ROW would be kept clear for weekly helicopter reconnaissance. These flights would be primarily to detect encroachment on the ROW. A detailed walk over the entire length of the ROW route would take place once a year. (Tr. 6/6/90, am, p.168; Tr., 6/11/90, p.142; p.197)
77. The clearing of the ROW could provide access for unauthorized people and off-road-vehicles which disturb wildlife, promote erosion, and prevent revegetation. (FERC FEIS, Vol.I, p.5-43)
78. Iroquois would limit unauthorized access to the ROW. Iroquois would screen access areas with trees or shrubs, put up stone fences, and install locked gates at highway crossings. (Tr., 6/6/90, am, p.154, p.180; Iroquois 1A, pp.V-90-91)
79. At all road, railway, power transmission line, and large stream crossings, Iroquois would install a small sign and two marker posts at the property limits on each side of the crossing. These signs would identify the ROW as a pipeline and would provide a "Call before you dig" telephone number. (Iroquois 5, Q.35)
80. No pipe storage areas would be placed on the ROW. The pipe storage areas would be adjacent to railroad sidings wherever possible. The only equipment on the ROW would be that needed for the installation of the pipe. All sources of fuel and lubricants would be stored at off-site locations. (Tr., 6/7/90, am, pp.110-111)
81. If any damage occurred on the ROW during or following construction, Iroquois would be responsible for making certain that the appropriate repairs were made and precautions were taken to prevent future occurrences. (FERC FEIS, Vol.III, p.3-142)
82. The only limitations on a property from a pipeline ROW are: (a) no permanent structures could be constructed on it; and (b) no trees or deep-rooted shrubs could be planted on the ROW. (FERC FEIS, Vol.III, p.3-128)

Wetlands

83. Wetlands function as natural sedimentation traps, filter out nutrients and pollution, provide flood control, serve as water recharge areas, and provide important habitat for plants and wildlife. (HVA 2, p.58)
84. Although Iroquois conducted surveys of 60 percent of the proposed route, the proposed route would cross approximately 7.8 miles of Connecticut-designated wetland areas. These include forested swamps, emergent marshes, shrub swamps, wet meadows, streams and rivers, and bays. (Iroquois 1A, p.IV-31)

85. It is the policy of Iroquois not to route the pipeline through wetlands if at all possible. (Tr., 6/5/90, am, p.82)
86. In Connecticut, approximately 40 acres in 90 wetlands would be impacted by the construction of the pipeline. (HVA 2, p.58; FERC FEIS, Vol.I, Table 4.1 7-2)
87. The primary damage construction of the pipeline would have on wetlands would be the alteration of wetland vegetation along the ROW. In some areas this impact would be temporary; in others, long-term. There would also be temporary changes in wetland hydrology, water quality, aesthetic values, and wildlife habitat. (FERC FEIS, Vol.I, p.5-56)
88. Wetlands would not be filled or drained, and therefore, in accordance with national policy, no net loss of wetlands should occur. (FERC FEIS, Vol.I, p.5-56; N.O.P.E. 1, App. F, p.3)
89. Construction in wetlands would not permanently affect wetland hydrology, as all contours would be restored. The construction of the pipeline would not permanently effect the flood storage capacity, nutrient retention, sediment trapping, or ground water recharge potential of wetlands. (Iroquois 1A, p.V-39)
90. Before construction began, Iroquois would employ certified soil scientists to delineate and flag the boundaries of wetlands. Minor routing modifications to avoid wetlands would be pursued. The pre-construction surveys would identify all wetlands, including vernal pool habitat. (Tr., 6/7/90, am, p.149; FERC FEIS, Vol.III, p.3-188)
91. In planning its proposed route, Iroquois utilized aerial photographs, topographic maps, National Wetland Inventory maps, Connecticut soil surveys, aerial reconnaissance, and field studies to avoid or minimize wetland crossings. (FERC FEIS, Vol.III, p.3-84)

Wetlands Construction

92. If wetlands had to be crossed by the pipeline route, Iroquois would cross them at the narrowest point practical. (Iroquois 1A, p.V-51)
93. During construction in wetlands, Iroquois would place a fiber fabric over the work site. Over this fabric an overlay of gravel would be placed to act as a work platform for the equipment. The equipment digging the trench would work off of prefabricated timber mats, which would be moved along as the digging progressed. After the completion of construction, the gravel would be removed off of the filter cloth, and the filter cloth

- would be removed. (Tr., 6/5/90, am, p.68; Tr., 6/8/90, p.18)
94. While excavating the trench in wetlands, Iroquois would strip off the organic layer for replacement during the closing of the trench. The root stocks and seeds in this layer would help the wetland to become re-established with native wetland vegetation. (Tr., 6/5/90, am, p.89)
95. Soils would be separated to the extent possible if they were not saturated. Topsoil would be placed farthest from the trench, with the subsoil placed next to the trench. During backfilling, the subsoil would be placed over the top of the pipe, and topsoil then placed on top. (Tr., 6/5/90, am, p.111)
96. In emergent marsh wetlands with deep organic soils, the soil could be removed in blocks, placed adjacent to the ROW, and later replaced as intact as possible. This would reduce the amount of exposed wetland soil. Disturbed wetland conditions provide ideal sites for the propagation of undesirable species such as phragmites and purple loosestrife. (Naromi Land Trust, Niering, p.9; Tr., 6/19/90, p.53)
97. The block-method of organic layer soil removal would not be useful in those wetlands with very shallow organic layers or with boulders or bedrock close to the surface. The method could be employed in site-specific areas which would be detailed in the D&M Plan. (Tr., 6/5/90, am, p.176; Tr., 6/19/90, p.55)
98. Iroquois would monitor wetland areas after construction until they were fully restored with vegetation. (Tr., 6/7/90, am, p.146)
99. Where undesirable existing wetland plants, such as phragmites or loosestrife, are encountered, they would be buried, and the area re-seeded with species such as Canada bluegrass, creeping red fescue, tall fescue, birds-foot trefoil, or annual grass. This would allow wetland species to become established as soon as possible. (Iroquois 1A, p.V-39; Iroquois 5, Q.39; Naromi Land Trust, Niering, App. A)
100. In forested wetlands, stumps would be left in place at ground level to encourage sprouting, except in the area immediately over the trench. The forest environment would return faster than if the stumps were removed, and in most cases the same overstory species would be re-established. (Tr., 6/8/90, p.50; Tr., 6/7/90, am, pp.196-197)
101. Temporary access roads would be located around the boundary of selected wetlands, outside of the ROW, to avoid the repeated movement of equipment through the

wetland buffer zone. No permanent access roads in wetlands are planned. (Iroquois 1C, Vol.8, p.8-6; Iroquois 1A, p.III - 29 to 31)

Mitigation Measures

102. Special mitigation measures would be used in forested wetlands. These procedures would include the removal and replacement of the A horizon of topsoil, the use of erosion control features such as waterbars, collection ditches, terraces, rip-rap, sand bags, or straw bales; drainage control; seed bed preparation; seed mixture; fertilizer and mulch; and the monitoring of disturbed areas. (Iroquois 1A, p.V-13 to 14)
103. Iroquois would follow erosion and sediment control measures as stated in the Connecticut Guidelines for Soil Erosion and Sediment Control. (Iroquois 5,Q.4; New Milford 3, DEP letter, 5/14/90, p.3)

Agricultural Land

104. The proposed route would traverse approximately 2.7 miles of agricultural land, with temporary disturbance to agricultural activities on approximately 33 acres. (Iroquois 1A, p.V-35)
105. Construction of the pipeline would result in the loss of crop production or pasture land directly along the ROW and temporary work space for the duration of the construction period. After construction, the entire disturbed area would be allowed to revert to agricultural use. Landowners and dairy farmers would be compensated for crop losses or damage caused by construction activities, as well as for any temporary declines in productivity. (Iroquois 1A, p.V-79; FERC FEIS, Vol.III, p.3-152)
106. Iroquois would consult landowners on the location of drainage systems, schedule construction to avoid wet periods, strip topsoil from the trench area for replacement during trench closure, replace drainage tiles damaged by construction, remove stones four inches in diameter or greater to plow depth, and revegetate the ROW with legumes or grasses. (Iroquois 1A, pp.80-81)
107. Temporary fences would contain livestock and prevent them from getting near the open trench. After construction, all fences and gates would be rebuilt immediately. (Iroquois 1A, pp.80-81)
108. Livestock might be adversely affected if cut wild cherry vegetation were left in areas accessible to livestock. Iroquois would identify areas of the ROW near livestock-use areas that contain cherry trees and ensure

that such vegetation was not stockpiled in areas accessible to livestock. (Iroquois 1C, Vol.8, p.8-100)

Stream and River Crossings

109. The proposed route would cross 47 streams and rivers in Connecticut; two of these streams are intermittent. (Iroquois 1A, p.IV-14)
110. Two types of stream crossing would be employed, wet or dry. In wet crossings, all construction work would take place in the water, and equipment would cross on a temporary bridge. Most streams greater than 10 feet in width and two feet in depth would be crossed with the wet technique. In dry crossings, the water flow is bypassed around the site of the crossing using flumes or dams. Minor streams (less than 10 feet in width) or major sensitive streams, would be crossed with the dry crossing method. (Iroquois 1A, pp.III-31 to 41; FERC FEIS, Vol.I., p.5-29)
111. In streams with important cold-water fisheries, construction would be limited to the period of July 15 to September 30. In streams with warm water fisheries, construction would be delayed until after July 15 and be completed by the end of the winter low flow to avoid spawning activity. Iroquois would provide for fish passage if construction takes place during fish migration. (Iroquois 1A, p.V-55)
112. A short term increase in sedimentation could be expected during stream crossings. Sedimentation in smaller streams could be somewhat controlled by a siltation fence placed across the stream. (Iroquois 1A, p.V-31 to 32; Iroquois 5, Q.40)
113. Stream crossings would be perpendicular to the flow of water. The pipeline would have at least five feet of cover at stream crossings. (Iroquois 1A, pp.III-31 to 41)
114. If a crossing had aesthetic impact, mitigative measures such as alignment modifications could reduce the line of sight visibility, and plantings could screen the crossing. (Iroquois 1A, pp.III - 31 to 41)
115. The proposed route would not traverse any rivers that currently comprise part of the National Wild and Scenic Rivers System. (Iroquois 1C, Vol.8, p.8-86)

Aquifers and Groundwater

116. The towns of Newtown, Shelton, Sherman, Monroe and Milford have limited water supplies drawn from public and private wells. (FERC FEIS, Vol.I, p.5-22)
117. In portions of New Milford, groundwater supplies are

marginally adequate. In Newtown, the Pootatuck Aquifer was designated a sole source aquifer by the Environmental Protection Agency (EPA) in March 1990. (FEIS, Vol.I, p.5-22 to 23; Iroquois 1A, p.IV-23)

118. The majority of groundwater impacts from the pipeline would be limited to areas where shallow aquifers were crossed. Water table elevations could be affected in a very localized area of the pipeline trench. (FERC FEIS, Vol.III, p.3-64)
119. The installation of the pipeline would not affect the potential of the aquifer as a future source of drinking water. The construction of the pipeline would not result in any long-term impact on groundwater quality or yield. (FERC FEIS, Vol.III, p.3-68)
120. Iroquois would assume responsibility if the installation of the pipeline changed the direction of groundwater flow or decreased groundwater yield. Prior to construction, Iroquois would examine the water sources of landowners along the route to establish a data base as to the quality and quantity of the landowner's water source. Iroquois would re-test the water yield and quality after construction. (Tr., 6/6/90, am, p.201)
121. Iroquois would identify all wells within 300 feet of the pipeline. Iroquois would inventory the water quality, level, and pressure in each well prior to and after construction. If appropriate, Iroquois would compensate the affected parties for the drilling and development of new wells at no cost to the owner and would provide sources of potable water in the interim. (Iroquois 5, Q.47; Iroquois 1A, p.V-27)

Seismic and Fault Concerns

122. Cameron's line is a thrust fault in western Connecticut which would be crossed by the proposed route. There are no records of surface ground ruptures or seismic events that approach the limits of the proposed pipeline's design level in the Cameron's Line region. (FERC FEIS, Vol.III, p.3-50; Brookfield 1A-2)
123. The pipeline would not require any special design to cross the Cameron's Line Fault. (Tr., 6/7/90, am, p.194)
124. There is no historical evidence of an earthquake of sufficient magnitude to trigger ground shaking or landsliding in this area that would affect the integrity of the pipeline. Earthquake intensities in Connecticut, when they do occur, are relatively low. (Iroquois 1A, p.IV-9; Iroquois 1C, Vol.6, p.6-30)

Safety Concerns

125. There is some degree of risk to the public from the transportation of natural gas by pipeline. The gas can be released and if subjected to an ignition source, can burn and/or explode. (Iroquois 1C, Vol.11, p.11-1)
126. Methane is not toxic, but is an asphyxiant, with an ignition temperature of 1004^oF. Methane is a greenhouse gas which is relatively insoluble in water and not harmful to aquatic life. (Iroquois 1C, Vol.11, p.11-1; Tr., 6/7/90, am, pp.50-51)
127. If methane from the pipeline leaked into the soil, it would migrate to the ground surface and disperse into the atmosphere. The surrounding vegetation would be discolored, and this could be detected by the weekly aerial reconnaissance. If methane leaked under water, the gas would bubble to the surface with no impact on water quality. (Iroquois 1A, p.V-24, p.V-27)
128. Upon release into the atmosphere, natural gas is not explosive when unconfined. (FERC FEIS, Vol.III, p.3-173)
129. For safety purposes, Iroquois would be required to have the natural gas in the pipeline odorized. (Tr., 6/8/90, p.100)
130. Iroquois would assume responsibility for all accidents on the ROW due to a gas leak. The probability of a reportable accident occurring anywhere along the entire 369 mile length of the pipeline is estimated at once every 24.6 years. (FERC FEIS, Vol.III, p.3-164; Iroquois 1A, pp.V-108 to 109)
131. The pipeline system would be designed with self-closing valves that would detect and respond to a pressure drop in the pipeline. (Tr., 6/7/90, am, P.200)
132. The pipeline would be designed, constructed, operated, and maintained in accordance with U.S. Department of Transportation regulations for safety standards for high pressure pipelines. These standards are administered and enforced by the Department of Public Utility Control (DPUC). On-site construction safety would be regulated by the Occupational Safety and Health Administration (OSHA). (FERC, FEIS, Vol.I, p.2-14; Iroquois 5, Q-79)
133. Iroquois would provide officials of the towns through which the pipeline would pass with a set of emergency numbers to contact personnel on call 24 hours a day. Iroquois would review its emergency procedures with municipal officials. (Tr., 6/7/90, am, p.81)
134. Herbicides would not be used to maintain the ROW; rather,

vegetation growth would be controlled by mechanical cutting. (Iroquois 1A, p.7; Tr. 6/7/90, am, pp.45-46)

135. Iroquois has concerns about its construction workers and equipment working in close proximity to electric transmission lines. For safety, there must be some separation between electric lines and construction equipment. The OSHA requires a 25-foot safety zone from the outside conductor of a transmission line. (Tr., 6/5/90, pm, p.50, p.55, p.62)
136. The electric field from electric transmission lines can induce a voltage on the above-ground portions of a pipeline, thereby posing a shock hazard to workers touching the pipeline. (Tr., 6/12/90, pp.6-9)
137. The current in electric transmission lines causes a magnetic field around the conductors and induces voltage on an adjacent pipeline. Mitigation measures can reduce this voltage to an acceptable 15 volts. (Tr., 6/12/90, pp.9-14)
138. A fault in a transmission line circuit could momentarily cause a large amount of electrical current to flow into a transmission line, thereby inducing voltage on a nearby pipeline. This induced voltage could cause larger voltages on a pipeline at points of physical or electrical discontinuity. (Tr., 6/12/90, pp.19-26)
139. A fault in a transmission line could cause an electrical current to flow directly down a transmission line tower into the ground through the tower footings. If a pipeline were close enough to a tower leg or tower counterpoise, a direct arc could occur between the tower and the pipeline. (Tr., 6/12/90, pp.26-28)
140. The flow of electrical current into the ground could cause a rise in the voltage on a nearby pipeline to several thousand volts, which could perforate the pipeline coating or rupture the pipeline. (Tr., 6/13/90, pp.32-38)
141. Iroquois has proposed to install an experimental mitigation measure consisting of a screen wire between the pipeline and electric transmission lines. To avoid direct arcing to this screen wire from transmission towers, a minimum distance of 45 feet would have to be maintained. The pipeline would have to be another 10 to 15 feet from the electric transmission line counterpoise for the screen wire to be effective. Therefore, the pipeline should be kept a minimum of 55 to 60 feet from the transmission line counterpoise. (Tr., 6/12/90, pp.62-63, p.72)

142. The high resistivity of Connecticut's rocky soils complicates the ability of construction personnel to achieve effective grounding of the pipeline. (Tr., 6/12/90, p.18, pp.27-28, p.44)
143. The FERC staff has recommended siting the pipeline a minimum of five feet within the edge of the existing CL&P ROW's. Due to Iroquois's concerns regarding the safety of workers along electric transmission lines and the potential for fault currents to damage the pipeline, Iroquois would conduct further detailed investigations. Iroquois has requested to the FERC that its Certificate include the flexibility to route the pipeline permanent ROW parallel and adjacent to existing electric transmission line ROW's where the terrain permits, and when there are sufficient technical, safety, and operational reasons for doing so. (FERC 23, pp.6-8; FERC FEIS, Vol, I, p.7-11)

Biological Surveys

144. Iroquois would conduct biological surveys of the entire route of the pipeline subsequent to obtaining access from landowners. The surveys would especially search for rare and endangered species. Plants and birds would be surveyed during their growing and breeding seasons. Surveys would be conducted for raptor nests in all forested areas. (Tr., 6/8/90, p.40, p.43)

Plants

145. The proposed route would cross approximately 29 miles of forest, consisting mostly of deciduous trees. (Iroquois 1A, p.IV-28)
146. The effects of construction on forests and vegetation along the route would include windthrow, sun scald, and changes in the understory vegetation. (Tr., 6/8/90, p.49)
147. The proposed route would not cross any known virgin or old growth forests. (FERC FEIS, Vol.III, p.3-98)
148. Iroquois would identify, clearly mark, and protect during construction any trees located immediately adjacent to the ROW that were of significant value to landowners. Landowners would be compensated for the value of trees destroyed by Iroquois. (FERC FEIS, Vol.III, p.3-98, p.3-154)
149. During the biological survey, snag or den trees would be identified, and would be avoided during construction if possible. (Iroquois 5, Q.75)
150. One federally endangered plant species could potentially occur in the vicinity of the proposed pipeline route, the

small whorled pogonia. Fifteen plant species of special concern occur within 1.5 miles of the proposed route. These species are the small-flowered agrimony, side-oats gramma grass, false mermaid, lizard's tail, arrowleaf, arrowhead, horned pond weed, golden club, false beach heather, narrow-leaved horse gentian, sickle-leaved golden aster, panic grass, prickly pear cactus, Indian plantain, and beach needle grass. (Iroquois 1A, p.IV-44) Iroquois 1C, Vol. 3, Table 3-6)

151. If a rare or endangered plant species were found, Iroquois would take steps to avoid the location during construction. (Tr., 6/18/90, p.43)

Wildlife

152. Construction of the pipeline would result in an increase in habitat diversity along the route with beneficial and adverse effects on various species of wildlife. Most wildlife would be temporarily displaced in the immediate vicinity during construction. (Iroquois 1A, pp.V-41 to 42)
153. The creation and maintenance of the ROW would establish a transition zone between two habitat types, known as an ecotone, with a greater diversity of wildlife likely. Species that would benefit include those with a preference for open or early second-growth forest. The ROW could also provide travel corridors for predators such as fox, coyote, and raccoon. (Iroquois 1A, pp.V-41 to 42)
154. Forest interior species could be negatively affected by the clearing of forest habitat. However, the overall density and diversity of both small mammal and bird species would probably increase after the initial clearing. Species that would be expected to utilize the ROW include numerous songbirds, ruffed grouse, wild turkey, white-tailed deer, and black bear. (FEIS, Vol.I, p.5-43)
155. The bald eagle, piping plover, bog turtle, and shortnose sturgeon are federally endangered or threatened species which could occur in portions of Connecticut through which the pipeline might pass. The portion of the Housatonic River below the Stevenson dam is an important bald eagle wintering area; however, the dredge and fill activities during the river crossing construction phase would not occur when the eagles are present. If nesting piping plovers were found within one half mile of the pipeline centerline, Iroquois would not construct in the area between March 15 and October 1. If wildlife surveys showed the high probability of bog turtles occurring in swamps or wet meadows along the route, the alignment of the ROW would be modified, including the avoidance of

important habitats and the timing of construction. The shortnose sturgeon, which spawns in the spring, would be unlikely to be affected, as there have been no recent sightings, and construction would occur in the winter. (Iroquois 1A, pp.IV-46 to 51, p.V-44 to 45; Iroquois 1C, Vol.2, p.4-14; Iroquois 5, Q. 11, Q-91, Q.94; FEIS, Vol.I, p.7-16; FEIS Vol.III, p.3-192)

156. Iroquois would establish wildlife brushpiles along the route, provided the landowner were agreeable. (Iroquois 5, Q.70)

Archaeological and Cultural Resources

157. Portions of the proposed route would traverse areas in which prehistoric and historic resources might be located. To protect these resources, no specific archaeological data has been released by Iroquois. This data, under a Phase I Archaeological Study, is being provided only to the FERC and the Connecticut Historical Commission. The State Historic Preservation Officer has offered detailed guidance to Iroquois concerning the identification, evaluation, and protection of Connecticut's cultural heritage. Iroquois has retained a consultant to implement a cultural resources work plan. (Iroquois 1A, p.IV-106; FEIS, Vol.III, p.3-170; State Historic Preservation Officer, letter of 6/13/90; Tr., 6/5/90, am, p.196)
158. If architectural or cultural resources were unearthed during construction, the construction would be halted on that area until appropriate authorities had been notified, and a determination made. A cultural resources consultant would be on call during construction. (Iroquois 5, Q.69)
159. The discovery of known archaeological skeletal remains would require the immediate cessation of work in that area and notification of the State Archaeologist. (Stop The Pipe 9, p.4)
160. No National Natural Landmarks would be crossed by the proposed route. (Iroquois 1C, Vol.8, p.8-22)

Route Selection Process

161. During the route selection process, Iroquois conducted an examination of regional maps, made helicopter flights, and conducted field reconnaissance. Environmental considerations included topography, geography, soils, wetlands, threatened and endangered species, cultural resources, and existing and proposed land uses. (Iroquois 1A, p.II-24)

162. Approximately 120 route variations were identified by Iroquois, government agencies, and the public. Iroquois reviewed these and included several into the routes considered by the FERC. (Iroquois 1A, p.II-27)
163. Areas of steep slopes, erosion, potential subsidence, slumping, or landsliding have been avoided or minimized. (Iroquois 1C, Vol.6, p.6-39)
164. The Iroquois pipeline would be in or adjacent to existing ROW's for 16.6 miles, approximately 36.5 percent of the proposed route in Connecticut. (Tr., 6/7/90, am, p.115)
165. Iroquois does not propose to be within an existing ROW anywhere along the route except in Stratford, if the original proposed route is chosen. (Tr., 6/11/90, p.187)
166. It is pipeline industry practice not to locate high-pressure gas pipelines less than 25 feet apart due to safety and operating considerations. (Tr., 6/15/90, pm, pp.58-59)

Proposed and Alternative Routes
SHERMAN

Proposed Route

167. The proposed route enters Connecticut from New York in Sherman and thereafter would cross residential, forest, and wetland areas. The route would cross the Appalachian Trail directly east of the New York border just south of Route 55 through an existing opening in a hedgerow bordering a field. Iroquois would use special construction techniques to minimize disturbance to the Appalachian Trail. (Iroquois 1A, p.B-58 to 59, p.IV-92; Iroquois 1B, Vol.2, Sheet 1)
168. Along the Appalachian Trail, the route would be aligned through open areas adjacent to the trail. The construction ROW would be narrowed to 50 feet in width to minimize tree removal. Approximately 850 feet of the Appalachian Trail property would be traversed in Sherman. (FERC FEIS, Vol.I, p.4-69; Iroquois 1C, Vol.8, pp.8-113 to 114)
169. Iroquois consulted with the National Park Service regarding the crossing of the Appalachian Trail and agreed to purchase land elsewhere along the trail to be deeded to the National Park Service. (Iroquois 1C, Vol.8, pp.8-113 to 114)
170. The 1.8 mile proposed route in Sherman would traverse two wetland areas: the 51-acre Wimisink Valley Sanctuary for approximately 1350 feet, and a narrow seasonally saturated forested wetland in a drainage way at approximately mile post (M.P.) 287.0 of the proposed

route. The Wimisink Valley Sanctuary is owned by the Naromi Land Trust. (Iroquois 1A, p.IV-92; Iroquois 1H, Sherman, p.4; Iroquois 5, Q.67)

171. The Wimisink Sanctuary contains a large wet meadow wetland, including a beaver pond. Iroquois believes this wetland could be crossed by the use of a fabric work pad. (Iroquois 5, Q.67, Tr., 6/5/90, am, p.74)
172. The Wimisink Sanctuary has a unique assemblage of plant species, and is the largest wetland in Sherman. The wetland is highly diverse, with open sedge meadows surrounded by shrub thickets and forested wetlands. (Tr., 6/5/90, am, p.151; Naromi Land Trust, Ex.1, Niering, pp.3-4)

Wimisink Variation

173. This variation, about 0.8 miles in length, would parallel the proposed route about 400 feet farther north along hedgerows through the Wimisink Valley Sanctuary and across the partially developed Smoke Ridge Subdivision. This variation is about the same length as the proposed route. (FERC FEIS, Vol. I, p. 3-50 to 51; Iroquois 1B, Vol.2, Sheet 1 of 8; Iroquois 1A, p.IV-92)
174. Iroquois and the FERC staff proposed this route to improve the alignment across the Wimisink Sanctuary and the Smoke Ridge Subdivision. The Wimisink Variation would cross approximately 1600 feet of emergent wetland. The variation would avoid a stand of swamp white oak, tamaracks, and an area of beaver activity within the Wimisink Sanctuary. (FERC FEIS, Vol.I, p.3-51; Tr., 6/5/90, am, p.74; Iroquois 5, Q.67)
175. The FERC staff recommends the Wimisink variation as the preferred alignment in this area. (FERC FEIS, Vol.III, p.6-53)

Sherman 1 (Wimisink Brook, Donohue) Variation

176. This variation, suggested by the Housatonic Valley Association (HVA) and the Naromi Land Trust, would skirt the western and southern edge of the wetlands of the Wimisink Sanctuary, is 0.7 miles longer than the proposed route, and would result in a 3600-foot ROW along the edge of the wetland versus a 1600-foot crossing in the proposed route and Wimisink Variation. (FERC FEIS, Vol. I, p.6-52)
177. The objective of The Sherman 1 Variation is to minimize impacts on the Wimisink wetland system by traversing the wetlands edge rather than its center. However, this variation would probably require the clearing of more forested area, and the FERC therefore believes its

impacts would outweigh its benefits. (FERC FEIS, Vol.I, pp.6-52 to 54; Iroquois 1B, Vol.2, Sheet 1 of 8)

Sherman 2 (Route 55/Route 39) Variation

178. This variation would be parallel and adjacent to Route 55 from the New York-Connecticut border east to Route 39, and then proceed south to the proposed route. The objective of this variation, proposed by the HVA, would be to avoid homes in the Anderson Road and Smoke Ridge subdivision areas and avoid the Wimisink wetland. (Tr., 6/5/90, am, p.53; Iroquois 1B, Vol.2, Sheet 1 of 8, Iroquois 5, Q-80, Table II-5)
179. Route 55 is bordered by wetlands and steep slopes down to the road, is narrow, and near some homes close to Route 55. To install a pipeline along this variation, Iroquois would have to construct under the pavement of Route 55, creating to traffic problems. Route 55 in Sherman has recently been resurfaced from the New York state line to Route 7. It is Department of Transportation policy to leave new pavement undisturbed for a substantial period of time. (Tr., 6/5/90, am, pp.55-58; Iroquois 11, DOT letter of July 18, 1990)
180. The Sherman 2 Variation is approximately 2.0 miles long, versus 1.3 miles for the proposed route, and would require a change in the crossing of the Appalachian Trail; the National Park Service has indicated such a change in crossing is not preferable. This variation would cross 2150 feet of wetland. The FERC staff does not recommend selection of this variation. (Iroquois 1A, pp.B-58 to 60; FERC FEIS, Vol. 1, p.6-52)

Dutton Variation

181. This variation would originate in Dover, New York, would cross a different section of the Appalachian Trail, would avoid the residences along Anderson Road and in the Smoke Ridge Subdivision, and would avoid most of the wetlands in the Wimisink Brook area. (Iroquois 1B, Vol.2, Sheet 1; Tr., 6/5/90, am, pp.127-129; Dutton, Ex. 1)
182. The Dutton variation would be longer than the proposed route, would cross other areas of proposed development, and would require more cutting of woody vegetation. (Iroquois 1B, Vol.2, Sheet 1; Iroquois 5, Q.80, Table II-5)

Dover/Sherman Variation

183. This variation would begin in Dover, New York, and continue into Sherman along an existing electric transmission line ROW. This ROW crosses many wetland areas and areas of severe side slopes. The variation

would involve a different crossing of the Appalachian Trail and two crossings of the Housatonic River. The FERC staff recommended against use of this variation. (FERC FEIS, Vol.1, p.6-51)

Smoke Ridge Variation

184. This variation was offered by the residents of the Smoke Ridge Subdivision and the Naromi Land Trust. The variation would leave the proposed route west of Anderson Road and the Appalachian Trail, traverse north of the proposed route following lot boundaries, traverse the edge of the Wimisink wetland near Route 55, and then head south along the Sherman-New Milford town line, before finally rejoining the proposed route. (Iroquois 18; Iroquois 19; Smoke Ridge 1)
185. This variation would cross the northern edge of the Wimisink Sanctuary wetland, rather than cross through its center as the proposed route would. (Tr., 6/5/90, am, pp.144-151, pp.164-165; Iroquois 18; Iroquois 29)
186. The Smoke Ridge Variation would move the location of a proposed valve site from the east side of Route 39 to the intersection of Routes 39 and 55. (Tr., 6/19/90, p.14)
187. The area in which this variation would cross the Wimisink wetlands was previously disturbed during the construction of Route 55. (Tr., 6/5/90, am, pp.144-151)

NEW MILFORD

Proposed Route

188. The proposed route would cross through approximately 10.9 miles of New Milford. Approximately 3.3 miles of this route would be aligned parallel and adjacent to an existing transmission line ROW. The proposed route would cross primarily woodlands (6.1 miles) and agriculture and open space lands (2.0 miles). (Iroquois 1A, pp.IV-93 to 94; Iroquois 1B, Vol. 2, Sheets 1-2)
189. Approximately 650 feet of federally-designated wetlands would be traversed by the proposed route in New Milford. (Iroquois 1H, New Milford, p.1)
190. The proposed route would traverse near residential developments along Stilson Hill Road and Old Stilson Hill Road; along Route 37; near Route 7; and near Maple Road and Sullivan Road. The proposed route would be approximately 250 feet to the east of the Hill and Plain School. (Iroquois 1A, p.IV-94; FERC FEIS, Vol.III, p.3-132)
191. The proposed route would traverse west of and upgradient from an approved Resource Conservation and Recovery Act

(RCRA) landfill operated by Kimberly-Clark in the vicinity of Pine Knob on Candlewood Mountain. North of the Lanesville area, the proposed route would cross west of and upgradient from the New Milford landfill which is used for solid waste disposal. The route would also pass through a portion of the Candlewood Valley Country Club golf course. (Iroquois 1A, p.IV-94; Iroquois 1B, Vol.2, Sheet 3 of 18; Tr., 6/5/90, pm, p. 84)

192. The proposed route would cross about 1.1 miles through agricultural parcels of land owned by the Sunny Valley Foundation, Inc. (Iroquois 1A, p. IV-94; Iroquois 1B, Vol. 2, Sheet 4 of 18)
193. The proposed route would cross the Candlewood Trail twice, at Pine Knob on property owned by Kimberly-Clark and along Rocky River Road between a gravel mining area and an industrial/commercial building. (Iroquois 1A, p.IV-94; Iroquois 1B, Vol.2, Sheet 1 of 8, Sheet 3 of 18)
194. For 2,000 feet, the proposed route would be on a 20-to 40-foot ledge, 50 feet west of a leachate collection ditch on the western edge of the New Milford landfill. (Tr., 6/5/90, pm, p.81; New Milford 10, p.5; Iroquois 16(b) p.1)
195. The New Milford landfill, which is an unlined landfill, might be a source of surface and groundwater contamination in the vicinity of the proposed route. However, shallow groundwater flow in the vicinity of the proposed route is easterly, and therefore the proposed route would most likely be upgradient of the landfill. (Iroquois 16(b), p.1; New Milford 10, p. 5)
196. Special construction techniques would be used in the vicinity of the New Milford landfill. These techniques would involve placing the pipe joint by joint, welding it over the ditch, and then back-filling. The ledge in the area would be widened to 50 feet. (Tr., 6/5/90, am, pp.221-222)
197. The proposed route would cross through about 820 feet of the Morrissey Brook Preserve, owned by the Weantinogue Heritage Inc. This property is wooded and includes a hiking/nature trail and wetland areas of high aesthetic value. Alignment of the pipeline through this parcel would be clearly visible from the preserve. The route would cross two brooks, a wetland, and a ledge in this preserve. (Iroquois 1A, p.IV-95, p.V-94; Tr., 6/6/90, am, p.54; Weantinogue Heritage 1)

Stilson Hill Road Variation

198. This variation was proposed by the residents of Stilson Hill to avoid sideslope wetlands in the area and make use of an existing cleared road through a forested area. This route would also avoid some of the wetlands along Morrissey Brook. (Tr., 6/5/90, pm, p.102; FERC FEIS, Vol.1, p.6-53; Iroquois 1B, Vol.2, Sheet 1 of 8)
199. Stilson Hill Road is a town-designated scenic area. This variation would place the pipeline about 400 feet farther away from homes than the proposed route. This variation traverses predominantly through cleared pasture lands for 3700 feet versus 1300 feet for the proposed route. The variation would also cross fewer wetlands, (500 feet versus 1100 feet). (New Milford 2, p.7; Iroquois 1A, pp.B-44 to 45)
200. The FERC staff recommends that Iroquois maximize the distance between this variation and a potentially significant historic residence on Church Road, and that the crossing of Morrissey Brook be aligned to avoid mature sycamores in the area. The FERC has recommended adoption of this variation. (FERC FEIS, Vol. p.6-53)

East Stilson Hill Road Variation

201. This variation, proposed by the HVA and the Town of New Milford to reduce visual impact, would be generally to the east of the proposed route, between Stilson Hill Road and Route 7. This variation would go up a steep slope, be approximately the same length as the proposed route, entail the clearing of four more acres of land, and be down-gradient from the Kimberly-Clark landfill. It would potentially result in a greater disruption to residences along Route 7. Because of the steep slopes, greater clearing of land, and greater disruption to homes, the FERC staff does not recommend this variation. (FERC FEIS, Vol. 1, pp.6-53 to 54, Vol.III, figure A-1, Sheet 48 of 57)

Kimberly-Clark Variation

202. This variation was proposed by Iroquois to avoid recently installed upgradient monitoring wells at the Kimberly-Clark landfill. The variation would also provide an improved alignment down steep terrain in a saddle along the ridge of Pine Knob on Candlewood Mountain. (FERC FEIS, Vol.I, p.6-54; Iroquois 27; Tr., 6/5/90, pm, p.84; FERC FEIS Vol.III, Fig. A-1, Sheet 48 of 57)
203. The variation is approximately 0.75 miles long, versus 0.65 miles for the proposed route. The variation would traverse through more areas of deciduous forest, while

the proposed route would cross more mature coniferous forest. The proposed route would traverse directly through several monitoring wells. (Iroquois 1A, p.B-45)

204. Both this variation and the proposed route would cross the Candlewood Trail, a hiking path. (Iroquois 1A, p.B-45)
205. The FERC staff recommends that Iroquois submit a detailed mitigation plan for the minimizing of clearing and the re-establishment of vegetation on the eastern slope of Pine Knob. The FERC recommends the adoption of the Kimberly-Clark variation. (FERC FEIS, Vol.1, p.6-54)

Still River Variation

206. This variation was proposed by Iroquois to minimize the crossing of wetlands and to avoid an oxbow crossing of the Still River. This 0.5 mile variation would be 250 to 350 feet north of the proposed route, and would be approximately the same length. (FERC FEIS, Vol.I, p.3-51, p.6-17)
207. The Still River variation would cross approximately 200 feet of wetlands and 1000 feet of forest. Although both the proposed route and this variation would cross the Still River Meanders Natural Area, this variation would deviate from the electric transmission line ROW that is paralleled by the proposed route to avoid the oxbow. (FERC FEIS, Vol.I, p.3-51)
208. The FERC staff recommends adoption of this variation to avoid construction parallel to the oxbow, thereby reducing riverbank clearing and the amount of sediment entering the river. (FERC FEIS, Vol.1, p.6-17)

Jerusalem Hill Road Variation

209. This variation was proposed by a New Milford resident to reduce effects on residences and forested wetland areas. This variation would put the pipeline adjacent to a CL&P ROW for a greater distance across the agricultural fields of the Sunny Valley Foundation. (Tr., 6/12/90, pp.184-186; Iroquois 27)
210. This variation would avoid some rock outcrops and would require considerably less blasting than the proposed route. (Tr., 6/12/90, p.190)

Candlewood Mountain Variation

211. Iroquois proposed this variation to avoid the clearing of upland vegetation on Candlewood Mountain and Pine Knob. This variation would diverge from the proposed route just west of Candlewood Mountain Road and diverge northeast

around the northern toe of Candlewood Mountain. The variation would be located behind two restaurants and would emerge out of a wooded slope into an already disturbed area which is mined for gravel. (Tr., 6/12/90, pp.180-182; Iroquois 27)

212. The variation route would be immediately north of the Kimberly-Clark landfill berm. Iroquois would have to purchase and remove one commercial building to avoid the landfill. The variation would then proceed directly south parallel to Route 7, on Kimberly-Clark property, and would probably intersect some down-gradient monitoring wells. The variation would reconnect with the proposed route in the Rocky River hydro-electric plant area. (Iroquois 27; Tr., 6/12/90, pp.180-182)

New Milford Variations 1, 2, 3, (a, b, c)

213. The New Milford 1 variation would deviate from the proposed route in the vicinity of Morrissey Brook, traverse a very steep wooded slope, and cross through agricultural areas, paralleling Stilson Hill Road to the east. Because of the side slopes, a ROW wider than 100 feet would be needed. (Tr. 6/6/90, am, p.53)
214. The New Milford 1 Variation would cross a slope of over 60 degrees, with numerous rock outcrops requiring extensive blasting. Part of this variation would traverse eight miles of Route 7 in New Milford and Brookfield, with resultant extensive disturbance along Route 7 to traffic, homes, and businesses along this road. Route 7 would have to be closed for several months. The variation would avoid the Stilson Hill and Pine Knob areas. (New Milford 10, p.11; Iroquois 1B, Vol, 2, sheet 2 of 8; Tr., 6/6/90, am, p.76; Iroquois 1A, pp.B-139 to 140)
215. The New Milford 2 Variation would deviate from the proposed route in the same vicinity as the New Milford variation, but the New Milford 2 Variation would be generally parallel to and west of Route 7. The New Milford 1 Variation would traverse a steep slope, follow side slopes, and require extensive cutting and filling. The long-term stability of the pipeline could be jeopardized if the slopes became destabilized. (Iroquois 1A, pp.B-141 to 142; Iroquois 1B, Vol.2, sheet 2 of 8)
216. The combination of New Milford variations 3, 3a, 3b, and 3c would replace the proposed route between mileposts 294.6 and 297.6. The FERC staff rejected these alternatives and their various combinations due to difficulties in crossing the Still River, impacts on wetlands, constraints by the Conrail ROW, and impacts to residential and commercial areas. (Iroquois 1A, p. B-143 to 144; FERC FEIS, Vol.1, 6-55 to 6-56; Iroquois 27, sheet 2 of 8)

Lanesville Alternative

217. This alternative would avoid the Waste Management landfill, the residential area immediately to the south of the landfill, the Hill and Plain Elementary School, and a crossing of the Still River. (New Milford 18; Iroquois 27)
218. The Lanesville alternative would be down-gradient of the New Milford landfill and closer to residential and commercial developments along Route 7 and Pickett District Road. (Tr., 6/12/90, pp. 192-197; pp.210-212; Tr., 6/19/90, pp.31-34, pp.83-88)

BROOKFIELD

Proposed Route

219. Approximately 6.8 miles of the proposed route would pass through Brookfield. The proposed route would traverse approximately four miles largely parallel and adjacent to an existing CL&P transmission line ROW, a railroad ROW, Route 7, and an existing Algonquin Gas Transmission Company (Algonquin) pipeline ROW. (Iroquois 1A, p.IV-96; Iroquois 1B, Vol.2, Sheet 3 of 8, Sheet 4 of 8)
220. The proposed route would traverse through 0.34 miles of the Still River Preserve, a site nominated for the National Register of Historic Places. The proposed route would be between the CL&P transmission line which traverses the preserve, and the Conrail tracks. Iroquois would avoid cutting the screen of mature trees adjacent to the railroad easement. (Iroquois 1A, pp.IV-96 to 97; C.L.E.M. 1;)
221. The Still River Preserve contains several calcareous spring seeps, over which the proposed route would pass. However, by backfilling the trench with on-site materials, no changes in the subsurface drainage patterns would occur. (FERC FEIS, Vol.III, p.3-93)
222. To avoid the creation of a new corridor, the FERC staff has recommended that Iroquois locate the pipeline five feet inside the outer edge of the CL&P ROW. (FERC FEIS, Vol.III, p.3-137)
223. The proposed route would pass through a historic district at the intersection of Route 25 and Ironworks Hill Road. In this vicinity are 200 year old homes and trees and the Still River Arch Bridge. Blasting is a concern in this area because of possibly unstable bedrock. (Brookfield 3; CLEM 1; Iroquois 1B, Vol.2, Sheet 3 of 8)
224. Where the proposed route is on the east side of the CL&P ROW, Iroquois would use a 40-foot temporary work area on

the CL&P ROW. The pipeline would be placed 10 feet outside the CL&P ROW. Continuing down slope to Route 25, the proposed route would be 20 feet off of the Conrail tracks on a restricted ROW for approximately 250 feet. The pipeline would then be within a tunnel underneath Route 25 for 250 feet. The proposed route would then go into a 75-foot ROW on the east side of the Conrail tracks. Of that 75 feet, 25 feet would be temporary construction ROW. (Tr., 6/7/90, am, p.113)

Brookfield Variation 1

225. This variation was proposed by Iroquois to provide a crossover of the existing Conrail and CL&P ROWs, while aligning the pipeline along the eastern edge of this ROW, providing greater distance between the pipeline route and the Still River gorge. This variation is recommended by the FERC. (FERC FEIS, Vol. I, p.6-56; Vol. III, Fig. A-1, Sheet 50 of 57)

Brookfield Variation 2

226. Iroquois proposed this variation to avoid wetland areas on the proposed route along the east side of the Conrail tracks. The variation would follow the west side of the Conrail tracks and would replace the Brookfield Wetland Variation, which was not recommended by the FERC. (FERC FEIS, Vol.I, p.6/56; Tr., 6/7/90, am, p.130; FERC FEIS, Vol.III, Fig. A-1, Sheet 50 of 57)
227. This variation would utilize an abandoned railroad grade, while avoiding a tree farm and a small wetland. The variation would place the route near four residences and the Brookfield Post Office. The FERC recommends adoption of this variation. (FERC FEIS, Vol.I, p.6-56)

Brookfield Variation 3

228. Proposed by Iroquois, this variation would align the route along property lines and avoid an area of future expansion of the Brookfield Jewish Cemetery. The FERC staff recommends this variation be adopted, with the provision that an existing vegetation screen between the cemetery and a nearby industrial park be retained. (FERC FEIS, Vol.I, p.6-56; FERC FEIS, Vol.III, Fig. A-1, Sheet 50 of 57)

Bound Swamp Variation

229. The purpose of this variation, proposed by FERC staff and Iroquois, would be to avoid an emergent marsh north of the Conrail railroad tracks and along the Algonquin ROW. (Tr., 6/7/90, am, p.75)
230. This variation of 2,640 feet is the same length as the

proposed route in the area, and is recommended by the FERC. (FERC FEIS, Vol.I, p.6-9, p.7-9)

Brookfield Meadows Variation

231. The proposed construction ROW in the Brookfield Meadows subdivision would be reduced from 75 feet to 50 feet to minimize impacts on residential lots. Pipe sections would be made up in work areas north and south of this area and carried to the narrow ROW and placed into the ditch. The ditch would be placed 10 feet inside the private properties from the Conrail ROW. This variation would minimize any interference with drainage or septic systems. (Tr., 6/19/90, pp.46-49; Iroquois 31)

Conrail Variations

232. Iroquois explored the possibility of using existing Conrail ROWs through Brookfield, Newtown, Monroe, and Shelton as a corridor for the pipeline. An investigation of the Conrail ROW revealed significant engineering, construction, environmental, and safety concerns. (FERC FEIS, Vol.I, pp.6-59 to 6-61; Iroquois 1B, Vol.2, Sheet 6 of 8, Sheet 7 of 8)
233. Among the constraints which would be encountered by using the Conrail ROW are difficult terrain, unstable slopes, an unstable railbed, and limited workspace. The blasting and regrading required could destabilize much of the railroad ROW. Iroquois would have to haul out spoil material blasted or graded from the ROW to temporary off-site locations. (FERC FEIS, Vol.I, pp.6-60 to 6-61)
234. Conrail would require any pipeline within 30 feet of its tracks to be encased in another pipe. To install one pipe within another, a perfectly straight alignment would be needed, and this would not be possible due to bends in the Conrail ROW route. (Tr., 6/7/90, p.76, p.129)
235. Iroquois would not endorse use of the Conrail ROW until Conrail agreed to surrender its right to force Iroquois to relocate the pipeline facility from the Conrail ROW after construction. Conrail would have to shut down its rail operations for 2.5 months to allow construction and would have to agree to reasonable and just compensation from Iroquois. Additionally, Conrail would have to allow Iroquois to use a work train off of the Conrail tracks; to blast within one foot of the tracks, and to lay the pipeline within eight feet of the elevated portions of the railbed in sheer rock cuts. (Shelton 3, Att. G)
236. Conrail has concerns that construction of the pipeline on its ROW would disrupt train traffic and affect the railroad bed. Conrail would restrict blasting along the ROW. The FERC staff decided the Conrail variation is not

practicable or acceptable. (Iroquois 1A, pp.B-49 to 50;
FERC FEIS, Vol.I., pp.6-61 to 62)

NEWTOWN

Proposed Route

237. The proposed route would cross approximately 11.1 miles through Newtown. Approximately 2.5 miles of the proposed route would abut the existing Algonquin pipeline easement, and about 1.7 miles would parallel Interstate 84. (Iroquois 1A, p.IV-97)
238. In Newtown, the proposed route would cross approximately seven miles through forested areas, 1.1 miles through residential areas, 3.2 miles through portions of subdivisions, 4.0 miles of the Pootatuck aquifer, and 0.7 miles of the Paugussett State Forest. (Iroquois 1A, p.IV-98 to 99; Iroquois 1B, Vol.2, Sheet 4 of 8, Sheet 5 of 8, Sheet 6 of 8; N.O.P.E. 1, Fig.1)

Algonquin Variation

239. This variation, proposed by Iroquois, would shift the proposed route from the north side to the south side of an existing Algonquin Pipeline ROW in Newtown. The variation would eliminate two extra crossings of the Algonquin Pipeline and minimize disturbance to residences. A federally designated wetland would be crossed for 150 feet, but this variation would be in proximity to one residence versus three for the proposed route. (FERC FEIS, Vol.I, p.3-51, p.6-17; Iroquois 1B, Vol.2, Sheet 4 of 8)
240. Since this variation would be similar to the proposed route, the FERC staff recommends adoption of this variation. (FERC FEIS, Vol.I, p.6-17)

Old Farm Hill Variation

241. The purpose of this variation proposed by Iroquois would be to minimize the pipeline's potential effects on the development of a nearby subdivision. Two portions of this variation in the Hanover Road area were considered, Old Farm Hill "A", and Old Farm Hill "B". (Tr., 6/11/90, pp.71-76, pp.102-105; Iroquois 19; Iroquois 21)
242. The Old Farm Hill "A" variation would depart from the proposed route at about m.p. 308.5 and parallel an existing CL&P transmission line across Hanover Road and proceed easterly for about 750 feet. The variation would proceed south from the transmission line and cross a forested area south of the Old Farm Hill subdivision, and rejoin the proposed route at about m.p. 309.0. This variation would traverse wetlands for approximately 500

feet, as opposed to about 600 feet for the proposed route. (Tr., 6/11/90, p. 73-74; Iroquois 21)

243. The Old Farm Hill "B" variation would follow a route similar to that of variation "A" except this variation would traverse about 1020 feet adjacent to the CL&P ROW, then turn south and proceed between undeveloped building lots within the Old Farm Subdivision. This variation would traverse wetlands for approximately 300 feet and rejoin the proposed route at about m.p. 309.9. N.O.P.E. prefers this variation. (Tr., 6/11/90, pp.73-76; Iroquois 21)

Newtown Subdivision Variation

244. This variation proposed by Iroquois would minimize environmental effects while limiting potential conflicts with subdivisions in Newtown, including the Trout Run, Green Ridge, Mountain Manor, Cobblers Mill, Deer Ridge, and Feather Meadow Subdivisions. (Iroquois 1A, p.B-30; Iroquois 1B, Vol.2, Sheet 5 of 8)
245. Iroquois developed a refined variation which would further minimize disturbance to the existing and planned subdivisions. This variation would be 0.3 miles longer than the proposed route and would result in 5.6 acres more forest clearing. Wetland disturbance would be reduced from 1.7 acres to 1.0 acre. This refined variation is recommended by the FERC. (FERC FEIS, Vol.I, pp.6-57 to 58)

Feather Meadow Variation

246. Iroquois modified the Newtown Subdivision variation north of Jeremiah Road to avoid wetlands in the Feather Meadow Subdivision, and to place the route farther from homes on Fox Hollow Road, while using designated open space in the Subdivision. (Tr., 6/19/90, pp.40-43; Iroquois 1B, Vol. 2, Sheet 10 of 18)

Deer Ridge Variation

247. This variation would align the pipeline through undeveloped subdivision lots to provide more distance between the pipeline route and existing residences along Jeremiah Road and Cobblers Mill Road. The distance traveled through wetlands would be minimized along this variation. (Tr., 6/11/90, pp.22-26, pp.111-114; Iroquois 22)

Pootatuck River Variation

248. This variation would be the same length as the proposed route, but would require only one crossing of the Pootatuck River, a cold water fishery, versus three crossings for the proposed route. Slightly less clearing

would be required for this variation. The FERC staff recommends adoption of this route. (FERC FEIS, Vol.1, p.6-18; Iroquois B, Vol.2, Sheet 5 of 8)

Paugussett State Forest Variation

249. The proposed route within the Paugussett State Forest would parallel the border of State Forest property for approximately 4000 feet, and would be approximately 150 to 200 feet away from nearby homes on Osborn Hill. The proposed route would cross 1.7 acres of wetland in the Paugussett State Forest, versus one acre for this variation. The Paugussett State Forest is included on the Natural Area Inventory of Connecticut as one of the few large undeveloped forest tracts remaining in the lower Housatonic Valley. (FERC FEIS, Vol.I, pp.6-58 to 59, p. 6-27; Iroquois, 1B, Vol.2, Sheet 5 of 8; DEP Comments, 6/4/90)
250. Iroquois identified this variation as an alignment farther east of the homes on Osborn Hill which would avoid wetlands in the State forest. In addition, this variation would respond to residents in the area who wanted the proposed route moved farther into the State forest, fearing hunters would use the future Iroquois ROW. (FERC FEIS, Vol.I, pp.6-58 to 59)
251. The Paugussett State Forest variation would traverse approximately 8000 feet of State Forest and would be about 800 feet from the nearest existing homes. This variation would provide some 500 feet of separation from the Forest View Subdivision. The FERC staff recommends adoption of this variation. (FERC FEIS, Vol.I, pp.6-58 to 59)
252. The Paugussett State Forest is currently managed by the DEP for timber, firewood, hunting, and hiking. The DEP believes the introduction of a ROW through this State forest would degrade the forest's existing character. The DEP opposes any private encroachment into public open space unless an absolute need is presented. (FERC FEIS, Vol.I, p.6-58; DEP Comments, 6/4/90)

DEP Paugussett Alternative

253. This alternative, submitted by the DEP, is designed to avoid intrusion into open space and to minimize wetland impacts. The alternative would also provide a minimum of 50 feet of buffer between the Paugussett State Forest boundary and existing residential lots. This route would be along the border of the State Forest, behind lots on Leopard Drive, Osborn Hill Road, Paugussett Road, and Forest View Drive. (DEP Comments, 6/4/90, pp.3-4)
254. To prevent trespassers on the pipeline ROW, the DEP

recommends prohibiting access onto the proposed ROW by preventing construction vehicles from entering via Paugussett Road. Instead, the DEP proposes construction access be from Kale Davis Road. The DEP would also recommend the erection of fences or berms and planting of vegetation to avert trespass. (DEP Comments, 6/4/90, p.4)

Forest View Subdivision Variation

255. This variation would be between m.p. 315.8 and m.p. 316.3, and would seek to limit potential conflicts with the nearby Forest View subdivision. This variation would be approximately 0.1 mile shorter than the proposed route and would affect less forest (4.8 acres versus 6.1 acres) than the proposed route. However, the FERC staff did not recommend this variation. (FERC FEIS, Vol. I, pp.6-62 to 6-63; p.6-28)

MONROE

Proposed Route

256. The proposed route would cross about three miles through the eastern portion of Monroe. Most of the proposed route would traverse wooded areas, accounting for 2.5 miles of the route. (Iroquois 1A, pp.IV-99 to 100; Iroquois 1B, Vol.2, Sheet 6 of 8)
257. The proposed route would impact about 11 acres of wetland and approximately 300 acres of Bridgeport Hydraulic Company public water supply watershed, and would traverse the Pomperaug Trail. (Monroe 1A, p.2, p.5)
258. The Pomperaug Trail, a hiking trail, is five to six feet in width. Iroquois would develop a special mitigation plan for this area, including plans for screening the ROW as it crosses the trail. (Tr., 6/8/90, am, pp.46-47; Iroquois 1A, p.V-97)
259. The Boys Halfway River Caves, an environmentally sensitive area, would be about 0.5 mile from the proposed route, but not visible from the proposed route. The area has several collapsed caves and calcareous soils which potentially could support rare or unique plant species. (Naromi Land Trust 1, Niering, p.6; FERC FEIS, Vol.I, p.5-46, Vol.III, p.3-158)
260. The FERC staff has directed Iroquois to undertake a plant and wildlife survey of the Boys Halfway River Caves area to determine if any species of concern are present and to develop a mitigation plan, including a centerline realignment in the area. (FERC FEIS, Vol.I, p.7-17)
261. The proposed route would cross Route 111 in a forested area. This crossing would be mitigated by putting a

vegetative screen along the road or by erecting a berm. Iroquois would encase the pipeline within another pipe and then bore under Route 111. Iroquois would obtain a permit from the Department of Transportation (DOT) for this road crossing. (Tr., 6/8/90, am, pp.36-38)

Powerline Variation

262. This variation would follow the CL&P Stevenson to Devon transmission line ROW and would generally parallel the proposed route approximately one mile to the east. The variation would cross Boys Halfway River, join the CL&P ROW, and follow the CL&P Row for 4.7 miles. The total length of this variation would be 5.6 miles, versus 6.2 miles for the proposed route. (FERC FEIS, Vol.I, p.3-52; Iroquois 1B, Vol.II, Sheet 6 of 8, Sheet 7 of 8)
263. The existing CL&P ROW is 100 feet wide and includes two transmission lines with 50 feet between the centerlines. The area surrounding the ROW is substantially developed. The FERC staff believes the pipeline could not be installed along this ROW without the relocation or disruption of residences, and therefore eliminated this variation from further consideration. (FERC FEIS, Vol.I, p.3-53)

Monroe Subdivision Variation

264. This variation, west of the proposed line between m.p. 316.7 and m.p. 318.2 in Newtown and Monroe, was proposed by Iroquois to minimize potential environmental effects on wetlands, and to limit conflicts with existing and proposed residential developments in the Whispering Pines and Buckhill Estate Subdivisions. The proposed route and this variation would cross Route 34 and the Boys Halfway River at the same location. (Iroquois 1A, p.B-39; Iroquois 1B, Vol.2, sheet 6 of 8; FERC FEIS, Vol. I, p. 3-52, p.6-63)
265. The Monroe subdivision variation would traverse primarily along property boundary lines, while the proposed route would not. Both the variation and the proposed route would traverse primarily forested areas. The FERC staff recommends adoption of this variation. (FERC FEIS, Vol. I, p.6-63; Iroquois 1A, p.B-39)

SHELTON

Proposed Route

266. The proposed route would cross approximately 7.8 miles of Shelton, through a mixture of woodlands, open areas, and suburban residential and commercial developments, including 4.8 miles of forest, 1.5 miles of residential development, about 1.45 miles of two planned subdivisions, and about 0.45 miles of a parcel of land

owned by the Shelton Land Conservation Trust, Inc., directly north of Route 110 and east of Means Brook. (Iroquois 1A, pp.IV-100 to 101; Iroquois 1B, Vol.2, Sheet 6 of 8, Sheet 7 of 8)

267. The 400-acre Means Brook wetland system, an old growth, mixed hardwood swamp, would be crossed for approximately 900 feet. This is the largest wetland in the Shelton area. (Tr., 6/18/90, am, p.64; FERC FEIS, Vol.I, p.6-61; Naromi Land Trust, Niering, pp. 5-6; Shelton 1, p.1)
268. Iroquois is investigating a revision to move the proposed route through the Means Brook wetland toward an upland area past the Bighorn Subdivision and a series of excavated ponds. The FERC has recommended Iroquois realign this portion of the proposed route to the eastern edge of this wetland. The FERC has also directed Iroquois to prepare a site-specific wetland restoration plan for the area. (Tr., 6/18/90, am, p.64; Tr., 6/11/90, p.151; FERC FEIS, Vol.I, pp.6-61 to 62, p.7-18)
269. The FERC staff has recommended that stump removal be limited to the area over the trench, and that the entire Means Brook wetland be allowed to revegetate to a woody condition. (FERC FEIS, Vol.I, p.6-62)

Blakeman Variation

270. This variation located between m.p. 323.1 and m.p. 323.8 was proposed by a resident to avoid the Summerfield Farm condominium development. Iroquois modified the proposed route to align the route adjacent to a proposed highway and farther from existing homes. The variation would avoid steep slopes, river crossings, and wetlands. About 2300 feet of forest and 625 feet of agricultural land would be crossed. (FERC FEIS, Vol.I, p.3-53; p. 4-63 Iroquois 1B, Vol.2, Sheet 7 of 8)
271. The Blakeman variation is similar in length to the proposed route and would result in clearing 1.5 acres less land than the proposed route. The FERC staff has recommended this alternative. (FERC FEIS, Vol.I, p.6-18)

Cranberry Pond Variation

272. The objective of this variation is to avoid the Cranberry Pond wetland, a federally designated scrub/emergent wetland, by traversing upland areas to the north and west of this pond. This variation is approximately the same length as the proposed route but would require two additional road crossings. The FERC staff believes the proposed route in this area would have minimal effect on the Cranberry Pond ecosystem. (FERC FEIS, Vol.I, p.6-25)

Shelton Pipeline Variation

273. This variation, suggested by the Town of Stratford, would diverge from the proposed route at MP 327.2, proceed east to a junction with the existing Tennessee pipeline ROW, and continue along this ROW, crossing the Housatonic River near the existing pipeline. On the east side of the Housatonic River, the variation would proceed south through Milford along the Boston and Maine Railroad ROW and rejoin the proposed route near MP 331.5, thereby completely bypassing both the Town of Stratford and Cranberry Pond. (FERC FEIS, Vol.I, p.6-63; FERC FEIS, Vol.III, Fig. A-1, Sheet 53A of 57)
274. The Shelton pipeline variation alignment along the existing Tennessee ROW would require placement of the pipeline within the residential development on Mustang Drive in Shelton, possibly requiring the removal of several residences. The FERC staff rejected this variation in favor of the Housatonic Valley Variation. (FERC FEIS, Vol.I, p.6-63)

Housatonic Valley Variation

275. Originally known as the Shelton/Stratford Alternative No. 1, this variation recommended by the FERC would leave the proposed route in Shelton at MP 326.8 and continue easterly through areas of mixed light industrial, residential, and agricultural land uses, avoiding the Town of Stratford entirely. The variation would then cross the Housatonic River through Murphy's Boat Yard in Shelton, 200 feet south of the crossing of the existing Tennessee pipeline. The route would emerge in Milford through a tidal wetland and continue south parallel to the Boston and Maine railroad corridor. (Iroquois 1A, p.B-145 to 147; Iroquois 24; FERC FEIS, Vol.I p.6-64; FERC FEIS, Vol.III, Fig.A-1, Maps 53A and 53B of 57; Tr., 6/12/90, p.174)
276. The Housatonic Valley Variation would be slightly longer than the proposed route (5.7 miles versus 5.4 miles), and less of it would be parallel to existing ROW's. The variation would also cross five streams versus nine for the proposed route. The Housatonic River crossing would be approximately 1300 feet in width, compared to 750 feet in width for the proposed route. (FERC FEIS, Vol.I, p.6-64; Iroquois 1A, p.B-147)
277. The variation would traverse less wetlands (3.9 acres versus 5.1 acres) and fewer forested areas (32.7 acres versus 45.5 acres) than the proposed route. (FERC FEIS, Vol.I, p.6-64)
278. The variation would pass downgradient of the D'Addario landfill in Milford, which is under investigation for

- possibly leaching contaminants into groundwater. (Tr., 6/12/90, p.175; Milford 3, p.3; FERC FEIS, Vol.I, p.6-64; Iroquois 1A, p.B-76)
279. If the Housatonic Valley variation were used, Iroquois would have to sample the D'Addario landfill area for leachate by conducting boring and sampling along the variation route. If contaminated soil were encountered, Iroquois would have to decide whether to mitigate the contamination or reroute the pipeline around it. (Tr., 6/11/90, pp.219-220)
280. Iroquois would prefer the variation be upgradient (east) of the D'Addario landfill to reduce the possibility of contamination. (Tr., 6/11/90, p.220)
281. The area through which the Housatonic Valley variation would traverse directly south of the Milford Parkway Extension might contain a prehistoric Indian village and a Revolutionary War burial site. (Tr., 6/8/90, p.178; Tr., 6/11/90, p.205)
282. The tidal wetland area through which the variation would pass on the east bank of the Housatonic River is a possible location for two plant species of special concern, the quillwort and the northern wild bean. (Iroquois 1A, p.B-145; Tr., 6/12/90, p.11; FERC FEIS, Vol.I, p.6-64; Rare and Endangered Species of Connecticut and their Habitats, p.49, p.75)
283. Should the Housatonic Valley variation be constructed, the Cranberry Pond area on the Shelton-Stratford boundary would be avoided entirely, and neither the proposed route nor the Cranberry Pond variation in that area would be necessary. (FERC FEIS, Vol.I, p.6-65; Iroquois 1B, Vol. 2, Sheet 8 of 8; Iroquois 24, Sheet 8 of 8)
284. The FERC staff believes the Housatonic Valley Variation provides an environmentally preferable alignment and recommends its adoption. The FERC staff also recommends that Iroquois conduct the necessary studies to identify and avoid any plant species of concern, and to characterize and mitigate potential problems with any landfills along this variation. (FERC FEIS, Vol.1, pp.6-64 to 65)
285. The 1986 Iroquois alternative route through Shelton leaves the proposed route in Shelton and joins the modified Stratford/HVA alternate to form the Housatonic Valley variation. Use of this alignment would preclude the necessity for Iroquois to acquire and remove structures in Shelton. (Tr., 6/11/90, pp.172-174, Iroquois 24, sheet 8 of 8)

Modified Stratford HVA Alternative #2

286. This alternate would diverge from the "1986 alternate" portion of the Housatonic Valley variation near Long Hill Avenue in Shelton and cross the Housatonic River south of Wooster Island. The alternate would then head east, and, at the junction of the Boston and Maine Railroad ROW, turn south to join the route of the Housatonic Valley variation. Iroquois agreed to continue to evaluate this alternate. (Iroquois 1A, pp.B-81 to 83; Iroquois 24, Sheet 8 of 8)

STRATFORD

Proposed Route

287. The originally proposed route would pass through 3.3 miles of Stratford. Approximately 1.7 miles of this distance would be aligned generally parallel to an existing CL&P transmission line ROW. The route would pass near residential areas along Jones Farm Road, cross .36 miles of the Roosevelt Forest, and traverse the Merritt Parkway before crossing the Housatonic River into Milford. The crossing of the Housatonic River would be approximately .04 miles to the north of the CL&P ROW. (Iroquois 1A, p.IV-101 to 102; Iroquois 1B, Vol.2, Sheet 8 of 8)
288. The Roosevelt Forest is a 220-acre recreation area owned by the Town of Stratford. Approximately 1.2 acres of this forest would be permanently lost due to construction of the proposed route. (Iroquois 1A, p. IV - 102; FERC FEIS, Vol.I, p.5-92)

United Illuminating ROW Variation
(Shelton/Stratford 2, Stratford 3)

289. The Town of Stratford and the HVA advocated use of the existing United Illuminating (UI) transmission line ROW south of Cranberry Pond in Stratford. The pipeline could not use this ROW between m.p. 329 and m.p. 330 due to the proximity of several homes to the ROW. (FERC FEIS, Vol. I, p.6-65; FERC FEIS, Vol.III, Fig. A-1, Sheet 53-B of 57; Iroquois 1B, Vol.2, Sheet 8 of 8)
290. The UI ROW variation was not recommended by the FERC staff because the pipeline could not use the transmission line ROW between m.p. 329 and m.p. 330 due to the proximity of several homes to the ROW. (FERC FEIS, Vol.I, p.6-65, p.7-10)

Carroll Variation

291. This variation, beginning approximately 2000 feet west of the proposed Housatonic River crossing, would be

approximately 250 feet longer than the proposed route. Its objective would be to increase the separation between existing and planned residences and the proposed route. The variation would be within 50 feet of two residences, while the proposed route would be within 50 feet of four residences. This variation would require the clearing of approximately 1.3 acres of forest, whereas the proposed route, along the north side of the transmission line ROW, would require approximately 0.9 acres of clearing. This variation would also require two crossovers of the existing ROW, while the proposed route would not cross over the ROW. (FERC FEIS, Vol.I, p.6-66; Iroquois 1B, Vol.2, Sheet 8 of 8)

292. This variation was suggested by a Stratford property owner to shift the route to the opposite side of the transmission line ROW and to provide greater clearance between his property and the pipeline. This variation would require 50 feet of additional permanent ROW for a distance of approximately 1,100 feet. (FERC FEIS, Vol.I, p.3-54)
293. Both the proposed route and the Carroll variation would cross the same amount of wetlands, 250 feet. The FERC staff recommends adoption of this variation if the pipeline is routed through Stratford. (FERC FEIS, Vol.I p.6-66, p.7-10)

MILFORD

Proposed Route

294. The proposed route would traverse approximately 3.2 miles of the City of Milford. Approximately 0.6 miles of the proposed route in Milford would pass near residential, commercial, or industrial areas. After entering Milford from Stratford, the proposed route would cross a former sand and gravel mining area and would then be aligned parallel to an existing electric transmission line ROW south to Oronoque Road. The route would pass near an industrial area and then traverse south adjacent to commercial buildings along Schoolhouse Drive, Interstate 95, and Route 1. (Iroquois 1A, p.IV-102 to 103; Iroquois 1B, Vol. 2,, Sheet 8 of 8)
295. The Housatonic River would be crossed by the proposed route approximately 4.5 miles upstream from Long Island Sound. The river width at the crossing of the proposed route is 745 feet. A main water quality concern is the polychlorinated biphenyl (PCB) contamination of river bottom sediments. Sediment analysis conducted at the proposed crossing point showed no PCB's were present, but chromium and copper were elevated above normal background levels. Testing indicates violations of water quality

standards would not result from re-suspension of sediment at this crossing. (FERC FEIS, Vol. I, p.4-25, p.5-32)

296. South of Interstate 95, the proposed route would cross several areas which have been set aside for forest management, development, and natural preservation. The Beaverbrook Reservoir would be approximately 0.1 miles south of the proposed route. The Beaverbrook Reservoir watershed is managed by the City of Milford for recreation, conservation, and agriculture. (Iroquois 1A, p.IV-103)
297. The crossing of the Housatonic River would require floating equipment to excavate the trench. Iroquois would provide a minimum of 10 feet of cover over the pipeline. This construction would require temporary work room on both sides of the river for spoil storage, pipe makeup, winch facilities, pipe storage, welding equipment, and concrete coating areas. After trench excavation work has checked by divers, the pipeline would be bottom-pulled across the river using a winch on the west side of the river. Floatation tanks would be secured along the top of the concrete-coated pipe to allow pulling. (Iroquois 1A, pp.III-42-47)
298. Once the pipeline is installed and checked by divers, the floatation tanks would be removed. The trench would then be backfilled, and the bottom contours and slope of the river would be restored. During construction, approximately 31,000 cubic yards of river bottom would be excavated by dragline, clamshell, or backhoe. The rock in the river might require blasting prior to excavation. (Iroquois 1A, pp.III-42 to 47; Iroquois 1G, Fig.1D)
299. Directional boring techniques are commonly used and desirable. Directional boring would require specialized equipment. Tanks would be required for the storage of drilling muds. The FERC staff believes that in areas where significant resources have been well documented, and where geologic conditions indicate a high probability of success, directional drilling techniques would be appropriate. (FERC FEIS, Vol. III, p. 3-76; Iroquois 5, Q. 43)
300. The two month period of construction during the crossing of the Housatonic River might limit boating and fishing in the vicinity. The crossing is planned between October 15 and February 15 to avoid conflicts with species such as winter flounder, which spawn in the period between January and May. (Iroquois 1A, p.V-22, p.25, p.54; FERC FEIS, Vol. I, p.5-39)
301. Iroquois would resample the sediments of all major river crossings in accordance with the request of the FERC. If heavy metals were found, Iroquois would consult the Corps

- of Engineers (COE) and the DEP regarding upland disposal of the sediments (Tr., 6/11/90, p. 183)
302. The southern-most portion of the Housatonic River is one of the best seed beds for oysters in the northeastern United States. All of the estuary portion of the Housatonic River is classified by the State of Connecticut as a Public Natural Bed. (Iroquois 1A, p.IV-41; HVA2, p.69)
303. The oyster spawning period in the Housatonic River is from June 1 to September 30. Dredging and siltation associated with the pipeline crossing of this river's estuary would not be detrimental to the oyster population if no dredging or other river bottom disturbances took place during this period. The FERC staff has recommended that no dredging for pipeline construction take place during the oyster spawning period. (FERC FEIS, Vol.III, p.3-104)
304. If oyster beds had to be relocated in the Housatonic River, Iroquois would pay for the loss of income to oyster harvesters while those beds were re-established. (Tr., 6/8/90, p.190)
305. The Housatonic River was considered as a pipeline route, but below the Route I-95 crossing this would have a detrimental effect on marine resources, including oyster beds. The construction could also have a major impact on tidal wetlands south of Route I-95, including a National Wildlife Refuge at Milford Point. (Tr., 6/8/90, p.191)
306. The proposed route would proceed through Silver Sands State Park on the way to Long Island Sound. Access would be from Route 1 via a ROW 334 feet in width. The proposed route would traverse 0.8 miles through the park itself. (Iroquois 1C, Vol, 8, p.8-68; Tr., 6/6/90, pm, p.97; FERC FEIS, Vol.I, p.4-64)
307. A former municipal solid waste landfill in an undeveloped portion of Silver Sands State Park is being capped with fly ash by the DEP. If the pipeline route is aligned on the east side of the access road, the probability of encountering fill would be minimized. (Tr., 6/11/90, pp.215-216; Iroquois, 1A, p.IV-27; FERC FEIS, Vol.I, p.4-64)
308. The DEP is in the process of developing plans for beach recreation at Silver Sands. The proposed route would traverse an area of this 293-acre park which would include bathhouses, concessions, and the park's main beach area. During the peak days of summer use, at least 1000 people would be directly along the proposed route. The DEP suggests an alternative route be considered for the southern portion of the park, which would be

developed for recreational use. (DEP Comments, 6/4/90, p.4; Iroquois 1C, Vol.8, p.8-18)

309. The proposed pipeline would pass to the east of an offshore tombolo and 23-acre Charles Island which are both part of Silver Sands State Park. This island and its tombolo are protected under the Coastal Barrier Resource Act. Silver Sands, Charles Island, and the City of Milford are all within the Connecticut Coastal Zone Management Area. (Iroquois 1C, Vol.8, p.8-69)

Marine Construction

310. The proposed route would enter Long Island Sound at Silver Sands State Park, turning to the west and passing north of Stratford Shoal before reaching landfall at Northport, Long Island, a distance of 26.3 miles. Excluding nearshore areas, water depths range from 60 to 100 feet. (Iroquois 1A, p. III-52; FERC FEIS, Vol. III, Fig. A-1, Sheet 55 of 57)
311. To increase stability, the marine pipeline would be concrete-coated. Approximately three to four months would be required for marine construction, which would take place between January and May. (Iroquois 1A, p.III-55)
312. In the offshore area, beyond 50 to 58-foot water depth, the pipeline would be laid directly on the sea bottom. It is expected the pipeline would settle into the seabed with time. A pre-dredged trench would be excavated from the shore out to the 30 foot water depth. A total of approximately 80,000 cubic yards of material would be excavated from the trench. Material from the trench would be used as backfill. (Iroquois 1A, p.III-61)
313. From a water depth of from 30 to 50 feet, the pipeline would be post-jettied below the seabed. With this method, high pressure air and water jets mounted on a steel sled would be towed via a cable or chain from a surface vessel. The jets would displace the sediments on the sea bottom, and the pipeline would then settle to the bottom behind the sled. The displaced soil would be dispersed away from the trench and deposited back onto the seabed. (Iroquois 1A, p.III-61)
314. A lay vessel would install the pipeline in Long Island Sound. This vessel would have eight to ten anchors extending up to one mile from the vessel. The pipeline would be installed at a rate of approximately 0.6 to 1.0 miles per day. The installation would continue 24 hours a day. At the Milford landfall, pipe would be buried through the surf zone to provide a minimum depth of cover of five feet. (Iroquois 1A, pp.III-52 to 61)

315. The dredge and fill activities of the construction in Long Island Sound would result in a short-term increase in the level of suspended particulates in the water, resulting in higher turbidity in the area. Filtered seawater would be used to test the marine pipeline. Placement of the pipeline on the seabed in Long Island Sound would directly affect approximately four acres. (Iroquois 1A, p.V-57, p.68; FERC FEIS, Vol.I, p.5-33)
316. Commercial fishing would be excluded from the area of the lay vessel for two to three days. Commercial fishing would be at a low point during the winter pipeline installation in Long Island Sound. There would be a moving exclusion zone within a radius of two miles around the pipe laying vessel. This 12.6 square mile zone would be off-limits to all other vessels during construction. (Iroquois 1A, p. V-71; FERC FEIS, Vol.I, p. 5-32)
317. Installation of the pipeline would adversely affect shellfish resources in the path of the trench and in the area of the sediment plume. The route would cross approximately 10,000 feet of shellfish beds near Milford. Iroquois would allow shellfish lease holders to harvest prior to pipeline construction and would compensate the leaseholders for lost resources. (Iroquois 1A, p.V-73 to 74; Iroquois 1G, p.46)
318. Installation of the pipeline in Long Island Sound would diversify the substratum and make it favorable to lobster communities. Pleasure vessel anchors and fishing gear would not be expected to damage the pipeline. (Iroquois 1A, p.V-68 to 69; Iroquois 1C, Vol.11,pp.11-27)
319. The entire marine route would be designated as a non-anchorage zone by the U.S. Coast Guard and would be so indicated on navigation charts, to avoid damage from anchor dragging. The proposed route would avoid magnetic anomalies which might represent shipwrecks. (FERC FEIS, Vol. III, p.3-140, p.3-169)
320. After construction and bottom restoration, cultch, a natural bed for oysters, would be placed on the seabed to help in the re-establishment of shellfish habitat. (Iroquois 1G, p.46)
321. The proposed route would have no effect on the transient anchorage north of Charles Island. No marine development would be allowed in the immediate area of the pipeline. (Tr., 6/11/90, p.206; FERC FEIS, Vol.I, pp.6-66 to 67)

Milford Landfall Variation

322. Concerned about the pipeline's effect on the transient anchorage north of Charles Island, the Milford Harbor Management Commission suggested an alternative alignment

to the west of the Charles Island tombolo. (FERC FEIS, Vol.I, p.6-66, Vol.III, Fig. A-1, Sheet 55 of 57)

323. Iroquois has indicated that the depth of burial through the anchorage would be increased to five feet, and that the type of craft using the anchorage would not be limited by the pipeline. The penetration depth of 1500-pound anchors is approximately four feet into the substratum. (FERC FEIS, Vol.I, p.6-67)
324. The Milford Landfall Variation would affect a larger area of shellfish resources than the proposed route in the Milford offshore area. (FERC FEIS, Vol.I, pp.6-66 to 67)

Milford Variation

325. To minimize wetland impacts, Iroquois identified a variation which would diverge from the proposed route in Milford on the east bank of the Housatonic River, continue parallel to an existing CL&P electric transmission line ROW, traverse close to commercial and industrial properties along Bic Drive, cross West Avenue to the east of Bic Drive through the parking lot of Automatic Data Processing, cross route I-95 adjacent to the Beaver Brook wetland, cross the Amtrak rail lines, proceed easterly along the rail lines, and rejoin the proposed route. (FERC FEIS, Vol.I, p.3-54; Iroquois IB, Vol.2, Sheet 8 of 8)
326. This variation, 2.1 miles in length, would replace a 1.7 mile-long portion of the proposed route in Milford. The variation would parallel the CL&P ROW for approximately 2400 feet, and would parallel the Amtrak lines for about 1000 feet. The proposed route does not parallel any existing ROW's. The variation would require the clearing of approximately 10.5 acres of wooded land, versus 14.3 acres for the proposed route. (FERC FEIS, Vol.I, p.3-54, p.6-18)
327. The Milford variation would avoid most of the federally designated wetlands in the area, while the proposed route would traverse approximately 800 feet of scrub/shrub wetland. Both routes would cross Beaver Brook. The route variation would also border an intertidal emergent wetland along the CL&P ROW adjacent to the Housatonic River, as would the proposed route. (FERC FEIS, Vol.I, pp.3-54 to 3-55, p. 6-19)
328. The variation would minimize disruption to the Beard Sand and Gravel Company and would be approximately 1,000 feet farther from the John F. Kennedy Elementary School than the proposed route which was adjacent to the school. (FERC FEIS, Vol.I, p.6-19 ; Iroquois IB, Sheet 8 of 8).

329. The Milford variation would cross a five-acre wetland at the corner of Naugatuck Avenue and Bic Drive. The City of Milford suggests an alternative to this variation which would entirely avoid wetlands in this area. This alternative would run along the north side of Caswell Street, cross Naugatuck Avenue to the east of Bic Drive, follow Bic Drive for about 700 feet, then cross to the west side of Bic Drive to be behind the businesses on that street. (City of Milford 3, p.4)
330. The Milford variation would cross Beaver Brook approximately 1000 feet upstream of the Milford Reservoir, Milford's major potential water supply. (FERC FEIS, Vol.I p.3-55; City of Milford 3, p.4)
331. The FERC staff believes the Milford variation is environmentally preferable to the proposed route; however, the FERC staff would impose additional restrictions to minimize the variation's impacts. These include maintaining existing vegetative screens, particularly in the Bic Drive area; limiting the construction ROW to 75 feet; placing vegetative screens at all road crossings; and minimizing the disruption to parking lots. (FERC FEIS, Vol.I, p.6-19)

Sales Meter Stations

332. Sales meter stations measure the volume of gas being delivered into another pipeline system. Sites in Connecticut are proposed for New Milford, at m.p. 297.2, for Yankee Gas Services Company; in Shelton, at m.p. 324.4, for Yankee Gas Services Company; and in Stratford at M.P. 330.10 for the Southern Connecticut Gas Company. (Iroquois 1A, p.II-11; Tr., 6/6/90, am, p.135)
333. Sales meter stations would be 200-foot by 100-foot facilities, with a fenced area measuring 50 feet by 110 feet. (Iroquois 1A, p.II-10)

Valve Sites

334. Valve sites spaced between eight and twenty miles apart, depending on population density, contain isolation valves which would allow Iroquois to shut off sections of the pipeline during maintenance or emergencies. The valve sites would be constructed to US DOT safety specifications. (Tr., 6/19/90, pp.73-74; Iroquois 1A, p.II-10)
335. In Connecticut, mainline valve sites are proposed for the following locations: in Sherman off Route 39; in New Milford adjacent to a proposed meter station off Route 7; in Newtown on Schoolhouse Hill Road; in Brookfield, off Vail Road; in Monroe, adjacent to Old Zoar Road; and in

Milford at Silver Sands State Park. (Iroquois 1A, p.II-11, p.II-31, p.V-96, p.V-97, Tr., 6/6/90, am, p.173; Iroquois 12)

336. Valve sites typically would occupy a fenced area of 18 feet by 40 feet. Mainline valve locations would change in response to the use of different route variations. (Iroquois 1A, pp.II-10 to 11)

Pig Launcher/Receive Site

337. There would be one pig launcher/receive site in Connecticut, near Bic Drive in Milford. The above-ground components of this site would be limited to a mainline valve assembly, two 20-foot long steel pipe barrels, and two four-inch vertical pipes. All piping would be painted white and enclosed within a fenced area measuring 40 feet by 120 feet. The pig launcher/receive site would be used approximately one day once a year to test and survey the pipeline. (Iroquois 5, Q.25)

Pipe Storage Sites

338. Four pipe storage areas would be required in Connecticut during construction. There would be one each in New Milford, Brookfield, Newtown, and Milford. The size of these storage yards would range from three to seven acres. The storage sites would usually be located in industrial areas or railway yards. Exact locations would be provided in the D&M Plan. (Iroquois 5, Q.30)
339. All above-ground components, such as the valve, meter, and the pig launcher/receive station, would be enclosed with chain link fences 8 feet 10 inches in height with one foot of barbed wire on top. Gates would be locked at all times. (Iroquois 1C, Vol.II, p. 11-26)

D&M Plan

340. The D&M Plan which Iroquois would submit to the Council would include specific information on wetlands, stream crossings, erosion and sedimentation controls, construction techniques, construction schedule, and whatever other information the Council might require. The D&M Plan would incorporate the FERC staff specifications as well as any stipulations reached as a result of the Siting Council process. Iroquois environmental inspectors would monitor construction activities to ensure compliance with D&M Plan requirements. (Iroquois 1A, p.III-72)
341. Iroquois would provide the D&M Plan to the inland wetland Commissions of those towns along the final pipeline route so that their comments on the D&M Plan could be received. (Tr., 6/6/90, am, p.162)

Permits

342. In addition to the FERC's requirement of a Certificate of Public Convenience and Necessity for the proposed pipeline, other federal regulations which would have to be adhered to by Iroquois include compliance with the Clean Water Act, the Rivers and Harbors Act, the Clean Air Act, and the Toxic Substances Control Act. Federal requirements of the Clean Water Act include compliance under Sections 401, 402 and 404. Water quality certification (Section 401) has been delegated to the jurisdiction of the individual State agencies. (FERC FEIS, Vol.I, p.2-25)
343. The Section 404 permitting process is administered by the Army Corps of Engineers (COE) for all stream and wetland crossings. The COE has determined that it will require Iroquois to secure a single individual Section 404 permit for each of Iroquois' wetland and surface water crossings. The COE individual wetland permit required prior to construction may impose additional conditions on the applicant that would further avoid wetlands or minimize wetland disturbance. (FERC FEIS, Vol.I, p.2-25, Vol.III, p.3-84)
344. The FERC staff has determined that Connecticut may apply its own state and local wetland regulations during the State and local permitting process. (FERC FEIS, Vol.III, p.3-85)
345. Iroquois applied to the DEP for Coastal Zone Consistency Certification, and for a Section 401 Water Quality Certificate; they would apply for a State Pollution Discharge Elimination System Permit (Section 402). A Temporary Operating Permit would be required if rock crushing were needed to dispose of excavated rocks. (Tr., 6/11/90, p.15; N.O.P.E. 1, App. A, p.21)
346. Iroquois withdrew its application for Coastal Zone Consistency Certification on May 23, 1990, citing the need for additional time for review of the material already submitted, and to provide additional information. In conjunction with its resubmitted application, Iroquois would submit additional information on the proposed trenching, sidecasting, and backfilling of sediments in the Housatonic River. Detailed site plans depicting all construction, ROWs, staging areas, and surveys of wetland areas would also have to be submitted. (DEP Comments, 6/4/90, p.5)