

4.0 ALTERNATIVES

We evaluated alternatives to the Islander East Pipeline Project to determine whether they would be reasonable and environmentally preferable to the proposed action. These alternatives include the no-action or postponed-action alternative, system alternatives, route alternatives, route variations, and aboveground facility alternatives. The full range of alternatives considered is discussed below.

The evaluation criteria for selecting potentially environmentally preferable alternatives are:

- Technical and economic feasibility and practicality;
- Significant environmental advantage over the proposed project ^{1/}; and
- Meeting the project objectives of:
 - Delivering increased volumes of natural gas to meet the load of new, efficient, clean burning, gas-fired electric generating plants as well as older, existing facilities that may convert to natural gas in the future;
 - Supplying enough natural gas to heat 600,000 homes in Long Island, and New York City and meet future local gas distribution company growth in Connecticut;
 - Fully integrating market access between New York and New England; and
 - Enhancing access to virtually every major natural gas supply basin in North America.

4.1 NO ACTION OR POSTPONED ACTION ALTERNATIVE

The FERC has three alternative courses of action in processing an application for a Certificate. It may: (1) grant the Certificate with or without conditions; (2) deny the Certificate; or (3) postpone the action pending further study.

If FERC postpones or denies the application, the short- and long-term environmental impacts identified in this EIS would not occur. If FERC were to select the no-action alternative, however, the objectives of the proposed project would not be met and there would be an insufficient supply of natural gas for the new power plants as well as other existing commercial, industrial, or domestic users. Although it would be purely speculative, and therefore beyond the scope of this EIS, to attempt to predict what actions may be taken by policy makers or end users in response to the no-action or postponed-action alternatives, the unmet demand on Long Island could be partially offset

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We defined "significant environmental advantage" based on guidelines provided in CEO's *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* to include both the context and intensity of the environmental impacts being compared (see 40 CFR 1508.27).

by conservation efforts. Conservation would probably reduce demand incrementally in response to increased prices and public awareness. However, in most cases customers would either experience energy shortages or would substitute using alternative fuels. Options for alternative energy sources such as oil, wood, coal, solar, or wind are extremely limited on Long Island. Increased use of alternative fuels such as oil, wood or coal would generally result in higher emission rates of NO_x and SO_2 than would have been the case with natural gas. Replacement of the natural gas by other energy sources is also impracticable in the timeframe required by the end users. Solar power, while very clean, is not a reliable energy source in the project area. Likewise, it is unlikely that wind power could be sufficiently developed in the project area to be a viable alternative to the proposed project. We do not consider liquefied or compressed natural gas as viable alternatives to the proposed action because of the significant new infrastructure that would be required; the long lead time that would be needed to design, permit, and construct these facilities; and the fact that there are no such projects currently under consideration.

It is difficult to determine the impact of a pipeline project on greenhouse gas emissions; however, credible estimates of greenhouse gas emissions can be developed based upon reasonable assumptions regarding the use of the natural gas delivered by the pipeline and what energy resources would likely be utilized if the gas from the pipeline was not available. Islander East's proposed project would provide an additional 260,000 Dth/d of natural gas to one local distribution company (KeySpan Energy Delivery Long Island) and two proposed power plants (the 500-MW Brookhaven Energy Power Plant and the 500-MW AES Long Island Power Plant). If the additional 260,000 Dth/d were replaced with other fossil fuels, greenhouse emissions could potentially increase by 2,166,000 metric tons of carbon dioxide per year, depending on the alternate fuel assumption made in the analysis.

This analysis only evaluates the potential change in greenhouse gas emissions for the ultimate end user of the natural gas volumes associated with the project. Greenhouse gas emissions are also related to the production, processing, transmission, and distribution of natural gas as well as the alternative fossil fuels.

4.2 SYSTEM ALTERNATIVES

System alternatives differ from alternative pipeline routes (i.e., route alternatives or route variations) in that they make use of other existing, modified or planned pipeline systems to meet the stated objectives of the proposed project. A system alternative would make it unnecessary to construct all or part of the proposed project, although some modifications to another existing pipeline system may be required to increase its capacity or, conversely, another entirely new system may need to be constructed. Although these modifications or additions could result in environmental impacts, the impacts may be less, similar to, or greater than the impacts that would result from the proposed project. The purpose of evaluating system alternatives is to determine whether potential environmental impacts associated with construction and operation of the proposed facilities could be avoided or reduced, while still allowing the stated objectives of the proposed project to be met.

The only existing interstate pipeline from Connecticut to Long Island is Iroquois. Iroquois' existing system does not have the capacity to make Islander East's deliveries without expansion and is not located near some of Islander East's customers. However, Iroquois has proposed expanding its system to deliver additional gas to eastern Long Island (ELI Extension Project). We have looked

at system alternatives which are based on the ELI Extension Project, but expanded to carry Islander East's volumes (ELI System Alternative) and carry the volumes of both the ELI and Islander East projects (One-Pipe System Alternative). We have also looked at a system alternative which is based on Tennessee's planned Connecticut-Long Island Lateral Project. In addition, commentors have requested that we study various alternatives that would deliver gas to Long Island without crossing Connecticut or Long Island Sound. It was also suggested that we examine the use of KeySpan's existing facilities. We have added a discussion of these system alternatives.

4.2.1 ELI System Alternative

In the event that only one pipeline is constructed, we have examined using a system alternative based on Iroquois' ELI Extension Project (ELI System Alternative) instead of the Islander East Project to deliver 260,000 Mcf per day.

The ELI System Alternative described in the DEIS included a 7-mile-long loop in Connecticut. Although, that design of the system alternative would deliver the volumes of gas required, we agree with Iroquois that there are various combinations of facilities that would transport the same amount of gas. Therefore, we have revised the facilities required for this system alternative based on Iroquois' statements and our engineering analysis, adding additional compression at the proposed Brookfield Compressor Station instead of the previously identified looping to provide the same service. We believe that the ELI System Alternative described below is more environmentally benign than the one described in the DEIS.

Table 4.2.1-1 compares the facilities required for the ELI System Alternative with the facilities required for the Islander East Project. It should be noted that Iroquois has filed an application (Docket No. CP02-31-000) to construct the Brookfield Compressor Station. At this time the Commission is still reviewing this proposal.

The location of the Sound crossing and the Brookfield and Milford Compressor Stations are shown on figure 4.2.1-1. The location of all other facilities is as shown in Appendix B

Using the ELI System Alternative would eliminate the construction of 10.2 miles of new onshore mainline in Connecticut. Avoiding the onshore pipeline construction in Connecticut associated with the Islander East Project would eliminate crossing 16 waterbodies, 41 wetlands, and about 0.4 mile of land trust property (see section 3.8 of this FEIS). The system alternative would also avoid disturbance of 185 acres of land onshore in Connecticut, including 32 acres of forested land, and construction within 50 feet of 34 residences. However, it would require the construction of a new compressor station at Milford, Connecticut, (as currently proposed in the ELI Project) and the addition of a new compressor unit at the currently proposed Brookfield Compressor Station.

Since the onshore portion of this proposal in New York is identical to Islander East's proposal the environmental impact of this segment is described in section 3 of this environmental document.

TABLE 4.2.1-1
Comparison of the Facilities Required for the ELI System Alternative with the Facilities Required for the Islander East Project

Facility	Location	ELI System Alternative	Islander East Project
Mainline Pipeline	Onshore Connecticut	none	10.2 miles
	Onshore New York	12.0 miles	12.0 miles
Mainline Pipeline	Offshore Connecticut	7.5 miles	11.0 miles
	Offshore New York	9.6 miles	11.6 miles
Lateral	Onshore New York	5.6 miles	5.6 miles
Compressor Stations	Connecticut	1-21,000 hp (Milford)	1-10,310 hp (Cheshire)
Additional Compression	Connecticut	10,000 hp ¹ (Brookfield)	none
Meter Stations	Connecticut and New York	2	3

¹ The ELI Project will reconfigure the Brookfield Compressor Station from mainline function on the Iroquois mainline to a transfer function from the Existing Algonquin mainline into the Iroquois mainline.

Our analysis of the system alternative offshore pipeline indicates the crossing of the Sound would be reduced by 5.5 miles. The ELI System Alternative would open-cut about 936 feet of shellfish leases, avoiding direct impacts to other near shore leases by tapping into Iroquois' existing pipeline offshore. Islander East would open-cut about 6,141 feet of shellfish leases, avoiding direct impact to other leases by drilling the Connecticut shoreline. Construction offshore would impact 2,930 acres for the ELI System Alternative and 3,106 acres for the proposed project. For a more complete discussion of the offshore impacts of the ELI System Alternative see the discussion of Iroquois' offshore pipeline in the Environmental Report for the Eastern Long Island Extension Project filed in Docket No. CP02-52-000.

As shown on table 4.2.1-2 the emissions from the Milford and Brookfield Compressor Stations would be greater than from the Cheshire Compressor Station. The Milford Compressor Station would be in an industrial area which includes a railroad, a landfill, and an asphalt plant. The proposed location of the Brookfield Compressor Station is an open field, with residences and a school in the vicinity. At this time the Commission is still reviewing Iroquois' application, including the location of the compressor station. The Cheshire Compressor Station is in an agricultural field, bordered by forest and Interstate 91.

TABLE 4.2.1-2
Comparison of the Construction and Operational Impacts of the Milford and Brookfield Compressor Stations and the Cheshire Compressor Station

Environmental Factor	Milford Compressor Station (ELI System Alternative)	Brookfield Compressor Station (ELI System Alternative)	Cheshire Compressor Station (Islander East Project)
Noise			
Nearest NSA	1,300 feet	600 feet	750 feet
Projected Noise Level at Nearest NSA	52 L _{dn}	45L _{dn} (attributable to new unit)	52 L _{dn}
Air Quality			
SO ₂	5.7 tons per year (tpy)	0.3 tpy	1.4 tpy
NO _x	47.7 tpy	24.1 tpy	39.1 tpy
CO	77.3 tpy	41.2 tpy	47.6 tpy
VOC	1.1 tpy	2.9 tpy	2.2 tpy
PM ₁₀	4.7 tpy	2.5 tpy	2.8 tpy
Existing Land Use	Industrial	open	Agricultural

Based on our analysis, if the ELI System Alternative was constructed instead of the Islander East Project there would be no change in impacts on Long Island. The onshore impacts in Connecticut would be limited to construction at the compressor station sites, noise, and air emissions. Air emissions would increase due to the greater amount of compression at Milford and Brookfield (versus Cheshire). Noise levels would also increase at these two sites. Impacts to the Sound should be reduced since the crossing length would be reduced by 5.5 miles.

Based on our environmental analysis, the ELI System Alternative is environmentally preferable to the proposed route because it reduces onshore and offshore impacts, except for emissions. However, there are a number of non-environmental factors in addition to environmental impacts that the Commission may take into account in its overall analysis of the public convenience and necessity and its decision on the proposal. These issues include flexibility and reliability of the interstate pipeline grid, competition, market need, precedent agreements, or lease agreements. We also note that there is no proposal before the Commission to construct this system alternative.

In Southern Natural Gas Company, the Commission stated that a determination of the public convenience and necessity connoted a flexible balancing process in which all factors -- environmental, competitive, and operational benefits -- are weighed prior to a final determination.²

^{2/} 79 FERC ¶ 61,289 (1997)(mimeo at p. 20).

4.2.2 Tennessee Connecticut-Long Island Lateral Project System Alternative

It has been suggested that we examine Tennessee's planned Connecticut-Long Island Lateral Project. At this time, Tennessee has not filed an application for this project and has not indicated that it still plans to pursue this project. A system alternative using Tennessee's route would require the construction of 110 miles of pipeline. We do not believe that the construction of system alternative that is 60 miles longer than the proposed project is a reasonable alternative.

4.2.3 New York/New Jersey System Alternatives

Several commentors have suggested that we examine making deliveries to Long Island through New York or New Jersey thereby avoiding impacts to Connecticut and Long Island Sound. Commentors have mentioned specific project, such as the Cross Bay and Millennium Pipeline Projects, as possible delivery systems. Other commentors suggested that a new pipeline be built from New Jersey to New York. We have not studied these system alternatives in depth because we do not believe that they are reasonable alternatives to the Islander East Pipeline Project since they would not meet the purpose of the project.

One of the purposes of the Islander East Pipeline Project is to enhance supply diversity and reliability. Both Cross Bay and Millennium would rely on gas supply from the western United States and Canada. The same would be true for a new pipeline built from New Jersey to New York City. While gas supplies for Islander East may come from the same source, its system would also have the ability to access gas supplies from Eastern Canada increasing the diversity and reliability of the supply.

Further, Islander East's proposed in service date is November 1, 2003. The planned capacity of the Cross Bay Project is about half of the volume proposed by Islander East. That project, which has been withdrawn, would need to be redesigned to be able to deliver the increased volumes. Millennium would also need to be redesigned to include the Islander East volumes. Neither of these projects would be able to meet Islander East's proposed in service date. A new pipeline project from New Jersey to New York could not be designed, studied, approved, and constructed by November 1, 2003.

4.2.4 KeySpan System Alternative

The Central Pine Barrens Commission has requested that we examine an alternative that makes use of the existing KeySpan system along the Long Island Expressway. We have determined that this system alternative would only replace the last 2.8 miles of the Islander East Project. The system alternative would require Islander East to deliver about 200,000 Dth/d into the KeySpan system near the intersection of the William Floyd Parkway and the Long Island Expressway. This alternative may require KeySpan to re-enforce its system by adding looping or compression. We believe that this is likely since KeySpan specifically contracted to receive gas at the proposed end of the Islander East mainline (MP 44.8). Adding looping or compression would negate the environment benefits of using the KeySpan System Alternative. Therefore, we do not recommend the KeySpan System Alternative. In addition, flexibility and reliability of the gas supply are purposes of this project. Using the KeySpan System Alternative would reduce the flexibility and reliability of the project.

4.2.5 One-Pipe System Alternative

Since the issuance of the DEIS additional information on this system alternative has been obtained. The specific locations of the facilities required for the One-Pipe System Alternative are speculative since numerous facility configurations and loop locations could provide the same capacity. However, in order to analyze the system alternative we must choose a configuration. Since no company has proposed to construct a system alternative, we are choosing the configuration for which we have the most information. Specifically, we will look at the facilities described in the DEIS, which were furnished by Iroquois in February 19, and March 6, 2002 filings in Docket No. CP02-52-000.

We have examined the One-Pipe System Alternative as an alternative to building both the ELI Extension Project and the Islander East Project. This alternative would transport the total volume of gas proposed in both projects, about 435,000 Mcf per day.

The One-Pipe System Alternative would require the construction of:

- 16 miles of 36-inch-diameter pipeline loop between Brookfield and Milford, Connecticut paralleling Iroquois's existing pipeline;
- 29.1 miles of 24-inch-diameter pipeline starting in the Sound near Milford, Connecticut and ending in Brookhaven, New York (the onshore portion of this alternative is nearly identical to the proposals by Islander East and Iroquois on Long Island);
- 5.6 miles of 24-inch-diameter pipeline lateral in Suffolk County, New York (the Calverton Lateral as proposed by Islander East);
- a new 20,000 horsepower compressor station in Milford, Connecticut (at the same site proposed by Iroquois in the ELI Extension Project); and
- meter stations in Brookhaven and Calverton, New York.

Maps of these facilities are contained in the DEIS for the Islander East Pipeline Project.

Table 4.2.5-1 compares the facilities required for the One-Pipe System Alternative with the facilities required for both the ELI Extension and the Islander East Projects. The only facility required for the system alternative which has not been proposed in either the ELI Extension Project or Islander East Project is the 16 miles of 36-inch-diameter pipeline loop in Connecticut.

TABLE 4.2.5-1
Comparison of the Facilities Required for the One-Pipe System Alternative with the Facilities Required for Both the ELI Extension and Islander East Projects

Facility	Location	One-Pipe System Alternative	ELI Extension and Islander East Projects
Mainline Pipeline	Onshore Connecticut	none	10.2 miles
	Onshore New York	12.0 miles	24 miles
Mainline Pipeline	Offshore Connecticut	7.5 miles	18.5 miles
	Offshore New York	9.6 miles	21.2 miles
Lateral	Onshore New York	5.6 miles	5.6 miles
Looping	Onshore Connecticut	16.0 miles	none
Compressor Stations	Connecticut	1-20,000 hp (Milford)	2-totalling 30,310 hp (Milford and Cheshire)
Meter Stations	Connecticut and New York	2	4

Table 4.2.5-2 compares the environmental factors affected by construction of the One-Pipe System Alternative with the environmental factors affected by the construction of both the Iroquois ELI Extension and the Islander East Pipeline Projects. This table does not include the impacts associated with the construction of the Calverton Lateral, since it would be constructed in either case and the impacts would be the same in either case.

Using this configuration, the One-Pipe System Alternative would require the construction of less pipeline, about 28.8 miles, than the combined ELI Extension and Islander East Projects. Offshore, the system alternative would avoid the dual crossing of Long Island Sound which would be required by the construction of the two proposed projects. It would also reduce the crossing of shellfish leases by about 6,141 feet.

Onshore, the system alternative would cross fewer parks and land trust properties. It would also require less compression which would result in fewer emissions. However, it would cross more streams (46) and more wetlands (20), although the length crossed would be similar to constructing the two proposed projects. The One-Pipe System Alternative would be within 50 feet of more residences (33) than the ELI Extension and Islander East Projects. The system alternative would also cross more areas potentially requiring blasting than the two proposed projects.

TABLE 4.2.5-2

Comparison of Environmental Factors Affected by the One-Pipe System Alternative and the Islander East and ELI Extension Projects

Environmental Factor	Unit	One-Pipe System Alternative	Islander East Project + ELI Extension Project
Onshore			
Length onshore ^a	mi.	28	34.2
Adjacent to existing right-of-way	mi.	26.8	28.8
Permanent right-of-way (onshore)	ac.	176	239
Construction right-of-way (onshore)	ac.	312	428
Stream crossings	no.	66	20 ^b
Sole source aquifer crossings	no.	2	2 ^c
Wetland crossings	no.	63	43 ^d
Wetlands traversed	mi.	3.4	3.6
Residences within 50 feet of construction right-of-way	no.	74	41 ^e
Estimated areas of blasting	mi.	6.3	1.2
Special land uses crossed (parkland/land trusts)	no.	8	16
Offshore			
Length Offshore	mi.	17.1	39.7
Construction right-of-way (offshore)	ac.	2930	6036
Length Shellfish lease crossing	ft	936	7,077

- a The Calverton Lateral is not included in any of these totals since it would be constructed in either case and the information would be the same in both cases.
- b Includes two separate crossings of the Peconic and Carmans Rivers.
- c Includes two separate crossings of the same aquifer.
- d Includes two separate crossings of the same wetlands on Long Island.
- e Seven of these residences may be disturbed on two separate occasions if both projects are constructed.

It appears based on our analysis that the One-Pipe System Alternative is feasible compared to building both the ELI Extension Project and the Islander East Project because it reduces areal disturbance in Long Island Sound and Suffolk County, New York by about 60 percent. This system alternative would, however, increase onshore impacts in Connecticut from the looping required on Iroquois' mainline. Some of this looping would occur very near congested residential areas and steep terrain.

As stated previously, Iroquois is not proposing to build this system alternative and there is no application for this alternative before the Commission. In addition, this FEIS concludes that Islander East's proposal is environmentally acceptable with appropriate mitigation.

4.2.6 Long Island System Alternative

Since both the Islander East Pipeline Project and the ELI Extension Project use the same route on Long Island we have examined using a single pipeline on the island to reduce environmental impacts, if the Commission were to approve both projects. In this system alternative each company would construct its own facilities in Connecticut and across the Sound. At Shoreham, New York a new 5,000 hp compressor station would be required. From this point the facilities would be nearly the same as proposed in the Islander East Pipeline Project: the Calverton Lateral, meter stations, and a single 12-mile-long, 30-inch-diameter pipeline. The single pipeline would deliver the volumes proposed in both projects.

The environmental impacts of the Long Island System Alternative onshore on Long Island would be as previously described in this FEIS for the Islander East Pipeline Project. Although the size of the pipeline would increase from 24-inch-diameter to 30-inch-diameter, the width of the construction (75 feet) and the permanent (50 feet) rights-of-way would remain the same. In determining the impacts of constructing both pipelines we assumed a 50 foot overlap of construction rights-of-way with a 25 foot overlap of permanent rights-of-way. The impacts resulting from the construction of the Calverton Lateral and the meter stations would not change.

It should be noted that Islander East has a proposed in-service date of late 2003, while Iroquois has proposed in-service date of late 2004. This means that if both projects were to be approved as stand alone projects, and constructed within the time frame proposed by the applicants, the areas disturbed by Islander East's construction would again be disturbed by Iroquois' construction the following year.

Constructing a single 12-mile-long, 30-inch-diameter pipeline instead of dual pipelines would result in a reduction of environmental impacts as shown on table 4.2.6-1. Since the total width of the construction and permanent rights-of-way would be reduced by 25 feet there would be an overall reduction in ground disturbance. The main environmental benefit of this system alternative is that it limits the number of times streams and wetlands would be crossed. It would also reduce the impact on nearby residences and traffic, particularly on the William Floyd Parkway, since construction would only occur once.

However, the Long Island System Alternative would also require the construction of a 5,000 hp compressor station near landfall in Shoreham, New York. We have identified a potential site for the compressor station on property owned by KeySpan adjacent to the KeySpan Access Road. Construction of the compressor station would disturb about 15 acres, assuming the physical lay-out would be similar to the Cheshire Compressor Station. After construction about 10 acres would be used for the operation of the compressor station. The site we have identified is a reasonably level and totally forested upland, leveling and grading would be required. It appears that no streams or wetlands would be affected. The nearest residence to this site appears to be at least 800 feet from the site. Emissions and noise from the compressor station would be similar to the Cheshire Compressor Station.

TABLE 4.2.6-1
**Comparison of the Long Island System Alternative to Constructing
 Dual Pipelines on Long Island**

Environmental Factor	Unit	Dual Pipelines on Long Island	Single Pipeline on Long Island
Area Disturbed by Construction	(ac)	273.8	237.4
Total Width Construction Right-of-Way	(ft)	100	75
Total Width of Permanent Right-of-way	(ft)	75	50
Waterbody Crossings	(no.)	4	2
NWI-mapped Forested Wetlands Disturbed	(ac)	2.5	1.9
Existing Residences within 50 feet of Construction Right-of-Way	(no.)	6 ^a	6

a The same 6 residences are within 50 feet of the construction right-of-way of both pipelines.

The major drawback to the Long Island System Alternative is that it would not reduce impacts to Connecticut or Long Island Sound, since both Islander East and Iroquois would still construct all of their proposed facilities in Connecticut and the Sound. In addition, Islander East's proposed mitigation, including: HDD crossings of the Carmans and Peconic Rivers; HDD crossings of portions of the Central Pine Barrens; and reduction of the right-of-way through the Central Pine Barrens has significantly reduced the impacts on Long Island. The HDD would also reduce disturbance in the vicinity of the residences. Iroquois has also agreed to drill the Carmans River. We believe that Iroquois could also implement similar mitigation for the Peconic River and the Central Pine Barrens which would further reduce impacts.

Although the Long Island System Alternative has some environmental benefits, we don't believe it has significant environmental advantages because we believe that the mitigation proposed by Islander East, which could also be applied to Iroquois, significantly reduces the impact to areas of concern including residences, waterbodies and the Central Pine Barrens.

4.3 ROUTE ALTERNATIVES

Geographic or major route alternatives are identified to determine if these alternatives could avoid or reduce impacts on environmentally sensitive resources, such as large population centers, scenic areas, conservation areas and larger wetland complexes that would be crossed by the proposed pipeline. The origin and delivery points of a major route alternative are generally the same as for the corresponding segment of a proposed pipeline. However, the alternative could follow routes significantly different from the proposed pipeline. Route alternatives would not modify or make use of an existing or modified pipeline system as would a system alternative.

We analyzed eight route alternatives to the Islander East Pipeline Project. A comparison of environmental factors of each major route alternative with the corresponding segment of proposed route is included with the discussion of each route alternative. A summary of the route alternatives evaluated for the Islander East Pipeline Project is provided in table 4.3.1-1.

4.3.1 Replacement Route Alternative (MP 0.0 to 6.1)

The Replacement Route Alternative was identified to minimize the need for additional permanent right-of-way. This alternative would remove the existing Algonquin C-5, 8-inch-diameter pipeline between the North Haven Meter Station at MP 0.0 and MP 6.1 and replace it with a new 24-inch-diameter pipeline instead of constructing the first 6.1 miles of the Islander East Pipeline. Because the Replacement Route Alternative would require taking the existing Algonquin C-5 pipeline out of service for an extended period of time and would interrupt Algonquin's firm service commitments to Southern Connecticut Gas Company, this alternative was eliminated from further consideration.

4.3.2 Sachem Head Route Alternative (MP 7.6 to 17.9)

The Sachem Head Route Alternative was identified at the request of the Connecticut Department of Agriculture, Division of Aquaculture, to attempt to avoid the shellfish beds crossed by the proposed route (see figure 4.3.2-1). The Sachem Head Route Alternative deviates from the proposed route at MP 7.6 and proceeds generally southeast running adjacent to existing powerline rights-of-way. Just west of West River the alternative leaves the powerline right-of-way and proceeds south, cross-country, for approximately 2.3 miles to the Sound shoreline. Once offshore, the Sachem Head Route Alternative proceeds southeast and then southwest for approximately 7.8 miles until it rejoins the proposed route at MP 17.9.

The Sachem Head Route Alternative would be adjacent to existing rights-of-way for 2.4 miles more than the proposed route, would not cross any shellfish bed leases, and would avoid crossing the Sound in the vicinity of the Thimble Islands.

However, the Sachem Head Route Alternative would be longer (4.3 miles), cross two more perennial streams and 1,700 feet more NWI-mapped wetlands, including more forested wetlands than the proposed route (see table 4.3.2-1). This route alternative would also require more forest clearing, and may cross about 850 feet of Cockaponset State Forest land, require relocation of several mobile homes, and pass within 50 feet of 9 more residences than the proposed route.

TABLE 4.3.1-1
Summary of Route Alternatives Evaluated

Location	Route Alternative Name	MP <u>a/</u>	Length (mi)	Purpose for Alternative
Connecticut				
	Replacement Route Alternative	0.0-6.1	6.1	Eliminates the need to expand the existing right-of-way.
	Sachem Head Route Alternative	7.6-17.9	14.6	Avoids shellfish beds crossed by the proposed route.
	Short Beach Route Alternative	2.9-16.2	14.2	Minimizes shellfish bed lease crossings and wetland and stream crossings.
	New Haven /Amtrak Route Alternative	N/A	N/A	Minimize impacts to the Branford Land Trust and reduce shellfish bed crossing.
	Option 2 Route Alternative	10.9-16.2	5.1	Reduces crossings of shellfish beds on the Connecticut side of the Sound.
	Option 3 Route Alternative	10.9-16.2	5.2	Minimizes crossings of shellfish beds on the Connecticut side of the Sound.
New York				
	LIPA Route Alternative	33.0-42.5	13.2	Maximize use of existing right-of-way, avoid developed areas.
	Calverton Lateral Route Alternative	CA 0.5-CA 3.3	2.2	Maximizes percentage of route adjacent to existing rights-of-way and avoids crossing of Central Pine Barrens CPA.
	Calverton State Route 25 Route Alternative	37.8-CA 5.6 <u>b/</u>	5.1	Reduces length of pipeline, avoids residences.

a/ MPs are proposed route MPs and correspond to where the route alternative deviates from and then rejoins the proposed route.

The difference between beginning and ending MPs does not reflect the actual length of the route alternative.

b/ The MPs on the Calverton Lateral are preceded by "CA" to distinguish them from the MPs on the Islander East Pipeline.

N/A=Not Applicable

TABLE 4.3.2-1
Comparison of the Sachem Head Route Alternative to the
Corresponding Segment of the Proposed Route
MP 7.6 to 17.9

Environmental Factor	Unit	Sachem Head Alternative	Islander East Proposed Route	Source
Length	(mi)	14.6	10.3	USGS Topographic Maps
Length On-shore	(mi)	6.8	2.6	USGS Topographic Maps
Length Adjacent to Existing Right-of-Way	(mi)	4.2	1.8	USGS Topographic Maps
Perennial Freshwater/Saltwater Waterbodies Crossed	(no.)	5	3	USGS Topographic Maps
NWI-mapped Wetlands Crossed	(ft)	4,475	2,775	NWI Maps
NWI-mapped Forested Wetlands	(ft)	2,700	2,307	NWI Maps
Forest Land Crossed	(mi)	5.0	1.4	Aerial Photographs
Agricultural Land Crossed	(mi)	0.0	0.0	Aerial Photographs
Existing Residences within 50 feet of Construction Right-of-Way	(no.)	17	8	Aerial Photographs
State/Town Shellfish Leases Crossed	(ft)	0.0	8,163	Ocean Surveys, Inc. Data

Although the proposed route would cross about 8,163 feet of shellfish bed leases, the directional drill would avoid direct impact to about 3,081 feet (see section 3.4.1.2). As previously mentioned, our review shows that two of the three state shellfish leases crossed by the proposed route are inactive and not commercially leased. The third lease site is used primarily for temporary placement of clams. Islander East's proposed mitigation measures for shellfish bed impacts are described in table 3.8.3-1. Potential impacts to the shellfish beds and our recommendations are described in section 3.4.1.2. Because of the increased terrestrial impacts, we do not recommend the Sachem Head Route Alternative.

4.3.3 Short Beach Route Alternative (MP 2.9 to 16.2)

The Short Beach Route Alternative was identified to maximize collocation of the pipeline route along another right-of-way corridor to the Sound and minimize wetland and stream crossing. In addition, this route alternative was proposed to minimize shellfish bed lease crossings (see figure 4.3.3-1). The Short Beach Route Alternative would begin at MP 2.9 and generally proceed south and southwest from the proposed route for approximately 4.6 miles across forest land to an existing powerline corridor. Near the south end of Lake Saltonstall, the alternative leaves the powerline and continues cross-country south and southeast across Interstate 95, U.S. Route 1, and a densely populated residential area before entering the Sound near Short Beach. Once offshore, the alternative turns and proceeds southwest until it rejoins the proposed route at MP 16.2.

4.0 ALTERNATIVES

The Short Beach Route Alternative offshore portion of the project is 1.1 miles longer than the proposed route and would disturb more sea floor. This route alternative crosses about 3,837 feet more of shellfish bed leases (see table 4.3.3-1). Also, the HDD for the Short Beach Route Alternative would exit within a town of Branford leased, active shellfish bed while the Proposed Route's HDD would exist within an inactive state shellfish bed.

**TABLE 4.3.3-1
Comparison of the Short Beach Route Alternative to the Corresponding Segment of the Proposed Route MP 2.9 to 16.2**

Environmental Factor	Unit	Short Beach Alternative	Islander East Proposed Route	Source
Length	(mi)	14.2	13.3	USGS Topographic Maps
Length On-shore	(mi)	7.1	7.3	USGS Topographic Maps
Length Adjacent to Existing Right-of-Way	(mi)	4.6	6.3	USGS Topographic Maps
Perennial Freshwater Waterbodies Crossed	(no.)	4	7	USGS Topographic Maps
NWI-Mapped Wetlands Crossed	(ft)	1,300	4,999	NWI Maps
NWI-Mapped Forested Wetlands Crossed	(ft)	1,150	3,957	NWI Maps
Forest Land Crossed	(mi)	4.3	2.7	Aerial Photographs
Agricultural Land Crossed	(mi)	0.1	0.3	Aerial Photographs
Existing Residences Within 50 feet of the Construction Right-of-Way	(no.)	50	37	Aerial Photographs
Water Supply Watershed Crossed	(mi)	4.5	2.3	Aquifer Protection Area Data
State/Town Shellfish Leases Crossed	(ft)	12,000	8,163	Ocean Surveys, Inc. Data

The onshore lengths of the Short Beach Route Alternative and the proposed route are similar, but the proposed route follows more existing rights-of-way and would result in less tree clearing than the Short Beach Route Alternative. The Short Beach Route Alternative reduces the number of perennial stream crossings and amount of NWI-mapped wetlands and forested wetlands crossed. However, the route alternative would cross more public water supply watersheds (i.e., Four River Diversion Watershed and Lake Saltonstall Watershed), public interest areas (the Lake Saltonstall Recreation Area and the Connecticut Sports Complex) and would be in close proximity to more residences than the proposed route. The route alternative would cross more areas of steep slope, particularly south of Farm River which would require the clearing of more temporary workspace. In addition, the Short Beach Route Alternative would parallel Lake Saltonstall for about 1.8 miles requiring the clearing of trees up slope of the lake. Based on our review, we do not believe that the environmental advantages of the Short Beach Route Alternative outweighs the disadvantages, and therefore, do not recommend the use of the Short Beach Route Alternative.

4.3.4 New Haven (Amtrak) Route Alternative

At the request of the Branford Land Trust, a route alternative that maximized the use of right-of-way associated with Amtrak and/or Interstate 91 (I-91) was studied to minimize potential impacts on Branford Land Trust land and residences in Branford. The route alternative would start near Exit 12 on I-91, where Algonquin's existing pipeline crosses the interstate, and continues south toward New Haven, Connecticut, using the interstate and/or Amtrak rights-of-way.

It has been suggested the pipeline be placed in the median of the interstate. We do not believe this is reasonable. Construction in the limited space available in the median would place motorists and construction workers at risk during construction and maintenance activities. Moving equipment and workers on and off the median would affect traffic. In order to store equipment, spoil, and pipe in this limited area lane closures may be required. All activities would need to be coordinated with state and local authorities in order to stop traffic to allow equipment to cross the interstate. While we agree that these impacts are temporary there are also long term impacts involved with placing a large diameter pipeline in the median of a major thoroughfare. Emergency maintenance of the pipeline would be delayed because of the limited access to the pipeline. Placing an aboveground facility, such as a valve, in the median would create a potential hazard for motorists for the life of the project. However, there may be some areas north of the I-91 crossing of the Quinnipiac River where the pipeline could be placed adjacent to the interstate right-of-way. We did not do an in depth analysis of these areas because we could find no reasonable route south of the Quinnipiac River crossing.

Following the Amtrak corridor does not appear to be a reasonable alternative either. From near Exit 10 of I-91 (where Amtrak closely parallels I-91), Amtrak parallels the Quinnipiac River. Amtrak's right-of-way, including a large marshalling yard, are in the tidal wetlands associated with the river. Construction of the pipeline would affect these wetlands and would require a crossing of the Quinnipiac River. Once again, although it may be possible to construct adjacent to the Amtrak right-of-way we did not conduct an in depth analysis because we could find no reasonable route south of the Quinnipiac River crossing.

Once south of the Quinnipiac River both Amtrak and I-91 enter the congestion of New Haven. The area adjacent to Amtrak and I-91 is highly congested with numerous existing commercial/industrial buildings and residences. In downtown New Haven, there is simply no space for a pipeline either adjacent to Amtrak or Interstate 91 because of buildings, powerlines, and bridges. In some areas Amtrak is below grade in a "concrete canyon" while I-91 is elevated on piers.

Based on our review of the Amtrak and I-91 corridors we believe that a route variation following I-91, Amtrak, or a combination of both that runs from Algonquin's existing system to New Haven is not reasonable or practicable.

4.3.5 Option 2 and Option 3 Route Alternatives (MP 10.9 to 16.2)

We examined two offshore route alternatives for the Connecticut side of the Sound between MP 10.9 and 16.2 to minimize the crossing of shellfish bed leases. The Option 2 Route Alternative deviates from the proposed route at MP 11.7 and continues south generally between 500 and 2,000 feet east of the proposed route. The Option 3 Route Alternative begins at MP 10.9 and proceeds south, southeast, and then south again generally between 2,000 and 5,800 feet east of the proposed route. Both route alternatives end when they rejoin the proposed route at MP 16.2 (see figure 4.3.5-1).

The Option 2 Route and Option 3 Route Alternatives would be slightly shorter than the proposed route (0.2 and 0.1 mile, respectively) (see table 4.3.5-1). The Option 3 Route Alternative crosses one shellfish bed lease, Option 2 Route Alternative crosses two shellfish bed leases, and the proposed route crosses three shellfish bed leases. However, two of the three state shellfish bed leases crossed by the proposed route and one of the shellfish bed leases crossed by the Option 2 Route Alternative are inactive and not commercially leased.

TABLE 4.3.5-1
Comparison of the Option 2 and Option 3 Route Alternatives to the Corresponding Segment of the Proposed Route MP 10.9 to 16.2

Environmental Factor	Unit	Option 2 Alternative	Option 3 Alternative	Islander East Proposed Route	Source
Length	mi	5.1	5.2	5.3	USGS Topographic Maps
State Shellfish Bed Leases Crossed	ft	4,449	1,348	6,141	Ocean Survey Inc. Data

Although the Option 3 Route Alternative has the least shellfish bed lease impacts, the sea floor topography and geologic conditions present engineering concerns with placement of the pipeline along this route (i.e., bedrock near the surface and/or bedrock outcrop onto the sea floor and steep abrupt drop offs). The Option 2 Route Alternative has terrain that is also steeper than the proposed route.

While the Option 3 Route Alternative and Option 2 Route Alternative would potentially affect less shellfish bed leases, we believe, from an engineering perspective, that these two option route alternatives are more difficult to construct and may require additional blasting. Although it is possible to mitigate for blasting impacts, there would be some permanent changes to the sea floor as the result of blasting. Based on our review, we believe that avoiding blasting is preferable to the Option 2 Route Alternative or the Option 3 Route Alternative crossing inactive shellfish lease beds. Therefore, we do not recommend the use of either the Option 2 Route Alternative or the Option 3 Route Alternative.

4.3.6 LIPA Route Alternative (MP 33.0 to MP 42.5)

The U.S. Department of Energy (DOE) has suggested that we look at using an existing powerline corridor as an alternative to the Islander East mainline on Long Island. The LIPA Route Alternative would leave the proposed route near MP33.0 and head east until it intersects with the the LIPA 138 kilovolt power line corridor, just south of the Shoreham power plant. The route alternative would then head south paralleling the power line until it intersects with the Long Island Expressway. The LIPA Route Alternative would then head west paralleling the Long Island Expressway until it rejoins the proposed route near MP 42.5 (see figure 4.3.6-1).

The LIPA Route Alternative is about 13.2 miles long. Although the alternative is about 1.2 miles longer than the proposed mainline, it would replace about 1.2 miles of the Calverton Lateral. Therefore, the proposed Islander East Project (mainline and Calverton Lateral) would be about the same length as the LIPA Alternative and the truncated Calverton Lateral.

The main benefit of this route alternative is that it avoids developed areas. The drawbacks of this route alternative are that in comparison to the proposed Islander East route it would cross about 3.8 miles more of Central Pine Barrens CPA and one additional waterbody, a pond. Both routes would cross the Peconic and Carmans Rivers. The LIPA Route Alternative would also cross about 1.8 miles of the Upton Ecological Reserve, which contains about 27 state-listed endangered, threatened, or species of concern. The proposed route does not cross this reserve.

We do not believe that the LIPA Route Alternative is environmentally better than the proposed route because of: the increased impacts on the Central Pine Barrens CPA; the additional waterbody crossing; and the crossing of the Upton Ecological Reserve.

4.3.7 Calverton Lateral Route Alternative (MP CA 0.5 to CA 3.3)

The Calverton Lateral Route Alternative was identified to maximize the use of existing rights-of-way, avoid crossing the Central Pine Barrens CPA, and avoid crossing a new subdivision (Meadowcrest) and a planned subdivision (Spring Meadow). The Calverton Lateral Route Alternative would begin at MP CA 0.5 and continue east adjacent to an existing powerline corridor just north of State Route 25A for approximately 1.7 miles until it reaches North Country Road. The route alternative then turns and proceeds southeast along the powerline and road for approximately 0.5 mile before turning south again, crosses State Route 25A, and rejoins the proposed route at MP CA 3.3 (see figure 4.3.7-1).

The Calverton Lateral Route Alternative would be about 0.6 mile shorter than the proposed route and follow adjacent to existing rights-of-way for 1.1 mile further. This route alternative would also cross less forest land (0.2 mile) and agricultural land (0.5 mile) than the proposed route (see table 4.3.7-1). The primary advantage of the Calverton Lateral Route Alternative is that it does not cross Central Pine Barrens CPA, and avoids potential habitat for a state-listed species.

However, both the Calverton Lateral Route Alternative and the proposed route cross residential areas. The alternative passes within 50 feet of 12 residences in an established subdivision, while the proposed route crosses within 50 feet of 11 residences (either existing or under construction) and would cross another planned subdivision. The established subdivision along this alternative could lose much of the mature tree screening between the residences and the overhead powerlines running through the front of their property. While this alternative avoids crossing the CPA, we do not believe that it is significantly better, since it moves construction impacts and easement restrictions from one subdivision to another. We believe that there are other alternatives that are environmentally better than the Calverton Lateral Route Alternative. See section 4.3.8 for a discussion of the Calverton State Route 25 Route Alternative.

TABLE 4.3.7-1
Comparison of the Calverton Lateral Route Alternative to the Corresponding Segment of the Proposed Route MP CA 0.5 to CA 3.3^{a/}

Environmental Factor	Unit	Calverton Lateral Alternative	Calverton Lateral Proposed Route	Source
Length	(mi)	2.2	2.8	USGS Topographic Maps
Length Adjacent to Existing Right-of-Way	(mi)	2.2	1.1	USGS Topographic Maps
Perennial Waterbodies Crossed	(no.)	0	0	USGS Topographic Maps
NWI-Mapped Wetlands Crossed	(ft)	0.0	0.0	NWI Maps
NWI-Mapped Forested Wetlands Crossed	(ft)	0.0	0.0	NWI Maps
Forest Land Crossed	(mi)	1.1	1.3	Aerial Photographs
Agricultural Land Crossed	(mi)	0.4	0.9	Aerial Photographs
Tree Nursery Crossed	(ft)	0.0	1,380	Aerial Photographs
Existing or Proposed Residences Within 50 feet of the Construction Right-of-Way	(no.)	12	11	Aerial Photographs, Meadowcrest plat
Central Pine Barrens CPA Crossed	(mi)	0.0	0.9	Data from the Central Pine Barrens Commission

^{a/} The MPs on the Calverton Lateral are preceded by "CA" to distinguish them from the MPs on the Islander East Mainline.

4.3.8 Calverton State Route 25 Route Alternative (MP 37.8 to MP CA 5.6)

The Calverton State Route 25 Route Alternative was originally identified to minimize the length of the Calverton Lateral and to maximize the use of existing rights-of-way. We have also studied this alternative to avoid crossing new subdivisions (Meadowcrest and Spring Meadow) on the proposed route. The Calverton State Route 25 Route Alternative begins at MP 37.8, adjacent to the William Floyd Parkway and State Route 25 (Middle Country Road) interchange. The route alternative proceeds northeast for 1.7 miles on the north side of State Route 25, crosses over to the south side and continues for another 3.3 miles until it rejoins the proposed route at MP CA 5.6 (see figure 4.3.8-1).

The Calverton State Route 25 Route Alternative would be about 0.7 mile shorter and located adjacent to existing rights-of-way for 1.4 mile longer than the proposed route. The Calverton State Route 25 Route Alternative would cross 1.6 mile more forest land and 2.4 miles more Central Pine Barrens CPA than the proposed route (see table 4.3.8-1).

TABLE 4.3.8-1
Comparison of the Calverton State Route 25 Route Alternative to the Corresponding Segment of the Proposed Route MP 37.8 to CA 5.6^{a/}

Environmental Factor	Unit	Calverton State Route 25 Alternative	Calverton Lateral Proposed Route	Source
Length	(mi)	5.1	5.6	USGS Topographic Maps
Length Adjacent to Existing Right-of-Way	(mi)	5.1	3.5	USGS Topographic Maps
Perennial Waterbodies Crossed	(no)	1	0	USGS Topographic Maps
NWI-Mapped Wetlands Crossed	(ft)	0.0	0.0	NWI Maps
NWI-Mapped Forested Wetlands Crossed	(ft)	0.0	0.0	NWI Maps
Forest Land Cleared	(acres)	26.9	21.0	Aerial Photographs
Agricultural Land Crossed	(mi)	0.2	5.5	Aerial Photographs
Residences Within 50 feet of the Construction Right-of-Way	(no)	2	11 ^{b/}	Aerial Photographs Meadowcrest plat
Central Pine Barrens CPA Affected	(acres)	23.3 ^{c/}	7.3 ^{d/}	Data from the Central Pine Barrens Commission

^{a/} The MPs on the Calverton Lateral are preceded by "CA" to distinguish them from the MPs on the Islander East Mainline.

^{b/} Does not include the 8 planned residences in the Spring Meadow subdivision.

^{c/} Based on a 60-foot-wide construction right-of-way in the CPA.

^{d/} With use of mitigation proposed by Islander East.

In addition, the route alternative would cross Horn Pond and require a tap valve between the Islander East and Calverton Lateral pipeline. The tap valve would require construction of aboveground facilities and an access road within the Central Pine Barrens CPA.

The NYSDEC has stated that the Calverton State Route 25 Route Alternative crosses an area that contains a coastal plain pond and habitat for the Spotted Turtle, a State Special Concern species, and the state endangered Tiger Salamander.

While the Calverton State Route 25 Route Alternative would be shorter (about 0.4 mile), disturb less land, and be within 50 feet of fewer residences than the proposed route, it would disturb more of the CPA of the Central Pine Barrens, cross Horn Pond, and disturb habitat for state listed species.

Because of our concern about creating a new right-of-way in an area that has no existing utility or road rights-of-way that could be paralleled (a greenfield pipeline right-of-way) through two subdivisions, one under construction and one in the planning stages which have no existing utility or road corridor, we looked at various ways to reduce the impacts associated with the Calverton State Route 25 Route Alternative.

Firebreak Variation

We looked at a variation to the beginning of the Calverton State Route 25 Route Alternative using an existing firebreak across the Brookhaven National Laboratory (BNL). The route variation would begin at MP 38.4, approximately 0.6 mile south of the start of the Calverton State Route 25 Route Alternative. From MP 38.4, it would proceed east for approximately 1.6 miles across primarily open land associated with an existing cleared firebreak on BNL property. It would then turn and proceed north adjacent to the east side of an existing electric transmission line for approximately 1.1 miles across primarily forest land until it reaches State Route 25 and joins the Calverton State Route 25 Route Alternative (see figure 4.3.8-1).

The Firebreak Variation would add about 1.1 miles to the Calverton State Route 25 Route Alternative, increasing ground disturbance by about 10 acres. The variation would avoid the crossing of Horn Pond. This variation would also increase the crossing of the Central Pine Barrens CPA by about 1.1 miles. Therefore, we have dropped consideration of this variation.

Construction Techniques

We have examined several construction techniques to reduce the impact of the route alternative on the CPA and Horn Pond and the surrounding habitat. The right-of-way in the CPA could be reduced from 75 to 60 feet wide. We believe that Horn Pond could be crossed using an HDD to avoid disturbance of the pond and to the surrounding habitat. The HDD would start in a partially cleared field about 1,000 feet west of Horn Pond and end in an area of less dense trees about 1,000 feet east of Horn Pond. Although some extra workspace would be required for the drill, an area 100 feet by 150 feet on either side, use of the drill would reduce the amount of clearing in the CPA by 2.9 acres.

We believe that the Calverton Lateral's permanent right-of-way could abut the road right-of-way. By closely paralleling State Route 25, the pipeline would avoid further fragmentation of the CPA.

We recognize that the CPA of the Central Pine Barrens is a sensitive area. Use of the proposed route would reduce impacts to the CPA by about 16 acres, but would cross a subdivision currently under construction and another planned subdivision. However, this alternative would affect, if Horn Pond is drilled, only 20.4 acres out of the 55,000 acres which have been designated CPA. This alternative would affect less than 0.04 percent of the CPA, all of which is along a state highway and has been affected by the construction and/or operation of that highway. Therefore, we recommend that:

- **Islander East incorporate the State Route 25 Route Alternative into the proposed route. Islander East should file a site specific plan for this route alternative with the Secretary for review and written approval by the Director OEP, prior to construction. This plan should include at a minimum the specifications for a directional drill of Horn Pond; location and size of extra workspace; areas where the construction right-of-way can be reduced to no more than 60 feet; erosion control; and restoration.**

4.4 ROUTE VARIATIONS

Route variations differ from system or route alternatives in that they are identified to reduce impacts on specific, localized resource issues (including isolated wetlands and residences), resolve landowner requests, and avoid construction constraints because of terrain condition. Although some variations can be several miles long, most are short and relatively close to the proposed route. We analyzed locations where site-specific issues warranted analysis of route variation. Each of these route variations is analyzed in comparison with the corresponding segment of proposed route. In addition to the route variation identified, it is expected that minor shifts in alignment may continue to be required prior to and during construction to accommodate site-specific routing constraints related to engineering, landowner, and environmental concerns.

4.4.1 Route 80 Variation (MP 4.7 to 6.1)

Several commentors have suggested that we examine a variation that follows the north side of State Route 80, in the vicinity of Cedar Lake to avoid crossing a subdivision and an area of potential groundwater contamination. The Route 80 Variation would start near MP 4.7. The variation would head east paralleling a powerline right-of-way for about 1,200 feet. The variation would then turn north following Twin Lakes Road, crossing to the north side of State Route 80 where it would turn east. The variation would follow State Route 80 and then parallel the Branford Steam Railroad for about 0.8 mile. At this point the variation would turn south on Commerce Street, until it rejoined the proposed route near MP 6.1 (see figure 4.4.1-1).

The Route 80 Variation would be about the same length as the proposed route, disturb less wetland (about 6.3 acres less), and avoid residences. Based on environmental factors it would appear that this variation may be better.

However, there are engineering concerns with the construction of this variation. Construction to widen State Route 80 is proposed to start in the fall of 2003. When the road is widened there would be about 140 feet between the railroad and the highway. If the ground were level, the pipeline could be placed there. However, because of the severe sideslope a wider construction right-of-way, 150 feet wide or more, would be required to safely install the pipeline. Placing the variation upslope of the railroad may be possible, but would require the blasting of a wide bench along the hillside for about 0.5 mile. If this could be safely accomplished and the pipeline laid, there still remains the problem of stabilizing the right-of-way. The right-of-way would not be restored to its previous condition because blast rock does not hold the same slope that consolidated rock does. Revegetation would be problematic. Since this area is presently forested a noticeable scar would be left across the hillside.

It should be noted that the proposed route follows an existing right-of-way (natural gas pipeline) through the residential area. A discussion of the impact of pipeline construction on the contaminated groundwater can be found in section 3.3.

Because of the engineering concerns we do not believe that this is a reasonable variation and do not recommend the Route 80 Variation.

TABLE 4.4.1-1
Comparison of the Route 80 Variation to the Corresponding
Segment of the Proposed Route (MP 4.7 to 6.1)

Environmental Factors	Unit	Route 80 Variation	Proposed Route
Length	miles	1.4	1.4
Length adjacent to existing right-of-way	feet	1.4	1.4
Construction right-of-way width	feet	75-150+	70-80
Residences within 50 feet of the construction right-of-way	number	0	8
Length of forest crossed	feet	4,550	4,250
Waterbodies crossed	number	1	1
Length of Delineated wetlands crossed	feet	100	3,800
Wetland disturbed by construction right-of-way	acres	0.2	6.5

4.4.2 Town Line Variation (MP 6.95 to 7.31)

The Town Line Variation was examined in response to comments that the pipeline would adversely impact an existing landscaping business (about MP 6.99 to 7.26). The property in question is bounded on the east by the grade for the Branford Steam Railroad and on the west by a stream and a forested wetland leaving a long, narrow (in some areas only about 100 feet wide) piece of commercially usable land. As proposed the pipeline would cross the property north to south adjacent to the railroad. Placing the pipeline right-of-way in this location would place serious restrictions on the landowner's use of the property, such as limiting the owner's ability to construct buildings and store rock and gravel. We looked at placing the pipeline on the other side (east) of the railroad tracks, however this property has several industrial buildings that back up to the toe of the slope for the railroad grade. Therefore, we examined the Town Line Variation which moves the pipeline further west toward and in some cases into the wetland.

From MP 6.95 to MP 7.02 the pipeline would be placed near the edge of the wetland. Islander East has agreed to install the pipeline with a minimum of 5 feet of cover in this area to safely allow operation of heavy equipment over the pipeline and to install additional protective devices to prevent excavation over the pipeline. From MP 7.02 to MP 7.07, the pipeline would be shifted further into property owned by adjacent landowners and closer to the wetlands adjoining the small stream in order to avoid the landowner's access between the north and south portions of his property. In the southern section (MP 7.07 to MP 7.28), the pipeline would be primarily located 25 feet west of an erosion control berm located at the west edge of the useable portion of the property. This would place the pipeline at the approximate edge of the wetland for the majority of this section of the pipeline. The permanent right-of-way would extend approximately 25 feet into the wetland. The pipeline would cross further into the wetlands near MP 7.24 to avoid a new soil storage structure that has been erected within 5 feet of the wetland boundary. At MP 7.28 to MP 7.31, the pipeline crossing of the Branford Steam Railroad would move about 120 feet north to avoid a proposed commercial development (see figure 4.4.2-1).

The Town Line Variation would be about 50 feet longer than the proposed route. It would also affect an additional 458 feet of wetland (see table 4.4.2-1). However, impacts to the wetlands would be limited to the edge of the wetland. The main portion of the forested wetland would not be disturbed and the stream in the wetland would not be affected. We believe that with proper erosion control, impacts to the wetland, except for some tree clearing, would be short term. Although this variation does not resolve all of the landowner's concerns it would significantly decrease the long term impacts on his use of the property. Therefore we recommend that:

- **Islander East incorporate the Town Line Variation into the proposed route. Islander East should file a site specific plan for this variation with the Secretary for review and written approval by the Director OEP, prior to construction. This plan should include at a minimum the specifications for landowner limitations, including building, storage, and equipment operation.**

TABLE 4.4.2-1
**Comparison of the Town Line Variation to the Corresponding
 Segment of the Proposed Route (MP 6.95 to 7.31)**

Environmental Factors	Unit	Town Line Variation	Proposed Route
Length	feet	1,940	1,890
Length adjacent to existing right-of-way	feet	211	1,890
Delineated wetlands crossed	feet	543	85
Wetlands disturbed by construction right-of-way	acres	0.93	0.10
Wetlands disturbed by temporary extra work space	acres	0.30	0.00
Wetlands in permanent right-of-way	acres	0.37	0.05
Construction right-of-way width	feet	75	100

4.4.3 Marshalling Yard Variation (MP 9.16 to 9.56)

The Marshalling Yard Variation was suggested by commentators to reduce impacts on wetlands. In the DEIS we rejected the variation because of landowner concerns, however, we now have more information and a slightly adjusted alignment that moves the pipeline further west, so we have re-examined this variation.

The Marshalling Yard Variation starts at MP 9.16 of the proposed route, it crosses to the west side of the Branford Steam Railroad (Tilcon) and remains there rejoining the proposed route at MP 9.56 (see figure 4.4.3-1). The variation is shorter and reduces the wetland crossing by 1,007 feet. The variation would require an extra workspace within a forested wetland in order to cross the railroad tracks. Even with this extra workspace the amount of wetland disturbance is reduced by 3.14 acres. The environmental comparison of the Marshalling Yard Variation and the proposed route is shown in table 4.4.3-1.

We believe that the reduction of wetland impacts makes this variation environmentally better than the proposed route. The CTDEP agrees with this conclusion. However, we acknowledge Tilcon's concerns that the placement of the pipeline west of the marshalling yard may limit potential future expansion. However, we believe that with the pipeline 100 feet from the nearest existing rail there is space for future expansion of the marshalling yard. Therefore, **we recommend that:**

- **Islander East should incorporate the Marshalling Yard Variation into the proposed route. Islander East should also continue to consult with Tilcon regarding its future plans for the marshalling yard.**

TABLE 4.4.3-1
Comparison of the Marshalling Yard Variation to the Corresponding
Segment of the Proposed Route (MP 9.16 to 9.56)

Environmental Factors	Unit	Marshalling Yard Variation	Proposed Route
Length	feet	1,960	2,120
Length adjacent to existing right-of-way	feet	950	2,120
Delineated wetlands crossed	feet	363	1,370
Wetland disturbed by construction right-of-way	acres	0.57	3.54
Wetland disturbed by temporary extra work space	acres	0.23	0.17
Wetland in permanent right-of-way	acres	0.24	0.47
Distance from closest track	feet	100	25

4.4.4 Pine Orchard Variation (MP 9.6 to 10.8)

The Pine Orchard Variation was identified during the site visit of the proposed route to minimize impacts on land owned and managed by the Branford Land Trust. The Pine Orchard Variation would deviate from the proposed route at MP 9.6 just south of the Amtrak Railroad. The variation would proceed southwest across 450 feet of forest land, and enter and cross approximately 3,000 feet of the Pine Orchard Yacht and Country Club (see figure 4.4.4-1). An HDD worksite would be set up at the south end of the driving range within a 150-foot by 200-foot extra workspace. The drill would be set up about 650 feet from the shoreline and would extend approximately 3,200 feet out into the Sound. The Pine Orchard Variation would end at the exit point at MP 10.8 in approximately the same location as the proposed drill exit point.

The Pine Orchard Variation would avoid the Branford Land Trust property and nature trail parallel to and crossed by the proposed pipeline route, and would reduce forest and wetland clearing impacts by approximately 2.8 acres. However, the variation would be 0.2 mile longer, cross more waterbodies, and require more permanent and construction rights-of-way than the proposed route (see table 4.4.4-1). None of the Pine Orchard Variation would be located adjacent to existing right-of-way, whereas the proposed route would be located adjacent to the Branford Steam Railroad right-of-way. In addition, there is a greater potential of encountering rock that would require blasting along the Pine Orchard Variation route. The variation would cross greens, fairways and the driving range resulting in impacts to golf course operation during construction and restoration.

Residents near the HDD site for the proposed route have raised concerns about noise from the drilling operation. We believe noise would be a greater concern with the Pine Orchard Variation because there are more residences closer to the HDD with less natural buffering (vegetation and topography). The HDD on the Pine Orchard Variation is also more problematic due to the engineering. Since we believe that the success of the HDD is critical to the protection of the shoreline and the nearshore habitat, we believe that the drill should occur in the location which has the greatest potential for success. Therefore, because of the increased length, increased potential of blasting, engineers' concerns for successfully completing the drill and increased noise issues, we do not recommend the Pine Orchard Variation.

The Branford Land Trust has suggested that the Pine Orchard Variation be realigned to follow the Amtrak right-of-way west from MP 9.5 until it intersects with Totoket Road. The variation would then follow Totoket Road south about 0.65 miles before heading west across the golf course to the drill site on the driving range. This alignment is about 1.7 miles long, crosses one waterbody, and would clear about 1.8 acres of forest, mainly adjacent to Amtrak. Since this route would cross the same ridge as the original alignment of the Pine Orchard Variation, it is reasonable to assume that blasting would be required. Although this alignment would avoid the Branford Land Trust and would reduce impacts to forest land we do not recommend it for the same reasons that we did not recommend the original alignment of the Pine Orchard Variation: it is longer, has greater potential for blasting, the directional drill of the shoreline would be more difficult, and noise would be a greater issue.

However, in order to address the Branford Land Trust concerns, we have looked at the Pond Variation, discussed below.

TABLE 4.4.4-1
Comparison of the Pine Orchard Variation to the Corresponding Segment of the
Proposed Route MP 9.6 to 10.8

Environmental Factor	Unit	Pine Orchard Variation	Proposed Route	Source
Length	(mi)	1.4	1.2	Aerial Photographs
Length adjacent to existing right-of-way	(mi)	0	1.0	Aerial Photographs
Permanent right-of-way <u>a/</u>	(acres)	3.7	3.1	Aerial Photographs
Construction right-of-way <u>a/</u>	(acres)	6.5 <u>b/</u>	4.6	Aerial Photographs
Residences within 50 feet of the edge of the construction right-of-way	(no.)	1	0	Aerial Photographs
Waterbodies crossed	(no.)	2	0	USGS Topographic Maps
NWI-mapped wetlands	(feet)	300	528	NWI maps and Aerial Photo Interpretation (for Variation) Field Delineation Data (for Proposed Route)
Agricultural land	(acres)	0	0	Aerial Photographs
Forest land	(acres)	1.3	4.1	Aerial Photographs
Branford Land Trust Crossing	(mi)	0	0.2	Aerial Photographs
Town Shellfish Bed Leases Crossed <u>d/</u>	(feet)	1,300	2,022	Ocean Surveys, Inc., Data

a/ Measurements represent the onshore portion of the route up to the HDD staging area.
b/ Based on a 90-foot-wide construction right-of-way within the limits of the golf course and a 75-foot-wide construction right-of-way elsewhere.
c/ Includes 0.2 acre for rock storage and 0.3 acre for staging road and waterbody crossings within the Pine Orchard Golf Course.
d/ Shellfish beds would be crossed using HDD methods.

4.4.5 Pond Variation (MP 9.7 to 9.85)

The Pond Variation was identified to reduce impacts on Branford Land Trust property. Based on our review of the alignment photos and site visit, the Pond Variation follows the western edge of the Tilcon tracks between MP 9.7 and MP 9.85. Construction would proceed through the eastern edge portion of the pond just west of the Tilcon track right-of-way. It is shorter than the proposed route and located adjacent to existing rights-of-way for an additional 0.1 mile. The Pond Variation would cross 0.1 mile of the Branford Land Trust property and eliminate the approximately 2.4 acres of tree clearing on Branford Land Trust property necessary under the proposed route alignment (see figure 4.4.5-1). However, the Pond Variation would cross one perennial waterbody (the pond) and the 50-foot-wide emergent wetland that encircles it (see table 4.4.5-1). The corresponding segment of the proposed route crosses no waterbodies or wetlands.

TABLE 4.4.5-1
**Comparison of the Pond Variation to the Corresponding Segment of the Proposed
Route (MP 9.7 - 9.85)**

Environmental Factor	Unit	Pond Variation	Proposed Route	Source
Length	(mi)	0.1	0.2	Alignment Sheets
Length Adjacent to Existing Right-of-way	(mi)	0.1	0	Alignment Sheets
Branford Land Trust Crossing Length	(mi)	0.1	0.2	Alignment Sheets
Perennial Waterbodies Crossed	(no.)	1 (pond)	0	USGS Topographic Maps
Wetlands Crossed	(ft)	380	0	Alignment Sheets & CT Wetland Delineation Reports
Forested Wetlands Crossed	(ft)	0	0	Alignment Sheets & CT Wetland Delineation Reports

The small shallow (2 to 3 feet deep) pond (approximately 200 feet long by 50 feet wide) sits at the base of a heavily wooded sloped area of the Branford Land Trust Goss property and the western edge of the Tilcon Railroad tracks. The pond and associated wetlands provide storage and purification of storm water runoff and habitat for ducks, birds and wetland edge animals. The dominant wetland vegetation surrounding the pond consists of a monotypic stand of common reed. Other wetland vegetation surrounding the pond includes swamp rose mallow, southern arrowwood, maleberry, chokecherry, and red maple. Water quality data and field observations of the pond indicate that there are high levels of total nitrogen (3.8 ppm) and suspended solids. The pond water has a grayish-blue color with poor water clarity. The pond does not meet the states' water quality standards of A or B. No federally or state-listed threatened and endangered species, or species of special concern, have been identified in the pond or associated wetlands. The pond and wetland appear to have been formed by the fill for the railroad which blocked drainage in the area.

The construction of the pipeline through the edge of the pond would directly impact aquatic wildlife and vegetation, and disturb pond soils and sediment structure. Islander East proposes to implement the measures outlined in its ESC Plan to minimize adverse effects to wetlands resulting from construction. In addition, Islander East stated that it would monitor wetlands annually for the first 3 to 5 years (or as required by permit) to determine the success of revegetation following construction. Directional drilling under the pond was determined not to be feasible because the length of the wetland and pond was too short for drilling. In addition, the extra workspace needed to conduct the drilling would require the clearing of additional Branford Land Trust property.

Placing the pipeline on the opposite side of the railroad would place it in a salt marsh. We do not believe crossing the salt marsh is an acceptable alternative.

The Pond Variation would more effectively use the existing railroad right-of-way and reduce tree clearing and recreation use impacts to Branford Land Trust property. Although direct impacts on wetlands associated with the pond and pond vegetation are higher, the proposed route around the

pond would also indirectly impact the pond by removing the trees directly west of the pond and allowing more sunlight to reach the pond and increase soil erosion impacts. In addition, our review indicates that the removal of trees on the Branford Land Trust property to accommodate the proposed route alignment around the pond would result in forest fragmentation and have long-term impacts on Branford Land Trust forest land whereas the Pond Variation wetland impacts would be short-term. Due to the increase in the collocation with an existing corridor, a decrease in the length of the pipeline, and the less long-term impact on Branford Land Trust property and forest land, we believe this route variation is environmentally better than the proposed route. The CTDEP concurs that the Pond Variation is preferable to the proposed route and that permanent impacts to the pond should not be great. The CTDEP also points out that construction through the pond would remove unwanted invasive vegetation. We note that Islander East has agreed to the Pond Variation, however, has not provided site-specific construction, restoration and monitoring information. Therefore, we recommend that:

- **Islander East should incorporate the Pond Variation into the proposed route. Islander East should also file with Secretary for review and written approval by the Director of OEP, prior to the start of construction, a site-specific plan for the crossing of the pond. This plan should include, at a minimum: construction methods; extra workspace location, size, and purpose; erosion control methods and placement; restoration and revegetation specifics; and a monitoring plan.**

4.4.6 William Floyd Parkway Variation (MP 41.1 to 42.4)

Several members of the New York Assembly, the Wading River Civic Association, and the Long Island Pine Barrens Society have requested that we examine alternatives to the proposed route where it parallels the east side of the William Floyd Parkway (Parkway) in order to avoid the CPA of the Central Pine Barrens. We have evaluated the proposed route from about MP 34.4 to about MP 42.4. Based on the information available to us, the following are our findings.

We examined placing the pipeline in the median of the Parkway. Based on our field, photo alignment, and topographic map examination of the median we have determined that this is not a feasible alternative. The median fluctuates in width and topography. In most areas it is not physically possible to place the pipeline in the median due to the width of the median, overpasses, and/or the topography (rock outcrops and steep narrow depressions). In all areas our major concern is for the safety of the construction workers and motorists during construction and maintenance activities. Working in the median would disrupt traffic in both directions. The Suffolk County Department of Public Works has indicated that the median is used for highway drainage.

We also examined placing the pipeline on the west side of the Parkway. From about MP 34.4 to about MP 38.2, the west side of the Parkway is not in the CPA, while the east side is. However, there are about 65 residences that backup against the Parkway on the west side, while the east side has only about 15 residences. If the pipeline were placed on the west side of the Parkway some of the 65 residences would lose at least part of their tree screen, some could lose all, and some could also lose swimming pools and sheds. Because of the impacts to the residences we do not recommend moving the pipeline to the west side of the Parkway for this segment.

From about MP 38.2 to about MP 39.5, both sides of the Parkway are in the CPA. However, it should be noted that once again there are more residences on the west side of the Parkway. From about MP 39.5 to about MP 41.5, the east side of the Parkway is not in the CPA while portions of the west side are. In this segment there is only one residence and it is on the east side. For these two segments we do not recommend moving the pipeline to the west side of the Parkway since it would increase the amount of CPA being crossed and not significantly diminish the number of affected residences.

However, from about MP 41.0 to about MP 41.7 the CPA is only on the east side of the Parkway. From MP 41.0 to MP 41.1 there are several residences on the west side of the Parkway, but from MP 41.1 to the end of the Parkway there are no residences and fewer trees on the west side. In this area we examined the William Floyd Parkway Variation which would cross the Parkway at about MP 41.0, using an HDD. The exit point for the drill would be in an open field at about MP 41.4, avoiding the residences on the west side of the Parkway. The route would then continue south along the edge of the field until it reaches the ramp of the Long Island Expressway, avoiding an area of planned development. At that point the variation would turn west until it joins the proposed route near MP 42.4 (see figure 4.4.6-1). This variation would reduce forest clearing in the Central Pine Barrens CPA by 2.7 acres and would not impact residences. Therefore, **we recommend that:**

- **Islander East incorporate the William Floyd Parkway Variation into the proposed route between MPs 41.0 and 42.4.**

We note for the areas along the Parkway that would not be affected by this variation, Islander East filed, on June 7, 2002, a modification to its construction techniques. These modifications, involving reducing right-of-way, using HDDs, and using more of the Parkway right-of-way, are discussed more fully in Section 3.8.3 of this document. The result is that clearing of trees in the CPA would be significantly reduced.

4.4.7 County Park Variation (MP CA 1.1 to CA 1.8)

The County Park Variation was originally identified to reduced the amount of tree clearing in the CPA of the Central Pine Barrens on Long Island. We have extended this alternative to avoid a planned subdivision (Spring Meadow) near MP CA 1.5. The County Park Variation deviates from the proposed route at MP CA 1.1 and continues south adjacent to the west side of an electric transmission line right-of-way for about 900 feet. At this point, the variation turns east and proceeds about 2,200 feet. The variation then turns northeast rejoining the proposed route near MP CA 1.8 (see figure 4.4.7-1).

The County Park Variation would increase the length of pipeline adjacent to existing rights-of-way by 0.2 mile but it would also be longer and disturb more land during construction and require more land for operation (1.8 acres and 1.3 acres, respectively) than the corresponding segment of the proposed route (see table 4.4.7-1). Both routes would require clearing approximately 3.3 acres of forest land during construction. However, approximately 0.7 acre of the 3.3 acres along the County Park Variation would occur within the Central Pine Barrens CPA.

Although this variation actually increases impacts to the CPA, it does avoid the planned subdivision. The proposed route would place the pipeline right-of-way within 50 feet of up to 8 residences in the planned subdivision (Spring Meadow). However, we do not recommend the County Park Variation because use of this variation would still leave the proposed route in a location that would cross the Meadowcrest subdivision (directly following this alternative at MP 2.0). There would be 11 residences within 50 feet of the construction right-of-way in Meadowcrest. We prefer not to create new greenfield pipeline right-of-way through a subdivision if a reasonable alternative is available. We believe that there is such an alternative, the Calverton State Route 25 Route Alternative which would avoid both subdivisions while making use of an existing right-of-way to limit impacts to the CPA.

TABLE 4.4.7-1
Comparison of the County Park Variation to the Corresponding Segment of the Proposed Route MP CA 1.1 to CA 1.8

Environmental Factor	Unit	County Park Variation	Proposed Route	Source
Length	(mi)	0.9	0.7	Aerial Photographs
Length adjacent to existing right-of-way	(mi)	0.2	0.0	Aerial Photographs
Permanent right-of-way	(acres)	5.5	4.2	Aerial Photographs
Construction right-of-way	(acres)	8.2	6.4	Aerial Photographs
Existing or Planned Residences within 50 feet of Construction Right-of-Way	(no.)	0	8	Aerial Photographs, Spring Meadow plat
Waterbodies crossed	(no.)	0	0	USGS Topographic Maps
NWI-mapped wetlands	(feet)	0	0	NWI Maps
Agricultural land	(acres)	0.0	0.0	Aerial Photographs
Forest land	(acres)	3.6	3.3	Aerial Photographs
County Parkland Crossed	(feet)	2,500	1,300	Aerial Photographs
Central Pine Barrens CPA	(acres)	1.5	0.0	Data from the Central Pine Barrens Commission

4.4.8 Other Site-Specific Variations

During the project site visits conducted on October 16 and 18, 2001, and February 20, 2002, the public identified a number of route variations to the proposed route to minimize environmental impacts and/or residential impacts. The following is a brief description of the variations proposed and the reasons why each variation is not recommended and was eliminated from further consideration.

It has been suggested that moving the route to the opposite side of the railroad track near MP 7.7 (Branford River) and MP 9.6 would avoid or reduce impacts on wetlands and waterbodies. In

both cases there are wetlands and waterbodies on both sides of the railroad track. In both cases crossing over the tracks would also place the route closer to residences. Near MP 7.7, utilities along the tracks and the crossing of U.S. Route 1 complicate the construction. It has been suggested that HDD crossing of U.S. Route 1 would solve some of these problems. We believe that this crossing is not a good candidate for an HDD because of its length. Near MP 9.6 the proposed route avoids large rock outcrops. These outcrops could be removed by blasting, but it would open a larger corridor through the forest. Therefore, we do not recommend a route variation for either of these locations.

Another suggestion was made to consider routing the pipeline at MP 4.5 east along the powerline, turn south along Twin Lake Road, and rejoin the proposed route near MP 5.0. We found that the narrow right-of-way already contains numerous utilities that would make placement of the pipeline within this area very difficult. Underground utilities include a natural gas distribution line, water distribution line, sanitary sewer line and storm sewer piping in addition to aboveground power and telephone lines. There would be insufficient room left to install a new 24-inch natural gas pipeline within the road as well. In addition, this alignment would increase the pipeline length by 750 feet, affect five additional residences, and disrupt traffic along the road for the 2 to 3 week estimated construction period for this section of the line. Therefore, we are not recommending this variation.

During the site visits, the public also questioned why the pipeline could not be routed between the two Tilcon tracks. We evaluated placing the pipeline in between the Tilcon tracks from MP 6.1 to about MP 10.1. In review of the railroad tracks layout within the right-of-way, we found that construction of the pipeline between the tracks would present an increased safety concern for workers. The area between the tracks is narrow and would require shutting down the rail line to excavate and lay the pipe. This would impact the operation of the Tilcon railroad between the quarry and barge loading site during construction of the pipeline along this segment. In addition, the track roadbed is fill and not a good construction base for installing the pipe. Further, excavating the roadbed could undermine the stability of the track base and increase safety concerns for operations of the active Tilcon railroad. We are not recommending the Tilcon track variation because of the possibility of undermining the stability of the rail roadbed and the close proximity of the two tracks which makes construction safety a major concern.

We have also examined the suggestion that the Calverton Lateral should use the State Route 25A easement from MP CA 0.7 to CA 2.72 in order to avoid the Meadowcrest subdivision. Between these two mileposts State Route 25A traverses a congested area that includes the main shopping area of Wading River, New York. Although construction impacts to the business and citizens of this area would be short term some may be significant. Construction would likely interfere with traffic flow and shopping. Noise and dust may be a concern. As pointed out by the commentor there are many utilities already in and around the road, making it difficult to place the pipeline in this area. Since we have identified and recommended another alternative which responds to the commentor's concern, without the impacts to Wading River, we did not recommend this alternative.

4.4.9 Variations Proposed by Islander East

On June 7 and 25, 2002, Islander East filed a Supplemental Data Filing detailing proposed changes to the pipeline route. Fourteen of these route variations are contained in Table 4.4.9-1. The

4.0 ALTERNATIVES

remaining thirteen route variations have been incorporated into the discussion of larger route alternatives/variations contained in this FEIS or are discussed in the Land Use section of this FEIS. Table 4.4.9-1 also includes a brief description of the route variation. Based on our review of maps, aerial photographs, information filed by the applicant and site visits we believe that there is no significant difference in the environmental impact of these fourteen route variations when compared to the proposed route. Therefore, we recommend that:

- To the extent that they are compatible with any Commission-required alternative routes, Islander East should incorporate the fourteen route variations contained in Table 4.4.9-1 of the FEIS into the proposed route.

TABLE 4.4.9-1
Route Variations Proposed by Islander East

Islander East's Reroute Number	Start MP	End MP	Length (feet)	Comment
1	0.00	0.06	313	Increase separation between existing AGT pipeline and the proposed Islander East Pipeline from 15 feet to 20 feet for the railroad crossing.
2	0.55	0.58	151	Relocate Islander East Pipeline crossover of AGT pipeline to avoid existing cemetery plots.
3	0.95	1.01	329	Decrease separation between existing AGT pipeline and proposed Islander East Pipeline from 15 feet to 10 feet to reduce residential impacts.
4	2.70	2.75	298	Move Islander East Pipeline crossover 200 feet to the east in an open field to avoid intermittent waterbody and reduce workspace in wetlands.
5	3.01	3.18	930	Increase separation between existing AGT pipeline and Islander East Pipeline. Reduces crossing length of wetland and eliminates two waterbody crossings.
6	4.18	4.36	940	Decrease separation between existing AGT pipeline and Islander East Pipeline from 20 feet to 15 feet in residential area.
7	5.68	5.76	440	Decrease separation between existing AGT pipeline and Islander East Pipeline from 20 feet to 10 feet to avoid clearing sugar maple and fruit trees.
8	6.18	6.25	362	Increase separation between Branford Steam Railroad and Islander East Pipeline to 90 feet to minimize clearing and grading on a side slope. Variation is in a commercial/industrial area.
9	6.71	6.94	1,200	Increase separation between Branford Steam Railroad and Islander East Pipeline by 15 feet to avoid a side slope and a sewer manhole. An additional 0.11 acre of wetland would be disturbed, but the variation would reduce the potential for mixing of wetland and upland spoil, including railroad ballast.
11	8.05	8.14	490	Relocate crossing of Interstate I-95 approximately 40 feet east to improve the position of the road bore and avoid sewerline.

TABLE 4.4.9-1 (continued)
Route Variations Proposed by Islander East

Islander East's Reroute Number	Start MP	End MP	Length (feet)	Comment
12	8.60	8.62	98	Relocate railroad crossing approximately 25 feet north to avoid Branford Land Trust property.
13	8.89	8.91	144	Relocate railroad crossing approximately 70 feet north to avoid Wightwood school property.
20	40.13	40.39	1,389	Relocate alignment up to 50 feet east of the proposed location to avoid a recharge basin at the entrance to Brookhaven National Laboratory. This variation would not cross the Central Pine Barrens CPA.
CA-4	CA5.13	CA5.56	3,290	Deviates from proposed route to avoid crossing an area to be used for the expansion of the Calverton National Cemetery. The variation is not in the CPA. It is about 1,240 feet longer than the proposed route, but, would not affect any new landowners.

4.5 ABOVEGROUND FACILITY ALTERNATIVES

Islander East and Algonquin propose to construct one compressor station, three meter stations, and five mainline valves. We did not identify any significant issues regarding the proposed locations of these facilities, so no alternative sites were studied in detail. CTDEP has requested that staff consider routing the access road to the Cheshire Compressor Station along the northern edge of the existing agricultural field to minimize impacts on the active cropland. We realize that there is a limited amount of cropland in the project area and that a permanent access road would reduce the amount of available cropland. However, there appears to be an existing farm road that already bisects part of the field that Algonquin's access road partially follows. We also recognize that Algonquin is purchasing this area for the construction and operation of a compressor station. Algonquin may or may not choose to allow the farming of this field after construction. Therefore, we are not recommending that Algonquin move the access road, but encourage Algonquin to preserve as much of the cropland as possible.