15.1 CONSTRUCTION PLAN

This Chapter assesses anticipated construction impacts associated with the project. The assessment includes: (1) construction employee estimates for major phases of construction, (2) a description of the anticipated phasing for construction and the construction period for all components of the Project, including the expected starting and ending dates, and a narrative description of each phase of construction and transportation routes, (3) a description of planned site security measures during construction, (4) a description of measures planned to deal with solid and sanitary waste generated by construction activities, (5) an assessment of potential traffic, air quality, noise, water quality, natural resources and hazardous material impacts that may be created by or encountered during project construction; and (6) a preliminary plan for the collection and treatment of stormwater runoff from the site during construction.

15.2 CONSTRUCTION EMPLOYEE REQUIREMENTS

It is expected that the project would generate approximately 375 peak construction jobs with the average workforce level to be approximately 250 construction employees. Construction is expected to be completed within a 26-month timeframe. During much of the 26-month period, construction workers employed at the project would be less than during the peak period. It is expected that the peak construction period would last approximately three months. The anticipated number of construction employees for each major phase is discussed below.

Construction would occur on a one ten-hour shift, five-day workweek from 6:30 AM to 4:30 PM, Monday through Friday. Work schedules have been planned to minimize shift-change traffic during peak traffic periods. Some evening activities could become necessary for certain construction tasks (e.g., concrete pours). These activities, however, would require a smaller number of workers than would occur during peak daytime hours. In the event that nighttime construction is required, approval of these activities would be sought from the Town of Brookhaven.

It is anticipated that the required construction labor force for the project would be readily met with the trades and union workforce in Nassau and Suffolk counties. As indicated by the Long Island Building and Construction Trades Council, the workforce requirements for the project would be met with available local labor without the need for in-migration of construction workers from outside Long Island or the New York metropolitan area. According to the trade council, approximately 60,000 construction trade works reside within Nassau and Suffolk Counties. Of this 60,000, 10,000 reside within the Town of Brookhaven.[1]

[1] Public statement by Jack Kennedy, President, Long Island Building and Construction Trades Council on January 5, 2005 at the public scoping meeting for this project.

15.2.1. SUMMARY OF PROPOSED CONSTRUCTION ACTIVITIES

The project's construction period is expected to be approximately 26 months. During the construction period numerous types of construction activity would occur at the Project site. It is currently anticipated that construction will commence in the fourth quarter of 2005 and finish in the summer of 2008.

During these 26 months construction would proceed as follows:

- installation of erosion and sedimentation control measures;
- installation of access drive and temporary utilities (electricity and phone);
- set-up and assembly of temporary office and warehouse;
- preparation of construction parking and equipment staging areas;
- site preparation;
- disposal of wastes during construction;
- excavation and construction of foundations;
- erection of permanent facility equipment and buildings;
- installation of project gas and electric interconnections;
- stabilization of disturbed areas following completion of final grading; and
- systems testing and commissioning.

Proposed construction phasing is described in more detail in the following sections.

A. PRECONSTRUCTION SITE PREPARATION

The construction sequence proceeds in a series of overlapping phases. It begins with site preparation. This would include clearing, grubbing, and initial grading of the 15-acre project site, 28-acre proposed construction laydown areas, and the site access road. Site preparation also includes excavation of the storm water detention and infiltration basins, and formation of drainage swales. These tasks would be conducted early in the construction schedule. The construction plans for these activities are illustrated on the construction phasing, soil erosion and sediment control plans, and grading and drainage plans included in Appendix C.

As site preparation progresses, the delivery and installation of temporary buildings to house offices and worker lockers would occur. An on-site area would be set aside for temporary laydown and storage of facility materials and equipment and construction parking. A gravel parking area would be constructed to serve workers and park construction vehicles when not in use. Temporary electric and phone utilities would be installed.

Site preparation would require heavy equipment for grading and excavation. This would include excavators, bulldozers, graders, front-end loaders, and dump trucks. During this

period, which should last about two months, there would be an estimated 35 workers at the site.

B. EXCAVATION AND FOUNDATION POURING

The next major step in the construction sequence would be excavation and compaction for foundations for the plant buildings, and excavation for and placement/backfilling of underground pipes and conduits. Excavated materials would be stored on-site and reused as fill and topsoil material in final grading to the extent possible.

Immediately following excavation, the building foundations would be formed, rebar and conduit would be installed, and concrete would be poured. At this juncture, approximately six months of the construction period would have elapsed. Dust from construction activities would be controlled by measures such as wetting of exposed soils on a regular basis and stabilizing storage piles by wetting and/or seeding. These measures would be implemented as standard practice for the construction effort. Truck trips would be heaviest during this period and would amount to a peak of 25 per day, primarily for concrete delivery.

Site preparation would require heavy equipment for pad and foundation construction. This would include excavators, bulldozers, graders, front-end loaders, dump trucks, and concrete trucks. During this period, which should last about three months, there would be an estimated 150 workers at the site.

C. ERECTION OF STRUCTURAL STEEL AND DELIVERY OF MAJOR EQUIPMENT

Following site preparation and installation of foundations, erection of structural steel would begin. Concurrently, major equipment—the gas turbine, steam turbine generators and Heat Recovery Steam Generator (HRSG)—would be delivered and set in place. On-site cranes are required to lift the components from the transport vehicles for placement on the individual equipment pads. Transport would be by truck. Field-erected tanks and vessels would be constructed.

During this period, which should last about six months, there would be an estimated 225 workers at the site. Equipment required during this construction phase includes cranes, compressors, welding machines, and hand held equipment.

D. UNIT ASSEMBLY AND SITE FINISH

Following the erection of structural steel and delivery of major equipment, the labor-intensive process of installing a complex array of interconnecting piping, electrical and instrument wiring and ductwork would begin. The peak labor force of 375 workers would be required in the phase.

As the erection of building walls, finish work and final connections of piping and wiring is nearing completion, the process of checking the electrical and control systems, starting up major equipment, cleaning pipelines, and testing all systems would begin.

Final site finishing activities would include construction of the paved perimeter drive providing access to equipment, installation of an 8-foot-high protective chain link fence and other security systems, site lighting, and implementation of the site landscaping plan

as illustrated on Sheet 8 of 15, *Final Landscape Plan*, of the site plan drawings included in Appendix C.

Equipment required during this construction phase includes cranes, compressors, welding machines, and hand held equipment. This construction phase is anticipated to last about 3 months and would require the peak construction workforce of 375 workers.

E. UTILITY CONNECTIONS

The proposed facility requires connections to natural gas, electrical substation and water. The project would interconnect to LIPA's 138-kilovolt (kV) transmission system within the 96-acre parcel via a newly constructed 138 kV switchyard. The new switchyard would be located adjacent to LIPA's Holbrook-to-Brookhaven transmission line right-of-way, approximately 1,500 feet from the project's step-up transformers. The 138 kV interconnection between the project's step-up transformers and the proposed switchyard would be accomplished via an overhead transmission line to be located entirely within the 96-acre parcel.

Natural gas would be provided to the proposed facility via a new 20-inch diameter natural gas transmission pipeline to be constructed on-site. The new on-site pipeline would be collocated within the proposed 138 kV on-site electric interconnection right-of-way. The on-site natural gas pipeline would interconnect with a new natural gas pipeline lateral that would be constructed to the site and it is contemplated that this pipeline would be developed by an entity other than LIPA or Caithness. This gas pipeline lateral would require either Public Service Commission (PSC) (Article VII of the Public Service Law) or the Federal Energy Regulatory Commission (FERC) approval, depending on which lateral option currently under consideration is pursued. Approval of the natural gas pipeline lateral is not part of this environmental review. It would go through its own separate environmental review and approval process.

The proposed water process and domestic water supply interconnections would be made to an existing 12-inch distribution main located along Zorn Boulevard. The interconnection would extend along Zorn Boulevard approximately 500 feet and would be equipped with a suitable backflow prevention device at the metering station. In addition, an automatic flow control valve would be installed to adhere to SCWA's nighttime peak flow limitation of 150 gpm between the hours of 12:00 midnight to 9:00 a.m.

The on-site utility connections would require the use of excavators, bulldozers, graders, front-end loaders, dump trucks and utility line trucks. This construction period would overlap with the unit assembly and site finishing activities described above and is considered by the project's peak construction workforce.

F. SYSTEMS TESTING AND COMMISSIONING

The culmination of project construction would be the firing and initial synchronization of the gas turbine and generators, followed by the production of steam, free blow of steam lines, and initial synchronization of the steam turbines. During this phase of the work, new equipment and systems would be prepared for operation, followed by initial

operation and performance testing. In preparing new equipment for operation, appropriate cleaning, testing, lubrication, and alignments would be performed. The initial operation involves operating individual pieces of equipment within the manufacturer's recommended limits and as an integrated system.

During the start-up phase, air or steam-blows of the HRSG, high-energy steam piping, and gas-blows of the on-site natural gas pipeline would be required to prepare new pipes for service. These scheduled blows generally occur over a one-week period and utilize silencers to reduce the noise generated. Hand cleaning to remove any construction debris is performed first. The HRSG steam-generating surfaces are then chemically cleaned, and the cleaning waste is disposed of at a licensed facility. Following chemical cleaning, the HRSG is operated to produce steam. The pressure is slowly increased in the HRSG and then rapidly discharged to the atmosphere through the high-energy steam piping (this is referred to as a "steam blow"). This steam-blowing process is repeated until the HRSG and high-energy steam piping are completely cleaned. Similarly, the natural gas pipelines and equipment are cleaned using compressed air or gas to remove any loose foreign material in the pipeline. Caithness would notify the Town of Brookhaven in advance of conducting the required steam blows and gas pipeline cleaning.

Finally, integrated combined-cycle operation would commence, and enter a rigorous test and shakedown period. The shakedown period is anticipated to last two to three months. The project would then enter commercial service.

The overall systems testing and commissioning phase of construction is anticipated to last about 4 months and would require a construction workforce of about 150 workers. Equipment required during this construction phase would include chemical cleaning equipment for auxiliary boiler, fractional tanks, miscellaneous piping and valves; high voltage test equipment; gas flow meters; and emissions testing trailer.

15.3 SECURITY

Prior to commencement of construction, a comprehensive security plan would be developed and implemented. The security plan will be provided to the Suffolk County Police Department and the Suffolk County Department of Fire, Rescue, and Emergency Services (FRES) for review.

The perimeter of the project site would be secured with a chain link fence, sliding gates and surveillance equipment so as to permit only authorized access to the facility's service drive, structures and operations. One gate would provide access into the project site, thereby restricting access to this facility area. The gate would be locked during normal operations with access provided by facility personnel. Normal plant lighting and emergency temporary lighting would be provided throughout the facility. Security personnel would be on site 24 hours per day, 7 days per week, 365 days per year. All site security personnel would be equipped with communication equipment to maintain contact with construction management personnel and/or the Suffolk County Police Department and the Suffolk County FRES.

15.4 SOLID, HAZARDOUS, AND SANITARY WASTE DURING CONSTRUCTION

Caithness would contract with private waste haulers to remove solid waste resulting from the project during construction. Waste disposal during construction would be minimized through the employment of a recycling program that would focus on scrap metal and reusable timber.

During the normal course of construction, the facility would generate minimal amounts of wastes that are classified as hazardous and subject to the Resource Conservation and Recovery Act of 1976 (RCRA), the Environmental Conservation Law §27 and the New York Hazardous Waste Regulations (6 NYCRR 370 et seq.) To minimize the quantities of solid and hazardous waste generated at the facility, Caithness would implement a solid waste management program during facility construction that incorporates waste minimization strategies such as recycling and the selection of solvents, paints, and other maintenance chemicals to produce non-hazardous wastes at the construction site.

The potentially hazardous wastes generated on-site would be separated from normal waste through segregation of storage areas and proper labeling of containers. All hazardous waste would be removed from the project site by licensed contractors in accordance with applicable regulatory requirements and disposed at either local or regional approved facilities.

Sanitary waste during construction would be handled through the installation of portable toilets. All sanitary waste would be removed from the project site by licensed contractors in accordance with applicable regulatory requirements and disposed at either local or regional approved facilities.

15.5 CONSTRUCTION IMPACT ASSESSMENT

15.5.1. TRAFFIC

A. INTRODUCTION

Caithness investigated the potential traffic impacts associated with the peak construction of the proposed facility. The construction traffic impact assessment addressed the same study intersections assessed for the operation of the project, including the intersection of Horseblock Road/CR 16 and Bellport Avenue/Station Road as addressed in Section 8.10, and followed the methodology described in Section 8.2 of this FEIS.

A construction time period of 26 months is expected. Peak construction activity would commence at approximately the 18th month of construction. Therefore, a construction year of 2006 was established for analysis. Peak construction activities are expected to last three months.

The full traffic impact report prepared for the project is included as Appendix G.

B. BASIS FOR ANALYSIS

The construction analysis consisted of two scenarios, the "No Build 2006 Construction Phase" and the "Build 2006 Construction Phase".

The "No Build Construction Phase" consists of an analysis of the future levels of service assuming the project is not constructed. In order to determine the projected volumes, an annual growth factor of 2.04 percent per year, supplied by the New York State Department of Transportation (NYSDOT), was applied to the existing intersection volumes for two years for the No Build Construction Phase. The application of the annual growth factor accounts for increases in population and additional traffic from proposed developments outside the project area. In addition, nearby projects under construction or in the planning stages were identified through discussions with the Town of Brookhaven Division of Traffic Safety, and the associated traffic was added to the existing traffic volumes at each of the study intersections. Two other planned developments, the Silver Corporate Park and Brookhaven Industrial Park, were identified by Town officials. See section 8.7.2 for detailed information regarding these planned developments.

The build 2006 construction phase consisted of an evaluation of the proposed site construction access via Zorn Boulevard at Horseblock Road to determine the impacts caused by construction traffic traveling to and from the site during peak activity in the construction schedule. The deliveries of supplies and materials would occur at various times during the day. The random delivery pattern lowers the potential of impact to the levels of service at the study intersections. The construction phase traffic would be comprised primarily of workers traveling to and from the site. Although the number of workers would vary on a daily basis depending on the type of work scheduled, the analysis conservatively considers the peak three-month period. During all other months of the 26-month construction period, the number of workers would be significantly less.

To account for potential turning restrictions at the intersection of Horseblock Road and Zorn Boulevard that were part of the Zorn Industrial Park development approval, two Zorn Boulevard site access configurations were analyzed for the 2006 build construction condition; one scenario allowing full turning access at the intersection; and the other scenario restricting the intersection to right-turn movements only (i.e., prohibiting all-left-turn movements, allowing entering and exiting right-turns only).[1]

It is estimated that a peak workforce of 375 workers per day would be on site during peak construction activity. However, the analysis utilized a conservative approach, which considered the potential for a second construction shift, which as described above, could be proposed for limited durations during the project's peak construction period to maintain the project's construction schedule. Therefore, the peak construction analysis

[1] The Suffolk County Department of Public Works recently approved a highway work permit in conjunction with the access improvements associated with the Zorn Industrial Park. The permit stipulated that the intersection with Horseblock Road would be reconfigured to prohibit all left-turn movements, allowing entering and existing right-turns only. At this time, the improvements have not been constructed and Caithness has requested that SCDPW consider maintaining the full access configuration during the construction phase of the proposed project.

considered a maximum of 500 workers at the project site. Trip generation was assumed to result in 400 and 5 vehicle trips entering and exiting the site during the morning peak period, respectively. For the evening peak period, 100 and 400 vehicle trips were assumed to entering and exiting the site, respectively. The 100 entering trips consider the potential for a second construction shift.

Workforce agreements specify a start-time of 6:30 AM and 10-hour days at 5 days per week. Therefore, workers would not be arriving during the peak volumes of the adjacent roadway network. However, in order to provide a conservative analysis, the peak hour of traffic in and out of the site was added to the peak hour of the roadway after the growth factor was applied to the existing volumes.

Existing levels of service at study intersection are identified in Table 8-4 of Chapter 8.0, Traffic and Transportation.

C. RESULTS OF ANALYSIS

Each of the study intersections was analyzed for existing conditions, the 2006 no build conditions, and the 2006 build construction phase. Tables 15-1 and 15-2 show the results of the LOS analysis.

An analysis of the build construction condition indicates that certain impacts arise by 2006, but in most cases, would occur even during the 2006 no build condition and are due to the volumes associated with the two other planned developments (see section 8.7.2) included in the study. Intersections experiencing temporary impacts during the construction phase consist of:

- Horseblock Road/County Road (CR) 16 at LIE North Service Road
- Horseblock Road/CR 16 at LIE South Service Road
- Horseblock Road/CR 16 at Sills Road/CR 101
- Horseblock Road/CR 16 at Bellport Avenue/Station Road

Construction impacts associated with the proposed project are not considered significant impacts since they are short-term, lasting no more than three months. Furthermore, as indicated above, the analysis was conservative since project workforce agreements specify start times of 6:30 AM, prior to the morning peak hour, and the peak arrival of the workforce was superimposed onto the AM peak hour of the intersections. Accordingly, it is anticipated that construction impacts during the AM peak hour would be less than presented in this analysis. Regarding the PM peak hour impacts, the analysis assumes a peak construction period second shift, which may not be required. Accordingly, it is anticipated that actual construction impacts during the PM peak period would be less as well. More importantly, however, are the substantial volumes generated by the other planned developments that greatly contribute to the conditions present during the construction phase as seen when comparing the existing conditions results to the no build 2006 results. The traffic volumes generated by the other planned developments, rather than the proposed Caithness Long Island Energy Center, are primarily governing

Table 15-1

LOS Summary–Comparison of Conditions: Signalized Intersections

Location / *Condition*	AM Peak Hour				PM Peak Hour		
	LOS	**Delay**	**V/C**		**LOS**	**Delay**	**V/C**
Horseblock Road & LIE North Service Road							
Existing	B	17.8	0.68		C	32.3	0.85
No Build 2006	C	25.9	0.86		F	90.2	2.23
Build Const 2006-Zorn Full Access	C	26.2	0.87		F	150.2	3.18
Build Const 2006-Zorn Blvd. Restrictions	C	26.3	0.87		F	150.2	3.18
Horseblock Road & LIE South Service Road							
Existing	C	34.0	0.80		E	59.5	1.01
No Build 2006	F	139.5	1.19		F	164.8	1.36
Build Const 2006-Zorn Full Access	F	218.6	1.36		F	236.9	1.54
Build Const. 2006-Zorn Blvd. Restrictions	F	218.7	1.36		F	236.9	1.54
Horseblock Road & Sills Road							
Existing	C	22.4	0.59		C	25.6	0.63
No Build 2006	D	37.0	1.01		D	37.5	1.12
Build Const 2006-Zorn Full Access	F	97.5	1.56		E	62.4	1.48
Build Const. 2006-Zorn Blvd. Restrictions	F	97.5	1.56		E	75.1	1.66
Horseblock Road & Old Dock Road							
Existing	A	8.1	0.41		B	11.0	0.50
No Build 2006	A	9.3	0.51		F	89.9	0.91
Build Const 2006-Zorn Full Access	A	9.6	0.51		E	76.0	0.98
Build Const. 2006-Zorn Blvd. Restrictions	A	9.6	0.51		E	75.2	0.98
Horseblock Road & Alexan Boulevard							
Existing	B	10.2	0.38		B	10.4	0.30
No Build 2006	B	10.6	0.48		B	11.3	0.34
Build Const 2006-Zorn Full Access	B	10.8	0.51		B	11.5	0.35
Build Const. 2006-Zorn Blvd. Restrictions	B	17.8	0.76		E	11.9	0.41
Sills Road & Mill Road/Main Street							
Existing	B	12.8	0.0		B	13.8	0.0
No Build 2006	B	16.1	0.0		B	16.9	0.0
Build Const 2006-Zorn Full Access	B	16.6	0.0		B	17.1	0.0
Build Const. 2006-Zorn Blvd. Restrictions	B	16.6	0.0		B	17.1	0.0
Sills Road & Long Island Avenue North							
Existing	A	9.1	0.67		A	8.7	0.65
No Build 2006	B	16.6	0.82		B	14.2	0.79
Build Const 2006-Zorn Full Access	B	18.1	0.84		B	15.2	0.80
Build Const. 2006-Zorn Blvd. Restrictions	B	18.1	0.84		B	15.2	0.80
Sills Road & LIE North Service Road							
Existing	B	14.6	0.63		B	11.0	0.44
No Build 2006	D	46.5	1.14		B	12.2	0.61
Build Const 2006-Zorn Full Access	D	49.0	1.19		B	12.8	0.68
Build Const. 2006-Zorn Blvd. Restrictions	D	49.0	1.19		B	12.8	0.68
Sills Road & LIE South Service Road							
Existing	B	14.1	0.40		B	18.9	0.50
No Build 2006	C	20.2	0.51		C	23.1	0.62
Build Const 2006-Zorn Full Access	C	21.7	0.56		C	23.3	0.64
Build Const. 2006-Zorn Blvd. Restrictions	C	21.7	0.56		C	23.3	0.64
Sills Road & Long Island Avenue South							
Existing	A	9.8	0.29		B	10.9	0.34
No Build 2006	B	10.8	0.37		B	11.7	0.44
Build Const 2006-Zorn Full Access	B	11.5	0.42		B	12.2	0.48
Build Const. 2006-Zorn Blvd. Restrictions	B	11.5	0.42		B	12.2	0.48
Horseblock Road & Bellport Avenue/Station Road							
Existing	B	17.1	0.60		C	21.0	0.74
No Build 2006	C	26.0	0.77		C	26.6	0.86
Build Const 2006	E	61.8	0.91		D	36.0	0.91

Notes: LOS = Level of Service, V/C = Volume/Capacity Ratio, Delay = seconds/vehicle

Table 15-2
LOS Summary – Comparison of Conditions
Unsignalized Intersections

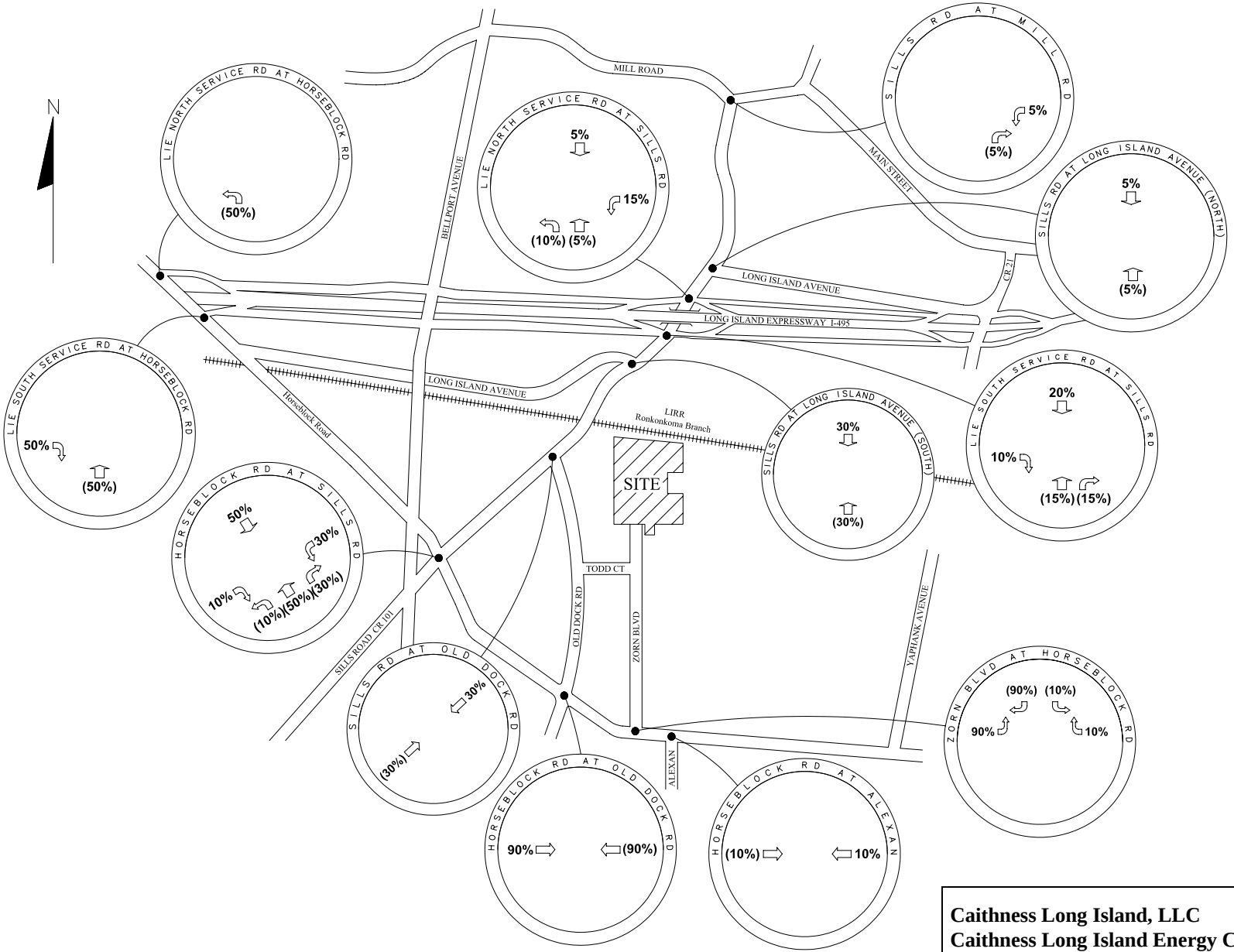
Location / *Condition*		AM Peak Hour		PM Peak Hour	
		LOS	**Control Delay (sec/veh)**	**LOS**	**Control Delay (sec/veh)**
Sills Road & Old Dock Road					
Existing	WB-R	B	10.5	B	13.2
No Build 2006	WB-R	B	11.8	C	16.9
Build Const 2006-Zorn Full Access	WB-R	B	11.8	C	19.2
Build Const. 2006-Zorn Blvd. Restrictions	WB-R	B	11.8	C	19.2
Zorn Boulevard & Horseblock Road					
Existing	EB-LT	---	---	---	---
	SB-LR	---	---	---	---
No Build 2006	EB-LT	---	---	---	---
	SB-LR	---	---	---	---
Build Const 2006-Zorn Full Access	EB-LT	B	12.3	A	86
	SB-LR	D	25.1	E	48.7
Build Const. 2006-Zorn Blvd. Restrictions	SB-R	C	16.1	C	23.9

Notes: LOS = Level of Service, V/C = Volume/Capacity Ratio, Delay = seconds/vehicle

the magnitude of improvements that would be needed to alleviate the construction impacts. The build condition in contrast represents the permanent characteristics of the site that traditionally dictates the identification of impacts. There are no impacts created at the intersections once the site is fully operational, and therefore, no mitigation measures are proposed at this time. Any need for improvements that would alleviate the construction traffic would be coordinated with the Town of Brookhaven Division of Traffic Safety and the Suffolk County Department of Public Works.

D. CONSTRUCTION ROADWAYS

The project site is served by excellent roadway infrastructure. Access would be provided to the site from Zorn Boulevard. Local roadways that would be used for the transport of construction materials to the project site include the Long Island Expressway (LIE) and associated service north and south services road, Horseblock Road, Patchogue-Yaphank/Sills Road, and Bellport Avenue/Station Road. Oversized facility components would be delivered to Port Jefferson via barge and delivered by tractor trailer to the project site. The route for oversized deliveries would travel south from Port Jefferson on County Route 112 to the intersection of County Route 112 and Horseblock Road, located north of the LIE, at which point the route would follow the LIE north service road east to Bellport Avenue/Station Road. At Bellport Avenue/Station Road the route would turn south, travel under the LIE, to the roadway's intersection with Horseblock Road, at which point the route would turn east/southeast on Horseblock Road to Zorn Boulevard (see Figure 15-1).



Caithness Long Island, LLC
Caithness Long Island Energy Center
Town of Brookhaven, Suffolk County, NY

Figure 15-1. Site Distribution –Full Construction Access at Zorn Boulevard

Source: Nelson & Pope, March 2005

The delivery of oversized equipment would be coordinated with the Town of Brookhaven Division of Traffic & Safety, the Suffolk County Department of Public Works, the New York State Department of Transportation, and the police departments with jurisdiction along the heavy haul route.

15.5.2. AIR QUALITY

This section presents a discussion of potential air quality impacts from the construction of the Caithness Long Island Energy Center. Construction-related emissions can be classified into two distinct sources: criteria pollutant emissions from private and construction vehicle internal combustion engines; and fugitive dust that results from vehicle movement over paved and unpaved roads, as well as activities associated with material handling, earth moving/grading, etc.

Construction-related emissions from the two types of sources vary with the types of activities associated with the three typical phases of a construction project. The United States Environmental Protection Agency (EPA), in Section 13.2.3 of its AP-42 emission factor guidance (EPA, 1995), identifies three phases of a heavy construction project with respect to construction-related emissions:

- Phase 1: Debris Removal;
- Phase 2: Site Preparation; and
- Phase 3: General Construction.

AP-42 includes the following activities under each phase:

Phase 1: Debris removal of any man-made or natural obstructions can include blasting, explosion, mechanical removal, material loading/unloading, and vehicular traffic over unpaved areas;

Phase 2: Site preparation is grading and soil stabilization, and cut and fill activities which can include movement of large earth moving equipment over disturbed surfaces, material/aggregate loading and unloading, vehicular traffic over unpaved areas; and

Phase 3: General construction is foundation work, structural steel, exterior/interior operations, piping/electrical work, final landscaping.

Potential criteria pollutant (engine) and fugitive dust emissions associated with the construction are discussed below.

A. CRITERIA POLLUTANT EMISSIONS FROM PRIVATE AND CONSTRUCTION VEHICLE INTERNAL COMBUSTION ENGINES

Criteria pollutant vehicle emissions can occur as a result of traffic and/or added trip length from private vehicles that encounter roadway diversions or detours associated with the project, as well as emissions from the actual construction vehicles. If the diversions and detours are significant, or impact a large number of private vehicles, an air quality analysis is recommended by the regulatory agency (NYSDOT, Environmental Analysis Bureau). No road closures or diversions during the construction are anticipated.

Therefore, an air impact analysis for this aspect of construction (i.e., private vehicles) is not required.

Off-road construction equipment, e.g., bulldozers, backhoes, etc., would emit criteria pollutants, such as PM-10, PM-2.5, SO_2, VOC, and NO_X. However, impacts are expected to be minimal for several reasons. During Phase I activity, little to no demolition would be required because the project site is clear of existing structures. During the Phase 2 activities, minimal grading would be required because the project site is relatively level. Therefore, heavy construction activity likely would be limited to a short period. During Phase 3, impacts would be minimal since much of the equipment is prefabricated prior to arrival at the project site or would require minimal on-site assembly. For these reasons, a minimal number of contractor vehicles are expected to be on-site. In addition, off-road construction equipment to be used would be well maintained, which would result in efficient fuel combustion and minimal criteria pollutant emissions. Finally, the project site is located more than 2,500 feet from the nearest residence. At this distance, any off-road construction equipment emissions would result in minimal and insignificant impacts.

In addition, construction vehicles delivering materials to the site would also emit criteria pollutants, such as PM_{10}, $PM_{2.5}$, SO_2, VOC, and NO_X. The peak number of construction trucks to the project site is not expected to exceed 25 trucks per hour. This small number of trucks per hour is not expected to result in any significant air quality impacts.

B. FUGITIVE DUST

As stated above, heavy construction activities would be minimal and conducted over a limited period of time, as demolition and grading activities would not be significant. In addition, as the nearest residence is located more than 2500 feet from the project site, there would be minimal impacts related to fugitive dust emissions. Several measures would be employed during construction activities to ensure that dust suspension is kept low. These include:

- keeping construction vehicle speed low to reduce dust suspension;
- covering exposed stockpiles of soil and gravel to eliminate wind-driven dust suspension, or as an alternate, minimizing the height of these piles;
- the periodic washing of paved surfaces during dry periods as a means to suppress dust suspension; and
- the application of water on stockpiles and unpaved roads during dry periods as a means to suppress dust suspension.

Based on limited expected incidence of heavy construction activities, the good maintenance of the construction vehicles, the use of previously stated measures to control dust suspension, and the distance of the construction area from the nearest residences, air quality-related construction impacts associated with the Caithness Long Island Energy Center would not be expected to be significant.

15.5.3. NOISE

The construction process for power plant construction projects generally occurs in the following phases:

- Initial grading and excavation
- Concrete pouring
- Building assembly
- Siding and machinery installation
- Exterior finish and cleanup

Construction equipment utilized would differ from phase to phase. In general, heavy equipment (bulldozers, excavators, dump trucks, cement mixers) would be used during excavation and concrete pouring activities. Noise is generated during construction primarily from diesel engines which power the equipment. Exhaust noise usually is the predominant source of diesel engine noise, which is the reason that maintaining functional mufflers on all equipment would be a requirement of the project.

Noise levels of construction equipment typically utilized for this type of project are presented in Table 15-3 (BBN, 1971). It is important to note that the equipment presented is not used in each phase of construction. Further, equipment used are not generally operated continuously, nor are the equipment always operated simultaneously. Site average sound levels for each phase of construction (BBN, 1971) are presented in Table 15-4. The highest site average sound levels (89 dB(A) at 50 feet) are associated with excavation and finishing activities.

Table 15-3
Noise Levels of Major Construction Equipment

Equipment Type	Noise Level at 50 Feet (dB(A))
Trucks	91
Crane	83
Roller	89
Bulldozers	80
Pickup Trucks	60
Backhoes	85

Note: dB(A) = decibels A-weighted (see Chapter 10 for definition)
Source: BBN, 1971

The residential receptors are located at various distances from where noise would be produced. The noise levels presented in Tables 15-3 and 15-4 are for a distance of 50 feet, but noise actually transmitted from the construction site would be attenuated by a variety of mechanisms. The most significant of these is the diversion of the sound waves with distance (attenuation by divergence). In general, this mechanism would result in a 6 dB(A) decrease in the sound level with every doubling of distance from the source.

Table 15-4
Typical Site Average Noise Levels At 50 Feet By Construction Activity

Construction Phase	Noise Level at 50 Feet (dB(A))
Site Clearing	84
Excavation	89
Foundations	77
Building Assembly	84
Finishing	89
Source: BBN, 1971	

The construction noise levels for each sensitive receptor location were calculated by determining the reduction in noise that would occur with distance and were compared to the existing daytime and late night L_{eq} noise levels in Table 15-5 below.

Table 15-5
Projected Construction Noise Levels by Phase (dB(A))

Receptor	Distance (feet)	Existing Daytime Leq	Existing Late Night Leq	Site Clearing	Excavation	Foundations	Building Assembly	Finishing
Horseblock Road	2600	66	55	50	55	43	50	55
Alexan Complex	3300	60	52	48	53	41	48	53
110 Long Island Avenue	6100	64	58	42	47	35	42	47
109A Long Island Avenue	3400	61	49	47	52	40	47	52
Patchogue-Yaphank/ Sills Road	2700	71	49	49	54	42	49	54

The project currently anticipates only daytime construction for the project. The calculated construction noise levels are shown to be well below existing daytime L_{eq} noise levels at all locations. In the event that nighttime construction is required due to schedule constraints, and is permitted by the Town, construction noise levels were also evaluated against existing late night L_{eq} levels. Calculated construction noise levels for the excavation and finishing phases (i.e., worst case) are shown to be above existing nighttime levels at three locations but by no greater than 5 dB(A). Noise levels for the remaining phases are below existing nighttime noise levels at all locations.

It is important to note that the equipment presented would not be used in each phase of construction. The excavation and finishing phases are anticipated to last only two to three months during the entire 26-month construction period. Further, the equipment is not generally operated continuously, nor are the equipment always operated simultaneously.

There would therefore be times when no equipment are operating and noise would be at ambient levels.

The construction noise levels presented above are those which would be experienced for people outdoors. A building (house) would provide significant attenuation for those who are indoors. Sound levels can be expected to be up to 27 dB(A) lower indoors with the windows closed. Even in homes with the windows open, indoor sound levels can be reduced by up to 17 dB(A) (EPA, 1978). Construction noise would also be temporary in nature. As such, no adverse or long-term noise impacts from construction noise are anticipated.

15.5.4. CONSTRUCTION STORMWATER AND WATER QUALITY

The construction plans for management of stormwater to prevent the contamination of stormwater and to protect water quality during construction is presented on the soil erosion and sediment control plans, and construction grading and drainage plans included as Sheets 10, 11, 12, 13, and 15 of the site plan drawings included in Appendix C.

Although not subject to a State Pollutant Discharge Elimination System (SPDES) permit, applicable guidelines for erosion and sediment control practices would be followed. Note that for the project, there are no surface waters or channelized flow on or near the project parcel. Thus, the guidelines are applicable with respect to preventing erosion, but sedimentation in water bodies is not a concern.

Erosion and sediment control measures would be installed prior to beginning other land disturbances and would not be removed until the disturbed land areas are stabilized. Such practices include seeding or mulching for surface stabilization, silt fences, haybale dikes, and water quality swales. Maintenance would be performed as necessary to ensure continued stabilization. See the site plan drawing, Sheet 15 of 15, *Site Details II* in Appendix C for more details. Below are descriptions of measures that would or may be used during project construction:

- *Protection of trees/mature vegetation* – Natural vegetation would be preserved whenever possible in accordance with the site clearing plan. Preserving natural and mature vegetation would provide aesthetic buffer, preserve habitat, and reduce soil erosion. When preserving vegetation, fences would be installed to prevent equipment from damaging areas designated for preservation.
- *Stabilized Construction Entrance* - All points of construction ingress and egress would be protected to prevent the deposition of materials onto traversed public thoroughfare(s) by installing and maintaining a stabilized construction entrance. Accumulated sediment would be removed when 60 percent of the storage capacity of the retention structure is filled with sediment. This is a standard construction practice, and would be used.
- *Vegetated swales* – During the early phases of construction, surface runoff that is relatively clean and free of sediment would be diverted or otherwise prevented from flowing through areas of construction activity on the project parcel via a system of temporary swales. The swales would route flow to temporary runoff collection ponds.

During the remainder of the construction period, as well as during operation, areas outside the buildings and pavement would continue to utilize vegetated swales in preference to a piped collection system.

- *Haybale Barriers* – Haybale barriers would be used to prevent sediment inflow into catchbasins during the construction process. They may also be used in place of silt fencing, where applicable.
- *Temporary Seeding* - Planting of fast-growing grasses provides rapid stabilization of disturbed surfaces that would experience further disturbance or construction activity at a later date. Temporarily seeded surfaces would have greater resistance to stormwater runoff and/or wind erosion. All disturbed areas would be seeded and stabilized with erosion control materials within 30 days of final grading. If construction has been suspended, or sections completed, areas would be seeded and stabilized with erosion control materials. Maintenance would be performed as necessary to ensure continued stabilization. This control can be used only if it is the growing season for grass seeds.
- *Permanent Seeding* – The permanent planting of vegetation, including but not limited to grass, trees, bushes and shrubs, would stabilize the soil by holding soil particles in place. Permanent seeding shall be used on graded and loamed surfaces with a mixture of fast growing and permanent seedings suitable to the project parcel and regional conditions, observing the "natural revegetation" requirements of the Brookhaven Code. Surfaces to be permanently seeded shall be properly prepared as a seedbed and treated with fertilizer as appropriate. Seeded surfaces would be compacted and mulched, and then watered and maintained until an adequate and permanent vegetative cover is established.
- *Permanent Plantings* – At the completion of the project, all plantings would be installed and maintained as required.
- *Mulching* – Mulching is the placement of material, including but not limited to hay, grass, woodchips, straw, and gravel, on the soil surface to cover and hold in place disturbed soils. This practice is complementary to seeding practices, and would be used.
- *Geotextiles* – Geotextiles are porous fabrics known in the construction industry as filter fabrics, road rugs, synthetic fabrics, construction fabrics, or simply fabrics. They are used for filtration, reinforcement, material separation, mattings, drainage applications and erosion control. For sediment and erosion control applications, they are most commonly used as mattings to stabilize flow in channels and swales and on recently planted slopes, and as separators to prevent the migration of sediments into other layers such as soil from beneath rip rap. Due to the relatively flat terrain on-site, use of geotextiles is not anticipated.

All erosion and sediment control measures and best management practices (including specifications for temporary and permanent seeding) used during construction would comply with the specifications contained in the New York State Stormwater Management Design Manual dated October 2001.

A detailed description of the spill prevention and control measures to be implemented at the project site during construction to prevent stormwater contamination is provided in Section 12.6.5 of this EIS.

15.5.5. NATURAL RESOURCES

A detailed assessment of natural resources at the project parcel is included as Chapter 14.0, Terrestrial Resources of this EIS.

Potential natural resources impacts due to construction activities for the project relate to the proposed disturbance of approximately 28 acres of the project parcel for materials lay down, equipment storage, construction parking, and a construction stormwater management detention basin.

On October 15 and November 6, 2002 and December 1, 2004 biologists characterized all natural resources at the 96-acre parcel, including terrestrial plant communities, presence/absence of rare, threatened, and endangered species, and wetlands.

Potential impacts to natural resources present at the site related to the clearing of the proposed materials lay down, equipment storage, construction parking, and a construction stormwater management detention basin are discussed below.

A. VEGETATION

Clearing of the construction laydown and parking area would impact a total of 28.0 acres of forested stands, which includes approximately 20.0 acres of Pitch Pine-Oak Forest and 8.0 acres of oak dominated forest. Of the 28.0-acre total, approximately 10.9 acres would be dedicated to a temporary construction parking area and a stormwater detention basin with associated grading. The temporary construction parking area would be re-graded once it is no longer needed and hydro-seeded following construction. The remaining 17.1 acres would be manually re-planted with Pine Barrens plant species and allowed to re-vegetate naturally.

The site landscaping plan included as Sheet 8 of 15, *Final Landscape Plan*, of the site plan drawings included in Appendix C, has been designed to minimize impacts resulting from the clearing of approximately 28 acres of the project parcel for materials lay down, equipment storage, and construction parking.

Impacts to plant communities associated with portions of the construction laydown and parking area that would be allowed to regenerate naturally would be temporary in nature, and the character of the plant community that regenerates is dependent upon remnant vegetation, the amount of hardwood stumps left (if any), adjacent seed sources, and the amount of soil disturbance.

The 10.1 acres that comprise the temporary construction parking area would be re-graded once it is no longer needed and hydro-seeded following construction. The remaining 17.1 acres would be manually re-planted with Pine Barrens plant species and allowed to re-vegetate naturally. The hydro-seed mix would contain a wildlife seed blend comprised of *Coreposis lanceolata* (lance-leaved coreopsis) and *Rudbeckia hirta* (black-eyed susan) amongst other wildflowers. Plantings within landscaped areas could potentially include

native tree species that favor high light conditions, low soil nutrient levels, and disturbed soil conditions such as pitch pine, gray birch (*Betula populifolia*), sassafras (*Sassafras albidum*), eastern red cedar (*Juniperus viginiana*), red oak, scarlet oak, and several berry-bearing shrubs such as bayberry (*Myrica pennsylvanica*), lowbush blueberry, and huckleberry.

B. WETLANDS

Federal, state, and local wetlands were not identified within the 96-acre parcel, accordingly, adverse impacts to wetland plant communities and wetland wildlife species would not occur as a result of proposed construction activities.

C. RARE, THREATENED, AND ENDANGERED SPECIES

According to a letter dated August 31, 2004, the DEC indicated that there are no known occurrences of rare, threatened, or endangered species present on the site. The United States Fish and Wildlife Service indicated the same in a letter dated September 10, 2004. Additionally, no rare, threatened, or endangered species were observed at the project site.

Given the absence of rare, threatened, and endangered species on the site, no rare threatened, endangered species, populations, communities, or associated habitats would be impacted as a result of construction activities.

D. WILDLIFE SPECIES

In that the 96-acre parcel historically has experienced selective cutting and other disturbances (i.e. fire and mechanical clearing), is currently subjected to heavy All Terrain Vehicle (ATV) traffic, and is located adjacent to an existing industrial park on industrially-zoned land, the impacts to wildlife associated with the project are expected to be temporary. Based upon the history of disturbance and the resilience of plant species present on this site, wildlife patterns of movement within cleared areas would return to a pre-disturbance state following the construction of the proposed facility. Therefore, no adverse and long-term indirect impacts on wildlife are expected to result from the proposed project, including the proposed disturbance of approximately 28 acres for materials lay down, equipment storage, and construction parking.

Cleared areas within the construction laydown area that are allowed to naturally re-vegetate would eventually support a forest dominated by pitch pine and scarlet oak with an admixture of white oak and shrub species. The consequence of this is that wildlife species that presently utilize pitch pine-oak forested stands would continue to have access to a significant amount of available habitat on the site following construction.

Those areas within the construction laydown and parking area that are manually planted and hydro-seeded would simply serve to accelerate the regeneration of the forest. Furthermore, the planting of shrubs and trees would add an instantaneous structural component to cleared areas, facilitating use by a wide range of wildlife.

15.5.6. VISUAL IMPACTS DURING CONSTRUCTION

The nature and degree of visual change during construction of the facility and aboveground interconnections is anticipated to be minimal. Construction of the project and various interconnections would take place over an approximately 26-month period. Potential visibility of the construction site would be limited to the ground level until structural erection occurs. The only views toward the construction areas would be from along Old Dock Road and Sills Road through the openings between the industrial buildings that line this roadway; however, the existing vegetation that would remain within the setback area limits the view toward the project site. The visibility of construction activities would be limited from Horseblock Road due to the distance between the construction site and the roadway and intervening vegetation along Horseblock Road and along the perimeter of the project site. Then, after several months of site preparation and foundation construction, steel erection would begin. The maximum visibility at that point would come from a crane or cranes on the site.

15.5.7. HAZARDOUS MATERIALS

Potential issues related to hazardous materials at the project site were assessed in Chapter 13.0, Contaminated Materials. That assessment concluded that there were no recognized environmental conditions at the project site that would be expected to have any significant adverse effects with regard to contaminated materials during construction and operation of the project.

A Health and Safety Plan would be developed and implemented by the project's general contractor during construction to ensure that the potential for exposure of construction workers, workers on nearby sites, and others in the area to any potential contaminants on site is minimized. The Health and Safety Plan would define worker safety training and monitoring procedures, personal protective equipment, air monitoring equipment, action levels, and appropriate protective measures. In addition, all material removed from the site would be disposed of in compliance with all applicable laws and regulations. With these measures, no significant impacts would occur during construction.

15.5.8. COMMUNITY SERVICES

A. POLICE SERVICES

Police protection for the project site is provided by Suffolk County Police Department Precinct #6 (based in Coram). Presently, the Suffolk Police Department provides full police protection for approximately 1.4 million citizens within the unincorporated areas within the Towns of Babylon, Brookhaven, Huntington, Islip and Smithtown. The project site is located within the unincorporated area of the Town of Brookhaven. Police department operations in 2003 included a total of 470,125 responses ranging from emergency medical medivac missions and marine search and rescue missions, to assisting

traffic accident victims and issuance of summonses. Approximately 120,000 calls for services were received within Precinct #6.[1]

The Caithness Long Island Energy Center project is expected to generate an estimated 375 temporary construction jobs. Considering a worst case in which a total of 400 new construction positions were required by the project and these positions were filled by workers from outside the current service area of the Suffolk County Police Department, the influx of project workers would represent a less than 0.03 percent increase in the population currently served by the department. Accordingly, it is anticipated that any increase in the demand for police services resulting from construction of the project would be negligible. This conclusion is strengthened by the fact that the project would have private security both during construction and operation, thereby requiring minimal to no police services.

15.5.9. FIRE AND EMERGENCY MEDICAL SERVICES

Presently, the Suffolk County Department of Fire, Rescue and Emergency Services (FRES) serves 1.4 million citizens, with 109 fire departments, 29 Emergency Medical Services (EMS) agencies, and approximately 10,500 fire and EMS responders[2]. The 96-acre parcel is located within two local fire districts. The Yaphank Volunteer Fire District provides fire protection for the 15-acre project site. This fire district also provides EMS response. The project's proposed construction laydown area and the proposed switchyard would be located within the Brookhaven Fire District. EMS responses within the Brookhaven Fire District are provided by South Country Ambulance. These Fire and EMS service providers operate under the umbrella of the Suffolk County FRES.

The plan is to provide a 750,000-gallon raw water and fire protection storage tank on-site to meet the proposed facility's firewater requirements in the unlikely event of a fire without relying on the local water distribution system. The raw water storage tank would be completed early in the project construction schedule to make it available to support a fire event during facility construction.

It is not expected that the project construction would result in significant adverse impacts to fire and emergency services. A safety orientation program and fire response plan would be in place during project construction to reduce the likelihood of the need for emergency services. Finally, prior to the commencement of project construction and operation, an Emergency Response Plan to support construction and operational activity at the site would be prepared, provided to the Suffolk County Police Department and the Suffolk County FRES for review, and implemented. ✷

[1] Suffolk County Police Department, Suffolk County 2005 Annual Budget Request

[2] Suffolk County Department of Fire, Rescue, and Emergency Services at: http://www.co.suffolk.ny.us/webtemp1.cfm?dept=5&ID=147