8.0 Environmental Impacts of Alternatives to Operating License Renewal

This chapter examines the potential environmental impacts associated with denying the renewal of the operating licenses (OLs) (i.e., the no-action alternative); the potential environmental impacts from electric generating sources other than St. Lucie Units 1 and 2; the possibility of purchasing electric power from other sources to replace power generated by St. Lucie and the associated environmental impacts; the potential environmental impacts from a combination of generating and conservation measures; and other generation alternatives that were deemed unsuitable for replacement of power generated by St. Lucie Units 1 and 2. The environmental impacts are evaluated using the NRC's three-level standard of significance—SMALL, MODERATE, or LARGE—developed using Council on Environmental Quality guidelines and set forth in the footnotes to Table B-1 of 10 CFR 51, Subpart A, Appendix B:

SMALL – Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.

MODERATE – Environmental effects are sufficient to alter noticeably, but not to destabilize important attributes of the resource.

LARGE – Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

The impact categories evaluated in this chapter are the same as those used in the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS) NUREG-1437, Volumes 1 and 2 (NRC 1996, 1999)[(a)] with the additional impact category of environmental justice.

8.1 No-Action Alternative

The NRC's regulations implementing the National Environmental Policy Act (NEPA) specify that the no-action alternative be discussed in an NRC environmental impact statement (EIS) (10 CFR 51, Subpart A, Appendix A[4]). For license renewal, the no-action alternative refers to a scenario in which the NRC would not renew the OLs for St. Lucie Units 1 and 2, and Florida Power and Light Company (FPL) would then decommission St. Lucie Units 1 and 2 when plant operations cease.

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1.

FPL will be required to comply with NRC decommissioning requirements whether or not the OLs are renewed. If the St. Lucie Units 1 and 2 OLs are renewed, decommissioning activities will not be avoided but may be postponed for up to an additional 20 year period. If the OLs are not renewed, FPL would conduct decommissioning activities according to the requirements in 10 CFR 50.82.

The environmental impacts associated with decommissioning under both license renewal and the no-action alternative would be bounded by the discussion of impacts in Chapter 7 of the GEIS, Chapter 7 of this supplemental environmental impact statement (SEIS), and the *Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities*, NUREG-0586 dated August 1988[a]. The impacts of decommissioning after 60 years of operation are not expected to be significantly different from those occurring after 40 years of operation.

The environmental impacts associated with the no-action alternative are summarized in Table 8-1. Implementation of the no-action alternative would also have certain positive impacts in that adverse environmental impacts associated with current operation of St. Lucie Units 1 and 2; for example, solid waste impacts and adverse impacts on aquatic life, would be eliminated.

The no-action alternative is a conceptual alternative resulting in a net reduction in power production, but with no environmental impacts assumed for replacement power. In actual practice, the power lost by not renewing the St. Lucie Units 1 and 2 OLs would likely be replaced by (1) demand-side management and energy conservation, (2) power purchased from other electricity providers, (3) generating alternatives other than St. Lucie Units 1 and 2, or (4) some combination of these options. This replacement power would produce additional environmental impacts as discussed in Section 8.2.

(a) The NRC staff is currently supplementing NUREG-0586 for reactor decommissioning. In November 2001, the staff issued draft supplement 1 to NUREG-0586 dealing with decommissioning of nuclear power reactors for public comment (NRC 2001a). The staff is currently finalizing the draft supplement for publication as a final document.

Table 8-1. Summary of Environmental Impacts of the No-Action Alternative

Impact Category	Impact	Comment
Land Use	SMALL	Onsite impacts expected to be temporary. No offsite impacts expected.
Ecology	SMALL	Impacts to ecology are expected to be temporary and largely mitigatable using best management practices.
Water Use and Quality	SMALL	Water use will decrease. Water quality unlikely to be adversely affected.
Air Quality	SMALL	Greatest impact is likely to be from fugitive dust; impact can be mitigated by good management practices.
Waste	SMALL	Low-level radioactive waste will be disposed of in licensed facilities. A permanent disposal facility for high-level waste is not currently available.
Human Health	SMALL	Radiological doses to workers and members of the public are expected to be within regulatory limits and comparable to, or lower than, doses from operating plants. Occupational injuries are possible, but injury rates at nuclear power plants are below the U.S. average industrial rate.
Socioeconomics	SMALL	Decrease in employment in St. Lucie and surrounding counties and tax revenues in St. Lucie County
Aesthetics	SMALL	Positive impact from eventual removal of buildings and structures. Some noise impact during decommissioning operations.
Historic and Archaeological Resources	SMALL	Impacts primarily confined to land utilized during plant operations. No impact to undisturbed land expected. Land occupied by Units 1 and 2 would likely be retained by FPL for other corporate purposes.
Environmental Justice	SMALL	Some loss of employment opportunities and social programs is expected.

8.1.1 Land Use

Temporary changes in onsite land use could occur during decommissioning. Temporary changes may include addition or expansion of staging and laydown areas or construction of temporary buildings and parking areas. No offsite land use changes are expected as a result of decommissioning. Following decommissioning, the St. Lucie site would likely be retained by FPL for other corporate purposes. Eventual sale or transfer of the site, however, could result in changes to land use. Notwithstanding this possibility, the impacts of the no-action alternative on land use are considered SMALL.

8.1.2 Ecology

At the St. Lucie site, impacts on aquatic ecology could result from removal of in-water pipes and structures or the filling of the intake and discharge canals. Impacts to aquatic ecology would

likely be short-term and could be mitigated. The aquatic environment is expected to recover naturally. Impacts on terrestrial ecology could occur as a result of land disturbance for additional laydown yards, stockpiles, and support facilities. Land disturbance is expected to be minimal and result in relatively short-term impacts that can be mitigated using best management practices. The land is expected to recover naturally. Overall, the ecological impacts associated with decommissioning are considered SMALL.

8.1.3 Water Use and Quality

Cessation of plant operations would result in a significant reduction in water use because reactor cooling will no longer be required. As plant staff size decreases, the demand for potable water is expected to also decrease. Overall, water use and quality impacts of decommissioning are considered SMALL.

8.1.4 Air Quality

Decommissioning activities that can adversely affect air quality include dismantlement of systems and equipment, demolition of buildings and structures, and the operation of internal combustion engines. The most likely adverse impact would be the generation of fugitive dust. Best management practices, such as seeding and wetting, could be used to minimize the generation of fugitive dust. Overall, air quality impacts associated with decommissioning activities are considered SMALL.

8.1.5 Waste

Decommissioning activities would result in the generation of radioactive and nonradioactive waste. The volume of low-level radioactive waste (LLW) could vary greatly depending on the type and size of the plant, the length of time it operated, the decommissioning option chosen, and the waste treatment and volume reduction procedures used. Low-level radioactive waste must be disposed of in a facility licensed by NRC or a State with authority delegated by NRC. Recent advances in volume reduction and waste processing have significantly reduced waste volumes.

A permanent repository for high-level waste (HLW) is not currently available. The NRC has made a generic determination that, if necessary, spent fuel generated in any reactor can be stored safely and without significant environmental impacts for at least 30 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor in its spent fuel pool or at either onsite or offsite independent spent fuel storage installations [10 CFR 51.23(a)]. Overall, waste impacts associated with decommissioning activities are considered SMALL.

8.1.6 Human Health

Radiological doses to occupational workers during decommissioning activities are estimated to average approximately 5 percent of the dose limits in 10 CFR Part 20, and to be similar to, or lower than, the doses experienced by workers in operating nuclear power plants. Collective doses to members of the public and to the maximally exposed individual as a result of decommissioning activities are estimated to be well below the limits in 10 CFR Part 20, and to be similar to, or lower than, the doses received from operating nuclear power plants. Occupational injuries to workers engaged in decommissioning activities are possible. However, historical injury and fatality rates at nuclear power plants have been lower than the average U.S. industrial rates. Overall, the human health impacts associated with decommissioning activities are considered SMALL.

8.1.7 Socioeconomics

If St. Lucie Units 1 and 2 ceased operation, there would be a decrease in employment and tax revenues associated with the closure. Employment (primary and secondary) impacts and impacts on population would occur over a wide area. Employees working at St. Lucie Units 1 and 2 reside in a number of Florida counties including St. Lucie, Martin, Indian River, and Palm Beach (FPL 2001). Tax-related impacts would occur in St. Lucie County. In 2000, FPL paid property taxes for the St. Lucie plant to St. Lucie County in the amount of $22,325,643 (FPL 2001). This payment represented approximately 10 percent of total property tax revenues in St. Lucie County and 9.4 percent of total revenues from all sources for St. Lucie County.

The no-action alternative would result in the loss of the taxes attributable to St. Lucie Units 1 and 2 as well as the loss of plant payrolls 20 years earlier than if the OLs were renewed. There would also be an adverse impact on housing values and the local nearby economy if St. Lucie Units 1 and 2 were to cease operations.

FPL employees working at St. Lucie Units 1 and 2 currently contribute time and money toward community involvement, including schools, churches, charities, and other civic activities. It is likely that with a reduced presence in the community following decommissioning, community involvement efforts by FPL and its employees in the region would be less.

Both Chapter 7.0 of the GEIS and Supplement 1 to NUREG-0586 (NRC 1988) note that socioeconomic impacts would be expected as a result of the decision to close a nuclear power plant, and that the direction and extent of the overall impacts would depend on the state of the economy, the net change in workforce at the plant, and the changes in local government tax receipts. The socioeconomic impacts of decommissioning activities themselves is expected to be SMALL. Appendix J of Supplement 1 to NUREG-0586 shows that the overall socioeconomic impact of plant closure plus decommissioning could be greater than SMALL.

The staff has concluded that when the property tax revenue from a nuclear power plant comprises less than 10 percent of the tax revenue of a local jurisdiction, the socioeconimic impacts associated with the loss of the plant's tax revenue as a result of plant closure is considered SMALL. The property taxes that FPL pays for St. Lucie Units 1 and 2 comprise less than 10 percent of total revenue of St. Lucie County; consequently, the socioeconomic impacts resulting from loss of this revenue are considered SMALL.

Employees at St. Lucie constitute approximately 0.6 percent of total employment in St. Lucie County and approximately 0.5 percent of total employment in Martin County. Loss of these jobs is considered to have a SMALL socioeconomic impact.

Overall, the staff concludes that the socioeconomic impacts associated with the no-action alternative would be SMALL.

8.1.8 Aesthetics

Decommissioning would result in the eventual dismantlement of buildings and structures at the site resulting in a positive aesthetic impact. Noise would be generated during decommissioning operations that may be detectable offsite, however the impact is unlikely to be of large significance. Overall, the aesthetic impacts associated with decommissioning are considered SMALL.

8.1.9 Historic and Archaeological Resources

The amount of undisturbed land needed to support the decommissioning process will be relatively small. Activities conducted within operational areas are not expected to have a detectable effect on important cultural resources because these areas have been impacted during the operating life of the plant. Minimal disturbance of land outside the licensee's operational area for decommissioning activities is expected. Historic and archaeological resources on undisturbed portions of the site are not expected to be adversely affected. Following decommissioning, the site would likely be retained by FPL for other corporate purposes. Eventual sale or transfer of the site, however, could result in adverse impacts to cultural resources if the land-use pattern changes dramatically. Notwithstanding this possibility, the impacts of the no-action alternative on historic and archaeological resources are considered SMALL.

8.1.10 Environmental Justice

Current operations at St. Lucie Units 1 and 2 have no disproportionate impacts on the minority and low-income populations of St. Lucie and surrounding counties. Closure of St. Lucie Units 1 and 2 would result in decreased employment opportunities and tax revenues in St. Lucie County and surrounding counties, with possible negative and disproportionate impacts on

minority or low-income populations. However, because St. Lucie Units 1 and 2 are located in a relatively urban area with many employment opportunities, the environmental justice impacts under the no-action alternative are considered SMALL.

8.2 Alternative Energy Sources

This section discusses the environmental impacts associated with alternative sources of electric power to replace the power generated by St. Lucie assuming that the OLs for Units 1 and 2 are not renewed. The order of presentation of alternative energy sources in Section 8.2 does not imply which alternative would be most likely to occur or to have the least environmental impacts. The following generation alternatives are considered in detail:

- coal-fired generation at an alternate site (Section 8.2.1)
- natural-gas-fired generation at an alternate site (Section 8.2.2)
- nuclear generation at an alternate site (Section 8.2.3).

The alternative of purchasing power from other sources to replace power generated by St. Lucie Units 1 and 2 is discussed in Section 8.2.4. Other power generation alternatives and conservation alternatives considered by the staff and found not to be reasonable replacements for St. Lucie Units 1 and 2 are discussed in Section 8.2.5. Section 8.2.6 discusses the environmental impacts of a combination of generation and conservation alternatives.

The St. Lucie site is not considered in this SEIS as a site for alternative power generation principally because there is insufficient suitable land at the site to construct an alternative generation source to replace St. Lucie generating capacity while St. Lucie Units 1 and 2 continue to operate. Additionally, there is no rail or natural gas service to or near the St. Lucie site.

The St. Lucie site is approximately 457 ha (1130 ac). FPL does not own additional land that is contiguous with the St. Lucie site. The principal land that could potentially be used for new power generation is an approximately 32-ha (80-ac) parcel west of the intake canal and south of the electric power transmission lines. This parcel could not accommodate a coal-fired plant or a new nuclear plant, but could potentially accommodate a completed natural gas combined-cycle[a] plant to replace St. Lucie Units 1 and 2. However, there are several obstacles that make siting on the parcel impractical. First, the completed combined-cycle plant would occupy approximately 26 ha (65 ac) or roughly 80 percent of the available land (FPL 2001). During the construction process it is unlikely there would be sufficient lay-down area available within the

(a) In a combined-cycle unit, hot combustion gases in a combustion turbine rotate the turbine to generate electricity. Waste combustion heat from the combustion turbine is routed through a heat-recovery boiler to make steam to generate additional electricity.

parcel for construction and plant equipment. Second, it is not clear that the existing barge slip on the St. Lucie site could be used to bring equipment to the site because the transmission lines are between the slip and the parcel. If the existing barge slip could not be used, dredging in environmentally sensitive areas of the Indian River could be necessary. Finally, the west and south sides of the parcel are bordered by mangroves and alteration of the mangroves to accommodate construction of a power plant would face regulatory obstacles. Mangroves provide many beneficial functions including trapping and cycling various organic materials, chemical elements, and important nutrients in the coastal ecosystem; providing one of the basic food chain resources for marine organisms; providing physical habitat and nursery grounds for a wide variety of marine organisms, many of which have important recreational or commercial value; and serving as storm buffers by reducing wind and wave action in shallow shoreline areas (FDEP 2002). Alteration of mangroves is restricted under Florida law. Removal of mangroves or cutting that results in the death or defoliation of mangroves is prohibited under the 1996 Florida Mangrove Trimming and Preservation Act unless a permit is obtained from the Florida Department of Environmental Protection (FDEP) or a local agency that has been delegated authority from FDEP to issue permits (Florida Statutes, section 403.9328).

The FPL land north of the St. Lucie discharge canal and Big Mud Creek is a red mangrove swamp and also includes the 5-ha (13-ac) Blind Creek Pass Park, which is leased by FPL to St. Lucie County. The FPL land south of the intake canal also has mangroves and includes the 10-ha (24-ac) Walton Rocks Park, which is also leased by FPL to St. Lucie County. Both parcels of land are bisected by State Road A1A. The staff assumed that construction of a new generating source on these lands would be impractical or impossible because of the condition of the land and restrictions under the Florida Mangrove Trimming and Preservation Act. For all of the preceding reasons, the staff assumed that construction of a power plant to replace St. Lucie Units 1 and 2 would occur at an alternate Florida site.

FPL's *Ten Year Power Plant Site Plan* (FPL 2002) identifies four preferred and four potential sites in Florida for new power-generating facilities. All of the sites are owned by FPL and all have existing generating plants except the property in St. Lucie County which has a substation. The four preferred sites are: (1) a site 6 km (4 mi) east of Tice in Lee County, (2) property within the city limits of Debary in Volusia County, (3) a site in unincorporated Manatee County approximately 8 km (5 mi) east of the community of Parrish, and (4) a site 11 km (7 mi) northwest of Indiantown in Martin County. The Martin County site is the closest preferred site to St. Lucie. There are four additional potential sites in the plan: (1) a site in Brevard County near the city of Port St. Johns, (2) a site in Palm Beach County within the city limits of Riviera Beach, (3) a site in Broward County at Port Everglades within the city limits of Fort Lauderdale, and (4) a site in unincorporated St. Lucie County approximately 8 km (5 mi) west of the community of White City. The potential site in St. Lucie County is the closest of the designated preferred and potential sites to the St. Lucie plant. This SEIS has been prepared taking account of FPL's preferred and potential sites, but not being limited to these particular sites.

Each year the Energy Information Administration (EIA), a component of the U.S. Department of Energy (DOE), issues an Annual Energy Outlook. In its *Annual Energy Outlook 2002*, EIA projects that combined-cycle or combustion turbine technology fueled by natural gas is likely to account for approximately 88 percent of new electric-generating capacity through the year 2020 (DOE/EIA 2001a). Both technologies are designed primarily to supply peak and intermediate capacity, but combined-cycle technology can also be used to meet base-load[(a)] requirements. Coal-fired plants are projected by EIA to account for approximately 9 percent of new capacity during this period. Coal-fired plants are generally used to meet base-load requirements. Renewable energy sources, primarily wind, geothermal, and municipal solid waste units, are projected by EIA to account for the remaining 3 percent of capacity additions. EIA's projections are based on the assumption that providers of new generating capacity will seek to minimize cost while meeting applicable environmental requirements. Combined-cycle plants are projected by EIA to have the lowest generation cost in 2005 and 2020, followed by coal-fired plants and then wind generation (DOE/EIA 2001a).

EIA projects that oil-fired plants will account for very little new generation capacity in the United States through the year 2020 because of higher fuel costs and lower efficiencies (DOE/EIA 2001a).

EIA also projects that new nuclear power plants will not account for any new generation capacity in the United States through the year 2020 because natural gas and coal-fired plants are projected to be more economical (DOE/EIA 2001a). In spite of this projection, a new nuclear plant alternative for replacing power generated by St. Lucie Units 1 and 2 is considered for reasons stated in Section 8.2.3. NRC established a New Reactor Licensing Project Office in 2001 to prepare for and manage future reactor and site licensing applications (NRC 2001b).

If an alternative generating technology were selected to replace power generated by St. Lucie Units 1 and 2, Units 1 and 2 would be decommissioned. Environmental impacts associated with decommissioning are discussed in Section 8.1 and are not otherwise addressed in Section 8.2.

8.2.1 Coal-Fired Generation

Environmental impact information for a replacement coal-fired power plant using closed-cycle cooling with cooling towers is presented in Section 8.2.1.1 and using once-through cooling in Section 8.2.1.2.

(a) A base-load plant normally operates to supply all or part of the minimum continuous load of a system and consequently produces electricity at an essentially constant rate. Nuclear power plants are commonly used for base-load generation; i.e., these units generally run near full load.

The staff assumed construction of four 400-megawatt electric [MW(e)] units,[a] which is consistent with FPL's Environmental Report (ER) for St. Lucie Units 1 and 2 (FPL 2001). This assumption will slightly understate the impacts of replacing the 1678 MW(e) from St. Lucie Units 1 and 2.

Unless otherwise indicated, the assumptions and numerical values used in Section 8.2.1 are from the FPL ER (FPL 2001). The staff reviewed this information and compared it to environmental impact information in the GEIS. Although the OL renewal period is only 20 years, the impact of operating the coal-fired alternative for 40 years is considered (as a reasonable projection of the operating life of a coal-fired plant).

Coal and lime or limestone for a coal-fired plant would most likely be delivered to the plant site by railroad. Barge delivery of coal and lime/limestone is potentially feasible for a coastal site with a protected dock. FPL estimates that the plant would consume approximately 4.9 million metric tonnes (MT) (5.4 million tons) of coal annually (FPL 2001). Lime[b] or limestone is used in the scrubbing process for control of sulfur dioxide emissions. FPL estimates that 245,000 MT (270,000 tons) of limestone would be used annually for flue gas desulfurization (FPL 2001a). A coal slurry pipeline is also a technically feasible coal delivery option; however, the associated cost and environmental impacts make a slurry pipeline an unlikely transportation alternative. Construction of a new electric power transmission line to connect to existing lines and a rail spur to the plant site may be needed.

(a) The units would have a rating of 424 gross MW and 400 net MW. The difference between "gross" and "net" is electricity consumed on the plant site.

(b) In a typical wet scrubber, lime (calcium hydroxide) or limestone (calcium carbonate) is injected as a slurry into the hot effluent combustion gases to remove entrained sulfur dioxide. The lime-based scrubbing solution reacts with sulfur dioxide to form calcium sulfite which precipitates out and is removed in sludge form.

The coal-fired plant is assumed to use tangentially fired, dry-bottom boilers and consume bituminous, pulverized coal with an ash content of approximately 8 percent by weight (FPL 2001). Annual coal consumption would be approximately 4.9 million MT/yr (5.4 million tons/yr) (FPL 2001). The FPL ER assumes a heat rate[a] of 2.9 J fuel/J electricity (9800 Btu/kWh) and a capacity factor[b] of 0.9.

8.2.1.1 Closed-Cycle Cooling System

The overall impacts of the coal-fired generating system using a closed-cycle cooling system with cooling towers are discussed in the following sections and summarized in Table 8-2. The extent of impacts will depend on the location of the particular site selected.

- **Land Use**

The coal-fired generation alternative would necessitate converting approximately 467 ha (1155 ac) to industrial use for the power block; infrastructure and support facilities; coal storage and handling; and landfill disposal of ash, spent selective catalytic reduction (SCR) catalyst (used for control of nitrogen oxide [NO_x] emissions), and scrubber sludge (FPL 2001). Of this amount, disposal of ash and sludge over a 40-year plant life would require approximately 280 ha (680 ac) (FPL 2001). Additional land could be needed for an electric power transmission line, a rail spur, and/or pipelines to supply cooling-water intake and discharge. The FPL ER (FPL 2001) assumes that these activities could impact up to 380 ha (940 ac). Land-use changes would occur offsite in an undetermined coal-mining area to supply coal for the plant. In the GEIS, the staff estimated that approximately 8900 ha (22,000 ac) would be affected for mining the coal and disposing of the waste to support a 1000 MW(e) coal plant during its operational life (NRC 1996). A replacement coal-fired plant for St. Lucie Units 1 and 2 would be 1600 MW(e) and would affect proportionately more land. Partially offsetting this offsite land use would be the elimination of the need for uranium mining to supply fuel for St. Lucie Units 1 and 2. In the GEIS, the staff estimated that approximately 400 ha (1000 ac) would be affected for mining the uranium and processing it during the operating life of a 1000 MW(e) nuclear power plant (NRC 1996).

The impact of a coal-fired generating unit on land use is best characterized as MODERATE to LARGE. The impact would definitely be greater than the alternative of renewing the OLs.

(a) Heat rate is a measure of generating station thermal efficiency. In English units, it is generally expressed in British thermal units (Btu) per net kilowatt-hour (kWh). It is computed by dividing the total Btu content of fuel burned for electric generation by the resulting net kWh generation.

(b) The capacity factor is the ratio of electricity generated, for the period of time considered, to the energy that could have been generated at continuous full-power operation during the same period.

Table 8-2. Summary of Environmental Impacts of Coal-Fired Generation Using Closed-Cycle Cooling at an Alternate Florida Site

Impact Category	Impact	Comment
Land Use	MODERATE to LARGE	Uses up to 467 ha (1155 ac) for power block; coal handling, storage, and transportation facilities; infrastructure facilities; and waste disposal. Additional land impacts for coal and limestone mining. Possible impacts of up to 380 ha (940 ac) for electric power transmission line, rail spur, and cooling-water intake and discharge pipelines.
Ecology	MODERATE to LARGE	Impact depends on location and ecology of the site, surface water body used for intake and discharge, and electric power transmission line route; potential habitat loss and fragmentation; reduced productivity and biological diversity; impacts to terrestrial ecology from cooling tower dnft.
Water Use and Quality	SMALL to MODERATE	Impact will depend on the volume of water withdrawn and discharged, the constituents in the discharge water, and the characteristics of the surface water body. Discharges would be regulated by FDEP.
Air Quality	MODERATE	Sulfur oxides • 15,200 MT/yr (16,700 tons/yr) Nitrogen oxides • 1840 MT/yr (2030 tons/yr) Particulates • 196 MT/yr (216 tons/yr) of total suspended particulates, which would include 45 MT/yr (50 tons/yr) of PM_{10} Carbon monoxide • 1230 MT/yr (1350 tons/yr) Small amounts of mercury and other hazardous air pollutants and naturally occurring radioactive materials – mainly uranium and thorium
Waste	MODERATE	Total waste volume would be approximately 900,000 MT/yr (1 million tons/yr) of ash, spent catalyst, and scrubber sludge requiring approximately 280 ha (680 ac) for disposal during the 40-year life of the plant.
Human Health	SMALL	Impacts are uncertain, but considered SMALL in the absence of more quantitative data.

Table 8-2. (contd)

Impact Category	Impact	Comments
Socioeconomics	MODERATE to LARGE	Construction impacts depend on location, but could be LARGE if plant is located in a rural area. St. Lucie County would experience loss of Units 1 and 2 tax base and employment, but impacts are likely to be SMALL. Impacts during operation would be SMALL. Transportation impacts associated with construction workers could be MODERATE to LARGE. For rail transportation of coal and lime/limestone, the impact is considered MODERATE to LARGE. For barge transportation, the impact is considered SMALL.
Aesthetics	MODERATE to LARGE	Impact would depend on the site selected and the surrounding land features. Power block, exhaust stacks, cooling towers, and cooling tower plumes will be visible from nearby areas. If needed, a new electric power transmission line could have a LARGE aesthetic impact. Noise impact from plant operations and intermittent sources such as rail transportation of coal would be MODERATE.
Historic and Archaeological Resources	SMALL	Alternate location would necessitate cultural resource studies.
Environmental Justice	SMALL	Impacts at alternate site vary depending on population distribution and makeup at site. St. Lucie County would lose tax revenue and jobs, however, the impacts on minority and low-income populations would likely be SMALL.

- **Ecology**

The coal-fired generation alternative would introduce construction impacts and new incremental operational impacts. Even assuming siting at a previously disturbed area, the impacts would alter the ecology. Impacts could include wildlife habitat loss, reduced productivity, habitat fragmentation, and a local reduction in biological diversity. Use of cooling makeup water from a nearby surface water body could have adverse aquatic resource impacts. If needed, construction and maintenance of an electric power transmission line and a rail spur would have ecological impacts. There would be some impact on terrestrial ecology from cooling tower drift. Overall, the ecological impacts at an alternate site would be MODERATE to LARGE and would be greater than renewal of the St. Lucie Units 1 and 2 OLs.

- **Water Use and Quality**

Cooling water would likely be withdrawn from a surface water body. Plant discharges would consist mostly of cooling tower blowdown, characterized primarily by an increased temperature

and concentration of dissolved solids relative to the receiving water body and intermittent low concentrations of biocides (e.g., chlorine). Treated process waste streams and sanitary wastewater may also be discharged. All discharges would be regulated by FDEP through a National Pollution Discharge Elimination System (NPDES) permit. Use of groundwater for a coal-fired plant at an alternate site is a possibility. Groundwater withdrawal could require a permit. There would be a consumptive use of water due to evaporation from the cooling towers. Some erosion and sedimentation would likely occur during construction (NRC 1996). Overall, impacts are considered SMALL to MODERATE.

- **Air Quality**

The air-quality impacts of coal-fired generation vary considerably from those of nuclear generation due to emissions of sulfur oxides (SO_x), NO_x, particulates, carbon monoxide, hazardous air pollutants such as mercury, and naturally occurring radioactive materials.

A new coal-fired generating plant would likely need a prevention of significant deterioration (PSD) permit and an operating permit under the Clean Air Act. The plant would need to comply with the new source performance standards for such plants set forth in 40 CFR 60 Subpart Da. The standards establish emission limits for particulate matter and opacity (40 CFR 60.42a), sulfur dioxide (SO_2) (40 CFR 60.43a), and NO_x (40 CFR 60.44a).

The U.S. Environmental Protection Agency (EPA) has various regulatory requirements for visibility protection in 40 CFR 51 Subpart P, including a specific requirement for review of any new major stationary source in an area designated as attainment or unclassified for criteria pollutants[(a)] under the Clean Air Act. All of the FPL preferred and potential power plant sites (FPL 2002) are in areas that are designated as attainment or unclassified for criteria pollutants.

Section 169A of the Clean Air Act (42 USC 7491) establishes a national goal of preventing future and remedying existing impairment of visibility in mandatory Class I Federal areas when impairment results from man-made air pollution. In addition, EPA regulations provide that for each mandatory Class I Federal area located within a state, the State must establish goals that provide for reasonable progress toward achieving natural visibility conditions. The reasonable progress goals must provide for an improvement in visibility for the most-impaired days over the period of the implementation plan and ensure no degradation in visibility for the least impaired days over the same period (40 CFR 51.308[d][1]). If a new coal-fired power station were located close to a mandatory Class I area, additional air pollution control requirements could be imposed. Mandatory Class I Federal areas in Florida are Everglades National Park, Chassahowitzka National Wildlife Refuge, and St. Marks National Wildlife Refuge (40 CFR 81.407).

(a) Criteria pollutants under the Clean Air Act are ozone, carbon monoxide, particulates, SO_2, lead, and NO_x. Ambient air quality standards for criteria pollutants are set forth in 40 CFR Part 50.

Impacts for specific pollutants are as follows:

- Sulfur oxides. A new coal-fired power plant would be subject to the requirements in Title IV of the Clean Air Act. Title IV was enacted to reduce emissions of SO_2 and NO_x, the two principal precursors of acid rain, by restricting emissions of these pollutants from power plants. Title IV caps aggregate annual power plant SO_2 emissions and imposes controls on SO_2 emissions through a system of marketable allowances. EPA issues one allowance for each ton of SO_2 that a unit is allowed to emit. New units do not receive allowances, but are required to have allowances to cover their SO_2 emissions. Owners of new units must therefore acquire allowances from owners of other power plants by purchase or reduce SO_2 emissions at other power plants they own. Allowances can be banked for use in future years. Thus, a new coal-fired power plant would not add to net regional SO_2 emissions, although it might do so locally. Regardless, SO_2 emissions would be greater for the coal alternative than the OL renewal alternative since a nuclear power plant releases almost no SO_2 during normal operations.

  FPL estimates that by using the best technology to minimize SO_2 emissions, the total annual stack emissions would be approximately 15,200 MT (16,700 tons) of SO_2 (FPL 2001). FPL states in its ER that an alternative coal-fired plant would use wet limestone flue-gas desulfurization technology (FPL 2001).

- Nitrogen oxides. Section 407 of the Clean Air Act establishes technology-based emission limitations for NO_x emissions. The market-based allowance system used for SO_2 emissions is not used for NO_x emissions. A new coal-fired power plant would be subject to the new source performance standard for such plants at 40 CFR 60.44a(d)(1), which limits the discharge of any gases that contain NO_x (expressed as NO_2) to 200 ng/J of gross energy output (1.6 lb/MWh), based on a 30-day rolling average.

  FPL estimates that by using low-NO_x burners with overfire air and selective catalytic reduction, the total annual NO_x emissions for a new coal-fired power plant would be approximately 1840 MT (2030 tons) (FPL 2001). Regardless of the control technology this level of NO_x emissions would be greater than the OL renewal alternative since a nuclear power plant releases almost no NO_x during normal operations.

- Particulates. FPL estimates that the total annual stack emissions of particulates would include approximately 196 MT (216 tons) of filterable total suspended particulates (particulates that range in size from less than 0.1 micrometer [μm] up to approximately 45 μm). The 196 MT (216 tons) would include approximately 45 MT (50 tons) of PM_{10} (particulate matter having an aerodynamic diameter less than or

equal to 10 μm). Fabric filters or electrostatic precipitators would be used for control (FPL 2001). In addition, coal-handling equipment would introduce fugitive particulate emissions. Particulate emissions would be greater under the coal alternative than the OL renewal alternative since a nuclear plant releases few particles during normal operations.

During the construction of a coal-fired plant, fugitive dust would be generated. In addition, exhaust emissions would come from vehicles and motorized equipment used during the construction process.

- Carbon monoxide. FPL estimates that total carbon monoxide emissions would be approximately 1230 MT (1350 tons) per year (FPL 2001). This level of emissions is greater than the OL renewal alternative.

- Hazardous air pollutants including mercury. In December 2000, the EPA issued regulatory findings on emissions of hazardous air pollutants from electric utility steam-generating units (EPA 2000a). The EPA determined that coal- and oil-fired electric utility steam-generating units are significant emitters of hazardous air pollutants. Coal-fired power plants were found by EPA to emit arsenic, beryllium, cadmium, chromium, dioxins, hydrogen chloride, hydrogen fluoride, lead, manganese, and mercury (EPA 2000b). The EPA concluded that mercury is the hazardous air pollutant of greatest concern. The EPA found that (1) there is a link between coal consumption and mercury emissions; (2) electric utility steam-generating units are the largest domestic source of mercury emissions; and (3) certain segments of the United States population (e.g., the developing fetus and subsistence fish-eating populations) are believed to be at potential risk of adverse health effects due to mercury exposures resulting from consumption of contaminated fish (EPA 2000b). Accordingly, EPA added coal- and oil-fired electric utility steam-generating units to the list of source categories under Section 112(c) of the Clean Air Act for which emission standards for hazardous air pollutants will be issued (EPA 2000b).

- Uranium and thorium. Coal contains uranium and thorium. Uranium concentrations are generally in the range of 1 to 10 parts per million. Thorium concentrations are generally about 2.5 times greater than uranium concentrations (Gabbard 1993). One estimate is that a typical coal-fired plant has an annual release of approximately 4.7 MT (5.2 tons) of uranium and 11.6 MT (12.8 tons) of thorium in 1982 (Gabbard 1993). The population dose equivalent from the uranium and thorium releases and daughter products produced by the decay of these isotopes has been calculated to be significantly higher than that from nuclear power plants (Gabbard 1993).

- Carbon dioxide. A coal-fired plant would have unregulated carbon dioxide emissions that could contribute to global warming.

- Summary. The GEIS analysis did not quantify emissions from coal-fired power plants but implied that air impacts would be substantial. The GEIS also mentioned global warming from unregulated carbon dioxide emissions and acid rain from SO_x and NO_x emissions as potential impacts (NRC 1996). Adverse human health effects such as cancer and emphysema have been associated with the products of coal combustion. The appropriate characterization of air impacts from coal-fired generation would be MODERATE. The impacts would be clearly noticeable, but would not destabilize air quality.

- **Waste**

Coal combustion generates waste in the form of ash, and equipment for controlling air pollution generates additional ash, spent SCR catalyst, and scrubber sludge. Four 400-MW(e) coal-fired plants would annually generate approximately 390,000 MT (430,000 tons) of ash and 532,000 MT (586,000 tons) of scrubber sludge (FPL 2001). Approximately 10 percent of the ash would be bottom ash that could be used beneficially (e.g., road base, fill, asphalt, and road surfacing) (FPL 2001). The remaining 90 percent of the ash would be fly ash. The fly ash and scrubber sludge would be disposed of in a landfill. Spent SCR catalyst would be regenerated or disposed of offsite. Waste impacts to groundwater and surface water could extend beyond the operating life of the plant if leachate and runoff from the waste storage area occurs. Disposal of the waste could noticeably affect land use and groundwater quality but, with appropriate management and monitoring, it would not destabilize any resources. After closure of the waste site and revegetation, the land could be available for some other uses.

In May 2000, the EPA issued a "Notice of Regulatory Determination on Wastes From the Combustion of Fossil Fuels" (EPA 2000b). The EPA concluded that some form of national regulation is warranted to address coal combustion waste products because (1) the composition of these wastes could present danger to human health and the environment under certain conditions; (2) EPA has identified 11 documented cases of proven damages to human health and the environment by improper management of these wastes in landfills and surface impoundments; (3) present disposal practices are such that, in 1995, these wastes were being managed in 40 percent to 70 percent of landfills and surface impoundments without reasonable controls in place, particularly in the area of groundwater monitoring; and (4) EPA identified gaps in State oversight of coal combustion wastes. Accordingly, EPA announced its intention to issue regulations for disposal of coal combustion waste under subtitle D of the Resource Conservation and Recovery Act.

Construction-related debris would be generated during construction activities.

For all of the preceding reasons, the appropriate characterization of impacts from waste generated from burning coal would be MODERATE; the impacts would be clearly noticeable but would not destabilize any important resource.

- **Human Health**

Coal-fired power generation introduces worker risks from coal and limestone mining, worker and public risks from coal and lime/limestone transportation, worker and public risks from disposal of coal combustion wastes, and public risks from inhalation of stack emissions.

Emission impacts can be widespread and health risks difficult to quantify. The coal alternative also introduces the risk of coal pile fires and attendant inhalation risks.

The staff stated in the GEIS that there could be human health impacts (cancer and emphysema) from inhalation of toxins and particulates from a coal-fired plant, but the GEIS does not identify the significance of these impacts (NRC 1996). In addition, the discharges of uranium and thorium from coal-fired plants can potentially produce radiological doses in excess of those arising from nuclear power plant operations (Gabbard 1993).

Regulatory agencies, including the EPA and State agencies, set air emission standards and requirements based on human health impacts. These agencies also impose site-specific emission limits as needed to protect human health. As discussed previously, the EPA has recently concluded that certain segments of the United States population (e.g., the developing fetus and subsistence fish-eating populations) are believed to be at potential risk of adverse health effects due to mercury exposures from sources such as coal-fired power plants. However, in the absence of more quantitative data, human health impacts from radiological doses and inhaling toxins and particulates generated by burning coal are characterized as SMALL.

- **Socioeconomics**

If a coal-fired power plant were built at an alternate site to replace power produced by St. Lucie Units 1 and 2, the communities around the St. Lucie site would experience the impact of St. Lucie operational job loss and St. Lucie County would lose tax base. These losses would have SMALL socioeconomic impacts, given the fact that St. Lucie provides less than or equal to 10 percent of the total revenue in St. Lucie County (see Section 8.1.1).

During construction of the new coal-fired plant, communities near the construction site would experience demands on housing and public services that could have MODERATE to LARGE impacts. After construction, the nearby communities would be impacted by the loss of the construction jobs. FPL estimates that the completed coal plant would employ approximately 250 to 300 workers (FPL 2001). Construction of the coal-fired alternative would take

approximately 5 years. The coal-fired plant would provide a new tax base for the local jurisdiction. The staff stated in the GEIS that socioeconomic impacts at a rural site would be larger than at an urban site because more of the peak construction work force would need to move to the area to work (NRC 1996). Socioeconomic impacts at a rural site could be LARGE. Transportation-related impacts associated with commuting construction workers at an alternate site are site-dependent, but could be MODERATE to LARGE. Transportation impacts related to commuting of plant operating personnel would also be site-dependent, but can be characterized as SMALL.

Coal and lime/limestone would likely be delivered to an alternate site by rail, although barge delivery is feasible for an alternate coastal location. Socioeconomic impacts associated with rail transportation would likely be MODERATE to LARGE. For example, there would be delays to highway traffic as trains pass and there could be negative impacts on the value of property close to the train tracks. Barge delivery of coal and lime/limestone would likely have SMALL socioeconomic impacts.

Overall, socioeconomic impacts are characterized as MODERATE to LARGE.

- **Aesthetics**

The four coal-fired power block units would be as much as 61 m (200 ft) tall and be visible from offsite during daylight hours. The four exhaust stacks would be as much as 180 m (600 ft) high. The stacks would likely be highly visible in daylight hours for distances greater than 16 km (10 mi). Cooling towers and associated plumes would also have an aesthetic impact. Natural draft towers could be up to 160 m (520 ft) high. Mechanical draft towers could be up to 30 m (100 ft) high. The stacks would be visible from parks, other recreational areas, and wildlife refuges in the vicinity of the plant. The power block units and associated stacks and cooling towers would also be visible at night because of outside lighting. The U.S. Federal Aviation Administration (FAA) generally requires that all structures exceeding an overall height of 61 m (200 ft) above ground level have markings and/or lighting so as not to impair aviation safety (FAA 2000). Visual impacts of a new coal-fired plant could be mitigated by landscaping and color selection for buildings that is consistent with the environment. Visual impact at night could be mitigated by reduced use of lighting, provided the lighting meets FAA requirements, and appropriate use of shielding. Overall, the coal-fired units and the associated exhaust stacks and cooling towers would likely have a MODERATE to LARGE aesthetic impact. There would also be an aesthetic impact that could be LARGE if construction of a new electric power transmission line is needed.

Coal-fired generation would introduce mechanical sources of noise that would be audible offsite. Sources contributing to the noise produced by plant operation are classified as continuous or intermittent. Continuous sources include the mechanical equipment associated

with normal plant operations and mechanical draft cooling towers. Intermittent sources include the equipment related to coal handling, solid-waste disposal, transportation related to coal and lime/limestone delivery, use of outside loudspeakers, and the commuting of plant employees. Noise impacts associated with rail delivery of coal and lime/limestone would be most significant for residents living in the vicinity of the facility and along the rail route. Although noise from passing trains significantly raises noise levels near the rail corridor, the short duration of the noise reduces the impact. Nevertheless, given the frequency of train transport and the fact that many people are likely to be within hearing distance of the rail route, the impacts of noise on residents in the vicinity of the facility and the rail line is considered MODERATE. Noise associated with barge transportation of coal and lime/limestone would be SMALL. Noise and light from the plant would be detectable offsite. Aesthetic impacts at the plant site would be mitigated if the plant were located in an industrial area adjacent to other power plants.

Overall, the aesthetic impacts associated with locating a coal-fired plant at an alternate Florida site can be categorized as MODERATE to LARGE.

- **Historic and Archaeological Resources**

A cultural resources inventory would likely be needed for any onsite property that has not been previously surveyed. Other lands, if any, that are acquired to support the plant would also likely need an inventory of field cultural resources, identification and recording of existing historic and archaeological resources, and possible mitigation of adverse effects from subsequent ground-disturbing actions related to physical expansion of the plant site.

Before construction, studies would likely be needed to identify, evaluate, and address mitigation of the potential impacts of new plant construction on cultural resources. The studies would likely be needed for all areas of potential disturbance at the proposed plant site and along associated corridors where new construction would occur (e.g., roads, transmission corridors, rail lines, or other rights-of-way). Historic and archaeological resource impacts can generally be effectively managed and as such are considered SMALL.

- **Environmental Justice**

Environmental impacts on minority and low-income populations associated with a replacement coal-fired plant built at an alternate Florida site would depend upon the site chosen and the nearby population distribution. Some impacts on housing availability and prices during construction might occur, and this could disproportionately affect minority and low-income populations. Closure of St. Lucie Units 1 and 2 would result in the loss of approximately 929 operating jobs. Resulting economic conditions could reduce employment prospects for minority or low-income populations. However, St. Lucie Units 1 and 2 are located in a relatively urban area with many employment possibilities. St. Lucie County would also experience a loss of property tax revenue, which could affect its ability to provide services and programs. However,

these losses would likely have SMALL environmental justice impacts given the moderate proportion of the tax base in St. Lucie County attributable to St. Lucie Units 1 and 2 (see Section 8.1.3). Overall, impacts are expected to be SMALL.

8.2.1.2 Once-Through Cooling System

The environmental impacts of constructing a coal-fired generation system at an alternate Florida site using once-through cooling are similar to the impacts for a coal-fired plant using a closed-cycle system. However, there are some environmental differences between the closed-cycle and once-through cooling systems. Table 8-3 summarizes the incremental differences.

Table 8-3. Summary of Environmental Impacts of Coal-Fired Generation at an Alternate Florida Site with Once-Through Cooling

Impact Category	Change in Impacts from Closed-Cycle Cooling System
Land Use	10 to 12 ha (25 to 30 ac) less land required because cooling towers and associated infrastructure are not needed.
Ecology	Impact would depend on ecology at the site. No impact to terrestrial ecology from cooling tower drift. Increased water withdrawal with possible greater impact to aquatic ecology.
Surface Water Use and Quality	No discharge of cooling tower blowdown. Increased water withdrawal and more thermal load on receiving body of water.
Groundwater Use and Quality	No change
Air Quality	No change
Waste	No change
Human Health	No change
Socioeconomics	No change
Aesthetics	Reduced aesthetic impact because cooling towers would not be used.
Historic and Archaeological Resources	Less land impacted
Environmental Justice	No change

8.2.2 Natural Gas-Fired Generation

The environmental impacts of a natural gas-fired plant using combined cycle combustion turbines are examined in this section for an alternate Florida site. The impacts of a plant with a closed-cycle cooling system with cooling towers are discussed in Section 8.2.2.1 and summarized in Table 8-4. The impacts of a plant with once-through cooling are discussed in Section 8.2.2.2.

Table 8-4. Summary of Environmental Impacts of Natural Gas-Fired Generation Using Closed-Cycle Cooling at an Alternate Florida Site

Impact Category	Impact	Comment
Land Use	MODERATE to LARGE	30 ha (75 ac) for power block, switchyard, cooling towers, and infrastructure support facilities. Additional impact of up to 425 ha (1050 ac) for electric power transmission line, natural gas pipeline, and cooling-water intake/discharge pipelines.
Ecology	MODERATE to LARGE	Impact depends on location and ecology of the site, surface water body used for intake and discharge, and possible electric power transmission and pipeline routes; potential habitat loss and fragmentation; reduced productivity and biological diversity; impacts to terrestrial ecology from cooling tower drift.
Water Use and Quality	SMALL to MODERATE	Impact depends on volume of water withdrawal and discharge, the constituents in the discharge water, and the characteristics of the surface water body. Discharge of cooling tower blowdown will have impacts.
Air Quality	MODERATE	Sulfur oxides • 150 MT/yr (165 tons/yr) Nitrogen oxides • 607 MT/yr (669 tons/yr) Carbon monoxide • 1402 MT/yr (1545 tons/yr) PM_{10} particulates • 89 MT/yr (98 tons/yr) Some hazardous air pollutants
Waste	SMALL	The only significant waste would be from spent SCR catalyst used for control of NO_x emissions.
Human Health	SMALL	Impacts considered to be minor.
Socioeconomics	MODERATE	During construction impacts would be MODERATE. Up to 700 additional workers during the peak of the 3-year construction period. St. Lucie County would experience loss of the tax base and employment associated with St. Lucie Units 1 and 2 with potentially SMALL impacts. Impacts during operation would be SMALL. Transportation impacts associated with construction workers would be MODERATE.
Aesthetics	MODERATE to LARGE	MODERATE impact from plant, stacks, and cooling towers and associated plumes. Additional impact that could be LARGE if a new electric power transmission line is needed.
Historic and Archaeological Resources	SMALL	Any potential impacts can likely be effectively managed.
Environmental Justice	SMALL	Impacts at alternate site vary depending on population distribution and makeup at site. St. Lucie County would lose tax revenue and jobs, however the impacts on minority and low-income populations would likely be SMALL.

The availability of natural gas in Florida is discussed in the Florida Public Service Commission's (FPSC's) *Review of Electric Utility 2001 Ten-Year Site Plans* (FPSC 2001). Currently, natural gas is supplied to Florida by the Florida Gas Transmission Company. Capacity enhancements will increase the company's pipeline capacity to 57 million m^3/day (2.0 billion ft^3/day) by 2003. The Gulfstream Natural Gas System pipeline, being constructed by subsidiaries of Williams Companies and Duke Energy, is expected to be completed in late 2002 and will bring an additional capacity of approximately 34 million m^3/day (1.2 billion ft^3/day) to Florida. The pipeline originates offshore near the Mississippi-Alabama border, extends across the Gulf of Mexico, comes ashore near Port Manatee, Florida, and terminates in Palm Beach County, Florida. Together, Florida Gas Transmission Company and the Gulfstream pipeline should have sufficient natural gas capacity to meet projected Florida demand of 79 million m^3/day (2.8 billion ft^3/day) in 2010.

For construction at an alternate site, a new pipeline would need to be constructed from the plant site to a supply point where a firm supply of gas would be available.

The staff assumed that a replacement natural gas-fired plant would use combined-cycle combustion turbines (FPL 2001). FPL estimates that the plant would consume approximately 2.86 billion m^3 (101 billion ft^3) of natural gas annually (FPL 2001). The following additional assumptions are made for the natural gas-fired plant (FPL 2001):

- three 596-MW(e) units, each consisting of two 170-MW combustion turbines and a 256-MW heat recovery boiler
- natural gas with an average heating value of 37 MJ/m^3 (1019 Btu/ft^3) as the primary fuel
- use of low-sulfur number 2 fuel oil as backup fuel
- heat rate of 2.1 J fuel/J electricity (7150 Btu/kWh)
- capacity factor of 0.9.

Unless otherwise indicated, the assumptions and numerical values used throughout this section are from the FPL ER (FPL 2001). The staff reviewed this information and compared it to environmental impact information in the GEIS. Although the OL renewal period is only 20 years, the impact of operating the natural gas-fired alternative for 40 years is considered (as a reasonable projection of the operating life of a natural gas-fired plant).

8.2.2.1 Closed-Cycle Cooling System

The overall impacts of the natural gas generating system are discussed in the following sections and summarized in Table 8-4. The extent of impacts at an alternate site will depend on the location of the particular site selected.

- **Land Use**

The natural gas-fired alternative would necessitate converting approximately 30 ha (75 ac) to industrial use for the power block, cooling towers, and infrastructure and support facilities (FPL 2001). Additional land would likely be impacted for construction of an electric power transmission line, natural gas pipeline, and water intake/discharge pipelines to serve the plant. The FPL ER assumes that these activities could impact up to 425 ha (1050 ac) (FPL 2001). For any new natural gas-fired power plant, additional land would be required for natural gas wells and collection stations. In the GEIS, the staff estimated that approximately 1500 ha (3600 ac) would be needed for a 1000 MW(e) plant (NRC 1996). Proportionately more land would be needed for a natural gas-fired plant replacing the 1678 MW(e) from St. Lucie. Partially offsetting these offsite land requirements would be the elimination of the need for uranium mining to supply fuel for St. Lucie. NRC staff stated in the GEIS (NRC 1996) that approximately 400 ha (1000 ac) would be affected for mining and processing the uranium during the operating life of a 1000 MW(e) nuclear power plant. Overall, land-use impacts for a natural gas-fired plant would be MODERATE to LARGE.

- **Ecology**

There would be ecological land-related impacts associated with siting of the gas-fired plant. If needed, there would also be temporary ecological impacts associated with bringing a new underground gas pipeline and/or electric power transmission line to the site. Ecological impacts would depend on the nature of the land converted for the plant and the possible need for a new transmission line and/or gas pipeline. Ecological impacts to the plant site and utility easements could include impacts on threatened or endangered species, wildlife habitat loss and reduced productivity, habitat fragmentation, and a local reduction in biological diversity. Cooling makeup water intake and discharge could have aquatic resource impacts. There would be some impact on terrestrial ecology from cooling tower drift. Overall, the ecological impacts are considered MODERATE to LARGE.

- **Water Use and Quality**

The impact on the surface water would depend on the discharge volume and the characteristics of the receiving body of water. Intake from and discharge to any surface body of water would be regulated by the State of Florida. There would be a consumptive use of water due to evaporation from the cooling towers. A natural gas-fired plant sited at an alternate site may use groundwater. Groundwater withdrawal impacts are considered SMALL.

Water-quality impacts from sedimentation during construction of a natural gas-fired plant was characterized in the GEIS as SMALL (NRC 1996). NRC staff also noted in the GEIS that operational water-quality impacts would be similar to, or less than, those from other generating technologies.

Overall, water-use and-quality impacts at an alternate Florida site are considered SMALL to MODERATE.

- **Air Quality**

Natural gas is a relatively clean burning fuel. The gas-fired alternative would release similar types of emissions, but in lesser quantities than the coal-fired alternative.

A new gas-fired generating plant would likely need a prevention of significant deterioration permit and an operating permit under the Clean Air Act. A new combined-cycle natural gas power plant would also be subject to the new source performance standards for such units at 40 CFR 60, Subparts Da and GG. These regulations establish emission limits for particulates, opacity, SO_2, and NO_x.

The EPA has various regulatory requirements for visibility protection in 40 CFR 51, Subpart P, including a specific requirement for review of any new major stationary source in areas, designated as attainment or unclassified under the Clean Air Act. All of the FPL preferred and potential power plant sites (FPL 2002) are in areas that are designated as attainment or unclassified for criteria pollutants.

Section 169A of the Clean Air Act (42 USC 7491) establishes a national goal of preventing future and remedying existing impairment of visibility in mandatory Class I Federal areas when impairment results from man-made air pollution. In addition, EPA regulations provide that for each mandatory Class I Federal area located within a state, the State must establish goals that provide for reasonable progress towards achieving natural visibility conditions. The reasonable progress goals must provide for an improvement in visibility for the most-impaired days over the period of the implementation plan and ensure no degradation in visibility for the least impaired days over the same period (40 CFR 51.308[d][1]). If a new natural gas-fired power station were located close to a mandatory Class I area, additional air pollution control requirements could be imposed. Mandatory Class I Federal areas in Florida are Everglades National Park, Chassahowitzka National Wildlife Refuge, and St. Marks National Wildlife Refuge (40 CFR 81.407).

FPL estimates that a natural gas-fired plant equipped with appropriate pollution control technology would have the following emissions (FPL 2001):

- sulfur oxides – 150 MT/yr (165 tons/yr)
- nitrogen oxides – 607 MT/yr (669 tons/yr)
- carbon monoxide – 1402 MT/yr (1545 tons/yr)
- PM_{10} particulates – 89 MT/yr (98 tons/yr).

A natural gas-fired plant would also have unregulated carbon dioxide emissions that could contribute to global warming.

In December 2000, the EPA issued regulatory findings on emissions of hazardous air pollutants from electric utility steam-generating units (EPA 2000a). Natural gas-fired power plants were found by EPA to emit arsenic, formaldehyde, and nickel (EPA 2000a). Unlike coal- and oil-fired plants, EPA did not determine that regulation of emissions of hazardous air pollutants from natural gas-fired power plants should be regulated under Section 112 of the Clean Air Act.

Construction activities would result in temporary fugitive dust. Exhaust emissions would also come from vehicles and motorized equipment used during the construction process.

Impacts of emissions from a gas-fired plant would be clearly noticeable, but would not be sufficient to destabilize air resources as a whole. The overall air-quality impact for a new natural gas-generating plant sited at an alternate Florida site is considered MODERATE.

- **Waste**

The only significant waste generated at a natural gas-fired plant would be spent SCR catalyst, which is used for control of NO_x emissions. The spent catalyst, approximately 31 m^3/yr (1100 ft^3/yr), would be regenerated or disposed of offsite. In the GEIS the staff concluded that waste generation from gas-fired technology would be minimal (NRC 1996). Gas firing results in few combustion by-products because of the clean nature of the fuel. Other than spent SCR catalyst, waste generation at an operating gas-fired plant would be largely limited to typical office wastes. Construction-related debris would be generated during construction activities. Overall, the waste impacts can be characterized as SMALL for a natural gas-fired plant.

- **Human Health**

In the GEIS, the staff identified cancer and emphysema as potential health risks from natural gas-fired plants (NRC 1996). The risk may be attributable to NO_x emissions that contribute to ozone formation, which in turn contribute to health risks. For a plant sited in Florida, NO_x emissions would be regulated by FDEP. Human health effects are not expected to be detectable or sufficiently minor that they would neither destabilize nor noticeably alter any important attribute of the resource. Overall, the impacts on human health of a natural gas-fired plant are considered SMALL.

- **Socioeconomics**

Construction of a natural gas-fired plant would take approximately 3 years. Peak employment could be up to 700 workers (FPL 2001). The staff assumed that construction would take place while St. Lucie continues operation and would be completed by the time St. Lucie permanently

ceases operations. During construction, the communities immediately surrounding the plant site would experience demands on housing and public services that could have MODERATE impacts. These impacts would be tempered by construction workers commuting to the site from more distant communities. After construction, the communities would be impacted by the loss of jobs. The current St. Lucie work force (929 workers) would decline through a decommissioning period to a minimal maintenance size. The new natural gas-fired plant would provide a new tax base at an alternate Florida site and provide approximately 125 permanent jobs (FPL 2001). Siting at an alternate Florida site would result in the loss of the nuclear plant tax base in St. Lucie County and associated employment. These losses would have SMALL socioeconomic impacts, given the moderate (10 percent) proportion of the tax base in St. Lucie County attributable to St. Lucie (see Section 8.1.1).

In the GEIS, the staff concluded that socioeconomic impacts from constructing a natural gas-fired plant would not be very noticeable and that the small operational work force would have the lowest socioeconomic impacts of any nonrenewable technology (NRC 1996).

Compared to the coal-fired and nuclear alternatives, the smaller size of the construction workforce, the shorter construction time frame, and the smaller size of the operations work force would mitigate socioeconomic impacts.

Transportation impacts associated with construction personnel commuting to the plant site would depend on the population density and transportation infrastructure in the vicinity of the site. The impacts can be classified as MODERATE. Impacts associated with operating personnel commuting to the plant site would be SMALL.

Overall, socioeconomic impacts resulting from construction of a natural gas-fired plant would be MODERATE.

- **Aesthetics**

The turbine buildings, exhaust stacks (approximately 61 m [200 ft] tall), cooling towers, and the plume from the cooling towers would be visible from offsite during daylight hours. The gas pipeline compressors also would be visible. Noise and light from the plant would be detectable offsite. If a new electric power transmission line is needed, the aesthetic impact could be as much as LARGE. Aesthetic impacts would be mitigated if the plant were located in an industrial area adjacent to other power plants. Overall, the aesthetic impacts associated with a replacement natural gas-fired plant at an alternate Florida site are categorized as MODERATE to LARGE, with site-specific factors determining the final categorization.

- **Historic and Archaeological Resources**

A cultural resource inventory would likely be needed for any onsite property that has not been previously surveyed. Other lands, if any, that are acquired to support the plant would also likely need an inventory of field cultural resources, identification and recording of existing historic and archaeological resources, and possible mitigation of adverse effects from subsequent ground-disturbing actions related to physical expansion of the plant site.

Before construction, studies would likely be needed to identify, evaluate, and address mitigation of the potential impacts of new plant construction on cultural resources. The studies would likely be needed for all areas of potential disturbance at the proposed plant site and along associated corridors where new construction would occur (e.g., roads, transmission and pipeline corridors, or other rights-of-way). Impacts to cultural resources can be effectively managed under current laws and regulations and kept SMALL.

- **Environmental Justice**

Environmental impacts on minority and low-income populations associated with a replacement natural gas-fired plant built at an alternate Florida site would depend upon the site chosen and the nearby population distribution. Some impacts on housing availability and prices during construction might occur, and this could disproportionately affect minority and low-income populations. Closure of St. Lucie would result in the loss of approximately 929 operating jobs. Resulting economic conditions could reduce employment prospects for minority or low-income populations. However, St. Lucie is located in a relatively urban area with many employment possibilities. St. Lucie County would also experience a loss of property tax revenue, which could affect its ability to provide services and programs. However, these losses would likely have SMALL environmental justice impacts, given the moderate proportion of the tax base in St. Lucie County attributable to St. Lucie (see Section 8.1.3). Overall, impacts are expected to be SMALL.

8.2.2.2 Once-Through Cooling System

The environmental impacts of constructing a natural gas-fired generation system at an alternate Florida location using a once-through cooling system are similar to the impacts for a natural gas-fired plant using closed-cycle cooling with cooling towers. However, there are some environmental differences between the closed-cycle and once-through cooling systems. Table 8-5 summarizes the incremental differences.

Table 8-5. Summary of Environmental Impacts of Natural Gas-Fired Generation with Once-Through Cooling at an Alternate Florida Site

Impact Category	Change in Impacts from Closed-Cycle Cooling System
Land Use	10 to 12 ha (25 to 30 ac) less land required because cooling towers and associated infrastructure are not needed.
Ecology	Impact would depend on ecology at the site. No impact to terrestrial ecology from cooling tower drift. Increased water withdrawal and possible greater impact to aquatic ecology.
Surface Water Use and Quality	No discharge of cooling tower blowdown containing dissolved solids. Increased water withdrawal and more thermal load on receiving body of water.
Groundwater Use and Quality	No change
Air Quality	No change
Waste	No change
Human Health	No change
Socioeconomics	No change
Aesthetics	Reduced aesthetic impact because cooling towers would not be used.
Historic and Archaeological Resources	Less land impacted
Environmental Justice	No change

8.2.3 Nuclear Power Generation

Since 1997, the NRC has certified three new standard designs for nuclear power plants under 10 CFR 52, Subpart B. These designs are the U.S. Advanced Boiling Water Reactor (10 CFR 52, Appendix A), the System 80+ Design (10 CFR 52, Appendix B), and the AP600 Design (10 CFR 52, Appendix C). All of these plants are light-water reactors. Although no applications for a construction permit or a combined license based on these certified designs have been submitted to the NRC, the submission of the design certification applications indicates continuing interest in the possibility of licensing new nuclear power plants. In addition, recent volatility in prices of natural gas and electricity have made new nuclear power plant construction more attractive from a cost standpoint. Additionally, Entergy Nuclear, a subsidiary of Entergy Corporation, recently announced that it will prepare an application for an early site permit for a new advanced nuclear power plant under the procedures in 10 CFR 52 Subpart A (Entergy Corporation 2002). For the preceding reasons, construction of a new nuclear power plant at an alternate Florida site using both closed- and open-cycle cooling is considered in this section. The staff assumed that the new nuclear plant would have a 40-year lifetime.

The NRC has summarized environmental data associated with the uranium fuel cycle in Table S-3 of 10 CFR 51.51. The impacts shown in Table S-3 are representative of the impacts that would be associated with a replacement nuclear power plant built to one of the certified designs. The impacts shown in Table S-3 are for a 1000-MW(e) reactor and would need to be adjusted to reflect replacement of St. Lucie, which has a capacity of 1678 MW(e). The environmental impacts associated with transporting fuel and waste to and from a light-water cooled nuclear power reactor are summarized in Table S-4 of 10 CFR 51.52. The summary of NRC's findings on NEPA issues for license renewal of nuclear power plants in Table B-1 of 10 CFR 51 Subpart A, Appendix B, is also relevant, although not directly applicable, for consideration of environmental impacts associated with the operation of a replacement nuclear power plant. Additional environmental impact information for a replacement nuclear power plant using closed-cycle cooling with cooling towers is presented in Section 8.2.3.1 and using once-through cooling in Section 8.2.3.2.

8.2.3.1 Closed-Cycle Cooling System

The overall impacts of the nuclear generating system are discussed in the following sections. The impacts are summarized in Table 8-6. The extent of impacts will depend on the location of the particular site selected.

- **Land Use**

Land-use requirements at an alternate Florida site would be approximately 200 to 400 ha (500 to 1000 ac) (NRC 1996). Additional land could be needed for an electric power transmission line, a rail spur to bring construction materials to the plant site, and/or pipelines to supply cooling-water intake and discharge. For an alternative coal-fired plant, the FPL ER (FPL 2001) estimates that these activities could impact up to 380 ha (940 ac). A similar land impact is likely for a nuclear plant. Depending particularly on transmission line routing, siting a new nuclear plant at an alternate Florida site could result in MODERATE to LARGE land-use impacts.

There would be no net change in land needed for uranium mining because land needed for the new nuclear plant would offset land needed to supply uranium for fuel for St. Lucie.

- **Ecology**

A new nuclear plant would introduce construction impacts and new incremental operational impacts. Even assuming siting at a previously disturbed area, the impacts would alter the ecology. Impacts could include wildlife habitat loss, reduced productivity, habitat fragmentation, and a local reduction in biological diversity. Intake and discharge of cooling water from a nearby surface water body could have adverse aquatic resource impacts. If needed,

Table 8-6. Summary of Environmental Impacts of New Nuclear Generation Using Closed-Cycle Cooling at an Alternate Florida Site

Impact Category	Impact	Comment
Land Use	MODERATE to LARGE	Requires approximately 200 to 400 ha (500 to 1000 ac) for the plant. Up to 380 ha (940 ac) for a new electric power transmission line, rail spur, and cooling-water intake/discharge pipelines.
Ecology	MODERATE to LARGE	Impact depends on location and ecology of the site, surface water body used for intake and discharge, and electric power transmission line route; potential habitat loss and fragmentation; reduced productivity and biological diversity; impacts to terrestrial ecology from cooling tower drift.
Water Use and Quality	SMALL to MODERATE	Impact will depend on the volume of water withdrawn and discharged, the constituents in the discharge water, and the characteristics of the surface water body. Discharges would be regulated by FDEP.
Air Quality	SMALL	Fugitive emissions and emissions from vehicles and equipment during construction. Small amounts of emissions from diesel generators, vehicles, and possibly other sources during operation.
Waste	SMALL	Waste impacts for an operating nuclear power plant are set forth in 10 CFR 51, Appendix B, Table B-1. Debris would be generated and removed during construction.
Human Health	SMALL	Human health impacts for an operating nuclear power plant are set forth in 10 CFR 51, Appendix B, Table B-1.
Socioeconomics	MODERATE to LARGE	During construction, impacts would be MODERATE to LARGE. Up to 2500 workers during the peak of the 5-year construction period. Operating work force assumed to be similar to St. Lucie. Impacts at a rural location could be LARGE. St. Lucie County would experience loss of tax base and employment with SMALL impacts. Transportation impacts associated with commuting construction workers could be MODERATE to LARGE. Transportation impacts during operation would be SMALL to MODERATE.
Aesthetics	MODERATE to LARGE	Containment buildings, cooling towers, and the plumes from cooling towers would be visible from offsite. No exhaust stacks would be needed. Daytime visual impact could be mitigated by landscaping and appropriate color selection for buildings. Visual impact at night could be mitigated by reduced use of lighting and appropriate shielding. Noise impacts would be relatively small and could be mitigated. Potential LARGE impact if a new electric power transmission line is needed.
Historic and Archaeological Resources	SMALL	Any potential impacts can likely be effectively managed.
Environmental Justice	SMALL	Impacts will vary depending on population distribution and makeup at the site. St. Lucie County would lose tax revenue and jobs, however, impacts on minority and low-income populations would likely be SMALL.

construction and maintenance of an electric power transmission line would have ecological impacts. There would be some impact on terrestrial ecology from cooling tower drift. Overall, the ecological impacts at an alternate Florida site would be MODERATE to LARGE.

- **Water Use and Quality**

Cooling water would likely be withdrawn from a surface water body. Plant discharges would consist mostly of cooling tower blowdown, characterized primarily by an increased temperature and concentration of dissolved solids relative to the receiving water body and intermittent low concentrations of biocides (e.g., chlorine). Treated process waste streams and sanitary wastewater may also be discharged. All discharges would be regulated by FDEP through a NPDES permit. Use of groundwater for a nuclear plant at an alternate site is a possibility. Groundwater withdrawal could require a permit. There would be a consumptive use of water due to evaporation from the cooling towers. Some erosion and sedimentation would likely occur during construction (NRC 1996). Overall, impacts are considered SMALL to MODERATE.

- **Air Quality**

Construction of a new nuclear plant would result in fugitive emissions during the construction process. Exhaust emissions would come from vehicles and motorized equipment during the construction process and after operation commences. An operating nuclear plant would have minor air emissions associated with diesel generators. These emissions would be regulated by FDEP. Overall, emissions and associated impacts are considered SMALL.

- **Waste**

The waste impacts associated with operation of a nuclear power plant are set forth in Table B-1 of 10 CFR 51, Subpart A, Appendix B. In addition to the impacts shown in Table B–1, construction-related debris would be generated during construction activities and removed to an appropriate disposal site. Overall, waste impacts are considered SMALL.

- **Human Health**

Human health impacts for an operating nuclear power plant are set forth in Table B-1 of 10 CFR 51, Subpart A, Appendix B. Overall, human health impacts are considered SMALL.

- **Socioeconomics**

The construction period and the peak work force associated with construction of a new nuclear power plant are currently unquantified (NRC 1996). In the absence of quantified data, the staff assumed a construction period of 5 years and a peak work force of 2500. The staff assumed

that construction would take place while the existing St. Lucie units continue operation and would be completed by the time St. Lucie permanently ceases operations. During construction, the communities surrounding the plant site would experience demands on housing, transportation, and public services that could have MODERATE to LARGE impacts. These impacts would be tempered by construction workers commuting to the site from more distant communities. In the GEIS, the staff noted that socioeconomic impacts at a rural site would be larger than at an urban site because more of the peak construction work force would need to move to the area to work (NRC 1996). Socioeconomic impacts at a rural site could be LARGE. After construction, the communities would be impacted by the loss of the construction jobs. The replacement nuclear units are assumed to have an operating work force comparable to the 929 workers currently working at St. Lucie. Transportation impacts related to commuting of plant operating personnel are considered SMALL to MODERATE. The communities around St. Lucie would experience the impact of St. Lucie operational job loss and St. Lucie County would experience the loss of tax base. However, the socioeconomic impacts would likely be SMALL (see Section 8.1.1).

- **Aesthetics**

The containment buildings for a replacement nuclear power plant, other associated buildings, the cooling towers, and the plume from the cooling towers would be visible during daylight hours. Natural draft towers could be up to 160 m (520 ft) high. Mechanical draft towers could be up to 30 m (100 ft) high and also have an associated noise impact. Visual impacts of buildings and structures could be mitigated by landscaping and selecting a color that is consistent with the environment. Visual impact at night could be mitigated by reduced use of lighting and appropriate use of shielding. There would also be a significant aesthetic impact if a new electric power transmission line were needed. No exhaust stacks would be needed.

Noise from operation of a replacement nuclear power plant would potentially be audible offsite in calm wind conditions or when the wind is blowing in the direction of the listener. Mitigation measures, such as reduced or no use of outside loudspeakers, could be employed to reduce noise level and keep the impact SMALL to MODERATE.

Overall, the aesthetic impacts can be categorized as MODERATE; however, the impact could be LARGE if a new electric power transmission line is needed to connect the plant to the power grid.

- **Historic and Archaeological Resources**

A cultural resources inventory would likely be needed for any onsite property that has not been previously surveyed. Other lands, if any, that are acquired to support the plant would also likely need an inventory of field cultural resources, identification and recording of existing historic and

archaeological resources, and possible mitigation of adverse effects from subsequent ground-disturbing actions related to physical expansion of the plant site.

Before construction, studies would likely be needed to identify, evaluate, and address mitigation of the potential impacts of new plant construction on cultural resources. The studies would likely be needed for all areas of potential disturbance at the proposed plant site and along associated corridors where new construction would occur (e.g., roads, transmission corridors, rail lines, or other rights-of-way). Historic and archaeological resource impacts can generally be effectively managed and as such are considered SMALL.

- **Environmental Justice**

Environmental impacts on minority and low-income populations associated with a replacement nuclear plant built at an alternate Florida site would depend upon the site chosen and the nearby population distribution. Some impacts on housing availability and prices during construction might occur, and this could disproportionately affect minority and low-income populations. Closure of St. Lucie would result in the loss of approximately 929 operating jobs. Resulting economic conditions could reduce employment prospects for minority or low-income populations. However, St. Lucie is located in a relatively urban area with many employment possibilities. St. Lucie County would experience a loss of property tax revenue that could affect its ability to provide services and programs. However, these losses would likely have SMALL environmental justice impacts, given the moderate (10 percent) proportion of the tax base in St. Lucie County attributable to the St. Lucie plant (see Section 8.1.3). Overall, impacts are expected to be SMALL.

8.2.3.2 Once-Through Cooling System

The environmental impacts of constructing a nuclear power plant at an alternate Florida site using once-through cooling are similar to the impacts for a nuclear power plant using closed-cycle cooling with cooling towers. However, there are some environmental differences between the closed-cycle and once-through cooling systems. Table 8-7 summarizes the incremental differences.

Table 8-7. Summary of Environmental Impacts of New Nuclear Power Generation Using Once-Through Cooling at an Alternate Florida Site

Impact Category	Change in Impacts from Closed-Cycle Cooling System
Land Use	10 to 12 ha (25 to 30 ac) less land required because cooling towers and associated infrastructure are not needed.
Ecology	Impact would depend on ecology at the site. No impact to terrestrial ecology from cooling tower drift. Increased water withdrawal with possible greater impact to aquatic ecology.
Surface Water Use and Quality	No discharge of cooling tower blowdown. Increased water withdrawal and more thermal load on receiving body of water.
Groundwater Use and Quality	No change
Air Quality	No change
Waste	No change
Human Health	No change
Socioeconomics	No change
Aesthetics	Reduced aesthetic impact because cooling towers would not be used.
Historic and Archaeological Resources	Less land impacted
Environmental Justice	No change

8.2.4 Purchased Electrical Power

If available, purchased power from other sources could potentially obviate the need to renew the St. Lucie Units 1 and 2 OLs. FPL currently purchases power from other generators. Overall, Florida is a net importer of electricity.

FPL includes future power purchases in its *Ten Year Power Plant Site Plan* (FPL 2002). The Plan indicates how FPL will meet customers' energy needs through existing generation, customer demand-side options, short-term purchase power transactions, and new generating resources constructed by FPL. The 2002 Plan shows power purchases of 2403 MW for the summer of 2002, dropping to 1757 MW for the summers of 2005 and 2006, and then decreasing further to 382 MW in the summers of 2010 and 2011 (FPL 2002). FPL purchases additional capacity in the short-term power market as necessary.

Imported power from Canada or Mexico is unlikely to be available for replacement of St. Lucie capacity. In Canada, 62 percent of the country's electricity capacity is derived from renewable energy sources, principally hydropower (DOE/EIA 2002). Canada has plans to continue developing hydroelectric power, but the plans generally do not include large-scale projects (DOE/EIA 2002). Canada's nuclear generation capacity is projected to increase by 2020, but its share of electric power generation in Canada is projected to decrease from 14 percent

currently to 13 percent by 2020 (DOE/EIA 2002). EIA projects that total gross United States imports of electricity from Canada and Mexico will gradually increase from 47.9 billion kWh in year 2000 to 66.1 billion kWh in year 2005 and then gradually decrease to 47.4 billion kWh in year 2020 (DOE/EIA 2001a). On balance, it appears unlikely that electricity imported from Canada or Mexico would be able to replace the St. Lucie capacity.

If power to replace St. Lucie capacity were to be purchased from sources within the United States or a foreign country, the generating technology likely would be one of those described in this SEIS and in the GEIS (probably coal, natural gas, or nuclear). The description of the environmental impacts of other technologies in Chapter 8 of the GEIS is representative of the impacts associated with the purchased electrical power alternative to renewal of the St. Lucie OLs. Under the purchased power alternative, the environmental impacts of imported power would still occur, but would be located elsewhere within the region, nation, or another country.

If implemented, the purchase power alternative could necessitate adding as much as 500 km (300 mi) of electric power transmission lines to import power to central Florida (FPL 2001). Assuming a 110-m (350-ft) right-of-way, the lines could impact up to 5140 ha (12,700 ac) and have MODERATE to LARGE land-use and aesthetic impacts.

8.2.5 Other Alternatives

Other generation technologies are discussed in the following sections.

8.2.5.1 Oil-Fired Generation

The EIA projects that oil-fired plants will account for very little of the new generation capacity in the United States through the year 2020 because of higher fuel costs and lower efficiencies (DOE/EIA 2001a). Oil-fired operation is more expensive than coal, natural gas, or nuclear generation alternatives. In addition, future increases in oil prices are expected to make oil-fired generation increasingly more expensive than other generation alternatives. The high cost of oil has prompted a steady decline in its use for electricity generation. In Section 8.3.11 of the GEIS, the staff estimated that construction of a 1000-MW(e) oil-fired plant would require about 49 ha (120 ac) (NRC 1996). Operation of oil-fired plants would have environmental impacts (including impacts on the aquatic environment and air) that would be similar to those from a coal-fired plant.

8.2.5.2 Wind Power

Most of Florida is in a wind power Class 1 region (average wind speeds at 9-m (30-ft) elevation of 0 to 4.4 m/s (9.8 mph). Class 1 has the lowest potential for wind energy generation (DOE 2002a). Wind turbines are economical in wind power Classes 4 through 7 (average wind speeds of 5.6 to 9.4 m/s [12.5 to 21.1 mph] [DOE 2002a]). Wind turbines typically operate at a

25 to 35 percent capacity factor compared to 80 to 95 percent for a base-load plant (NWPPC 2000). As of December 31, 2000, there were no grid-connected wind power plants in Florida (NREL 2001). Nine offshore wind power projects are currently operating in Europe, but none have been developed in the United States. The European plants together provide approximately 90 MW, which is far less than the electrical output of St. Lucie (British Wind Energy Association 2002). For the preceding reasons, the staff concludes that locating a wind-energy facility on or near the St. Lucie site or offshore as a replacement for St. Lucie generating capacity would not be economically feasible given the current state of wind energy generation technology.

8.2.5.3 Solar Power

Solar technologies use the sun's energy and light to provide heat and cooling, light, hot water, and electricity for homes, businesses, and industry. Solar power technologies, photovoltaic and thermal, cannot currently compete with conventional fossil-fueled technologies in grid-connected applications due to higher capital costs per kilowatt of capacity. The average capacity factor of photovoltaic cells is about 25 percent (NRC 1996), and the capacity factor for solar thermal systems is about 25 percent to 40 percent (NRC 1996). Energy storage requirements limit the use of solar-energy systems as base-load electricity supply.

There are substantial impacts to natural resources (wildlife habitat, land-use, and aesthetic impacts) from construction of solar-generating facilities. As stated in the GEIS, land requirements are high—14,000 ha (55 mi^2) per 1000 MW(e) for photovoltaic (NRC 1996) and approximately 5700 ha (22 mi^2) per 1000 MW(e) for solar thermal systems (NRC 1996). Neither type of solar electric system would fit at the St. Lucie site, and both would have large environmental impacts at an alternate site.

The St. Lucie site receives approximately 4 to 5 kWh of direct normal solar radiation per square meter per day compared to 7 to 8 kWh of solar radiation per square meter per day in areas of the western United States such as California, which are most promising for solar technologies (DOE/EIA 2000). Because of the natural resource impacts (land and ecological), the area's relatively low rate of solar radiation, and high cost, solar power is not deemed a feasible base-load alternative to renewal of the St. Lucie OLs. Some onsite generated solar power, e.g., from rooftop photovoltaic applications, may substitute for electric power from the grid. Implementation of solar generation on a scale large enough to replace St. Lucie would likely result in LARGE environmental impacts.

8.2.5.4 Hydropower

Florida has an estimated 43 MW of undeveloped hydroelectric resource (INEEL 1998). This amount is significantly less than needed to replace the 1678 MW(e) capacity of St. Lucie. As

stated in Section 8.3.4 of the GEIS, hydropower's percentage of United States generating capacity is expected to decline because hydroelectric facilities have become difficult to site as a result of public concern about land requirements, destruction of natural habitat, and alteration of natural river courses. EIA states that potential sites for hydroelectric dams have already been largely established in the United States, and environmental concerns are expected to prevent the development of any new sites in the future (DOE/EIA 2002). In the GEIS, the staff estimated that land requirements for hydroelectric power are approximately 400,000 ha (1 million ac) per 1000 MW(e) (NRC 1996). Replacement of St. Lucie generating capacity would require flooding more than this amount of land. Due to the relatively low amount of undeveloped hydropower resource in Florida and the large land-use and related environmental and ecological resource impacts associated with siting hydroelectric facilities large enough to replace St. Lucie, the staff concludes that local hydropower is not a feasible alternative to renewal of the St. Lucie OLs. Any attempts to site hydroelectric facilities large enough to replace St. Lucie would result in LARGE environmental impacts.

8.2.5.5 Geothermal Energy

Geothermal energy has an average capacity factor of 90 percent and can be used for base-load power where available. However, geothermal technology is not widely used as base-load generation due to the limited geographical availability of the resource and immature status of the technology (NRC 1996). As illustrated by Figure 8.4 in the GEIS, geothermal plants are most likely to be sited in the western continental United States, Alaska, and Hawaii where hydrothermal reservoirs are prevalent. There is no feasible eastern location for geothermal capacity to serve as an alternative to St. Lucie. The staff concludes that geothermal energy is not a feasible alternative to renewal of the St. Lucie OLs.

8.2.5.6 Wood Waste

A wood-burning facility can provide base-load power and operate with an average annual capacity factor of around 70 to 80 percent and with 20 to 25 percent energy conversion efficiency (NRC 1996). The energy conversion efficiency of a conventional fossil-fired plant is on the order of 35 percent. The fuels required are variable and site-specific. A significant barrier to the use of wood waste to generate electricity is the high delivered fuel cost and high construction cost per MW of generating capacity. The larger wood-waste power plants are only 40 to 50 MW(e) in size. Estimates in the GEIS suggest that the overall level of construction impact per MW of installed capacity should be approximately the same as that for a coal-fired plant, although facilities using wood waste for fuel would be built at smaller scales (NRC 1996). Like coal-fired plants, wood-waste plants require large areas for fuel storage and processing and involve the same type of combustion equipment.

Due to uncertainties associated with obtaining sufficient wood and wood waste to fuel a base-load generating facility, ecological impacts of large-scale timber cutting (e.g., soil erosion and

loss of wildlife habitat), and relatively low energy conversion efficiency, the staff has determined that wood waste is not a feasible alternative to renewing the St. Lucie OLs.

8.2.5.7 Municipal Solid Waste

Municipal waste combustors incinerate waste and use the resultant heat to generate steam, hot water, or electricity. The combustion process can reduce the volume of waste by up to 90 percent and the weight of the waste by up to 75 percent (EPA 2001). Municipal waste combustors use three basic types of technologies: mass burn, modular, and refuse-derived fuel (DOE/EIA 2001b). Mass burning technologies are most commonly used in the United States. This group of technologies processes raw municipal solid waste "as is," with little or no sizing, shredding, or separation before combustion. The initial capital costs for municipal solid-waste plants are greater than for comparable steam-turbine technology at wood-waste facilities. This is due to the need for specialized waste-separation and -handling equipment for municipal solid waste (NRC 1996).

Growth in the municipal waste combustion industry slowed dramatically during the 1990s after rapid growth during the 1980s. The slower growth was due to three primary factors: (1) the Tax Reform Act of 1986, which made capital-intensive projects such as municipal waste combustion facilities more expensive relative to less capital-intensive waste disposal alternative such as landfills; (2) the 1994 Supreme Court decision (*C&A Carbone, Inc. v. Town of Clarkstown*), which struck down local flow control ordinances that required waste to be delivered to specific municipal waste combustion facilities rather than landfills with lower fees; and (3) increasingly stringent environmental regulations that increased the capital cost necessary to construct and maintain municipal waste combustion facilities (DOE/EIA 2001b).

Municipal solid waste combustors generate an ash residue that is buried in landfills. The ash residue is composed of bottom ash and fly ash. Bottom ash refers to that portion of the unburned waste that falls to the bottom of the grate or furnace. Fly ash represents the small particles that rise from the furnace during the combustion process. Fly ash is generally removed from flue-gases using fabric filters and/or scrubbers (DOE/EIA 2001b).

Currently, there are approximately 102 waste-to-energy plants operating in the United States. These plants generate approximately 2800 MW(e), or an average of approximately 28 MW(e) per plant (Integrated Waste Services Association 2001). The staff concludes that generating electricity from municipal solid waste would not be a feasible alternative to replace the 1678 MW(e) base-load capacity of St. Lucie and, consequently, would not be a feasible alternative to renewal of the St. Lucie OLs.

8.2.5.8 Other Biomass-Derived Fuels

In addition to wood and municipal solid waste fuels, there are several other concepts for fueling electric generators, including crops, crops converted to a liquid fuel such as ethanol, and crops (including wood waste) that have been converted to a gas. In the GEIS, the staff stated that none of these technologies has progressed to the point of being competitive on a large scale or of being reliable enough to replace a base-load plant such as St. Lucie (NRC 1996). For these reasons, such fuels do not offer a feasible alternative to renewal of the St. Lucie OLs.

8.2.5.9 Fuel Cells

Fuel cells work without combustion and its environmental side effects. Power is produced electrochemically by passing a hydrogen-rich fuel over an anode and air over a cathode and separating the two by an electrolyte. The only by-products are heat, water, and carbon dioxide. Hydrogen fuel can come from a variety of hydrocarbon resources by subjecting them to steam under pressure. Natural gas is typically used as the source of hydrogen.

Phosphoric acid fuel cells are generally considered first-generation technology. These are commercially available today at a cost of approximately $4500 per kW of installed capacity (DOE 2002b). Higher-temperature second-generation fuel cells achieve higher fuel-to-electricity and thermal efficiencies. The higher temperatures contribute to improved efficiencies and give the second-generation fuel cells the capability to generate steam for cogeneration and combined-cycle operations. DOE has a performance target that by 2003, two second-generation fuel cell technologies using molten carbonate and solid oxide technology, respectively, will be commercially available in sizes up to approximately 3 MW at a cost of $1000 to $1500 per kW of installed capacity (DOE 2002b). For comparison, the installed capacity cost for a natural gas-fired combined-cycle plant is approximately $456 per kW (DOE/EIA 2001a). As market acceptance and manufacturing capacity increase, natural gas-fueled fuel cell plants in the 50- to 100-MW range are projected to become available. At the present time, however, fuel cells are not economically or technologically competitive with other alternatives for base-load electricity generation. Fuel cells are, consequently, not a feasible alternative to renewal of the St. Lucie OLs.

8.2.5.10 Delayed Retirement

FPL has no current plans to retire any existing generating units. For this reason, delayed retirement of FPL generating units would not be a feasible alternative to renewal of the St. Lucie OLs.

8.2.5.11 Utility-Sponsored Conservation

FPL has developed residential, commercial, and industrial programs to reduce both peak demands and daily energy consumption. These programs are commonly referred to as demand-side management (DSM). FPL's DSM programs through 2001 have resulted in a cumulative summer peak reduction of approximately 2790 MW at the meter (FPL 2002). FPL's additional incremental summer peak reduction goals attributable to DSM programs are 269 MW at the meter for 2002 increasing to 765 MW by 2009 (FPL 2002). These goals have been approved by the Florida Public Service Commission (FPL 2001).

FPL's current DSM program includes the following components (FPL 2002):

- Residential Conservation Service – This is an energy audit program designed to assist residential customers in understanding how to make their homes more energy-efficient through the installation of conservation measures and practices.
- Residential Building Envelope – This program encourages the installation of energy-efficient ceiling insulation in residential dwellings that use whole-house electric air conditioning.
- Duct System Testing and Repair – This program encourages demand and energy conservation through the identification of air leaks in whole-house air conditioning duct systems and the repair of those leaks by qualified contractors.
- Residential Air Conditioning – This program is designed to encourage customers to purchase higher-efficiency central cooling and heating equipment.
- Residential Load Management (On Call) – This program offers load control of major appliances and household equipment to residential customers in exchange for monthly electric bill credits.
- New Construction (BuildSmart) – This program encourages the design and construction of energy-efficient homes that cost-effectively reduce FPL's coincident peak demand and energy consumption.
- Business Energy Evaluation – This program encourages energy efficiency in both new and existing commercial and industrial facilities by identifying DSM opportunities and providing recommendations to the customer.
- Commercial/Industrial Heating, Ventilating, and Air Conditioning – This program encourages the use of high-efficiency heating, ventilating, and air conditioning systems in commercial and industrial facilities.
- Commercial/Industrial Efficient Lighting – This program encourages the installation of energy-efficient lighting measures in commercial and industrial facilities.

- Business Custom Incentive – This program encourages commercial and industrial customers to implement unique energy conservation measures or projects not covered by other FPL programs.
- Commercial/Industrial Load Control – This program reduces peak demand by controlling customer loads of 200 kW or greater during periods of extreme demand or capacity shortages in exchange for monthly electric bill credits.
- Commercial/Industrial Building Envelope – This program encourages the installation of energy-efficient building envelope measures such as window treatments and roof/ceiling insulation.
- Business on Call – This program offers load control of central air conditioning units to small, non-demand billed and medium, demand-billed commercial and industrial customers in exchange for monthly electric bill credits.

FPL's DSM program also includes a variety of research and development activities (FPL 2002).

Historic and projected reduction in generation needs as a result of DSM programs have been credited in the FPL *Ten Year Power Plant Site Plan 2002-2011* (FPL 2002) to meet part of FPL's projected customer demand. Because these DSM savings are part of the long-range plan for meeting projected demand, they are not available offsets for St. Lucie. Therefore, the conservation option is not considered a reasonable replacement for the OL renewal alternative.

8.2.6 Combination of Alternatives

Even though individual alternatives might not be sufficient on their own to replace St. Lucie capacity due to the small size of the resource or lack of cost-effective opportunities, it is conceivable that a combination of alternatives might be cost-effective.

As discussed in Section 8.2, St. Lucie has a combined average net capacity of 1678 MW(e). For the natural gas combined-cycle alternative, FPL assumed three 596-MW units in its ER (FPL 2001) as potential replacements for the two St. Lucie nuclear units. The staff also assumed three 596-MW units as potential replacements for the two St. Lucie units in Section 8.2.2.

There are many possible combinations of alternatives. Table 8-8 contains a summary of the environmental impacts of an assumed combination of alternatives consisting of 1192 MW(e) of combined-cycle natural gas-fired generation (two 596-MW units) at an alternate Florida site using closed-cycle cooling, 298 MW(e) purchased from other generators, and 298 MW(e) gained from additional DSM measures. The impacts associated with the combined-cycle natural gas-fired units are based on the gas-fired generation impact assumptions discussed in Section 8.2.2, adjusted for the reduced generating capacity. While the DSM measures would have few environmental impacts, operation of the new natural gas-fired plant would result in increased emissions (compared to the OL renewal alternative) and other environmental

impacts. The environmental impacts associated with power purchased from other generators would still occur, but would be located elsewhere within the region, nation, or another country as discussed in Section 8.2.4. The environmental impacts associated with purchased power are not shown in Table 8-8. The staff concludes that it is very unlikely that the environmental impacts of any reasonable combination of generating and conservation options could be reduced to the level of impacts associated with renewal of the St. Lucie OLs.

Table 8-8. Summary of Environmental Impacts for an Assumed Combination of Generating and Acquisition Alternatives

Impact Category	Impact	Comment
Land Use	MODERATE to LARGE	20 ha (50 ac) for power block, offices, roads, and parking areas. Additional impact for construction of an underground natural gas pipeline, electric power transmission line, and cooling-water intake/discharge pipelines.
Ecology	MODERATE to LARGE	Impact depends on location and ecology of the site, surface water body used for intake and discharge, and transmission and pipeline routes; potential habitat loss and fragmentation; reduced productivity and biological diversity; impacts to terrestrial ecology from cooling tower drift.
Water Use and Quality	SMALL to MODERATE	Impact depends on volume of water withdrawal and discharge, the constituents in the discharge water, and the characteristics of the surface water body. Discharge of cooling tower blowdown will have impacts.
Air Quality	MODERATE	Sulfur oxides: 100 MT/yr (110 tons/yr) Nitrogen oxides: 406 MT/yr (448 tons/yr) Carbon monoxide: 939 MT/yr (1035 tons/yr) PM_{10} particulates: 59 MT/yr (65 tons/yr) Some hazardous air pollutants.
Waste	SMALL	The only significant waste would be from spent SCR catalyst used for control of NO_x emissions.
Human Health	SMALL	Impacts considered to be minor.
Socioeconomics	MODERATE	Construction impacts depend on location, but could be significant if location is in a rural area. St. Lucie County would experience loss of tax base and employment with potentially SMALL impacts. Impacts during operation would be SMALL. Transportation impacts associated with construction workers would be MODERATE.

Table 8.8. (contd)

Impact Category	Impact	Comment
Aesthetics	MODERATE to LARGE	MODERATE impact from plant, stacks, and cooling towers and associated plumes. Additional impact that could be LARGE if a new electric power transmission line is needed.
Historic and Archaeological Resources	SMALL	Any potential impacts can likely be effectively managed.
Environmental Justice	SMALL	Impacts vary depending on population distribution and makeup at site. St. Lucie County would lose tax revenue and jobs; however, the impacts on minority and low-income populations would likely be SMALL.

8.3 Summary of Alternatives Considered

The environmental impacts of the proposed action, renewal of the St. Lucie OLs, are SMALL for all impact categories (except collective offsite radiological impacts from the fuel cycle and from high-level waste and spent fuel disposal, for which a single significance level was not assigned). Alternative actions, i.e., no-action alternative (discussed in Section 8.1), new generation alternatives (from coal, natural gas, and nuclear discussed in Sections 8.2.1 through 8.2.3, respectively), purchased electrical power (discussed in Section 8.2.4), alternative technologies (discussed in Section 8.2.5), and the combination of alternatives (discussed in Section 8.2.6) were considered.

The no-action alternative would result in decommissioning St. Lucie Units 1 and 2 and would have SMALL environmental impacts for all impact categories. The no action alternative is a conceptual alternative resulting in a net reduction in power production, but with no environmental impacts assumed for replacement power. In actual practice, the power lost by not renewing the St. Lucie Unit 1 and 2 OLs would likely be replaced by (1) DSM and energy conservation, (2) power purchased from other electricity providers, (3) generating alternatives other than St. Lucie, or (4) some combination of these options. This replacement power would produce additional environmental impacts as discussed in Section 8.2.

For each of the new generation alternatives (coal, natural gas, and nuclear), the environmental impacts would not be less than the impacts of license renewal. For example, the land-disturbance impacts resulting from construction of any new facility would be greater than the impacts of continued operation of St. Lucie. The impacts of purchased electrical power would

still occur, but would occur elsewhere. Alternative technologies are not considered feasible at this time and it is very unlikely that the environmental impacts of any reasonable combination of generation and conservation options could be reduced to the level of impacts associated with renewal of the OLs for St. Lucie.

8.4 References

10 CFR 50. Code of Federal Regulations, Title 10, *Energy,* Part 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51. Code of Federal Regulations, Title 10, *Energy,* Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Functions."

10 CFR 52. Code of Federal Regulations, Title 10, *Energy,* Part 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

40 CFR 51. Code of Federal Regulations, Title 40, *Protection of Environment,* Part 51, "Requirements for Preparation, Adoption, and Submittal of Implementation Plans."

40 CFR 60. Code of Federal Regulations, Title 40, *Protection of Environment,* Part 60, "Standards of Performance for New Stationary Sources."

40 CFR 81. Code of Federal Regulations, Title 40, *Protection of Environment,* Part 81, "Designation of Areas for Air Quality Planning Purposes."

British Wind Energy Association. 2002. http://www.offshorewindfarms.co.uk/else.html. Accessed June 4, 2002.

C & A Carbone, Inc. v. Town of Clarkstown, 511 U.S. 383, (U.S. Supreme Court 1994).

Clean Air Act (CAA). 42 USC. 7401, et seq.

Entergy Corporation. 2002. News Release – "Entergy Will Prepare Early Site Permit at Grand Gulf Nuclear Station." http://www.entergy.com/news_database/news-detail.asp?ID=350&RC=CORP&List=Region. Accessed June 4, 2002.

Florida Department of Environmental Protection (FDEP). 2002. "Environmental Resource Permitting Program Mangrove Coordination." http://www.dep.state.fl.us/water/wetlands/mangroves/mangrove.htm. Accessed April 10, 2002.

Florida Mangrove Trimming and Preservation Act, Florida Statutes, Sections 403.9321-403.9333.

Florida Power and Light Company (FPL). 2001. *Applicant's Environmental Report – Operating License Renewal Stage St. Lucie Units 1 & 2.* Docket Nos. 50-335 and 50-389, Miami, Florida.

Florida Power and Light Company (FPL). 2002. *Ten Year Power Plant Site Plan 2002 - 2011.* Miami, Florida.

Florida Public Service Commission (FPSC). 2001. *Review of Electric Utility 2001 Ten-Year Site Plans.* http://www.psc.state.fl.us/general/publications/tysp2001.pdf. Accessed March 26, 2002.

Gabbard, A. 1993. "Coal Combustion: Nuclear Resource or Danger," *Oak Ridge National Laboratory Review.* Oak Ridge National Laboratory: Oak Ridge, Tennessee. http://www.ornl.gov/ORNLReview/rev26-34/text/colmain.html. Accessed April 10, 2002.

Idaho National Engineering and Environmental Laboratory (INEEL). 1998. *U.S. Hydropower Resource Assessment for Florida* . DOE/ID-10430(FL), Idaho Falls, Idaho. http://hydropower.inel.gov/state/fl/flappa.htm. Accessed March, 27, 2002.

Integrated Waste Services Association. 2001. "About Waste to Energy." http://www.wte.org/waste.html. Accessed June 4, 2002.

National Environmental Policy Act of 1969 (NEPA). 42 USC 4321, et seq.

National Renewable Energy Laboratory (NREL). 2001. *IEA Wind Energy Annual Report 2000.* Golden, Colorado. http://www.iea.org/impagr/imporg/ann_reps/Wind00/WIND.HTM. Accessed May 10, 2002.

Northwest Power Planning Council (NWPPC). 2000. "Northwest Power Supply Adequacy/ Reliability Study Phase I Report." http://www.nwcouncil.org/library/2000/2000-4a.pdf. Accessed June 4, 2002.

Resource Conservation and Recovery Act (RCRA) of 1976. 42 USC 6901, et seq., as amended.

U.S. Department of Energy, Energy Information Administration (DOE/EIA). 2000. *Energy Consumption and Renewable Energy Development Potential on Indian Lands.* SR/CNEAF/2000-01, Washington, D.C. http://www.eia.doe.gov/bookshelf/renew.html. Accessed February 19, 2002.

U.S. Department of Energy, Energy Information Administration (DOE/EIA). 2001a. *Annual Energy Outlook 2002 with Projections to 2020.* DOE/EIA-0383(2002), Washington, D.C. http://www.eia.doe.gov/oiaf/fore_pub.html. Accessed February 19, 2002.

U.S. Department of Energy, Energy Information Administration (DOE/EIA). 2001b. *Renewable Energy 2000: Issues and Trends.* DOE/EIA-0628(2000), Washington, D.C. http://tonto.eia.doe.gov/FTPROOT/renewables/06282000.pdf. Accessed February 19, 2002.

U.S. Department of Energy, Energy Information Administration (DOE/EIA). 2002. *International Energy Outlook 2002.* DOE/EIA-0484(2002). Washington, D.C. http://www.eia.doe.gov/oiaf/ieo/index.html. Accessed May 10, 2002.

U.S. Department of Energy (DOE). 2002a. "U.S. Wind Energy Resource Map." http://www.eren.doe.gov/wind/we_map.html. Accessed March 27, 2002.

U.S. Department of Energy (DOE). 2002b. "Fuel Cell Technology." http://www.fe.doe.gov/coal_power/fuelcells/index.shtml. Accessed March 27, 2002.

U.S. Environmental Protection Agency (EPA). 2000a. "Regulatory Finding on the Emissions of Hazardous Air Pollutants from Electric Utility Steam Generating Units." *Federal Register.* Vol. 65, No. 245, pp. 79825-79831. Washington, D.C. (December 20, 2000.)

U.S. Environmental Protection Agency (EPA). 2000b. "Notice of Regulatory Determination on Wastes From the Combustion of Fossil Fuels." *Federal Register.* Vol. 65, No. 99, pp. 32214-32237. Washington, D.C. (May 22, 2000.)

U.S. Environmental Protection Agency (EPA). 2001. "Municipal Solid Waste Disposal." http://www.epa.gov/epaoswer/non-hw/muncpl/disposal.htm. Accessed February 19, 2002.

U.S. Federal Aviation Administration (FAA). 2000. "Obstruction Marking and Lighting." Advisory Circular AC 70/7460-1K. http://www.faa.gov/ats/ata/ai/circV.pdf. Accessed May 17, 2002.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants.* NUREG-1437, Volumes 1 and 2, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Main Report.* "Section 6.3 – Transportation, Table 9.1 Summary of findings on NEPA issues for license renewal of nuclear power plants, Final Report." NUREG-1437, Volume 1, Addendum 1, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 2001a. "Notice of Availability of the Draft Supplement to the Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities and Notice of Public Meetings." *Federal Register.* Vol. 66, No. 218, pp. 56721-56722. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 2001b. "NRC Organizes Future Licensing Project Organization." Press Release No. 01-035, March 30, 2001.

9.0 Summary and Conclusions

By letter dated November 29, 2001, the Florida Power and Light Company (FPL) submitted an application to the U.S. Nuclear Regulatory Commission (NRC) to renew the operating licenses (OLs) for St. Lucie Units 1 and 2 for an additional 20-year period (FPL 2001a). If the OLs are renewed, State regulatory agencies and FPL will ultimately decide whether the plant will continue to operate based on factors such as the need for power or other matters within the State's jurisdiction or the purview of the owners. If the OLs are not renewed, then the plant must be shut down at or before the expiration of the current OLs, which expire on March 1, 2016, for Unit 1, and April 6, 2023, for Unit 2.

Section 102 of the National Environmental Policy Act (NEPA) (42 USC 4321) directs that an environmental impact statement (EIS) is required for major Federal actions that significantly affect the quality of the human environment. The NRC has implemented Section 102 of NEPA in 10 CFR Part 51. Part 51 identifies licensing and regulatory actions that require an EIS. In 10 CFR 51.20(b)(2), the Commission requires preparation of an EIS or a supplement to an EIS for renewal of a reactor OL; 10 CFR 51.95(c) states that the EIS prepared at the OL renewal stage will be a supplement to the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437, Volumes 1 and 2 (NRC 1996, 1999).[a]

Upon acceptance of the FPL application, the NRC began the environmental review process described in 10 CFR Part 51 by publishing a notice of intent to prepare an EIS and conduct scoping (67 FR 9333 [NRC 2002a]) on February 28, 2002. The staff visited the St. Lucie site in April 2002 and held public scoping meetings on April 3, 2002, in Port St. Lucie, Florida (NRC 2002b). The staff reviewed the FPL Environmental Report (ER; FPL 2001b), compared it to the GEIS, consulted with other agencies, and conducted an independent review of the issues following the guidance set forth in NUREG-1555, Supplement 1, *The Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal* (NRC 2000). The staff also considered the public comments received during the scoping process for preparation of this draft supplemental environmental impact statement (SEIS) for St. Lucie Units 1 and 2. The public comments received during the scoping process that were considered to be within the scope of the environmental review are provided in Appendix A, Part I, of this SEIS.

The staff will hold two public meetings in Port St. Lucie, Florida, in December 2002 to describe the preliminary results of the NRC environmental review, answer questions on the staff's preliminary analysis, and to provide members of the public with information to assist them in

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1.

formulating their comments on the draft SEIS. When the comment period ends, the staff will consider and disposition all of the comments received. These comments will be addressed in Appendix A, Part II, of the final SEIS.

This draft SEIS includes the NRC staff's preliminary analysis that considers and weighs the environmental effects of the proposed action, the environmental impacts of alternatives to the proposed action, and mitigation measures available for reducing or avoiding adverse effects. It also includes the staff's preliminary recommendation regarding the proposed action.

The NRC has adopted the following statement of purpose and need for license renewal from the GEIS:

> The purpose and need for the proposed action (renewal of an operating license) is to provide an option that allows for power generation capability beyond the term of a current nuclear power plant operating license to meet future system generating needs, as such needs may be determined by State, utility, and, where authorized, Federal (other than NRC) decisionmakers.

The goal of the staff's environmental review, as stated in 10 CFR 51.95(c)(4) and the GEIS, is to determine

> ...whether or not the adverse environmental impacts of license renewal are so great that preserving the option of license renewal for energy planning decisionmakers would be unreasonable.

Both the statement of purpose and need and the evaluation criterion implicitly acknowledge that there are factors, in addition to license renewal, that will ultimately determine whether an existing nuclear power plant continues to operate beyond the period of the current OL.

NRC regulations [10 CFR 51.95(c)(2)] contain the following statement regarding the content of SEISs prepared at the license renewal stage:

> The supplemental environmental impact statement for license renewal is not required to include discussion of need for power or the economic costs and economic benefits of the proposed action or of alternatives to the proposed action except insofar as such benefits and costs are either essential for a determination regarding the inclusion of an alternative in the range of alternatives considered or relevant to mitigation. In addition, the supplemental environmental impact statement prepared at the license renewal stage need not discuss other issues not related to the environmental effects of the proposed action and the alternatives, or any aspect of the storage of spent fuel for the facility

within the scope of the generic determination in § 51.23(a) and in accordance with § 51.23(b).[a]

The GEIS contains the results of a systematic evaluation of the consequences of renewing an OL and operating a nuclear power plant for an additional 20 years. The staff evaluated 92 environmental issues in the GEIS using the NRC's three-level standard of significance—SMALL, MODERATE, or LARGE—developed using the Council on Environmental Quality guidelines. The following definitions of the three significance levels are set forth in the footnotes to Table B-1 of 10 CFR Part 51, Subpart A, Appendix B:

SMALL – Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.

MODERATE – Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.

LARGE – Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

For 69 of the 92 issues considered in the GEIS, the staff analysis in the GEIS shows the following:

(1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristic.

(2) A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the impacts (except for collective offsite radiological impacts from the fuel cycle and from high-level waste [HLW] and spent fuel disposal).

(3) Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are likely not to be sufficiently beneficial to warrant implementation.

(a) The title of 10 CFR 51.23 is "Temporary storage of spent fuel after cessation of reactor operations–generic determination of no significant environmental impact."

These 69 issues were identified in the GEIS as Category 1 issues. In the absence of new and significant information, the staff relied on conclusions as amplified by supporting information in the GEIS for issues designated Category 1 in Table B-1 of 10 CFR Part 51, Subpart A, Appendix B.

Of the 23 issues that do not meet the criteria set forth above, 21 are classified as Category 2 issues requiring analysis in a plant-specific supplement to the GEIS. The remaining two issues, environmental justice and chronic effects of electromagnetic fields, were not categorized. Environmental justice was not evaluated on a generic basis and must also be addressed in a plant-specific supplement to the GEIS. Information on the chronic effects of electromagnetic fields was not conclusive at the time the GEIS was prepared.

This draft SEIS documents the staff's evaluation of all 92 environmental issues considered in the GEIS. The staff considered the environmental impacts associated with alternatives to license renewal and compared the environmental impacts of license renewal and the alternatives. The alternatives to license renewal that were considered include the no-action alternative (not renewing the OLs for St. Lucie Units 1 and 2, not replacing the power produced by St. Lucie Units 1 and 2, and decommissioning both units) and not renewing the OLs for St. Lucie Units 1 and 2 and replacing their power production with alternative methods of power generation. These alternatives were evaluated assuming that the replacement power generation plant is located at potential power plant sites identified in FPL's *Ten Year Power Plant Site Plan* (FPL 2002) or some other unspecified location.

9.1 Environmental Impacts of the Proposed Action – License Renewal

FPL and the staff have established independent processes for identifying and evaluating the significance of any new information on the environmental impacts of license renewal. Neither FPL nor the staff has identified information that is both new and significant related to Category 1 issues that would call into question the conclusions in the GEIS. Similarly, neither the scoping process, FPL, nor the staff has identified any new issue applicable to St. Lucie Units 1 and 2, that has a significant environmental impact. Therefore, the staff relies upon the conclusions of the GEIS for all Category 1 issues that are applicable to St. Lucie Units 1 and 2.

FPL's license renewal application presents an analysis of the Category 2 issues that are applicable to St. Lucie Units 1 and 2, plus environmental justice and chronic effects from electromagnetic fields. The staff has reviewed the FPL analysis for each issue and has conducted an independent review of each issue. Five Category 2 issues are not applicable because they are related to plant design features or site characteristics not found at St. Lucie.

Four Category 2 issues are not discussed in this draft SEIS because they are specifically related to refurbishment. FPL (FPL 2001b) has stated that its evaluation of structures and components, as required by 10 CFR 54.21, did not identify any major plant refurbishment activities or modifications as necessary to support the continued operation of St. Lucie Units 1 and 2 for the license renewal period. In addition, any replacement of components or additional inspection activities are within the bounds of normal plant component replacement and, therefore, are not expected to affect the environment outside of the bounds of the plant operations evaluated in the *Final Environmental Statement Related to the St. Lucie Plant Unit No. 1* (AEC 1973) and *The Final Environmental Statement Related to the Operation of St. Lucie Plant Unit No. 2* (NRC 1982).

Twelve Category 2 issues related to operational impacts and postulated accidents during the renewal term, as well as environmental justice and chronic effects of electromagnetic fields, are discussed in detail in this draft SEIS. For all 12 Category 2 issues and environmental justice, the staff concludes that the potential environmental effects are of SMALL significance in the context of the standards set forth in the GEIS. In addition, the staff determined that appropriate Federal health agencies have not reached a consensus on the existence of chronic adverse effects from electromagnetic fields. Therefore, no further evaluation of this issue is required. For threatened and endangered species, the staff's preliminary conclusion is that the impact resulting from license renewal would be SMALL and further mitigation is not warranted. For severe accident mitigation alternatives (SAMAs), the staff concludes that a reasonable, comprehensive effort was made to identify and evaluate SAMAs. Based on its review of the SAMAs for St. Lucie Units 1 and 2, the staff preliminarily concludes that none of the candidate SAMAs is cost-beneficial.

Mitigation measures were considered for each Category 2 issue. Current measures to mitigate the environmental impacts of plant operation were found to be adequate, and no additional mitigation measures were deemed sufficiently beneficial to be warranted, except for the SAMA identified above.

The following sections discuss unavoidable adverse impacts, irreversible or irretrievable commitments of resources, and the relationship between local short-term use of the environment and long-term productivity.

9.1.1 Unavoidable Adverse Impacts

An environmental review conducted at the license renewal stage differs from the review conducted in support of a construction permit because the plant is in existence at the license renewal stage and has operated for a number of years. As a result, adverse impacts associated with the initial construction have been avoided, have been mitigated, or have

already occurred. The environmental impacts to be evaluated for license renewal are those associated with refurbishment and continued operation during the renewal term.

The adverse impacts of continued operation identified are considered to be of SMALL significance, and none of them warrant implementation of additional mitigation measures. The adverse impacts of likely alternatives if St. Lucie Units 1 and 2 cease operation at or before the expiration of the current OLs will not be smaller than those associated with continued operation of these units, and they may be greater for some impact categories in some locations.

9.1.2 Irreversible or Irretrievable Resource Commitments

The commitment of resources related to construction and operation of St. Lucie Units 1 and 2 during the current license period was made when the plants were built. The resource commitments to be considered in this draft SEIS are associated with continued operation of the plants for an additional 20 years. These resources include materials and equipment required for plant maintenance and operation, the nuclear fuel used by the reactors, and ultimately, permanent offsite storage space for the spent fuel assemblies.

The most significant resource commitments related to operation during the renewal term are related to fuel fabrication and the disposal of low- and high-level radioactive wastes. St. Lucie Units 1 and 2 replace approximately one-third of the fuel assemblies in each of the two units during every refueling outage, which occurs on an 18-month cycle.

The likely power generation alternatives if St. Lucie Units 1 and 2 cease operation on or before the expiration of the current OLs will require a commitment of resources for construction of the replacement plants as well as for fuel to run the plants.

9.1.3 Short-Term Use Versus Long-Term Productivity

An initial balance between short-term use and long-term productivity of the environment at the St. Lucie site was set when the plants were approved and construction began. That balance is now well established. Renewal of the OLs for St. Lucie Units 1 and 2 and continued operation of the plant will not alter the existing balance, but may postpone the availability of the site for other uses. Denial of the application to renew the OLs will lead to shutdown of the plant and will alter the balance in a manner that depends on subsequent uses of the site. For example, the environmental consequences of turning the St. Lucie site into a park or an industrial facility are quite different.

9.2 Relative Significance of the Environmental Impacts of License Renewal and Alternatives

The proposed action is renewal of the OLs for St. Lucie Units 1 and 2. Chapter 2 describes the site, the plant, and interactions of the plant with the environment. As noted in Chapter 3, no refurbishment and no refurbishment impacts are expected at St. Lucie Units 1 and 2. Chapters 4 through 7 discuss environmental issues associated with renewal of the OLs. Environmental issues associated with the no-action alternative and alternatives involving power generation and use reduction are discussed in Chapter 8.

The significance of the environmental impacts from the proposed action (approval of the application for renewal of the OLs), the no-action alternative (denial of the application, no replacement generation, and decommissioning the two units), alternatives involving alternate power generation by nuclear, coal, or gas generation of power at an unspecified "greenfield site," and a combination of alternatives are compared in Table 9-1. Use of a closed-cycle cooling system with cooling towers for alternate power generation is assumed for Table 9-1. Once-through cooling impacts will be smaller in some instances, (e.g., Land Use and Ecology), because additional land is not required to support cooling towers and associated infrastructure.

Table 9-1 shows that the significance of the environmental effects of the proposed action are SMALL for all impact categories (except for collective offsite radiological impacts from the fuel cycle and from HLW and spent fuel disposal, for which a single significance level was not assigned [see Chapter 6]). The alternative actions, including the no-action alternative, may have environmental effects in at least some impact categories that reach MODERATE or LARGE significance.

9.3 Staff Conclusions and Recommendations

Based on (1) the analysis and findings in the GEIS (NRC 1996, 1999); (2) the ER submitted by FPL (FPL 2001b); (3) consultation with Federal, State, and local agencies; (4) the staff's own independent review; and (5) the staff's consideration of public comments received during the scoping process, the preliminary recommendation of the staff is that the Commission determine that the adverse environmental impacts of license renewal for St. Lucie Units 1 and 2 are not so great that preserving the option of license renewal for energy planning decisionmakers would be unreasonable.

Table 9-1. Summary of Environmental Significance of License Renewal, the No-Action Alternative, and Alternative Methods of Generation Using Closed Cycle Cooling

Impact Category	Proposed Action–License Renewal	No Action Alternative–Denial of Renewal	Coal-Fired Generation	Natural Gas-Fired Generation	New Nuclear Generation	Combination of Alternatives
			Greenfield Site[a]	Greenfield Site[a]	Greenfield Site[a]	Greenfield Site[a]
Land Use	SMALL	SMALL	MODERATE to LARGE	MODERATE to LARGE	MODERATE to LARGE	MODERATE to LARGE
Ecology	SMALL	SMALL	MODERATE to LARGE	MODERATE to LARGE	MODERATE to LARGE	MODERATE to LARGE
Water Use and Quality	SMALL	SMALL	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE
Air Quality	SMALL	SMALL	MODERATE	MODERATE	SMALL	MODERATE
Waste	SMALL	SMALL	MODERATE	SMALL	SMALL	SMALL
Human Health[b]	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL
Socioeconomics	SMALL	MODERATE	MODERATE to LARGE	MODERATE	MODERATE to LARGE	MODERATE
Aesthetics	SMALL	SMALL	MODERATE to LARGE	MODERATE to LARGE	MODERATE to LARGE	MODERATE to LARGE
Historic and Archaeological Resources	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL
Environmental Justice	SMALL	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE

(a) A greenfield site is assumed, for the purpose of bounding potential impacts, to be an undeveloped site with no previous construction.
(b) Excludes collective offsite radiological impacts from the fuel cycle and from HLW and spent-fuel disposal, for which single significance levels were not assigned. See Chapter 6 for details.

9.4 References

10 CFR 51. Code of Federal Regulations, Title 10, *Energy*, Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

10 CFR 54. Code of Federal Regulations, Title 10, *Energy*, Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants."

Florida Power and Light Company (FPL). 2001a. *Application for Renewed Operating Licenses, St. Lucie Units 1 and 2.* Miami, Florida.

Florida Power and Light Company (FPL). 2001b. *Applicant's Environmental Report – Operating License Renewal Stage St. Lucie Units 1 and 2.* Docket Nos. 50-335 and 50-389, Miami, Florida.

Florida Power and Light Company (FPL). 2002. *Ten Year Power Plant Site Plan 2002 - 2011.* Miami, Florida.

National Environmental Policy Act of 1969 (NEPA). 42 USC 4321, et seq.

U.S. Atomic Energy Commission (AEC). 1973. *Final Environmental Statement Related to the St. Lucie Plant Unit No. 1, Florida Power and Light Company.* Docket No. 50-335, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1982. *Final Environmental Statement Related to the Operation of St. Lucie Plant, Unit No. 2, Florida Power and Light Company, Orlando Utilities Commission of the City of Orlando, Florida.* Docket No. 50-389, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants.* NUREG-1437, Volumes 1 and 2, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Main Report*, "Section 6.3–Transportation, Table 9.1 Summary of findings on NEPA issues for license renewal of nuclear power plants, Final Report." NUREG-1437, Volume 1, Addendum 1, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 2000. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal.* NUREG-1555, Supplement 1, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 2002a. "Florida Power and Light Company, Saint Lucie Plant, Units 1 and 2; Notice of Intent To Prepare an Environmental Impact Statement and Conduct Scoping Process." *Federal Register*. Vol. 67, No. 40, pp. 9333-9335, February 28, 2002. Washington D.C.

U.S. Nuclear Regulatory Commission (NRC). 2002b. *Environmental Scoping Summary Report – St. Lucie Units 1 and 2, St Lucie County, Florida.* Docket Nos 50-335 and 50-389. June 2002. Washington, D.C.

Appendix A

Comments Received on the Environmental Review

Appendix A

Comments Received on the Environmental Review

Part I - Comments Received During Scoping

On February 28, 2002, the U.S. Nuclear Regulatory Commission (NRC) published a Notice of Intent in the Federal Register (67 FR 9333), to notify the public of the staff's intent to prepare a plant-specific supplement to the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437, Volumes 1 and 2, to support the renewal application for the St. Lucie operating licenses and to conduct scoping. The plant-specific supplement to the GEIS has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), Council on Environmental Quality (CEQ) guidelines, and 10 CFR Part 51. As outlined by NEPA, the NRC initiated the scoping process with the issuance of the Federal Register Notice. The NRC invited the applicant; Federal, State, and local government agencies; local organizations; and individuals to participate in the scoping process by providing oral comments at the scheduled public meetings and/or submitting written suggestions and comments no later than April 30, 2002.

The scoping process included two public scoping meetings, which were held at the Council Chambers in Port St. Lucie, Florida, on April 3, 2002. Approximately 30 members of the public attended the meetings. Both sessions began with NRC staff members providing a brief overview of the license renewal process and the NEPA process. After the NRC's prepared statements, the meetings were open for public comments. Thirty-three attendees provided either oral or written statements that were recorded and transcribed by a certified court reporter. The transcripts of the meetings and the meeting summary were issued on May 7, 2002. The meeting summary and transcripts are available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System (PARS) component of NRC's document system ADAMS under accession numbers ML021160265, ML021160237, and ML021300604. In addition to the comments provided during the public meetings, five comment letters and seven e-mail messages were received by the NRC in response to the Notice of Intent.

At the conclusion of the scoping period, the NRC staff and its contractor(s) reviewed the transcripts and all written material to identify individual comments. All comments and suggestions received orally during the scoping meetings or in writing were considered. Each set of comments was given a unique identifier (Commenter ID number), so that each set of comments from a commenter could be traced back to the transcript or letter by which the comments were submitted. Several commenters submitted comments through multiple sources (e.g., afternoon and evening scoping meetings, letters, or email messages).

Table A-1 identifies the individuals who provided comments and the Commenter ID number associated with each person's set(s) of comments. The individuals are listed in the order in which they spoke at the public meeting and in alphabetical order for the comments received by letter or e-mail.

Specific comments were categorized and consolidated by topic. Comments with similar specific objectives were combined to capture the common essential issues raised by the commenters. The comments fall into one of several general groups. These groups include

- Specific comments that address environmental issues within the purview of the NRC environmental regulations related to license renewal. These comments address Category 1 or Category 2 issues or issues that were not addressed in the GEIS. They also address alternatives and related federal actions.

- General comments (1) in support of or opposed to nuclear power or license renewal or (2) on the renewal process, the NRC's regulations, and the regulatory process. These comments may or may not be specifically related to the St. Lucie license renewal application.

- Questions that do not provide new information.

- Specific comments that address issues that do not fall within or are specifically excluded from the purview of NRC environmental regulations. These comments typically address issues such as the need for power, emergency preparedness, current operational safety issues, and safety issues related to operation during the renewal period.

Each comment applicable to this environmental review is summarized in this section. This information, which was extracted from the St. Lucie Scoping Summary Report, is provided for the convenience of those interested in the scoping comments applicable to this environmental review. The comments that are general or outside the scope of the environmental review for St. Lucie are not included here. More detail regarding the disposition of general or inapplicable comments can be found in the summary report. The ADAMS accession number for the summary report is ML021160348.

This accession number is provided to facilitate access to the document through the Public Electronic Reading Room (ADAMS) at http://www.nrc.gov/reading-rm.html.

The following pages summarize the comments and suggestions received as part of the scoping process that are applicable to this environmental review and discuss the disposition of the comments and suggestions. The parenthetical alpha-numeric identifier after each comment refers to the comment set (Commenter ID) and the comment number.

Table A-1. Individuals Providing Comments During Scoping Comment Period

Commenters ID	Commenter	Affiliation (If Stated)	Comment Source and ADAMS Accession Number
SL-A	Anderson	St. Lucie County	Afternoon Public Meeting[a]
SL-B	Mascara	St. Lucie County	Afternoon Public Meeting
SL-C	Minsky		Afternoon Public Meeting
SL-D	Hall		Afternoon Public Meeting
SL-E	Sizemore	St. Lucie County	Afternoon Public Meeting
SL-F	Campbell	Martin County Emergency Services	Afternoon Public Meeting
SL-G	Miller		Afternoon Public Meeting
SL-H	Jernigan	Florida Power & Light Company	Afternoon Public Meeting
SL-I	Abbatiello	Florida Power & Light Company	Afternoon Public Meeting
SL-J	Bangert	Conservation Alliance of St. Lucie County	Afternoon Public Meeting
SL-K	Brown	United Way	Afternoon Public Meeting
SL-L	Leslie		Afternoon Public Meeting
SL-M	Grande	The President's Council of Hutchinson Island	Afternoon Public Meeting
SL-N	Perry		Afternoon Public Meeting
SL-O	Oncavage		Afternoon Public Meeting
SL-P	Root	St. Lucie County Economic Development Council	Afternoon Public Meeting
SL-Q	Thompson	System Council U-4	Afternoon Public Meeting
SL-R	Smilen		Afternoon Public Meeting
SL-S	Egan	Marine Resources Council	Afternoon Public Meeting
SL-T	Doyle		Afternoon Public Meeting
SL-U	Jernigan	Florida Power & Light Company	Evening Public Meeting[b]
SL-V	Abbatiello	Florida Power & Light Company	Evening Public Meeting
SL-W	O'Keefe	American Association of University Women	Evening Public Meeting
SL-X	Hiott	St. Lucie Council of Social Agencies	Evening Public Meeting
SL-Y	Rowley		Evening Public Meeting
SL-Z	Barry		Evening Public Meeting
SL-AA	Fojcsik	United Way of Martin County	Evening Public Meeting
SL-AB	Baldwin	Soroptimists International of St. Lucie County	Evening Public Meeting
SL-AC	Davis	St. Lucie County Chamber of Commerce	Evening Public Meeting
SL-AD	Theodore		Evening Public Meeting
SL-AE	Doyle		Evening Public Meeting
SL-AJ	Case	Broward Sierra Club	E-Mail ML021260520
SL-AP	Leslie		E-Mail ML021330038
SL-AH	Oncavage		E-Mail ML021330074
SL-AO	Oncavage		E-Mail ML021260597
SL-AQ	Oncavage	The Florida Chapter of the Sierra Club	Letter ML021260502
SL-AI	Smilan		E-Mail ML021260542

Table A-1. (contd)

Commenters ID	Commenter	Affiliation (If Stated)	Comment Source and ADAMS Accession Number
SL-AL	Smilan		E-Mail ML021260502
SL-AG	Southard	Board of County Commissioners	Letter ML021330016
SL-AF	Vogel	The School Board of St. Lucie County	Letter ML021330021
SL-AM	Woodfin		Letter ML021330006
SL-AN	Woodfin		E-Mail ML021330078
SL-AK	Zinng		E-Mail ML021260528

(a) The afternoon transcript can be found under accession number ML021160237.
(b) The evening transcript can be found under accession number ML021160265.

Comments in this section are grouped in the following categories:

(1) Comments Concerning Socioeconomic Issues
(2) Comments Concerning Air Quality Issues
(3) Comments Concerning Human Health Issues
(4) Comments Concerning Aquatic Ecology Issues
(5) Comments Concerning Terrestrial Resource Issues
(6) Comments Concerning Uranium Fuel Cycle and Waste Management Issues
(7) Comments Concerning Threatened and Endangered Species Issues
(8) Comments Concerning Alternatives to the Proposed Action

1. Comments Concerning Socioeconomic Issues

Comment: While at the same time, time and time again, it has been involved in a lot of very good efforts, both in terms of education and energy efficiency, and just in general, in terms of the plant and the employees in the plant, in terms of participating in local humanitarian type of efforts. (SL-S-7)

Comment: For the last five years on an average, they have been good corporate citizens and good employees. They have donated on an average of over $103,000 a year for the last five years. Not only have they donated their time and money, but they have given of all of their energies to this community to make it a better place to live. (SL-K-3)

Comment: I can attest that FPL has been an outstanding partner to our school district. The plant's Energy Encounter hosts thousands of visitors annually, including many students. In addition to providing hands-on science programs for schools, free workshops for teachers are offered. The plant donated computers and supplies to local schools, and FPL has made substantial contributions to the Regional Sports Stadium and the St. Lucie County Marine Center. (SL-AF-2)

Comment: I am pleased to be a part of a group of FPL employees who contribute to local area agencies through the United Way. (SL-V-2) (SL-I-2)

Comment: The people of Hutchinson Island have asked me to let you know that the community in the immediate vicinity of the power plant views the plant as a good neighbor and a conscientious advocate and friend of the fragile barrier island environment. (SL-M-1)

Comment: Our (FPL) employees also mentor students and volunteer in local schools. We also support the St. Lucie County Education Foundation in its scholarship program. (SL-V-3) (SL-I-3)

Comment: FPL employees are also involved in helping the community through other organizations, such as Scouts, Little Leagues, civic groups, and church programs. (SL-V-4) (SL-I-4)

Comment: The Plant's (St. Lucie's) information center, called the Energy Encounter, hosts about 40,000 visitors each year, including 15,000 students who visit on educational field trips. (SL-V-5) (SL-I-5)

Comment: I have found them (FPL) to be a very good neighbor, three miles away. They are involved in the community. (SL-W-5)

Comment: The employees at the plant give very generously to local United Way campaigns here on the Treasure Coast. They contribute hundreds of thousands of dollars each year to local charitable organizations through their participation. (SL-AA-4)

Comment: But more importantly our people do more than just work at the power plant. They're involved in the community. They're part of this community. (SL-H-3) (SL-U-3)

Comment: The St. Lucie Power Plant is a good neighbor that participates or sponsors a number of educational, environmental, and civic activities. (SL-Z-4)

Comment: The St. Lucie Plant is a good neighbor. Speaking on behalf of the United Way of Martin County, I personally know many of the employees at the St. Lucie Plant and I know how they're involved in the community. And I know personally that they are involved with many organizations that are making a difference in our quality of life in the community. (SL-AA-3)

Comment: They're (FPL) good neighbors. Good neighbors always contribute the economy. (SL-Y-4)

Comment: Of course, many people spoke about how community-active they are. And I don't know as much about that, but I do know Rachel Scott and I do know her leadership for United Way here in St. Lucie County has been phenomenal this past year. (SL-AC-6)

Comment: I see all the good involvement they have in the social services in this community. United Way wouldn't be the same without them. Certainly our own personal experience at Big Brothers, Big Sisters would not be the same. They've worked for hundreds and thousands of people in this community every year. (SL-G-7)

Comment: I can tell you all the things they're involved in, in the school system, in education, the Energy Encounter plant that brings thousands of kids in each year to educate them about science and electricity. (SL-G-6)

Comment: That number of employees who have money and time participate actively in local charities and support our local PTAs and schools in a number of ways that we just don't see, but it happens all the time. (SL-F-2)

Comment: They (FPL) do build houses for habitat for low-income families. (SL-W-2)

Comment: I'm here to tell you about the good neighbor that I think that Florida Power and Light has been over all of the years I've been in the community. (SL-G-1)

Comment: FPL employees, led by Rachel Scott, External Affairs Manager, are active in the community and serve on various boards including the Education Foundation. (SL-AF-3)

Response: The comments are noted. The comments are supportive of license renewal for St. Lucie Units 1 and 2. Public services were evaluated in the GEIS and determined to be a Category 1 issue. Information regarding the impact on socioeconomic issues will be discussed in Chapter 4 of the SEIS.

Comment: Today I draw issues from an economic development point of view. St. Lucie Power Plant has a tremendous effect on St. Lucie County. (SL-P-1)

Comment: The plant is also one of the largest employers in our area, and it's very important to our local economy. A business of this size would be very difficult to replace. The plant's payroll, purchases and property taxes supply our local governments with revenue which we need to provide services on which we depend. (SL-AA-5)

Comment: The estimated economic impact of plant operation (St. Lucie) is more than 80 million dollars annually. (SL-I-14) (SL-V-14)

Comment: I'm here to speak about the economic health of St. Lucie County, of which the St. Lucie Power Plant is a key contributor. (SL-A- 1)

Response: The comments are noted. Effects on the local economy due to license renewal are considered as a Category 2 issue in the GEIS and are, therefore, examined on a site-specific basis in Chapters 2 and 4 of the supplement to the GEIS for St. Lucie license renewal.

Comment: Florida Power and Light is the second largest employer in the county, with more than 800 full-time workers and contributes more than 80 million to the local economy. (SL-AF-4)

Comment: We are one of the largest employers in the St. Lucie and Martin County areas, with over 800 full-time employees. (SL-H-2) (SL-U-2)

Comment: There are about 800 or more employees that work at the power plant. (SL-D-5)

Comment: FP&L is our, one of our major employers in this community. (SL-AC-4)

Comment: St. Lucie Power Plant employs approximately, twelve hundred people. (SL-A-2)

Comment: There are 378 people at the plant who live in St. Lucie County and the payroll is about 23 million dollars. (SL-P-3)

Comment: If the St. Lucie Power Plant were to leave St. Lucie County, it would be difficult, we feel, to have those twelve hundred jobs absorbed into our community, and also our unemployment rate would start going back up, it would go back up. (SL-A-3)

Comment: FP&L has good paying jobs. (SL-A-4)

Comment: A clean industry that brings 800 or so paying, high paying jobs to the local economy, is just a phenomenal asset to have in this area. (SL-F-1)

Response: The comments are noted. Employment factors related to license renewal are considered as a Category 2 issue in the GEIS and are, therefore, examined on a site-specific basis in Chapters 2 and 4 of the supplement to the GEIS for St. Lucie license renewal.

Comment: FP&L on the tax rolls brings a billion eighty million dollars in assess valuation. That's the size of business that would be very hard to replace in St. Lucie County, not to mention the unemployment that could result if they were to leave. (SL-G-2)

Comment: Their investments in property and facilities provide extremely strong part of our tax base that drives our community. (SL-AC-5)

Comment: The taxes paid here due to the St. Lucie Plant is approximately 20 million dollars a year. (SL-P-2)

Response: The comments are noted. The comments are supportive of license renewal and relate to the socioeconomic benefits that the plant brings to the local communities. Effects on the tax base due to license renewal are considered as a Category 2 issue in the GEIS and are, therefore, examined on a site-specific basis in Chapters 2 and 4 of the supplement to the GEIS for St. Lucie license renewal.

2. Comments Concerning Air Quality Issues

Comment: The carbon emissions from the endless line of nuclear-laden security truck convoys will surely contribute a little something. (SL-T-4)

Comment: The St. Lucie Power Plant provides a source of clean energy. And it's through our operations that we avoid production of greenhouse gases, which many scientists believe contribute to global warming. (SL-U-4) (SL-H-4)

Comment: Another benefit in renewing the St. Lucie Plant licenses is our ability to continue providing clean energy without using additional land for new power plants. In fact, nuclear power plants prevent substantial amount of carbon emissions and other pollutants from going into the air we breathe. The positive impact on air quality will continue during the period of extended operation. (SL-V-12) (SL-I-12)

Comment: When I look at the options that are out there, I'm looking for the kind of electricity that shows the least amount of pollution and I'm very, very pleased to be able to say that we have a nuclear power plant in St. Lucie County and that it's got the controls against pollution that it has. (SL-G-4)

Comment: But I have always felt that the clean air has been tested by the national people, by the state people. (SL-W-4)

Response: The comments are noted. These emissions are regulated through permits issued by the U.S. Environmental Protection Agency and the State of Florida. Air quality will be discussed in Chapter 2 of the SEIS. The comments provide no new information and, therefore, will not be evaluated further.

3. Comments Concerning Human Health Issues

Comment: I believe that the St. Lucie Site-Specific Environmental Impact Statement must include careful analysis of the following factors, fully considering their impact throughout the 20-year extension period: analysis of health and environmental effects of airborne and liquid radioactive waste the St. Lucie plant has released and is projected to release during its operating life. (SL-AN-11)

Comment: My death and the possible death of countless peoples is acceptable to NRC regulations and FP&L procedures. It's threatening and it's not worth it. (SL-AE-5)

Comment: The nuclear industry presents a catastrophic scenario never before imaginable, and, besides the usual number of injuries and deaths in the energy field. (SL-AE-4)

Comment: I do believe that all industries, coal-fired plants, oil burning plants, they all have their allowable deaths per million ratio, but nuclear power, by the very nature of it, it's acceptance and promulgation among the very few governing and regulatory bodies, we don't have a lot of people giving input on this, just the NRC and FP&L. (SL-AE-3)

Response: The comments are noted. Radiation exposure to the public and workers from routine releases were evaluated in the GEIS and determined to be a Category 1 issue. The comments provide no new information and, therefore, will not be evaluated further.

Comment: The company and outside agencies consistently monitor the air and water quality around the plant and surrounding communities, to ensure those strict environmental standards are not only maintained, but upheld. (SL-Q-5)

Comment: The company operates more than 30 different environmental monitoring stations that sample the air and the water, to ensure that they meet and do better than federal, state, and county standards. (SL-J-4)

Comment: The State of Florida, Department of Health, Bureau of Radiation and Control, independently monitors levels at locations surrounding Florida Power and Light's nuclear power plants and the agency also, they sample new plant soil and other water to confirm that they're testing their findings. (SL-D-6)

Comment: The State of Florida's Department of Health, Bureau of Radiation Control independently monitors and tests radiation levels at locations surrounding St. Lucie Plant. Monitoring and testing includes sampling of air, water, shoreline sediment, fish, crustacea, broad leaf vegetation, and milk. These levels have consistently been comparable to those measured throughout the state for the last 25 years. (SL-AG-4)

Comment: The NRC has a terrible track record as far as really addressing the problems of contamination of the environment. (SL-R-2)

Comment: Plant Emissions. The Generic EIS for License Renewal of Nuclear Plants, NUREG-1437, fails to list the isotopes and isotopic concentrations for radioactive pollution released to the public in airborne and waterborne waste streams for St. Lucie Units 1 & 2. The draft SEIS needs to list this information for each of the previous 10 years and project radioactive pollution amounts for the 20 years of license extension. Since the GEIS was completed in April 1996, the calculated exposure rates and the calculated adverse health effects have become woefully outdated. At a public meeting sponsored by the NRC in Homestead, Florida, it was stated by a member of the NRC staff that the work on the GEIS began in 1992. The date of April 1996 for manuscript completion gives no assurance that the data and calculations were current as of April 1996. (SL-AO-12) (SL-AQ-12)

Comment: All studies on radiation health effects completed since April 1996 are being ignored. The draft SEIS needs to publish accurate historical data on St. Lucie radioactive emissions, year by year, isotope by isotope. This would give independent scientists as well as industry scientists an opportunity to use current data and calculations to improve the accuracy of findings of the outdated GEIS in time to be included in the final SEIS. By hiding this data from the public, the NRC fosters the perception that publishing isotopic emissions data is something to be feared and avoided at all costs. (SL-AO-13) (SL-AQ-13)

Response: The comments are noted. The requirements for monitoring and quantification of routine releases to the environment are beyond the scope of license renewal. The NRC requires the licensee routinely to conduct radiological monitoring of all plant effluents, as well as sample biota and locally grown food-stuffs. Additionally, the State of Florida independently monitors the environment around the nuclear plant for radioactive contamination. The NRC also communicates with permitting agencies that administer the Clean Water Act and the Clean Air Act, State radiological agencies, the Fish and Wildlife Service, and other organizations. Any potential noncompliance of monitoring requirements is an operational safety issue, handled through the inspection and reporting process and is not within the scope of license renewal. The comments provide no new information, and, therefore, will not be evaluated further.

4. Comments Concerning Aquatic Ecology Issues

Comment: The power plant itself has not been emitting pollutants of any kind that would have been damaging our marine resources. (SL-S-4)

Response: The comment is noted. The comment concerns a Category 1 issue: effects of plant releases on aquatic biota near St. Lucie Units 1 and 2. Aquatic ecology will be discussed in Chapter 2 and environmental impacts of operation will be discussed in Chapter 4 of the SEIS. The comment provides no new information and, therefore, will not be evaluated further.

Comment: I believe that the St. Lucie Site-Specific Environmental Impact Statement must include careful analysis of the following factors, fully considering their impact throughout the 20-year extension period: analysis of bioaccumulated radioactivity in marine life at the outfall pipe and projected additional accumulation during the extended operating period. (SL-AN-12)

Response: The comment is noted. The comment concerns accumulation of radioisotopes in aquatic biota, which was evaluated in the GEIS and determined to be a Category 1 issue. Aquatic ecology will be discussed in Chapter 2 and environmental impacts of operation will be discussed in Chapter 4 of the SEIS. The comments provide no new information and, therefore, will not be evaluated further.

5. Comments Concerning Terrestrial Resource Issues

Comment: And the fact that the plant takes up quite a bit of very prime real estate and leaves it in its natural state is a spectacular opportunity for us in terms of providing habitat that we could not afford to purchase these properties and maintain them in that natural state. (SL-S-5)

Response: The comment is noted and relates to terrestrial ecology Category 1 issues. The comment provides no new information; therefore, it will not be evaluated further.

6. Comments Concerning Uranium Fuel Cycle and Waste Management Issues

Comment: I believe that the St. Lucie Site-Specific Environmental Impact Statement must include careful analysis of the following factors, fully considering their impact throughout the 20-year extension period: Costs of safely and securely storing high level nuclear wastes on site for at least 20 more years. (SL-AN-9)

Comment: The cost impact analysis should include: Risks of accidental radiation release from a fuel transport and storage. (SL-AM-3)

Comment: I believe that the St. Lucie Site-Specific Environmental Impact Statement must include careful analysis of the following factors, fully considering their impact throughout the 20-year extension period: Long term storage and transportation hazards of high level nuclear wastes, including analysis of land routes for the transportation of new fuel and spent fuel through Florida. (SL-AN-10)

Comment: Why do you need a separate license for the pool expansion or dry cask storage? This should be planned along with the license to renew, to operate. (SL-T-3)

Response: Onsite storage of spent nuclear fuel is a Category 1 issue. The safety and environmental effects of a long-term storage of spent fuel onsite has been evaluated by the NRC and, as set forth in the Waste Confidence Rule, the NRC generically determined that such storage could be accomplished without significant environmental impact. In the Waste Confidence Rule, the Commission determined that spent fuel can be stored onsite for at least 30 years beyond the licensed operating life, which may include the term of a renewed license. At or before the end of that period, the fuel would be moved to a permanent repository. The *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437, is based upon the assumption that storage of the spent fuel onsite is not permanent. The plant-specific supplement to the GEIS that will be prepared regarding license renewal for the St. Lucie Units 1 and 2, will be based on the same assumption.

Likewise, the matter of processing and storage of low-level waste is considered a Category 1 issue. The conclusion regarding this issue in the GEIS included consideration of the long-term storage of low-level waste onsite during the license renewal term. The comments provide no new information; therefore the comments will not be evaluated further.

7. Comments Concerning Threatened and Endangered Species Issues

Comment: The St. Lucie Power Plant is not only a place that produces clean, safe, low cost electricity, it also is an environmentally friendly facility, that provides a home to dozens of rare, threatened or endangered birds and animals. (SL-Z-7)

Comment: The plant itself, it's been mentioned, the nuclear plant doesn't take up but a small portion of the total acreage on the barrier island site. So the rest of the acreage is left in its natural state and it's maintained in a natural state, in fact enhanced in some areas, by removing exotic vegetation such as Brazilian Pepper and Australian Pine, and does provide habitat for a tremendous diversity of life that's on the barrier island, associated with the coastal area, about a 180 or so species of plants and animals that are associated with the site, about 36 different endangered species there, or threatened species that are on the site, too. (SL-N-2)

Response: The comments are noted. Threatened or Endangered Species is a Category 2 issue, and will be addressed in Sections 2.2 and 4.6 of the supplemental EIS for St. Lucie Units 1 and 2.

Comment: The St. Lucie Plant, which looks out on the Atlantic Ocean, maintains a strong commitment to sea turtle protection. Our (FPL) sea turtle program involves around the clock efforts, including scientific research and data gathering, participation in the sea turtle stranding and salvage program, participation in the sea turtle beach nesting surveys and our free guided turtle walks for the public. (SL-I-9) (SL-V-9)

Comment: The work they (FPL) do on local marine life and their specialized work with our sea turtle population fills a very important need for us. (SL-M-2)

Comment: There's also a great deal of care for some of our lagoon residents, such as the sea turtles, that could be killed or injured in water intakes and things of that nature. Every effort is made to protect them. (SL-S-6)

Comment: The Turtle Beach nature trail mentioned here earlier, is open to the public to enjoy Florida's natural beauty. The plant's beaches provide one of the best nesting sites for threatened or endangered sea turtles, and the overall facility itself is a place of quiet beauty. (SL-Z-8)

Response: The comments are noted. Sea turtles are protected under the Endangered Species Act, and are evaluated as Threatened or Endangered Species, which is a Category 2 issue. That analysis will be presented in Sections 2.2 and 4.6 of the supplemental EIS for St. Lucie Units 1 and 2.

8. Comments Concerning Alternatives to the Proposed Action

Comment: I also feel that the NEPA, National Environmental Policy Act goes way back, too. That's all the way back to 1969. That's what a lot of this is being based on. I think it's a pro-nuclear bill. It's basically about the process to consider alternatives, which aiming right towards nuclear power. (SL-T-1)

Comment: If the application is not renewed, he said it would take ten years to create an alternate source of energy. And think about that. We'd have to take ten years to find alternate sources of energy. What is the cost going to be? Where is it going to come from? Is it going to be available? And now we have a plant we have to shut down. What's the cost of shutting the plant down? What's the cost going to be for jobs in the community if we have to shut the plant down? And what are the other environmental costs that it's going to take to get sources that probably aren't going to be in our own community? Our community will suffer. (SL-AB-2)

Comment: An environmental trade study comparing the estimated cost and pollution of various energy conversion plants should be a part of the renewal process. This should include the total cost per kW and total cost per kWh including any subsidies. These trades should include those sources that would be substituted if the renewal license were denied and other energy sources must be used in compensation. These should include coal, oil, natural gas, wind, solar, and other less likely forms such as biomass, wave and tidal energy. (SL-AP-1)

Response: The comments are noted. Impacts from reasonable alternatives for the St. Lucie license renewal will be evaluated in Chapter 8 of the SEIS.

Comment: The other aspect of what Florida has is biomass, and in spite of our state senator arguing for the burning of city waste and incinerator plants, using the heat form that to generate more energy, there are a lot of pollutants that are associated with human induced waste. The aspects of mercury, lead, various heavy metals that are within the incineration system and have to be removed, some remaining to go into the air and water. (SL-L-6)

Comment: There are aspects that should be compared for the non-license renewable aspect in the EIS scoping to include coal plants, oil fired plants, the natural gas plants that are far lower in pollution, but there's a lot of limit as to how much there is. It's all fossil fuel. (SL-L-3)

Comment: I read somewhere, on a scale comparing fossil fuel plants with nuclear plant, the fossil plants pollute at the rate of 30 to 45 percent and the nuclear plant, in comparison, about 3 percent. (SL-J-3)

Comment: They don't burn fossil fuel, although we are concerned about where that spent fuel is going to go and what's going to happen. There are other alternatives that always can be explored and looked at. (SL-N-6)

Response: The comments are noted. Impacts from reasonable alternatives, including alternative fuels, for the St. Lucie license renewal will be evaluated in Chapter 8 of the SEIS.

Comment: Nowhere here tonight did I hear that we must conserve. I think this is one of our greatest focuses that we must do. The electricity consumed per customer has to decrease. I hear that's been on the increase. (SL-AE-7)

Response: The comment is noted. Impacts from reasonable alternatives, including conservation, for the St. Lucie license renewal will be evaluated in Chapter 8 of the SEIS.

Comment: The other aspect of renewable energy is also very difficult. For Florida you'd think, well, it's the sunshine state, but we don't get as much as Arizona. We have sea breeze storms, cloud cover, roughly five hours on the average of sunlight, direct blue sky sunlight a day. That's quite a limitation. (SL-L-4)

Response: The comment is noted. Impacts from reasonable alternatives, including solar power generation, for the St. Lucie license renewal will be evaluated in Chapter 8 of the SEIS.

Comment: As much as I'm a wind energy fan, there's not a lot of wind in Florida. It's rated marginal by FP&L. (SL-L-5)

Response: The comment is noted. Impacts from reasonable alternatives, including wind power, for the St. Lucie license renewal will be evaluated in Chapter 8 of the SEIS.

Part II. Comments Received on the Draft SEIS

Appendix B

Contributors to the Supplement

Appendix B

Contributors to the Supplement

The overall responsibility for the preparation of this supplement was assigned to the Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission (NRC). The statement was prepared by members of the Office of Nuclear Reactor Regulation with assistance from other NRC organizations and the Pacific Northwest National Laboratory, Los Alamos National Laboratory, Energy Research Incorporated, and the Information Systems Laboratory.

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(a) Pacific Northwest National Laboratory is operated for the U.S. Department of Energy by Battelle Memorial Institute.
(b) Los Alamos National Laboratory is operated for the U S Department of Energy by the University of California.

Appendix C

Chronology of NRC Staff Environmental Review Correspondence Related to Florida Power and Light Company's Application for License Renewal of St. Lucie Units 1 and 2

Appendix C

Chronology of NRC Staff Environmental Review Correspondence Related to Florida Power and Light Company's Application for License Renewal of St. Lucie Units 1 and 2

This appendix contains a chronological listing of correspondence between the U.S. Nuclear Regulatory Commission (NRC) and Florida Power and Light Company (FPL) and other correspondence related to the NRC staff's environmental review, under 10 CFR Part 51, of FPL's application for renewal of the St. Lucie Units 1 and 2 operating licenses. All documents, with the exception of those containing proprietary information, have been placed in the Commission's Public Document Room, at One White Flint North, 11555 Rockville Pike (first floor), Rockville, Maryland, and are available electronically from the Public Electronic Reading Room found on the Internet at the following web address: http://www.nrc.gov/reading-rm.html. From this site, the public can gain access to the NRC's Agencywide Document Access and Management Systems (ADAMS), which provides text and image files of NRC's public documents in the Publicly Available Records System (PARS) component of ADAMS. The ADAMS accession numbers for each document are included below.

November 29, 2001	Letter from Mr. J. A. Stall, Florida Power and Light Company (FPL) to U.S. Nuclear Regulatory Commission (NRC), submitting the application for the renewal of the operating licenses for St. Lucie, Units 1 and 2 (Accession No. ML013400155)
December 19, 2001	Letter from NRC to Mr. J. A. Stall, FPL, concerning the receipt and availability of the license renewal application for St. Lucie, Units 1 and 2 (Accession No. ML013520570)
December 31, 2001	NRC press release announcing the availability of license renewal application for St. Lucie, Units 1 and 2 (Accession No. ML020070030)
January 29, 2002	NRC press release announcing the opportunity to request a hearing for license renewal application for St. Lucie Units 1 and 2 (Accession No. ML020300074)
February 18, 2002	Letter from FPL to NRC regarding the distribution of additional copies of application for renewed operating licenses for St. Lucie, Units 1 and 2 (Accession No. ML020520515)

February 21, 2002	Letter from NRC to Dr. Rudolph Widman, Indian River Community College Library, concerning the maintenance of reference material for the St. Lucie license renewal application (Accession No. ML020560548)
February 27, 2002	Letter to Mr. Jay Slack, U.S. Fish and Wildlife Service from NRC, requesting list of protected species within the area under evaluation for the St. Lucie plant license renewal (Accession No. ML020570547)
March 15, 2002	Response from Ms. Linda S. Ferrell, U.S. Fish and Wildlife Service, including a list of protected species within the area under evaluation for the St. Lucie plant license renewal (Accession No. ML020880223)
March 19, 2002	NRC press release, public meetings on April 3, 2002, to discuss environmental scoping process for St. Lucie Plant, Units 1 and 2, license renewal application (Accession No. ML020850293)
March 19, 2002	Letter from Dr. William Vogel, Superintendent of The School Board of St. Lucie County, providing scoping comments on the St. Lucie plant license renewal (Accession No. ML021010247)
March 25, 2002	Letter from Emilie L. Julian, (NRC) Assistant for Rulemakings and Adjudications, to Joseph Kaplan acknowledging receipt of general comments for Turkey Point and St. Lucie Power Plants, with attached letter from Mr. Kaplan received on February 1, 2002 (Accession No. ML020860403)
March 26, 2002	Scoping comment letter from Mr. Jack T. Southard, Public Safety Director, and Mr. Charles T. Christopher, Radiological Coordinator, of St. Lucie County Department of Public Safety (Accession No. ML020880213)
April 3, 2002	Comments from Mr. James P. Vojcsik, Executive Director, United Way of Martin County, providing scoping comments for St. Lucie license renewal (Accession No. ML021160494)
April 24, 2002	Email from Mr. Mark Oncavage providing scoping comments on St. Lucie license renewal (Accession No. ML021260597)
April 29, 2002	Email from Mr. Sidney M. Ziring providing scoping comments regarding St. Lucie, Units 1 and 2 license renewal (Accession No. ML021260528)

April 29, 2002	Email providing scoping comments concerning St. Lucie license renewal from Ms. Sara Case, Energy Issues Chair, Broward Sierra Club (Accession No. ML021260520)
April 30, 2002	Email from Mr. Stanley Smilan providing scoping comments in regard to St. Lucie license renewal (Accession No. ML021260502)
April 30, 2002	Scoping comment letter from Mr. Stanley Smilan on St. Lucie license renewal (Accession No. ML021260542)
May 1, 2002	Letter from Mr. Jim Woodfin providing scoping comments concerning St. Lucie license renewal (Accession No. ML021330006)
May 4, 2002	Email from Mr. Jim Woodfin providing scoping comments on St. Lucie license renewal (Accession No. ML021330078)
May 4, 2002	Email from Mr. Mark Oncavage providing scoping comments regarding St. Lucie license renewal (Accession No. ML021330074)
May 5, 2002	Email from Mr. Frank R. Leslie providing scoping comments in reference to St. Lucie license renewal (Accession No. ML021330038)
May 7, 2002	Summary of April 3, 2002, public scoping meetings for the St. Lucie Plant, Units 1 and 2, license renewal application (Accession Nos. ML021300604) Also includes transcripts from public meetings held April 3, 2002 (ML021160237 [afternoon session], and ML021160265 [evening session])
May 7, 2002	Letter from NRC to Mr. J. A. Stall of FPL, request for additional information related to the staff's review of severe accident mitigation alternatives for St. Lucie Units 1 and 2 (Accession No. ML021340363)
May 20, 2002	Fax letter from Mr. Mark Oncavage, providing scoping comments pertaining to St. Lucie license renewal (Accession No. ML021490145)
June 3, 2002	NRC letter to Dr. Joseph E. Powers, National Marine Fisheries Service, regarding the "Environmental Review on Florida Power and Light Company's Application for a 20-Year Renewal of the Operating Licenses for St. Lucie, Units 1 and 2" (Accession No. ML021570345)

June 6, 2002	Note to file, docket information that includes emails between NRC and FPL regarding RAI's (Request for additional information) concerning SAMA (Severe Accident Mitigation Assessment) review for the St. Lucie license renewal application (Accession No. ML021650664)
June 25, 2002	Letter from Mr. D. E. Jernigan, FPL, regarding the response to NRC request for additional information related to the staff's review of severe accident mitigation alternatives for St. Lucie, Units 1 and 2 (Accession No. ML021820106)
July 8, 2002	NRC letter to Mr. J. A. Stall, FPL, concerning the issuance of environmental scoping summary report associated with the staff's review of the application by FPL for renewal of the operating licenses for St. Lucie, Units 1 and 2 (Accession Nos., NRC letter ML021920289, and Environmental Scoping Summary Report ML021920439)
July 22, 2002	NRC letter to Mr. J. A. Stall, FPL, to discuss the environmental assessment and finding of no significant impact related to amendments to the environmental protection plans at St. Lucie, Units 1 and 2 (Accession No. ML021980172)
July 24, 2002	NRC letter to Mr. Jay Slack, U.S. Fish and Wildlife Service, regarding the biological assessment for license renewal at St. Lucie, Units 1 and 2, and request for informal consultation (Accession Nos. [Package No. ML022060314], NRC letter ML022060232, and Biological Assessment ML022060295)
July 30, 2002	Letter from Dr. Joseph E. Powers, National Marine Fisheries Service, concerning NRC letter dated June 3, 2002 regarding FPL's application for a 20-year renewal of operating licenses for St. Lucie, Units 1 and 2 (Accession No. ML022200253)
August 23, 2002	NRC letter to Dr. Joseph E. Powers, National Marine Fisheries Service, requesting consultation under Section 7 of the Endangered Species Act for St. Lucie, Units 1 and 2 (Accession No. ML022350292)
August 23, 2002	NRC letter to Mr. J. A. Stall, FPL, regarding the reinitiation of consultation under Section 7 of the Endangered Species Act for the St. Lucie, Units 1 and 2 (Accession No. ML022350329)

August 26, 2002	Letter from Mr. D. E. Jernigan, FPL, regarding supplemental response to NRC request for additional information related to the staff's review of severe accident mitigation alternatives for St. Lucie Units 1 and 2 (Accession No. ML022410053)

Appendix D

Organizations Contacted

Appendix D

Organizations Contacted

During the course of the staff's independent review of environmental impacts from operations during the renewal term, the following Federal, State, regional, and local agencies were contacted:

Business Development Board of Martin County, Stuart, Florida

Comprehensive Planning, Growth Management, Stuart, Florida

County Administrator, Martin County, Stuart, Florida

Department of Community Development, St. Lucie County, Ft. Pierce, Florida

Florida Department of Environmental Protection, St. Lucie Field Office, Florida

Florida Department of Health, Environmental Radiation Control, Orlando, Florida

Florida Fish and Wildlife Conservation Commission, Tequesta, Florida

Florida Fish and Wildlife Conservation Commission, Vero Beach, Florida

Florida State Historic Preservation Office, Tallahassee, Florida

Hoyt C. Murphy Realty, Ft. Pierce, Florida

Martin County Property Appraiser, Stuart, Florida

Martin County Property Cooperative Extension, Stuart, Florida

National Marine Fisheries Service, St. Petersburg, Florida

Port St. Lucie Mayor, Port St. Lucie, Florida

Port St. Lucie City Manager, Port St. Lucie, Florida

Property Appraiser, St. Lucie County, Fort Pierce, Florida

Salvation Army, Ft. Pierce, Florida

Appendix D

St. Lucie County Administrator, Ft. Pierce, Florida

St. Lucie County Community Services, Ft. Pierce, Florida

St. Lucie County Economic Development Council, Port St. Lucie, Florida

St. Lucie County Extension Service, Ft. Pierce, Florida

St. Lucie County Tax Collector, Ft. Pierce, Florida

U.S. Fish & Wildlife Service, Vero Beach, Florida

Appendix E

Florida Power and Light Company's Compliance Status and Consultation Correspondence

Appendix E

Florida Power and Light Company's Compliance Status and Consultation Correspondence

The licenses, permits, consultations, and other approvals obtained from Federal, State, regional, and local authorities for St. Lucie Units 1 and 2 are listed in Table E-1.

Following Table E-1 are reproductions of correspondence prepared and sent during the evaluation process of the application for renewal of the operating licenses for St. Lucie Units 1 and 2.

Appendix E Correspondence

Source	Recipient	Date of Letter
United States Nuclear Regulatory Commission (C. I. Grimes)	U.S. Fish and Wildlife Service	February 27, 2002
Florida Coastal Management Program (S. W. Collins)	Florida Power and Light Company	March 6, 2002
United States Nuclear Regulatory Commission (P. T. Kuo)	National Marine Fisheries Service	June 3, 2002
United States Nuclear Regulatory Commission (P. T. Kuo)	U.S. Fish and Wildlife Service	July 24, 2002
United States Nuclear Regulatory Commission	Biological Assessment	June 2002
National Marine Fisheries Service (J.E. Powers)	United States Nuclear Regulatory Commission	July 30, 2002
United States Nuclear Regulatory Commission (B. T. Moroney)	National Marine Fisheries Service	August 23, 2002

Table E-1. Federal, State, Local, and Regional Licenses, Permits, Consultations, and Other Approvals for St. Lucie Units 1 and 2

Agency	Authority	Description	Number	Expiration Date	Remarks
NRC	10 CFR Part 50	Operating license, St. Lucie Unit 1	DPR-67	3/1/16	Authorizes operation of Unit 1
NRC	10 CFR Part 50	Operating license, St. Lucie Unit 2	NPF-16	4/6/23	Authorizes operation of Unit 2
FWS NMFS	Section 7 of the Endangered Species Act (16 USC 1536)	Consultation	Letters: PSL-LR-01-0053; PLL-LR-01-0054		Section 7 of the Endangered Species Act requires that Federal agencies, in cooperation with the license applicant, consult with the FWS and/or the NMFS concerning the potential impacts of a proposed licensing action on threatened or endangered species. FPL initiated this consultation process with letters to FWS and NMFS sent April 19, 2001.
U.S. Army Corps of Engineers	Rivers and Harbors Act (33 USC 403) and Clean Water Act 1344)	Dredging permit	199301803	12/21/03	Authorizes maintenance dredging of intake canal
Florida Department of Community Affairs	Section 307 of the Coastal Zone Management Act [16 USC 1456(c)(3)(A)]	Consistency determination with the Florida Coastal Management Program	Letter from Shirley Collins, Florida Coastal Management Program, to FPL; FL200201111376C; March 6, 2002	None	The Department of Community Affairs determined that renewal of the St. Lucie OLs would be consistent with the Florida Coastal Management Program.

Table E-1. (contd)

Agency	Authority	Description	Number	Expiration Date	Remarks
Florida Division of Historic Resources	Section 106 of the National Historic Preservation Act (16 USC 470f)	Consultation	Letter from Janet Snyder Matthews, State Historic Preservation Officer to FPL, 5/22/01		The National Historic Preservation Act requires Federal agencies to take into account the effect of any undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places. The Florida Division of Historical Resources determined that renewal of the OLs is not an undertaking that is likely to affect historic properties.
FDEP	Clean Water Act, Section 402; Florida Statutes, Chapter 403	NPDES permit	FL0002208-Major	1/9/05	Permit covers surface water discharges and stormwater discharges from diked petroleum storage and handling areas.
FDEP	Florida Statutes, Chapter 376	Annual storage tank registration	Facility ID: 8630677 Placard No.: 135878	6/30/02	Registration covers five above ground petroleum storage tanks.
FDEP and Siting Board (Governor and Cabinet)	Florida Statutes, Sections 403.501 - 518	Certification under the Florida Electrical Power Plant Siting Act	Case No: PA74-02	Life of plant	Siting, construction, and operation of St. Lucie Unit 2 (Unit 1 was permitted before enactment of the Siting Act in 1973)

Table E-1. (contd)

Agency	Authority	Description	Number	Expiration Date	Remarks
FDEP	Florida Statutes, Chapter 403	Air emissions permit	1110071-003-AO	6/26/05	Permit covers emissions from six emergency diesel generators, miscellaneous diesel-driven equipment, and facility-wide fugitive emissions from storage tanks, roadways, and paint/sandblasting activities.
FFWC	Florida Administrative Code, Chapter 39	Special purpose permit	01S-018	1/26/02	Permit covers collection and possession of marine organisms for experimental purposes.
FFWC	Florida Administrative Code, Chapter 39	Marine turtle permit	TP#026	1/31/02	Permit authorizes turtle watches and the maintenance and display of preserved specimens.
FFWC	Florida Administrative Code, Chapter 39	Marine turtle permit	TP#125	1/31/02	Permit authorizes various turtle activities including net capture, tagging, nesting surveys, hand capture, nest relocation, rescue and release of hatchlings, and stranding and salvage activities.
FFWC	Florida Administrative Code, Chapter 39	Scientific collecting permit	WS01374	6/25/04	FPL system-wide permit authorizing carcass or wildlife salvage and possession for scientific or educational purposes.
FFWC	Florida Administrative Code, Chapter 39	Migratory bird next permit	WN01373	6/25/03	FPL system-wide permit authorizing destruction of inactive migratory bird nests other than osprey nests.

Table E-1. (contd)

Agency	Authority	Description	Number	Expiration Date	Remarks
SFWMD	Florida Administrative Code, Section 40E-20.042	General water use permit	56-01238-W	7/13/02	Permit covers remediation of surficial aquifer.
SFWMD	Florida Administrative Code, Section 65-25	Stormwater discharge permit	56-00848-S	Perpetual	Permit authorizes stormwater discharge from the overflow parking lot.
SFWMD	Florida Administrative Code, Section 65-25	Stormwater discharge permit	85-142	Perpetual	Permit authorizes stormwater discharge from the simulator building.

CFR = Code of Federal Regulations
FDEP = Florida Department of Environmental Protection
FFWC = Florida Fish and Wildlife Commission
FWS = U.S. Fish and Wildlife Service
ID = identification number
NMFS = National Marine Fisheries Service
NPDES = National Pollution Discharge Elimination System
NRC = U.S. Nuclear Regulatory Commission
OL = operating license
SFWMD = South Florida Water Management District
USC = United States Code

February 27, 2002

Mr. Jay Slack, Field Supervisor
US Fish and Wildlife Service
South Florida Ecological Service Office
1339 20th Street
Vero Beach, FL 32960

SUBJECT: REQUEST FOR LIST OF PROTECTED SPECIES WITHIN THE AREA UNDER EVALUATION FOR THE ST. LUCIE PLANT LICENSE RENEWAL

The Nuclear Regulatory Commission (NRC) is evaluating an application submitted by Florida Power and Light Company for the renewal of the operating licenses for its St. Lucie Plant, Units 1 and 2. The NRC is preparing a supplement to its "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (NUREG-1437) for this proposed license renewal, for which we are required to evaluate potential impacts to threatened and endangered species. A member of my staff, Dr. Michael T. Masnik, visited your Vero Beach, Florida office on December 17, 2001, and had preliminary discussions related to the FPL application for license renewal with Mr. Charles Kelso of your staff.

The proposed action would include use and continued maintenance of existing facilities and transmission lines and would not result in new construction or disturbance. The St. Lucie Plant and the associated transmission corridor that is under review as part of the license renewal application is located in St. Lucie County, Florida. The transmission corridor is approximately 11 miles long and varies from 660 to 813 feet in width. The plant uses once-through cooling water from the Atlantic Ocean to remove waste heat from the facility. Ocean water is drawn through three offshore intake structures into an intake canal that leads to the plant. The heated water is discharged back to the Atlantic Ocean through offshore diffusers. The Atlantic Ocean in the vicinity of the plant is considered part of the aquatic environment of interest.

To support the environmental impact statement preparation process and to ensure compliance with Section 7 of the Endangered Species Act, the NRC requests a list of species and information on protected, proposed, and candidate species and critical habitat that may be in the vicinity of the St. Lucie Plant and its associated transmission lines.

Also, we would like confirmation that the South Florida Ecological Service Office will serve as the U.S. Fish and Wildlife Service's point of contact for Endangered Species Act compliance, including any Section 7 consultation that may be needed, for the St. Lucie Plant.

If you have any comments or questions, please contact Dr. Michael T. Masnik, Senior Project Manager, at (301) 415-1191 or MTM2@NRC.GOV.

Sincerely,
Original Signed By: CIGrimes
Christopher I. Grimes, Program Director
License Renewal and Environmental Impacts
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket Nos. 50-335 and 50-389

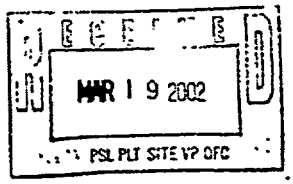
cc: See next page

Paul H.

STATE OF FLORIDA
DEPARTMENT OF COMMUNITY AFFAIRS
"Dedicated to making Florida a better place to call home"

JEB BUSH
Governor

STEVEN M. SEIBERT
Secretary



March 6, 2002

Mr. D.E. Jernigan
Florida Power & Light Company
6501 South Ocean Drive
Jensen Beach, Florida 34957

RE: Department of Energy - Florida Power & Light Company - St. Lucie Nuclear Power Plant Units 1 and 2 - Applicant's Environmental Report Operating License Renewal Stage - Docket Nos. 50-335 and 50-389 - Hutchinson Island, St Lucie County, Florida
SAI: FL200201111376C

Dear Mr. Jernigan:

The Florida State Clearinghouse, pursuant to Presidential Executive Order 12372, Gubernatorial Executive Order 95-359, the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended, and the National Environmental Policy Act, 42 U.S.C. §§ 4231, 4331-4335, 4341-4347, as amended, has coordinated a review of the above-referenced project.

The Florida Department of Environmental Protection (DEP) notes that anoxic conditions have been reported at the bottom of Big Mud Creek where the water depth exceeds 40 feet. Fish kills have been reported in that area over time; therefore, DEP recommends that the creek be filled to a more environmentally friendly depth, provided there are no critical operational constraints that would prohibit such action. Please refer to the enclosed DEP comments for further details

The Florida Fish and Wildlife Conservation Commission (FWC) has not identified any new concerns for fish and wildlife resources involved with this license renewal However, in a related matter, FWC will be reviewing Big Mud Creek to determine if additional manatee protection measures are warranted. This area may have thermal properties or other characteristics that are attractive to manatees. In addition, FWC would like to work with the

2555 SHUMARD OAK BOULEVARD • TALLAHASSEE, FLORIDA 32399-2100
Phone: 850.488.8466/Suncom 278.8466 FAX: 850 921 0781/Suncom 291.0781
Internet address: http://www.dca.state.fl.us

CRITICAL STATE CONCERN FIELD OFFICE
2796 Overseas Highway Suite 212
Marathon, FL 33050-2227

COMMUNITY PLANNING
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100

EMERGENCY MANAGEMENT
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100

HOUSING & COMMUNITY DEVELOPMENT
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100

Florida Power & Light Company to formalize a protocol for the capture and recovery of manatees entrained in the power plant's intake canal. Please refer to the enclosed FWC comments for further details

The Florida Department of Transportation (FDOT) notes that State Road A-1-A may be affected if work occurs on the power plant's intake and discharge systems. FDOT should be contacted regarding any activities that impact state owned rights-of-way, as permits may be required. All work within DOT rights-of-way must be accomplished in accordance with the requirements of FDOT's Utility Accommodation Manual. Please refer to the enclosed FDOT comments for further details.

Based on the information contained in the environmental report and the enclosed comments provided by our reviewing agencies, the state has determined that, at this stage, the above-referenced action is consistent with the Florida Coastal Management Program.

Thank you for the opportunity to review this project. If you have any questions regarding this letter, please contact Ms. Jasmin Raffington at (850) 922-5438.

Sincerely,

Shirley W. Collins, Acting Administrator
Florida Coastal Management Program

SWC/dc

Enclosures

cc: Robert W. Hall, Florida Department of Environmental Protection
Bradley J. Hartman, Florida Fish and Wildlife Conservation Commission
Larry Hymowitz, Florida Department of Transportation

June 3, 2002

Dr. Joseph E. Powers, Acting Regional Administrator
National Marine Fisheries Service
Southeast Regional Office (SERO)
9721 Executive Center Drive North
St. Petersburg, FL 33702

SUBJECT: ENVIRONMENTAL REVIEW ON FLORIDA POWER AND LIGHT COMPANY'S APPLICATION FOR A 20-YEAR RENEWAL OF THE OPERATING LICENSES FOR ST. LUCIE, UNITS 1 AND 2

Dear Dr. Powers:

The Nuclear Regulatory Commission (NRC) is evaluating an application submitted by Florida Power and Light Company (FPL) for the renewal of the operating licenses for St. Lucie Nuclear Plant (St. Lucie), Units 1 and 2, located on Hutchinson Island, Florida. The operating license for St. Lucie Unit 1 expires in 2016 and Unit 2 in 2023. The NRC is preparing a site-specific supplement to its "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (NUREG-1437) for this proposed action. As part of the action, the NRC evaluates potential impacts to threatened and endangered species under the Endangered Species Act (ESA).

The proposed action would include use and continued maintenance of existing facilities and transmission lines and FPL has indicated that the proposed action would not result in new construction or habitat disturbance. St. Lucie and the associated transmission corridor that is under review as part of the license renewal application is located in St. Lucie County, Florida. The transmission corridor is approximately 17.7 km (11 mi) long and varies from 200 to 250 m (660 to 813 ft) in width. The plant uses once-through cooling water from the Atlantic Ocean to remove waste heat from the facility. Ocean water is drawn through three offshore intake structures into an intake canal that leads to the plant. The heated water is discharged back to the Atlantic Ocean through offshore diffusers. The Atlantic Ocean in the vicinity of the plant is considered part of the aquatic environment of interest.

On May 4, 2001, the National Marine Fisheries Service (NMFS) issued a biological opinion (F/SER/2000/01394) related to the operation of the St. Lucie plant on federally protected marine species. The May 4, 2001, biological opinion (Opinion) provided a list of protected species under the jurisdiction of NMFS known to occur in the vicinity of St. Lucie. The Opinion concluded that species of large whales and Johnson's seagrass (and its critical habitat), which are protected under the Endangered Species Act, are not likely to be affected by the continued operation of the plant. The Opinion also identified five species of sea turtle known to inhabit the waters in the vicinity of the plant that may be affected by plant operation. However, the Opinion concluded that the continued operation of the circulating seawater cooling system at St. Lucie is not likely to jeopardize the continued existence of the loggerhead (*Caretta caretta*), Kemp's ridley turtle (*Lepidochelys kempii*), green turtle (*Chelonia mydas*), leatherback turtle

(Dermochelys coriacea), and hawksbill turtle (*Eretmochelys imbricata)*, in accordance with section 7 of the Endangered Species Act of 1973, as amended (ESA). On June 8, 2001, by letter to Mr. R. Hoffman, the NRC confirmed the discussions of a telephone conference call clarifying certain provisions of the Incidental Take Statement (ITS) contained in the May 4, 2001, Opinion. In its reply to the June 8, 2001, letter, NMFS responded to each of the six issues identified in the NRC's letter. Based on the May 4, 2001, Opinion and on subsequent correspondence, the NRC has accepted and implemented the NMFS position on the potential for impact of plant operations on the aquatic species protected under the ESA, and we believe that no additional consultation, either formal or informal, is necessary at this time.

We understand that FPL is planning to make modifications to their intake canal and existing turtle excluder net near the A1A Bridge. These modifications have been discussed with NMFS (Mr. R. Hoffman of your staff). We believe that the proposed modifications will further reduce sea turtle morbidity and mortality that could result from plant operation.

During the course of the NRC review for the proposed license renewal action the staff did identify one requirement in the Opinion, as clarified by your October 8, 2001 letter, that we want to assure that we are interpreting correctly. In your correspondence dated October 8, 2001, in your response to our question four, you state that "... if the number of loggerhead and green turtles injured or killed as a result of plant operation were greater than 1% of the total number of loggerhead and green turtles taken by the end of said year", then reinitiation of formal consultation is required. Based on this statement the NRC will reinitiate consultation if the number of loggerheads and green turtles injured or killed in a calendar year is greater than one percent (rounded up to the next whole number), of the total green and loggerhead turtles taken in that calendar year. We emphasize that the action level is "greater than" rather than "greater than or equal to".

Although not required for our record of decision for the proposed license renewal action, we are requesting confirmation that no additional consultation related to federally protected species under the jurisdiction of NMFS is necessary at this time. We believe that the "Terms and Conditions" section of the Opinion will provide adequate limits and controls on the licensee to assure a continued "no jeopardy" conclusion relative to the five species of sea turtles known to inhabit the waters near the plant. Furthermore, the NRC staff recognizes that future informal and formal consultations are likely over the continued operation of the plant, even during the period of initial licensing, as changes occur in the sea turtle populations and local habitat. We are committed to continue to work closely with your staff in the protection of species under your jurisdiction. Additionally, if we have interpreted incorrectly the action level that requires reinitiation of consultation for green and loggerhead turtles we do need written clarification on the issue.

If you have any comments or questions, please contact Dr. Michael T. Masnik, Senior Project Manager, at (301) 415-1191 or MTM2@NRC.GOV.

Sincerely,
Original Signed By: PTKuo
Pao-Tsin Kuo, Program Director
License Renewal and Environmental Impacts
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket Nos. 50-335 and 50-389

cc: See next page

July 24, 2002

Mr. Jay Slack, Field Supervisor
U.S. Fish and Wildlife Service
South Florida Ecological Service Office
1339 20th Street
Vero Beach, FL 32960

SUBJECT: BIOLOGICAL ASSESSMENT FOR LICENSE RENEWAL AT ST. LUCIE, UNITS 1 AND 2 AND REQUEST FOR INFORMAL CONSULTATION (TAC NOS. MB3407 AND MB3411)

Dear Mr. Slack:

The Nuclear Regulatory Commission (NRC) is evaluating an application submitted by Florida Power and Light Company for the renewal of the operating licenses for an additional 20 years for its St. Lucie Nuclear Plant, Units 1 and 2. The St. Lucie plant is located in St. Lucie County, Florida, on Hutchinson Island approximately 7.2 km (4.5 miles) east of the city of Port St. Lucie, Florida. The current license for Unit 1 will expire on March 1, 2016, and for Unit 2 on April 6, 2023. License renewal will extend the operating license for each unit an additional 20 years past the above dates. The proposed action would include the continued operation and maintenance of the existing facilities at the St. Lucie plant site and the transmission corridor that connects St. Lucie, Units 1 and 2 to the regional electrical grid. The proposed action will not include any new construction or onsite disturbance. The NRC is preparing a supplement to its 1996 "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (NUREG-1437) for this proposed license renewal. As part of the renewal review, we evaluate potential impacts to Federally listed, proposed, or candidate species, as well as designated or proposed critical habitat.

In a letter to you dated February 27, 2002, the NRC staff requested a list of Federally-protected species and any critical habitat known from the vicinity of the St. Lucie plant. The NRC staff received correspondence from Ms. L. Ferrell of your staff, dated March 15, 2002, that provided a list of listed, proposed, or candidate species known from the vicinity of the plant site. On April 2, 2002, the NRC staff conducted a site audit of the St. Lucie facility in which subject matter experts from a variety of disciplines were present to conduct the environmental evaluation. Mr. C. Kelso, of your staff, was present at the site audit.

Since April 2, 2002, the NRC staff and its contractor, Pacific Northwest National Laboratory, has evaluated the potential impact of the power plant re-licensing on the list of species provided in your March 15, 2002, correspondence. We have prepared the enclosed biological assessment (BA) that provides an evaluation of the potential for impact to each of the 14 Federally-protected species known from the vicinity of the site.

The staff has determined that the proposed action is not a major construction activity. The proposed action will "not effect" the American alligator (*Alligator mississippiensis*), the bald

eagle (*Haliaeetus leucocephalus*), the wood stork (*Mycteria americana*), the red-cockaded woodpecker (*Picoides borealis*), the Audubon's crested caracara (*Polyborus plancus audubonii*), the Everglades snail kite (*Rostrhamus sociabilis*), the southern beach mouse (*Peromyscus polionotus niveiventris*), the Lakela's mint (*Dicerandra immaculate*) and the tiny milkwort (*Polygala smallii*). The staff has determined that the proposed action is "not likely to adversely affect" the eastern indigo snake (*Drymarchon corias couperi*), the Florida scrub-jay (*Aphelocoma coerulescens*), the Florida manatee (*Trichechus manatus*), the four-petal pawpaw (*Asimina tetramera*), or the fragrant prickly apple (*Harrisia (Cereus) eriophorus*).

The staff has also determined that there is designated critical habitat for the Florida manatee in all of the Indian River Lagoon that forms the western boundary of the St. Lucie, Units 1 and 2 site. Direct effects of plant operations on the designated critical habitat on the manatees in the Indian River Lagoon are determined to be non-existent. Nearby Big Mud Creek, an arm of the Indian River Lagoon that is closest to the plant, is closed to the general public for reasons of plant physical security and the licensee withdraws no water or has any routine activities in this or any other nearby habitat designated critical during normal plant operations.

The reasons for our conclusions related to the "no effect" or "not likely to adversely affect" for each of the 14 species and a discussion of the critical habitat in Indian River are documented in the enclosed BA. We are placing a copy of the BA in our project files and on our public docket for this license renewal application and are requesting your concurrence with our determination.

If you have questions regarding the proposed action, the BA, or the staff's request for concurrence, please contact the environmental project manager, Dr. Michael Masnik, by telephone at 301-415-1191 or e-mail at MTM2@NRC.GOV.

Sincerely,
Original Signed By: PTKuo
Pao-Tsin Kuo, Program Director
License Renewal and Environmental Impacts
Division of Regulatory Improvement Program
Office of Nuclear Reactor Regulation

Docket Nos.: 50-335 and 50-389

Enclosure: As stated

cc w/encl.: See next page

Biological Assessment

St. Lucie Units 1 and 2
License Renewal Review

St Lucie County, Florida

June 2002

Docket Nos. 50-335 and 50-389

U.S. Nuclear Regulatory Commission
Rockville, Maryland

Evaluation of the Potential Effects on Endangered or Threatened Species from the Proposed License Renewal for the St. Lucie Units 1 and 2 Nuclear Power Plants.

The Setting:

The proposed license renewal will apply to the facilities at the site of St. Lucie Units 1 and 2 on Hutchinson Island approximately 11.2 km (7 mi) southeast of Ft. Pierce, FL, as well as the 17 6 km (11 mi) long transmission line that connects the nuclear units with the regional transmission grid at the Midway Substation (Figure 1).

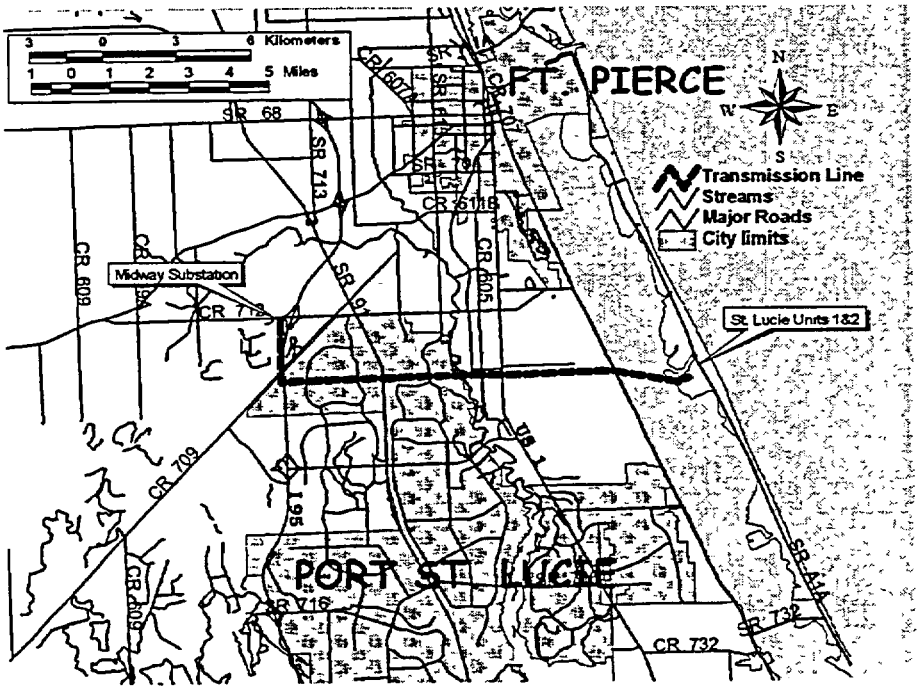


Figure 1. General Location of the St. Lucie Units 1 and 2 Nuclear Power Station, and the associated transmission corridor.

Hutchinson Island is typical of the offshore sandbars which line the southern U.S. Atlantic coastline. It consists of a sandbar on the eastern side that rises to about 4 6 m (15 ft) above MSL and a broader, sloping swale on the western side. The seaward side of the dunes currently have no vegetation and the inland side of the dunes are dominated by sea oats (*Unida paniculata*), sea grape (*Coccoloba uvifera*), salt marsh hay (*Spartina patens*), Australian pine (*Casuarina equisetifolia*), marsh ox-eye (*Barrichia*

frutescens), beach sunflower (*Helianthus debilis*), marsh elder (*Iva frutescens*), bay bean (*Canaualia rosea*), and railroad vine (*Ipomoea pescaprae*) (Foster Wheeler 2001).

Prior to the 1930's, the mangrove swamps on the western side of the island were maintained by tidal and occasional storm driven incursions of sea water as well as by rain (AEC 1973). The swales were dominated by red mangrove (*Rhizophora mangle*), with black mangrove (*Avicennia nitida*) and white mangrove (*Raguncularia racemosa*) established in the higher and less frequently flooded ground. These mangrove swamps are noteworthy for their high productivity, and the rich animal communities that they support. Much of these natural mangrove swamps were destroyed during the 1930's and 1940's as part of a mosquito control program initiated by the Work Projects Administration (W.P.A). The swamps were trenched, dyked, and flooded with sea water which greatly reduced mosquito breeding, but also led to the loss of many trees, especially the black mangroves (AEC 1973). Since that time, there has been partial restoration of the swales, but much of the area continues to be maintained in an inundated state by the local mosquito control districts.

There are also a few small tropical hammock habitats on Hutchinson Island near the St. Lucie site; the largest is among the mangrove stands north of the discharge canal. These habitats are unusual this far north, prominent species include gumbo-limbo (*Bursera simaruba*), paradise tree (*Simarouba glauca*), white and Spanish stoppers (*Eugenia axillaris and E. foetida*), wild lime (*Zanthoxylum fagara*), white indigo berry (*Randia aculeata*), mastic (*Mastichodendron foetidissimum*), and snow berry (*Chiococcca alba*).

Habitat in the transmission line corridor is a mixture of man-altered areas, sand pine scrub, prairie/pine flatwoods, wet prairie, and isolated marshes. In the 1970's, much of the corridor was used for agricultural purposes such as orange groves, row crops, and pastureland (AEC 1973). Most of that agricultural use has since been abandoned, except for the western portions that are used for grazing.

There is designated critical habitat for the Florida manatee in all of the Indian River Lagoon to the west of St. Lucie Units 1 and 2, including Big Mud Creek, an extension of Indian River which adjoins the plant site to the north. Critical habitat for the snail kite is located approximately 19 km (11.8 mi) northwest of the Midway Substation. Additionally, although not designated as critical habitat, the beach areas on the eastern side of Hutchinson Island are important nesting areas for the loggerhead *(Caretta caretta)* sea turtle, and they are also used to a lesser extent for nesting by green *(Chelonia mydas)* and leatherback *(Dermochelys coriacea)* sea turtles. Potential impacts to endangered or threatened sea turtles has been evaluated through a separate consultation with the National Marine Fisheries Service

Proposed Action

The proposed action is the granting of a renewal of the current operating licenses for St. Lucie Units 1 and 2, that would allow these units to continue operations for an additional 20 years beyond their current license terms. The license for Unit 1 is currently set to expire in March, 2016, and the Unit 2 License will expire in April 2023. The proposed license renewal will, therefore, extend the license terms for Unit 1 until 2036 and for Unit 2 until 2043.
The extension of the license terms will result in the continuation of the operation and maintenance of the nuclear power reactors, the cooling water intake and discharge structures and canals, and support facilities at the plant site. No changes are expected in terms of

ecological or environmental impacts of the present operations. In addition, the renewal of the operating license is not anticipated to require any significant new construction or modification of existing terrestrial or aquatic habitats. The St. Lucie site occupies approximately 457 ha (1130 ac), of which approximately one-third has been significantly modified for the construction and operation of the power production reactors, intake and discharge canals, switchyard, and support facilities.

If the license renewal is granted, the transmission lines and corridor that connects St. Lucie Units 1 and 2 to the regional transmission grid will continue to be operated and maintained as they have for the last 25 years. FPL maintains the Midway Corridor using a combination of trimming, mowing, and herbicide application. When required, FPL trims trees at a height of 22.5 m (14 ft) to maintain clearances below the conductors. Tree trimming is typically needed only at the midspan of the transmission lines between the towers. In open areas, FPL usually follows a five-year mowing cycle. Herbicides are used both for spot treatment of individual trees and occasionally as broadcast applications to control exotic grasses. FPL uses only non-restricted use herbicides, which are applied under the supervision of licensed pesticide applicators. FPL uses a computer database to prepare management prescriptions for each section of transmission line corridor that incorporates known management concerns and environmental sensitivities, including rare species.

Species Evaluated

There are at 14 species listed as threatened or endangered under the Federal ESA within St. Lucie County (Table 1). There are no species currently proposed for formal listing or considered candidates for listing in St. Lucie County. The NRC has determined that the proposed action will either have *no effect* or will be *not likely to adversely affect* the endangered or threatened species in the vicinity of the St. Lucie plant and associated transmission corridor. The basis for the determinations for each species in the vicinity of the plant site and transmission corridor are discussed in the following paragraphs.

1. *Drymarchon corias couperi*, Eastern indigo snake

The eastern indigo snake has not been observed on the St. Lucie site or along the transmission corridor, but individuals have been observed elsewhere on Hutchinson Island (FPL 2001). Gopher tortoises *(Gopherus polphemus)* are present on the site, especially on the leeward side of the dunes to the east of the plant site and intake/discharge canals (FPL 2001). Gopher tortoises also occur within the St. Lucie to Midway transmission corridor, particularly in the strip between the Indian River and the eastern marshes of the Savannas State Preserve (Foster Wheeler 2001). Indigo snakes are known to seek out gopher tortoise burrows for shelter and denning (FWS 1999) and they have been observed elsewhere on Hutchinson Island and in St. Lucie County. Presumably, the St. Lucie plant site and portions of the St. Lucie to Midway transmission corridor constitute suitable habitat, and the staff has chosen to assume that the eastern indigo snake is present in the vicinity of the site and transmission corridor. The proposed extension of the operating license would not result in any changes to the habitat at the plant site or along the transmission corridor, and in some ways may act to preserve areas of

Table 1. Species Listed as Endangered or Threatened under the Endangered Species Act That Have Been Reported to Occur Within St. Lucie County, Florida.

Scientific Name	Common Name	Federal Status[a]	Determination
Reptiles			
Drymarchon corias couperi	Eastern indigo snake	T	Not likely to adversely affect
Alligator mississippiensis	American alligator	T(SA)	No Effect
Birds			
Aphelocoma coerulescens	Florida scrub-jay	T	Not likely to adversely affect
Haliaeetus leucocephalus	Bald eagle	T	No Effect
Mycteria americana	Wood stork	E	No Effect
Picoides borealis	Red-cockaded woodpecker	E	No Effect
Polyborus plancus audubonii	Audubon's crested caracara	T	No Effect
Rostrhamus sociabilis	Everglades snail kite	E	No Effect
Mammals			
Peromyscus polionotus niveiventris	Southeastern beach mouse	T	No Effect
Trichechus manatus	Florida manatee	E	Not likely to adversely affect
Plants			
Asimina tetramera	Four-petal paw paw	E	Not likely to adversely affect
Dicerandra immaculate	Lakela's mint	E	No Effect
Harrisia (Cereus) eriophorus	Fragrant prickly apple	E	Not likely to adversely affect
Polygala smallii	Tiny milkwort	E	No Effect

(a)E = endangered, T = threatened, T(SA) = threatened due to similarity of appearance,
Sources: Based on FWS [http://verobeach.fws.gov], FNAI [http://www.fnai.org], FFWCC [http://floridaconservation.org/pubs/endanger.html], Atlas of Florida Vascular Plants [http://www.plantatlas.usf.edu] and Florida Geographic Data Library [http://www.fgdl.org] Internet Sites as of March 2002.

suitable habitat from other forms of development. Additionally, FPL staff and corridor maintenance workers are trained to recognize and avoid the eastern indigo snake, and FPL incorporates sensitive species protection in its corridor maintenance specifications. Therefore,

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suitable habitat from other forms of development. Additionally, FPL staff and corridor maintenance workers are trained to recognize and avoid the eastern indigo snake, and FPL incorporates sensitive species protection in its corridor maintenance specifications. Therefore,

although the eastern indigo snake is likely to be present within the project area, the NRC staff has determined that the continued operation of St. Lucie Units 1 and 2 is not likely to adversely affect the eastern indigo snake.

2. *Alligator mississippiensis*, American alligator

American alligators are common in freshwater wetland areas throughout South Florida. They are not present at the St. Lucie plant site because all of the aquatic environments in the immediate vicinity of the St. Lucie site are either salty or brackish. Alligators may occur in the freshwater marsh areas and along the St. Lucie River, west of the plant site, within or near the transmission corridor. However, the proposed activities (continued transmission corridor maintenance) will not result in detectable modifications of these freshwater systems, and will not alter the habitat quality of the surrounding areas. Therefore, the NRC staff has determined that the proposed license renewal would have no effect on American alligators.

3. *Aphelocoma coerulescens*, Florida scrub-jay

Florida scrub-jays are found in various forms of Florida scrub, including the coastal scrub found in eastern St. Lucie County. The largest populations of Florida scrub-jays are located in the central portion of the Florida Peninsula in Polk and Highlands Counties, but they are also found along both coasts, and north of Orlando in Volusia, Lake, and Marion Counties. Although it is fairly widespread throughout peninsular Florida, it has extremely specific habitat requirements, the ancient dune ecosystems, which are dominated by xeric oaks (FWS 1999). The habitat on the plant site is not typical of the Florida scrub-jay requirements There have not been any onsite sightings of Florida scrub-jays. Scrub-jays have been observed beneath the transmission lines in the vicinity of the FEC Railroad, and there is a narrow band of vegetation between the Indian River and the Savannas State Preserve that is suitable scrub-jay habitat. There have been other periodic sightings of Florida scrub-jays within the coastal scrub areas along the west shore of the Indian River within approximately 3 km (1.8 mi) of the St. Lucie transmission line (FGDL 2002). In general, the maintenance practices used by the applicant within the St. Lucie to Midway corridor (i.e., selective removal of larger trees) may help to maintain the open scrub habitat required by the scrub-jays. The applicant has indicated that it has no plans to change the way that this or any other portion of the transmission corridor is maintained The FPL transmission corridor database clearly indicates that the strip between the Indian River and the Savannas State Preserve is suitable habitat for Florida scrub-jays, and the maintenance is planned and performed with that in mind. Therefore, the NRC staff has determined that the proposed license renewal for St. Lucie Units 1 and 2 is not likely to adversely affect Florida scrub-jays within the transmission corridor.

4 *Haliaeetus leucocephalus*, Bald eagle

Bald Eagles are known to nest approximately 2 km (1.2 mi) south of the St. Lucie transmission corridor. They usually nest in tall trees near major waterways and feed on fish, waterfowl, and occasionally carrion. Bald eagles are occasionally observed along the Indian River and near the St. Lucie plant site, but they are not regular inhabitants of these areas. According to the Southeast Region bald eagle habitat management guidelines (FWS 1987), many activities should be restricted within 450 m (1500 ft) of a nest site, but, in general, activities beyond 1.6

km (1 mi) from the nest site will not adversely affect nesting eagles. Therefore, the NRC staff has determined that the proposed action will have no effect on bald eagles.

5. *Polyborus plancus audubonii*, Audubon's crested caracara

The Audubon's crested caracara is a large, long-legged, boldly patterned, non-migratory raptor. It occurs in south Texas, southwestern Arizona, and through Mexico from Baja, California, to Panama and Cuba. Only the Florida population is protected under the ESA (FWS 1999). In South Florida, the caracara occurs in dry or wet prairies with scattered cabbage palms (*Sabal palmetto*), or occasionally in lightly wooded areas. They usually build well concealed nests within cabbage palms. Much of the historical habitat areas for the caracara have been greatly modified or destroyed, but there are indications that the caracara is able to utilize improved or semi-improved pastures (FWS 1999). Caracaras are opportunistic feeders, and will consume both carrion and live prey. The species has not been reported from the plant site. Although individuals may be present in the vicinity of the transmission corridor, there are no known observations in the area. They are primarily found in the western portions of St. Lucie County. Field surveys (Foster Wheeler 2001) indicated that, at best, marginal habitat was present within the transmission corridor. Therefore, the NRC staff has determined that the proposed license renewal would have no effect on the Audubon's crested caracara.

6. *Mycteria americana*, Wood stork

Wood storks are a large wading bird that rely on freshwater and estuarine habitats for nesting, roosting, and foraging. They build nests in colonies, usually in medium to tall trees that occur in either swamps or on islands surrounded by open water (FWS 1999) and they often share these rookeries with other wading birds. Wood storks forage by tactolocation and, therefore, rely on prey that is relatively concentrated. The alterations of the natural hydrologic regime in south Florida has eliminated much of the seasonal hydrological variation on which wood storks historically relied, in that they exploited the fish that would become concentrated in alligator holes and other depressions during the dry season. Wood storks are observed occasionally in the vicinity of the St. Lucie plant and the transmission corridor, but there are no known rookeries within many miles of the plant site or transmission corridor. The maintenance of the plant site and transmission corridor will not adversely modify the swamps, marshes, or other freshwater habitats, nor significantly alter the surrounding upland habitats. There have been no reported mortalities of wood storks related to the operation or maintentence of the St. Lucie transmission line. Therefore, the NRC staff has determined that the proposed license renewal for St. Lucie Units 1 and 2 will have no effect on the wood stork.

7. *Rostrhamus sociabilis*, Everglades snail kite

The snail kite is a medium sized raptor with very specialized dietary requirements in that it feeds almost exclusively on apple snails (*Pomacea paludsa*) which are found in freshwater marshes and the shallow, vegetated edges of lakes. Most of the snail kite populations are located on the west side of Lake Okeechobee and in the everglades west of Palm Beach, Fort Lauderdale, and Miami. However, there is one small area within St. Lucie County that has been designated as critical habitat for the snail kite. This area includes the Cloud Lake and Strazzulla Reservoirs, approximately 19 km (12 mi) northwest of the Midway substation. This species has been occasionally observed within several kilometers of the transmission corridor

(FGDL 2002) and it is possible that they may use the scattered freshwater marshes in the vicinity for foraging. However, there is no indication that this species is a regular inhabitant in the vicinity of the transmission corridor, and it was not observed during field surveys of the corridor (Foster Wheeler 2001). Therefore, the staff has determined that the proposed license renewal for St. Lucie Units 1 and 2 will have no effect on the snail kite.

8. *Picoides borealis*, Red-cockaded woodpecker

Red-cockaded woodpeckers occur throughout the southeastern United States in pine stands or pine-dominated pine-hardwood stands with sparse understory and ample old-growth trees (FWS 1999). Population levels have drastically declined over the last century due to logging and conversion of habitat to other uses. The status of red-cockaded woodpeckers in south Florida, including St. Lucie County, is not well known (FWS 1999), but because of the species' requirements for old-growth pine-dominated forests, they are highly unlikely to occur at or near the St. Lucie plant and suitable habitat is very limited or absent from the transmission corridor (Foster Wheeler 2001) as well. Therefore, the NRC staff has determined that the proposed license renewal action will have no effect on the red-cockaded woodpecker.

9. *Peromyscus polionotus niveiventris*, Southeastern beach mouse

Southeastern beach mice inhabit the sea oats zone of the primary coastal dunes (FWS 1999). In many cases, suitable habitat for the southeastern beach mouse may only be a few meters wide, and in most cases it is highly heterogeneous. They primarily feed on the seeds of sea oats and panic grass (*Panicum amarum*), although they will eat seed of other dune species as well as insects. The current distribution is severely limited by the modification and destruction of habitat along the Florida barrier islands. The largest populations are located at Canaveral National Seashore, and other locations within Brevard County, and Indian River County has a number of populations. Individuals were captured during a survey conducted in the mid to late 1980's from St. Lucie County at Pepper Beach County Park, Fort Pierce Inlet State Recreation Area, and Surfside Beach State Park, all located at least 13 km (8.1 mi) north of the St. Lucie plant. However, more recent surveys have failed to collect any southeastern beach mice at the historic population sites within St. Lucie County, and the beach mouse may have been extirpated from the county. There have not been any specific recent surveys for this species at the St. Lucie plant site; however, if it were present, the site would certainly function as a refugium for this species, because the vegetation on the lee sides of the coastal dunes is relatively undisturbed, and human interference in this area is minimal with limited public access to the beach. Because the species is not known from the site and no indication that the species is present at the plant site or along the transmission corridor, the NRC staff has determined that the proposed license renewal will have no effect on the southeastern beach mouse.

10. *Trichechus manatus*, Florida manatee

The Florida or West Indian manatee inhabits the Indian River Lagoon and Atlantic coastal waters off Hutchinson Island. Although preferred habitats are in the Indian River Lagoon and other inland waterways, where food sources are abundant, they do occasionally travel up and down the coast near shore. The entire inland section of water known as the Indian River is designated as critical habitat for the manatee (50 CFR Part 17.108). Manatees are mostly found where food sources are abundant. Water is not withdrawn nor discharged to the Indian

River for normal operations at St. Lucie Units 1 and 2 and there is little attached vegetation in the near-oceanshore environment adjacent to the St. Lucie plant. Manatees are present in the area known as Big Mud Creek within the plant boundaries. This area has been closed to public access since September 2001 due to NRC security concerns. Any boats that are operated within Big Mud Creek are required to travel at idle-speed and produce no wake.

There have been five occasions when manatees have entered in the intake canal. During 1991, two individuals entered the intake canal and FPL coordinated the capture with the FWS and Florida Department of Environmental Protection (predecessor to the FWCC). After capture, the animals underwent evaluation and rehabilitation and were released to the wild. Except for the first manatee, the animals were removed from the canal within a day of each first sighting. Two of these animals were taken to rehabilitation facilities prior to their release. One was treated for deep propeller wounds that it incurred prior to entering the canal and one appeared to be a small calf separated from its mother. None of the manatees appeared to have been harmed or to have died as a result of entering the intake canal. FPL procedures require coordination with the FWCC on the capture and evaluation of entrapped manatees. FPL assists the FWCC, as needed, in transporting ill or injured animals to approved rehabilitation facilities, and in releasing animals that have entered the intake canal back to the wild (Ecological Associates 2001). The last manatee to enter the intake canal from the ocean through the velocity cap was in December 1997.

In addition to potential impacts from the water intake system, the attraction to or contact with the warm waters discharged from the plant need to be considered. The discharge canal transports the heated cooling water to two discharge pipes. The pipes transport water beneath the beach and dune system back to the Atlantic Ocean. The pipes extend about 366 m (1500 ft) and 1036 m (3400 ft) offshore, and terminates in a two-port "Y" diffuser. The discharge of heated water through the Y-port and multiport diffusers ensure distribution over a wide area and rapid and efficient mixing with ambient waters (FPL 1996, Foster Wheeler 2000). Modeling studies presented by the Atomic Energy Commission (AEC) and NRC in the operating stage Final Environmental Statements indicate that the areas of the thermal plumes to the 1.1 °C (2 °F) isotherm from the St. Lucie Units 1 and 2 diffusers under typical conditions would be about 72.8 hectares (180 acres) and 70.8 hectares (175 acres), respectively (AEC 1973, NRC 1982). Considering that some of the manatee-captures have occurred during summer months, there seems to be no compelling evidence to infer that manatees congregate at, or are attracted to, the warm water discharges of the St. Lucie plant.

Direct effects of the St. Lucie plants on manatees in the Indian River Lagoon or Big Mud Creek are essentially non-existent, and access and boat speeds within Big Mud Creek are controlled to prevent adverse impacts to the manatees.

FPL has worked with the appropriate state and federal agencies to develop a system to detect and remove the infrequent manatees that may find there way into the intake canals. These procedures appear to adequately protect those manatees that enter the cooling canal system. Therefore, the NRC has determined that the proposed renewal of the operating licenses for St. Lucie Units 1 and 2 is not likely to adversely affect the West Indian manatee.

8

11. *Asimina tetramera*, Four-petal pawpaw

The four petal pawpaw is an aromatic shrub approximately 1 to 3 m (3 to 10 ft) tall. It occurs in sand pine scrub within the coastal dune system. It's historic range has been greatly reduced by habitat conversion, and it is now known from few locations between Palm Beach Gardens and the Savannas State Preserve in Martin County, and a few locations in northern St. Lucie County (FWS 1999). This species is found in various seral stages of sand pine scrub, and is adapted to infrequent, intense fires. This species is not likely to be found at the St. Lucie site, and along the transmission corridor, it would only be found near the west shore of the Indian River where suitable habitat is present. Although field surveys did not detect the four petal pawpaw within the transmission corridor (Foster Wheeler 2001), there appears to be a reasonable potential that this species could occur within or very near the transmission corridor on the west edge of the Indian River. However, because this area is maintained using minimal disturbance because of other known ecological sensitivities, the NRC has determined that the proposed license renewal for St. Lucie Units 1 and 2 is not likely to adversely affect the four petal pawpaw.

12. *Dicerandra immaculate*, Lakela's mint

Lakela's mint is a small aromatic shrub that inhabits scrub areas of the Atlantic coastal ridge (FWS 1999). It occupies sites with varying amounts of organic litter, from partly covered to bare sand. This species is currently known from approximately six sites between Fort Pierce and Vero Beach, and at Hobe Sound National Wildlife Refuge, where it was introduced in 1991 and 1992 (FWS 1999). Although suitable habitat exists in the vicinity of the transmission corridor at the western shore of the Indian River, none were found during field surveys (Foster Wheeler 2001). Because all of the natural populations are found at least eight to ten miles from the transmission corridor, it is unlikely that individuals would be present within the small area of suitable habitat included in the transmission corridor. Therefore, the NRC has determined that renewal of the operating licenses for St. Lucie Units 1 and 2 will have no effect on Lakela's mint.

13. *Harrisia (Cereus) enophorus*, Fragrant prickly apple

The fragrant prickly apple is a solitary tree cactus that is endemic to St. Lucie County, and is known only from approximately 11 small, disjunct sites, all along the Atlantic Coastal Ridge on the western shore of the Indian River (FWS 1999). The St. Lucie to Midway transmission corridor crosses this ridge between the Indian River and the marshes on the east side of the Savannas State Preserve. Several of the known populations are located within 2 to 3 km (1.2 to 1.9 mi) of the St. Lucie to Midway transmission corridor but none of the known populations are close enough to the transmission corridor to be directly affected by maintenance of the corridor. Although field surveys of the corridor did not reveal any fragrant prickly apple specimens (Foster Wheeler 2001), there appears to be a reasonable potential that the fragrant prickly apple could occur within or very near the transmission corridor on the west edge of the Indian River. However, because this area is maintained using minimal disturbance because of other known ecological sensitivities, the NRC has determined that the proposed license renewal for St. Lucie Units 1 and 2 is not likely to adversely affect the fragrant prickly apple.

14. *Polygala smallii*, Tiny milkwort

The tiny milkwort is a small, short lived, herbaceous species that is restricted to sand pockets within pine rocklands, open sand pine scrub, slash pine, high pine, and well drained coastal spoil (FWS 1999). It requires high light levels, and little to no organic litter accumulation. All known populations are within 9.7 km (6 mi) of the Atlantic coast between Miami-Dade County

and St. Lucie County. The only known population in St. Lucie County is located approximately 6.7 km (4 3 miles) south of the St. Lucie to Midway transmission line. Field surveys of the corridor did not detect the presence of the tiny milkwort (Foster Wheeler 2001). Because the only known population in St. Lucie County is a considerable distance from the transmission corridor, and no individuals were observed during field surveys of the affected area, the NRC has determined that the proposed renewal of the operating licenses for St. Lucie Units 1 and 2 will have no effect on the tiny milkwort.

In addition to the species listed in Table 1, there are several other Federally listed species that have been reported from the counties surrounding St. Lucie county. These conceivably could occur in the vicinity of the St. Lucie plant or associated transmission line. These species include Atlantic salt marsh snake (*Nerodia fasciata taeniata*), Florida grasshopper sparrow (*Ammodramus savannarum floridanus*), piping plover (*Charadrius melodus*), Florida panther (*Felis concolor coryi*), Perforate reindeer lichen (*Cladonia perforata*), and beach clustervine (*Jacquemontia reclinata*). Because there is no clear indication that these species are near the plant or associated transmission line, the NRC has determined that the proposed action would have no effect on those species.

REFERENCES

1. U.S. Atomic Energy Commission (AEC), *Final Environmental Statement Related to the St. Lucie Plant Unit No. 1; Florida Power & Light Company*, Docket No. 50-335, Directorate of Licensing, Washington, D.C., June 1973.

2. Ecological Associates, Inc., *Survey of Aquatic Environments Potentially Affected by the Operation of the St. Lucie Power Plant, Hutchinson Island, Florida*. Prepared for Florida Power & Light Company, Jensen Beach, FL by Ecological Associates, Inc , Jensen Beach, FL, 2001.

3. Florida Natural Areas Inventory (FNAI), 2002. FNAI website: http://www.fnai.org

4. Florida Fish and Wildlife Conservation Commission (FFWCC), 2002. FFWC endangered species website: http://floridaconservation.org/pubs/endanger.html

5. Florida Geographic Data Library (FGDL), Florida Geographic Data Library, Version 3 0, State Data GeoPlan Center, University of Florida, Gainesville, FL, 2002. http:/www/fgdl org/fgdl htm

6. Florida Power and Light (FPL). Applicants Environmental Report, Operating License Renewal Stage, Florida Power and Light Company, Juno Beach, FL, 2001.

7. Florida Power & Light Company (FPL), *St. Lucie Plant Wastewater Permit Application*, Jensen Beach, FL, April 1996.

8. Foster-Wheeler Environmental Corporation, *Annual Operation & Maintenance Status Report (1999-2000) for FPL St. Lucie Power Plant Unit 1 & Unit 2*, Remedial Action, Suart, FL, August 3, 2000.

9. Foster Wheeler Environmental Corporation, *Florida Power and Light Co. St. Lucie Power Plant and Transmission Line Threatened and Endangered Species Survey*, February 2001.

10. U.S. Nuclear Regulatory Commission (NRC), *Final Environmental Statement Related to the Operation of St. Lucie Plant, Unit No. 2; Florida Power & Light Company, Orlando Utilities Commission of the City of Orlando, Florida*, Docket No. 50-389, NUREG-0842, Office of Nuclear Reactor Regulation, Washington, D C., April 1982.

11. University of South Florida, *Atlas of Florida Vascular Plants, 2002*. [http://www plantatlas usf edu]

12. U.S. Fish And Wildlife Service (FWS), Habitat Management Guidelines for the Bald Eagle in the Southeast Region, 3rd Revision, Atlanta, GA,. 9 pp., 1987.

13. U.S. Fish And Wildlife Service (FWS), South Florida Multi-Species Recovery Plan, Atlanta, GA, 2172 pp., 1999a..

14. U S. Fish And Wildlife Service (FWS), 2002b, Vero Beach Ecological Services website: http //verobeach fws gov

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50-335/389

Mr. Pao-Tsin Kuo
License Renewal and Environmental Impacts
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington D.C. 20555-0001

Dear Mr. Kuo:

This is in response to your letter dated June 3, 2002, regarding Florida Power and Light Company's (FPL) application for a 20-year renewal of the operating licenses for the St. Lucie Power Plant's units 1 and 2. This would allow the continued operation and maintenance of existing facilities and transmission lines, including the cooling water intake system for these units beginning in 2016 and 2023 respectively. FPL has indicated that the proposed action would not result in new construction or habitat disturbance. FPL's St. Lucie Power Plant is located in St. Lucie County, Florida. The National Marine Fisheries Service (NOAA Fisheries) consultation number for this project is I/SER/2002/00628; please refer to this number in future correspondence on this project.

NOAA Fisheries in a biological opinion (Opinion) dated May 4, 2001, determined that the use of the cooling water intake system for both units was likely to adversely affect loggerhead, green, Kemp's ridley, hawksbill, and leatherback sea turtles. In its May 4, 2001, Opinion NOAA Fisheries determined that the effects associated with the cooling water intake system were not likely to jeopardize the continued existence of the five species of sea turtles listed above over a ten year period. However, NOAA Fisheries determined take of these species was likely and issued an incidental take statement (ITS) with its Opinion. The ITS also contained mandatory terms and conditions to minimize the effects of this take. Because the proposed action is so far in the future, NOAA Fisheries does not believe additional consultation is required at this time. The current Opinion is valid until May 4, 2011, at which time consultation should be reinitiated and another Opinion issued. Consultation should also be reinitiated if new information reveals effects of the action not previously considered, or the identified action is subsequently modified in a manner that causes an effect to listed species or critical habitat in a manner or to an extent not previously considered, if a new species is listed or critical habitat designated that may be affected by the identified action or if the plant meets or exceeds the current ITS levels.

Your letter mentions our letter dated June 8, 2001, and the clarification we gave regarding the incidental take of loggerhead and green turtles. In this letter we state, "the ITS limits for injured and dead loggerhead and green turtles are based on a percentage (1%) of the total loggerhead and

Add: Pao-Tsin Kuo

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green turtles taken in one year; therefore, reinitiation would have to take place if the number of loggerhead and green turtles injured or killed as a result of plant operations were greater than 1% of the total number of loggerhead and green turtles taken by the end of said year"; however, this is incorrect. Consultation should be reinitiated if take is *greater than or equal to* that of the May 4, 2001, Opinion. We apologize for this error and any inconvenience it may have caused.

Your letter also indicates that FPL is planning a separate action that would make modifications to the intake canal and its existing turtle excluder net. Please send the plans for this modification to us for review and consultation under section 7 of the Endangered Species Act (ESA).

If you have any questions about this ESA section 7 consultation, please contact Mr. Robert Hoffman, fishery biologist, at the number listed above.

Sincerely yours,

for, Joseph E. Powers, Ph.D.
Acting Regional Administrator

cc: F/PR3
F/SER43 - Mike Johnson

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File: 1514.22f.1
Ref: I/SER/2002/00628

August 23, 2002

Joseph E. Powers, Ph D.
Acting Regional Administrator
National Marine Fisheries Service
Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, FL 33702

SUBJECT: REQUEST FOR CONSULTATION UNDER SECTION 7 OF THE ENDANGERED SPECIES ACT FOR THE ST. LUCIE NUCLEAR PLANT

Dear Dr. Powers:

We have received your letter of July 30, 2002, regarding the incidental take of protected sea turtles at the St. Lucie nuclear plant located on Hutchinson Island, St. Lucie County, Florida Based on the clarification provided in your July 30, 2002, letter to the incidental take statement contained in your May 4, 2001, Biological Opinion for the St. Lucie Plant, we request reinitiation of consultation regarding the incidental capture of green and loggerhead turtles (*Chelonia mydas* and *Caretta caretta*). Our decision to request reinitiation was communicated by phone to Mr. Robert Hoffman of your staff by Dr. Michael Masnik, NRC, on August 13, 2002.

Within the next couple of months the NRC staff plans to provide the National Marine Fisheries Service with the facts surrounding the green and loggerhead turtle mortalities attributable to plant operation that occurred during calendar year 2001. Additionally, as requested by your letter dated July 30, 2002, the NRC staff will provide you with the details of Florida Power and Light Company's plans to modify the St. Lucie intake canal and the existing turtle excluder (block) net. The planned modifications should result in a reduction of sea turtle mortalities

If you have any comments or questions, please contact me at (301) 415-3974 or Dr. Masnik at (301) 415-1191.

Sincerely,
/RA/

Brendan T. Moroney, Project Manager, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos 50-335 and 50-389

cc: See next page

Appendix F

GEIS Environmental Issues Not Applicable to St. Lucie Units 1 and 2

Appendix F

GEIS Environmental Issues Not Applicable to St. Lucie Units 1 and 2

Table F-1 lists those environmental issues listed in the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS) (NRC 1996; 1999)[a] and 10 CFR Part 51, Subpart A, Appendix B, Table B-1, that are not applicable to St. Lucie Units 1 and 2 because of plant or site characteristics.

Table F-1. GEIS Environmental Issues Not Applicable to St. Lucie Units 1 and 2

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	Category	GEIS Sections	Comment
SURFACE WATER QUALITY, HYDROLOGY, AND USE (FOR ALL PLANTS)			
Altered thermal stratification of lakes	1	4.2.1.2.3 4.4.2.2	St. Lucie Units 1 and 2 do not discharge to a lake.
Water-use conflicts (plants with cooling ponds or cooling towers using makeup water from a small river with low flow)	2	4.3.2.1 4.4.2.1	The St. Lucie Units 1 and 2 cooling system does not use makeup water from a small river with low flow.
AQUATIC ECOLOGY (FOR ALL PLANTS)			
Premature emergence of aquatic insects	1	4.2.2.1 4.4.3	Aquatic insects only present in freshwater environments.
AQUATIC ECOLOGY (FOR PLANTS WITH COOLING-TOWER-BASED HEAT DISSIPATION SYSTEMS)			
Entrainment of fish and shellfish in early life stages	1	4.3.3	This issue is related to heat-dissipation systems that are not installed at St. Lucie Units 1 and 2.
Impingement of fish and shellfish	1	4.3.3	This issue is related to heat-dissipation systems that are not installed at St. Lucie Units 1 and 2.
Heat shock	1	4.3.3	This issue is related to heat-dissipation systems that are not installed at St. Lucie Units 1 and 2.

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1.

Table F-1. (contd)

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Category	GEIS Sections	Comment
GROUNDWATER USE AND QUALITY			
Groundwater use conflicts (potable and service water, and dewatering; plants that use <100 gpm)	1	4.8.1.1 4.8.1.2	St. Lucie Units 1 and 2 withdraw groundwater in excess of 100 gpm.
Groundwater-use conflicts (plants using cooling towers withdrawing makeup water from a small river)	2	4.8.1.3 4.4.2.1	St. Lucie does not use cooling towers.
Groundwater-use conflicts (Ranney wells)	2	4.8.1.4	St. Lucie Units 1 and 2 do not have or use Ranney wells.
Groundwater quality degradation (Ranney wells)	1	4.8.2.2	St. Lucie Units 1 and 2 do not withdraw groundwater.
Groundwater quality degradation (saltwater intrusion)	1	4.8.2.1	St. Lucie Units 1 and 2 do not withdraw groundwater.
Groundwater quality degradation (cooling ponds in salt marshes)	1	4.8.3	St. Lucie Units 1 and 2 do not use cooling ponds.
Groundwater quality degradation (cooling ponds at inland sites)	2	4.8.3	St. Lucie Units 1 and 2 do not use cooling ponds.
TERRESTRIAL RESOURCES			
Cooling tower impacts on crops and ornamental vegetation	1	4.3.4	St. Lucie Units 1 and 2 lack cooling towers and cooling ponds.
Cooling tower impacts on native plants	1	4.3.5.1	St. Lucie Units 1 and 2 lack cooling towers and cooling ponds.
Bird collisions with cooling towers	1	4.3.5.2	St. Lucie Units 1 and 2 lack cooling towers and cooling ponds.
Cooling pond impacts on terrestrial resources	1	4.4.4	St. Lucie Units 1 and 2 lack cooling towers and cooling ponds.
HUMAN HEALTH			
Microbiological organisms (occupational health)	1	4.3.6	This issue is related to workers maintaining cooling towers, which St. Lucie does not have.
Microbiological organisms (human health) (plants using lakes or canals, or cooling towers or cooling ponds that discharge to a small river)	2	4.3.6	St. Lucie Units 1 and 2 do not use lakes or canals, or cooling towers or cooling ponds that discharge to small river.

F.1 References

10 CFR 51. Code of Federal Regulations, Title 10, *Energy,* Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants.* NUREG-1437, Volumes 1 and 2, Washington, D.C.

NRC FORM 335 (2-89) NRCM 1102, 3201, 3202

U.S. NUCLEAR REGULATORY COMMISSION

BIBLIOGRAPHIC DATA SHEET

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Regarding St. Lucie Units 1 and 2

Draft Report for Comment

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Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

9 SPONSORING ORGANIZATION - NAME AND ADDRESS *(If NRC, type "Same as above"; if contractor, provide NRC Division, Office or Region, U S Nuclear Regulatory Commission, and mailing address.)*

Same as 8 above

10 SUPPLEMENTARY NOTES

Docket Numbers 50-335, 50-389

11 ABSTRACT *(200 words or less)*

This draft supplemental environmental impact statement (SEIS) has been prepared in response to an application submitted to the NRC by the Florida Power and Light Company (FPL) to renew the OLs for St. Lucie Units 1 and 2 for an additional 20 years under 10CFR Part54. This draft SEIS includes the NRC staff's analysis that considers and weighs the environmental impacts of the proposed action, the environmental impacts of alternatives to the proposed action, and mitigation measures available for reducing or avoiding adverse impacts. It also includes the staff's preliminary recommendation regarding the proposed action.

The NRC staff's preliminary recommendation is that the Commission determine that the adverse environmental impacts of license renewal for St. Lucie Units 1 and 2 are not so great that preserving the option of license renewal for energy-planning decisionmakers would be unreasonable. This recommendation is based on (1) the analysis and findings in the GEIS; (2)the Environmental Report submitted by FPL; (3) consultation with Federal, State, and local agencies; (4) the staff's own independent review; and (5) the staff's consideration of public comments received during the scoping process.

12 KEY WORDS/DESCRIPTORS *(List words or phrases that will assist researchers in locating the report.)*

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St. Lucie
Supplement to the Generic Environmental Impact Statement
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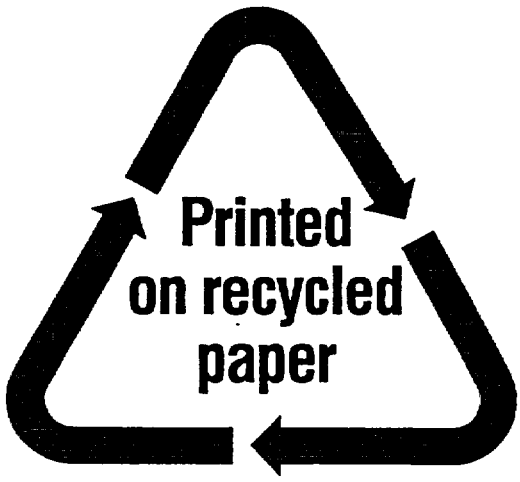

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