

**Levy Nuclear Plant Units 1 and 2
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3.0 PLANT DESCRIPTION

This chapter has been prepared in accordance with the requirements specified in NUREG-1555, Environmental Standard Review Plans (ESRPs) 3.0 through 3.8. This chapter provides site-specific information about the proposed Levy Nuclear Plant Units 1 and 2 (LNP) to be constructed by Florida Power Corporation doing business as Progress Energy Florida, Inc. (PEF) at the proposed site in Levy County, Florida. The following information is discussed in the Environmental Report (ER) sections that follow:

- ER **Section 3.1** — External Appearance and Plant Layout
- ER **Section 3.2** — Reactor Power Conversion System
- ER **Section 3.3** — Plant Water Use
- ER **Section 3.4** — Cooling System
- ER **Section 3.5** — Radioactive Waste Management Systems
- ER **Section 3.6** — Nonradioactive Waste Management Systems
- ER **Section 3.7** — Power Transmission System
- ER **Section 3.8** — Transportation of Radioactive Materials

3.1 EXTERNAL APPEARANCE AND PLANT LAYOUT

The LNP site is located in Levy County, Florida (**Figure 1.1-1**). This is a large, primarily rural site located southwest of Gainesville and west of Ocala, and approximately 15.5 kilometers (km) (9.6 miles [mi.]) northeast of the Crystal River Energy Complex (CREC), an energy facility owned by PEF (**Figure 1.1-1**).

The LNP site is approximately 1257 hectares (ha) (3105 acres [ac.]) in size. The two reactors and ancillary power production support facilities will be located near the center of the site.

The LNP will consist of two pressurized water reactors (PWRs), Units 1 and 2. These units are based on the Westinghouse Electric Company, LLC (Westinghouse), AP1000 Reactor (AP1000) standard design. The major structures of the LNP that will contain radioactive materials are the containment buildings, annex buildings, radwaste buildings, and auxiliary buildings.

Figure 2.3-1 provides an illustration of the LNP site in relation to the region and state. **Figure 2.3-2** presents a depiction of the LNP site in relation to the local area. **Figure 2.1-2** presents a depiction of the proposed reactors superimposed on a map of the LNP site area, the makeup and blowdown piping routes, proposed

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transmission corridors, cooling towers, switchyard, and intake location on the Cross Florida Barge Canal (CFBC). **Figure 2.3-3** provides an illustration of the LNP, which is superimposed onto a topographic map of the site. **Figure 3.1-1** is an architect's rendition of an AP1000 reactor plant when built. **Figure 3.1-2** illustrates the AP1000 plant layout. A conceptual view of major station components on the LNP site is presented in **Figure 3.1-3**.

3.1.1 STATION LAYOUT AND APPEARANCE

The LNP site will be a large industrial facility similar in general appearance to most nuclear power generating facilities. As noted in ER **Section 3.1**, the LNP site is approximately 1257 ha (3105 ac.) in size. The primary location for the two reactors and ancillary power production support facilities comprises approximately 121 ha (300 ac.) near the center of the site.

The Westinghouse Electric Company, LLC, AP1000 Design Control Document for the certified design as amended (DCD) indicates that the plant arrangement (for each AP1000 unit) is comprised of the following five principal building structures: nuclear island, turbine building, annex building, diesel generator building, and radwaste building. The overall plant arrangement uses building configurations and structural designs to minimize the building volumes and quantities of bulk materials consistent with safety, operational maintenance, and structural requirements.

The associated cooling towers are not considered part of the plant arrangement.

3.1.1.1 Nuclear Island

The DCD provides the following information about the nuclear island for each unit:

The nuclear island consists of a free-standing steel containment building, a concrete shield building, and an auxiliary building. The foundation for the nuclear island is an integral basemat which supports these buildings.

The nuclear island structures are designed to withstand the effects of natural phenomena such as hurricanes, floods, tornadoes, tsunamis, and earthquakes without loss of capability to perform safety functions.

3.1.1.1.1 Containment Building

The DCD provides the following information about the containment building:

The containment building is the containment vessel and the structures contained within the containment vessel. The containment building is an integral part of the overall containment system with the functions of containing the release of airborne radioactivity following postulated design-basis accidents and providing shielding for the reactor core and the reactor coolant system [RCS] during normal operations.

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4.0 ENVIRONMENTAL IMPACTS OF CONSTRUCTION

This chapter of the Environmental Report (ER) presents the environmental impacts of construction and is organized by the following sections:

- ER **Section 4.1** — Land Use Impacts
- ER **Section 4.2** — Water-Related Impacts
- ER **Section 4.3** — Ecological Impacts
- ER **Section 4.4** — Socioeconomic Impacts
- ER **Section 4.5** — Radiation Exposure to Workers
- ER **Section 4.6** — Measures and Controls to Limit Adverse Impacts during Construction
- ER **Section 4.7** — Cumulative Impacts Related to Construction Activities
- ER **Section 4.8** — Activities Undertaken Under a Limited Work Authorization

As discussed in ER **Chapter 3**, construction of the proposed Levy Nuclear Plant Units 1 and 2 (LNP) site will result in a large industrial facility similar in general appearance to most nuclear power generating facilities. The Westinghouse Electric Company, LLC (Westinghouse), AP1000 Design Control Document for the certified design as amended (DCD), indicates that the plant arrangement (for each Westinghouse AP1000 Reactor [AP1000] unit) is made up of the following five principal building structures: nuclear island, turbine building, annex building, diesel generator building, and radwaste building. ER **Subsection 3.1.1** discusses in detail the location of the two reactors and ancillary power production support facilities comprising approximately 121 hectares (ha) (300 acres [ac.]) near the center of the site. However, the size of the developed area (including material and equipment laydown areas) is expected to be approximately 242.8 ha (600 ac.).

The construction impacts of the following major LNP components are discussed:

- On-Site Areas:
 - Proposed Levy Nuclear Plant Unit 1 (LNP 1), proposed Levy Nuclear Plant Unit 2 (LNP 2), and associated cooling towers.
 - 500-kilovolt (kV) switchyard.
 - Site access roads.

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- Stormwater ponds.
- Transmission Corridor and Off-Site Areas:
 - Transmission corridors (south transmission line corridor leaving the site as well as the individual 500-kV transmission line corridors and associated substations and switchyard).
 - Heavy haul road and barge slip access road.
 - Anticipated barge slip.
 - Makeup and blowdown pipeline corridor and associated cooling water intake and discharge structures.

It is noted that the construction impacts described in this section are in reference to the cumulative construction impacts that will occur during the construction of the entire LNP. These cumulative impacts are summarized in ER **Subsection 4.6.2**. ER **Subsection 4.6.2** also provides a summary of the estimated construction impacts attributable to the construction of “safety-related structures, systems, or components (SSCs)” of the facility (that is, as defined in 10 CFR 50.2, “Definitions”). These estimates provide additional information on “construction” and “pre-construction” activities, where “construction” refers only to SSC-related activities. Originally, a rail spur was proposed that would provide service to LNP. The decision was made in late 2008 that the rail spur would not be pursued. With no rail service planned for the LNP site, an increase in truck and barge traffic is expected; however, the overall impacts related to this change in construction traffic are expected to remain SMALL to MODERATE and other impacts are expected to remain SMALL.

4.1 LAND USE IMPACTS

This section describes the land use impacts of construction and is divided into three subsections that address the site and vicinity, appurtenant facilities and off-site areas, and historic properties, respectively. Because land use impacts are also discussed in ER **Subsection 4.3.1** and ER **Section 4.4**, the discussion in this section is limited to those direct physical changes and restrictions on land use at the site and vicinity as a result of plant construction.

The following assumptions, which are discussed further in ER **Subsection 4.4.2**, are used to bracket land use impacts associated with construction:

- Site preparation will take approximately 18 months, commencing by 2010 or 2011.
- Construction will take approximately 3 to 4 years, with the construction schedule staggered 1 year between units.
- Construction will be complete in 2016 or 2017 for LNP 1 and in 2017 or 2018 for LNP 2.

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important areas to link with existing conservation areas and wildlife corridors for a variety of species. The 2005 update of the linkage prioritization was needed to address changes in the base boundary of the FEGN adopted by the Florida Greenways and Trails Council in 2004. The FEGN strives to identify opportunities to protect intact landscapes important to the overall conservation of Florida's biodiversity and ecosystem services. (Reference 4.1-013)

The Florida Forever Board of Trustees (formerly known as CARL projects) plans to acquire lands with outstanding natural resources, with opportunities for natural resource-based recreation, or for the historical and archaeological resources found therein. Florida Forever conducted an inventory in December 2007 and mapped all the properties the board wishes to acquire with the aim of conserving the lands in perpetuity. (Reference 4.1-014)

Paddling trail opportunities were first identified by the Office of Greenways and Trails in the 1999 Implementation Plan adopted by the Florida Legislature. The Greenways and Trails Implementation Plan for prioritizing paddling trail opportunities was completed in May 2004. Paddling trail segments studied and prioritized included trails not previously designated or part of the Florida Circumnavigational Trail. (Reference 4.1-015)

Impacts from construction on current land use plans in the LNP site and vicinity will be SMALL, short term, and minimal.

4.1.1.2 Short-Term Physical Changes in Land Use and Mitigation

Mitigation measures designed to lessen the impact of construction activities will be specific to erosion control, controlled access roads for personnel and vehicle traffic, and restricted construction zones. The LNP site preparation work will be completed in two stages. The first stage will consist of stripping, excavating, and backfilling the areas occupied by structures and roadways. The second stage will consist of developing the LNP site with the necessary facilities to support construction, such as construction offices, warehouses, trackwork, large unloading facilities, water wells, construction power, and construction drainage.

Stormwater runoff from the LNP site will be collected and controlled by a stormwater drainage system. The three drainage ponds on the LNP site affect 36.2 ha (89.5 ac.). After site grading, a series of stormwater drainage features will be constructed within the plant site to drain the stormwater to three stormwater detention ponds located around the LNP site. Site drainage will be maintained through a series of features such as pipes, open ditches, culverts, and storm sewers.

Given the scale and quality of the land use changes discussed in ER Subsection 4.1.1.1, the land use impacts associated with the construction of the LNP site will be SMALL. ER Section 4.6 discusses associated measures and controls to limit environmental impacts.

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4.1.1.3 Construction Impacts on the Geologic Environment

As described in ER [Subsection 2.2.1.2](#), Mineral Resources, no active quarrying or mining facilities are located within the 9.7-kilometer (km) (6-mile [mi.]) radius of the LNP site. Gulf Rock, Inc., is an inactive mine located 6.3 km (3.9 mi.) from the LNP site. Tarmac America, LLC, is planning a mining operation, Tarmac King Road Limestone Mine, within 8 km (5 mi.) of the LNP site, approximately 1.6 km (1 mi.) west of US-19 ([Reference 4.1-016](#)). The proposed facility plans to mine approximately 12.1 ha (30 ac.) of the 1942.5-ha (4800-ac.) tract annually for the next century. Tarmac America, LLC estimates that the King Road Limestone Mine will utilize less than 1 mgd of water and will generate approximately 500 truck trips entering US-19/US-98 at King Road each day ([Reference 4.1-017](#)). The USACE anticipates that the Environmental Impact Statement (EIS), triggered by their Section 404 review of the project's permit application, will result in a Record of Decision in the summer of 2009 ([Reference 4.1-016](#)).

No mineral rights have been leased within the exclusion area, and there are no outstanding mineral rights that could result in the production of either surface or subsurface minerals at the LNP site. Because LNP-related construction activities will neither affect the operation of an active quarry or mine, nor will they affect existing mineral rights, impacts on the geologic environment are expected to be SMALL.

4.1.2 TRANSMISSION CORRIDORS AND OFF-SITE AREAS

This subsection assesses the direct impacts of construction on land use within all LNP corridors, including those within the site and vicinity, and all off-site areas; it builds on the information found in ER [Subsection 2.2.2](#). Where necessary and appropriate, consideration that is given to alternative routing, location, or construction practices that would mitigate adverse environmental impacts are discussed. For the purposes of this subsection, transmission corridors include the south transmission line corridor leaving the site, as well as the individual 500-kV transmission line corridors as they exit the south transmission line corridor and connect with two high-voltage substations and a 500-kV switchyard east and south of the LNP site at the Crystal River Energy Complex (CREC). Off-site areas include the heavy haul road, barge slip access road, anticipated barge slip, makeup and blowdown pipeline corridor including the associated cooling water intake and discharge structures.

4.1.2.1 Transmission Corridors

The transmission corridors discussed in this subsection include the south transmission line corridor leaving the site, as well as four major 500-kV transmission lines. As discussed in detail in ER [Subsection 2.2.2](#) and ER [Section 3.7](#), two of the major lines will connect to the proposed Citrus Substation, one line to the proposed Central Florida South Substation, and one to the existing CREC 500-kV switchyard. Additional system upgrades will be constructed by PEF to accommodate demand in the central and south Florida areas primarily served by the LNP. Detailed descriptions of the transmission line

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4.1.2.2 Off-Site Areas

Table 4.1-5 summarizes the off-site land use changes anticipated by construction of the LNP by general component (**Figure 4.1-1**). A total of 309.8 ha (765.5 ac.), or 1.1 percent of the LNP vicinity area will be affected during construction, including the following components, which are discussed and are further described in the next subsections, unless otherwise noted:

- Heavy haul road and barge slip access road south from the site (28.2 ha [69.7 ac.]).
- Anticipated barge slip along the Cross Florida Barge Canal (CFBC) (0.2 ha [0.6 ac.])
- Blowdown pipeline corridor (46.8 ha [115.6 ac.]) and associated cooling water intake structure (0.4 ha [1.1 ac.]).
- Makeup pipeline corridor (27.5 ha [68.0 ac.]).

The majority, 75 percent, of the affected land is forested, 21 percent are wetlands, 10 percent is developed, and 7 percent are general agricultural lands. Impacts from construction on off-site area land use in the LNP vicinity will be SMALL and minimal.

4.1.2.2.1 Heavy Haul Road and Barge Slip Access Road

The heavy haul road will be constructed specifically to transport equipment and materials. The heavy haul road extends north from County Road (CR-40) to the LNP site. The barge slip access road extends from CR-40 south to the anticipated barge slip. **Table 4.1-5** shows that the heavy haul road and the barge slip access road will primarily affect mixed forested lands (16.9 ha [41.8 ac.]), forested wetlands (4.4 ha [10.9 ac.]), and other agricultural lands (3.5 ha [8.7 ac.]). The land use will change to a transportation, communications, and utilities land use, as illustrated in **Figure 4.1-1**.

Stormwater runoff will be diverted away from the roadways near the LNP site by constructing swales along the roads. These swales will be constructed on the sides of the roadway to provide essential drainage and water quality treatment. Roadways and swales will be designed using FDOT design standards. Overflow from these swales will discharge to surrounding lands as sheet flow to reduce the potential for erosion. Cross drains under roadways will be designed to equalize the water levels on both sides of the roads around the plant site.

For the purposes of LNP on-site construction, the PPSA certification will address stormwater permit requirements typically included in the state Environmental Resource Permit (ERP). Federal stormwater construction site permitting will be

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obtained by using the Generic Permit for Stormwater Discharge from Large and Small Construction Activities, which is also administered by the Florida Department of Environmental Protection (FDEP). Site grading and drainage during site preparation activities will be designed to mitigate erosion and comply with a comprehensive erosion and sedimentation control plan (E&SCP) and a Stormwater Pollution Prevention Plan (SWP3), which are required by FDEP to comply with the generic permit. These plans will be written and approved for the LNP prior to the start of site grading and construction activities.

4.1.2.2.2 Barge Slip

Construction of the LNP will utilize an anticipated barge slip being considered on the CFBC (**Figure 4.1-1**). The new slip will be located on the northern bank of the CFBC at the end of the proposed barge slip access road. Creation of the new barge slip will require dredging of 0.45 ha (1.1 ac.) below mean high water (MHW) and excavation of 0.41 ha (1 ac.) above MHW, which will result in a change in land use of 0.85 ha (2.1 ac.) from Mixed Forest Land to Streams and Canals. It is anticipated that this will have limited impact on surrounding land use because these lands are not unique to the vicinity. It is estimated that 83,044 cubic yards (yd³) (63,491 cubic meters [m³]) of material will be excavated for the barge slip of which 23,260 yd³ (17,784 m³) will be dredged material. 23,260 yd³ (17,784 m³) of dredged material will require disposal. ER **Subsection 4.2.1.5** addresses the disposal of any dredge spoil materials that are created as a result of construction activities in wetlands or other water bodies.

4.1.2.2.3 [Not Used]

4.1.2.2.4 Makeup and Blowdown Pipeline Corridors and Associated Structures

A makeup water pipeline and corridor will connect the CFBC and the LNP, while a blowdown pipeline and corridor will connect the LNP to the CREC resulting in 46.8 ha (115.6 ac.) of land use changes, or 0.2 percent of the vicinity, to land already used for other urban or built-up purposes (**Table 4.1-5** and **Figure 4.1-1**).

Operations at the LNP will require makeup water from the CFBC. The construction of an LNP makeup water system intake structure and LNP makeup

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water system pumphouse on the CFBC is proposed. The intake structure will be located approximately 11.1 km (6.9 mi.) from the Gulf of Mexico on the berm that forms the north side of the canal and is within 0.8 km (0.5 mi.) of the Inglis Lock. The cooling water intake structure (CWIS) consists of the intake structure, vertical bar screens, traveling screens, pumps, and pumphouse. The makeup water pumphouse at the intake location affects 0.4 ha (1.1 ac.) of land already used for transportation, communications, and utilities (Table 4.1-5).

Cooling tower blowdown from a series of on-site mechanical draft cooling towers, including residual waste heat, will be transported in two pipelines (one for each unit) from the LNP. The two pipes, one per unit, will carry blowdown from the cooling towers to the proposed discharge location at the CREC. These two pipes will follow a pipeline corridor located in Levy and Citrus counties to reach the discharge location.

Impacts from construction on current land use in the pipeline corridors and off-site areas will be SMALL, short-term, and minimal.

4.1.2.3 Short-Term Physical Changes in Land Use and Mitigation

Mitigation measures designed to lessen the impact of construction activities will be specific to erosion control, controlled access roads for personnel and vehicle traffic, and restricted construction zones. The LNP corridor preparation work will be completed in two stages. The first stage will consist of stripping, excavating, and backfilling the areas occupied by structures and roadways. The second stage will consist of developing the LNP corridors and off-site areas with the necessary facilities to support construction, such as construction offices, warehouses, trackwork, large unloading facilities, water wells, construction power, and construction drainage.

Stormwater runoff from the LNP corridors will be collected and controlled by a stormwater drainage system, which will include a series of pipes, open ditches, culverts and storm sewers. Given the scale and quality of the land use changes discussed in ER Subsections 2.2.2 and 4.1.2.1, the land use impacts associated with the construction of the LNP corridors will be SMALL. ER Section 4.6 discusses associated measures and controls to limit environmental impacts.

4.1.3 HISTORIC PROPERTIES

This subsection provides an assessment of the potential impacts of the proposed construction activities on historic properties on the LNP site and associated facilities, and within the respective Areas of Potential Effect (APEs) for archaeology and structures. It builds on the information found in ER Subsection 2.5.3.

4.1.3.1 Historic Properties within the LNP Site and Associated Facilities

Cultural resource investigations conducted in 2007 and 2008 determined that the LNP site APEs did not include any resources that were listed in or eligible for

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listing in the National Register of Historic Places (NRHP). The surveys also covered the proposed construction areas for the property south of the LNP site (including the heavy haul road, transmission corridor, and the makeup and blowdown pipeline corridor) and the off-site blowdown pipeline. Based on a review of the Florida Master Site File (FMSF) records, no previously recorded resources of local, regional, or state significance were located in the LNP site, or in the above-listed construction areas ([References 4.1-018](#) and [4.1-019](#)). See ER [Subsection 2.5.3](#) for further detail on the 2007 and 2008 cultural resource surveys. The survey findings have not yet been submitted to the FL State Historic Preservation Officer (SHPO) for concurrence. The technical report with the archaeological and standing structure findings, as well as eligibility recommendations, will be submitted by PEF to the SHPO for comment and concurrence prior to submittal of the Combined License Application (COLA). PEF will coordinate with the SHPO as part of the permitting process. Field surveys will be conducted on the proposed transmission line corridors after the routes have been finalized and before construction activities begin, in accordance with federal regulations.

4.1.3.2 Previously Surveyed Properties within 15 Km (9 Mi.) of the LNP Site

A review of FMSF records in October 2007 showed 197 previously surveyed archaeological sites within a 15-km (9-mi.) radius: 101 in Levy County, 75 in Citrus County, and 21 in Marion County. Of the 197 previously surveyed sites, 32 have been determined ineligible for listing in the NRHP by the SHPO; 24 sites showed insufficient information to make a determination; two sites were recommended for more work by the surveyor but were not yet evaluated by the SHPO; 82 were recommended ineligible by the surveyor but had not yet been evaluated by the SHPO; and 49 had not been evaluated by the surveyor or by the SHPO. Eight sites were recommended eligible for listing in the NRHP by the surveyor, but had not been evaluated by the SHPO. Of those, only four are in Levy County, and all but one of them is located more than 8.1 km (5 mi.) from the LNP site. The Tidewater site (LV0253) is approximately 6.4 km (4 mi.) from the LNP site. The others, more than 8 km (5 mi.) from the LNP site, are the Spring Run Burial Ground (LV0469), located along the western coast, the Sand Slough Burial Mound (LV00250), and the Goethe site (LV00259). None of these sites are located within the APE and none have been determined eligible for listing in the NRHP. It is customary not to publish the locations of potentially sensitive archaeological sites. ([Reference 4.1-020](#))

The Knotts Supply Company Store (LV00707) at 6302 Riverside Drive in Yankeetown, Levy County, was constructed in 1920, with a later addition to the north side of the building from 1940. It was built to serve as a general store, post office, and lumber yard office, and continues to fulfill a commercial use as a real estate office. It is a simple, balloon-framed structure with a rectangular footprint and a gable roof. It sits on a concrete block foundation. Next door is the former Yankeetown Post Office (LV00708), at 6304 Riverside Drive. It was constructed in 1926 in the same style as the Knotts Supply Company Store. Like its neighbor, it is a simple, balloon-framed structure with a rectangular footprint and a gable

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roof on a concrete block foundation. The primary decorative features of both buildings are wood slat gable vents, and palm tree posts supporting the shed roofs of the front porches. No significant archaeological sites were identified when the buildings were surveyed in February 2007. At that time, they were recommended as eligible for the NRHP for architectural significance, and for significance related to the history of the commerce of the area at the local level. SHPO agreed they were potentially eligible on May 1, 2007. (Reference 4.1-021) See Figure 2.5-13 for the locations of LV00707 and LV00708.

4.1.3.3 Inadvertent Discovery of Human Remains

If human remains are discovered during survey or site development, all work in the near vicinity of the human remains will cease and reasonable efforts will be made to avoid and protect the remains from additional impact. When human remains are encountered, federal and state guidelines must be followed, including those contained in the Native American Graves Protection and Repatriation Act of 1990 (on federal land) and Chapter 872.05, F.S. (on state-owned or privately owned land). Regardless of which law takes precedence, consultation with the SHPO (or the State Archaeologist in the case of Chapter 872.05, F.S.) and appropriate interested parties will occur to determine appropriate treatment and disposition of the remains.

4.1.3.4 Impacts of Construction on Historic Properties

Impacts from construction on historic properties are anticipated to be SMALL. Results of 2007 and 2008 archaeological and architectural resource surveys (see ER Subsection 2.5.3) indicate that the LNP site lies within an area of low probability for containing significant archaeological resources, and that the survey areas contained no structures that are listed in or eligible for listing in the NRHP. The survey did not identify any NRHP-eligible cultural resources within the respective APEs on the LNP site, the property south of the LNP site, or along the blowdown pipeline. No properties listed or eligible for listing in the NRHP will be affected by the proposed construction activities in the areas surveyed (Reference 4.1-018). This does not include the off-site transmission line corridors.

PEF has guidelines for employees and contractors designed to protect historic sites, historic landmarks, and artifacts or archaeological sites during land-disturbing activities. If a project or work activity inadvertently uncovers an archaeological site or other historical artifacts, activities in the site area will be halted, and the appropriate PEF Environmental Support Organization (ESO) will be contacted. For the LNP project, PEF's Environmental Health and Safety Services (EHSS) would be contacted. In the event of an inadvertent find, a cultural resource assessment would be performed, and EHSS would consult with the SHPO, as necessary, to determine appropriate steps to be taken prior to resuming site activities. PEF will coordinate directly with the Florida SHPO to determine appropriate mitigation or other measures, as needed, in accordance with federal and state regulations and PEF policy.

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4.1.4 REFERENCES

- 4.1-001 University of Florida GeoPlan Center, "Water Management District Land Use 2004 - St. John's River & Southwest Florida," Website, www.fgdl.org, accessed February 11, 2008.
- 4.1-002 University of Florida GeoPlan Center, "Suwannee River Water Management District Land Use 1995 - Updated," Website, www.fgdl.org, accessed February 11, 2008.
- 4.1-003 State of Florida Department of Transportation Geographic Mapping Section, "Florida Land Use, Cover and Forms Classification System," 3rd ed., January 1999.
- 4.1-004 U.S. Geological Survey, "A Land Use and Land Cover Classification System for Use with Remote Sensor Data," UGSGS Professional Paper 964, 1976, Website, www.ncrs.fs.fed.us/4153/deltawest/landcover/LLCoverPub.html, accessed March 5, 2008.
- 4.1-005 University of Florida GeoPlan Center, "FDOT District 2 - Generalized Future Land Use," Website, www.fgdl.org, accessed March 8, 2008.
- 4.1-006 University of Florida GeoPlan Center, "Developments of Regional Impact - 2007 QUARTER 4," Website, www.fgdl.org, accessed March 8, 2008.
- 4.1-007 University of Florida GeoPlan Center, "Planned Unit Development - 2007 QUARTER 4," Website, www.fgdl.org, accessed March 8, 2008.
- 4.1-008 Progress Energy Florida and Engelhardt, Hammer & Associates, "Application for Large-scale Future Land Use Map and Text Amendments," March 1, 2007.
- 4.1-009 State of Florida Department of Community Affairs, "Proposed Comprehensive Plan Amendment Review Objections, Recommendations and Comments Reports" Memorandum, September 28, 2007.
- 4.1-010 Levy County Florida, "Ordinance Number 2008-03 and Ordinance Number 2008-04," March 18, 2008.
- 4.1-011 State of Florida Department of Community Affairs, "Notice of Intent", May 8, 2008.

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**Table 4.1-4
LNP On-Site Land Use Impacts by Major Component (in Hectares)**

USGS Land Use	LNP 1, LNP 2, and Associated Cooling Towers (2)	500-kV Switchyard	Site Access Roads	Drainage Ponds	Total On-Site Impacts
Forested Wetland	2.7	2.9	1.7	8.0	15.3
Mixed Forest Land	2.5	15.6	7.7	25.1	50.8
Nonforested Wetland	0.3	0.1	0.2	0.2	0.8
Other Agricultural Land	9.2	0.9	2.1	3.0	15.2
Transportation, Communications, and Utilities	--	--	0.2	--	0.2
Total (hectares)	14.8	19.5	11.7	36.2	82.2

Sources: [References 4.1-001](#) and [4.1-002](#)

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Table 4.1-5 (Sheet 1 of 2)
LNP Off-Site Land Use Impacts by Major Component (in Hectares)

USGS Land Use	Heavy Haul Road and Barge Slip Access Road	Barge Slip	Makeup Water Pumphouse Units (2)	Transmission Line Corridor to the CFBC	Blowdown Pipeline Corridor from CFBC to CREC	Blowdown and Makeup Pipeline Corridors from LNP to CFBC	Total Off-Site Impacts
Cropland and Pasture	--	--	--	--	--	--	--
Deciduous Forest Land	0.2	--	--	6.7	1.4	0.5	<u>8.8</u>
Evergreen Forest Land	0.8	--	--	7.2	0.5	0.6	<u>9.1</u>
Forested Wetland	4.4	--	--	40.4	0.8	5.6	<u>51.2</u>
Lakes	--	--	--	--	--	--	--
Mixed Forest Land	16.9	--	--	129.5	--	16.4	<u>162.8</u>
Mixed Rangeland	--	--	--	--	--	--	--
Nonforested Wetland	1.1	--	--	6.2	4.4	1.2	<u>12.9</u>
Other Agricultural Land	3.5	--	--	15.9	--	2.5	<u>21.9</u>
Other Urban or Built-up Land	0.8	0.2	--	--	29.9	0.3	31.3
Reservoirs	--	--	--	--	0.9	--	<u>0.9</u>
Residential	--	--	--	--	--	--	--
Shrub and Brush Rangeland	--	--	--	--	1	--	<u>1</u>
Streams and Canals	< 0.1 ha	--	--	--	0.7	--	0.7
Strip Mines, Quarries, and Gravel Pits	--	--	--	--	0.9	--	0.9
Transitional Areas	--	--	0.8	--	--	--	0.8

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Table 4.1-5 (Sheet 2 of 2)
LNP Off-Site Land Use Impacts by Major Component (in Hectares)

USGS Land Use	Heavy Haul Road and Barge Slip Access Road	Barge Slip	Makeup Water Pumphouse Units (2)	Transmission Line Corridor to the CFBC	Blowdown Pipeline Corridor from CFBC to CREC	Blowdown and Makeup Pipeline Corridors from LNP to CFBC	Total Off-Site Impacts
Transportation, Communications, and Utilities	0.5	--	0.4	--	6.3	0.3	7.5
Total	28.2	0.2	1.2	205.9	46.8	27.5	<u>309.8</u>

Notes:

ha = hectare

Sources: [References 4.1-001](#) and [4.1-002](#)

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4.2 WATER-RELATED IMPACTS

This section describes the potential hydrologic alterations (ER [Subsection 4.2.1](#)) and water use impacts (ER [Subsection 4.2.2](#)) that may result from construction of the following infrastructure at the LNP site:

- Reactor Units LNP 1 and LNP 2.
 - Makeup and blowdown pipeline corridor.
 - Cooling water intake and discharge structures.
 - 500-kV switchyard.
 - Auxiliary buildings 115, 114, 114A, 169, and 141.
 - Drainage ponds A, B, and C (C1 and C2).
- |
- South transmission line corridor.
 - Heavy haul road and barge slip access road.

The LNP site is located in southwestern Levy County, Florida, and encompasses an area of approximately 1257 ha (3105 ac.). The Gulf of Mexico is located approximately 12.8 km (7.9 mi.) west of the site, and Lake Rousseau is approximately 4.8 km (3.0 mi.) south of the site ([Figure 4.1-2](#)). As part of the proposed construction, a 304.8-m (1000-ft.) wide transmission corridor will be constructed from the southern border of the site. A construction corridor approximately 45.7-m (150-ft.) wide will also be constructed in a southerly direction from the southern border of the site to the CFBC. This corridor will be used for site access and movement of equipment and supplies. A 45.7-m (150-ft.) wide corridor for the makeup and blowdown pipelines will be constructed adjacent to the construction corridor ([Figure 2.1-2](#)). Construction of the blowdown pipeline will also include construction along the CFG State Recreation and Conservation Area, across the CFBC, and adjacent to the Crystal River State Buffer Preserve. The blowdown pipeline will connect to an existing discharge canal located at the CREC.

Several public trust lands, including natural and preserve areas, are within close proximity to the LNP site, including the Big Bend Seagrasses Aquatic Preserve, the Crystal River Preserve State Park, the Waccasassa Bay Preserve State Park, and the Goethe State Forest ([Figure 2.4-7](#)).

The LNP site is located in the SWFWMD and is within the Waccasassa River and Withlacoochee River drainage basins ([Figure 2.3-4](#)). There are no named streams at the LNP site. Runoff from the site is primarily overland, with storage

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4.3 ECOLOGICAL IMPACTS

This section addresses potential impacts on terrestrial and aquatic ecosystems resulting from the construction of the LNP and associated facilities. Construction impacts on terrestrial ecosystems are discussed in ER [Subsection 4.3.1](#) and impacts on aquatic ecosystems are discussed in ER [Subsection 4.3.2](#).

4.3.1 TERRESTRIAL ECOSYSTEMS

ER [Subsection 4.3.1.1](#) addresses anticipated construction impacts on terrestrial ecosystems on the plant site. Impacts on ecosystems in the areas of the associated facilities are addressed in ER [Subsection 4.3.1.2](#). A Site Redress Plan will accompany this COLA and provides guidance for returning a proposed site to an environmentally stable and aesthetically acceptable condition appropriate with local zoning laws in the event that site activities allowed under a Limited Work Authorization (LWA) are performed. Including the Site Redress Plan with the COLA constitutes assurance that, if activities authorized by the LWA are carried out but are terminated by PEF, the LWA is revoked by the U.S. Nuclear Regulatory Commission (NRC), or the final decision of the NRC is to deny the COLA, the site will not be left in an unacceptable condition or state.

4.3.1.1 Plant Site

Construction of the LNP will result in temporary and permanent impacts on terrestrial ecological communities. Construction will cause direct loss of planted pine and forested wetland communities, and alteration of some of the remaining communities that are located near the construction areas on the LNP site.

[Table 4.3-1](#) depicts the approximate areas of impact by land cover type. The land cover types in the table and described below are based on the FLUCCS ([Reference 4.3-001](#)). [Figure 2.4-6](#) depicts the land cover types on the LNP site.

Construction of the LNP will result in permanent loss of 338 ac. of tree plantation, (Code 440); 140 ac. of cypress swamp (Code 621); 145 ac. of open lands (Code 260); and 5 ac. of bottomland swamp (Code 615). Less than 23 ac. of the following land cover types will be affected by construction of the LNP: wetland forested mixed (Code 630), freshwater marsh (Code 641), and upland coniferous forest (Code 410).

Most of the subject property, 2455 ac., will remain undeveloped following construction of the LNP. Approximately 650 ac. or about 21 percent will be cleared out of a total 3105 ac., with the balance of the LNP site remaining undisturbed as vegetated buffer.

Construction will result in alteration of some of the remaining habitat through modification in community structure and composition. Construction will further modify a landscape already highly fragmented by silvicultural rotations of pine plantings and harvesting. Creation of additional open area (transmission corridor and other clearings) will favor wildlife species that prefer ecotonal or “edge” environments (such as white-tailed deer [*Odocoileus virginianus*], bobwhite quail

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[*Colinus virginianus*], and eastern cottontail rabbit [*Sylvilagus floridanus*] (Reference 4.3-002) over species that prefer the forest interior. Fragmentation can also make it easier for invasive exotic plant species, such as cogon grass (*Imperata cylindrica*) and Chinese privet (*Ligustrum sinense*), to colonize and spread (Reference 4.3-003). These deleterious impacts can be partially offset through impact minimization measures as discussed in ER Section 4.6.

Terrestrial ecosystems on-site have been degraded through decades of silviculture operations. Conversion from a diverse natural system to planted pine reduces the habitats available to wildlife (see ER Subsection 2.4.1.1.1.6, Other Open Lands, Rural [Code 260]). Construction will result in permanent loss of previously disturbed areas. Most of the wildlife species affected are common and widespread, and tolerant of some degree of human disturbance (see ER Subsection 2.4.1.1).

Construction-related noise and expected disturbance is expected to cause most mobile wildlife to avoid the LNP site during active construction periods, and either return after construction is complete, or migrate to adjacent natural lands. The site borders conservation lands (Goethe State Forest, Figure 2.4-7) and other undeveloped areas that represent abundant and similar habitats for displaced wildlife. Use of elevated construction equipment, such as cranes, will be restricted only to the area and duration necessary to minimize the potential for avian collisions. Clearing and construction will be conducted in a manner that minimizes sedimentation by complying with federal, state, and county regulations and ordinances. ER Section 4.2 more thoroughly discusses BMPs, including sedimentation control measures. Erosion and sedimentation control devices will be maintained, regularly inspected, and re-assessed following storms. Construction dust will be controlled to minimize short-term effects such as sedimentation to streams and CFBC and degradation of water quality. Measures to control construction fugitive dust include wetting the area, as necessary, and using erosion and sedimentation control measures. Any dredge spoil materials that are created as a result of construction activities in wetlands or other water bodies will be tested according to applicable permit requirements and properly disposed of according to the test results.

Individuals of more sedentary wildlife species (such as small reptiles, amphibians and burrowing species) are likely to be directly destroyed by construction. Construction of the LNP will result in direct mortality for certain wildlife and will reduce the available habitat area, but will not adversely affect local or regional populations of wildlife species. Impacts on terrestrial ecosystems are, therefore, expected to be SMALL.

4.3.1.1.2 Important Species

Important species identified at the LNP site (Table 2.4-5) include the game species white-tail deer (*Odocoileus virginianus*), bobwhite quail (*Colinus virginianus*), and wild turkey (*Meleagris gallopavo*), as well as certain protected species such as gopher tortoise (*Gopherus polyphemus*) and eastern indigo snake (*Drymarchon corais couperi*) that either have been observed on-site or are

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identified as likely to occur on-site based on published records (Reference 4.3-003). These species are discussed further in ER Subsection 2.4.1.1.3. Potential effects on important species resulting from LNP construction are described below.

Local and regional populations of white-tail deer, bobwhite quail, and wild turkey are not expected to be adversely affected by construction of the LNP. About 276 ha (683 ac.) out of the 1257 ha (3105 ac.) or 22 percent of the total property area will be developed for the LNP project, leaving abundant similar habitat of planted pine and cypress and mixed hardwood swamp. Development of the transmission corridor, which will create early successional habitat, could enhance forage opportunities for these species (ER Subsection 4.3.1.2).

Several listed species were either observed on-site during ecological surveys by CH2M HILL biologists, or were identified as having potential to occur on-site based on documented occurrences in the property vicinity (Reference 4.3-003) (Tables 2.4-5, 2.4-6, and 2.4-7). Potential impacts on these species as a result of LNP construction are discussed below.

Although the eastern indigo snake was not observed at the LNP site during ecological surveys, it could forage in wetlands on the property and use gopher tortoise burrows for refuge. Areas known to have gopher tortoise burrows will be largely undisturbed, but the loss of on-site wetlands could represent loss of forage habitat for this species. In addition, increased traffic on-site during the construction period increases the chances of roadway mortality for individual snakes.

As stated above, the gopher tortoise is known to inhabit higher elevations in the northeastern and south-central portions of the LNP site. Most of these areas will remain undisturbed following construction. Gopher tortoises found in construction areas will be relocated to appropriate on-site habitat in accordance with the Florida Fish and Wildlife Conservation Commission (FFWCC) Guidelines (Reference 4.3-004), and as discussed in ER Subsection 6.5.1. Gopher tortoises frequently burrow in disturbed and grassy areas such as transmission corridors, and these areas may be used by gopher tortoises following construction.

Bald eagles (*Haliaeetus leucocephalus*) are occasionally observed in flight over the LNP site. An active bald eagle nest is located just south of the LNP site, west of the proposed heavy haul road (see ER Subsection 2.4.1.1.3.2.3). No active eagle nests have been identified on-site, and while forage habitat will be reduced through construction, the LNP project will not adversely affect regional populations of the bald eagle and will minimize the disturbance of bald eagle nests.

Florida black bears are known to inhabit the adjacent Goethe State Forest (ER Subsection 2.4.1.1.3.2.4), and it is likely that they will occasionally use the LNP site for forage or as a travel corridor. They are expected to avoid the site during construction because of noise and human presence, and they will be prevented from entering the LNP site after perimeter fencing is installed.

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Red-cockaded woodpecker (*Picoides borealis*) is not known to occur on the LNP site, and is not expected to occur because of the absence of preferred habitat. Therefore, construction of the LNP is not expected to adversely affect red-cockaded woodpecker populations.

The American Alligator (*Alligator mississippiensis*) is known to inhabit marshes and swamps on-site. This species is locally common and construction will not adversely affect local or regional populations.

Wood storks (*Mycteria americana*) and other wading birds, including great blue heron (*Ardea herodias*), little blue heron (*Ardea caerulea*) and white ibis (*Eudocimus albus*), are occasionally observed feeding in on-site wetlands. These birds are transient visitors to the LNP, usually during periods of high water, and they are not known to nest on-site. Very little of the open water habitat favored by these species currently exists on-site, and it is possible that construction of the stormwater ponds will attract more of these birds to the area.

The Florida Natural Areas Inventory (FNAI) Occurrence Report ([Reference 4.3-003](#)) identifies several rare plant species documented as occurring near, but not within the LNP site. No federally listed plant species is known to occur on the LNP site. Cinnamon fern (*Osmunda cinnamomea*) and royal fern (*Osmunda regalis*) were identified in cypress swamps on-site during field surveys. These species are listed as Florida Species of Special Concern because of the potential for commercial exploitation. Some of these plants are expected to be destroyed by construction; however, the species are common in the region and the loss is expected to have an insignificant impact on regional populations.

Consultation with federal and state agencies including the USFWS, National Marine Fisheries Service, and the FFWCC concerning the potential presence of protected species is currently being conducted as part of federal and state permitting processes. Monitoring programs associated with protected terrestrial species are described in ER [Section 6.5](#).

Construction of the LNP is not expected to adversely affect the regional population of any protected plant or animal species. Native habitats on the LNP property have been significantly altered through silviculture operations, and mobile listed species are likely to preferentially use less disturbed habitats on adjacent conservation lands. Impacts on important species are expected to be SMALL.

4.3.1.1.3 Important Terrestrial Habitats

Important terrestrial habitats are defined by the NRC in NUREG-1555 as: 1) wildlife sanctuaries, refuges, and preserves, 2) habitats identified by state or federal agencies as unique, rare, or a protection priority, 3) wetlands and floodplains, and 4) land areas identified as critical habitat for species listed as threatened or endangered. These habitats and their presence within and in the vicinity of the LNP are described in ER [Subsection 2.4.1.1.5](#).

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Several conservation areas are in the vicinity of the LNP, and are not expected to be affected by the LNP construction. There are no areas on-site designated by the USFWS as critical habitat for listed species ([Reference 4.3-005](#)).

Wetlands comprise the major important terrestrial habitats on-site. Impacts on wetlands were avoided and minimized to the extent practicable during facility siting and site investigative activities. No dredge spoils will be redeposited in wetlands as a result of construction activities. Habitat areas affected by construction of the LNP, including wetland areas, are depicted on [Figure 2.4-6](#). Approximately 88 ha (218 ac.) of wetlands on-site will be permanently affected through construction ([Table 4.3-1](#)). Of these, approximately 70 ha (172 ac.) of cypress swamp, 10 ha (26 ac.), bottomland swamp, 6 ha (15 ac.) of mixed hardwood swamp, and 2 ha (5 ac.) of freshwater marsh will be permanently affected. Compensation to offset unavoidable impacts on wetlands is required through both the Federal Section 404/10 and the State of Florida ERP processes. Loss of or impairment to functions of these wetlands will be mitigated through the permitting process (ER [Subsection 6.5.1](#)), and habitats similar to the areas affected are abundant in the vicinity. Overall impacts on wetlands as a result of the LNP construction are expected to be MODERATE, based on the abundance of similar wetlands in the vicinity and on the anticipated mitigation of wetlands within the watershed as required under ERP guidelines.

4.3.1.2 Associated Facilities

This subsection discusses construction impacts on areas of the associated facilities, which comprise the associated facilities and the transmission corridors. The associated facilities consist of the following:

- Heavy haul road and barge slip access road.
- Makeup water pumphouse.
- Blowdown pipeline corridor.
- Makeup pipeline corridor.

Land use construction impacts for the associated facilities and the transmission corridors beyond (south of) the CFBC are addressed in detail in ER [Section 4.1](#).

[Figure 2.4-8](#) and [Table 4.3-2](#) depict the approximate areas of impact by land cover type. The land cover types in the table and described below are based on the FLUCCS. ([Reference 4.3-001](#)) Construction of the LNP-associated facilities are anticipated to result in impacts on approximately 99.1 ha (225.1 ac.) of predominantly pine plantation, upland forest, and freshwater wetlands and swamp. The areas affected by construction of the associated facilities are similar

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to the ecosystems on the LNP site as a result of having been disturbed through silviculture and other anthropogenic activities.

4.3.1.2.1 Important Species

Important terrestrial species identified in the areas of the associated facilities are the same as those identified on the LNP site (ER [Subsection 2.4.1.1.3](#)). Important species located in the vicinity of the transmission corridors are identified in ER [Subsection 2.4.1.2](#). Potential impacts on these species resulting from construction of the LNP-associated facilities are anticipated to be similar to those described above for the plant site, with mobile species avoiding the construction areas and returning following construction. Mortality of less mobile wildlife species, such as small mammals, reptiles and amphibians, and burrowing species is expected; however, no significant adverse impacts on the regional population of any species are expected.

An active bald eagle nest is located just south of the LNP site, west of the proposed heavy haul road (ER [Subsection 2.4.1.1.3.2.3](#)). LNP construction activities are anticipated to occur only beyond 200 m (660 ft.) from the nest, the guidance distance identified by the USFWS within which monitoring is required. Activities in the vicinity of the nest will be conducted in accordance with current USFWS guidance to minimize any effects on the eagle nest and its occupants ([Reference 4.3-006](#)).

4.3.1.2.2 Important Habitats

Important terrestrial habitats in the areas of the associated facilities include the CFG State Recreation and Conservation Area, and wetland systems.

The heavy haul road will go north from CR-40 to the LNP site. The barge slip access road travels south from CR-40 to the anticipated barge slip across CFG land ([Figure 2.1-2](#)). This area is a maintained public recreation area, and construction of the LNP-associated facilities will not adversely affect important natural systems in this area. The blowdown pipeline will be buried in the berm of the CFBC from its entry point near the proposed CWIS to a point west of the Route 19 bridge where the pipeline corridor intersects an existing transmission line corridor. The buried pipeline trench will simply be covered by the removed soils, and any excess soils will be removed from the top of the berm and properly disposed of or re-utilized elsewhere on the site. The construction area for the pipeline is mostly unvegetated or scrub vegetation and is not considered important habitat for terrestrial wildlife.

[Table 4.3-2](#) lists the vegetative cover types that will be affected by construction of the LNP early infrastructure facilities. Approximately 53 ha (130 ac.) of wetlands will be affected by the LNP project, including 21 ha (52 ac.) of freshwater marsh, and 19 ha (47 ac.) of cypress swamp. Like the wetlands on the LNP site, wetlands that will be affected by construction of the associated facilities have been degraded, largely through silvicultural activities (ER [Subsection 2.4.1.1.1.6](#)

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**Table 4.3-1
Potential Land Cover Class Impacts on the LNP Site**

FLUCCS Code	Classification	Area On-Site (ac.)	Percentage of Total Site Area
260	Other Open Lands (Rural)	<u>32.4</u>	<u>1.0</u>
410	Upland Coniferous Forest	<u>1.3</u>	0
440	Tree Plantations	<u>317.0</u>	10.2
615	Stream and Lake Swamps (Bottomland)	<u>0.6</u>	0
621	Cypress	<u>88.3</u>	<u>2.8</u>
630	Wetland Forested Mixed	<u>15.0</u>	0.5
641	Freshwater Marshes	<u>5.1</u>	0.2

Notes:

ac. = acre

Source: [Reference 4.3-001](#)

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**Table 4.3-2
Potential Land Cover Class Impacts for
LNP-Associated Facilities**

FLUCCS Code	Classification	Area (ac.)
<u>160</u>	<u>Extractive</u>	<u>4.6</u>
<u>190</u>	<u>Open Land</u>	<u>48.1</u>
<u>260</u>	<u>Other Open Lands (Rural)</u>	<u>6.4</u>
<u>320</u>	<u>Shrub and Brushland</u>	<u>3.2</u>
<u>330</u>	<u>Mixed Rangeland</u>	<u>10.0</u>
<u>410</u>	<u>Upland Coniferous Forests</u>	<u>10.1</u>
<u>440</u>	<u>Tree Plantations</u>	<u>71.5</u>
<u>510</u>	<u>Streams and Waterways</u>	<u>2.5</u>
<u>530</u>	<u>Reservoirs</u>	<u>2.3</u>
<u>620</u>	<u>Wetland Coniferous Forests</u>	<u>11.8</u>
<u>630</u>	<u>Wetland Forested Mixed</u>	<u>2.4</u>
<u>640</u>	<u>Vegetated Non-Forested Wetlands</u>	<u>16.0</u>
<u>810</u>	<u>Transportation</u>	<u>5.4</u>
<u>830</u>	<u>Utilities</u>	<u>14.5</u>
	TOTAL	<u>225.1</u>

Notes:

These data do not include transmission corridors.

ac. = acre

Source: [Reference 4.3-001](#)

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for the pipeline and heavy haul road corridors, and the cooling water pumphouse that will be located near the CFBC. However, noise levels in these areas are expected to persist for a much shorter duration than at the main plant site. BMPs will also be developed, implemented, and periodically revised construction in these areas.

Construction noise could be noticed by a few nearby residents and some individuals participating in recreational activities along the CFG and in Goethe State Forest. The Inglis Island Trail, part of the CFG, is approximately 5.4 km (3.4 mi.) from the LNP site, and the closest point in the Goethe State Forest is 4.5 km (2.8 mi.) from the LNP site (Figure 2.1-1). The nearest residences are located approximately 2.6 km (1.6 mi.) to the northwest and 2.8 km (1.7 mi.) to the west-southwest of the center of the LNP site (Figure 2.3-40). At these distances, construction noise is not expected to be very noticeable except possibly during limited periods of very intense construction noise (such as pile driving), and when ambient background noise is exceptionally low.

In general, noise during construction is not expected to significantly affect off-site areas, including the locations of nearest residences and recreational areas that are in the general proximity of the LNP site. Noise impacts on the surrounding area during construction are, therefore, anticipated to be SMALL.

4.4.1.2 Air Quality

The construction of the LNP site has the potential to have an impact on ambient air quality in the immediate vicinity of the main plant site, and to a lesser extent, in the vicinity of the heavy haul road, transmission corridors, pipeline corridor, and installation of the intake structure and pumphouse near the CFBC. However, because of the very large nature of the site (approximately 1257 ha [3105 ac.]) for the main site, exclusive of pipeline corridors or other linear access routes), and the relatively large distance from the center of the project site (where most construction and equipment laydown will occur) to the site boundaries, impacts on air quality at off-site locations are expected to be infrequent and minimal during site development and plant construction. Construction activities can be expected to generate fugitive particulate matter (PM) emissions, as well as vehicle and construction equipment-related exhaust emissions. Fugitive PM emissions will result primarily from ground clearing, excavation, grading, cut and fill operations, and vehicular travel over paved and unpaved roads. Construction equipment emissions will primarily come from diesel-powered heavy equipment used and traffic caused by construction workers accessing the site. Once cleared, exposed land areas may also generate fugitive dust as a result of wind erosion.

As part of the site development, vegetation and forested areas will be cleared from the necessary portions of the project site that will be developed. The size of the developed area (including material and equipment laydown areas) is expected to be in the range of 20 percent of the overall site area (approximately 242.8 ha [600 ac.]). Cleared material will either be processed for beneficial reuse or burned on-site. Any open burning associated with land clearing will be

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conducted in accordance with Florida Regulations, specifically Chapter 62-256 Open Burning, of the F.A.C. Open burning would only be conducted after the appropriate notifications and approvals are obtained from the FDEP, as required by F.S.

Emissions from on-site construction equipment including cranes, trucks, earthmoving equipment, compressors, pile drivers, and other diesel- and gasoline-powered equipment will also occur, primarily as emissions of particulate matter of 10 micrometers and smaller (PM₁₀), sulphur dioxide (SO₂), nitrogen oxides (NO_x), carbon monoxide (CO), and volatile organic compound (VOC). These emissions are expected to be consistent with emissions from other large construction projects of this size, and there should be no significant impacts on air quality at off-site locations during the construction period.

Foundations and other structures will require substantial amounts of concrete. The large volume requirements will require the installation and operation of a temporary concrete batch plant on the site during the construction period. While there will be air emissions from the concrete batch plant, they are expected to consist primarily of PM (from cement and aggregate handling and storage) and diesel exhaust emissions from trucks accessing the batch plant during operations. It is expected that batch plant operations will be monitored by the plant operator and its emissions controlled to limit emissions during operation, and there should be no significant or discernible impacts on air quality at off-site locations resulting from its operation. Because materials used in concrete production will be delivered to the site in bulk by truck or barge, the operation of an on-site concrete batch plant will effectively reduce regional and local emissions from concrete mixing and delivery trucks that would otherwise be entering and leaving the site. If any temporary air operating permits will be required for the operation of the batch plant, they will be obtained by the operator of the plant, and the plant will comply with all applicable requirements imposed by FDEP's regulations.

A variety of control measures will be implemented during the construction period to minimize air emissions and their potential impact on the surrounding environment particularly at off-site locations. These measures will include the following controls and procedures:

- Grading will be performed to promote good drainage. This will minimize the potential accumulation of mud on equipment tires that could be transferred to road surfaces, which could generate fugitive dust from wind erosion, traffic, or heavy equipment operation.
- Ground surfaces will be stabilized as soon as practical to prevent wind erosion.
- Those areas that will revert to maintained grounds will be reseeded as soon as practicable to reduce the potential for fugitive dust generation.

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- During dry conditions, bare ground in the construction area and along nearby construction roads will be wetted to minimize the generation of fugitive dust from vehicle traffic.
- Roadways used to access the LNP site will be wetted to minimize fugitive dust from traffic or heavy equipment operation.
- Open or lightly traveled areas will either be paved, covered in hard-packed aggregate, or vegetated to minimize fugitive dust emissions from traffic and wind erosion.
- Heavily traveled unpaved construction roads and laydown areas will be stabilized with suitable materials such as stone dust to prevent wind erosion or fugitive dust generation by heavy equipment.
- Applicable air pollution control regulations with regard to open burning and the operation of fueled vehicles will be followed.
- Where required, permits and operating certificates will be obtained.
- Fuel-burning construction equipment will be maintained in proper mechanical order to minimize emissions.
- All reasonable precautions will be implemented to prevent accidental brush or forest fires.

A fugitive dust control plan will be developed and reviewed periodically to assess and improve the effectiveness of fugitive dust control measures and practices.

During the construction period, PM emissions will be generated that will consist of both PM and PM₁₀. The emissions can be expected to vary considerably during the hours of construction on a daily basis (primarily during daylight hours), as well as throughout the construction period. The primary variables that will affect construction-related emissions are expected to be the type and amount of construction activities, and ambient conditions such as wind speed, wind direction, humidity, and soil moisture content. While the U.S. Environmental Protection Agency (USEPA) and FDEP have promulgated ambient air quality standards for PM₁₀, it is not expected that this standard will be exceeded or even threatened at any off-site locations as a result of construction activities. Presently, the entire State of Florida is designated as being in attainment of the National Ambient Air Quality Standards (NAAQS) for all pollutants. The LNP site is located in Levy County, which is currently designated by the USEPA as being in attainment of the NAAQS. The compliance status of the area is not expected to change as a result of the construction of the LNP.

Air quality impacts on the surrounding area attributable to the construction of the LNP site are anticipated to be SMALL.

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4.4.1.3 Visual Aesthetic Disturbances

The LNP uses vegetation and distance as a visual screen or buffer from surrounding land uses. Construction activities at the plant site should not be visible to nearby residences. However, the construction activities of the LNP site and its associated components, including the pumphouse, transmission corridor, blowdown pipeline corridor, heavy haul road, and barge slip access road may be visible to those recreating in Goethe State Forest and to boaters or other individuals conducting water-based recreational activities on the CFG. Because the main portion of Lake Rousseau is east of the LNP, those pursuing water-based activities will have minimal visual exposure to construction activities. See [Figure 2.1-1](#) for the locations of these recreational areas in relation to the LNP site. A detailed description of transmission line corridors and the blowdown pipeline corridor is further discussed in ER [Subsection 4.1.2](#).

Tree clearing and construction activities will be visible along roads, along the transmission corridors, along the pipeline corridor, and at the construction site for the intake structure and pumphouse. The Inglis Island Trail, located approximately 5.4 km (3.4 mi.) from the LNP site, and Inglis Lock Recreation Area will experience the most tree clearing and construction impacts south of the LNP site because of the transmission line and blowdown pipeline corridor construction as shown on [Figure 2.1-2](#). Recreational users of the Goethe State Forest, located 4.5 km (2.8 mi.) north of the LNP site, might also experience visual aesthetic disturbances from construction ([Figure 2.1-1](#)).

The area around the site is buffered with trees and shrubs that help mitigate the visibility of construction activities. The edge of the Goethe State Forest is near the northern border of the LNP site property. Currently, the LNP site is buffered from the state forest with trees and scrubs, but the existing vegetation will be cleared during construction. However, the clearing and construction will only affect the areas of the Goethe State Forest closest to the site. Overall, the Goethe State Forest encompasses a land area of 21,609 ha (53,398 ac.), and the majority of the forest will experience little to no construction impacts.

The area to the south of LNP site is also buffered with vegetation, but the presence of the manmade CFBC and the cleared lands along the shoreline contribute to the area's nonpristine conditions. However, the CFBC is popular fishing area to recreational users. During the construction phase, recreational users on the CFG and along the CFBC near the transmission corridor, heavy haul road, pipeline corridor, or pumphouse construction site will not be screened from the timber harvesting activities. To avoid visual and noise impacts from these construction activities, users can relocate to other areas of the CFG. This potential displacement would be a SMALL impact because other areas of the park are available and are relatively not affected.

BMPs to mitigate visual aesthetics during construction activities will be used and include the following:

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respectively. Each of the remaining four counties (Dixie, Gilchrist, Hernando, and Sumter) is estimated to experience a 2 percent or 67 person increase.

For 2005, the following populations were reported for each of the counties discussed above: 304,926 (Marion), 240,764 (Alachua), 132,635 (Citrus), 37,985 (Levy), 15,377 (Dixie), 16,211 (Gilchrist), 150,784 (Hernando), and 74,052 (Sumter) ([Reference 4.4-001](#)). Population projections for 2010 reported the following: 350,923 (Marion), 260,751 (Alachua), 147,437 (Citrus), 42,411 (Levy), 16,973 (Dixie), 18,583 (Gilchrist), 169,976 (Hernando), and 92,211 (Sumter) ([Reference 4.4-009](#)). Based on this data, the following increases in population percentages are expected: 15.3 percent (Marion), 8.3 percent (Alachua), 11.2 percent (Citrus), 11.7 percent (Levy), 10.4 percent (Dixie), 14.6 percent (Gilchrist), 12.7 percent (Hernando), and 24.5 percent (Sumter). While it is unlikely that LNP construction was taken into consideration in the future population's projections, the additional growth that would result from LNP construction would be minimal. It is estimated that less than 0.5 percent increase in each county will occur from construction worker and their families relocating to the region.

Approximately 161 primary and secondary schools are located within the 80-km (50-mi.) region. Currently, the Levy School District is under capacity, only three out of 17 schools in Citrus County are over capacity. Marion County School District currently has 23 out of 45 schools over capacity. For the remaining counties (Alachua, Dixie, Gilchrist, Hernando, and Sumter) any additional school impacts are anticipated to be dispersed among the other school districts. If the number of school-age children increases slightly, the school system might have sufficient capacity to serve them. Because construction workers and their families will be distributed amongst the eight counties, impacts on the educational system will be SMALL.

4.4.2.6 Recreation

ER [Subsection 2.5.2.7](#) describes recreational facilities in the vicinity. Construction activities will temporarily disrupt recreational activities at some of these locations. Fishing, hunting, hiking, bicycling, and horseback riding are some recreational activities that will be affected by the construction of the LNP site and its associated components, such as the transmission line corridors, blowdown pipeline corridor, heavy haul road, barge slip access road, and pumphouse ([Figure 2.1-2](#)). Most of the hiking, bicycling, and horseback riding trails in the CFG will be relatively unaffected by construction impacts because of the distance and vegetation screening between the LNP site and the CFG. Recreational users can always move to these other areas of the CFG during construction to avoid impacts. The trails on the Inglis Island portion of the CFG will be affected with visual and minor noise disturbances, but access will not be limited in these areas. Anglers will also be able to fish along the southern side of the CFG during construction of the LNP, but there would be visual aesthetics and minor noise impacts. Overall, most of the construction will occur on the opposite side of the CFBC where these facilities are located, which will create a small buffer to the foreseen visual and noise impacts ([Figure 2.1-2](#)).

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The trails in the Goethe State Forest could also experience impacts that would be similar to those along the CFG. Hunters will still be able to hunt in the Goethe State Forest even though hunting was terminated on the LNP site property for safety and security. However, hunting in the forest may also be affected by minor noise and visual aesthetics around the LNP site, but the rest of the forest will not be affected. Therefore, the impact to on-site recreation will be SMALL.

Figures 2.1-1 and 2.1-2 show the LNP site and its components related to the nearby recreational facilities discussed in this section.

The CFG and Goethe State Forest are not the only resources in the region for meeting recreational demands such as those listed previously. Fishing areas, hiking trails, and bicycling trails can also be found in the Crystal River Preserve State Park (Reference 4.4-020). Fanning Springs State Park also has an abundance of fishing areas (Reference 4.4-021). The Withlacoochee State and the Ocala National Forests also offer fishing, hiking, and hunting (References 4.4-022 and 4.4-023). The Withlacoochee State Forest also offers horseback riding trails (Reference 4.4-023). Those who use the CFG and Goethe State Forest facilities can modify their recreational activities by visiting these other recreational resources when noise and visual impacts begin.

It is assumed that 50 percent of the 2700 peak construction workforce will migrate into the region with their families. Therefore, a temporary increase in the regional population is expected especially for Marion, Citrus, and Alachua Counties. Table 2.5-26 lists the recreational areas within the 80-km (50-mi.) region and their average daily attendances, capacities, and utilization rates. Based on the relatively low daily attendance rates and the daily capacities listed in Table 2.5-26, the recreational areas should be able to accommodate an increase in population and tourism. Increased hunting is also expected in the region from the influx of construction workers. Hunting statistics for Goethe State Forest are shown in Table 2.5-27. An estimated 169 people, includes the construction workers and their estimated family size, are expected to relocate to Levy County. According to the hunting statistics, Goethe Forest has not reached hunter quotas and would be able to accommodate these additional people. This also assumes the hunters are following state and local hunting regulations. Hunting will also be available in the Ocala National Forest and the Withlacoochee State Forest. Communication with affected organizations and relocation of the affected resources will help minimize the impacts of construction activities.

Because of the abundance of recreational facilities and opportunities within the vicinity and region of the LNP site, construction impact on recreation is expected to be SMALL.

4.4.2.7 Public Facilities and Services

As stated in ER Subsection 4.4.2, it is assumed that 50 percent of the new construction workers will already live within the region and the remaining 50 percent of workers will relocate to the region. Therefore, public facilities

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- Aquatic ecosystem.
- Socioeconomic.
- Radiation exposure to construction workers.
- Other (site-specific).

Table 4.6-1 uses the NRC's three-level standard of significance levels for each element (SMALL, MODERATE, or LARGE). These significance levels were determined by evaluating the potential effects after any controls or mitigation measures had been implemented. The significance levels used in the evaluation were developed using Council on Environmental Quality (CEQ) guidelines 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 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," NUREG-1437, Volumes 1 and 2.

In addition to the cumulative impacts attributable to the construction of the entire LNP facility that are summarized in **Table 4.6-1**, a breakdown or separation of "construction" and "preconstruction" environmental impacts has been estimated in **Table 4.6-2** for the purpose of assessing impacts attributable specifically to the construction of "safety-related structures, systems, or components (SSCs)" as defined in 10 CFR 50.2, "Definitions." All other construction activities can be considered to be either "preconstruction" or "other than construction" under the definition of construction in 10 CFR 50.2.

Table 4.6-2 provides estimates of the percentage of impacts attributable to "construction" and to "preconstruction," as well as a summary of the basis for the estimates. The estimated construction related impacts presented in the table were based primarily on two factors, namely the area associated with the construction of SSCs and the labor hours associated with the construction of SSCs. Information related to these two factors is provided as follows:

- Construction Area — The LNP site consists of 3105 contiguous ac., exclusive of off-site linear facilities (heavy haul road, water pipelines, and |

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electric transmission lines) or other supporting facilities such as the barge dock. The total estimated area that will be developed for the LNP is estimated to be approximately 1253 ac., exclusive of electric transmission lines. Of these developed areas, approximately 50 ac. will be developed for SSCs (25 ac. each for LNP 1 and LNP 2). The area that will be developed for the construction of SSCs therefore represents approximately 4 percent of the total area that will ultimately be developed (excluding electric transmission lines). Because this estimate does not include electric transmission lines, it is considered to be a very conservative estimate. For the purposes of this assessment, the impacted area associated with SSCs is considered to be less than 5 percent.

- Labor Hours — Based on preliminary construction estimates for all phases of development of the LNP, the estimated labor hours associated with the construction of SSCs is approximately 36 percent of the total labor hours associated with the development of the entire LNP. For the purpose of this assessment, the labor hours associated with SSC construction is considered to be less than 35 percent.

4.6.3 MEASURES AND CONTROLS TO LIMIT ADVERSE IMPACTS

The following measures and controls will limit potential adverse environmental impacts related to construction activities for the LNP:

- Compliance with federal, state, and local laws, ordinances, and regulations intended to prevent or minimize adverse environmental effects (for example, solid waste management, erosion and sediment control, air emissions, noise control, stormwater management, spill response and cleanup, and hazardous waste management).
- Compliance with applicable requirements of existing permits and licenses (for example, Florida NPDES permit for blowdown discharge, Operating License) for the CREC and other permits and licenses required for construction of the LNP (for example, application to the NRC for approval to conduct certain LWA construction activities, USACE Section 404 Permit, a NPDES for stormwater discharge, a Prevention of Significant Deterioration air permit, a 316(b) demonstration for the proposed CWIS, and the Florida SCA process for addressing state and local permitting information and coordination requirements).
- Compliance with existing PEF processes and/or procedures applicable to construction environmental compliance activities for the LNP (for example, solid waste management, hazardous waste management, and spill prevention and response).
- Incorporation of environmental requirements into construction contracts.

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**Table 4.6-1 (Sheet 2 of 8)
Summary of Measures and Controls to Limit Adverse Impacts during Construction**

Section Reference	Potential Impact Significance ^{(a), (b)}												Impact Description or Activity	Specific Measures and Controls	
	Noise	Erosion and Sediment	Air Quality	Traffic	Effluents and Wastes	Surface Water	Groundwater	Land Use ^(c)	Water Use ^(d)	Terrestrial Ecosystem	Aquatic Ecosystem	Socioeconomic			Rad Exp to Const Wkrs
ER Subsection 4.1.1.3 Construction Impacts on the Geologic Environment								S						Impacts on mineral resources.	PEF to maintain control of mineral rights; no mineral rights outstanding or leased.
ER Subsection 4.1.2.1 Transmission Corridors								S						Impacts associated with construction of three new transmission corridors to three high-voltage substations and a 500-kV switchyard.	Follow BMPs, ROW preparation; erosion and sediment controls; minimize clearing; minimize effects on human populations, wetlands and water bodies, archaeological and historic sites, vegetation, and wildlife; and comply with permit and regulatory requirements and mitigation plans as required. See ER Subsection 2.2.2 and Section 3.7.
ER Subsection 4.1.2.2 Off-Site Areas								S						Impacts from construction of heavy haul road, barge slip access road, and makeup water and blowdown pipeline corridors.	Erosion and sediment controls; Construct stormwater drainage systems; follow stormwater BMPs; and comply with regulatory and permit requirements as required.
ER Subsection 4.1.2.3 Short-Term Physical Changes in Land Use and Mitigation								S						1. Impacts on nearby structures and roadways. 2. Impacts associated with stormwater drainage system.	1. Minimal expansion of infrastructure, use of access roads, and use of restricted construction zones. See ER Subsection 2.2.2. 2. Erosion and sediment control. See ER Section 4.6.
ER Subsection 4.1.3 Historic Properties								S						Impacts of construction on or near archeological or historic properties.	Conduct additional surveys prior to construction and ground disturbing activities. Consultation with SHPO. See ER Subsection 2.5.3.

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**Table 4.6-1 (Sheet 3 of 8)
Summary of Measures and Controls to Limit Adverse Impacts during Construction**

Section Reference	Potential Impact Significance ^{(a), (b)}											Impact Description or Activity	Specific Measures and Controls		
	Noise	Erosion and Sediment	Air Quality	Traffic	Effluents and Wastes	Surface Water	Groundwater	Land Use ^(c)	Water Use ^(d)	Terrestrial Ecosystem	Aquatic Ecosystem			Socioeconomic	Rad Exp to Const Wkrs
ER Section 4.2 Water-Related Impacts															
ER Subsection 4.2.1.1 Freshwater Streams		S				S									Follow regulatory and permit requirements; erosion and sediment control; revegetation of disturbed land; use of BMPs; and minimize clearing and ground disturbance.
ER Subsection 4.2.1.2 Lakes and Impoundments						S									Implement sediment and erosion control; comply with regulatory and permit requirements; use of BMPs; and trenchless technologies. See ER Subsection 4.2.1.1 on grading and drainage.
ER Subsection 4.2.1.3 Cross Florida Barge Canal						S			S						Implement sediment and erosion control; comply with regulatory and permit requirements; use of BMPs; and trenchless technologies. See ER Subsection 4.2.1.1 on grading and drainage.
ER Subsection 4.2.1.4 Groundwater						S	S								Groundwater elevations will be monitored during construction and dewatering during construction will be kept to a minimum.
ER Subsection 4.2.1.5 Wetlands		S				S									Follow regulatory and permit requirements; erosion and sediment controls; use of silt fences; revegetation of disturbed land; minimize clearing and ground disturbance; compliance with FESC manual and ROMA plan; stockpiling, characterizing, and proper disposal of dredge spoils, if necessary.
ER Subsection 4.2.2.1 Freshwater Water Bodies						S			S						Implement sediment and erosion control; comply with regulatory and permit requirements; use of BMPs; and trenchless technologies.

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associated with an electrical power plant, such as the proposed transmission lines, the PPSA provides for the certification of "corridors," which is the area within which the associated linear facility ROW must be located. Certification under the PPSA is the sole license of the State of Florida, and nonfederal agency approval of the location of the LNP, associated facilities, and transmission corridors, and authorizes construction and maintenance of the transmission lines.

Maintenance activities for the transmission lines will consist of preventive and corrective measures. Although transmission lines normally require minimal maintenance, PEF will conduct annual inspections to ensure the safe and reliable operation using ground or aerial means.

In general, maintenance of the ROWs will consist of mowing, pruning, and removing trees (including danger trees), as well as herbicide treatments. Clearing will be determined by existing conditions, environmental constraints, and line design requirements. Vegetation in upland areas will be cleared to ground level. Vegetation in wetland areas will be cleared using restrictive clearing techniques. Restrictive wetland clearing will be done by hand, usually with chain saws, or with low-ground pressure shear or rotary machines to reduce soil compaction and damage to vegetation. These methods may be used alone or in combination, as may be necessary for specific sites. Pruning along the ROW edge will be performed to remove any overhanging branches in the easement area. Herbicides used on the transmission line ROW will include only those registered by the U.S. Environmental Protection Agency (USEPA) and which have state approval. Herbicide application rates and concentrations will be in accordance with label directions and will be carried out by a licensed applicator, meeting all federal, state, and local regulations.

Danger trees are any dead, diseased, damaged, or leaning trees standing outside the easement area that could interfere with or endanger the transmission lines and related facilities. Danger trees also will be removed in accordance with the guidelines above, except in wetlands, where the wetland tree removal guidelines described below will be followed.

The exact manner in which maintenance will be performed will depend on the location, type of terrain, and surrounding environment. Each area of the ROW will be addressed based on site-specific vegetation and habitat. Endangered or threatened species, if present, are considered and accommodated in the maintenance program.

Maintenance of the transmission line will be performed using various types of equipment. This equipment may consist of helicopters, bucket trucks, cranes, semi-trucks and support vehicles. Typical line maintenance operations may include insulator replacements, conductor repairs, shield wire repairs, grounding, and other activities associated with structures, conductors, and foundations. In general, PEF crews or authorized contractors will mobilize in-line trucks capable of supporting various operations. Once on-site, the crew will establish a safe working area and perform the required repair. When repairs require affecting environmentally sensitive areas, authorities will be notified of the proposed

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operation. When maintenance is required in environmentally sensitive areas where access and fill pads do not exist, temporary matting may be used to minimize damage to the areas during repairs.

Wherever the transmissions line will be constructed either adjacent to, or in proximity of existing ROW and/or existing planted pine, impacts on plant and animal populations as a result of maintenance and post-construction activities will be minimized. In those areas where the existing ROW will need to be widened to accommodate the transmission lines, maintenance practices for the new transmission lines will be similar to the initial clearing activities and are not expected to result in adverse impacts on plant and animal populations.

Neither the establishment of the transmission line ROW nor the construction of access roads is anticipated to increase the exposure of previously undisturbed areas to the public. The only vehicular traffic permitted will be that necessary for PEF routine maintenance activities. In areas where the transmission lines will be located either adjacent to, or in proximity of, existing transmission line ROW, the degree of public access is anticipated to remain unchanged. Locked gates will be provided at all points where a transmission line access road intersects previously fenced property. Other access restrictions will be coordinated with the underlying fee owners.

PEF currently maintains a ROW utilization program that will consider requests for multiple uses. Multiple uses within a transmission line ROW typically can include agricultural operations (for example, grazing, orange groves, and row crops), controlled landscaping, and other activities that do not interfere with PEF's use of the ROW for the safe and reliable operation and maintenance of the transmission lines. In areas where the new transmission lines will be located within, adjacent to, or in proximity of an existing transmission line ROW, multiple uses consistent with those currently allowed will generally be acceptable.

Because maintenance will follow established industry procedures and conform to any applicable regulations, impacts associated with routine ROW maintenance are anticipated to be SMALL.

5.1.2.2 Off-Site Areas

Table 4.1-5 summarizes the off-site land use changes anticipated by construction of the LNP by general component. **Figure 4.1-2** shows that a total of 309.8 ha (765.5 ac.), or 1.1 percent of the LNP vicinity area, will be affected during construction. The majority of these lands will be returned to their preconstruction use during operation, with the exception of the heavy haul road, anticipated barge slip, and access road south from the site, and the makeup water pumphouse at the intake location. Construction and erosion control measures and stormwater controls, as discussed in ER **Subsection 4.2.1**, apply to this subsection, and will be followed during clearing, preparation, and construction activities. If necessary, best management practices (BMPs) used during construction will be maintained to minimize erosion and sedimentation in off-site areas. Maintenance activities for these off-site areas will consist of

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preventive and corrective measures, if required. Measures may include mowing, pruning, removing trees, and herbicide treatments. Because the lands tabulated for these components in **Table 4.1-4** are not unique to the vicinity, impacts from operation on land use in the LNP vicinity are expected to be SMALL.

5.1.3 HISTORIC PROPERTIES

There are no known archaeological or historic sites on the LNP site and associated facilities described in ER **Subsection 2.5.3**, though field surveys of the transmission lines are pending route finalization. It is unlikely that unidentified resources would be found on the LNP site during facility operation. In the event that a project or work activity during facility operation inadvertently uncovered an archaeological site or other historical artifacts, activities in the site area will be halted, and the appropriate PEF Environmental Support Organization (ESO) for the LNP project will be contacted. For the LNP project the ESO is the Environmental Health and Safety Services (EHSS). A cultural resource assessment will be performed and PEF, through EHSS, will consult with the Florida State Historic Preservation Officer (SHPO), as necessary, to determine appropriate steps to be taken prior to resuming site activities. PEF will coordinate directly with the Florida SHPO to determine appropriate mitigation or other measures, as needed, in accordance with federal and state regulations and PEF policy.

The technical report describing the results of the 2007 and 2008 architectural and archaeological surveys will be submitted to the Florida SHPO for concurrence. It is anticipated that no historic properties will be affected by the operation of the LNP site and associated facilities or the impacts are expected to be SMALL (see ER **Subsection 2.5.3.1**).

5.1.4 REFERENCES

- 5.1-001 Levy County, "Levy County Comprehensive Plan Future Land Use Element (Data and Analysis)," adopted June 1999.
- 5.1-002 Progress Energy Florida and Engelhardt, Hammer & Associates, "Application for Large-scale Future Land Use Map and Text Amendments," March 1, 2007.

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5.2 WATER-RELATED IMPACTS

The LNP site will be located in Levy County, Florida, near the Gulf of Mexico. Hydrologic alterations may result from construction of the site and operation of the reactor units. The LNP will require a supply of freshwater for general plant operation, a supply of freshwater or saltwater for cooling, and a location for discharge of cooling water, which is not evaporated in the cooling process.

This section describes the analysis and assessment of the changes to surface water and groundwater that could occur during plant operation. ER [Subsection 5.2.1](#) describes the plant water supply and anticipated alterations to hydrologic features and their potential effects on other users that may result from operation of the LNP. ER [Subsection 5.2.2](#) describes the anticipated impacts on water use in the vicinity of the LNP as a result of plant water use.

Hydrologic alterations and impacts on water use were evaluated with regards to domestic, commercial, municipal, agricultural, industrial, mining, recreation, navigation, and hydroelectric power. Stormwater permits, water use permits, and effluent discharge permits will be developed during the facility permitting process to ensure that operational activities affecting surface water and groundwater quality groundwater withdrawals will comply with federal, state, regional, local, and affected Native American tribal agency water quality standards for effluents and receiving water bodies. Several agencies have been contacted regarding this Combined License Application (COLA) and have been consulted about hydrologic impacts. Contact information for these agencies is summarized in ER [Section 1.2](#).

The topics discussed in this section include the following:

- Analysis of plant water needs and availability of water supply.
- Identification and description of hydrologic alterations resulting from proposed operational activities.
- The effects, description, and analysis of the hydrologic alterations on the water supply for other water users.
- Analysis of practices to minimize water use impacts.
- Conclusions of adequacy of the water supply.

5.2.1 HYDROLOGIC ALTERATIONS AND PLANT WATER SUPPLY

A number of environmental effects of operation were identified in ER [Section 5.0](#). Of these, the withdrawal of water for general plant operation and for cooling water may cause hydrological alterations. The discharge of blowdown water may also cause hydrological alterations. Impacts related to the construction phase of project are described in ER [Chapter 4](#).

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ER **Section 4.4** discusses construction activities that may also have operational impacts. Direct physical impacts on the site, vicinity, and region resulting from these activities are further described in the following subsections.

5.8.1.1 Noise

When the LNP becomes fully operational, the potential for impacts on ambient noise levels in the areas surrounding the plant and its supporting facilities will exist from the following primary sources of noise or noise-producing activities:

- Main plant components, including the mechanical draft cooling towers, main transformers, steam turbines, circulating water pumps, and emergency power equipment.
- Off-site supporting equipment, including the cooling system makeup water pumphouse that will be located adjacent to the CFBC, approximately 5.75 km (3.5 mi.) south of the center of the main plant site near CR-40.
- Transportation-related noise attributable to an increase in the workforce and associated growth as a result of the operation of the plant.

An assessment of the impacts on ambient noise levels during the operation of the LNP was previously evaluated in support of PEF's SCA to the State of Florida and described in a report entitled, "Noise Assessment of Proposed Levy Nuclear Plant," dated March 10, 2008. The noise sources evaluated as part of this assessment included the main plant components and the cooling system makeup water pumphouse located near the CFBC. The emergency power equipment (diesel-powered emergency generators and diesel fire pumps) at the LNP will be located inside buildings equipped with noise reduction provisions to reduce ambient noise levels in the immediate vicinity of the equipment. Additionally, these units will be operated only very infrequently, primarily for testing and maintenance or during emergency conditions. As a result, these units are not expected to be significant sources of noise, particularly at off-site locations.

The noise assessment of the LNP was performed in support of the PEF's SCA to the State of Florida. The noise assessment, which included an ambient background noise survey (described in ER **Subsection 2.5.2.7.1**), was based on a conservative noise modeling analysis to predict noise levels during operation. This analysis indicated that noise from the main plant equipment may be perceptible at the nearest off-site locations (that is, near the west property boundary of the project site); however, the areas where these perceptible noise levels would exist are not presently developed, and there are no sensitive noise receptors (residences) in those areas. The nearest existing residences are located approximately 2.6 km (1.6 mi.) to the northwest and 2.8 km (1.7 mi.) to the west southwest of the center of the project site. There are no other potentially sensitive noise receptors at closer distances than these residences relative to the main plant site. At these locations noise impacts attributable to plant operation were predicted to be in the range of 25 to 28 dBA at the three nearest

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residences, which are located to the west of the project site. These noise levels would only be perceptible under limited ambient conditions, such as calm winds with very low background ambient noise levels. During the quietest periods of the day, the increase in noise levels (above the existing ambient background) at the nearest residences is predicted to be no greater than 1 dBA.

The presence of extensive vegetation in the site area should result in further reductions in noise levels that were not accounted for in the noise modeling. The noise analysis also predicted that off-site noise levels would not exceed the noise limitations established by the Levy County Noise Ordinance (that is, 65 dBA for daytime hours, 55 dBA for nighttime hours in rural and residential areas) at any location. The LNP site will be designed to ensure that all applicable Occupational Safety and Health Administration (OSHA) noise requirements are met.

A noise assessment was also performed in the vicinity of the cooling system makeup water pumphouse that will be located adjacent to the CFBC, which parallels the CFG. Maximum noise levels in the publicly accessible areas near the proposed location of the pumphouse (which will be constructed of concrete and sound-absorbing materials to maximize noise attenuation to the outside), are predicted to be well below the Levy County permissible noise levels for residential and recreational use areas and in the range of existing background levels. Final design of the pumphouse structure will incorporate these requirements to minimize ambient noise impacts in the immediate vicinity of the pumphouse. These noise levels are below the Levy County Noise Ordinance limitations for rural and residential areas.

Noise will also be generated by periodic testing of emergency sirens used to alert on- and off-site personnel for plant emergencies. Noise of this type will be episodic and infrequent, and comparable to civil defense siren testing or to sirens currently in place for the CREC.

The closest recreation areas to the proposed LNP site (including the pipeline and heavy haul road corridor) are the CFG (parallel to the CFBC) and the Goethe State Forest, the most southerly portion of which borders the north boundary of the plant site (approximately 2.9 km [1.8 miles] from the center of the plant site). Because of the large distances of these two areas from the main plant components at the LNP, noise impacts attributable to the operation of that equipment in these recreational areas are not expected to be significant. While noise levels in the immediate vicinity of the pumphouse may be noticeable, it will not exceed the Levy County Noise Ordinance limitations. The area where noise levels may be noticed is expected to be very localized and in close proximity to the pumphouse.

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**Table 5.10-1 (Sheet 1 of 17)
Summary of Measures and Controls to Limit Adverse Impacts During Operation**

Section Reference	Potential Impact Significance ^{(a), (b)}														Impact Description or Activity	Measures and Controls to Limit Adverse Impacts
	Noise	Erosion and Sediment	Air Quality	Traffic	Effluents and Wastes	Surface Water	Groundwater	Land Use ^(c)	Water Use ^(d)	Terrestrial Ecosystem	Aquatic Ecosystem	Socioeconomic	Rad Exp to Wkrs	Other (Site-Specific)		
ER Section 5.1 Land Use Impacts																
ER Subsection 5.1.1.1 Impacts on Crops, Vegetation, or Transportation Systems				S			S							S	1. Impacts on on-site and in-vicinity transportation infrastructure from an increased workforce. 2. Impacts from salt drift from cooling and heat dissipation system on vegetation. 3. Operational impacts on the 100-year floodplain.	1. Modifications and upgrades, if required, to existing roads and highways. Appropriate measures to minimize disturbances during maintenance. 2. Operation of cooling towers within design parameters. 3. Construction and grading to meet facility design plans.
								S							Impacts of changes to Levy County's current zoning and future land use designation for the LNP site.	Development of revised FLUM and text amendment for Levy County comprehensive land use plan for submittal to FDCA and Levy County Board of County Commissioners.
								S							Routine vegetation inspection and clearing activities in the ROW and access road construction for temporary maintenance needs.	Maintenance will follow established industry procedures and conform to any applicable regulations to minimize any soil or water impacts.
ER Subsection 5.1.1.2 Long-Term Land Use Restrictions																
ER Subsection 5.1.2.1 Transmission Corridors																

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**Table 5.10-1 (Sheet 2 of 17)
Summary of Measures and Controls to Limit Adverse Impacts During Operation**

Potential Impact Significance ^{(a), (b)}															Impact Description or Activity	Measures and Controls to Limit Adverse Impacts
Section Reference	Noise	Erosion and Sediment	Air Quality	Traffic	Effluents and Wastes	Surface Water	Groundwater	Land Use ^(c)	Water Use ^(d)	Terrestrial Ecosystem	Aquatic Ecosystem	Socioeconomic	Rad Exp to Wkrs	Other (Site-Specific)		
ER Subsection 5.1.2.2 Off-Site Areas								S							Routine vegetation inspection and clearing activities in the ROW and access road construction for temporary maintenance needs.	If necessary, BMPs used during construction will be maintained to minimize erosion and sedimentation in off-site areas. Maintenance activities for these off-site areas will consist of preventive and corrective measures, if required. Measures may include mowing, pruning, removing trees, and herbicide treatments.
ER Subsection 5.1.3 Historic Properties														S	Impacts on historic properties and archaeological sites.	In the event of an inadvertent cultural resource discovery during operation, PEF procedures will be followed and the Florida SHPO will be notified.
ER Section 5.2	Water-Related Impacts															
ER Subsection 5.2.1.1 Freshwater Streams						S			S						Hydrological impacts associated with stormwater management and blowdown discharge.	Maintenance of erosion control and stabilization measures; compliance with applicable discharge regulations and permits.
ER Subsection 5.2.1.2 Lakes and Impoundments						S			S						Surface water impacts associated with water quality and water use.	No impacts to lakes or impoundments are anticipated. No mitigation measures are required.

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6.5 ECOLOGICAL MONITORING

This section describes the monitoring programs designed to identify and evaluate ecological systems that might be affected by LNP construction and operation. ER [Subsection 6.5.1](#) describes the monitoring program for terrestrial ecological communities, and ER [Subsection 6.5.2](#) describes the monitoring program for aquatic ecological communities.

6.5.1 TERRESTRIAL ECOLOGY AND LAND USE

This subsection describes the monitoring program for terrestrial ecological communities that was initiated during the preapplication phase and will be continued during construction and operation of the LNP. The monitoring data will be used to support the preparation of the COLA and the Florida SCA for the LNP. The terrestrial ecology monitoring program consists of the following primary elements:

- Preapplication terrestrial ecology monitoring: This phase of the monitoring is designed to identify background terrestrial community conditions, and support the ecological descriptions that are presented in ER [Section 2.4](#).
- Construction terrestrial ecology monitoring: This phase of the monitoring is designed to evaluate changes in terrestrial communities that could result from site preparation and construction activities.
- Preoperational terrestrial ecology monitoring. This phase of the monitoring will be used to establish a baseline from which the identification and assessment of environmental effects attributable to facility operation can be made.
- Operational terrestrial ecology monitoring. This phase of the monitoring will be used to document changes in terrestrial communities that might result from facility operation.

The objectives of the terrestrial ecology monitoring program are to identify effects on the terrestrial community caused by the development, construction, and operation of LNP 1 and LNP 2, and identify alternatives or engineering measures that could be used to reduce potential adverse effects.

6.5.1.1 Preapplication Terrestrial Ecology Monitoring

Preapplication monitoring of terrestrial ecological communities was initiated in October 2006 to identify and characterize habitats on the LNP site and in areas of the associated facilities. These habitats are described in ER [Subsection 2.4.1](#). The ongoing monitoring program consists of literature and regulatory agency database reviews and pedestrian surveys.

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6.5.1.1.1 Important Species

Important species that might occur on the LNP site or in the areas of the associated facilities are identified in ER [Subsection 2.4.1.1.3](#) and include recreationally important species such as white-tail deer (*Odocoileus virginianus*) and bobwhite quail (*Colinus virginianus*); and threatened and endangered species such as gopher tortoise (*Gopherus polyphemus*), eastern indigo snake (*Drymarchon corais couperi*), and bald eagle (*Haliaeetus leucocephalus*) ([Reference 6.5-001](#)). Most of the LNP site will remain undeveloped following construction of the LNP and available to wildlife species.

Pedestrian surveys for threatened and endangered species were conducted as part of habitat characterization and wetland delineation activities. In addition, CH2M HILL ecologists conducted field surveys for gopher tortoise burrows on the LNP site and in the vicinity of the proposed heavy haul road between December 4, 2007, and January 28, 2008. The presence of gopher tortoise burrows is useful in assessing the possible presence of listed commensal species, such as the eastern indigo snake. Survey crews made up of two to three ecologists conducted pedestrian surveys along representative transects, with one GPS orienteer guiding the surveys and documenting burrow locations. Relevant data including canopy closure, shrub density, forage vegetation, estimated groundwater depth, level of disturbance, soil type, and land use were collected along each transect.

No threatened or endangered plant species have been identified on the LNP site or within the areas of the associated facilities.

6.5.1.1.2 Important Habitats

Important habitats on and in the vicinity of the LNP site are described in ER [Subsection 2.4.1.1.5](#). No unique or rare habitats or habitats with priority for protection were identified on the LNP site; however, some of these areas occur in the vicinity of the associated facilities, such as the Goethe State Forest located immediately north of the LNP site

Wetlands on and in the vicinity of the LNP site and associated facilities were identified and characterized through review of agency databases, aerial photographs, published documents, and subsequently through field delineation by CH2M HILL ecologists. State jurisdictional boundaries for wetlands on the LNP site will also be confirmed through a formal jurisdictional determination process by FDEP Wetlands Evaluation and Delineation Service biologists.

The Unified Mitigation Assessment Method is a wetland functional analysis method used by the FDEP and the Jacksonville District of the U.S. Army Corps of Engineers (USACE) to evaluate wetland functions and estimate associated mitigation requirements ([Reference 6.5-002](#)). This analysis was conducted for representative wetlands on the LNP site and in the areas of the associated

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Table 6.6-4 (Sheet 3 of 3)
Summary of Raw Water Withdrawal Sentinel Well Chemical Groundwater Monitoring Program for the LNP

Description	Preapplication	Construction	Preoperation	Operation
Sample Collection for Water Quality Parameters	N/A	N/A	With a flow-through cell after purging activities.	With a flow-through cell after purging activities.
Data Analysis	N/A	N/A	Statistical trend	Statistical trend

Notes:

N/A = not applicable
WW = raw water withdrawal

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6.7 SUMMARY OF MONITORING PROGRAMS

This section summarizes the individual environmental monitoring programs for thermal monitoring, radiological monitoring, hydrological monitoring, meteorological monitoring, ecological monitoring including terrestrial and aquatic communities, and chemical monitoring for LNP 1 and LNP 2. As appropriate, the summary covers: (1) preapplication monitoring (2) project construction monitoring, (3) preoperational monitoring, and (4) operational monitoring.

6.7.1 THERMAL MONITORING

6.7.1.1 Preapplication Thermal Monitoring

This phase of the monitoring is designed to establish background conditions and support the thermal descriptions that are presented in ER [Subsection 2.3.3](#). The LNP preapplication thermal monitoring program was performed to establish background water temperatures in groundwater, the CFBC, the Gulf of Mexico, and the CREC discharge canal near the proposed discharge site before development and operation of the LNP. There are no freshwater streams, lakes, or impoundments on the LNP site. In addition, no lakes or impoundments considered to be waters of the State will be used or affected by the construction or operation of the LNP. ER [Section 6.1](#) contains detailed sampling program information.

6.7.1.2 Construction and Preoperational Thermal Monitoring

The construction and preoperational thermal monitoring program is designed to continue preapplication thermal monitoring activities during the development stages (site preparation and construction) of the LNP until they are operational. Surface water monitoring will continue at most locations and frequencies of the preapplication thermal monitoring program. Construction monitoring will begin approximately 1 year before site preparation and end when construction is complete. Preoperational monitoring will begin 1 year prior to plant operation to establish a refined baseline for water temperature at the LNP site. Specific monitoring may be required as part of the NPDES permit process. In addition, the need for modifications to the monitoring program will be assessed regularly and over the duration of the construction and preoperational thermal monitoring program. Thermal groundwater monitoring efforts can be grouped by functional intent as follows: reactor-area monitoring to establish background conditions and document changes in the immediate vicinity of the reactors, sentinel well monitoring to establish background conditions and document changes upgradient and downgradient of the reactor units, and raw water withdrawal sentinel wells to establish background conditions and document changes in temperature and salinity due to pumping of raw water from groundwater aquifers. Thermal monitoring details for each phase are presented in [Tables 6.1-4](#), [6.1-5](#), and [6.1-6](#), respectively. Additional locations and more frequent measurements may be incorporated into the construction and preoperational thermal monitoring program as the project progresses.

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6.7.1.3 Operational Thermal Monitoring

The operational thermal monitoring program will be implemented to document water temperature and identify any changes resulting from operation of the LNP. The specific operational monitoring requirements will be developed in consultation with the FDEP relative to NPDES permit requirements and monitoring requirements for the LNP. Although the specific procedures of the operational thermal monitoring program have not been finalized, it is anticipated that the monitoring stations will be the same as those used during the construction and preoperational thermal monitoring programs (see ER **Subsection 6.1.2**).

Tables 6.1-1 and **6.1-2** list the surface water and groundwater monitoring stations and project phase during which each will be monitored. **Tables 6.1-3, 6.1-4, 6.1-5, and 6.1-6** summarize the parameters measured and the frequency at which they are collected. **Figures 6.1-1 and 6.1-3** show the surface water monitoring locations. **Figure 6.1-2** shows the proposed preoperational and operation phase monitoring well locations. Data will be evaluated for temperature variability, as well as temporal trends. Modifications to the operational thermal monitoring program (for example, changes in monitoring stations and collection procedures) will be assessed regularly and over the duration of the monitoring program.

6.7.2 RADIOLOGICAL MONITORING

The REMP will be implemented in accordance with 10 CFR 20.1501 and Criterion 64 of 10 CFR 50, Appendix A. The program will be developed using the following guidance published by the NRC:

- Regulatory Guide 4.1, Revision 1, "Programs for Monitoring Radioactivity in the Environs of Nuclear Power Plants."
- Regulatory Guide 4.13, Revision 1, "Performance, Testing, and Procedural Specifications for Thermoluminescence Dosimetry; Environmental Applications."
- Regulatory Guide 4.15, Revision 1, "Quality Assurance for Radiological Monitoring Programs (Normal Operations) – Effluent Streams and the Environment."
- Regulatory Guide 1.109, Revision 1, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR 50, Appendix I."

Figure 6.2-1 presents the basic pathways for gaseous and liquid radioactive effluent releases to the public. The "important pathways" selected are based primarily on how radionuclides move through the environment and how they could eventually expose the public, taking into consideration people's use of the environment. The scope of the program will include monitoring the media identified in **Table 6.2-2**. The REMP will monitor the environment by sampling air, water, sediment, fish and food products, as well as measuring radiation directly.

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Milk samples are also monitored, if milk-producing animals are present within 8 km (5 mi.) of the plant.

6.7.2.1 Preoperational Radiological Environmental Monitoring

The preoperational REMP will be used to establish the baseline for the local radiation environment. The preoperational REMP will measure background levels and their variations along the anticipated critical pathways in the area surrounding the LNP, train personnel, and evaluate procedures, equipment, and techniques. However, because the LNP will be sited near CR-3, the preoperational and operational phases of the REMP were developed from baseline data already established for the CR-3. The preoperational monitoring program, which will be implemented 2 years before commercial operation, will monitor the radiological environment around the LNP. The duration of the preoperational program for specific media is given in **Table 6.2-1**.

6.7.2.2 Operational Radiological Environmental Monitoring

The operational REMP will include measures to document the effectiveness of procedures and processes that restrict or control releases of radioactive materials to the environment. The elements (sampling media and analysis type) for both the preoperational and operational REMP phases will be essentially the same. To the greatest extent practical, the REMP will use the same sampling locations as the CR-3's existing REMP. New sampling locations will be chosen based on the selected plant design parameters.

6.7.3 HYDROLOGICAL MONITORING

6.7.3.1 Preapplication Hydrological Monitoring

This phase of the monitoring will support the background hydrologic descriptions presented in ER **Section 2.3**. The objective of the preapplication hydrological monitoring program is to document background conditions for surface water and groundwater before the construction and operation of the LNP. Limited hydrological and hydrogeological information is available for the LNP site. For this reason, preapplication hydrological data were collected to establish the existing conditions at the site. Baseline data collected during this monitoring program were used to determine the following:

- Surface water depth characteristics in the site vicinity.
- Groundwater flow characteristics in the site vicinity (ER **Subsection 2.3.1.5** describes the groundwater system at the LNP).
- Effect of sanitary and chemical waste-retention methods on groundwater quality (ER **Section 4.2** describes water-related effects and controls associated with construction and subsequent construction and preoperational activities).

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**7.0 ENVIRONMENTAL IMPACTS OF POSTULATED ACCIDENTS
INVOLVING RADIOACTIVE MATERIALS**

This chapter evaluates the environmental impacts of postulated accidents involving radioactive materials related to the operation of the proposed Levy Nuclear Plant Units 1 and 2 (LNP) and several appurtenant facilities. These appurtenant facilities include electric transmission lines, an electric switchyard, a water intake structure and associated pumphouse located on the Cross Florida Barge Canal (CFBC), and makeup and blowdown pipelines.

This chapter includes the following key components in the following sections of this Environmental Report (ER):

- ER **Section 7.1** — Design Basis Accidents
- ER **Section 7.2** — Severe Accidents
- ER **Section 7.3** — Severe Accident Mitigation Measures
- ER **Section 7.4** — Transportation Accidents

7.1 DESIGN BASIS ACCIDENTS

The purpose of this section is to provide a comparison of the off-site dose consequences and resulting health effects for design basis accidents (DBAs), as identified in the Westinghouse Electric Company, LLC (Westinghouse), AP1000 Design Control Document for the certified design as amended (DCD), and those contained in Section 15 of the Safety Evaluation Report (SER). The following sections contain information to meet the guidance specified in Chapter 7 of NUREG-1555.

7.1.1 SELECTION OF DESIGN BASIS ACCIDENTS

The DBAs considered in this subsection are from the DCD and are consistent with the U.S. Nuclear Regulatory Commission (NRC) Regulatory Guide 1.183. **Table 7.1-1** lists the DBAs having the potential for releases to the environment and provides an initial evaluation of each accident. The radiological consequences of the DBAs listed in **Table 7.1-1** are assessed to demonstrate that two new Westinghouse Electric Company, LLC, AP1000 Reactor (AP1000) units can be sited at the LNP site without undue risk to the health and safety of the public.

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7.1.2 EVALUATION METHODOLOGY

Doses for the selected DBAs were evaluated at the LNP site exclusion area boundary (EAB) and low population zone (LPZ). The DCD presents the radiological consequences for the accidents identified in [Table 7.1-1](#). The DCD DBAs are updated with LNP site data to demonstrate that the DCD analyses are bounding for the LNP site. The basic scenario for each accident is that some quantity of activity is released at the accident location inside a building and this activity is eventually released to the environment. The transport of activity within the plant is independent of the site and specific to the AP1000 design. Details about the methodologies and assumptions pertaining to each of the accidents are provided in the DCD. These doses must meet the site acceptance criteria in 10 Code of Federal Regulations (CFR) 50.34, provided as follows:

- (1) An individual located at any point on the boundary of the exclusion area for any 2 hour period following the onset of the postulated fission product release, would not receive a radiation dose in excess of 25 [roentgen equivalent man] rem total effective dose equivalent (TEDE).
- (2) An individual located at any point on the outer boundary of the low population zone, who is exposed to the radioactive cloud resulting from the postulated fission product release (during the entire period of its passage) would not receive a radiation dose in excess of 25 rem total effective dose equivalent (TEDE).

These criteria are stated for evaluating reactor accidents of exceedingly low probability of occurrence and low risk of public exposure to radiation (for example, a large break loss of coolant accident [LOCA]). For events with a higher probability of occurrence, postulated EAB and LPZ doses should not exceed the additional acceptance criteria provided in Regulatory Guide 1.183. The dose acceptance criteria from Regulatory Guide 1.183, with one exception, are listed in [Table 7.1-2](#). No dose limit is listed in the Regulatory Guide for the small line break outside containment. Therefore, the criterion was adopted from DCD [Subsection 15.6.2](#) and is consistent with Environmental Standard Review Plan (ESRP) 15.6.2 of NUREG-0800. The dose limits ensure that the consequences of each DBA are acceptable from an overall risk perspective.

The dose to an individual located at the EAB or LPZ is calculated based on the amount of activity released to the environment, the atmospheric dispersion of the activity during the transport from the release point to the off-site location, the breathing rate of the individual at the off-site location, the time of exposure, and activity-to-dose conversion factors. The only site-specific parameter is atmospheric dispersion. The DCD doses are determined using time-dependent atmospheric dispersion coefficient (X/Q) values corresponding to the top 5th percentile meteorology during the first two hours of the accident, meaning that conditions would be more favorable for dispersion 95 percent of the time. The doses evaluated herein are calculated based on the 50th percentile site-specific X/Q values during the first two hours of the accident, reflecting more realistic meteorological conditions. Site-specific doses are obtained by adjusting the DCD

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10.1.2.2 Hydrological and Water Use

The proposed project is to install and operate two Westinghouse Electric Company, LLC (Westinghouse), AP1000 Reactors (AP1000) at the LNP site. As discussed in ER [Subsection 3.3.1](#), operation of the two reactors will require additional water supply for cooling tower evaporation, cooling tower blowdown, service water tower evaporation, service water tower blowdown, sanitary waste discharge, raw water use, demineralizer water discharge, raw water makeup to the demineralizer, and fire protection. Per [Table 3.3-2](#), it is estimated that the normal consumptive water use from cooling tower evaporation is 2.3 cubic meters per second (m^3/s) (81.4 cubic feet per second [ft^3/sec]) or 30,427 gallons per minute (gpm). Consumptive water use from service tower evaporation is 0.08 m^3/s (2.8 ft^3/sec) or 1248 gpm ([Table 3.3-2](#)). Water consumption for fuel cycle activities would require approximately 43,067 million liters (L) (11,377 million gallons [gal.]) of water ([Table 10.2-2](#)).

As discussed in ER [Section 5.2](#), unavoidable adverse effects on hydrology and water use are primarily associated with water withdrawal from the CFBC. These effects would be minimized by meeting permit requirements for water withdrawal. The proposed withdrawal of makeup water from the CFBC will have SMALL impacts on water availability and SMALL impacts on water quality in the CFBC and Gulf of Mexico. Discharge of blowdown water through the Crystal River Energy Complex (CREC) discharge canal to the Gulf of Mexico will have a SMALL effect on water availability and a SMALL effect on water quality. Ensuring permitted limits are met through operational controls and monitoring will minimize the potential for adverse impacts.

Per ER [Subsection 5.2.1.4](#), it is anticipated that the groundwater supply would be sufficient to provide the water supply for service water tower evaporation, service water tower drift, potable water supply, raw water supply, raw water to the demineralizer, fire protection, service water strainer backwash, and media filter backwash. Use of the groundwater supply could alter the groundwater characteristics in the area. Groundwater impacts will be evaluated using the Southwest Florida Water Management District's (SWFWMD) District Wide Regulation Model, version 2 (DWRM2). The overall impact on groundwater in the vicinity of the plant is SMALL.

10.1.2.3 Ecological (Terrestrial and Aquatic)

Unavoidable adverse effects to the terrestrial ecosystem during LNP operation activities are associated with limited maintenance of access roads and vegetation along the pipeline and transmission line corridors. Maintenance activities may temporarily displace wildlife that use the land. Impacts to vegetative communities will occur as a result of clearing activities. Impacts will be noticeable but will not destabilize the resource. Overall, impacts on terrestrial habitat are anticipated to be SMALL.

Impacts on the CFBC aquatic ecology from those organisms impinged and entrained into the LNP CWIS are projected to be minimal due to compliance with

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the 316(b) component of the National Pollutant Discharge Elimination System (NPDES) permit. Impacts on aquatic ecology are anticipated to be SMALL due to implementation of operational controls and monitoring. The anticipated impacts to aquatic ecology from transmission system maintenance are anticipated to be SMALL.

10.1.2.4 Socioeconomic

There will be no physical impacts (noise, air, and aesthetic disturbances) from the operation of the new facilities outside of the radius of the vicinity. The surrounding area will buffer any potential noise, air, or aesthetic disturbances. There will be an increase in traffic on local roads from the influx of workers needed to operate the LNP. Per ER **Subsection 5.8.2.8**, it is anticipated that adverse impacts the transportation infrastructure in the area would be SMALL. The operation of the LNP will create new jobs, which would provide a SMALL beneficial economic impact to the region. In addition, PEF annual property tax payments from the operation of the LNP would provide a LARGE beneficial economic impact to Levy County; therefore, mitigation is not warranted.

There are no known archaeological or historic sites on the LNP site or associated facilities. It is unlikely that unidentified resources would be found on the LNP site

during facility operation. During post-construction operation, land disturbance activities would cease in the vicinity of an inadvertent cultural resource discovery and the Florida State Historic Preservation Officer (SHPO) would be notified. It is anticipated that no historic properties will be affected by the operation of the LNP site and associated facilities; therefore adverse impacts are anticipated to be SMALL.

10.1.2.5 Radiological

Unavoidable adverse radiological effects associated with the uranium fuel cycle (UFC) are insignificant in comparison with background radiation. Control actions such as monitoring and the ongoing collection of air and water samples will ensure that radiological effects are minimized during operation. Landfills and other site uses may be restricted after decommissioning. The overall environmental impacts of the UFC will be SMALL, and mitigation is not warranted.

10.1.2.6 Atmospheric and Meteorological

As discussed in ER **Subsection 5.8.1.2**, as a nuclear-powered electrical generating plant, the LNP will have very few sources of air emissions. With the exception of some relatively small diesel-fueled emergency power-generating equipment and fire pumps, the plant will not have any significant sources of emissions attributable to the combustion of fossil or other fuels. The LNP will contain two banks of mechanical draft cooling towers (one for each reactor),

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10.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

In accordance with NUREG-1555, ESRP 10.2, this section provides a summary of the irreversible and irretrievable material commitments of resources associated with the construction and operation of the LNP. "Irreversible" refers to environmental resource commitments that cannot be altered to restore the present condition. "Irretrievable" refers to material resources that, once used, cannot be recycled or restored for other uses.

This section is organized into the following subsections:

- ER **Subsection 10.2.1** — Irreversible Environmental Commitments
- ER **Subsection 10.2.2** — Irretrievable Material Commitments of Resources

10.2.1 IRREVERSIBLE ENVIRONMENTAL COMMITMENTS

Table 10.2-1 summarizes the irreversible environmental commitments that are expected to result from the construction and operation of LNP and the associated structures. The following areas are evaluated below for irreversible environmental commitments:

- Land use.
- Hydrological and water use.
- Ecological (terrestrial and aquatic).
- Socioeconomic.
- Radiological.
- Atmospheric and meteorological.
- Disposal of hazardous and radioactively contaminated waste.
- Commitment of underground geological resources for disposal of radioactive spent fuel.
- Destruction of geological resources during uranium mining and fuel cycle.

10.2.1.1 Land Use

The LNP site is approximately 1257 ha (3105 ac.) in size. The two reactors and ancillary power production support facilities will be located near the center of the site. The LNP will consist of two pressurized water reactors (PWR), LNP 1 and

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LNP 2. These units are based on the AP1000 standard design. The plant arrangement (for each AP1000 unit) is comprised of the following five principal building structures: nuclear island, turbine building, annex building, diesel generator building, and radwaste building. Other components of the LNP consist of an exclusion area boundary (EAB) that is the sum of the EABs for each unit, makeup and blowdown water system piping, proposed transmission corridors,

cooling towers, switchyard, and intake structure on the CFBC. The overall plant arrangement uses building configurations and structural designs to minimize the building volumes and quantities of bulk materials consistent with safety, operational maintenance, and structural requirements.

As discussed in ER [Subsection 2.2.2](#) and ER [Section 3.7](#), transmission lines and associated infrastructure will be needed to connect the LNP to the PEF electrical grid. Four major 500-kilovolt (kV) transmission lines will leave the station switchyard and connect with three high-voltage (HV) substations and a 500-kV switchyard east and south of the LNP site. Additional system upgrades will be constructed by PEF to accommodate demand in the central and southern Florida areas primarily served by the LNP. Detailed descriptions of the transmission line system and associated construction- and operation-related environmental impacts are described in ER [Section 3.7](#) and ER [Chapters 4](#) and [5](#), respectively.

The proposed routing of the transmission lines may be within the footprint of new or existing transmission line corridors, to lessen adverse environmental impacts. Most transmission corridors would pass through land that is primarily agricultural and forest land. The areas are mostly rural and remote, with low population densities. The longer lines cross numerous state and United States highways. The effect of these corridors on land usage is minimal; farmlands that have corridors passing through them generally continue to be used as farmland. PEF will design and construct the LNP transmission lines in accordance with industry standards and guidance. Transmission line maintenance practices would be conducted to ensure the conformance of the lines with applicable electrical safety code requirements for on line clearance to limit shock from induced currents.

New land use commitments will be needed for the makeup and blowdown water system pipelines associated with LNP. It is anticipated that the pipelines will follow a pipeline corridor located in Levy and Citrus counties and will not significantly alter land use. Another alteration of land use will be the relatively small area associated with the land needed for the makeup water system pipeline pumphouse. As described in ER [Subsection 2.2.3.1](#), no federal, state, or regional land use plans apply to the area where the intake structure and pumphouse will be located. Furthermore, this alteration is not irreversible because the structure could be dismantled and the habitat restored, if necessary.

The overall commitment of land required for LNP is not large. Large areas of habitat exist in proximity to the site, making it possible for wildlife to relocate. In addition, permit and regulatory requirements will be met in order to minimize the impact to this area. Therefore, no irreversible land use commitments are expected to result from the construction or operation of the LNP, including the

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10.3.1.7 Transmission Lines

Transmission lines and associated infrastructure will be needed to connect the LNP to the PEF electrical grid. The proposed routing of the transmission lines may be within the footprint of new or existing transmission line corridors to lessen adverse environmental impacts. PEF will design and construct the LNP transmission lines in accordance with industry standards and guidance. Land-clearing or construction activities in the corridors would follow BMPs and would be mitigated to the extent possible.

Most transmission corridors would pass through land that is primarily agricultural and forest land. The areas are mostly rural and remote, with low population densities. The longer lines cross numerous state and United States highways. The effect of these corridors on land usage is minimal; farmlands that have corridors passing through them generally continue to be used as farmland. In the short-term, this may result in some potential loss in agricultural productivity or natural habitats. However, this does not represent a long-term loss as the land may be released for other uses or returned to its natural state after decommissioning. As a result, environmental impacts of transmission corridor construction would be SMALL.

10.3.1.8 Cultural Resources

The proposed project will comply with Section 106 of the National Historic Preservation Act (NHPA), 16 United States Code (USC) § 470, and its implementing regulations (36 CFR 800). Cultural resource investigations, as required by the NHPA, were conducted to identify the full extent of historic properties in the Area of Potential Effect (APE). The APE included areas of direct construction impact for the two reactor units, the areas of direct construction impact for the makeup and blowdown water lines and cooling water intake structure pumphouse. No NRHP-eligible or -listed properties were found during these surveys. It is anticipated that impacts to cultural resources would be SMALL based on the results of the cultural resource surveys of the proposed construction areas.

If a project or work activity inadvertently uncovers an archaeological site or other historical artifacts, activities in the site area will be halted, and the appropriate PEF Environmental Support Organization will be contacted. For the LNP project, PEF's Environmental Health and Safety Services (EHSS) would be contacted. In the event of an inadvertent find, a cultural resource assessment would be performed, and EHSS would consult with the SHPO, as necessary, to determine appropriate steps to be taken prior to resuming site activities. PEF will coordinate directly with the Florida SHPO to determine appropriate mitigation or other measures, as needed, in accordance with federal and state regulations and PEF policy.

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10.3.1.9 Socioeconomic

Socioeconomic construction-related impacts are described in the subsections below.

10.3.1.9.1 Transportation

According to ER [Subsection 4.4.2.10](#), additional traffic will be generated in the area during construction of the LNP. The peak construction period is anticipated to occur once the LNP is 50- to 70-percent complete. It is estimated that at the peak construction/operational phase, the project will attract 4725 daily trip ends associated with construction traffic. Once these tasks are complete, the workforce and average daily vehicle traffic are expected to decline steadily until the LNP is operational. Some limited congestion problems may occur as vehicles enter and exit the LNP site when work shifts begin and end.

An increase in traffic to and from the LNP site would temporarily increase the level of vehicular noise for those residences along routes that access the LNP site. At times, the construction schedule could span 24-hour days, up to 7 days per week. In some instances, it is anticipated that the night-shift construction activities would involve a fewer number of workers than the day-shift construction activities. Standard noise control devices (such as mufflers and sound-proofing) will be used to reduce noise impacts to nearby residences and other sensitive receptors. The increased traffic volumes associated with construction of the facility would be temporary and short-term.

Overall transportation impacts are anticipated to be SMALL to MODERATE.

10.3.1.9.2 Aesthetics

Per ER [Subsection 3.1.4.3](#), the structures at the LNP site will not be high enough to be visible from public areas at ground level, and only the cooling tower plumes are likely to be visible to a few residences and recreational users in the vicinity. The effects, if any, of seasonal changes on the vegetation that would affect the viewshed surrounding the LNP are considered minor. The site is heavily forested and vegetated and is secluded from public areas. Plans to screen the LNP will not be required nor warranted. Given its remote location, it is anticipated that construction activities at the plant site would not be visible to nearby residences. Therefore, aesthetic impacts within the construction areas are expected to be SMALL. It is anticipated that long-term indirect or cumulative impacts to visual aesthetics will be SMALL.

10.3.1.9.3 Labor

As discussed in ER [Subsection 4.4.2](#), it is estimated that the peak construction workforce will reach approximately 2700 workers. This maximum construction

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10.3.2.3 Water

Operating the new reactor units will require makeup water that is withdrawn from the CFBC. After the reactors cease to operate and the units are decommissioned, water withdrawal from the canal will cease. The LNP will adhere to applicable federal, state, and local regulations and permit requirements with regard to water usage, including makeup water withdraws from the CFBC. Therefore, water use impacts are anticipated to be SMALL.

Per ER [Subsection 5.2.1.4](#), it is anticipated that the groundwater supply would be sufficient to provide the water supply for service water tower evaporation, service water tower drift, potable water supply, raw water supply, raw water to the demineralizer, fire protection, service water strainer backwash, and media filter backwash. Use of the groundwater supply could alter the groundwater characteristics in the area. Groundwater impacts were evaluated using the SWFWMD's DWRM2 model. As described in ER [Subsection 5.2.2.3](#), the overall impact on groundwater in the vicinity of the plant is anticipated to be SMALL.

10.3.2.4 Terrestrial and Aquatic Ecosystems

Impacts to the terrestrial ecosystems at the LNP during operation activities are associated with limited maintenance of access roads and vegetation along the pipeline and transmission line corridors. It is anticipated that surveys to monitor soil and terrestrial plant and animal communities would be conducted, as directed by the applicable agencies. Generally, data would be collected on a seasonal basis and should be sufficient to characterize seasonal variations throughout at least one cycle. Additional data may be needed on a site-specific basis, or as directed by appropriate permit requirements. Surveys may include terrestrial field investigations and surveys for terrestrial flora and fauna, sensitive habitat and species of interest. Therefore, impacts on terrestrial wildlife and habitat are anticipated to be SMALL.

Impacts on the CFBC aquatic ecology from those organisms impinged and entrained into the LNP CWIS are projected to be minimal due to compliance with the 316(b) component of the NPDES permit. It is anticipated that specific monitoring requirements would be designed to minimize adverse environmental impacts and to ensure that organisms will be protected against the cooling water intake structures. An aquatic monitoring program would be developed to support and satisfy various environmental regulations, licenses, and permits associated with operation of the LNP. Water quality would be monitored at the locations expected to be impacted by operation of the LNP site including the makeup water system pipeline outfall. Impacts on aquatic ecology are anticipated to be SMALL due to implementation of operational controls and monitoring. Impacts to aquatic ecology from transmission system maintenance are anticipated to be SMALL.

10.3.2.5 Noise

Equipment used for operation of the LNP will follow applicable federal, state, and local noise control regulations. Noise control devices will be used on equipment

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that exceeds noise abatement criteria. Equipment manufacturers will be required to guarantee that specifications on allowable octave bands will be met. Most equipment will be located inside structures; therefore, building walls will reduce outside noise levels. Further, reduction in noise impacts will be achieved as noise travels out towards the property line. It is anticipated that noise impacts would be SMALL.

10.3.2.6 Transmission

It is anticipated that PEF would acquire transmission line right-of-ways (ROWS) (either by outright purchase of the land, easements, or permits) that would allow access and control over how the land in the transmission corridor is managed. PEF would ensure that land use in the corridors and underneath the high-voltage lines is compatible with the reliable transmission of electricity. Vegetation communities in these corridors would be kept at an early successional stage by maintenance activities, such as mechanical clearing, hand cutting, and herbicide application. PEF's control and management of these ROWs would preclude residential and industrial use of the transmission corridors. PEF would establish transmission vegetation management and line maintenance procedures that would be used to maintain the new corridors and transmission lines. Therefore, impacts to land use in transmission corridors would be SMALL and not require mitigation.

Operational activities within the transmission corridors may include visual inspection and appropriate maintenance of transmission line ROWs. Maintenance activities may include reclearing vegetation, tree trimming/removal, danger tree cutting, and encroachment licensing/removal. For maintenance purposes, wooded sections of the ROW would be recleared to the full width through mechanical clearing, hand cutting, or herbicide application.

Routine inspections of the ROW would be conducted periodically to monitor vegetation growth, ROW contractor effectiveness, and encroachments within the ROW. Maintenance and repair inspections required by cause, such as storms that may down timber on or near the lines, will be as required by the circumstances. These occurrences are expected to be few, and will have limited impact on the land.

10.3.2.7 Cultural Resources

There are no known historic properties on the LNP site or associated facilities. It is unlikely that unidentified resources would be found on the LNP site during facility operation. During post-construction operation, land disturbance activities would cease in the vicinity of an inadvertent cultural resource discovery and the Florida SHPO would be notified. It is anticipated that no historic properties will be affected by the operation of the LNP site and associated facilities; therefore, adverse impacts are anticipated to be SMALL.

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Summary of the Benefits and Costs of the Proposed Project**

Cost Category	Proposed Site LNP Site	Option 1 Crystal River Site	Option 2 Dixie County Site	Option 3 Highlands County Site	Option 4 Putnam County Site
Operating Cost Note: Cost value is a roll-up of the Internal Cost values for operating the facility which include labor, materials, and services).	The nuclear industry's average production cost in 2007 was 1.68 cents per kWh.	Costs would be similar to the LNP site.	Costs would be similar to the LNP site.	Costs would be similar to the LNP site.	Costs would be similar to the LNP site.
Land Use	The LNP is located on land already owned by PEF. Site is characterized primarily by forested pineland but has been heavily timbered with associated disturbance to site ecology. Some wetlands indicator species apparent on relatively small fraction of site area. Small land use impacts would also result from construction of off-site facilities, including intake system and pipeline, blowdown pipeline, heavy haul road, and transmission lines. Siting of a nuclear facility at the LNP site would require a land use change. Overall land use impacts are anticipated to be SMALL.	The Crystal River site is on land already owned by PEF and is already zoned for uses compatible with development of new units. The existing facility is integrated into the surrounding land use patterns. Construction at the Crystal River site is not expected to have long-term impacts on land use. It is expected that the industrial nature of the facility will continue during construction. Overall land use impacts are anticipated to be SMALL.	The Dixie County site is a greenfield site located in Dixie County, Florida. The site is characterized primarily by open forested pineland with some evidence of timbering. Overall land use impacts are anticipated to be SMALL to MODERATE.	The Highlands County site is a greenfield site that is located in a rural and agricultural area of Florida. The surrounding land has been cleared for agricultural purposes, including sod and cattle/dairy farming. Overall land use impacts are anticipated to be SMALL to MODERATE.	The Putnam County site is a greenfield site that is characterized by mostly open canopied forest. Overall land use impacts are anticipated to be SMALL to MODERATE.

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**Table 10.4-1 (Sheet 9 of 16)
Summary of the Benefits and Costs of the Proposed Project**

Cost Category	Proposed Site LNP Site	Option 1 Crystal River Site	Option 2 Dixie County Site	Option 3 Highlands County Site	Option 4 Putnam County Site
Materials	Construction materials include: concrete, aggregate, rebar, conduit, cable, piping, building supplies, and tools. Operating materials include uranium.	Construction materials include: concrete, aggregate, rebar, conduit, cable, piping, building supplies, and tools. Operating materials include uranium.	Construction materials include: concrete, aggregate, rebar, conduit, cable, piping, building supplies, and tools. Operating materials include uranium.	Construction materials include: concrete, aggregate, rebar, conduit, cable, piping, building supplies, and tools. Operating materials include uranium.	Construction materials include: concrete, aggregate, rebar, conduit, cable, piping, building supplies, and tools. Operating materials include uranium.
Equipment	Typical construction equipment will include cranes, cement trucks, excavation equipment, dump truck, and graders. Equipment for the new facility would include the necessary components for the facility such as the reactors, turbines, cooling systems, water processing/ treatment systems, and cooling towers.	Typical construction equipment will include cranes, cement trucks, excavation equipment, dump truck, and graders. Equipment for the new facility would include the necessary components for the facility such as the reactors, turbines, cooling systems, water processing/ treatment systems, and cooling towers.	Typical construction equipment will include cranes, cement trucks, excavation equipment, dump truck, and graders. Equipment for the new facility would include the necessary components for the facility such as the reactors, turbines, cooling systems, water processing/ treatment systems, and cooling towers.	Typical construction equipment will include cranes, cement trucks, excavation equipment, dump truck, and graders. Equipment for the new facility would include the necessary components for the facility such as the reactors, turbines, cooling systems, water processing/ treatment systems, and cooling towers.	Typical construction equipment will include cranes, cement trucks, excavation equipment, dump truck, and graders. Equipment for the new facility would include the necessary components for the facility such as the reactors, turbines, cooling systems, water processing/ treatment systems, and cooling towers.
Services	Support services and supplies would be needed during construction. Security, maintenance, trash removal, and/or landscaping services may be needed during operation of the facility.	Support services and supplies would be needed during construction. Security, maintenance, trash removal, and/or landscaping services may be needed during operation of the facility.	Support services and supplies would be needed during construction. Security, maintenance, trash removal, and/or landscaping services may be needed during operation of the facility.	Support services and supplies would be needed during construction. Security, maintenance, trash removal, and/or landscaping services may be needed during operation of the facility.	Support services and supplies would be needed during construction. Security, maintenance, trash removal, and/or landscaping services may be needed during operation of the facility.

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**Table 10.4-1 (Sheet 14 of 16)
Summary of the Benefits and Costs of the Proposed Project**

Cost Category	Proposed Site LNP Site	Option 1 Crystal River Site	Option 2 Dixie County Site	Option 3 Highlands County Site	Option 4 Putnam County Site
Socioeconomic (Continued)	The overall population level is anticipated to be sufficiently large that the impact on area employment from construction and operation of the two new nuclear units would be low. It is expected that the impact on housing and community services would be negligible. The site area appears to have sufficient population centers such that its public services sector would be able to absorb the population in-migration associated with plant construction and operation with minimal impact.	The impact on area employment from construction and operation of the proposed nuclear facility would be low because Citrus County is in close proximity to one population center within 20 mi. (Dunnellon, Florida [1898 persons per square mile {psm}]) and one densely populated area within 40 mi. (Ocala, Florida [1189 psm]). Due to the population size in the vicinity of the plant, it is expected that most construction workers would come from within the region surrounding the site. Should a larger than expected number of construction workers come from outside the region, there could be a noticeable increase in population, but it would not be excessive. The overall population level is anticipated to be sufficiently large that the impact on area employment from construction and operation of the two new units would be low. It is expected that the impact on housing and community services would be negligible. The site area appears to have sufficient population centers within commuting distance such that its public services sector would be able to absorb the population in-migration associated with plant construction and operation with minimal impact.	Due to the population size in the vicinity of the plant, it is expected that most construction workers would come from within the region surrounding the site. Should a larger than expected number of construction workers come from outside the region, there could be a noticeable increase in population, but it would not be excessive.	Due to the population size in the vicinity of the plant, it is expected that most construction workers would come from within the region surrounding the site. Should a larger than expected number of construction workers come from outside the region, there could be a noticeable increase in population, but it would not be excessive.	Due to the population size in the vicinity of the plant, it is expected that most construction workers would come from within the region surrounding the site. Should a larger than expected number of construction workers come from outside the region, there could be a noticeable increase in population, but it would not be excessive.

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Summary of the Benefits and Costs of the Proposed Project**

Cost Category	Proposed Site LNP Site	Option 1 Crystal River Site	Option 2 Dixie County Site	Option 3 Highlands County Site	Option 4 Putnam County Site
Housing	No anticipated short-term impact on availability of housing units in the area during construction.	No anticipated short-term impact on availability of housing units in the area during construction.	No anticipated short-term impact on availability of housing units in the area during construction.	No anticipated short-term impact on availability of housing units in the area during construction.	No anticipated short-term impact on availability of housing units in the area during construction.
Local Infrastructure	Local infrastructure surrounding the LNP site is discussed in ER Sections 2.1 and 2.2 . There are sufficient roads that provide access to the LNP site. However, construction of local access roads would be required. No egress limitations are anticipated from the area surrounding the site based on the current level of service designations. Active rail is located approximately 10 miles southeast of the site. Barge access is available in the vicinity along the CFBC 3.2 miles south of the site. Use of barge will require construction of supporting infrastructure. No airports are located within the vicinity. Emergency evacuation of the area is possible in all directions. Increased traffic at beginning and end of shifts may increase traffic on highways to and from plant. Little impact on availability of services.	There are sufficient roads that provide main access to the proposed Crystal River Site. Local roads provide access to the Crystal River Energy Complex, co-located with the proposed site. Therefore, new road construction is expected to be minimal. Local rail is located approximately 1.1 mi. south of the site (co-located with the CREC). The local rail line connects to Seaboard Coast rail road approximately 7.8 mi. east of site near Citronelle, Florida. Barge access is available in the immediate vicinity since the Crystal River site is located approximately 3 mi. east of the Gulf of Mexico and approximately 1.5 mi. northeast of an inlet channel near the Crystal River Energy Complex.	The Dixie site is located near suitable roads which provide main access to the area. However, construction of local access roads would be required. Both railroad and barge access could be made available, but may not be practical because of the need to construct supporting infrastructure. Emergency evacuation of the area is possible in three directions, being limited to the west by the Gulf of Mexico. Increased traffic at beginning and end of shifts may increase traffic on highways to and from plant. Little impact on availability of services.	There are sufficient roads that provide main access to the proposed Highlands County Site. However, construction of local access roads would be required. Both railroad and barge access could be made available, but may not be practical because of the need to construct supporting infrastructure. Emergency evacuation of the area is possible in all directions, but area evacuation is limited to the southeast due to Lake Okeechobee. Increased traffic at beginning and end of shifts may increase traffic on highways to and from plant. Little impact on availability of services.	There appears to be sufficient roads in the vicinity of the Putnam County site which provides main access to the area. However, construction of local access roads would be required. Both railroad and barge access to the site may be practical. Emergency evacuation of the area is possible in all directions, but area evacuation is limited to the east due to the Atlantic Ocean. Increased traffic at beginning and end of shifts may increase traffic on highways to and from plant. Little impact on availability of services.