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From: Bruner, Douglas
Sent: Tuesday, September 08, 2009 2:18 PM
To: LevyCOL Resource
Subject: FW: Supplement to Response to Environmental RAIs
Attachments: NPD-NRC-2009-203 - Final Response to NRC.pdf

From: Wilkins, Tillie [mailto:tillie.wilkins@pgnmail.com]
Sent: Tuesday, September 08, 2009 1:26 PM
To: Anderson, Brian; Bruner, Douglas
Cc: Snead, Paul
Subject: Supplement to Response to Environmental RAIs

A revised response to ER RAI 2.4.1-3 is attached.

Tillie Wilkins
Nuclear Plant Development Licensing
Progress Energy
VNet: 770-6754
Bell: 919-546-6754

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Serial: NPD-NRC-2009-203
September 3, 2009

10 CFR 52.79

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

LEVY NUCLEAR PLANT, UNITS 1 AND 2
DOCKET NOS. 52-029 AND 52-030
SUPPLEMENT 5 TO RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING THE ENVIRONMENTAL REVIEW

References:

1. Letter from Douglas Bruner (NRC) to James Scarola (PEF), dated February 24, 2009, "Request for Additional Information Regarding the Environmental Review of the Combined License Application for the Levy Nuclear Power Plant, Units 1 and 2"
2. Letter from Garry D. Miller (PEF) to the U. S. Nuclear Regulatory Commission dated March 27, 2009, "Response To Request For Additional Information Regarding The Environmental Review", Serial NPD-NRC-2009-042
3. Letter from Garry D. Miller (PEF) to the U. S. Nuclear Regulatory Commission dated June 12, 2009, "Supplement 1 to Response to Request for Additional Information Regarding the Environmental Review", Serial NPD-NRC-2009-107
4. Letter from Garry D. Miller (PEF) to the U. S. Nuclear Regulatory Commission dated July 24, 2009, "Supplement 2 to Response to Request for Additional Information Regarding the Environmental Review", Serial NPD-NRC-2009-172
5. Letter from Garry D. Miller (PEF) to the U. S. Nuclear Regulatory Commission dated July 29, 2009, "Supplement 3 to Response to Request for Additional Information Regarding the Environmental Review", Serial NPD-NRC-2009-166
6. Letter from Garry D. Miller (PEF) to the U. S. Nuclear Regulatory Commission dated August 31, 2009, "Supplement 4 to Response to Request for Additional Information Regarding the Environmental Review", Serial NPD-NRC-2009-192

Ladies and Gentlemen:

Progress Energy Florida, Inc. (PEF) hereby submits a supplemental response to the Nuclear Regulatory Commission's (NRC) request for additional information provided in Reference 1.

Progress Energy Carolinas, Inc.
P.O. Box 1551
Raleigh, NC 27602

A revised response to one of the NRC questions (2.4.1-3) is provided in Enclosure 1. Enclosure 1 also identifies changes that will be made in a future revision of the Levy Nuclear Plant Units 1 and 2 application. Enclosure 2 provides a list of files included on the attached CD; these files have been prepared in accordance with NRC electronic submittal guidance. A pre-flight report is included as Enclosure 3.

If you have any further questions, or need additional information, please contact Bob Kitchen at (919) 546-6992, or me at (919) 546-6107.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on September 3, 2009.

Sincerely,

Garry D. Miller
General Manager
Nuclear Plant Development

Enclosures/Attachment

cc (without attached CD):
U.S. NRC Region II, Regional Administrator
Mr. Brian Anderson, U.S. NRC Project Manager

cc (with 3 copies of attached CD):
Mr. Douglas Bruner, U S Environmental Project Manager

Levy Nuclear Plant Units 1 and 2
Supplement 5 to Response to Request for Additional Information Regarding the Environmental Review, dated February 24, 2009

NRC RAI #	Progress Energy RAI #	Progress Energy Response
2.7-1	L-0076	March 27, 2009: NPD-NRC-2009-042
3.3-1	L-0077	March 27, 2009: NPD-NRC-2009-042
4.5-1	L-0078	March 27, 2009: NPD-NRC-2009-042
5.4.4-1	L-0079	March 27, 2009: NPD-NRC-2009-042
7.1-1	L-0401	June 12, 2009; NPD-NRC-2009-107
2.7.5-1	L-0508	July 24, 2009; NPD-NRC-2009-172
3.6.3-1	L-0082	March 27, 2009: NPD-NRC-2009-042
5.3.3-1	L-0083	March 27, 2009: NPD-NRC-2009-042
2.3.1-1	L-0398	June 12, 2009; NPD-NRC-2009-107
2.3.1-2	L-0085	March 27, 2009: NPD-NRC-2009-042
2.3.1-3	L-0399	June 12, 2009; NPD-NRC-2009-107
2.3.1-4	L-0087	March 27, 2009: NPD-NRC-2009-042
2.3.1-5	L-0088	March 27, 2009: NPD-NRC-2009-042
2.3.1-6	L-0089	March 27, 2009: NPD-NRC-2009-042
2.3.3-1	L-0090	March 27, 2009: NPD-NRC-2009-042
2.3.3-2	L-0091	March 27, 2009: NPD-NRC-2009-042
4.6-1	L-0092	March 27, 2009: NPD-NRC-2009-042
4.6-2	L-0093	March 27, 2009: NPD-NRC-2009-042
5.2.2-1	L-0396	June 12, 2009; NPD-NRC-2009-107
5.2.2-2	L-0095	March 27, 2009; NPD-NRC-2009-042
5.2.2-3	L-0522	July 29, 2009; NPD-NRC-2009-166
5.3.2.1-1	L-0097	March 27, 2009: NPD-NRC-2009-042
2.4.2-1	L-0098	March 27, 2009: NPD-NRC-2009-042
2.4.2-2	L-0099	March 27, 2009: NPD-NRC-2009-042
2.4.2-3	L-0100	March 27, 2009: NPD-NRC-2009-042
4.7-1	L-0101	March 27, 2009: NPD-NRC-2009-042
2.4.1-1	L-0402	June 12, 2009; NPD-NRC-2009-107
2.4.1-2	L-0403	June 12, 2009; NPD-NRC-2009-107
2.4.1-3	L-0533	Revised response enclosed; see following pages
2.4.1-4	L-0405 & L-0538	June 12, 2009; NPD-NRC-2009-107; & August 31, 2009; NPD-NRC-2009-192
2.4.1-5	L-0106	March 27, 2009: NPD-NRC-2009-042
4.3.1-1	L-0406	June 12, 2009; NPD-NRC-2009-107
4.3.1-2	L-0407	June 12, 2009; NPD-NRC-2009-107
4.3.1-3	L-0535	August 31, 2009; NPD-NRC-2009-192

NRC RAI #	Progress Energy RAI #	Progress Energy Response
4.3.1-4	L-0110	March 27, 2009: NPD-NRC-2009-042
4.3.1-5	L-0408	June 12, 2009; NPD-NRC-2009-107
4.3.1-6	L-0112	March 27, 2009: NPD-NRC-2009-042
4.3.1-7	L-0409	June 12, 2009; NPD-NRC-2009-107
4.7-2	L-0114	March 27, 2009: NPD-NRC-2009-042
5.3.3.2-1	L-0410	June 12, 2009; NPD-NRC-2009-107
2.5.1-1	L-0116	March 27, 2009: NPD-NRC-2009-042
2.5.2-1	L-0412	June 12, 2009; NPD-NRC-2009-107
2.5.2-2	L-0118	March 27, 2009: NPD-NRC-2009-042
2.5.2-3	L-0119	March 27, 2009: NPD-NRC-2009-042
2.5.2-4	L-0120	March 27, 2009: NPD-NRC-2009-042
2.5.4-1	L-0413	June 12, 2009; NPD-NRC-2009-107
4.4.2-1	L-0524	July 29, 2009; NPD-NRC-2009-166
4.4.2-2	L-0123	March 27, 2009: NPD-NRC-2009-042
4.4.2-3	L-0124	March 27, 2009: NPD-NRC-2009-042
4.4.2-4	L-0125	March 27, 2009: NPD-NRC-2009-042
4.4.2-5	L-0126	March 27, 2009: NPD-NRC-2009-042
4.4.2-6	L-0127	March 27, 2009: NPD-NRC-2009-042
4.4.2-7	L-0128	March 27, 2009: NPD-NRC-2009-042
4.4.2-8	L-0129	March 27, 2009: NPD-NRC-2009-042
4.4.2-9	L-0523	July 29, 2009; NPD-NRC-2009-166
4.4.2-10	L-0131	March 27, 2009: NPD-NRC-2009-042
4.7-1	L-0132	March 27, 2009: NPD-NRC-2009-042
5.11-1	L-0133	March 27, 2009: NPD-NRC-2009-042
5.8.2-1	L-0134	March 27, 2009: NPD-NRC-2009-042
9.4.1-1	L-0135	March 27, 2009: NPD-NRC-2009-042
9.4.1-2	L-0136	March 27, 2009: NPD-NRC-2009-042
9.4.2-1	L-0521	July 29, 2009; NPD-NRC-2009-166
9.4.2-2	L-0138	March 27, 2009: NPD-NRC-2009-042
9.4.2-3	L-0139	March 27, 2009: NPD-NRC-2009-042
9.3-1	L-0140	March 27, 2009: NPD-NRC-2009-042
9.3.2.1-1	L-0141	March 27, 2009: NPD-NRC-2009-042
3.7-1	L-0142	March 27, 2009: NPD-NRC-2009-042
3.7-2	L-0143	March 27, 2009: NPD-NRC-2009-042
4.8.3-1	L-0144	March 27, 2009: NPD-NRC-2009-042
6.2-1	L-0145	March 27, 2009: NPD-NRC-2009-042

NRC Letter No.: ER-NRC

NRC Letter Date: February 24, 2009

NRC Review of Environmental Report

NRC RAI #: 2.4.1-3

Text of NRC RAI:

Provide additional information needed to update and complete the baseline characterization and impact assessment for wetland resources.

Wetlands descriptions in ER Section 2.4.1 were based on the Florida Land Use and Cover Classification System (FLUCCS), as interpreted and mapped by SWFWMD and field verified by PEF. Wetland delineations for the Levy site and verification by the U.S. Army Corps of Engineers is ongoing. Reference is made in ER Sections 5.2.1.5 and 5.2.2.3 to groundwater pumping that could adversely affect wetlands, but little detail is provided. Provide the following items:

- A new wetlands map (clearly reproducible in black-and-white) for the site and south of the site that includes jurisdictional and non-jurisdictional wetlands, as well as an overlay of the limits of ground disturbance. Identify the project facilities and features depicted on the map.
- A new table with the existing acreage of wetlands, including jurisdictional and non-jurisdictional wetlands.
- A new wetland impacts table with the acreage of jurisdictional and non-jurisdictional wetlands broken out by temporary and permanent impacts and by facilities (see ER Land Use Tables 4.1-4 and 4.1-5 for a breakdown of facilities).
- A discussion to explain the Unified Mitigation Assessment Method (UMAM) functional assessment for impact wetlands and for mitigation wetlands.
- A qualitative discussion on the effects of construction dewatering on wetlands, including the disposition of water during construction.
- Discussions addressing groundwater drawdown due to operations and any wetlands monitoring that would be implemented.
- Estimated groundwater drawdown isopleths (minimum 1-foot elevation interval) resulting from operational water withdrawal overlaid on the wetland delineation map (clearly reproducible in black-and-white).
- A discussion to describe and explain estimates of wetland loss due to the drawdown, as well as information on how impacts can be minimized and why impacts are unavoidable.
- Updated estimates of wetland and upland impacts along the transmission lines (up to the first substation).

PGN RAI ID #: L-0533

PGN Response to NRC RAI:

A map of jurisdictional and non-jurisdictional wetlands at the LNP site and the property south of the site, as well as an overlay of the limits of ground disturbance, is provided as Attachment

2.4.1-3A. The map is clearly reproducible in black and white and includes project facilities and features. Wetlands depicted on the map are based on field-delineated wetland boundaries, except in a minor area outside the areas of impact where wetland boundaries are based on aerial photo-interpretation.

Table 2.4.1-3-001 presents existing wetland acreage by wetland type at the LNP site and the off-site areas, which include all other project elements, including the property south of the LNP site and the blowdown corridor to the Crystal River Energy Complex (CREC). These values are based on delineations completed in April 2009; however, field visits by the U.S. Army Corps of Engineers (USACE) and the Florida Department of Environmental Protection (FDEP) are ongoing. Because the final jurisdictional determinations by the USACE and the FDEP have not been received, all wetlands on-site are considered to be jurisdictional and the potential impact numbers are preliminary. PEF is expecting FDEP and USACE verification of these delineations by September 30, 2009.

Table 2.4.1-3-001
Total Wetland Acreage on the LNP Site and Off-Site Areas

FLUCCS Description	On-Site (Acres)	Associated Facilities excluding Transmission Lines (Acres)	Transmission Line Corridors up to First Substation (Acres)	Transmission Line Corridors Beyond First Substation (Acres)	Total (Acres)
Streams and Waterways		174.9	68.7	4.1	247.7
Lakes			30.9	8.7	39.6
Reservoirs			57.2	59.7	116.9
Bays and Estuaries		1.6	1		2.6
Stream and Lake Swamps (Bottomland)			604.8	104.1	708.9
Mixed Wetland Hardwoods	317.6		32.9		32.9
Wetland Coniferous Forests				5.9	5.9
Cypress	402.6	2.5	191.8	119.7	314.0
Wetland Forested Mixed	156.4	80.5	422.2	96.4	599.1
Freshwater Marshes	23.5	44	928.2	218.2	1190.4
Saltwater Marshes		93.4	6.5		99.9
Wet Prairies	14.3		276	51.6	327.6
Emergent Aquatic Vegetation			60.7	10.4	71.1
Mixed Scrub-Shrub Wetland			10.8		10.8
Intermittent Ponds			34.4	15.6	50.0
Wet Planted Pine	812.7				
Treeless Hydric Savannah	274.4				
Totals	**2001.5**	**396.9**	**2,726.1**	**694.4**	**3817.4**

Notes:
FLUCCS = Florida Land Use and Cover Classification System

Land use in the corridors based on FLUCCS data is described in Table 2.4.1-3-002 (the FLUCCS data were obtained from the Southwest Florida Water Management District (SWFWMD) publication: http://www.swfwmd.state.fl.us/data/gis/layer_library/metadata/lu07.html; accessed 8/11/2003).

These corridors include the transmission lines and other facilities, such as the blowdown pipeline and access roads, to the first substation and beyond the first substation.

Table 2.4.1-3-002 (Sheet 1 of 3)
Estimates Land Use Categories in Off-Site Corridors

FLUCCS Description	FLUCCS Code	Associated Facilities excluding Transmission Lines		Transmission Line Corridors up to First Substation		Transmission Line Corridors Beyond First Substation	
		Acres	Hectares	Acres	Hectares	Acres	Hectares
Residential Low Density < 2 Dwelling Units	110	27.5	11.1	1,564.6	633.2	2,301.4	931.3
Rural Residential	118			3.6	1.5		
Residential Med Density 2->5 Dwelling Unit	120	1.4	0.6	22.7	9.2	388.3	157.1
Residential High Density	130			55.7	22.5	136.6	55.3
Commercial and Services	140	3.0	1.2	180.7	73.1	122.7	49.7
Industrial	150			102.6	41.5	34.7	14.0
Other Light Industrial	155			3.7	1.5		
Extractive	160	32.3	13.1	183.1	74.1	41.2	16.7
Holding Ponds	166			0.7	0.3		
Institutional	170	7.6	3.1	20.5	8.3	16.2	6.6
Recreational	180			58.8	23.8	19.3	7.8
Golf Courses	182					29.5	11.9
Open Land	190	330.4	133.7	1,813.5	733.9	647.4	262.0
Cropland and Pastureland	210			6,514.1	2,636.2	754.0	305.1
Row Crops	214			234.6	94.9	17.5	7.1
Field Crops	215			6.3	2.5		
Tree Crops	220					73.5	29.7
Feeding Operations	230					13.5	5.5
Nurseries and Vineyards	240			3.0	1.2	17.3	7.0
Specialty Farms	250			22.5	9.1	7.5	3.0
Other Open Lands <Rural>	260	2.4	1.0	1,071.5	433.6	109.2	44.2
Herbaceous Upland Nonforested	310			15.8	6.4		
Shrub and Brushland	320	37.6	15.2	216.6	87.6	147.3	59.6
Mixed Rangeland	330	23.5	9.5	36.0	14.6	3.8	1.5

Table 2.4.1-3-002 (Sheet 2 of 3)
Estimates Land Use Categories in Off-Site Corridors

FLUCCS Description	FLUCCS Code	Associated Facilities excluding Transmission Lines		Transmission Line Corridors up to First Substation		Transmission Line Corridors Beyond First Substation	
		Acres	Hectares	Acres	Hectares	Acres	Hectares
Mixed Upland Nonforested	330			12.1	4.9		
Upland Coniferous Forest	410	38.7	15.7	162.1	65.6	43.7	17.7
Pine Flatwoods	411	42.1	17.1	159.7	64.6	75.2	30.4
Longleaf Pine - Xeric Oak	412	21.7	8.8	806.2	326.2	1,392.2	563.4
Upland Hardwood Forests - Part 1	420			61.9	25.0		
Hardwood Conifer Mixed	434	213.2	86.3	2,626.0	1,062.7	254.8	103.1
Upland Mixed Coniferous/Hardwood	434			6.7	2.7		
Tree Plantations	440	71.5	28.9	1,784.9	722.3	171.7	69.5
Coniferous Pine	441			50.3	20.4		
Streams and Waterways	510	174.9	70.8	68.7	27.8	4.1	1.6
Lakes	520			30.9	12.5	8.7	3.5
Reservoirs	530			57.2	23.2	59.7	24.2
Bays and Estuaries	540	1.6	0.6	1.0	0.4		
Stream and Lake Swamps (Bottomland)	615			604.8	244.7	104.1	42.1
Mixed Wetland Hardwoods	617			32.9	13.3		
Wetland Coniferous Forests	620					5.9	2.4
Cypress	621	2.5	1.0	191.8	77.6	119.7	48.4
Wetland Forested Mixed	630	80.5	32.6	422.2	170.9	96.4	39.0
Freshwater Marshes	641	44.0	17.8	928.2	375.6	218.2	88.3
Saltwater Marshes	642	93.4	37.8	6.5	2.6		
Wet Prairies	643			276.0	111.7	51.6	20.9
Emergent Aquatic Vegetation	644			60.7	24.6	10.4	4.2
Mixed Scrub-Shrub Wetland	646			10.8	4.4		
Intermittent Ponds	653			34.4	13.9	15.6	6.3

Table 2.4.1-3-002 (Sheet 3 of 3)
Estimates Land Use Categories in Off-Site Corridors

FLUCCS Description	FLUCCS Code	Associated Facilities excluding Transmission Lines		Transmission Line Corridors up to First Substation		Transmission Line Corridors Beyond First Substation	
		Acres	Hectares	Acres	Hectares	Acres	Hectares
Disturbed Land	740			113.8	46.0	24.1	9.8
Transportation	810	13.2	5.4	569.5	230.5	46.0	18.6
Roads and Highways	814			13.7	5.6		
Utilities	830	16.4	6.6	2,054.5	831.4	1,113.0	450.4
Electrical Power Transmission Lines	832			0.2	0.1		
Totals		**1,279.4**	**517.9**	**23,278.3**	**9,420.2**	**8,696.0**	**3,518.9**

Notes:
FLUCCS = Florida Land Use and Cover Classification System

The following discussion summarizes the temporary and permanent impacts associated with each facility at the LNP site (i.e., LNP building footprint), including the LNP pipeline to the Cross Florida Barge Canal (CFBC). Permanent impacts are those impacts that are due to permanent facilities, such as building footprints, while temporary impacts are those impacts that are of shorter duration, such as during construction. Information that distinguishes between temporary and permanent impacts for the on-site transmission corridor is not available at this time. Therefore, all impacts associated with the transmission lines and the southernmost portion of the blowdown pipeline are depicted as permanent and are being mitigated in their entirety, which overstates the amount of mitigation that may ultimately be required when permanent impacts are finalized.

Table 2.4.1-3-003 presents the onsite potential impact acreage by temporary and permanent impacts and by facilities. Table 2.4.1-3-004 presents the offsite (excluding the transmission lines) potential impact acreage by temporary and permanent impacts and by facilities.

Table 2.4.1-3-003 (Sheet 1 of 5)
Total Onsite Project Impacts by Facility

Facility	Location	Impact	Land Use Type	Impact Area[(a)] (ac.)	Impact Area[(a)] (ha.)
Heavy Haul Road	On-site	Permanent	260 - Other open lands (rural)	0.3	0.1
			440 - Tree Plantations	5.9	2.4
			621 - Cypress	1.1	0.4
			629 - Wet Planted Pine	1.2	0.5
			630 - Wetland Forested Mixed	0.6	0.2
			643 - Wet Prairies	0.1	0.1
Misc. Fill	On-site	Permanent	260 - Other open lands (rural)	3.7	1.5
			440 - Tree Plantations	39.2	15.7
			621 - Cypress	7.2	2.9
			629 - Wet Planted Pine	19.2	7.7
			630 - Wetland Forested Mixed	1.8	0.7
			641 - Freshwater Marshes	0.1	0.0
			643 - Wet Prairies	0.1	0.0
			646 - Treeless Hydric Savannah	41.3	16.5
Misc. Pipeline	On-site	Permanent	260 - Other open lands (rural)	0.7	0.3
			440 - Tree Plantations	1.5	0.6
			621 - Cypress	0.3	0.1
			629 - Wet Planted Pine	0.3	0.1
			630 - Wetland Forested Mixed	1.6	0.7
			643 - Wet Prairies	0.0	0.0

Table 2.4.1-3-003 (Sheet 2 of 5)
Total Onsite Project Impacts by Facility

Facility	Location	Impact	Land Use Type	Impact Area[(a)] (ac.)	Impact Area[(a)] (ha.)
Misc. Structures	On-site	Permanent	260 - Other open lands (rural)	6.2	2.5
			440 - Tree Plantations	30.2	12.1
			617 - Mixed Wetland Hardwoods	0.7	0.3
			621 - Cypress	1.7	0.7
			629 - Wet Planted Pine	17.1	6.8
			630 - Wetland Forested Mixed	4.9	1.9
			641 - Freshwater Marshes	0.3	0.1
			643 - Wet Prairies	0.0	0.0
			646 - Treeless Hydric Savannah	13.1	5.2
Pipeline LNP to CFBC	On-site	Permanent[(b)]	260 - Other open lands (rural)	1.0	0.4
			440 - Tree Plantations	7.2	2.9
			621 - Cypress	1.9	0.7
			629 - Wet Planted Pine	1.2	0.5
			630 - Wetland Forested Mixed	3.7	1.5
			643 - Wet Prairies	0.3	0.1
			646 - Treeless Hydric Savannah	0.4	0.2
Pond A	On-site	Permanent	440 - Tree Plantations	19.6	7.8
			629 - Wet Planted Pine	30.1	12.1
			630 - Wetland Forested Mixed	6.3	2.5
			641 - Freshwater Marshes	3.7	1.5
			646 - Treeless Hydric Savannah	10.1	4.1
Pond B	On-site	Permanent	260 - Other open lands (rural)	6.8	2.7
			621 - Cypress	3.0	1.2
			629 - Wet Planted Pine	0.0	0.0
			630 - Wetland Forested Mixed	0.1	0.1
			643 - Wet Prairies	4.0	1.6

Table 2.4.1-3-003 (Sheet 3 of 5)
Total Onsite Project Impacts by Facility

Facility	Location	Impact	Land Use Type	Impact Area[(a)] (ac.)	Impact Area[(a)] (ha.)
Pond C	On-site	Permanent	440 - Tree Plantations	15.6	6.3
			621 - Cypress	2.5	1.0
			629 - Wet Planted Pine	6.1	2.5
			641 - Freshwater Marshes	0.2	0.1
Shooting Range	On-site	Permanent	440 - Tree Plantations	0.1	0.0
Site Access Roads	On-site	Permanent	260 - Other open lands (rural)	1.5	0.6
			440 - Tree Plantations	15.4	6.1
			621 - Cypress	2.5	1.0
			629 - Wet Planted Pine	8.1	3.2
			630 - Wetland Forested Mixed	1.0	0.4
			646 - Treeless Hydric Savannah	0.7	0.3
Switchyard	On-site	Permanent	440 - Tree Plantations	28.4	11.4
			621 - Cypress	5.3	2.1
			629 - Wet Planted Pine	7.1	2.9
Switchyard Connection	On-site	Permanent	260 - Other open lands (rural)	1.1	0.4
			440 - Tree Plantations	11.0	4.4
			621 - Cypress	4.2	1.7
			629 - Wet Planted Pine	5.1	2.0
			641 - Freshwater Marshes	0.0	0.0
			643 - Wet Prairies	0.1	0.0
			646 - Treeless Hydric Savannah	1.7	0.7

Table 2.4.1-3-003 (Sheet 4 of 5)
Total Onsite Project Impacts by Facility

Facility	Location	Impact	Land Use Type	Impact Area[(a)] (ac.)	Impact Area[(a)] (ha.)
Transmission Corridor	On-site	Permanent	410 - Upland coniferous forests	0.1	0.0
			440 - Tree Plantations	100.5	40.2
			617 - Mixed Wetland Hardwoods	9.5	3.8
			621 - Cypress	24.1	9.6
			629 - Wet Planted Pine	33.9	13.6
			630 - Wetland Forested Mixed	8.4	3.3
			641 - Freshwater Marshes	2.0	0.8
			643 - Wet Prairies	0.3	0.1
Unit 1	On-site	Permanent	260 - Other open lands (rural)	5.5	2.2
			629 - Wet Planted Pine	3.4	1.4
			630 - Wetland Forested Mixed	0.7	0.3
			641 - Freshwater Marshes	2.0	0.8
			646 - Treeless Hydric Savannah	3.8	1.5
Unit 2	On-site	Permanent	260 - Other open lands (rural)	4.3	1.7
			440 - Tree Plantations	2.9	1.2
			629 - Wet Planted Pine	2.1	0.9
			630 - Wetland Forested Mixed	0.0	0.0
			641 - Freshwater Marshes	3.7	1.5
			643 - Wet Prairies	0.1	0.1
			646 - Treeless Hydric Savannah	2.3	0.9

Table 2.4.1-3-003 (Sheet 5 of 5)
Total Onsite Project Impacts by Facility

Facility	Location	Impact	Land Use Type	Impact Area[(a)] (ac.)	Impact Area[(a)] (ha.)
			260 - Other open lands (rural)	9.1	3.6
			440 - Tree Plantations	56.6	22.6
			617 - Mixed Wetland Hardwoods	2.7	1.1
			621 - Cypress	13.2	5.3
50' Buffer to CFBC	On-site	Temporary	629 - Wet Planted Pine	39.5	15.8
			630 - Wetland Forested Mixed	7.4	2.9
			641 - Freshwater Marshes	0.6	0.2
			643 - Wet Prairies	1.5	0.6
			646 - Treeless Hydric Savannah	19.1	7.6
Subtotal Permanent				627.1	251.0
Subtotal Temporary				149.7	59.7
TOTAL				**776.8**	**310.7**

a) The on-site areas noted in the table are in various stages of delineation. The most up-to-date information has been used in area calculations, including formal jurisdictional delineations, field-verified lines by the Florida Department of Environmental Protection (FDEP), consultant established lines, and SWFWMD land use lines. For all off-site areas, the FLUCCS data were used to determine impacts.

b) For impacts that could be considered both permanent and temporary, the calculations of total impacts have assumed these areas to be permanent in order to provide the most conservative estimate.

Table 2.4.1-3-004 (Sheet 1 of 2)
Offsite Project Impacts by Facility
(Excluding Transmission Lines)

Facility	Location	Impact	Land Use Type	Impact Area (ac.)	Impact Area (ha.)
Blowdown Pipeline	Off-Site	Permanent	160 - Extractive	4.5	1.8
			190 - Open Land	37.8	15.3
			320 - Shrub and Brushland	0.9	0.4
			330 - Mixed Rangeland	9.4	3.8
			410 - Upland Coniferous Forest	2.3	0.9
			411 - Pine Flatwoods	3.8	1.5
			412 - Longleaf Pine - Xeric Oak	0.7	0.3
			434 - Hardwood Conifer Mixed	16.9	6.8
			440 - Tree Plantations	6.5	2.6
			510 - Streams and Waterways	1.7	0.7
			530 - Reservoirs	2.3	0.9
			630 - Wetland Forested Mixed	2.2	0.9
			641 - Freshwater Marshes	6.5	2.6
			642 - Saltwater Marshes	4.5	1.8
			810 - Transportation	1.6	0.7
			830 - Utilities	14.6	5.9
Heavy Haul Road	Off-Site	Permanent	260 - Other Open Lands <Rural>	6.6	2.7
			410 - Upland Coniferous Forest	1.9	0.8
			434 - Hardwood Conifer Mixed	0.1	0.0
			440 - Tree Plantations	23.1	9.4
			621 - Cypress	5.3	2.1
			641 - Freshwater Marshes	2.5	1.0
Misc Pipeline	Off-Site	Permanent	260 - Other Open Lands <Rural>	1.2	0.5
			434 - Hardwood Conifer Mixed	0.8	0.3
			440 - Tree Plantations	3.4	1.4
			641 - Freshwater Marshes	0.3	0.1

Table 2.4.1-3-004 (Sheet 2 of 2)
Offsite Project Impacts by Facility
(Excluding Transmission Lines)

Facility	Location	Impact	Land Use Type	Impact Area (ac.)	Impact Area (ha.)
Pipeline CFBC to CREC	Off-Site	Both*	260 - Other Open Lands <Rural>	7.2	2.9
			410 - Upland Coniferous Forest	1.5	0.6
			434 - Hardwood Conifer Mixed	1.1	0.4
			440 - Tree Plantations	27.0	10.9
			621 - Cypress	6.4	2.6
			630 - Wetland Forested Mixed	0.2	0.1
			641 - Freshwater Marshes	2.6	1.1
Site Access Roads	Off-Site	Permanent	410 - Upland Coniferous Forest	0.0	0.0
			434 - Hardwood Conifer Mixed	0.0	0.0
			440 - Tree Plantations	3.6	1.5
			621 - Cypress	0.8	0.3
			641 - Freshwater Marshes	0.6	0.2
			810 - Transportation	0.1	0.0
			830 - Utilities	0.2	0.1
50' Buffer to CFBC	Off-Site	Temporary	260 - Other Open Lands <Rural>	8.4	3.4
			410 - Upland Coniferous Forest	1.6	0.7
			434 - Hardwood Conifer Mixed	1.8	0.7
			440 - Tree Plantations	11.8	4.8
			621 - Cypress	3.8	1.5
			630 - Wetland Forested Mixed	0.8	0.3
			641 - Freshwater Marshes	1.4	0.6
			Permanent Subtotal	212.7	85.9
			Temporary Subtotal	29.6	12.0
			Total	**242.3**	**97.9**

Notes:
"Both*" are considered permanent to provide the most conservative estimates.
For all off-site areas, the FLUCCS data were used to determine impacts.

The 50-foot buffer to the CFBC is outside the direct impact area (footprint) of the project, but it may be temporarily impacted through construction activities, such as temporary placement of construction materials and roadway. Currently, this area consists of spoil material placed during the original dredging of the canal and is vegetated largely by bahia grass and ruderal species. Silt fencing will be placed prior to any land disturbance activities to minimize the potential for sedimentation into the canal. Following construction, any temporary impacts within the buffer area will be restored by grading to pre-existing contours and seeding in accordance with the project's sedimentation and erosion control plan.

Although some portions of the hydric pine plantation are not historic wetlands, they have been accounted for as wetlands. The areas of pine plantation designated as uplands have been identified separately as FLUCCS 440, whereas FLUCCS 629 was used to identify hydric pine plantation. Therefore, impacts to hydric pine plantation (FLUCCS 629) were originally lumped together with the impacts proposed for native wetland systems (that is, FLUCCSs 617, 621, 630, 641, 643, 646).

The impacts associated with the off-site transmission lines are presented in Table 2.4.1-3-005. A map showing the locations of transmission line segments is provided in Attachment 2.4.1-3B.

Table 2.4.1-3-005 (Sheet 1 of 3)
Transmission Line Impacts

Segment	Land Use (FLUCCS)	FLUCCS Description	Area (ac.)	Hectare (ha.)	Estimated Clearing (ac.)
1	411	Pine Flatwoods	16.1	6.5	0.0
	434	Hardwood - Conifer Mixed	48.2	19.5	27.5
	441	Coniferous Plantations	138.9	56.2	0.0
	510	Streams and Waterways	1.2	0.5	0.0
	615	Stream and Lake Swamps (Bottomland)	0.0	0.0	0.0
	621	Cypress	34.7	14.0	150.5
	624	Cypress-Pine-Cabbage Palm	2.6	1.1	0.0
	630	Wetland Forested Mixed	11.0	4.5	12.0
	641	Freshwater Marshes	0.0	0.0	0.0
	643	Wet Prairies	0.6	0.2	0.0
	830	Utility ROW	2.6	1.0	0.0
		Subtotal	**255.9**	**103.5**	**190.0**
2	412	Longleaf Pine - Xeric Oak	82.1	33.2	70.3
	434	Hardwood - Conifer Mixed	102.4	41.4	74.7
	510	Streams and Waterways	0.1	0.0	0.0
	530	Reservoirs	0.2	0.1	0.0
	615	Stream and Lake Swamps (Bottomland)	5.0	2.0	6.6
	621	Cypress	1.9	0.8	0.8
	630	Wetland Forested Mixed	1.8	0.7	0.6
	641	Freshwater Marshes	10.3	4.2	0.0
	830	Utility ROW	0.3	0.1	0.0
		Subtotal	**204.1**	**82.6**	**153.1**
3	412	Longleaf Pine - Xeric Oak	0.9	0.4	0.2
	434	Hardwood - Conifer Mixed	45.9	18.6	25.6
	615	Stream and Lake Swamps (Bottomland)	0.4	0.2	0.9
	621	Cypress	0.5	0.2	0.5
	630	Wetland Forested Mixed	0.4	0.2	0.9
	641	Freshwater Marshes	5.9	2.4	0.0
	653	Intermittent Ponds	0.0	0.0	0.0
	830	Utility ROW	35.0	14.2	0.0
		Subtotal	**89.0**	**36.0**	**28.2**

Table 2.4.1-3-005 (Sheet 2 of 3)
Transmission Line Impacts

Segment	Land Use (FLUCCS)	FLUCCS Description	Area (ac.)	Hectare (ha.)	Estimated Clearing (ac.)
4	411	Pine Flatwoods	6.2	2.5	4.5
	412	Longleaf Pine - Xeric Oak	14.1	5.7	11.0
	413	Sand Pine	31.3	12.7	22.9
	421	Xeric Oak	56.4	22.8	41.0
	427	Live Oak	6.7	2.7	4.6
	434	Hardwood - Conifer Mixed	109.8	44.4	81.4
	441	Coniferous Plantations	62.3	25.2	44.6
	510	Streams And Waterways	0.2	0.1	0.0
	520	Lakes	0.9	0.4	0.0
	530	Reservoirs	0.1	0.0	0.0
	615	Stream and Lake Swamps (Bottomland)	7.8	3.2	17.9
	621	Cypress	0.0	0.0	0.4
	630	Wetland Forested Mixed	0.0	0.0	0.1
	641	Freshwater Marshes	9.6	3.9	0.0
	643	Wet Prairies	3.9	1.6	0.0
	653	Intermittent Ponds	0.0	0.0	0.0
	830	Utility ROW	50.9	20.6	0.0
		Subtotal	**360.2**	**145.8**	**228.4**
5	411	Pine Flatwoods	0.0	0.0	0.0
	412	Longleaf Pine – Xeric Oak	6.4	2.6	0.0
	413	Sand Pine	1.3	0.5	0.0
	421	Xeric Oak	0.3	0.1	**0.0**
	434	Hardwood – Conifer Mixed	0.1	0.0	**0.0**
	441	Coniferous Plantations	0.5	0.2	**0.0**
	530	Reservoirs	0.0	0.0	**0.0**
	615	Stream and Lake Swamps (Bottomland)	0.0	0.0	0.0
	621	Cypress	0.0	0.0	0.0
	630	Wetland Forested Mixed	0.0	0.0	0.0
	641	Freshwater Marshes	1.1	0.4	0.0
	653	Intermittent Ponds	0.0	0.0	0.0
	830	Utility ROW	130.2	52.7	0.0
		Subtotal	**139.9**	**56.6**	**0.0**
6	412	Longleaf Pine – Xeric Oak	1.0	0.4	0.0
	615	Stream and Lake Swamps (Bottomland)	0.0	0.0	0.0
	830	Utility ROW	7.2	2.9	0.0
		Subtotal	**8.2**	**3.3**	**0.0**

Table 2.4.1-3-005 (Sheet 3 of 3)
Transmission Line Impacts

Segment	Land Use (FLUCCS)	FLUCCS Description	Area (ac.)	Hectare (ha.)	Estimated Clearing (ac.)
7	411	Pine Flatwoods	3.4	1.4	0.0
	424	Melaleuca	0.3	0.1	0.0
	434	Hardwood – Conifer Mixed	31.8	12.9	0.0
	441	Coniferous Plantations	0.6	0.2	0.0
	510	Streams and Waterways	0.6	0.2	0.0
	520	Lakes	0.9	0.4	0.0
	530	Reservoirs	6.3	2.5	0.0
	534	Reservoirs < 10 Acres	0.4	0.2	0.0
	615	Stream and Lake Swamps (Bottomland)	3.4	1.4	0.0
	621	Cypress	2.4	1.0	0.0
	630	Wetland Forested Mixed	3.8	1.5	0.0
	631	Wetland Scrub	0.1	0.0	0.0
	641	Freshwater Marshes	32.4	13.1	0.0
	643	Wet Prairies	0.9	0.4	0.0
	653	Intermittent Ponds	0.0	0.0	0.0
	830	Utility ROW	43.1	17.4	0.0
		Subtotal	**130.4**	**52.8**	**0.0**
		Total	**1186.4**	**480.1**	**599.6**

Notes:

For the transmission line right-of-way (ROW) impacts, SWFWMD 2005 and SJRWM 2004 Land Use data were modified by Golder (following limited field reconnaissance).

The Transmission line impacts should be considered preliminary as final route selection has not occurred at this time.

For segments 5, 6, and 7 no clearing impacts were calculated because of Progress Energy's existing maintenance practices within existing rights of way.

Segment 1 - LNP to Levy/Citrus County Line (includes the conceptual ROW that includes 4 500-kV lines between LNP and the Citrus County Line).

Segment 2 – Levy/Citrus County Line to Citrus Substation

Segment 3 – Citrus Substation to Crystal River Energy Complex

Segment 4 – Citrus Substation to Proposed Central Florida South Substation

Segment 5 – Crystal River Energy Complex to Brookridge Substation

Segment 6 – Brookridge Substation to Brookville West Substation

Segment 7 – Kathleen Substation to Lake Tarpon Substation

The majority of the FLUCCS categories have been described in other documents supporting the COLAs. However, Tables 2.4.1-3-001, 2.4.1-3-002 and 2.4.1-3-003 list new categories that are described below.

“Wet Planted Pine” refers to wetland areas where the native vegetative cover has been removed and replaced with slash pine seedlings. The soils have typically been bedded in alternating furrows and ridges to facilitate drainage and elevate the seedling roots above the water table. These are often transitional areas on the perimeter of wetter systems. The dominant vegetative species is planted slash pine (*Pinus elliottii*), with a sparse groundcover of moisture-tolerant herbaceous species such as blue maidencane (*Amphicarpum muhlenbergium*), broomsedge (*Andropogon sp*), Virginia chain fern (*Woodwardia virginica*), and yellow-eyed grass *(Xyris* spp.), with scattered shrubs such as gallberry (*Ilex glabra*) and fetterbush (*Lyonia lucida*).

“Treeless Hydric Savannah” describes low-lying flats that are vegetated largely by wet prairie species such as broomsedge (*Andropogon spp*), pipeworts (*Eriocaulon spp*.), yellow-eyed grass *(Xyris* spp.), and wiregrass (*Aristida stricta*), as well as shrub species such as fetterbush (*Lyonia lucida*) and wax myrtle (*Myrica cerifera*).

“Mixed Wetland Hardwoods” are characterized on-site by a mixture of wetland tree species, including red bay (Persea palustris), sweet bay (*Magnolia virginiana*), red maple (*Acer rubrum*), dahoon holly (*Ilex cassine*), and pond cypress (*Taxodium ascendens*). Shrub species include button bush (*Cephalanthus occidentalis*), fetterbush (*Lyonia lucida*), and wax myrtle (*Myrica cerifera*). On the LNP site, these communities typically represent cutover pond cypress swamps, where fire suppression has allowed the proliferation of hardwood species.

Uniform Mitigation Assessment Method

The Uniform Mitigation Assessment Method (UMAM), developed by the FDEP and contained in Chapter 62-345, Florida Administrative Code (F.A.C.), was used to evaluate the function of uplands and wetlands identified within the study area in regards to expected wildlife species in accordance with guidelines set forth in Chapter 62-345, F.A.C. (see Attachment 2.4.1-3C). The intent of UMAM is to provide a standardized procedure for assessing wetland functions, the degree of functional loss due to an impact, and the amount of mitigation needed to offset those losses. UMAM has been used as the quantitative tool for determining wetland mitigation requirements in a wide range of projects permitted through the USACE in Florida and has been adopted by USACE for use in Florida by a Public Notice issued on July 18, 2005. There is a minor difference between the way the State of Florida and the USACE calculate the timing associated with mitigation maturity using UMAM.

Three main parameters are assessed under the UMAM protocol. Each parameter is given a score between 0 (lowest) and 10 (highest) in increments of 1.0, with specific scoring considerations and criteria described in the FDEP guidance to ensure consistency. The final score is a weighted average. UMAM variables considered for each wetland include: Location and Landscape, Water Environment, and Community Structure. Assessment areas were scored based on the current condition (“Without Project” scenario) and compared with proposed impact or mitigation (“With Project” scenario) scores to determine the Relative Functional Gain for the project. UMAM calculations also provide for quantitative consideration of the likelihood of success of the proposed mitigation (risk) and the time expected to attain the desired conditions

(temporal factor). Under UMAM, a project must result in at least a balance between the functional loss from impacts and the functional gain from mitigative actions.

UMAM results for on-site impacts and proposed mitigation wetlands are summarized in the Wetland Mitigation Plan, which is included as Attachment 2.4.1-3D.

Wetland Impact Areas

Without Project – Assessment areas were generally given a score of "4" for the Location and Landscape Support category due to limited habitat availability in surrounding landscapes, wildlife access being limited by distance and barriers, area land uses having adverse effects on wildlife, and hydrologic impediments that limit assessment areas from providing benefits downstream. Water Environment scores ranged from "2" to "10" and were based on the differences in land management practices, including ditching, bedding, haul roads, and the effects on the habitat. Community Structure scores ranged from "2" to "9" and were based on the degree of regeneration/recruitment, cover of desirable species, species diversity, and the quality of structure available to wildlife. Wetland areas typically scored toward the higher range of the category.

With Project – Impacts to assessment areas are considered to be direct and permanent, resulting in a total loss of function according to UMAM and receiving a score of zero.

Potential Mitigation Areas

Without Project – In general, conditions at mitigation areas were similar to impact areas, as described above. Mitigation areas were generally given a score of "4" for the Location and Landscape Support category based on ongoing land management practices and support to wildlife, as described above. Water Environment scores ranged from "4" to "10" and Community Structure scores ranged from "3" to "10".

With Project – Mitigation areas were scored under optimal conditions based on identified restoration, enhancement, or preservation opportunities. Location and Landscape Support scores for wetland mitigation areas were "9" for increased optimal habitat availability and removal of current land uses (silviculture). Water Environment scores were only slightly greater than the "Without Project" scenario, due to few hydrologic enhancement opportunities. The exception was in planted pine wetland areas, which scored a "9" based on improvements to the habitat once silviculture activities end. Community Structure scored a "9" based on removal of slash pine from wetlands and natural regeneration/recruitment particularly in transition communities, along with changes in current land use such as logging. Uplands mitigation areas scored a "9" based on optimal structural habitat, regeneration/recruitment potential, and typical age/size distribution of vegetation species once desired land management plans are implemented.

The amount of time for mitigation implementation to maturity between the "Without Project" and "With Project" scenarios was based on forested wetlands and ranged from 5 to 15 years. Herbaceous wetlands were assigned 5 years to reach maturity. Risk factors ranged from 1.5 (high) for planted pine wetlands to 1.25 (low) for all other wetlands and upland assessment areas.

Effects of Construction Dewatering on Wetlands

Dewatering during construction will be conducted so as to minimize potential impacts to adjacent wetlands. For the foundation of each nuclear island, the underlying bedrock will be sealed by drilling and pressure grouting and the area will be excavated. Reinforced diaphragm walls will be installed around each nuclear island perimeter so that only the interior of the

excavation will require dewatering. This technique creates a “bathtub” effect. The reinforced diaphragm walls will prevent significant drawdowns from occurring in the surficial aquifer system outside of the excavation area. Thus, the reinforced diaphragm walls will prevent the construction dewatering from impacting wetlands outside the footprint of the nuclear islands. Pumped water will be discharged to an infiltration basin sized for the estimated flow rate. The groundwater drawdown inside and outside the nuclear island foundation design was simulated during dewatering pumping from inside the diaphragm wall. The model included nine observation wells, two wells on each of the cardinal axis located 12.5 and 62.5 feet away from the diaphragm wall and one well at the center of the nuclear island. The change in head was modeled comparing predevelopment water levels to the dewatering water levels. The average change in water level resulting from dewatering in the wells located 12.5 feet outside of the diaphragm wall was 0.6 to 0.7 foot. The average change in water level resulting from dewatering in the wells located 62.5 feet outside of the diaphragm wall was 0.5 to 0.6 foot. The drawdown in groundwater levels is estimated to diminish rapidly with distance from the diaphragm wall and is not expected to cause wetland impacts in any of the nearby wetlands.

Construction-related dewatering activities will be evaluated and approved by the FDEP and the SWFWMD as part of the post-certification review period, following submittal of final construction designs. A construction dewatering plan will be provided to the SWFWMD for approval prior to dewatering. The plan will include details of the dewatering system, discharge quantities and location, a monitoring plan, and other details as appropriate to demonstrate that the plans meet the SWFWMD’s proposed Conditions of Certification and comply with all applicable Environmental Resource Permit construction dewatering requirements. Preliminary dewatering details are found in the *Preliminary Sitewide Dewatering Plan*, a copy of which is available in the Progress Energy-provided Reading Room.

Additional questions and clarifications were requested by the NRC on conference calls held in July and August with regard to PEF Supplemental Response to NRC RAI 2.4.1-3. Those questions are as follows:

6.a) The June 12 RAI response includes a discussion referring to groundwater modeling for the nuclear island construction dewatering. How long will construction dewatering occur for the nuclear islands? Provide groundwater isopleths derived from the modeling. Confirm that groundwater levels would be restored to pre-development conditions after the dewatering pumping ceases.

6.b) Would any other substantial dewatering occur during construction (e.g., for makeup/blowdown pipelines, etc.)? If so, describe the effect. Provide an analysis of the potential effect of any other dewatering on adjacent wetlands.

6.c) Pumped water from construction dewatering will be “discharged to an infiltration basin sized for the estimated flow rate.” Clarify whether this infiltration basin would become part of the stormwater retention ponds that would ultimately handle operational stormwater runoff, or would it be a new pond located at a new site.

These questions are addressed in the following documents.

- Design Calculation LNG-0000-XEC-001, Rev. 1, Design of Excavation Dewatering System (Revision 1), prepared by Paul C. Rizzo Associates, Inc. (posted in the Reading Room).

- Design Calculation LNG-0000-XDC-001, Rev. 2, Effect of Grouting on Groundwater Flow Regime (Revision 2), prepared by Paul C. Rizzo Associates, Inc. (posted in the Reading Room).

- LNP Final Safety Analysis Report (FSAR), Subsection 2.5.2.6.2 Construction Dewatering.

The dewatering impacts associated with the nuclear island foundations were simulated using a MODFLOW groundwater flow model in the referenced Design of Excavation Dewatering System Calculation. The model was used to simulate stages of excavation and resulting dewatering pumping rates on a simulated model of the groundwater system. It predicted several incremental pumping rates, each related to the stage and depth of excavation with the highest predicted long-term pumping rate of 67 gallons per minute (gpm) extending from day 80 to day 345 of projected dewatering. This rate does not include precipitation falling on the excavation, estimated to average 4.4 gpm over the duration of dewatering.

An additional model stress period was run (stress period 5) to evaluate the sensitivity of the model to differing hydraulic conductivities of the grouted floor or diaphragm wall of the excavation. The hydraulic conductivity was changed from the expected 1.0×10^{-4} to 1.0×10^{-3} centimeters per second (cm/sec) and the resulting dewatering flow rate changed from 67 gpm to 452 gpm.

Groundwater contour isopleths were provided in the referenced Effect of Grouting on Groundwater Flow Regime Calculation. A MODFLOW groundwater model was used to simulate impacts to groundwater flow from the construction of the nuclear island foundation. Groundwater isopleths are presented for both pre-grouting and post-grouting conditions, showing the impact of construction on the groundwater gradient and heads. Predicted changes in groundwater head before and after grouting was minimal, with only localized gradient changes around the foundation.

For construction design purposes, the total flow that must be accommodated with sumps and shallow wells was conservatively determined to be in the range of 1136 to 1893 liters per minute (Lpm) (300 to 500 gpm) at steady-state conditions during construction, based on the site hydraulic conductivity characteristics summarized in FSAR Table 2.5.4.6-201 and the hydrogeological conditions at the site, as described in FSAR Subsection 2.4.12. The groundwater pumping rate during excavation can be managed by six submersible pumps (each with 100 gpm capacity) installed in wells located around the inside perimeter of the diaphragm wall and pumps placed in sumps within the excavation.

When the excavation has reached its target depth, the surface of the competent bedrock and the diaphragm wall will be inspected and evaluated for leakage. In the event that significant leakage is observed (e.g., greater than 379 Lpm [100 gpm]), a second round of drilling and pressure grouting at specific locations will be implemented to seal areas where groundwater is seeping through the engineered barriers. During construction, a groundwater monitoring program will be implemented to monitor the head differential between the inside and the outside of the diaphragm wall, as well as the uplift pressure on the bottom of the excavation.

The estimated flow rates include the depletion of storage within the “bathtub,” leakage through the diaphragm wall and grouted bottom, and precipitation. If the six 100-gpm pumps are not capable of dewatering the excavation, additional drilling and grouting will be performed to reduce the wall/floor infiltration.

Dewatering of pipeline excavations will be performed in a segmented fashion, with dewatering discharged to basins located between the excavation activity and wetlands, thereby creating a groundwater mound that will serve to minimize the impact to the adjacent wetlands. These segmented excavations and subsequent pipeline installation and backfill will be relatively short

in duration. Due to the short duration, the shallow depth of the excavations, and the mitigative measures through recharge, no additional monitoring/action levels are necessary.

In deeper excavations, such as the turbine building and circulating water system between the turbine building and the cooling towers, a combination of sheeting, well-points, wells and grouting may be applied, to facilitate excavation. Water will be discharged to basins to recharge the wetlands and water levels outside of the excavations will be monitored adjacent to wetlands to ensure the dewatering impacts are minimized. Background water levels determined by the ongoing groundwater level monitoring program will be used to determine the impact of dewatering on the water levels at the wetlands. If any detrimental impact to water levels at the wetlands is determined, mitigative measures such as drilling and grouting, sheeting, or re-design of recharge basins will be implemented.

Operational Groundwater Withdrawal

The use of brackish water from the CFBC for cooling, instead of groundwater, drastically reduces the LNP's use of fresh water. Additionally, PEF worked closely with the SWFWMD in designing and modeling the wellfield to avoid and minimize potential impacts resulting from groundwater withdrawal. Based on revised modeling results, as discussed in the SWFWMD Staff Recommendations on Certification, the wellfield was relocated from the northeast portion of the site to higher transmissivity areas of the Floridan aquifer in the southern portion of the property. A figure depicting modeled groundwater drawdown isopleths resulting from operational water pumpage is included as Attachment 2.4.1-3E.

Drawdown of the water table resulting from wellfield pumpage has potential to adversely affect adjacent wetlands. As previously discussed, the location of the on-site wellfield and the pumpage schedule were changed to minimize potential impacts to wetlands. While a predicted 1-foot decline in water levels has been suggested as the drawdown level that will cause adverse impacts seasonally to semi-permanently flooded wetlands in Florida (Reference 2.4.1-3 01), it is possible that lower drawdown values may result in adverse changes to wetland composition and functions. The predicted surficial aquifer drawdown depicted in 338884-TMEM-074, Rev. 1, in the vicinity of the LNP wellfield is not expected to adversely impact wetlands, because the predicted drawdown is primarily limited to an area close to the well points and is below the threshold that is expected to cause any kind of impact in the types of wetland systems present on the site (Durbin, Site Certification Application Testimony, p.328-29, 2009). However, given the potential model variability associated with groundwater modeling, PEF has agreed as part of the proposed Conditions of the State of Florida Certification to monitor wetlands in areas potentially affected by groundwater withdrawals. Groundwater withdrawal cannot cause unacceptable adverse impacts to wetlands or other surface waters, in accordance with the SWFWMD review criteria for Water User Permits and SWFWMD proposed Conditions of the State of Florida Certification. The following SWFWMD performance standards apply to the review of potential impacts to wetlands:

- Wet season water levels shall not deviate from their normal range.
- Wetland hydroperiods shall not deviate from their normal range and duration to the extent that wetlands plant species composition and community zonation are adversely impacted.
- Wetland habitat functions, such as providing cover, breeding, and feeding areas for obligate and facultative wetland animals, shall be temporally and spatially maintained and not adversely impacted as a result of withdrawals.

- Habitat for threatened or endangered species shall not be altered to the extent that use by those species is impaired.

To confirm that water use associated with operations of the LNP does not cause adverse environmental impacts, PEF has agreed as part of the proposed Conditions of the State of Florida Certification to develop and implement an environmental monitoring plan (based on the SWFWMD Wetland Assessment Procedure) to evaluate the relative condition of surface waters and wetlands in areas potentially affected by groundwater withdrawals. Monitoring will continue for a minimum of 5 years after groundwater withdrawals reach 1.25 mgd on an annual average basis.

References

Reference RAI 2.4.1-3 01

Mortellaro, S., S. Krupa, L. Fink, and J. VanArman, "Literature Review on the Effects of Groundwater Drawdowns on Isolated Wetlands," Technical Publication 96-01, WRE #330, South Florida Water Management District, West Palm Beach, Florida, November 1995.

Associated LNP COL Application Revisions:

The following changes will be made to the LNP ER in a future revision:

1. In a future revision of the ER, Table 4.1-4 will be replaced with RAI Table 2.4.1-3-003.

2. In a future revision of the ER, Table 4.1-5 will be replaced with RAI Table 2.4.1-3-004 and RAI Table 2.4.1-3-005.

3. In ER Subsection 4.1.1.1.2, the following statement will be changed from:

   "As mentioned previously, the LNP site is approximately 1257 ha (3105 ac.) in size, with the primary location for the two reactors and ancillary power production support facilities comprising approximately 121 ha (300 ac.) near the center of the site."

   to:

   "As mentioned previously, the LNP site is approximately 1257 ha (3105 ac.) in size, with the primary location for the two reactors and ancillary power production support facilities near the center of the site."

4. In ER Subsection 4.1.1.1.2, the following statement will be changed from:

   "Construction activities within the LNP site boundary will change the existing use of 82.2 ha (203.2 ac.) of land, or 6.5 percent of the total LNP site, and 0.3 percent of the total vicinity area. The footprints of LNP 1, LNP 2, and cooling towers will change 14.8 ha (36.6 ac.) of land from primarily other agricultural lands (62.5 percent), forested wetlands (18.2 percent), and mixed forests (17.1 percent) to a transportation, communications, and utilities land use. Other on-site features include a 500-kV switchyard affecting 17.8 ha (44.0 ac.) of land. Upgrading site access roads will affect 11.7 ha (28.9 ac.) (Table 4.1-4 and Figure 4.1-1). The creation of the three stormwater ponds (A, B, and C) illustrated on Figure 2.1-2 will replace 36.2 ha (89.5 ac.) of land currently used for mixed forests (25.1 percent), wetlands (8.2 percent), and other agricultural lands (3.0 percent) (as illustrated on Figure 2.2-3)."

to:

"Construction activities within the LNP site boundary will change the existing use of 310.6 ha (627.0 ac.) of land, or 20 percent of the total LNP site, and 0.9 percent of the total vicinity area. The footprints of LNP 1, LNP 2, cooling towers, and miscellaneous structures will change 42.1 ha (105.0 ac.) of land from primarily other agricultural lands, forested wetlands, and mixed forests to a transportation, communications, and utilities land uses. Other on-site features include a 500-kV switchyard affecting 16.1 ha (40.8 ac.) of land. Upgrading site access roads will affect 11.6 ha (29.2 ac.) (Table 4.1-4 and Figure 4.1-1). The creation of the three stormwater ponds (A, B, and C) illustrated on Figure 2.1-2 will replace 36.6 ha (108.0 ac.) of land currently used for mixed forests, wetlands, and other agricultural lands (as illustrated on Figure 2.2-3)."

5. The first sentence of Subsection 4.2.1.1 of the ER will be changed from:

"Construction will be focused on a 121-ha (300-ac.) area where the plant will be located, but construction activities will not be limited to the site."

to:

"Construction will be focused on a 310-ha (627-ac.) area where the plant will be located, but construction activities will not be limited to the site."

6. In a future revision of the ER, Table 4.3-1 will be replaced with the table below (which is a summary of RAI Table 2.4.1-3-003):

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

FLUCCS Code	FLUCCS Description	Ac.	Percentage of total site area
260	260 - Other open lands (rural)	31.1	1%
410	410 - Upland coniferous forests	0.1	0%
440	440 - Tree Plantations	277.5	9%
617	Mixed Wetland Hardwoods	10.2	0%
621	Cypress	53.8	2%
629	Wet Planted Pine	134.9	4%
630	Wetland Forested Mixed	29.1	1%
641	Freshwater Marshes	12	0%
643	Wet Prairies	5	0%
646	Treeless Hydric Savannah	73.4	2%

7. In ER Subsection 4.3.1.1.2, the following sentence will be changed from:

"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."

to:

"Approximately 128 ha (318 ac.) of wetlands on-site will be permanently affected through construction (Table 4.3-1). Of these, approximately 54.2 ha (134.9 ac.) of wet planted pine, 294 ha. (73.4 ac.) of treeless hydric savannah, 21.4 ha. (53.8 ac.) of cypress, 11.6 ha. (29.1 ac.) of wetland forested mixed, 4.8 ha. (12 ac.) of freshwater marshes, 4.1 ha. (10.2 ac.) of mixed wetland hardwoods, and 2.0 ha. (5.0 ac.) of wet prairies will be permanently affected."

Attachments/Enclosures:

- Attachment 2.4.1-3A.pdf, Wetlands & Potential Areas of Disturbance on the Levy Nuclear Plant Site
- Attachment 2.4.1-3B.pdf, Segments Figure 1
- Attachment 2.4.1-3C.pdf, Uniform Mitigation Assessment Method
- Attachment 2.4.1-3D.pdf, Wetland Mitigation Plan for the Progress Energy Levy Nuclear Plant and Associated Transmission Lines
- Attachment 2.4.1-3E.pdf, Wetland Map with Simulated Incremental Drawdown Contours in Surficial Aquifer Revised Wellfield Layout

Listing of Files Included on CD Provided with NPD-NRC-2009-203

Filename	**Description**
001Attachment 2.4.1-3A.pdf	Wetlands & Potential Areas of Disturbance on the Levy Nuclear Plant Site
002Attachment 2.4.1-3B.pdf	Segments Figure 1
003Attachment 2.4.1-3C.pdf	Uniform Mitigation Assessment Method
004Attachment 2.4.1-3D.pdf	Wetland Mitigation Plan for the Progress Energy Levy Nuclear Plant and Associated Transmission Lines
005Attachment 2.4.1-3E.pdf	Wetland Map with Simulated Incremental Drawdown Contours in Surficial Aquifer Revised Wellfield Layout

LNP ER RAI 2.4.1-3 (L-0533) PREFLIGHT REPORT

This table serves as a pre-flight report for the LNP ER RAI 2.4.1-3 (L-0533) submittal in support of the LNP COLA. The following files where checked for items related to pre-flight/electronic submittal acceptance. The results of the review are shown below. For files that do not pass pre-flight, the reason for the error is provided, however all files within this submittal are deemed compliant with the NRC electronic submittal checklist as noted below. For files that do not pass pre-flight the text is word searchable and clarity/legibility is of high quality. Most of the files that do not pass pre-flight, either have photos embedded into the documents or have been rescanned and had OCR run.

		Acceptance Review			Preflight Review		
Item #	File Name	Word Searchable? (Y/N)	Fast Web View? (Y/N)	Fonts Embedded? (Y/N)	Preflight (Pass/Fail)	Failure Reason (<300 ppi or unembedded fonts)	Comments
Black and White							
1	001Attachment 2.4.1-3A.pdf	Y	Y	Y	PASS	N/A	N/A
2	002Attachment 2.4.1-3B.pdf	Y	Y	Y	FAIL	<300 PPI	LOGO <300 PPI
3	003Attachment 2.4.1-3C.pdf	Y	Y	Y	PASS	N/A	N/A
4	004Attachment 2.4.1-3D.pdf	Y	Y	Y	FAIL	<300 PPI	SOME LOGOS, MAPS, PHOTOGRAPHS, FIGURES <300 PPI
5	005Attachment 2.4.1-3E.pdf	Y	Y	Y	PASS	N/A	N/A

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