

**UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION**

**Before the Atomic Safety and Licensing Board**

In the Matter of	)		
	)	Docket Nos.	52-029-COL
Progress Energy Florida, Inc.	)		52-030-COL
	)		
(Combined License Application for	)		
Levy County Nuclear Plant, Units 1 and 2)	)	ASLBP No.	09-879-04-COL

**PROGRESS ENERGY FLORIDA, INC.'S REBUTTAL STATEMENT OF POSITION  
IN THE CONTESTED HEARING FOR CONTENTION 4A**

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## TABLE OF CONTENTS

TABLE OF AUTHORITIES .....	ii
TABLE OF SELECTED ACRONYMS .....	iv
I. INTRODUCTION .....	1
II. OVERVIEW OF PEF’S REBUTTAL .....	2
III. PEF’S REBUTTAL TESTIMONY .....	5
A. Dr. Paul C. Rizzo .....	6
B. Peter G. Hubbell .....	6
IV. REBUTTAL STATEMENT OF POSITION .....	7
A. An EIS Is Not Intended To Be A Research Document.....	7
B. The Intervenor’s Improperly Rely On Documents That Are Not In The Evidentiary Record.....	9
C. Intervenor’s Substantive Challenges To The FEIS Are Without Merit.....	10
1. The Groundwater Modeling Upon Which The FEIS Relies Is Properly Based On Groundwater Flows Through A Porous Medium.....	10
2. The FEIS’s Groundwater Modeling Was Reasonable.....	12
3. The FEIS Adequately Addresses And Correctly Characterizes Impacts From Changes In Hydroperiods Due To LNP Dewatering.....	15
4. The FEIS Adequately Addresses And Correctly Characterizes The Cumulative Impacts At Issue In Contention 4A.....	17
a. The FEIS Appropriately Addresses Cumulative Impacts Relating To The Tarmac Mine, The Knight Farm Sand Mine, The Adena Springs Ranch, And Recently-Authorized Groundwater Withdrawals In The SRWMD .....	18
b. The FEIS Adequately Analyzes And Appropriately Characterizes As SMALL, Impacts Of Groundwater Withdrawals On Saltwater Intrusion .....	19
c. The Contribution To Cumulative Impacts From Salt Deposition And/Or Wildfires Will Be Negligible .....	21
5. The FEIS Gives Appropriate Consideration To The State Of Florida’s Groundwater Permitting Process.....	24
6. The Impacts Of Climate Change On Sea Level Rise, Rainfall, And Temperature Are Too Speculative To Quantify Or Predict In A Scientifically Defensible Manner .....	27
7. The Intervenor’s Witnesses’ Claims Regarding Impacts From Passive Dewatering Are Without Merit.....	28
D. The Board Need Not Separately Determine Whether The FEIS Adequately Addressed Dr. Bacchus’s Comments On The DEIS.....	30
V. CONCLUSION .....	30

## TABLE OF AUTHORITIES

<u>Cases</u>	<u>Page</u>
<u>Citizens Against Burlington, Inc. v. Busey</u> , 938 F.2d 190 (D.C. Cir. 1991) .....	25
<u>Culpeper League for Env'tl. Prot. v. NRC</u> , 574 F.2d 633 (D.C. Cir. 1978).....	26
<u>Duke Energy Corp.</u> (McGuire Nuclear Station, Units 1 and 2), CLI-03-17, 58 NRC 419 (2003) .....	25
<u>Entergy Nuclear Generation Co.</u> (Pilgrim Nuclear Power Station), CLI-10-11, 71 NRC 287 (2010).....	7,8,12,15,28
<u>Entergy Nuclear Generation Co.</u> (Pilgrim Nuclear Power Station), CLI-10-22, 72 NRC 202 (2010) ....	7,12
<u>Hydro Resources, Inc.</u> (P.O. Box 15910 Rio Rancho, NM 87174), CLI-01-4, 53 NRC 31 (2001) .....	8
<u>Louisiana Energy Services, L.P.</u> (Claiborne Enrichment Center), CLI-98-3, 47 NRC 77 (1998).....	8
<u>Natural Res. Def. Council v. Hodel</u> , 865 F.2d 288 (D.C. Cir. 1988).....	8
<u>NextEra Energy Seabrook, LLC</u> (Seabrook Station, Unit 1), CLI-12-05, 75 NRC __ (Mar. 8, 2012) .....	7,12,14
<u>Nuclear Innovation North America LLC</u> (South Texas Project Units 3 and 4), LBP-11-07, 73 NRC __ (Feb. 28, 2011).....	8
<u>Progress Energy Florida, Inc.</u> (Levy County Nuclear Power Plant, Units 1 and 2), LBP-09-10, 70 NRC 51 (2009).....	17
<u>Progress Energy Florida, Inc.</u> (Levy County Nuclear Power Plant, Units 1 and 2), LBP-09-22, 70 NRC 640 (2009).....	1
<u>Public Service Co. of New Hampshire</u> (Seabrook Station, Units 1 and 2), CLI-77-8, 5 NRC 503 (1977).....	26
<u>Public Service Co. of New Hampshire</u> (Seabrook Station, Units 1 and 2), CLI-78-1, 7 NRC 1 (1978), <u>petition for review dismissed</u> , <u>Pub. Serv. Co. of N.H. v. NRC</u> , 582 F.2d 77, <u>cert. denied</u> , 439 U.S. 1046 (1978) .....	26
<u>Robertson v. Methow Valley Citizens Council</u> , 490 U.S. 332 (1989).....	25
<u>Town of Winthrop v. FAA</u> , 535 F.3d 1 (1st Cir. 2008) .....	8
<u>Virginia Electric &amp; Power Co.</u> (North Anna Nuclear Power Station, Units 1 and 2), LBP-75-70, 2 NRC 879 (1975), <u>aff'd</u> , ALAB-325, 3 NRC 404 (1976), <u>aff'd sub nom.</u> , <u>Culpeper League for Env'tl. Prot. v. NRC</u> , 574 F.2d 633 (D.C. Cir. 1978) .....	26

**Statutes & Regulations**

10 C.F.R. Part 51.....	1,7
10 C.F.R. § 2.1207 .....	9

## TABLE OF SELECTED ACRONYMS

<b><u>Acronym</u></b>	<b><u>Definition</u></b>
APT	Aquifer Performance Testing
CFBC	Cross Florida Barge Canal
C.F.R.	Code of Federal Regulations
COC	Conditions of Certification
COL	Combined License
DEIS	Draft Environmental Impact Statement
DWRM2	District Wide Regulation Model Version 2
EMP	Environmental Monitoring Plan
FEIS	Final Environmental Impact Statement
LNP	Levy Nuclear Plant
NEPA	National Environmental Policy Act
NRC	U.S. Nuclear Regulatory Commission
PCR	Paul C. Rizzo Associates, Inc.
PEF	Progress Energy Florida, Inc.
SRWMD	Suwannee River Water Management District
SWFWMD	Southwest Florida Water Management District
USACE	U.S. Army Corps of Engineers

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**PROGRESS ENERGY FLORIDA, INC.’s REBUTTAL STATEMENT OF POSITION IN  
THE CONTESTED HEARING FOR CONTENTION 4A**

**I. INTRODUCTION**

Pursuant to the Atomic Safety and Licensing Board’s (“Board”) Initial Scheduling Order of August 27, 2009,<sup>1</sup> as revised by the Board’s May 23, 2012 Memorandum and Order,<sup>2</sup> Progress Energy Florida, Inc. (“PEF”) hereby submits its Rebuttal Statement of Position (“Rebuttal Statement”) in the contested hearing regarding Contention 4A.

This contested hearing involves the question of whether the Final Environmental Impact Statement (“FEIS”) prepared by the NRC Staff for PEF’s proposed new nuclear plant in Levy County, Florida (the “LNP”) takes a “hard look” at the “reasonably foreseeable” environmental impacts at issue in Contention 4A, as required under the NRC’s regulations at 10 C.F.R. Part 51 and the National Environmental Policy Act (“NEPA”). The initial statements and expert testimony submitted by PEF and the NRC Staff show that the FEIS satisfies those requirements. Nothing in the Intervenor’s direct case demonstrates otherwise.

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<sup>1</sup> Progress Energy Florida, Inc. (Levy County Nuclear Power Plant, Units 1 and 2), LBP-09-22, 70 NRC 640 (2009).

<sup>2</sup> Licensing Board Memorandum and Order (Ruling on Motions for Extension of Time and Motion to Change the Trigger Date for the Evidentiary Hearing) (May 23, 2012) (unpublished).

## **II. OVERVIEW OF PEF'S REBUTTAL**

The Intervenor's direct case relies on the testimony of four witnesses: Mr. Gareth Davies (INT001R), Dr. Tim Hazlett (INT101R), Mr. David Still (INT201R), and Dr. Sydney Bacchus (INT301R). As set forth below, that testimony is easily rebutted. Nothing in the Intervenor's case shows that the FEIS failed to adequately analyze and appropriately characterize the environmental issues raised by Contention 4A.

In general, Mr. Davies testifies that the presence of karst in the vicinity of the LNP site has created preferential conduits for groundwater that should have been taken into consideration in the groundwater modeling relied upon by the FEIS. As described in the rebuttal testimony of Dr. Paul Rizzo (PEF700) and Mr. Jeffrey Lehen (PEF218), Mr. Davies's claims are without merit. Mr. Davies's testimony is geographically misplaced because his discussion focuses on examples of karstic conditions in the Ocala Formation in Florida (and similar formations), rather than the Avon Park Formation that actually lies under the LNP site and the surrounding area. The dolomitic limestone (with a high percentage of magnesium) in the Avon Park Formation is not as susceptible to dissolution and karst formation as is the more pure limestone in the Ocala and other formations. In addition, detailed environmental and safety studies performed by PEF have shown that the Avon Park Formation does not have preferential groundwater conduits. Furthermore, Mr. Davies's recommendations – that thousands of additional borings be drilled to characterize the karst and conduits and that further mapping of the LNP site subsystem should be undertaken – are unrealistic, impractical, inconsistent with industry standards, and ask the NRC Staff to perform research projects that are not required under NEPA.

Even if Mr. Davies were accurate in his belief that there are preferential groundwater conduits at and in the vicinity of the LNP, that does not mean there would be LARGE environmental impacts from LNP dewatering. In fact, just the opposite would be true. As Mr. Lehen's rebuttal testimony (PEF218) shows, preferential groundwater conduits would result in more efficient groundwater flow through the aquifer in the relevant area than the groundwater flow relied upon in the FEIS's modeling. The more

efficient flow would result in even smaller environmental impacts to water resources than those identified in the FEIS. Accordingly, the groundwater modeling relied upon in the FEIS takes a more conservative approach than the approach recommended by the Intervenors.

Dr. Hazlett generally testifies that the groundwater modeling relied upon by PEF and the FEIS is inappropriate for evaluating the impacts on groundwater from LNP dewatering. He implicitly contends that an integrated groundwater/surface water model should have been used.<sup>3</sup> However, as set forth in the rebuttal testimony of Mr. James Rumbaugh (PEF104) and Mr. Lehnert (PEF218), the groundwater modeling relied upon by PEF and the FEIS has been utilized routinely by Florida water management districts, including the Southwest Florida Water Management District (“SWFWMD”), for many years with reliable results. In addition, an integrated model does not exist for the area at issue in this proceeding. Developing such a model here would require the costly compilation and processing of a significant amount of site-specific data. That is unnecessary, given that the LNP will be withdrawing relatively small amounts of groundwater. Furthermore, NEPA does not require agencies to rely on emerging technologies or perform research projects; the chosen methodology must only be reasonable. There is no basis for concluding that it was unreasonable for the FEIS to rely on the type of groundwater modeling that the SWFWMD required in its review of the LNP’s water use permit application, and that the SWFWMD routinely uses when reviewing applications similar to the LNP’s.

Mr. Still’s testimony generally criticizes the SWFWMD’s process for water use permitting. He also criticizes the FEIS for relying on the Conditions of Certification (“COC”) accompanying the LNP’s State certification to ensure there will be no LARGE impacts to water resources from LNP dewatering. As explained in the rebuttal testimony of Mr. Peter Hubbell (PEF800) and of Dr. William Dunn

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<sup>3</sup> Dr. Hazlett’s testimony asserts that he is an expert in “integrated groundwater-surface water modeling”. INT101R at p. 1. Although Dr. Hazlett does not explicitly recommend the substitution of an integrated model for the District Wide Regulation Model, Version 2, upon which the FEIS relies, many of his criticisms of that model relate to the purported advantages of integrated groundwater models. Intervenors’ Initial Statement at page 9 asserts that the FEIS is inadequate due to, among other reasons, “the use of an inappropriate groundwater model.”



(PEF315), Mr. Still's criticisms are without merit. They are informed by Mr. Still's 18 years of experience working for the Suwannee River Water Management District ("SRWMD"), whose regulatory programs and tools for protecting water resources and the environment are outmoded in comparison to those in the SWFWMD and other more developed water management districts. The SWFWMD's process of environmental monitoring, aquifer testing and, if necessary, mitigation is thorough, detailed, and appropriately follows adaptive management strategies, which Mr. Still ignores. In addition, Commission precedent permits the NRC Staff to give substantial weight to the COC that the SWFWMD developed for the LNP and that were issued by the State of Florida's Siting Board.

Dr. Bacchus's testimony raises a host of issues relating to alleged environmental impacts from dewatering. She often relies for support on anecdotal evidence, newspaper articles, photographs, and publications that do not directly address her arguments, as well as conjecture, rather than scientific analysis. Her main argument asserts that the FEIS does not address the impacts to "natural hydroperiods" from LNP dewatering. However, as the rebuttal testimony of Dr. Dunn (PEF315) shows, the FEIS indeed examines "hydroperiods" (although it does not generally use that particular term), and properly concludes that the potential direct, indirect, and cumulative impacts from active dewatering to wetlands and aquatic ecosystems during construction and operation of the LNP would not be greater than SMALL to MODERATE.

Dr. Bacchus (and the Intervenor's other experts) claims that that the FEIS ignores various cumulative impacts, including impacts relating to groundwater users other than the LNP, and impacts from the potential intrusion of saltwater into the groundwater aquifer due to dewatering. Mr. Lehnen (PEF218) and Dr. Dunn (PEF315) explain that the FEIS adequately considered other groundwater users. Mr. Lehnen (PEF218), Mr. Hubbell (PEF800), and Dr. Mitchell Griffin (PEF016) demonstrate that saltwater intrusion would be at most SMALL, given that the water level elevations of the groundwater aquifer at the LNP and the LNP's wellfield are significantly higher than seawater and brackish surface water elevations in the vicinity.

In addition, Dr. Bacchus claims that the FEIS underestimates the environmental impacts, including cumulative impacts (such as those on Federally-listed species), which will result from passive dewatering, salt drift, and wildfires. The direct testimonies of Dr. Griffin (PEF001), Dr. Dunn (PEF300), Dr. Kevin Robertson (PEF400), Dr. George Howroyd (PEF500), and Dr. Don Blancher (PEF600) have previously shown why the FEIS satisfies NEPA with respect to those issues. Their rebuttal testimonies further explain why nothing raised by Dr. Bacchus's direct testimony changes the conclusion that such environmental impacts, including cumulative impacts, will be anything greater than SMALL (or in one case, SMALL to MODERATE). There will be no net passive dewatering; salt deposition will be minor and will be substantially diluted by rainfall and/or water bodies; and there is no basis for claiming that LNP dewatering will lead to wildfires resulting in increased nutrient concentrations in water resources. In addition, as Dr. Dunn (PEF315) testifies, the FEIS addresses in detail impacts on Federally-listed species, including their habitats.

Finally, several of the Intervenor's witnesses claim that the FEIS did not appropriately consider the impacts of climate change. The FEIS does discuss climate change. However, as the FEIS and Dr. Howroyd's rebuttal explain, the impacts of climate change on matters such as sea level rise, rainfall, and temperature are too speculative and scientifically uncertain to play a prominent role in the FEIS's analysis of reasonably foreseeable impacts on water resources due to LNP dewatering and salt drift.

### **III. PEF'S REBUTTAL TESTIMONY**

PEF's Rebuttal Statement is supported by the pre-filed rebuttal testimony and associated exhibits of the following expert witnesses that PEF identified in its June 26, 2012 Initial Statement of Position: Dr. Mitchell Griffin (PEF016 through PEF024); James Rumbaugh (PEF104 through PEF105); Jeffrey Lehen (PEF218 through PEF228); Dr. William Dunn (PEF315 through PEF316); Dr. Kevin Robertson (PEF404 through PEF411); Dr. George Howroyd (PEF506 through PEF508); and Dr. Eldon Blancher (PEF608 through PEF611).

This Rebuttal Statement is also supported by the rebuttal testimony of the following additional experts:

**A. Dr. Paul C. Rizzo**

- Dr. Rizzo rebuts the Intervenor's testimony asserting that groundwater at the LNP flows through preferential conduits due to the presence of karst.
- Dr. Rizzo is the founder of Paul C. Rizzo Associates, Inc. ("PCR"), located in Pittsburgh, Pennsylvania. PCR is a 300-person international engineering firm that works extensively in the global nuclear energy sector. Dr. Rizzo holds a B.S., an M.S., and a Ph.D, all in civil engineering from Carnegie Institute of Technology. He is a registered Professional Engineer in 36 States, including Florida. Dr. Rizzo has worked extensively on siting issues for nuclear power plants around the world, including in Florida. Dr. Rizzo and his team assessed the geologic and geotechnical conditions of the LNP site to develop a plan for designing and constructing the LNP's foundations. He is the principal investigator and Engineer-of-Record for the structural foundation at the LNP site.
- Dr. Rizzo's testimony is set forth in Exhibit No. PEF700, and he sponsors Exhibit Nos. PEF701 through PEF705.

**B. Peter G. Hubbell**

- Mr. Hubbell rebuts the Intervenor's testimony challenging the SWFWMD's processes for water use permitting and the protection of water resources.
- Mr. Hubbell is a co-founder, Principal, and Senior Hydrologist for Water Resources Associates, Inc., an environmental engineering firm located in Tampa, Florida. Mr. Hubbell holds a B.S. in Hydrology and Water Resource Management from the University of Maryland. Mr. Hubbell has spent most of his career addressing State, regional, and local water resource issues in Florida. Among his other positions, from 1988 to 1997, Mr. Hubbell was the Executive Director of the SWFWMD. Mr. Hubbell has worked with PEF to assist with developing PEF's Environmental Monitoring Plan ("EMP") (PEF305), Aquifer Performance Testing ("APT") Plan (PEF304), and strategies for adaptive management in connection with the LNP's proposed wellfield.
- Mr. Hubbell's testimony is set forth in Exhibit No. PEF800, and he sponsors Exhibit Nos. PEF801 through PEF804.

#### IV. REBUTTAL STATEMENT OF POSITION

##### A. An EIS Is Not Intended To Be A Research Document

PEF's Initial Statement describes the applicable legal standards for determining whether the FEIS satisfies the NRC's regulations in Part 51 and NEPA. PEF Initial Statement at pp. 10-13. Each party in its initial statement acknowledged that NEPA requires the NRC to take a "hard look" at the "reasonably foreseeable" environmental impacts of a proposed action. The dispute in this contested hearing is whether the FEIS satisfies that requirement with respect to Contention 4A.

As explained throughout this Rebuttal Statement, many of the Intervenor's' challenges to the FEIS demand that the NRC Staff perform additional research and studies. For example, Intervenor's suggest that as many as 1000 test borings *per acre* may need to be drilled to adequately analyze karst and conduit flow through the LNP site. INT001R at pp. 14-15. They claim that the area studied by the FEIS should have been expanded beyond 20 miles from the LNP. Intervenor's' Initial Statement at p. 10. They also claim that the impacts on "hydroperiods" were not sufficiently studied (*id.* at p. 11), and that climate change should have played a greater role in the FEIS's assessment of environmental impacts (*id.* at pp. 12-13). Intervenor's implicitly argue that "integrated" surface water/groundwater modeling should have been performed. *Id.* at p. 10. They state that many permutations of cumulative impacts should have been analyzed. *Id.* at pp. 11-12. All of these claims are individually shown in this Rebuttal Statement to be inaccurate or invalid criticisms of the FEIS. As a general matter, however, these claims also improperly ask the Board to require the NRC to undertake additional studies, and to accumulate data, far in excess of what is necessary or required under NEPA.

It is well-established that an EIS is not intended to be a research document. NextEra Energy Seabrook, LLC (Seabrook Station, Unit 1), CLI-12-05, 75 NRC \_\_ (slip op. at 52) (Mar. 8, 2012); Entergy Nuclear Generation Company (Pilgrim Nuclear Power Station), CLI-10-11, 71 NRC 287, 315 (2010); Entergy Nuclear Generation Company (Pilgrim Nuclear Power Station), CLI-10-22, 72 NRC 202, 208 (2010). The Commission in Pilgrim, for example, found that the appropriate NEPA inquiry is not

whether there are alternative models that could have been used, or whether refinements could be made to an analysis, but whether the agency's chosen methodology is reasonable. CLI-10-11, 71 NRC at 315-316.<sup>4</sup>

Indeed, “while there ‘will always be more data that could be gathered,’” agencies complying with NEPA must have some discretion to “‘draw the line’” on the amount of information that must be collected. Pilgrim, CLI-10-11, 71 NRC at 315, citing Town of Winthrop, 535 F.3d at 11. The NEPA process involves an almost endless series of judgment calls, such that it is always possible to explore a subject more deeply or discuss it more thoroughly. Hydro Resources, Inc. (P.O. Box 15910 Rio Rancho, NM 87174), CLI-01-4, 53 NRC 31, 60 (2001). As a result, NEPA gives agencies broad discretion to keep their environmental impact inquiries within appropriate and manageable bounds. Louisiana Energy Services, L.P. (Claiborne Enrichment Center), CLI-98-3, 47 NRC 77, 103 (1998).<sup>5</sup> NEPA “‘should be construed in the light of reason if it is not to demand’ virtually infinite study and resources.” Pilgrim, CLI-10-11, 71 NRC at 315, citing Natural Res. Def. Council v. Hodel, 865 F.2d 288, 294 (D.C. Cir. 1988).

As demonstrated below, and in the testimony and Initial Statements previously submitted by PEF and the NRC Staff, the FEIS's accumulation of data and chosen methodologies for evaluating the

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<sup>4</sup> See also Nuclear Innovation North America LLC (South Texas Project Units 3 and 4), LBP-11-07, 73 NRC \_\_ (slip op. at 9) (Feb. 28, 2011) (NEPA permits agencies “to select their own methodology as long as that methodology is reasonable”) (footnote omitted); Town of Winthrop v. FAA, 535 F.3d 1, 11-13 (1st Cir. 2008) (“[a]gencies are entitled to select their own methodology as long as that methodology is reasonable. The reviewing court must give deference” to that decision).

<sup>5</sup> In their Initial Statement, the Intervenor cite to Claiborne as an example where an EIS had “not sufficiently” analyzed certain environmental impacts. Intervenor’s Initial Statement at pp. 4-5. In Claiborne, however, the Commission held that the FEIS was not sufficient because it: (i) gave no consideration to the effect on pedestrian traffic of the proposed action, which included closing a road that was of special significance to the affected community; (ii) included only a cursory statement with absolutely no explanation or analysis of the potential impact on property values; and (iii) gave no consideration to whether actions could be taken to mitigate the expected impacts of closing the road or on property values. Claiborne, CLI-98-3, 47 NRC at 107-110. That is far different from the circumstances here, where the FEIS has studied the issues in great detail and the Intervenor are suggesting that additional research or analysis be performed.

environmental impacts at issue in Contention 4A were reasonable and consistent with accepted industry practice. The FEIS “draws the line” between sufficient information gathering and preparing a “research document” at an appropriate place. Nothing in the Intervenor’s direct case demonstrates otherwise.

**B. The Intervenor’s Improperly Rely On Documents That Are Not In The Evidentiary Record**

The Intervenor’s pre-filed testimony in this proceeding often relies on documents that the Intervenor has not identified as exhibits to be placed in the evidentiary record. For example, on pages 4 through 6 of Mr. Davies’s testimony, he cites to the following articles: “Shade, 2002”; “Davies (2008)”; “Worthington et al. (2000)”; “Quinlan et al. (1996)”; “(Davies and Quinlan, 1993)”; and “McDonald et al, (1998)”, all of which are not identified as exhibits to be placed in the evidentiary record. INT001R at pp. 4-6. Indeed, this occurs in many other instances throughout Mr. Davies’s testimony. Mr. Still’s testimony cites to “(Krause, P.E. and Robert B. Randolph, 1989 p. D-6)” (INT201R at p. 17), which also was not proffered as evidence. Consistent with its February 22, 2012 Order (Providing Instructions on Pre-Filed Evidentiary Material) in this proceeding, the Board should not consider any such publications or documents.

In the February 22nd Order, the Board expressly stated that its decision on the merits of the admitted contention ““must be based solely upon the information in the record or facts officially noticed.”” Feb. 22, 2012 Order, slip op. at 1, quoting 10 C.F.R. § 2.1207 (emphasis added). The Board added that it “will base its decision on evidence (written testimony and exhibits) that is proffered and admitted.” Id. at 2. The February 22nd Order expressly states that documents the parties have disclosed and exchanged with each other during discovery “are not in the evidentiary record of this adjudication.” Id. (emphasis in original). The Board made it clear that, if the Intervenor “want[ ] the Board to base its decision on a particular . . . document, then it must submit such . . . document as proffered evidence” when it makes its pre-evidentiary hearing filings. Id. The Board could not have been more direct. As a

result, the Board should disregard all documents cited by the Intervenors that have not been proffered as evidence. PEF's rebuttal will not respond to those documents.

### **C. Intervenors' Substantive Challenges To The FEIS Are Without Merit**

The Intervenors claim that the FEIS is inadequate because it is inappropriately based on the following "key assumptions":

- (a) the assumption that the geologic medium through which groundwater flows is evenly porous, (b) the use of an inappropriate groundwater model, (c) reliance on outdated data regarding drought and rainfall, and (d) averaging of data regarding the hydroperiods, or seasonal fluctuation in water levels, on which the plants and animals in the LNP wetlands depend.

Intervenors' Initial Statement at p. 9. The Intervenors also claim that the FEIS failed to adequately address certain "cumulative impacts" of LNP dewatering, and the impacts of "climate change." Id. at pp. 11-13. The Intervenors add that the NRC Staff's conclusions in the FEIS inappropriately relied on the State of Florida regulatory process to ensure less than LARGE impacts, and that the FEIS failed to adequately address the Intervenors' expert's comments on the Draft Environmental Impact Statement ("DEIS") for the LNP. Id. at pp. 13-14. As set forth below, the FEIS does not suffer from any of these alleged shortcomings.

#### **1. The Groundwater Modeling Upon Which The FEIS Relies Is Properly Based On Groundwater Flows Through A Porous Medium**

A significant portion of the Intervenors' direct case is tied to their claim that the presence of karst and conduits underlying the LNP site and the surrounding area calls into question the groundwater modeling relied upon in the FEIS to assess the impacts of LNP dewatering. According to the Intervenors, the FEIS improperly assumes that "groundwater flows through a porous medium and does not adequately recognize that most of the flow in this area goes through preferential path-ways." Id. at p. 9.

The Intervenors are incorrect when they claim that most of the groundwater flow at the LNP is through preferential pathways. That claim stems from Mr. Davies's apparent confusion of dolomitic

limestone in the Avon Park Formation with the more pure limestone in the Ocala Formation. The LNP site and surrounding area is underlain by the Avon Park Formation. PEF700 at pp. 6-7; PEF703 at pp. 2.5-93 to 2.5-97; PEF704. The Avon Park Formation is a highly dolomitized carbonate rock formation that is resistant to the type of dissolution that creates new karst phenomena such as the preferential conduits that Mr. Davies describes.<sup>6</sup> PEF700 at pp. 8-9; PEF703 at RAI Response No. 02.05.01-1; PEF218 at pp. 5-6; NRCTEST at pp. 124-125. The Ocala Formation in Florida – which does not have the same highly dolomitized rock as Avon Park – has developed the type of preferential conduits cited by Mr. Davies. PEF700 at p. 8; PEF218 at pp. 5-6. However, the Ocala Formation does not underlie the LNP site and the surrounding area. PEF700 at pp. 6-7. In addition, detailed study of the LNP site for both environmental and safety purposes has shown there is no evidence of significant flow along preferential conduits. Id. at pp. 8-10. It is simply incorrect to compare the LNP site located on the Avon Park Formation (where preferential conduits of the sort described by Mr. Davies are not expected and were not found after a comprehensive safety and environmental investigation) with sites located on the Ocala Formation (which is susceptible to such conduits). PEF700 at pp. 7-8. Accordingly, contrary to the Intervenor's claims, the groundwater modeling relied upon by PEF and the NRC Staff is properly based on groundwater flow through a porous medium. PEF218 at pp. 5-6; PEF700 at pp. 9-10.

Moreover, even if the geologic formation underlying the LNP site did not support using porous media assumptions for groundwater modeling, the Intervenor's incorrectly identify the consequences. PEF218 at pp. 5-6. The presence of preferential conduits improves hydraulic conductivity and transmissivity. Id. Accordingly, preferential conduits of the type described by Mr. Davies would actually *diminish* the magnitude of drawdowns and the size of the drawdown area, rather than increase them as Mr. Davies contends. Id. The FEIS's reliance on porous media assumptions in the groundwater modeling is actually a more conservative approach than the one Mr. Davies recommends. Id.

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<sup>6</sup> Dolomitized limestone has a smaller lattice structure than non-dolomitized limestone due to the size of the magnesium and calcite molecules. This smaller lattice reduces the volume of voids within the structure, which will reduce the amount of secondary porosity and fracturing within the rock. PEF703 at RAI Response No. 02.05.04-1.



Mr. Davies also criticizes the number of geotechnical borings (118) PEF used to characterize subsurface conditions at the LNP site in the location of the two nuclear islands. In doing so, he cites to a paper (that was not submitted as an exhibit) suggesting that “1,000 3-cm drill holes per acre (404 per hectare) [would] have a 90% probability of intersecting a 1-meter solid elliptical object”. INT001R at p. 14. He concludes that the 118 borings drilled at the site “is less than the optimum number needed for an accurate analysis ....” Id. at p. 15. Similarly, Mr. Still claims the FEIS is “deficient because it fails to map the conduit system.” INT201R at p. 6.

The number, spacing, diameter, type and depth of the test borings drilled at the LNP site are consistent with, and even exceed, the requirements set forth in NRC regulatory guides and general industry practice. PEF700 at pp. 10-12. Dr. Rizzo’s testimony describes in detail the extent of geologic investigation that was performed in addition to the test borings. PEF700 at pp. 10-11. Drilling the large number of borings suggested by Mr. Davies would have been impractical and unrealistic, as well as inconsistent with industry standards. Id. at p. 10. Nor was it necessary under NEPA. As explained above, an FEIS is not a research document. Seabrook, CLI-12-05, 75 NRC \_\_ (slip op. at 52).; Pilgrim, CLI-10-11, 71 NRC at 315; Pilgrim, CLI-10-22, 72 NRC at 208. There is no basis for the Board to conclude that the methodology employed by PEF, and relied upon by the NRC Staff to evaluate the characteristics of the LNP site for both its safety review and in preparing the FEIS, was unreasonable.

## **2. The FEIS’s Groundwater Modeling Was Reasonable**

The Intervenor also take issue with the type of groundwater modeling that the FEIS (and PEF) relied upon to predict the impacts of LNP dewatering. According to the Intervenor, the groundwater modeling supporting the FEIS has certain “shortcomings” that render it unsuitable to predict how wetlands will be affected by LNP dewatering. Intervenor’s Initial Statement at p. 10. They state that the modeling “is a steady state media model<sup>7</sup> that makes no attempt to predict the interaction of freshwater in

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<sup>7</sup> It is incorrect to characterize the groundwater modeling relied upon by the FEIS as “steady-state”. PEF218 at p. 18.

the [Floridan aquifer system] with saline water from the Gulf.” Id. Dr. Hazlett implies that an integrated surface water/groundwater model should have been used. INT101R at pp. 2, 5-8.

The type of groundwater modeling that informed the analysis in the FEIS (based upon the District Wide Regulation Model, Version 2 (“DRWM2”)) has been used in the water permitting process by all Florida water districts (including the SWFWMD) for many years, and has produced reliable results. PEF104 at pp. 2-4; PEF218 at pp. 17-18. Indeed, the three water districts closest to the LNP (Suwannee River Water Management District, St. Johns River Water Management District, and SWFWMD) all generally use models similar to the DWRM2 in connection with their water permitting activities, rather than an integrated model. PEF104 at pp. 4-6.<sup>8</sup>

Contrary to the Intervenor’s claims that the groundwater modeling used was “steady-state”, the FEIS relies on groundwater modeling run in “transient” mode. Groundwater modeling was initially run in steady-state mode to simulate conditions before any development in the vicinity of the LNP site (no groundwater withdrawals modeled), and again to simulate current conditions before the commencement of LNP groundwater withdrawals (existing permitted withdrawals modeled).<sup>9</sup> PEF218 at p. 18. Subsequently, groundwater modeling was run in transient mode to obtain predictions regarding the effects on groundwater resources from active groundwater withdrawals by the LNP and other permitted users. Id.

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<sup>8</sup> In addition, Dr. Hazlett’s various specific criticisms of the modeling relied upon by PEF and by the NRC Staff in preparing the FEIS are unavailing. That modeling was designed for localized use, relied on adequate data sets, properly used averaged values for hydraulic properties, and was appropriate for the hydrogeologic characteristics of the LNP site. PEF104 at pp. 6, 8-12.

<sup>9</sup> Mr. Still criticizes the withdrawal rates for existing permitted use in the groundwater modeling as being based on obsolete data. INT201R at pp. 14-17. However, CH2M HILL’s recent review of the SWFWMD Water Management Information System database indicates that the aggregate withdrawal rate of all permitted users within the 400 square mile model domain remains a small fraction of the estimated flow of groundwater through the Upper Floridan Aquifer near the LNP site. PEF218 at pp. 19-20.

There also was no need to use a model domain larger than 400 square miles, as Intervenor request. If the model were too small, drawdown would have been observed at the boundaries of the model domain, or the drawdown curves would have resembled the shape of the model boundary. PEF218 at pp. 18-19. The groundwater modeling described in the FEIS had neither of these characteristics. The cone of depression around the 1.58 million gallon per day average pumping from the LNP wells in that modeling is significantly smaller than the 400 square mile model domain. PEF104 at pp. 12-13; PEF218 at pp. 18-19. In addition, the drawdown curves obtained from that modeling do not resemble the shape of the model boundaries. PEF218 at pp. 18-19.

Furthermore, an integrated surface water/groundwater model does not currently exist for the area at issue in this proceeding. Expanding the scope of the existing groundwater model to account for the relationship between ground and surface water would risk adding increased uncertainty to the modeling process. Id. at pp. 17-18. It also would be extremely expensive to compile and process the significant amount of site-specific data that would be needed. Id. Such data may not even be available over the long period of time that is necessary to perform proper integrated modeling. Id. In addition, using a surface water/groundwater model would not have been appropriate, given the small amount of groundwater that will be withdrawn by the LNP relative to the flow through the aquifer.<sup>10</sup> PEF104 at pp. 4-6.

Perhaps most importantly, NEPA does not require that the integrated surface water/groundwater computer modeling implicitly advocated by Dr. Hazlett be used here. As the Commission has held, “an environmental impact statement is not intended to be a ‘research document’, reflecting the frontiers of scientific methodology, studies, and data.” Seabrook, CLI-12-05, 75 NRC \_\_ (slip op. at 52-53); Pilgrim,

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<sup>10</sup> Mr. Hubbell describes in his testimony an integrated surface water/groundwater model developed by Tampa Bay Water in collaboration with the SWFWMD for the Tampa Bay region. The withdrawals in that case are from large public supply wellfields and rivers in a conjunctive use water supply system. In addition, the Tampa Bay region is characterized as having consistent to “leaky” confinement between the surficial and Upper Floridan aquifers. Unlike the Tampa Bay region, there is not a conjunctive water supply to integrate at the region including the LNP site, and there is effectively no confinement between the surficial and Upper Floridan aquifer to model. The SWFWMD does not view integrated modeling as practical or necessary for the LNP site. PEF800 at pp. 21-22.

CLI-10-11, 71 NRC at 315. Under Commission precedent, the NRC's chosen groundwater modeling need not reflect emerging methodologies; it need only be reasonable. Pilgrim, CLI-10-11, 71 NRC at 315. There is no basis for claiming it is unreasonable for the NRC Staff to rely upon the same type of groundwater modeling that the SWFWMD developed, prefers, and used to evaluate the LNP's water use application,<sup>11</sup> and that water management districts in Florida have utilized routinely for years in circumstances similar to the LNP's.

### **3. The FEIS Adequately Addresses And Correctly Characterizes Impacts From Changes In Hydroperiods Due To LNP Dewatering**

The Intervenor also argue that the FEIS oversimplifies the hydroecological conditions of the site, and fails to analyze the role that "hydroperiods" play in the ecological health of the region. Intervenor's Initial Statement at p. 11. See, e.g., INT301R at pp. 5, 9, 14-17. These claims are without merit. PEF315 at pp. 2-7.

Dr. Bacchus provides the following explanation of what is meant by "hydroperiod": "Ecological systems such as wetlands depend on natural fluctuations of the water table – the surficial aquifer – to maintain their essential functions. These fluctuations of the water table are known as the 'hydroperiod.' Three important aspects of a wetland hydroperiod are: (1) the depth or stage of fluctuating ground and surface water; (2) the duration of the water level at a given depth or stage; and (3) the periodicity or seasonality of the water level fluctuations." INT301R at p. 12. Dr. Bacchus asserts that "[d]isruption of any one of these three aspects can lead to the degradation and ultimate destruction of the wetland and the biota it supports." Id. She fails, however, to provide a threshold for change for triggering an adverse impact; nor does she define what she means by "adverse impact" or how such an impact would occur.

Although the FEIS does not generally use the term "hydroperiods," as Dr. Dunn testifies in his rebuttal, consideration of impacts to hydroperiods is embedded in the FEIS, particularly through the

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<sup>11</sup> Although the LNP's authorization for water use from the SWFWMD is commonly referred to as a "water use permit" in this proceeding, the SWFWMD actually provided a recommendation of certification for water use under the Florida Electrical Power Plant Siting Act. PEF300 at p. 24.

FEIS's consideration of the dewatering analyses performed by the SWFWMD and the NRC Staff, and the requirements established by the COC (including the EMP). PEF315 at p. 7.

In analyzing impacts from groundwater withdrawals, the SWFWMD has moved away from the simplistic concept of hydroperiods to a more dynamic statistical hydrology approach. This approach acknowledges that wetlands and aquatic ecosystems are adapted to a range of natural inundation and dewatering conditions, and that both types of conditions are needed to maintain the structure, functions, and species assemblages of the wetlands and aquatic ecosystems. Id. at pp. 3-4. In comparison to the more static hydroperiod approach, this frequency-based statistics approach recognizes that: monitoring data is essential; links between hydrology and ecological health can be established; and protective criteria and/or thresholds can be developed to prevent adverse impacts from occurring. The 0.5 foot drawdown threshold of concern used by the SWFWMD in its water use permitting decisions (and cited by the NRC Staff) was derived from this approach, and is based on studies of wetlands and aquatic ecosystems with 6 to more than 30 years of hydrology monitoring data. Id. at pp. 5, 9-10. Similarly, the DWRM2 groundwater model that is the basis for the groundwater model that the SWFWMD used in permitting the LNP (and upon which the FEIS in part relied) is the product of a transient calibration against monthly data, including recharge from precipitation, taken from over 1,000 monitoring points over an eight-year time period (1995-2002). Id. at pp. 4-5. Additionally, in order to have issued the LNP's recommendation of certification, the SWFWMD was required to determine that its regulatory performance standards for wetlands had been met. Id. at p. 5. Those standards specifically address hydroperiods. Id.

The requirements of the COC also apply this frequency-based statistics approach. The APT Plan and the EMP that PEF must implement will confirm the results of the groundwater modeling relied upon by the SWFWMD and the NRC Staff. Those monitoring activities will ensure that there will be no unacceptable adverse impacts to wetlands and aquatic ecosystems at and in the vicinity of the LNP site. Id. at pp. 5-7. The EMP will specifically monitor the effects of groundwater withdrawal on wetland hydroperiods and the resulting impacts to wetlands and aquatic ecosystems. Monitoring under the EMP

will be timely to detect and prevent harm to wetlands, since change in the hydrologic regime of a wetland sufficient in magnitude to induce long-term harm will be detectable well before the wetland actually exhibits the indicators of harm or is subject to loss of structures, species, or functions. If unacceptable adverse impacts due to hydroperiod alterations are predicted to occur by the required monitoring, PEF must either mitigate the adverse impact or implement an alternative water supply. Id. at p. 7.

The FEIS specifically and extensively considered the potential direct, indirect, and cumulative impacts from active dewatering to wetlands and aquatic ecosystems during construction and operation of the LNP, relying on the SWFWMD analysis as well as the NRC's own independent review. NRC001 at pp. 4-31 to 4-35, 5-26 to 5-31, 7-20 to 7-34. The NRC Staff's direct testimony provides additional clarification of their efforts to assess the possible effects of active dewatering on wetlands. NRCTEST at pp. 88-99. Consideration of impacts to hydroperiods are embedded within the dewatering review of the FEIS. PEF315 at p. 7. The NRC Staff reasonably concluded that the impacts from dewatering to wetlands and aquatic ecosystems during construction and operation of the LNP would be, at most, SMALL to MODERATE. Id. at p. 3.

#### **4. The FEIS Adequately Addresses And Correctly Characterizes The Cumulative Impacts At Issue In Contention 4A**

The Intervenor argues that the FEIS fails to adequately address various "cumulative impacts" of LNP dewatering. Intervenor's Initial Statement at pp. 11-12. According to the Intervenor, such impacts include those associated with quarrying in the vicinity of the LNP;<sup>12</sup> groundwater withdrawals by the Tarmac Mine, the Knight Farm Sand Mine, the Adena Springs Ranch, and recently-authorized users in the SRWMD; the potential for saline intrusion to inland freshwater supplies; salt drift from the LNP's cooling towers; and the release of nutrients from wildfires allegedly caused by dewatering. Id. As set

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<sup>12</sup> Dr. Rizzo's testimony shows that the foundation design for the LNP reactors will not adversely affect the groundwater flow, and there will be no blasting or development of quarries at the LNP site. PEF700 at pp. 14-15. Issues regarding impacts relating to offsite mining were not admitted in this proceeding. Progress Energy Florida, Inc. (Levy County Nuclear Power Plant, Units 1 and 2), LBP-09-10, 70 NRC 51, 103-04 (2009).

forth below, the FEIS adequately addresses and appropriately characterizes the reasonably foreseeable cumulative impacts relating to issues raised by Contention 4A.

**a. The FEIS Appropriately Addresses Cumulative Impacts Relating To The Tarmac Mine, The Knight Farm Sand Mine, The Adena Springs Ranch, And Recently-Authorized Groundwater Withdrawals In The SRWMD**

Contrary to the Intervenor's claims, the FEIS considers cumulative impacts of groundwater withdrawals, including those from the Tarmac Mine, and found such impacts to be SMALL. PEF218 at pp. 10-12; NRC001 at pp. 7-13 to 7-15. The FEIS, however, need not have evaluated impacts associated with the Adena Springs Ranch for a variety of reasons, including that the amount of withdrawals from the ranch are still a matter of conjecture, the ranch is nearly 40 miles north-east of the LNP site, and groundwater modeling shows that the drawdown curves associated with the LNP's permitted withdrawal and the Adena Springs Ranch's projected withdrawal do not overlap. PEF218 at pp. 10-13. It also was not necessary for the FEIS to evaluate cumulative impacts relating to the Knight Farm Sand Mine, because there are no groundwater withdrawals planned for that mine. Id. at pp. 10-14. Dr. Dunn's rebuttal testimony confirms that (1) the FEIS adequately studied cumulative impacts relating to LNP dewatering and the Tarmac Mine, and (2) there was no reason for the FEIS to study cumulative impacts relating to groundwater withdrawals from the Adena Springs Ranch and the Knight Farm Sand Mine because such impacts are not reasonably foreseeable. PEF315 at pp. 14-15. Furthermore, cumulative impacts associated with groundwater withdrawals will be captured by the testing and monitoring requirements of the APT Plan and the EMP. Id. at p. 16.

In addition, contrary to Mr. Still's claim (INT201R at p. 16), the FEIS need not have considered the cumulative impacts associated with recently-authorized groundwater withdrawals in the SRWMD. Those withdrawals were authorized too recently to have been incorporated into the groundwater modeling or reviewed in preparing the FEIS. PEF218 at pp. 13-15. They also are too distant from the LNP site and wellfield to contribute to the cumulative environmental impacts at issue in this proceeding. Id.

**b. The FEIS Adequately Analyzes And Appropriately Characterizes As SMALL, Impacts Of Groundwater Withdrawals On Saltwater Intrusion**

In its discussion of cumulative impacts, the Intervenor's Initial Statement makes various claims regarding how LNP dewatering will result in saltwater intrusion into fresh groundwater. Intervenor's Initial Statement at p. 11. Intervenor witnesses Mr. Still and Dr. Bacchus contend that groundwater withdrawals associated with the LNP will result in saltwater intrusion into the Floridan aquifer and that such impacts were not adequately addressed in the FEIS. INT301R at pp. 18-23; INT201R at pp. 3, 4, 8, 9, 18. Those claims are without merit.

It is simply incorrect for Mr. Still (INT201R at pp. 8-9) and Dr. Bacchus (INT301R at pp. 57-61) to claim evidence shows that the LNP site and the surrounding area are currently experiencing saltwater intrusion. PEF218 at pp. 3-4, 24; PEF016 at pp. 12-13; PEF800 at pp. 20-21. Those witnesses cite to concerns regarding saltwater intrusion in drinking water in small communities that are generally distant (some more than 30 miles) from the LNP, and that are close to the Gulf of Mexico. Unlike at the LNP, available freshwater in the ground at those low-lying communities is thin, and there is a small gradient between the groundwater aquifers (freshwater) and the saline or brackish water body. PEF218 at pp. 3-4; PEF016 at pp. 12-13. Potential saltwater intrusion impacts from the LNP have been extensively analyzed by the State of Florida, the U.S. Army Corps of Engineers ("USACE") and the NRC Staff; the FEIS properly concludes that potential groundwater quality impacts from the LNP due to such intrusion would be SMALL. PEF016 at p. 13. Citing to anecdotal evidence from small coastal communities does not call into question the FEIS's determination.

Dr. Bacchus (INT301R at pp. 58-59, 64) and Dr. Hazlett (INT101R at pp. 9-10) testify that sea level rises resulting from climate change combined with LNP dewatering will result in saltwater intrusion into groundwater aquifers. The relatively high water level elevation of the LNP site and wellfield, however, ensure that the LNP's small predicted groundwater drawdowns will not reverse the gradient between seawater and groundwater in the vicinity of the LNP. PEF218 at pp. 22-23. Although the effects



of climate change on sea level are at best uncertain,<sup>13</sup> LNP withdrawals will not reverse the gradient between saltwater and the groundwater aquifers in even the conservative scenarios (predicting a sea level increase of 3 feet over the next century) identified by the NRC. Id. Consequently, the risk of saltwater intrusion below ground into freshwater aquifers as a result of the LNP's withdrawals is SMALL. Id.; NRC001 at pp. 4-27, 5-16. For similar reasons, the LNP will not pull saltwater upgradient into the freshwater aquifers through preferential conduits as alleged by Dr. Bacchus (INT301R at p. 11). PEF218 at pp. 24-25. In fact, as explained earlier, the presence of preferential conduits (if there were any) would make it even less likely that LNP withdrawals would introduce saltwater into the freshwater aquifer, since the presence of such flowpaths would reduce the size of the drawdown area.

Finally, Intervenor's argue that the FEIS ignores or downplays significant contributors to the cumulative impacts from the effect of water withdrawals from the CFBC on salinity levels in Withlacoochee Bay. Intervenor's Initial Statement at p. 12; INT301R at p. 5. However, the FEIS addresses the withdrawal of cooling water from the CFBC, as acknowledged by Dr. Bacchus. The FEIS finds that the salinity in the CFBC could increase, causing "minor" changes in shoreline vegetation. NRC001 at p. 5-33; INT301R at p. 20. Dr. Bacchus expresses "concern about the effects of increased salinity on coastal estuaries and the plants and animals that live there." INT301R at p. 22. She does not support her concern with any data or other evidence of a LARGE impact.

The impacts of the LNP's withdrawal of cooling water from the Cross Florida Barge Canal ("CFBC") are not part of Contention 4A. In any event, Dr. Griffin describes the data on salinity in the CFBC that was collected at the direction of PEF (as well as other data from an 11-year study conducted by the University of Florida and the Florida Department of Environmental Protection), which were made available to both the NRC and Florida Fish and Wildlife Conservation Commission. PEF016 at p. 14; PEF021; PEF022. Dr. Griffin analyzes the data to rebut the various salinity concerns of Dr. Bacchus about both cooling water withdrawal from the CFBC and groundwater withdrawal during operation.

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<sup>13</sup> Issues relating to climate change are addressed in a separate discussion below.

PEF016 at pp. 14-17. These salinity impacts are discussed extensively in the FEIS. NRC001 at pp. 5-10 to 5-16, 5-48, and 5-55).

When operational, the LNP's withdrawal of cooling water will draw more water from the Gulf of Mexico into the CFBC and the brackish water will get saltier. The FEIS analyzed the increase in the salinity of the CFBC and the Withlacoochee Bay and its potential impacts on estuarine resources, and found "the impact on water quality of the CFBC due to operation of the LNP intake is expected to be minimal." NRC001 at p. 5-12; see also id. at pp. 2-93 through 2-101; 4-79; 5-23; 5-33; 7-34. The salinity profile in the remnant Withlacoochee River will increase at the interface of the river and canal somewhat as a result of removing water from the CFBC, but the large freshwater spring near the dam (a discharge of about 70 cubic feet per second) will keep the remnant river water fresh below the dam. The NRC Staff has reviewed these data and determined the amount of the withdrawals to be relatively small and the potential impacts to both surface water and groundwater to be SMALL. PEF016 at pp. 15-17; NRC001 at p. 5-16.

**c. The Contribution To Cumulative Impacts From Salt Deposition  
And/Or Wildfires Will Be Negligible**

The Intervenor claim that the FEIS should have examined the cumulative effects of dewatering combined with deposition of salt from the LNP's cooling towers and "destructive" wildfires. Intervenor's Initial Statement at 12. However, since the impacts of salt drift will be minor at most, and there is no basis for claiming there will be an increase in destructive wildfires leading to additional nutrient concentrations as alleged in Contention 4A, the contribution to cumulative impacts from salt drift and/or wildfires would be negligible.

As the direct and rebuttal testimony of Dr. Howroyd and Dr. Blancher conclude, the NRC Staff performed a careful, detailed, and scientific salt drift analysis, and the FEIS correctly found that the impacts of salt drift on fauna, flora, and water at the LNP will be minor and limited to the LNP site.

PEF600 at pp. 4, 11; PEF506 at p. 8; PEF608 at p. 6; NRC001 at pp. 5-19 through 5-26. Nothing in the Intervenor's direct testimony weakens that conclusion.

Although Dr. Bacchus attempts to argue that the salt dispersion modeling performed by the NRC was inadequate (INT301R at pp. 41-47), her claims are without merit. Dr. Bacchus is confused regarding the source of the meteorological data that were used in the modeling. PEF506 at pp. 3-4. She also argues that naturally-present salt should have been considered in the salt drift modeling (INT301R at p. 43), but she fails to recognize that the amount of airborne salt 15 kilometers from the Gulf of Mexico is so minor it need not have been considered. PEF506 at p. 6; PEF608 at p. 2; NRCTEST at p. 157. Dr. Bacchus's arguments also fail to recognize that the salt drift modeling performed by the NRC Staff and PEF rely on a widely-accepted dispersion model (the American Meteorological Society/Environmental Protection Agency Regulatory Model), and that the NRC Staff's analysis is based, in part, on the results of actual cooling tower salt drift studies as set forth in NRC NUREGs 1555 and 1437. PEF506 at pp. 4-7; NRC001 at pp. 5-20 through 5-23.

Dr. Bacchus's challenges to the FEIS's analysis regarding the potential impacts of salt drift also fall short. Her challenges are based on speculation rather than science. For example, Dr. Bacchus does not account for the fact that salt deposits from the LNP cooling tower will be substantially diluted by rainfall and/or by the water into which the salt is directly deposited. PEF608 at pp. 2-4, 6; NRC001 at pp. 5-22, 5-24. She also overlooks the fact that the thresholds used by the FEIS to determine salt drift impacts are based on dry salt deposits and various types of plants. NRC001 at pp. 5-20 through 5-22; PEF608 at p. 3; PEF506 at p. 5. In addition, contrary to Dr. Bacchus's testimony, the NRC Staff considered the impact of drought conditions on salt drift. NRC001 at p. 5-24; NRCTEST at pp. 159-160; PEF608 at pp. 3-4; see also PEF600 at pp. 6-10.

To support her claims, Dr. Bacchus does not rely on LNP site-specific data, such as predicted rates of salt deposition and salt concentrations. Rather, she cites to anecdotal examples and photos where

plants were damaged due to salt deposited by seawater (or other undetermined causes), and certainly not due to cooling tower drift. PEF608 at pp. 4-5, 8. Any comparison to seawater is inapposite. Seawater has salt concentrations of up to 35 parts per thousand. NRCTEST at p. 160; PEF608 at p. 5. That concentration is orders of magnitude greater than projected salinity concentrations resulting from LNP cooling tower salt deposition based on various LNP-specific conservative scenarios as set forth in the FEIS (NRC001 at p. 5-24), the direct testimony of PEF's expert Dr. Blancher (PEF600 at p. 7), and the direct testimony of the NRC Staff (NRCTEST at pp. 159-160). PEF608 at p. 5.

Dr. Bacchus also argues that salt drift will contribute to a wide array of cumulative impacts. Contrary to Dr. Bacchus's assertions, however, given the low amount of projected salt deposition, as well as its dilution by rain and/or water bodies, the contribution of salt drift to any "cumulative impacts" relating to LNP dewatering will be negligible. Id. at pp. 6-8; PEF315 at pp. 17-19.

Dr. Bacchus's testimony regarding wildfires also fails to demonstrate that the FEIS is inadequate. Her argument that eutrophication would increase due to aerial deposition of "particulate nitrogen" associated with wildfires caused by LNP dewatering (INT301R at p. 38) is without support and easily debunked by the relevant scientific literature. PEF404 at pp. 1-2. Her testimony lacks any empirical data to support her claim that dewatering by the LNP will result in increased, destructive wildfires. Id. at pp. 2-3. She cites to examples of wildfires that are sufficiently explained by drought, not manmade dewatering. Id. Her testimony makes generalizations regarding potential impacts of dewatering on wildfires, without specifically taking into account the limited amount of drawdown projected to occur at the LNP site or the LNP's site-specific soil characteristics. Id. In addition, Dr. Bacchus underestimates the value of controlled burns and rapid fire response in managing wildfires that may occur. Id. at pp. 3-4. Because there is no basis for claiming that wildfires due to LNP dewatering will result in the spread of increased nutrients (PEF400 at p. 12), there is no need to evaluate the contribution of wildfires to cumulative impacts. PEF315 at pp. 19-20.

## **5. The FEIS Gives Appropriate Consideration To The State Of Florida's Groundwater Permitting Process**

The Intervenor argue that the FEIS improperly relies on a “groundwater monitoring plan” and a “‘dewatering’ plan,” which the Intervenor claim are “to be reviewed by the State of Florida and approved in ‘Conditions of Certification’ after the COL is issued.” Intervenor’s Initial Statement at p. 13. Intervenor state that, by relying on the COC, the NRC Staff has put off environmental issues into the future, and has improperly “assign[ed] to a state agency its own independent responsibility under NEPA for evaluating environmental impacts.” Id. at pp. 3, 14.

As an initial matter, the Intervenor are simply wrong when they state that the groundwater monitoring plan and the dewatering plan – which PEF assumes are references to the PEF’s EMP (PEF304) and APT Plan (PEF305) – are future plans that the NRC has not reviewed. In fact, PEF has fully developed the EMP and the APT Plan in conjunction with the SWFWMD, the USACE, and the NRC. Those plans are awaiting USACE approval. PEF300 at pp. 27-30. Thus, the NRC Staff has reviewed the plans and is very familiar with their contents.

While the Alternative Water Supply Plan has not yet been developed, the COC require that such a plan be submitted within 3 years of completion of the site aquifer testing, if testing were to indicate that an alternative water supply were necessary. PEF005 at p. 44. Mr. Still claims this requirement is unreasonable. INT201R at pp. 9-10. However, contrary to Mr. Still’s implication, the requirement is consistent with Florida law, which does not prescribe when water management districts are to mandate that such a plan be developed. PEF800 at p. 16. In addition, the SWFWMD considered alternative water supply as part of its water use permitting process for the LNP. Id. at pp. 13-15. In evaluating the LNP’s potential dewatering impacts, it was reasonable for the FEIS to rely in part on the State regulatory

requirement that PEF must develop an Alternative Water Supply Plan, if necessary. Indeed, the FEIS considered alternative water supply options for the LNP.<sup>14</sup> See NRC001 at pp. 9-249 through 9-251.

Moreover, NEPA does not mandate that mitigation measures be in place. The United States Supreme Court has found that an EIS is not rendered deficient even when a mitigation plan considered by an EIS is merely conceptual and is not fully formulated or adopted. Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 339, 352 (1989) (holding that the Forest Service need not wait to act until after State and local government entities decide what mitigating measures they might consider necessary). The United States Court of Appeals for the District of Columbia Circuit has similarly held that: “NEPA not only does not require agencies to discuss any particular mitigation plans that they might put in place, it does not require agencies – or third parties – to effect any.” Citizens Against Burlington, Inc. v. Busey, 938 F.2d 190, 206 (D.C. Cir. 1991). In addition, according to the NRC, “the Supreme Court has made clear that the underlying statute, NEPA, demands no ‘fully developed plan’ or ‘detailed explanation of specific measures which *will* be employed, to mitigate adverse environmental effects.’” Duke Energy Corp. (McGuire Nuclear Station, Units 1 and 2), CLI-03-17, 58 NRC 419, 431 (2003) (emphasis in original) (footnote omitted). Accordingly, the extent to which PEF’s State-required mitigation plans have been developed is not a relevant inquiry under NEPA.

Intervenors also claim that the NRC Staff has improperly assigned to a State agency its independent responsibility under NEPA to evaluate the environmental impacts at issue. PEF’s Initial Statement fully addresses that issue. PEF Initial Statement at pp. 34-37. As PEF describes there, the NRC performed its own, independent, in-depth analysis of the environmental impacts at issue in Contention 4A, which took into account – but did not rely exclusively – on the plans required under the

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<sup>14</sup> Mr. Still’s criticisms regarding alternatives to the LNP production wells are devoid of facts and analysis. For example, Mr. Still states: “One excellent source of alternative supply could be the waste water flows from nearby communities.” INT201R at p. 7. Mr. Hubbell evaluates the average daily flows from all nearby waste water treatment facilities and reports that the cumulative flow would be inadequate and the majority of the waste water is committed to other beneficial reuse. PEF800 at pp. 14-15.

COC. In any event, Commission precedent makes it clear that, when conducting environmental reviews, the NRC is entitled to give “substantial weight” to environmental studies and analyses prepared by competent State authorities. Public Service Co. of New Hampshire (Seabrook Station, Units 1 and 2), CLI-77-8, 5 NRC 503, 527 (1977); Virginia Electric & Power Co. (North Anna Nuclear Power Station, Units 1 and 2), LBP-75-70, 2 NRC 879, 890 (1975), aff’d ALAB-325, 3 NRC 404 (1976), aff’d sub nom., Culpeper League for Env’tl. Prot. v. NRC, 574 F.2d 633 (D.C. Cir. 1978).<sup>15</sup> The Staff did not violate NEPA by considering in its environmental impact analysis the testing, monitoring and mitigation plans that PEF is required to implement by the State of Florida.

The testimony of Intervenor’s witness David Still calls into question the process set up by the SWFWMD for water use permitting, monitoring and mitigation.<sup>16</sup> He characterizes the SWFWMD’s requirements as “flawed State processes.” INT201R at pp. 2-3, 10-19. Mr. Still’s opinions may be influenced by the approach to water use permitting at the SRWMD, where he most recently served as Executive Director and where the application for a water use permit is a three-page document. PEF800 at pp. 12-13. In contrast, Mr. Hubbell, former Executive Director at SWFWMD, describes the SWFWMD process for issuing a water use permit as a “very deliberate, consistent and comprehensive approach to water allocation and water resource and environmental protection.” Id. at p. 10. Indeed, the SWFWMD’s water allocation strategies and regulatory system is recognized and acclaimed within the State of Florida and nationally for its effectiveness. Id. at p. 9.

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<sup>15</sup> See also Public Service Co. of New Hampshire (Seabrook Station, Units 1 and 2), CLI-78-1, 7 NRC 1, 26 (1978) (giving substantial weight to determinations of aquatic impacts made by the EPA), petition for review dismissed, Pub. Serv. Co. of N.H. v. NRC, 582 F.2d 77 (1st Cir. 1978), cert. denied, 439 U.S. 1046 (1978).

<sup>16</sup> PEF notes that, until recently, Mr. Still worked for the SRWMD in Florida for 18 years. Unlike the SWFWMD, which has spent the last 30 years developing and refining its nationally-recognized water allocation strategies and regulatory schemes, the SRWMD’s regulatory programs remain outmoded and ineffective. PEF800 at p. 10.

**6. The Impacts Of Climate Change On Sea Level Rise, Rainfall, And Temperature Are Too Speculative To Quantify Or Predict In A Scientifically Defensible Manner**

The Intervenor also challenge the FEIS to the extent that it relies on annual precipitation of 53 inches in the area of the LNP. INT201R at p. 3-4; INT301R at p. 29. The Intervenor claim that historical rainfall averages should not be used, because “there are indications that drought conditions are becoming more common.” Intervenor’s Initial Statement at p. 10. They claim that relying on 53 inches of rainfall does not reflect current conditions or “recent climate trends.” Id. The Intervenor also argue that the FEIS inadequately considered the effects of climate change, including its effects on increases in sea levels. Id. at pp. 12-13; INT301R at p. 58; INT001R at pp. 19-20; INT101R at p. 9.

As an initial matter, Dr. Bacchus is wrong when she claims in her testimony that the FEIS contains “no analysis of the impacts of climate change on ANY aspect of the LNP.” INT301R at p. 58. The FEIS discusses climate change and its potential impacts in numerous places. PEF506 at pp. 9-10; see, e.g., NRC001 at pp. 2-181, 7-12 through 7-15, 7-18 through 7-20, 7-22 through 7-23, 7-26 through 7-28, 7-34, 7-42 through 7-47. The FEIS acknowledges that current projections indicate there could be some increase in average temperature, a decrease in precipitation, and sea level changes in the vicinity of the LNP. The FEIS does not, nor could it, quantify the magnitude of such potential changes with any reliability or accuracy. PEF506 at pp. 10-11.

The impacts of climate change are too speculative to quantify in a scientifically-supportable manner. Id. at pp. 9-11. As Dr. Howroyd testifies, “the ability to predict what those changes or their impacts will be with any accuracy is not feasible with current scientific tools and theories.” Id. at p. 9. Even if one were to accept that changes in averages of some meteorological parameters – such as temperature and precipitation – are occurring over time, the amount of any such change is difficult if not impossible to reliably predict. Id. at pp. 9-10. Given that data regarding climate change “cannot be reviewed on a site-specific basis with any degree of accuracy or reliability,” a more detailed discussion of the impact of such changes in the FEIS is not feasible. Id. at p. 10. Nor is such a discussion mandated



under NEPA. “NEPA does not require agencies to study phenomena for which there are not yet standard methods of measurement or analysis.” Pilgrim, CLI-10-11, 71 NRC at 315 (footnote omitted).

More specifically, Mr. Davies’s testimony cites to a projected sea level rise of 7 meters over the next 60,000 years. INT001R at p. 20. Since the projected life of the LNP is 60 years, a linear calculation of the estimated sea rise in Mr. Davies’s testimony would result in a sea level increase of only one-quarter of an inch over the life of the plant. PEF506 at p. 11. Relying on the one projection cited by the Intervenor, sea level rise would not be significant or relevant. Id. The larger point, however, is that any projection in sea level rise due to climate change based on data in existence today “is essentially conjecture that cannot be quantifiably substantiated by either science or fact.” Id.

The same point is true regarding projections of future rainfall at the LNP. Mr. Still and Dr. Bacchus claim that the FEIS should not have relied on annual rainfall of 53 inches when evaluating environmental impacts of dewatering and salt drift. INT201R at p. 4; INT301R at p. 29. Mr. Still in particular states that the 53 inches is no longer valid due to current rainfall trends. INT201R at pp. 3-4. However, as the testimony of Dr. Howroyd shows, the FEIS was reasonable in basing its projection of future rainfall on data covering an extensive period, from 1892 to 2009, rather than examining only recent information. PEF506 at pp. 12-13. Indeed, Mr. Still’s own data shows that, from 1915 through 2009, long term average annual rainfall in Levy County and the surrounding area has not substantially changed. Id.; PEF016 at pp. 2-3; PEF017. Accordingly, it is reasonable for the FEIS to rely on 53 inches of annual rainfall, since that is within the expected range of rainfall variation across the region for the LNP’s projected lifetime. PEF506 at p. 13. In addition, there is insufficient data to support Mr. Still’s suggestion that any recent trend showing decreasing rainfall is due to climate change. Id.

#### **7. The Intervenor’s Witnesses’ Claims Regarding Impacts From Passive Dewatering Are Without Merit**

Contention 4A states that the FEIS does not adequately address, and inappropriately characterizes as SMALL, impacts from “passive dewatering.” As set forth in PEF’s Initial Statement, “passive

dewatering” is not a term normally used by water resource engineers. PEF Initial Statement at p. 42. In fact, the term “passive dewatering” is not even mentioned in the Intervenor’s Initial Statement. Nevertheless, the direct testimonies of Dr. Bacchus and Mr. Still raise certain issues regarding stormwater management that relate to what is being called “passive dewatering” in this proceeding.

Dr. Bacchus criticizes the use of “average”<sup>17</sup> rainfall data to assess whether stormwater ponds to be constructed at the LNP will cause passive dewatering. She claims that “evaporative loss exceeds rainfall during the entire dry season of every year” and that “evaporative loss exceeds rainfall during droughts.” INT301R at pp. 29-30. However, as explained by Dr. Griffin’s rebuttal, it is not true that rainfall in dry months never exceeds evapotranspiration. PEF016 at pp. 4-5. Moreover, data make it clear that precipitation on the LNP stormwater ponds will offset evaporation for the majority of the year on average, and runoff from the LNP’s raised power block will provide additional stormwater volume for percolation into the aquifer. Id. The NRC Staff agrees that the stormwater ditches and stormwater ponds will be a source of recharge to the aquifer for most of the year and cannot reasonably be foreseen to cause net passive dewatering. Id. at p. 5.

Dr. Bacchus makes various arguments relating to stormwater management that are inaccurate or unsupported. Contrary to her testimony, the LNP stormwater ponds were designed to minimize impacts to wetlands, will provide water quality treatment for runoff, and will capture water to displace floodplain storage. PEF016 at p. 8.<sup>18</sup> Historic stormwater flow paths will only be disturbed on a small fraction of the 3,105 acre site where new facilities will be located, but that flow will be sent to ponds for capture,

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<sup>17</sup> The FEIS relies on mean, not average, rainfall data. NRC001 at p. 2-21.

<sup>18</sup> In addition, there is no basis for Dr. Bacchus’s claims that stormwater retention ponds will cause sinkholes at the LNP. INT301R at pp. 11-12, 18-20, 32-33. Her claims lack adequate evidentiary support, and the geological characteristics at the LNP inhibit the existence and creation of sinkholes. PEF016 at pp. 9-10; PEF700 at pp. 8-9, 15-17. Nor will the stormwater retention ponds cause sinkhole collapse, as Dr. Bacchus asserts. INT301R at p. 32; INT381. In fact, the water in the stormwater ponds will weigh less than the overburden soil that presently exists, and the effective vertical stress in the geologic materials directly beneath the ponds will be diminished compared to the stress that now exists. PEF700 at p. 16; PEF016 at p. 10.

treatment, and slow release. Id. Accordingly, the FEIS properly found that water use impacts will be SMALL, and in one case, SMALL to MODERATE. Id. In addition, the concerns raised by Mr. Still (INT201R at pp. 4-6) regarding stormwater management result from his misunderstanding of how stormwater will actually be managed at the LNP. PEF016 at pp. 6-7.

**D. The Board Need Not Separately Determine Whether The FEIS Adequately Addressed Dr. Bacchus's Comments On The DEIS**

Finally, the Intervenor's argue that the FEIS did not sufficiently respond to Dr. Bacchus's comments on the DEIS. Intervenor's Initial Statement at p. 14. To the extent that Dr. Bacchus's DEIS comments raised matters at issue in Contention 4A, this contested hearing will determine whether the FEIS has adequately addressed her concerns. To the extent that her comments raise other issues, the Intervenor's claim that the FEIS does not sufficiently consider those matters is outside the scope of this hearing. Accordingly, there is no need for a separate determination regarding whether the FEIS sufficiently addressed Dr. Bacchus's comments on the DEIS.

**V. CONCLUSION**

For the foregoing reasons, nothing in the Intervenor's case demonstrates that the FEIS fails to satisfy the Commission's regulations and NEPA with respect to the allegations raised by Contention 4A. Accordingly the Board should deny all of the Intervenor's claims in that Contention.

Respectfully Submitted,

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Dated: July 31, 2012

Counsel for Progress Energy Florida, Inc.

**UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION**

Before the Atomic Safety and Licensing Board

In the Matter of	)		
	)	Docket Nos.	52-029-COL
Progress Energy Florida, Inc.	)		52-030-COL
	)		
(Combined License Application for	)		
Levy County Nuclear Plant, Units 1 and 2)	)	ASLBP No.	09-879-04-COL

CERTIFICATE OF SERVICE

I hereby certify that the foregoing Progress Energy Florida, Inc.'s Rebuttal Statement Of Position In The Contested Hearing For Contention 4A, dated July 31, 2012, and all PEF Exhibits cited therein, were provided to the Electronic Information Exchange for service to those individuals on the service list in this proceeding this 31<sup>st</sup> day of July 2012.

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