May 20, 2019

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TWFN-7-A60M
ATTN: Program Management, Announcements and Editing Staff
U.S. Nuclear Regulatory Commission
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RE: **Comments of Natural Resources Defense Council, Friends of the Earth, and Miami Waterkeeper on the Draft Supplemental Environmental Impact Statement for Turkey Point Nuclear Generating Units Nos. 3 and 4 (NUREG–1437, Supplement 5, Second Renewal, draft) (Docket ID NRC-2018-0101).**

Dear Ms. Borges:

The Natural Resources Defense Council ("NRDC"), Friends of the Earth ("FOE"), and Miami Waterkeeper (together, "Commenters") submit these comments on the Nuclear Regulatory Commission's ("NRC") *Turkey Point Nuclear Generating Unit Nos. 3 and 4 Draft Supplemental Environmental Impact Statement; Draft Report for Comment* (hereinafter "Draft SEIS").[1] The Draft SEIS fails to meet the requirements of the National Environmental Policy Act ("NEPA") 42 U.S.C. § 4321 *et seq.* by presenting only portions of the necessary facts and analysis while disregarding vital information.

I. Background

As the NRC is aware, Commenters are currently admitted parties in this matter in a hearing before the Atomic Safety and Licensing Board (the "Board"). On August 1, 2018, and pursuant to 10 C.F.R. § 2.309 and the NRC's Federal Register notice published at 83 Fed. Reg. 19,304 (May 2, 2018), Commenters submitted a Petition to Intervene and Request for a Hearing in the Turkey Point subsequent license renewal proceeding. Commenters articulated five contentions in their Petition. These contentions address various deficiencies in the Environmental

[1] *See* Florida Power & Light Company; Turkey Point Nuclear Generating Unit Nos. 3 and 4, 84 Fed. Reg. 13,322 (Apr. 4, 2019).

Report submitted by Florida Power & Light ("Applicant") with its subsequent license renewal application. These deficiencies persist in the Draft SEIS.

Following briefing on the admissibility of each contention, the Board issued Memorandum and Order LBP-19-3 referring a single issue directly to the NRC as well as admitting two of Commenters' five contentions in part. On April 1, 2019, Applicant filed an appeal of LBP-19-3 and argued that the Board abused its discretion by admitting Commenters' two contentions. Commenters and NRC Staff opposed the appeal. The NRC has yet to decide either issue.

In the meantime, on April 4, 2019, NRC Staff issued the Draft SEIS for the Turkey Point Units Nos. 3 and 4 subsequent relicensing. Amended or new contentions on the Draft SEIS are due June 24, 2019. It is there that NRC regulations mandate the real substance of the Draft SEIS's deficiencies play out. Our comments today – and any comments submitted by parties not already admitted as an intervenor to the Board hearing – are therefore substantially less meaningful than they should be in almost any other NEPA context. Comments such as these and the associated agency response are not a pathway to judicial review of the agency's action and any NRC response, and subsequent judicial review, should that be necessary, will be subsumed by the agency's response to the admitted contentions. Thus, our filing today on the Draft SEIS in this comment period – dissimilar to many other federal agencies as there is no specific pathway *via this filing* to addressing deficiencies in the environmental review – can be brief. Therefore, we summarize some of the immediate deficiencies here and will more fully respond to specifics on the admitted contentions next month.[2]

II. Legal Standards

The Draft SEIS does not satisfy the NRC's basic duty under NEPA to take a "hard look" at the significant environmental impacts associated with a major federal action. NEPA's "hard look" standard is the heart of a federal agency's obligations. NEPA requires an agency to

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[2] Commenters incorporate by reference their Petition to Intervene and attachments, and their Reply. Commenters, *Request for Hearing and Petition to Intervene Submitted by [Commenters]*, (Aug. 1, 2018) (ML18213A418–ML18213A436); *Reply in Support of Request for Heaering and Petition to Intervene Submitted by [Commenters]* (Sep. 10, 2018) (ML18253A280). These comments should not be construed in the subsequent license renewal proceeding as a waiver of any issue not raised here.

consider the direct effects, indirect effects that are reasonably foreseeable, and cumulative effects of the proposed action.[3] Direct effects are caused by the action and occur at the same time and place, and indirect effects are caused by the action later in time or farther removed in distance but still reasonably foreseeable.[4] Cumulative impacts are impacts of the action *added to* other past, present, or reasonably foreseeable future actions.[5] In addition to consideration of these effects, NEPA requires the NRC to consider alternatives and mitigation to address adverse environmental impacts.

III. Summary of Comments

The Draft SEIS fails to take this requisite hard look because, while it provides pieces of information about the effects of the Turkey Point subsequent relicensing and general facts about the environment, the Draft SEIS fails to (1) analyze the environmental benefits of replacing the cooling canal system with cooling towers and (2) account for the effects of climate change.

A. Cooling Towers

The Draft SEIS fails to analyze the environmental benefit of installing cooling towers as an alternative to the current cooling canal system. Its analysis focuses almost entirely on the environmental impacts of constructing and operating cooling towers. It presents essentially no comparison of the benefits to endangered species or the environment of replacing the cooling canal system with cooling towers.[6] But replacing the cooling canals with cooling towers would mitigate serious environmental impacts on water sources and threatened and endangered species. Thus, the Draft SEIS completely ignores the point of considering cooling towers as an alternative, in effect treating the alternative of cooling towers as if it had no environmental benefits. The failure to address those benefits represents a failure to meet the NRC's obligations to consider reasonable alternatives under NEPA and its own regulations.

The Draft SEIS acknowledges, for example, that the existing cooling canal system is hydrologically connected to the Biscayne aquifer and surrounding waters and thus that it impacts

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[3] 40 C.F.R. § 1508.25.

[4] *Id*. § 1508.8.

[5] *Id*. § 1508.7.

[6] *See, e.g.,* Draft SEIS at 4.5.7, 4.7.7, and 4.8.

surrounding water sources.[7] It also considers some adverse impacts to protected species like the American crocodile.[8] But the Draft SEIS fails to provide an analysis of how constructing cooling towers would eliminate the negative impacts on the American crocodile and other species by eliminating the ammonia now leaking from the cooling canal system.[9]

Thus, the Draft SEIS fails to take a hard look at the impacts of the cooling canal system because it does not provide any analysis of the beneficial effects operating cooling towers would have on listed species and the aquatic environment.

B. Climate Change

The Draft SEIS also fails to take a hard-look at the impact of continuing to operate Turkey Point during a period marked by increasing severity of climate change impacts. The Draft SEIS recites a few general facts about climate change – which it attempts to discount – but fails to analyze how those facts relate to the action of subsequently relicensing Turkey Point. Dismissing it as beyond the scope, the Draft SEIS does not consider the substantial environmental impacts of the continuing operations of the Turkey Point reactors in the steadily changing climate of the licensing period. Rather, the Draft SEIS's discussion of climate change is a mere litany of generic facts without any analysis of how they relate to proposed subsequent relicensing of Turkey Point.

In reviewing climate change impacts on all alternatives, the Draft SEIS presents observed historical climate trends in the last century in south Florida and discusses and compares results of climate modeling scenarios with respect to rising sea levels, increasing temperatures, and severity of extreme weather events.[10] Throughout this litany of climate projections, the Draft SEIS attempts to cast doubt on the accuracy of the federal government's climate projections,

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[7] *See, e.g.*, *id.* at 4.5.1.1.

[8] See U.S. Nuclear Regulatory Commission, Biological Assessment for the Turkey 10 Point Nuclear Generating Unit Nos. 3 and 4 Proposed Subsequent License Renewal (Dec. 11, 2018) (ADAMS Accession No. ML18344A008).

[9] The Biological opinion does consider ammonia impacts on the manatee, but it does not explain why that is the only species considered. U.S. Nuclear Regulatory Commission, *Biological Assessment for the Turkey Point Nuclear Generating Unit Nos. 3 and 4 Proposed Subsequent License Renewal*, 59–61 (Dec. 11, 2018) (ML18344A008).

[10] Draft SEIS at 4.15.3.

inaccurately communicates the urgency with which these projections were reported, and dismisses the notion that new information about changing environmental conditions is available.[11] The most recent science, however, is clear and pointed.

For example, global mean sea level in the area around Turkey Point has risen over the past century and is projected to continue rising at an accelerated rate throughout this century and beyond. In every reasonably foreseeable climate change scenario, sea-level rise for south Florida, including around Turkey Point, will be faster than the average over the last century. Relative to the year 2000, there is at least a 90 percent probability that global mean sea level will rise by 0.3–0.6 feet by 2030 and 0.5–1.2 feet by 2050. By 2100, there is a 15 to 83 percent chance that average sea level will exceed 4 feet if today's rate of growth in emissions of greenhouse gases continues.[12] This sea-level rise will increase the frequency and degree of extreme flooding, which will exacerbate storm surges.[13] Thus, climate reports emphasize "the need to consider revising flood study techniques and standards that are *currently used* to design and build coastal infrastructure."[14]

Despite these alarming findings, the Draft SEIS asserts that the NRC may relicense the plant relying on a fifty-year old understanding of climate perturbation.[15] In a rapidly changing climate regime, the NRC cannot rely on "environmental conditions . . . considered when siting" Turkey Point fifty years ago that, as the Draft SEIS admits, no longer exist today, let alone during the proposed subsequent license renewal period ending in 2053. The NRC cannot meet its obligations under NEPA to take a "hard look" at the environmental consequences of its proposed

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[11] Draft SEIS at 4-108 to 4-111.

[12] Declaration of Dr. Robert Kopp (July 26, 2018) (ML18213A433) (referencing William V. Sweet et al., "*Sea Level Rise*," in CLIMATE SCIENCE SPECIAL REPORT: FOURTH NATIONAL CLIMATE ASSESSMENT, Vol. 1 333–363 (D.J. Wuebbles et al. eds., 2017)).

[13] *Id*.

[14] U.S. Global Change Research Program, CLIMATE SCIENCE SPECIAL REPORT: FOURTH NATIONAL CLIMATE ASSESSMENT (2018) (emphasis added).

[15] Draft SEIS at 4-110 ("The effects of climate change on Turkey Point Unit 3 and 4 structures, systems, and components are outside the scope of the NRC staff's license renewal environmental review [because] Site-specific environmental conditions are considered when siting nuclear power plants.").

further extension of the license using outdated assumptions of a stable climate made half a century ago, devoid of the most recent science.

In every instance, the Draft SEIS fails to adequately take into account foreseeable effects of climate change in analyzing the proposed action's environmental impacts. For example, in analyzing the cumulative impacts of climate change as related to the subsequent relicensing of Turkey Point, the Draft SEIS relies on a prior Environmental Impact Statement for the bulk of its cumulative impacts analysis for water resources.[16] However, that Environmental Impact Statement evaluates a proposed cooling tower system rather than the cooling canal system and thus would have distinctly different impacts on water resources. Even after acknowledging that "Climate change can impact groundwater availability and quality as a result of changes in temperature and precipitation, as well as due to sea level rise,"[17] the Draft SEIS fails to discuss how groundwater availability and quality will affect the environmental impact of the continued operation of Turkey Point Units 3 and 4. This is not the "hard look" and cumulative impact analysis NEPA requires.

Case in point is the Draft SEIS's analysis of FPL's "freshening" effort. FPL is required to lower the salinity of the cooling canal system by pumping low saline groundwater from subsurface aquifers to the cooling canal system. Several factors will affect this effort:

1. **Groundwater salinity** in the Upper Floridan aquifer. The more saline the extracted water, the less it can "freshen" the cooling canal system.[18]
2. **Air temperature**. Hotter air temperatures increase the rate of evaporation in the cooling canal system leading to higher salinity.
3. **Water temperature**. Hotter water temperatures increase evaporation in the cooling canal system leading to higher salinity.[19]

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[16] U.S. Nuclear Regulatory Commission, *Environmental Impact Statement for 23 Combined Licenses (COLs) for Turkey Point Nuclear Plant Units 6 and 7*, Final Repor*t, I-5* (Oct. 24, 2016) (ML16335A219).

[17] Draft SEIS at 4-117.

[18] Tetra Tech, "Evaluation of Required Floridan Water for Salinity Reduction in the Cooling Canal System" 3 (May 9, 2014) (ML14279A555).

[19] Draft SEIS at 3-46.

4. **Precipitation**. Less precipitation (i.e., freshwater recharge) will lead to higher levels of salinity.[20]
5. **Scarcity**. FPL could be required to reduce its use of groundwater or take other measures if the "freshening" efforts harms offsite groundwater users.[21]

Climate change will negatively impact each of these factors. Sea level rise will lead to additional saltwater intrusion, which has "significant implications" for Miami-Dade County and others. "Increased salinity levels in groundwater supplies would increasingly require public and private groundwater users to invest in treatment technologies (e.g., desalination), to relocate supply wells and supporting infrastructure, to seek out and develop new water supply sources, or to pursue a combination of approaches to manage degraded groundwater quality."[22] Air temperatures will rise by 1.9–2.4 °C across the southeast by mid-century according to recent modeling.[23] Drought will become more frequent in the southeast due to extended periods without precipitation.[24] And water will become scarcer as demand increases. "Water demand across South Florida is projected to increase by more than 50 percent by 2060, relative to 2005, based on combined changes in population, socioeconomic conditions, and climate. For most of Florida, this increase in demand is forecast even without assuming climate change. Regardless, climate change, mainly due to increases in temperature and evapotranspiration, would decrease water availability and further drive demand."[25]

The Draft SEIS fails to account for these changes in its evaluation of impacts on water resources or its cumulative impacts analysis. None of the models referenced in the Draft SEIS address these factors despite all indications showing FPL will need more fresh water to address rising salinity at the same time regional demand is increasing. That the Draft SEIS ignores these

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[20] Draft SEIS at 3-46.

[21] *Id*. at 4-32.

[22] *Id*. at 4-118.

[23] *Id*. at 4-107 to 4-108.

[24] Carter, et. al, "*Southeast*" in FOURTH NATIONAL CLIMATE ASSESSMENT, VOL. II 775 (Reidmiller, D.R., et. al. eds., 2018).

[25] Draft SEIS at 4-117.

issues is particularly troubling given FPL's freshening efforts have not delivered the expected results and FPL is optimistic that freshening will work under "more favorable climatic conditions (e.g., less severe dry seasons) . . . ."[26]

The Draft SEIS also did not adequately address the reasonably foreseeable impacts on surface water resources of operating Units 3 & 4 for another 20 years in conjunction with foreseeable sea level rise. The NRC Staff claim there is no need to analyze cumulative impacts because the proposed action "is unlikely to have any incremental impacts" on surface water.[27] But the Draft SEIS points to no analysis of potential impacts on surface water; rather, it assumes that there will be no surface water impacts because FPL's permit prohibits discharges to the surface water and because of requirements imposed by FDEP and DERM to mitigate the hypersaline plume.[28] These regulatory requirements alone, however, will not prevent surface water discharges when the cooling canal system is overtopped by reasonably foreseeable flooding.

FPL's own studies demonstrate surface water discharges from the cooling canal system are foreseeable. Figure 4-37 below is a representative cross section of the Turkey Point plant.[29] Below that (Figure 4-35) is a bird's-eye view of the cross section. FPL's consultant prepared these figures in connection with an NRC-mandated "Flooding Hazard Reevaluation Report" following the Fukushima disaster. The studies show, and NRC Staff confirm, that flood water levels could reach up to 19.1 ft NAVD88[30]—well above the 16 ft NAVD88 height of the breakwater barrier east of the power block shown in Figure 4-37 that separates Biscayne Bay from the cooling canal.[31] Notably, this modeling effort only accounted for sea level rise through

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[26] *Id.* at 3-49.

[27] *Id*. at 4-111.

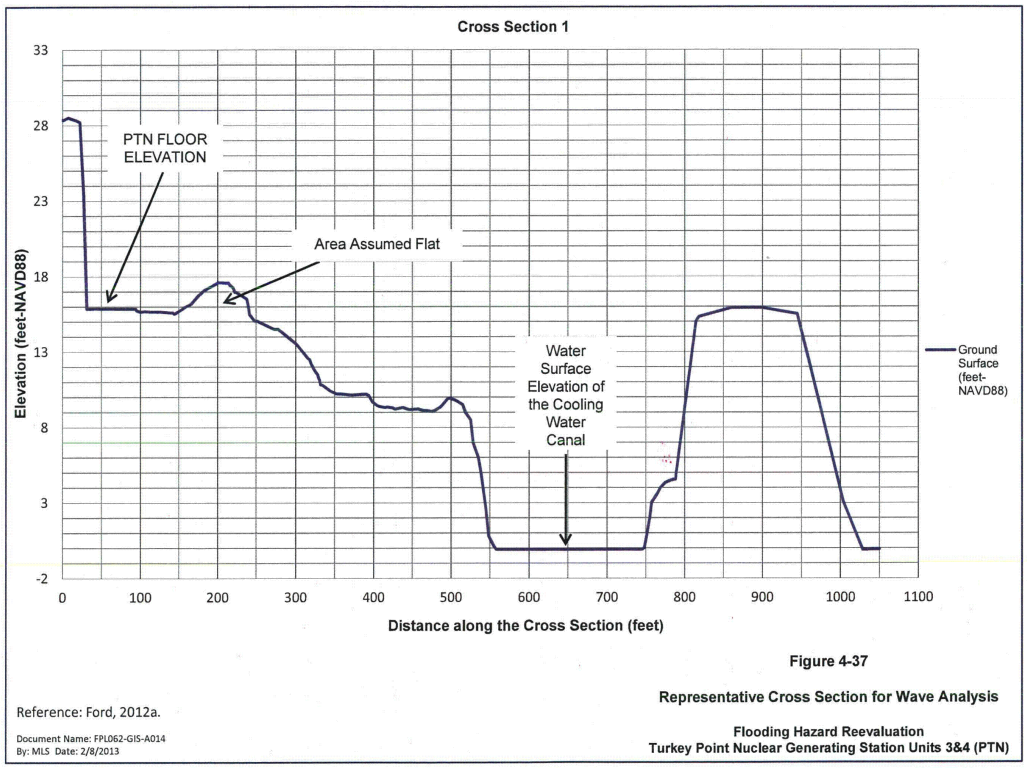
[28] *Id*.

[29] ENERCON Services Inc. "Turkey Point Units 3 and 4 Flood Hazard Reevaluation Report," (Mar. 11, 2013) (ML13095A196, ML13095A197).

[30] NAVD88 is the North American Vertical Datum of 1988, an elevation benchmark.

[31] NRC, "Staff Assessment by the Office of Nuclear Reactor Regulation Related to Mitigation Strategies for Turkey Point Nuclear Generating, Unit Nos. 3 and 4 as a Result of the Reevaluated Flooding Hazard Near-Term Task Force Recommendation 2.1-Flooding," 5 (Jun. 27, 2017) (ML17143A034).

the current license period.[32] It did not account for additional projected sea level rise and other climate-related flood risks during the subsequent license renewal period.



[32] FP&L, Letter, "NEI 12-06, Revision 2, Appendix G, G.4.2, Mitigating Strategies Assessment (MSA) for FLEX Strategies report for the New Flood Hazard Information," 16 (Dec. 20, 2016) (ML17012A065).

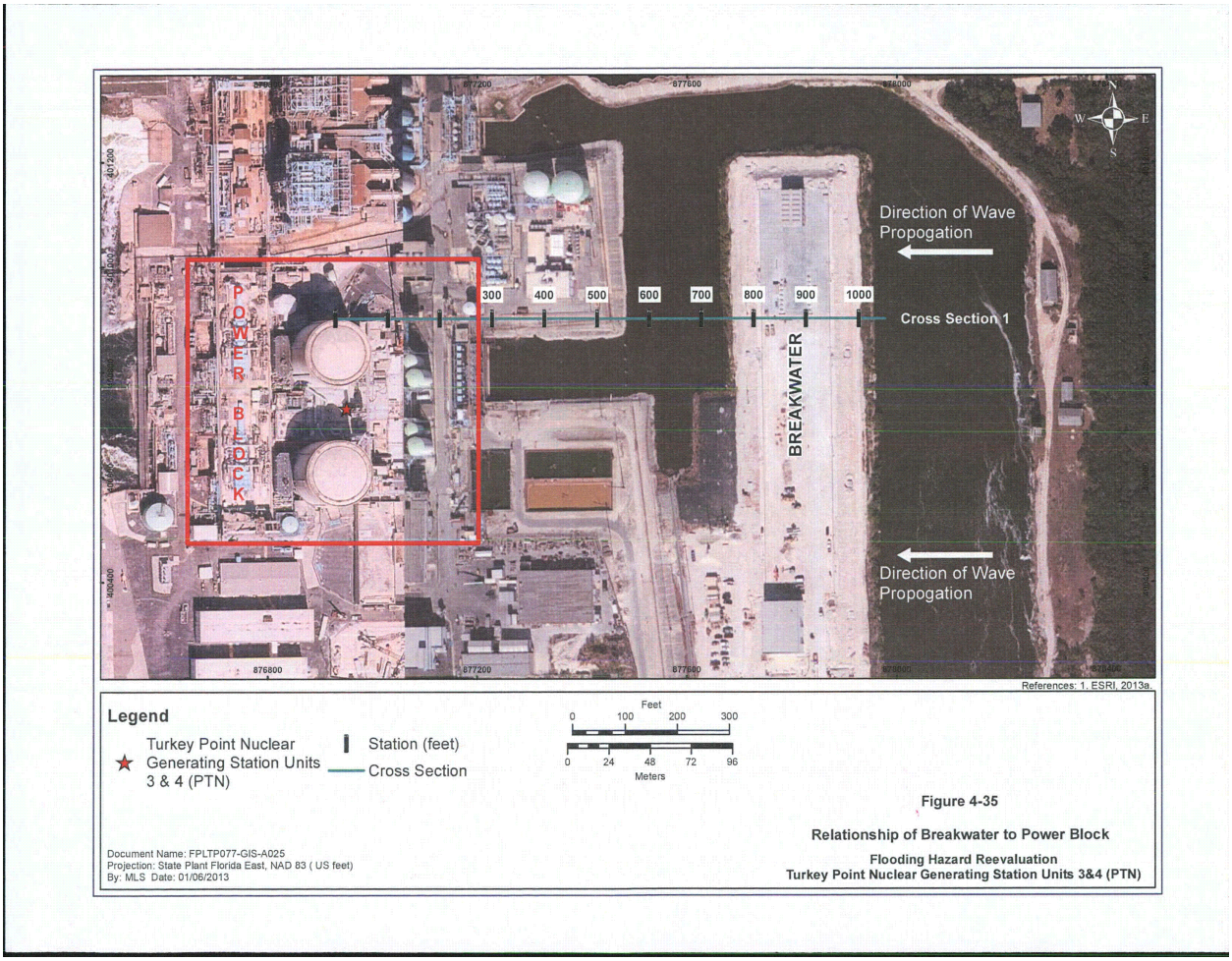


Figure 4-35

Relationship of Breakwater to Power Block

Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)

While the NRC Staff evaluated flooding for safety purposes, it ignored the impacts of flooding on the environment. The impacts of overtopping the cooling canal system are significant. Pollutants in the cooling canals will inundate the Biscayne Bay and the surrounding environment with hyper saline water, tritium, sediment, ammonia, and other pollutants in the cooling canals.

Finally, the Draft SEIS simply ignores the effects of climate change and related sea level rise on termination and decommissioning of Turkey Point Units 3 and 4. If the subsequence license renewal is granted, Units 3 and 4 will be permitted to remain open until the early 2050s. Decommissioning can reasonably be expected to take 60 years to complete. This means that decommissioning activities will likely continue past 2100, when sea level rise at Turkey Point

could rise between four to ten feet above current levels.[34] NEPA requires this scenario and the relevant environmental impacts be analyzed, including the cost of armoring the plant against sea level rise and the environmental impacts of decommissioning when the plant is a virtual island.

Thus, the Draft SEIS fails to take a hard look at the foreseeably affected environment and how those climate change-related effects can add to Turkey Point's impact on the environment.

IV. Conclusion

As we noted at the outset, rather than comply with well-established NEPA requirements of taking a "hard look" at the environmental impacts of a major federal action, the Draft SEIS provides some disjointed facts about climate change and sea level rise without relating them to the issue at hand—further extension of the operating license for Turkey Point—or analyzing how the facts recited affect the environmental impact of the plant. Nowhere does the Draft SEIS provide an understanding of the benefits for the environment of operating cooling towers instead of the current cooling canal system. Likewise, the Draft SEIS avoids any analysis of how climate disruption and resulting sea level rise would affect the environmental impact of operating Turkey Point for a total of 80 years, with a further 60 years of decommissioning, instead hiding behind the climate naïve analysis of 50 years ago. In light of the changes in climate that have already begun, and we know will worsen over this century, a searching look at the effects of extending the operations of these nuclear reactors for a total of 80 years is essential, especially when that nuclear power plant sits on the tip of Florida where climate change is projected to significantly alter and impact the environment.

Thank you for the opportunity to file these comments. Please contact us if you have any questions.

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[34] Declaration of Dr. Robert Kopp (July 26, 2018) (ML18213A433).

Sincerely,

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