



UNITED STATES DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office

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May 22, 2015

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(Sent via electronic mail)

Colonel Alan Dodd, Commander
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Miami Permits Section
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Miami, Florida 33176

Jennifer Dixon-Herrity, Chief
U.S. Nuclear Regulatory Commission
Division of New Nuclear Reactor Licensing
Mail Stop: TWFN 6C32
Washington, D.C. 20555-001

Attention: Megan Clouser and Alicia Williamson

Dear Colonel Dodd and Ms. Dixon-Herrity:

NOAA's National Marine Fisheries Service (NMFS) reviewed public notice SAJ-2009-02417 (SP-MLC) dated March 13, 2015, from the U.S. Army Corps of Engineers Jacksonville District (USACE) and the draft *Environmental Impact Statement for the Combined Licenses (COLs) for Turkey Point Units 6 and 7* (EIS), dated February 2015, prepared by the Nuclear Regulatory Commission (NRC). Both documents describe plans by the Florida Power and Light Company (FPL) to build and operate two new 1,100-megawatt nuclear generating units referred to as Units 6 and 7 at the Turkey Point Nuclear Plant adjacent to Biscayne Bay in Miami-Dade County. In addition to the public notice and draft EIS, the NRC prepared an essential fish habitat (EFH) assessment and provided it to the NMFS by letter dated February 25, 2015. The project components most germane to the EFH consultation are the filling of 1,000 acres of wetlands for construction of the nuclear units and related infrastructure and establishing four radial collector wells (RCW) that would withdraw 43,200 gallons of water per minute (gpm) from the Biscayne Bay aquifer for 60 days per year under normal operating conditions. As the nation's federal trustee for the conservation and management of marine, estuarine, and anadromous fishery resources, the following comments and recommendations are provided pursuant to authorities of the Fish and Wildlife Coordination Act and the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

Essential Fish Habitat Consultation

The public notice and draft EIS identify the NRC as the lead federal agency for consultation conducted pursuant to the EFH provisions of the Magnuson-Stevens Act. By letter dated August 5, 2010, the NMFS reviewed for the NRC the content required of an EFH assessment under 50 CFR 600.920(e)(3) and (4). Overall, the NRC provided an initial determination that construction and operation of the RCWs, 105 acres of mangrove impact, and 0.10 acres of seagrass impact, located within or adjacent to the Biscayne Bay Aquatic Preserve and designated Habitat Areas of Particular Concern (HAPCs) by the South Atlantic Fishery Management Council, would not result in an adverse impact on EFH or federally managed fishery species. The NRC provides individual determinations on the effects of six actions or activities on mangrove, seagrass, and unconsolidated bottom habitats in the EFH assessment (Table 1). As described



further below, the NMFS disagrees with these determinations and concludes the proposed dredging and operation of the RCWs would result in adverse impacts to seagrass or mangroves. In particular, the RCW operation could alter nearshore water quality resulting in hypersalinity and hyperthermal conditions impacting additional seagrass and fishery resources in the Biscayne Bay Aquatic Preserve. Due to the potential severity of these impacts, a biological monitoring and adaptive management plan is recommended to evaluate the predicted impacts of RCW operation relative to the actual impacts and to implement corrective actions or mitigation measures if environmental thresholds are reached. The USACE did not make an initial determination in its public notice on whether the impacts to 1,000 acres of wetlands, including over 100 acres of mangroves, would result in an adverse impact on EFH or federally managed fishery species noting the NRC is the lead federal agency for the EIS and is responsible for the EFH consultation.

Table 1: Summary of NRC's initial determination on effects to EFH and HAPCs (modified from EFH Assessment Table 7-1).

| <i>Action or Activity</i> | <i>Impact type</i> | <i>Mangrove</i> | <i>Seagrass and estuarine bottom</i> |
|---|---|--|---|
| Construction of reclaimed wastewater system | Habitat disturbance or loss | No adverse impacts | No adverse impacts |
| Operation of Units 6 and 7 cooling systems using reclaimed wastewater | Entrainment or impingement | No adverse impacts | No adverse impacts |
| | Cooling-tower deposition | No adverse impacts | No adverse impacts |
| Construction of RCW cooling system | Habitat disturbance or loss | Minimal temporary impacts on mangroves in the vicinity of RCW caissons | No adverse impacts |
| Operation of Units 6 and 7 cooling systems using RCWs | Noticeable alternations to nearshore salinity in Biscayne Bay | Minimal impacts expected, but localized, temporary minimal adverse impacts could occur from increased salinity in nearshore areas near the Turkey Point site | Minimal impacts expected, but localized, temporary minimal adverse impacts from increased salinity in nearshore areas near the Turkey Point site |
| | Entrainment or Impingement | No adverse impacts | No adverse impacts under normal operation; minimal to substantial localized impacts if frac-out occurred |
| | Cooling-tower deposition | No adverse impacts | No adverse impacts |
| Equipment barge unloading Area expansion | Water-quality degradation; noise emissions, habitat disturbance or loss | No adverse impacts | Minimal impacts expected, but localized, temporary substantial adverse impacts from water-quality changes and noise emissions could occur during dredging operations and sheet-pile installation adjacent to the unloading area |
| Deep-aquifer injection of blowdown | Indirect impacts on water quality that affects EFH or HAPCs | No adverse impacts | No adverse impacts |

Description of Project Components Most Relevant to the EFH Consultation

The public notice describes the project as having six main components, and the draft EIS describes 13 project components (draft EIS, Table 4-2). To streamline review, the NMFS identified elements of the project most relevant to the EFH consultation to include the filling of wetlands, the construction and operation of the RCW cooling system, and to a lesser degree, the dredging of the barge basin.

Equipment Barge Canal Expansion

The equipment-barge unloading area at the northeastern portion of the Turkey Point Nuclear Facility would be expanded by dredging 0.75 acres of estuarine bottom, including 0.10 acres of seagrass habitat, to support construction activities. The NRC and FPL propose use of turbidity curtains to limit water

quality degradation caused by dredging. The EFH assessment states the basin contains sparse growth of seagrass and macroalgae. The NMFS requests the final EIS and EFH assessment include a more detailed habitat characterization and compensatory mitigation to offset the seagrass impacts.

Wetland Fill

In order to construct Units 6 and 7 and related infrastructure, including pipelines and the RCWs, the NRC and FPL propose to fill approximately 1,000 acres of wetlands. The public notice does not identify the impacts to mangroves from this work; however, the draft EIS indicates approximately 105 acres of mangroves would be filled, permanently or temporarily to facilitate construction (Table 2). The NRC expects about half of the mangrove impacts to be construction related and temporary. Project plans in the final EIS and EFH assessment should reflect all practicable avoidance and minimization of impacts to mangroves. In addition, a compensatory mitigation plan should be provided demonstrating, through a functional assessment comparing impact and mitigation areas, that sufficient mitigation is proposed. The mitigation plan should describe how mangrove temporary impact areas would be re-graded to appropriate elevations and monitored to ensure mangrove vegetation returns to the impacted sites at locally appropriate densities. Performance measures, monitoring criteria, schedule, and frequency should also be identified in the plan (see the Federal Compensatory Mitigation Rule dated April 2008).

| Table 2: FPL proposed land disturbance on the Turkey Point site and Florida land use, cover, and forms classification system (FLUCFCS) summary for the different categories of mangrove impacts (modified from Table 4-1 in the draft EIS) | | | | |
|---|--|--------------|--------------|--------------|
| Land disturbance activity | Acreage of mangrove impacts by FLUCFCS | | | |
| | Dwarf | Head | Swamp | Swamp/Exotic |
| Unit 6 & 7 plant area | | 12.14 | | |
| Western lay down area | 16.87 | | | |
| Training parking | | | 5.61 | 1.85 |
| Nuclear administration parking | | | 18.68 | |
| Transmission laydown lines | 0.31 | | | |
| RCW area, RCW laydown area, FPL reclaimed wastewater treatment | 42.82 | | | |
| Treated reclaimed wastewater delivery pipelines | 3.06 | | | |
| RCW delivery pipeline | | | 3.98 | |
| Total = 105.32 ac | 63.06 | 12.14 | 28.27 | 1.85 |

Construction and Operation of RCWs

Construction of RCW: The draft EIS and EFH assessment note frac-outs may occur during the drilling needed for the RCWs; however, the discussion focuses only on one aspect of what constitutes a frac-out. The NRC describes a frac-out as one or more significant fractures of the limestone above the RCW lateral pipelines altering fine-scale water flows during RCW system operation potentially resulting in impingement or entrainment of early life stages of fishery species. It is not clear to the NMFS how the NRC views this impact. While the NRC notes monitoring and detecting this type of frac-out and its impacts would be difficult, it goes on to conclude no adverse impacts would result from the entrainment or impingement of aquatic resources but later states there would be small, localized adverse effects. The NMFS requests the final EIS and EFH assessment clarify this issue.

Neither the draft EIS nor the EFH assessment describe another type of frac-out associated with horizontal directional drilling (HDD), the construction method for the RCWs. During HDD, drilling mud can escape into the environment through fractures in the rock potentially degrading EFH. The Southeast Florida Coral Reef Initiative's *Best Management Practices (BMPs) for Construction, Dredge and Fill and Other Activities Adjacent to Coral Reefs*¹ notes the risk of frac-outs occurring can be reduced through proper geotechnical assessment practices and prudent drill planning and execution. The BMPs also describe how the extent of damage from a frac-out can be limited by carefully monitoring the hydraulic pressure and having the appropriate response equipment and contingency plans ready in the event that a

¹ Available at: www.floridadep.org/coastal/programs/coral/reports/MICCI/MICCI_6_BMP_Manual.pdf

frac-out occurs. While these measures and BMPs are useful in reducing and limiting the occurrence of frac-outs, direct measures of borehole pressure may be necessary for the agencies to have reasonable assurance that damage from frac-outs would be minimal. Stauber et al. (2003) presents a method for predicting borehole pressure by means of a demand-capacity analysis. With a calculated maximum allowable borehole pressure curve for a given HDD bore profile, specifications could require borehole pressure be maintained below the maximum allowable value or to maintain rheological properties within specified limits.

The NMFS requests the NRC update final EIS and EFH assessment to describe plans to perform close monitoring along the RCW lateral pipelines during construction to ensure frac-outs are identified and remediated immediately and, if necessary, compensatory mitigation implemented. To assist with developing this monitoring plan for the Turkey Point RCWs, the NMFS will send separate from this letter monitoring plans used by the NMFS, USACE, and Florida Department of Environmental Protection (FDEP) for similar projects.

Operation of RCWs: The primary source of cooling water for the proposed Turkey Point Units 6 and 7 would be reclaimed wastewater from the Miami-Dade Wastewater and Sewer Department. Because the availability of the reclaimed wastewater supply will vary, FPL plans to install four RCWs on the Turkey Point peninsula to provide a secondary source of cooling water. Each RCW would consist of a central reinforced concrete caisson with 8 to 12 lateral pipelines (horizontal collector lines) extending out from the caisson. The horizontal extent of the RCW lateral pipelines would be up to 900 feet beneath Biscayne Bay and would be approximately 25 to 40 feet below the bay bottom. In order to maintain the RCW system, the RCWs would be used up to 60 days per year with a maximum saltwater makeup-water rate under normal operating conditions being 43,200 gpm. The EFH assessment does not address use of the RCW system outside this maintenance; i.e., when it becomes the main water supply when the primary supply is inadequate. The NMFS recommends the final EIS and EFH assessment analyze the effects of operating the RCW as the main water supply when the reclaimed wastewater becomes unavailable for longer periods than expected. Alternatively, the NRC or the USACE may need to reinitiate EFH consultation prior use of RCWs for time periods exceeding those evaluated in the draft EIS and EFH assessment.

Operation of the RCWs would result in hypersaline conditions and thermal events within estuarine habitats in Biscayne Bay known to support federally managed species. The severity of these effects would depend on annual rainfall levels (i.e., more severe effects are expected during dry years than wet years). This is of concern because hypersaline conditions and thermal events can be bio-energetically expensive and reduce capacity for reproduction or growth. Impacts to seagrass habitats and fishery resources from the RCW operation are not quantified in the public notice. However, the draft EIS attempts to quantify these effects based the modelling FPL has completed to predict the influence RCWs will have on local salinity regimes in Biscayne Bay (provided in the draft EIS Appendix G). The draft EIS also briefly describes how the recent upgrades of Turkey Point Units 3 and 4 have led to increased discharge temperatures within the cooling canals contributing to an extensive algal bloom (draft EIS, Section 7.2.2.1). Based on maps provided with the public notice, it appears the RCWs would collect water in the vicinity of elevated temperature discharge plumes from the cooling canals.

The NMFS believes applying the results of the modelling conducted by FPL to predict impacts to seagrass and federally managed species is problematic because it focuses on mean conditions as opposed to ecologically relevant conditions. In addition, the modelling performed was based on an inaccurate assumption that the cooling canals are a closed system (i.e., no exchange between the canals and Biscayne Bay). A more reliable way to analyze the impacts would be to examine ecologically relevant scenarios, such as the frequency, duration, and intensity of the salinity and temperature disturbance (i.e., extreme)

events. In addition, the impact analysis should be updated to characterize and quantify the level of exchange between the cooling canals and Biscayne Bay and then incorporate that working understanding of the level of exchange into the analysis of impacts and the development of monitoring to verify those impacts.

Need for a Biological Monitoring and Adaptive Management Plan

A biological monitoring and adaptive management plan based on ecologically relevant impacts should be developed, and the NMFS offers to assist development of the plan. The plan should be developed to measure impacts predicted from a reliable impact assessment that considers ecologically relevant water quality conditions and interactions between the cooling canals and Biscayne Bay waters. The plan should be implemented in perpetuity for the life of the RCWs and include no less than three years of baseline monitoring (pre-operation) during dry years to characterize the ambient conditions at the site.

FPL and the National Park Service, Biscayne National Park (NPS), are currently conducting water quality monitoring, and the NMFS recommends installing an additional four or five continuous water quality monitoring sites with similar equipment to assess the frequency duration, and intensity of hyperthermal and hypersaline events. The NMFS can assist in determining the location of the sites (spatially with respect to other sites and the work proposed and location in the water column). The water quality monitoring component of the plan should clearly identify the environmental thresholds requiring adaptive management and options to manage the operation. Because this type of monitoring generates a lot of data, an efficient plan to manage, analyze, and share data is also recommended.

Seagrass monitoring should also be a component of this plan. The NMFS reviewed the FDEP Certificate of Conditions (May 2014) containing recommendations for monitoring changes to the seagrass communities near the Turkey Point Nuclear Plant resulting from RCW operation. The NMFS believes the monitoring effort would be more efficient by incorporating relatively new approaches, for example using geo-spatial video-based survey techniques described in Lirman et al. (2008). The monitoring plan should demonstrate capability in detecting the level of biological change that constitutes an adverse effect to seagrass and fishery resources in Biscayne Bay. The sampling plan should be supported by a power analysis to demonstrate the sampling proposed is sufficient to detect the expected impacts.

One way to efficiently accomplish developing the biological monitoring and adaptive management plan would be to establish and interagency team to contribute to the development of the plan. Ideally, the team should be composed of staff from the NMFS, NPS, NRC, USACE, U.S. Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service, FDEP, Florida Fish and Wildlife Commission, Miami-Dade Department of Environmental Resources Management, South Florida Water Management District, and FPL. The final plan implemented should reflect substantial input from this team. The NMFS, National Park Service, and others are currently planning to meet May 29, 2015, in Homestead to discuss this monitoring need (please contact Jocelyn Karazsia for additional information about this meeting, her contact information is at the end of this letter)

Sequential Mitigation of Impacts to Essential Fish Habitat

Under the Clean Water Act, its implementing regulations, and EPA guidelines, wetland impact avoidance and minimization are the first two steps in sequential mitigation, and the third step is compensatory mitigation for unavoidable impacts. The public notice does not describe any measures to avoid or minimize impacts to mangroves or seagrass from the project. Based on the drawings provided with the notice, it appears 100 percent of the wetlands on the site are proposed for impact. The public notice states the applicant submitted a mitigation plan that includes debiting of mitigation credits from the FPL Everglades Mitigation Bank, purchasing of mitigation credits from the Hole-in-the-Donut in-lieu-fee program, and constructing permittee-responsible mitigation. The public notice, draft EIS, and EFH

assessment neither describe the permittee-responsible mitigation, how well the credits from these mitigation banks match the impacts, nor the number of credits required. In letters to the USACE dated April 9, 2015, and May 4, 2015, the EPA provides additional detail on concerns about how the sequential mitigation process has been implemented for this project.

The NMFS believes the proposed mangrove fill is not consistent with EPA's Guidelines for Specification of Disposal Sites for Dredged or Fill Material. The fundamental precept stated in 40 CFR 230.1(c) that "dredged or fill material should not be discharged into the aquatic ecosystem unless it can be demonstrated that such a discharge will not have an unacceptable adverse impact either individually or in combination with known and/or probable impacts of other activities affecting the ecosystems of concern" would not be met by this project. The basic purpose of the project, as stated in the public notice is to meet the public's need for electric energy. Based on guidance provided by 40 CFR 230.10(a)(3), energy development does not require access or proximity to or siting within wetlands to achieve the basic purpose (i.e., energy production is not water dependent). In discussing the water dependency requirement, the guidelines state that for non-water dependent projects, practicable alternatives that do not involve special aquatic sites (e.g., wetlands adjacent to and within the Biscayne Bay Aquatic Preserve) are presumed to be available.

EFH Conservation Recommendations

Based on the information provided in the public notice, the NMFS concludes the proposed dredging of seagrass habitat, filling of mangrove habitat, and RCW construction and operation would adversely impact EFH. Section 305(B)(4)(A) of the Magnuson-Stevens Act requires the NMFS to provide EFH conservation recommendations for any federal action or permit which may result in adverse impacts to EFH. Therefore, NMFS recommends the following to ensure the conservation of EFH and associated fishery resources:

- Project plans within the Clean Water Act permit and project license should reflect all practicable avoidance and minimization of impacts to mangroves and seagrass habitats and demonstrate adequate compensatory mitigation is planned, as shown through a functional assessment comparing impact and mitigation areas. The mitigation plan should describe how mangrove impact areas will be re-graded to appropriate elevations and monitored to ensure mangrove vegetation returns to the impacted site. Performance measures, monitoring criteria, schedule, and frequency should also be identified in the plan.
- The final EIS and EFH assessment should analyze the effects of operating the RCW as the main water source when the primary water supply becomes unavailable for periods longer than 60 days or commit to notifying or reinitiating consultation with the NMFS when this occurs.
- The final EIS and EFH assessment should characterize and quantify the level of exchange between the cooling canals and Biscayne Bay in order to ensure the biological monitoring implemented for RCW operation considers the interrelatedness and water exchange of the cooling canals and the RCW collection area.
- The Clean Water Act permit and project license should require implementation of a biological monitoring and adaptive management program to assess changes in salinity and temperature in Biscayne Bay resulting from RCW operation. The NMFS offers to assist in the development of this plan.
- The Clean Water Act permit and project license should require the permittee to quickly identify and remedy both types of frac-outs in the case they occur.

Section 305(b)(4)(B) of the Magnuson-Stevens Act and implementing regulation at 50 CFR Section 600.920(k) require the USACE and NRC to provide a written response to this letter within 30 days of its receipt. If it is not possible to provide a substantive response within 30 days, an interim response should

be provided to NMFS. A detailed response then must be provided prior to final approval of the action. The detailed response must include a description of measures proposed by the USACE and NRC to avoid, mitigate, or offset the adverse impacts of the activity. If the response is inconsistent with the EFH conservation recommendations, the USACE and NRC must provide a substantive discussion justifying the reasons for not following the recommendations.

In accordance with section 7 of the Endangered Species Act of 1973, as amended, it is the responsibility of the USACE and NRC to review and identify any proposed activity that may affect endangered or threatened species and their designated critical habitat. Determinations involving species under NMFS jurisdiction should be reported to NMFS Protected Resources Division at the letterhead address.

Thank you for the opportunity to provide comments. Please direct related correspondence to the attention of Ms. Jocelyn Karazsia at our West Palm Beach office, 400 North Congress Avenue, Suite 110, West Palm Beach, Florida, 33401. She may be reached by telephone at (561) 249-1925, or by e-mail at Jocelyn.Karazsia@noaa.gov.

Sincerely,



/ for

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Assistant Regional Administrator
Habitat Conservation Division

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Literature Cited

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Stauber, R., Bell, J., and Bennett, R. 2003. A Rational Method for Evaluating the Risk of Hydraulic Fracturing in Soil during Horizontal Directional Drilling. *Proceedings of North American Society of Trenchless Technology and International Society of Trenchless Technology International Conference (a.k.a. NoDig 2003)*, Las Vegas, Nevada, March 31, 2003.