

November 14, 2014

MEMORANDUM TO: Jennifer L. Dixon-Herrity, Chief  
Environmental Project Branch  
Division of New Reactor Licensing  
Office of New Reactors

FROM: Alicia Williamson, Project Manager */RA/*  
Environmental Project Branch  
Division of New Reactor Licensing  
Office of New Reactors

SUBJECT: SUPPLEMENTAL SITE AUDIT SUMMARY RELATED TO THE  
ENVIRONMENTAL REVIEW OF THE PROPOSED TURKEY  
POINT NUCLEAR POWER PLANT UNITS 6 AND 7

On October 14, 2014, the U.S. Nuclear Regulatory Commission (NRC) staff conducted a supplemental site audit related to the combined license (COL) application submitted by Florida Power and Light Company (FPL) for the proposed Turkey Point Nuclear Power Plant (Turkey Point) Units 6 and 7. The purpose of the supplemental site audit was to assist the staff in determining if proposed changes to the existing Turkey Point Units 3 and 4 cooling canal system (CCS) would result in additional information to inform the environmental review for the proposed new units or alter conclusions submitted by FPL in the Environmental Report submitted as part of the COL application.

In July 2014, FPL notified the NRC, Office of Nuclear Reactor Regulation, that the CCS, which supports the operation of Turkey Point Units 3 and 4, was experiencing an algal bloom as well as an increase in water temperature and other constituents (i.e. salinity, nitrogen, etc.). FPL applied for and was granted amendments to the NRC license and several emergency permits issued by the Florida Department of Environmental Protection (FDEP) to support the safe operation of Units 3 and 4 while simultaneously improving the overall water quality of the CCS. In order to reduce the risk of this type of event from reoccurring, FPL submitted a permit modification application to the FDEP to allow for additional consumptive water use. The staff intends to reflect this potential change to the existing environment in the draft Environmental Impact Statement (EIS) on the application, which the staff is now preparing.

CONTACT: Alicia Williamson, NRO/DNRL  
301-415-1878

The supplemental audit consisted of a three-hour meeting at the Turkey Point site among representatives of the NRC staff along with its contractor Pacific Northwest National Laboratory, the U.S. Army Corps of Engineers, Miami Field Office, the National Park Service, Biscayne Bay and Everglades National Parks, as well as representatives of FPL. Enclosed is a list of the audit participants, the audit agenda, supplemental audit information needs, and a summary of the audit discussion.

Docket Nos.: 52-040 and 52-041

Enclosures:  
As stated

cc w/enclosures: see next page

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AWilliamson, NRO

MDelligatti, NRO

RWeisman, OGC

MMasnik, NRO

JDixon-Herrity, NRO

MComar, NRO

RWhited, NRO

OGCRidsOgcMailCenter

RidsNroDnrl

RidsNroDsea

RidsRgn2MailCenter

[rw.bryce@pnnl.gov](mailto:rw.bryce@pnnl.gov)

[Sandra.Mcinturff@pnnl.gov](mailto:Sandra.Mcinturff@pnnl.gov)

[Megan.L.Clouser@usace.army.mil](mailto:Megan.L.Clouser@usace.army.mil)

[Bryan.Faehner@nps.gov](mailto:Bryan.Faehner@nps.gov)

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<b>OFFICE</b>	NRO/DNRL/EPB:LA	NRO/DNRL/EPB:PM	OGC	NRO/DNRL:BC
<b>NAME</b>	MBrown	AWilliamson	RWeisman	JDixon-Herrity
<b>DATE</b>	11/07/2014	11/05/2014	11/14/2014	11/14/2014

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U.S. Nuclear Regulatory Commission  
Turkey Point Units 6 and 7  
Docket Nos. 52-040 and 52-041  
Environmental Review Supplemental Site Audit Summary

October 14, 2014

List of Attendees

Participants in the supplemental audit included staff members from U.S. Nuclear Regulatory Commission (NRC), Pacific Northwest National Laboratory (PNNL), U.S. Army Corps of Engineers (USACE), National Park Service (NPS), and Florida Power and Light (FPL).

<b>Name</b>	<b>Affiliation</b>
Ms. Alicia Williamson	NRC
Ms. Jennifer Dixon-Herrity	NRC
Mr. Michael Masnik	NRC
Mr. Peyton Doub	NRC
Mr. Dan Barnhurst	NRC
Ms. Maria Brown	NRC
Mr. Robert Bryce	PNNL
Ms. Sandi McInturff	PNNL
Mr. Lance Vail	PNNL
Mr. Paul Thorne	PNNL
Mr. Corey Duberstein	PNNL
Mr. Jeff Ward	PNNL
Ms. Megan Clouser	USACE
Ms. Sarah Bellmund	NPS (Biscayne National Park)
Mr. David Rudnick	NPS (Everglades National Park)
Mr. Bill Maher	FPL
Mr. Rick Orthen	FPL
Mr. Matt Raffenburg	FPL
Mr. Paul Jacobs	FPL
Mr. Steve Scroggs	FPL
Ms. Mary Richmond	Bechtel
Mr. Garrett Day	Bechtel
Mr. James Ross	TetraTech
Mr. Pete Andersen	TetraTech

U.S. Nuclear Regulatory Commission

Turkey Point Units 6 and 7  
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Information Needs

1. Provide a knowledgeable expert who can discuss the causes and impacts of the current algal bloom in the cooling canal system (CCS) for Units 3 and 4, and the associated water quality issues that have been observed in the cooling canals this summer. Also, be prepared to discuss the potential effects of suggested Florida Power and Light (FPL), Florida Department of Environmental Protection, and South Florida Water Management District mitigation measures to control the algal bloom. These mitigation measures were outlined in submittals from FPL to NRC for a license amendment to increase the discharge temperature in July 2014 and August 2014.
2. Provide a knowledgeable expert who can discuss the possible effects of the proposal to install additional groundwater wells and pump groundwater from the upper Floridan on the current and forecasted hydrological environment, including Biscayne aquifer, Biscayne Bay and other nearby major water features as noted in environmental report (ER) sections 2.3.1.2.3, 4.2 and 5.2. This includes effects in an environment where FPL would be operating the proposed Units 6 and 7 radial collector wells.
3. Provide a knowledgeable expert who can discuss whether pumping of additional water from the upper Floridan would affect any of the ER predictions of groundwater or surface water quality. This includes potential salinity changes in the Biscayne aquifer, Biscayne Bay or other nearby major water features in the vicinity of the proposed radial collect wells as noted in ER sections 2.3.1.2.3, 4.2 and 5.2.
4. Provide a knowledgeable expert who can discuss the potential effects of new proposed pumping from the upper Floridan on the upper Floridan aquifer and deeper aquifers, including the potential for upward migration of injected wastewater streams from the proposed Units 6 and 7.
5. Provide a knowledgeable expert to discuss if the current increase in salinity in the CCS will invalidate any of the predictions of salinities in the Biscayne Bay or other nearby major hydrologic features as noted in ER section 2.3, 4.2, and 5.2.
6. Provide a knowledgeable expert to clarify if onsite aquatic or terrestrial resources would be affected by the suggested mitigation measures as noted in Question 1.

U.S. Nuclear Regulatory Commission  
Turkey Point Units 6 and 7  
Docket Nos. 52-040 and 52-041  
Environmental Review Supplemental Site Audit Summary

Background

In July 2014, FPL notified the NRC, Office of Nuclear Reactor Regulation, that the CCS, which supports operation of Turkey Point Units 3 and 4, was experiencing an algal bloom as well as an increase in water temperature and other constituents (i.e. salinity, nitrogen, etc.). FPL applied for and was granted amendments to the NRC license and several emergency permits issued by the Florida Department of Environmental Protection (FDEP) to support the safe operation of Units 3 and 4 while simultaneously improving the overall water quality of the CCS. In order to reduce the risk of this type of event from reoccurring, FPL submitted a permit modification application to the FDEP for additional consumptive water use. The NRC requested that FPL meet with the NRC and provide subject matter experts to resolve the Information Needs provided by the NRC's environmental review staff.

Summary

On October 14, 2014, the NRC staff conducted a supplemental site audit and met with FPL at the FPL offices in Homestead, Florida. The meeting included participants from NRC, Pacific Northwest National Laboratory (PNNL), U.S. Army Corps of Engineers (USACE), National Park Service (NPS), and FPL and its contractors.

The audit meeting began with introductions of the participating staffs, and FPL then provided background information on the algal bloom. Mr. Matt Raffenburg of FPL explained that in late June 2014, FPL recognized the cooling canal water temperature was getting warmer, which FPL attributed to the algal bloom. In addition, FPL noted the canal water levels were lower than usual. FPL began to look for methods to get additional water into the CCS to assist with lowering the temperature as well as get rid of the algae. Eventually the FDEP granted FPL approval to administer a combination of chemicals (copper sulfate, hydrogen peroxide, and biostimulants) in the CCS to reduce the amount of algae. The chemical combination started reducing the amount of algae but the CCS temperature was not dropping very much. Next, FPL requested and was approved to temporarily use excess surface water from the L-31 canal to assist with temperature reduction. The South Florida Water Management District (SFWMD) contacts FPL daily to inform FPL of the exact amount of water that they can utilize. FPL was approved to utilize up to 100 million gallons per day (mgd) but only received about 30 mgd. The temporary permit was set expire on October 15, 2014. Increased rainfall in proceeding weeks along with the excess water from the L-31 canal did reduce the temperature and salinity within the CCS. FPL indicated the current salinity readings in the CCS were approximately 70 practical salinity units (psu) as opposed to the 90 psu earlier in the summer.

Next, FPL spoke about potential long term plans to improve the overall water quality in the CCS. Specifically, they are looking at improving the flow of the water throughout the entire canal system and was working with FDEP and SFWMD to create a long term management plan to permanently "freshen " the canal system to be more like surrounding water bodies in terms of

salinity. They indicated a plan to dredge the canals is being considered. This included a spoils and muck management plan to control leaching of other nutrients such as phosphorus and nitrogen. FPL mentioned aquatic vegetation and approved prohibitors that should keep phosphorus and nitrogen to lower levels within the CCS. The last time the canals were dredged was in the early 1990's.

Another long term strategy FPL mentioned they were considering to improve the CCS water quality, is the use of additional water from the Upper Floridan aquifer. They have requested a permit modification from FDEP and SFWMD that would allow for installation of up to six groundwater wells from which FPL could withdraw approximately 14 mgd of water from the Upper Floridan Aquifer. The requested modification to the state permit would also allow FPL to re-allocate approximately 2.9 mgd of the water authorized for the existing Turkey Point Unit 5 to the CCS. Based on data collected for the annual uprate monitoring report and water budget modeling, FPL predicts it could reduce the cooling canals salinity to measurements in the 30 psu range. Details regarding the salinity reduction plan are included in FPL application dated September 5, 2014, to modify the FDEP/SFWMD state certification application, but more details will be in an administrative order, expected from FDEP/SFWMD later this year.

Next, FPL discussed the potential for interface with adjacent aquifers as a result of installing additional wells and extracting large amounts of water from the Upper Floridan Aquifer. FPL indicated no interface between the adjacent aquifers should occur due to the various confining layers and proper well construction. In addition, FPL described exploratory well tests that were conducted using the deep injection well for the proposed Units 6 and 7 showed no interface occurring between the aquifers and wells. This report was provided to the NRC safety project manager earlier this year.

Finally, the discussion turned towards the potential impacts to aquatic and terrestrial organisms that utilize the CCS. FPL indicated there has been no evidence that the algal bloom or temperature increase negatively impacted aquatic or terrestrial organisms within the canals system. FPL did not observe any fish kills in the CCS but said the water was very brown. While trying to reduce the algae and temperature of the CCS, FPL measured for oxygen and thought dissolved oxygen levels sufficient for supporting fish in the canals. FPL did indicate in July 2014, a dead threatened American crocodile was discovered at the plant intake bay. The animal was approximately 2.5 to 3 meters long and there were no signs of injury or trauma. A necropsy has not been performed on the animal but it is currently being kept in a storage freezer. FPL did notify the U.S. Fish and Wildlife Service and the Florida Fish and Wildlife Commission as required by law but no additional actions have been taken. In addition, FPL referred to a letter recently written by the US FWS which stated no additional analysis was needed on the crocodile discovered in the intake bay. Regarding the proposed corrective actions that might be implemented to improve the water quality of the canal system, FPL indicated there will be no impact to aquatic and terrestrial organisms because of the overall improvements to the system.

The FPL representatives made available to address the NRC's Information Needs were able to sufficiently address the Information Needs and additional questions that arose during the discussions. To the extent the NRC staff decides to use the information discussed during the audit in the EIS and that information has not already been submitted to the NRC or is not available from some other source, the staff will propose RAIs to confirm that information on the Turkey Point COL docket.