

PMTurkeyCOLPEm Resource

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Sent: Friday, May 27, 2011 10:15 AM
To: Orthen, Richard; Franzone, Steve; Maher, William; steven.hamrick@fpl.com
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Subject: Forwarding Revisions to Draft RAIs 5763, 5765, 5766, 5768, and 5769, Hydrology for Chapters 2, 4, 5, 7, and 9
Attachments: 110527-NPS comments on Draft RAI 5769-Hydro 9-3 for transmittal.docx; 110527-NPS comments on Draft RAI 5763 - Hydro 2-3 for transmittal.docx; 110527-NPS comments on Draft RAI 5765-Hydro4-2 for transmittal.docx; 110527-NPS comments on Draft RAI 5766-Hydro5-2 for transmittal.docx; 110527-NPS comments on Draft RAI 5768-Hydro7-2 for transmittal.docx

Steve

Attached are revisions to draft RAIs 5763, 5765, 5766, 5768, and 5769 prepared by the NRC staff for the environmental review of Turkey Point Units 6 and 7. These RAIs are related to the hydrology evaluation for Chapters 2, 4, 5, 7, and 9, respectively. The revisions reflect comments that the National Park Service, which recently became a cooperating agency for the Turkey Point Units 6 & 7 environmental impact statement, has provided to NRC. For convenience, the revisions are in tracked changes in Word.

After you've had an opportunity to review the revised RAIs, we can discuss them in calls involving FPL, the Corps, NPS and NRC for any clarifications of the requests. At that time we can also discuss an appropriate timeframe for the FPL response. If you have any questions, please give me a call.

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110527-NPS comments on Draft RAI 5763 - Hydro 2-3 for transmittal.docx			21001
110527-NPS comments on Draft RAI 5765-Hydro4-2 for transmittal.docx			24017
110527-NPS comments on Draft RAI 5766-Hydro5-2 for transmittal.docx			28762
110527-NPS comments on Draft RAI 5768-Hydro7-2 for transmittal.docx			25941

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Draft Request for Additional Information No. 5769

Turkey Point Units 6 and 7
Florida P and L
Docket No. 52-040 and 52-041
SRP Section: EIS 9.3 - Alternative Sites
Application Section: Part 3, Environmental Report, Section 9.3

QUESTIONS for Environmental Technical Support Branch (RENV)

EIS 9.3-***

Provide current and past water usage from the Floridan Aquifer at the West County Fossil Plant including flow, and hydrogeologic strata, and depth range from which the water was obtained. The applicant's experience with water withdrawals from the Floridan Aquifer at the nearby West County plant will inform the staff on how agencies might handle similar requests involving the Floridan Aquifer for alternative sites.

EIS 9.3-***

Provide water quality information for all water resources considered as viable sources of water or receivers of effluent for the alternative sites (Glades, Martin, Okeechobee 2, and St. Lucie), including but not limited to the Floridan Aquifer, Biscayne Aquifer, Kissimmee River, C-43 and C-44 canals, and the Atlantic Ocean near St. Lucie.

EIS 9.3-***

Provide the receiving water bodies and expected rates of discharge for the plant excavation dewatering for each alternative site (Glades, Martin, Okeechobee 2, St. Lucie).

EIS 9.3-***

Provide information on the calculation of flow rates available from surface water and groundwater resources listed in the ER at each alternative site (groundwater only for St. Lucie). Clarify whether droughts and population trends and resulting demand on water resources were considered in the site selection process.

EIS 9.3-***

Identify general locations of fill sources for each alternative site (Glades, Martin, Okeechobee 2, and St. Lucie) and provide estimates of environmental impacts of obtaining and transporting the fill as well as the need for additional roads or road impacts due to construction of a new plant at that site.

EIS 9.3-***

For all alternative sites (Glades, Martin, Okeechobee 2, and St. Lucie), clarify if makeup water reservoirs will be necessary. If they are needed, provide an estimate of the volume/acreage necessary for the reservoirs at each site.

EIS 9.3-***

Where excavation is necessary, estimate the total volume to be excavated for each alternative site and identify where spoils from building the plant would likely be placed.

EIS 9.3-***

Provide the estimate of reuse water that will be used at the West County Plant. Describe whether reuse water is a possible supplement to building and/or operational water needs (availability currently and projected in future) at each alternative site.

Draft Request for Additional Information No. 5763

Turkey Point Units 6 and 7
Florida P and L
Docket No. 52-040 and 52-041
SRP Section: EIS 2.3 - Water
Application Section: Part 3, Environmental Report, Section 2.3

QUESTIONS for Environmental Technical Support Branch (RENV)

EIS 2.3-***

The identification of consumptive surface water users is provided as a GIS overlay (ER Figure 2.3-51). Figure 2.3-52 provides water needs for agricultural crops. Quantify the consumptive use and withdrawals by volume and duration for each of the identified users and the source of any data that are available. Data for monthly intervals is requested to show the seasonal variability of the withdrawals.

EIS 2.3-***

Provide a copy of the "Hydrologic Study" required by Miami Dade County Resolution Z-56-07.

EIS 2.3-***

Provide a current potentiometric map for the Upper Floridan aquifer in addition to the 1980 potentiometric surface map provided in the ER. This information is requested to allow the staff to determine flow directions within the Upper Floridan Aquifer (UFA) and potential for vertical flow from the Boulder Zone to the UFA.

EIS 2.3-***

Provide an analysis of tidal oscillations in site monitoring wells in both the Key Largo and Miami limestone to determine aquifer diffusivity (T/S) and evaluate influence of the cooling canals as a head boundary on the observed tidal response. Provide water level data used in the analysis and the calculations.

EIS 2.3-***

Canal flows from Caccia and Boyer 2005 for the wet and dry seasons have been cited in ER Table 2.3-13. Provide flows for the L31E and Model Land Canal, as well as other canals near the site shown in Figure 2.3-10. The flow data should include flows to illustrate the seasonal variability such as wet and dry seasons.

EIS 2.3-***

The spatial variability of water quality constituent concentrations is provided in ER Tables 2.3-31 and 2.3-32 for the surface waters of Biscayne Bay and the industrial wastewater facility system. The tables provide monthly average concentrations at each station. To better define the temporal variability of the constituent concentrations, provide maximum and minimum concentrations for each month's data. Include information for ~~any~~ Biscayne Bay stations, including continuous recording salinity sites, not previously reported in the region potentially influenced by the radial wells, and in regions affected by potential exchange with the cooling canal system of the industrial wastewater facility, Card Sound, and other local canals.

Draft Request for Additional Information No. 5765

Turkey Point Units 6 and 7
Florida P and L
Docket No. 52-040 and 52-041
SRP Section: EIS 4.2 - Water-Related Impacts
Application Section: Part 3, Environmental Report, Section 4.2

QUESTIONS for Environmental Technical Support Branch (RENV)

EIS 4.2-***

FSAR Figure 3.4.2-203 provides the drainage pattern during operation of the plant. Provide a plan view of surface water flow routing (runoff throughout the facility), with quantification of runoff throughout the area prior to disturbance for building activities. Include a depiction in GIS format for the period prior to disturbance. Provide a discussion comparing changes in flow magnitude and direction as a result of building and operating Units 6 & 7. Identify how the uprate to Units 3 and 4 and activities to be completed under CERP will alter surface water flows.

EIS 4.2-***

Provide the locations for all effluent discharge points, including runoff, effluents associated with blowdown, and other ancillary flows. Provide data in GIS format for effluent locations and flow directions and magnitudes. In addition, provide water quality information (TDS, nitrogen, phosphorus, dissolved oxygen, carbon, inorganics/metals, and organic contaminants for all flows with expected variability in the concentrations) for all effluents.

EIS 4.2-***

Explain how, if at all, dewatering of the site and routing of the dewatering flows to the cooling canals will change the velocity structure within the cooling canals, the height/depth of the cooling canals, and the exchange rates with the Biscayne Aquifer and Biscayne Bay. Provide the total volume of dewatering-sourced water (upper estimate) that will be routed to the cooling canals, and the time frame for the dewatering to be routed to the cooling canals – (number of weeks, for example). Discuss the possibility for, and consequence of, the cooling canals' capacity being exceeded at any time during dewatering. Provide, in a table or other suitable form, the capacity of the cooling canals to receive dewatering flows.

EIS 4.2-***

Provide the capacity of the makeup water reservoir. Explain how the reservoir will alter groundwater flow patterns and how it will exchange with surface water resources including the Biscayne Bay. Provide quantification for the changes in groundwater and

surface water flows and justification for assumptions used. Explain how the modeling for the reservoir accounts for precipitation and evaporation.

EIS 4.2-***

What are typical sedimentation rates and transport patterns along the shoreline in the vicinity of the location where the dredging will take place for the barge turning basin, and along the Turkey Point Peninsula? How will sedimentation patterns change locally with the dredging needed for the barge turning basin, and the emplacement of pipelines along the coast, including the radial well and reclaimed water pipelines? In addition, provide an aerial photo prior to the original plant's construction (preferably early 1960's) which includes the Turkey Point Peninsula and coastal Biscayne Bay near the plant, including the barge turning area.

EIS 4.2-***

Provide all data being gathered for surface and ground waters associated with the Units 3 and 4 uprate monitoring program, including but not limited to water quality (salinity, temperature, TDS, dissolved oxygen, organics, heavy metals, nitrogen, phosphorus, carbon, tritium), velocity, and exchange measurements. The provided data should include some measures of its temporal variability and including any other sources of waste water to the cooling canals. This information is requested for the cumulative impacts analysis.

EIS 4.2-***

Describe any changes to the plans presented in the ER for controlling groundwater inflow to the power block excavations, any revised calculations of groundwater inflow to the excavations, and any revised plans for disposal of water removed from the excavations.

Describe the maximum expected flow rate and total volume of groundwater expected to be removed while dewatering the power block excavations.

EIS 4.2-***

Describe the range of volumes of groundwater expected to be removed or the range of expected flow rates and durations, and describe the affected aquifers, for all anticipated dewatering activities associated with installation of pipelines, radial collector wells, transmission towers, roads, the reclaimed water treatment facility, and other buildings and facilities other than the power block excavations. Also describe specific techniques that will be used to control withdrawal rates and protect the quality of surface and groundwater.

EIS 4.2-***

Describe the effects, if any, that groundwater pumping and discharge associated with excavation dewatering will have on the hypersaline groundwater plume from the existing cooling canals.

EIS 4.2-***

Describe the potential impacts to groundwater and to the L-31 canal that may be caused by evaporation from the approximately 300 acre lake that would result from using the FPL owned fill source described in the ER. [How will this feature affect the hydrology of the surrounding Biscayne Bay Coastal Wetlands \(BBCW\) component of the Comprehensive Everglades Restoration Plan \(CERP\).](#) If other commercial sources of fill material will be used, describe the effects, if any, on groundwater and surface water from the expansion of these sources to meet FPL's needs, including impacts to groundwater from any active or passive dewatering of the shallow aquifer. [In addition, provide information on the quantities of fill currently available from authorized sources in comparison to the amount of fill material needed for this project.](#)

EIS 4.2-***

Provide "Hydrologic Associates 2009: Summary of Hydrologic, Geologic, and Salinity for FPL Owned Fill Source Water Mgmt Project Area (June 2009)."

EIS 4.2-***

Borrow areas are mentioned in Section 4.2.1 Hydrologic Alterations, which are created from excavation activities to provide fill material for building Units 6 and 7. One of those borrow areas includes a "water management feature" created at an FPL fill source and is discussed in Section 4.1.2.3 FPL-Owned Fill Source and in Section 5.2.1.2.1 Fill Borrow Areas. In Section 4.1 the "water management feature" is stated as being a "newly created lake," and according to Section 5.2 it "would be designed to store excess stormwater to complement regional wetland rehydration projects." Clarify the intended use of the "water management feature," and whether this would be a water of the state of Florida or of the United States. If the "water management feature" is to be used to store stormwater, provide the estimated average and maximum monthly discharges into the water management feature.

Draft Request for Additional Information No. 5766

Turkey Point Units 6 and 7
Florida P and L
Docket No. 52-040 and 52-041
SRP Section: EIS 5.2 - Water Related Impacts
Application Section: Part 3, Environmental Report, Section 5.2

QUESTIONS for Environmental Technical Support Branch (RENV)

EIS 5.2-***

The radial collector well system is described as a backup water supply. Describe the maximum amount of time each year that the radial collector wells (RCW) will be operated, the maximum continuous time they will be operated, the distribution of operational time through the year, and the lengths of time and pumping rates during the operational periods of the radial collector wells. Explain any assumptions used to support this response.

Different reports supporting the COL propose different lateral lengths for the radials of the RCW. The Groundwater Modeling Report states 700 feet and the Cooling Water Supply and Disposal Conceptual Design Report states 900 feet. Please clarify the length and number of the RCW laterals. Please provide a map to scale showing the layout of the RCW laterals and the Biscayne National Park boundaries including the proposed coordinates of the position of the RCWs and the projected cone of influence of the full scale operation of the RCWs.

EIS 5.2-***

Describe any monitoring of chemical parameters that will be conducted on the water produced by the radial collector wells and the water within the overlying Biscayne Bay (including Card and Barnes Sounds) during radial collector well operations. Describe how this data could be used to verify the model-predicted proportions of water taken from the Bay versus water taken from the Biscayne aquifer under lands to the west of Biscayne Bay.

EIS 5.2-***

What is the predicted additional drawdown at the nearest offsite water supply well caused by operation of the radial collector well system? Describe how this predicted drawdown was calculated, including all parameters, assumptions and model implementation details.

EIS 5.2-***

Describe the effects, if any, that pumping from the radial collector wells will have on the hypersaline groundwater plume from the existing cooling canals, considering the potential for density-driven unsteady flow of the hypersaline plume.

EIS 5.2-***

Provide any comprehensive geological subsurface survey that would identify karst features and quantify the potential for fracture or collapse of the limestone bay bottom for the area proposed to be drilled. Provide any models and reports to show that the area for drilling will not collapse, (e.g., the lithographic information collected as part of the well construction for monitoring under the Uprate Monitoring Plan).

EIS 5.2-***

Provide the document, "Cooling water supply and disposal conceptual design report: FPL proposed units 6&7 at Turkey Point" prepared in March 2009. This report is requested to provide information on the temporal distribution and maximum and average water available as reclaimed water, and the temporal distribution and maximum and average water quality for the reclaimed water. The document also provides other information about water quality and chemicals to be used for treatment, including the planned treatment at the South Dade Waste Water Treatment Plant.

EIS 5.2-***

Provide the current status and content of the agreement for access to/appropriation of 90 MGD reclaimed water described in the ER. The staff is aware of an unsigned version of a Joint Participation Agreement between Miami-Dade County and FPL providing for development of a reclaimed water project.

EIS 5.2-***

During the site audit, staff reviewed the document "Cooling water supply and disposal conceptual design report: FPL proposed units 6&7 at Turkey Point" prepared in March 2009. This document discusses several possible routes to be used for the reclaimed water pipeline in the area near the South Dade Waste Water Treatment Plant. Provide information on these identified routes in a referenceable form. If a route has been chosen from among these possible routes, provide a description of the proposed route and a GIS overlay of the route (the available GIS layer shows all the possible routes).

EIS 5.2-***

Provide an analysis of the reclaimed water treatment facility stormwater capacity and runoff. Include a figure showing storm water discharge locations.

EIS 5.2-***

ER Revision 2 Section 2.3.1.1.4 Industrial Wastewater Facility states that the water level in the industrial wastewater facility (IWF) rises and falls with the tide in Biscayne Bay. Provide water level time series data in the IWF that show this phenomenon at a time frequency (minimum interval of 1 hour) adequate to resolve the shape, tidal range, maximum water levels, and minimum water levels. Also, include a map of the measurement locations. Include the maximum measured range in water level. Include data for a period of at least two weeks. Also, provide a discussion of a plausible conceptual model that accounts for the tidally-induced water level variation in the IWF. Provide a discussion concerning the effects of the operation of the RCW's on these phenomena. This information is requested for the cumulative impacts analysis.

EIS 5.2-***

The review team requests information on the quality of water that will be delivered to the Turkey Point Site. Provide water quality data (concentrations) for proposed plant water supply sources including reclaimed wastewater and water from radial wells. Provide the water quality data at a frequency sufficient to characterize seasonal variability (monthly intervals if available). The water quality constituent data of interest focuses on EPA priority and non-priority constituents and emerging constituents of concern. These include but are not limited to such constituents as the following: salinity; total suspended solids; nutrients (e.g., nitrogen, phosphorus); etiologic agents (e.g., fecal coliform); heavy metals/inorganics (e.g., mercury, antimony, arsenic, selenium, beryllium, cadmium, lead); pharmaceuticals (e.g., triclosan, warfarin, estradiol or other hormones); and organics (for example, but not limited to, phenol, anthracene, naphthalene, phthalate, benzene). Discuss the transitioning between sources that would be necessary during times of low water availability.

EIS 5.2-***

The proposed cooling water supply sources are reclaimed wastewater and marine water from Biscayne Bay. The use of reclaimed wastewater may necessitate the use of treatment to produce water quality suitable for use in the cooling water system. Explain anticipated treatment needs and methods. Provide an estimate of the volume of waste that would be generated from treatment. Provide a discussion of the methods for disposal of any sludge produced from treatment. Include in the discussion the effect of treatment on concentrations of EPA priority pollutants and emerging constituents of concern.

EIS 5.2-***

The review team requests information on the quality of water that will enter the condenser cooling system and how the condenser cooling system will alter the water quality. Provide a process flow diagram with description of the proposed FPL reclaimed water treatment plant including characterization of plant effluent. Provide a technical discussion and analysis of the effect that the proposed cooling tower (heat transfer) process will have on the reclaimed water constituents (concentrations and transformations). Source water analysis constituents to be addressed include: TDS, total suspended solids, etiologic agents (protozoa, viruses, and bacteria, including fecal coliform), chlorides, carbon, nutrients (nitrogen and phosphorus); pharmaceuticals (e.g., triclosan, warfarin, estradiol or other hormones), organics (including but not limited to pesticides, benzene, anthracene, phenol, phthalates) and metals.

EIS 5.2-***

Provide water quality/chemical concentrations for cooling water to be used from radial collector wells. Provide an evaluation on the effect that the cooling tower (heat transfer) process has on the radial collector well water constituents (concentrations and transformations).

Radial collector well water constituents to be addressed include: TDS, total suspended solids, chlorides, organics and metals.

EIS 5.2-***

In the Salinity Impact Analysis, the ocean salinity concentration of 35 ppt does not reflect the actual seasonal variability in salinity concentrations that occur in Biscayne Bay. Monthly averages obtained from actual salinity data measurements from a nearby source would better estimate any salinity impacts. Provide available representative data for salinity in the area in the vicinity of the Turkey Point power plant.

The analysis assumes that the annual average rainfall is equal to the annual average evaporation in the calculation.; Provide the basis for this assumption including a reference for the evaporation value used. A value obtained from a weather station in close proximity to the site is preferred.

Draft Request for Additional Information No. 5768

Turkey Point Units 6 and 7
Florida P and L
Docket No. 52-040 and 52-041
SRP Section: EIS 7.2 - Water Use and Quality
Application Section: Part 3, Environmental Report, Section 5.11

QUESTIONS for Environmental Technical Support Branch (RENV)

EIS 7.2-***

During the site audit staff reviewed the document "Task 1.4: Analysis of Baseline water source technical review report: HDR Dec. 2007", in particular Figure 1.0, which shows overlap of plant footprint with projects that result in cumulative impacts to surface and groundwater resources. Provide this document and any related documents in a referenceable form. Please provide the data to support this figure and this analysis.

EIS 7.2-***

During the Site Audit staff reviewed "Water Management Project Design Document: CH2MHill Oct 2009". Provide this document and any related documents in a referenceable form. Clarify whether the "Water Management Feature" described in the ER (sections 4.1 and 5.2) will be included in the final plant design.

EIS 7.2-***

Provide a copy of the personal communication between Scroggs (FPL) and Marc C. LaFerrier/Miami Dade County, Department of Planning and Zoning dated August 7, 2008, as cited in Water Management Project Design Document: CH2MHill Oct 2009. In addition provide key subsequent communication about the "Water Management Feature" (as both a fill source or as a water management feature) between FPL and all agencies within the State of Florida, Miami-Dade County, the US Army Corps of Engineers (ACOE), and/or any federal agency. Include any and all Planning and Zoning documents.

EIS 7.2-***

Provide the documentation and reference for the horizontal to vertical hydraulic conductivity ratio (100:1) used in the COL Table 2.412-205 and in the CH2MHill Report (page 3-9) FPL Turkey Point Units 6 & 7 Water Management Project Design Document. Describe which stratigraphic unit within the Biscayne Aquifer the anisotropy ratio of 100:1 is intended to represent and how it was determined, with references and documents, if the references are not readily available.

EIS 7.2-***

Provide a discussion of any adaptations being considered to account for the changes in environmental impacts, if any, anticipated to result from sea level rise at the site of at least 1 ft by 2050, including potential impacts from operating the Turkey Point Units 6&7 radial collector wells at such increased sea levels. Also provide a discussion of changes in environmental impacts, if any, expected to result from operation of other infrastructure, such as the reclaimed water treatment plant, under such conditions. How will this amount of sea level change affect how the cooling canals function, how they respond to the operation of the RCWs, and how will these changes be mitigated or affect the operations of the proposed new plant (Units 6 & 7).

EIS 7.2-***

Explain to what extent the building and operation of the new units (radial collector well operations, site stormwater runoff, site dewatering flows, concrete island emplacement) could interact hydraulically with the existing cooling canal system. In particular, explain to what extent the building and operation of the new units, including the operation of the radial wells, could affect intrusion of saltwater from the cooling canals into aquifers, and/or into the Biscayne Bay. Provide quantification, ~~and~~ assumptions and references for determining the impacts.

EIS 7.2-***

Beginning with the current rate of chloride increase in the cooling canal system as a baseline, provide an analysis of the increasing salt concentration and rate due to additional salt deposition from the cooling towers when the proposed radial collector wells are in operation. This calculation should include the additional salt loading that is predicted to occur due to the assumed evaporation increases in the cooling canals from the Uprate project, since the Uprate project is proposed to be operational prior to the use of the proposed radial collector wells and would therefore be considered as background to units 6 & 7 changes.

In addition, provide an analysis showing how the increasing salt concentration will affect the wetlands known as the "Model Lands", Biscayne Bay, Biscayne National Park and Card Sound.

EIS 7.2-***

Explain how the activities related to building and operating the new units would interact with activities in the Comprehensive Everglades Restoration Project (CERP). Include in the response a quantitative description of the extent to which the activities on the site of Units 6&7 (e.g., dewatering, land modifications) and off the site (e.g., mining, roads, transmission) would affect hydrology, water resource availability, water clarity and water quality (dissolved oxygen, nutrient, chlorophyll a, TDS, organic and inorganic water quality constituents).

EIS 7.2-***

Provide available historical and current data on groundwater chemistry including (but not limited to) chemical constituents (including barium), radionuclides, and stable isotopes from wells within an 8-2 mile radius of the proposed plant locations. Also, provide any additional data on chemical constituents (including barium), conductivity, temperature depth, salinity, radionuclides, and stable isotopes for groundwater or surface water samples related to the cooling canal investigation or the FPL Turkey Point Power Plant Groundwater, Surface Water, and Ecological Monitoring Plan. Provide spatial extent and direction of chemical constituents including barium pursuant to the uprate monitoring requirements.

EIS 7.2-***

Describe the current understanding of the lateral and vertical configuration of the industrial waste water hypersaline plume from the existing cooling canals, including the location and temporal movement of chloride isopleths, and temperature isopleths, and tritium signature. Describe current efforts to determine the extent of this plume, including all pore water data collected to date as part of the state process to determine the extent of the interaction with the plume, the wetlands, and the bay.

Provide access to all data collected as part of the Units 3 & 4 Uprate monitoring provided to the state of Florida.