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From: Hambrick, Gordon A SAJ [Gordon.A.Hambrick@usace.army.mil]
Sent: Monday, January 30, 2012 1:19 PM
To: Hambrick, Gordon A SAJ; Snead, Paul; Bruner, Douglas; DavidA Pritchett; Gagliano.Paul@epamail.epa.gov; Dierolf, Amy C.; Kitchen, Robert; Hunter, John J (Jamie); Kitchen, Robert; Frank Matthews
Cc: Collazo, Osvaldo SAJ; Kasbar, John F SAJ; Weeks, Russell SAJ; Kemp, Susan K SAJ; Loschiavo, Andrew J SAJ; Hudson, Theresa SAJ
Subject: Final meeting notes with attachments for PEF/LNP Meeting on 01/19/2012 (UNCLASSIFIED)
Attachments: Attachment 1 for 01-19-2012 Meeting.pdf; Attachment 2 for 01-19-2012 Meeting.pdf; Attachment 3 for 01-19-2012 Meeting.pdf; Attachment 4 for 01-19-2012 Meeting.pdf; PEF MeetingNotes 01-19-2012.pdf

Classification: UNCLASSIFIED
Caveats: NONE

All:
I received one correction and no additions in response to the draft meeting notes. Attached are final meeting notes and the attachments for the meeting notes.

Don

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Attachment 1 for 01-19-2012 Meeting.pdf	472659	
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Attachment 4 for 01-19-2012 Meeting.pdf 1336422
PEF MeetingNotes 01-19-2012.pdf 810620

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Attachment 1

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS

US Army Corps of Engineers®

Meeting Attendees List

Date: January 19, 2012

Location: Corps of Engineers, Jacksonville District – Jacksonville, Florida

Time: 1000 EST

Meeting Subject: Progress Energy Florida/Levy Nuclear Plant – SAJ-2008-00490(IP-GAH)

Attendees

Name	Affiliation	Phone
Don Hambrick	USACE	(850) 763-0717 ex25
Amy Dierolf	Progress Energy	(727) 820-5657
Paul Snead	Progress Energy	(919) 546-2836
Bob Kitchen	Progress Energy	919 546-6992
Frank Matthews	" " (HGS)	850 222 7500
Douglas Brunt	NRC	301-415-2730
Oswaldo Collazo	USACE	904-232-1659
Russ Weeks	USACE	904-232-1159
John F. Kasbar	USACE	904-232-2120
Andrew Loschiavo	USACE	904-232-2077
Susan Kemp	USACE	904-232-2017
Jeff Lefner - CARMHell		Theresa Hudson, USACE
Paul Gagliano - EPA, NEPA		
Jamie Hunter - PEF		
" " " - EPA 404		

by telephone

Attachment 2

Meeting Regarding FEIS / 404 Permitting Needs

For PEF – Levy Nuclear Plant
(SAJ-2008-00490)

January 19, 2012
Jacksonville, Florida

AGENDA

- NRC / USACE FEIS Writing Session – Any open issues?
- Status of USACE Review of PEF Responses to Corps Position Letters dated 06/23/11 and 09/09/11
    - Evaluation of LNP as the LEDPA Site
    - Evaluation of Avoidance and Mimimization
- Cultural Resource Consultation
- Wetland Mitigation Plan Implementation (on Government lands)
- Other Items

Attachment 3

"Position Letter Checklist – 06-23-2011 & 09-09-2011" for PEF/NRC/EPA/Corps Meeting on 01/19/2012

From Corps 06/23/2011 Position Letter:

Please be advised that the Corps has not yet engaged in detailed evaluation of PEF's proposed wetland mitigation plan; and is working with the NRC and PEF in ongoing coordination with the U.S. Fish and Wildlife Service (FWS) in regard to impacts the project may have on fisheries, wildlife, and animal and plant species subject to the FWS authority under the Endangered Species Act and the Fish and Wildlife Coordination Act; and in ongoing coordination with the Seminole Tribe of Florida in regard to potential project impacts on cultural resources. These ongoing evaluations and coordination efforts may be the subject of future correspondence and requests for additional information to PEF from the Corps.

EPA Comments - Corps initial evaluation/comments in red. Need concurrence/response/input from EPA, since these are EPA's comments.

1. Provide an analysis of alternatives to avoid and minimize impacts to high quality wetlands, associated with the installation of pipelines, including alternatives such as tunneling or horizontal directional drilling.

PEF Response #1, dated 09/20/2011 – PEF #L-0960 and Attachment 338884-THEM-129, *Evaluation and Management of Materials Dredged from the Cross Florida Barge Canal for the Construction of Barge Slip, Intake Structure, and Pipeline Facilities Associated with the Levy Nuclear Plant, Levy County, Florida*. This document appears acceptable to the Corps.

PEF also referenced PEF #L-0977 to be submitted in the future, which PEF states includes additional information in regard to pipelines & minimization. (PEF #L-0977 with Attachment E, part of PEF Response #3, dated October 20, 2011 to Corps's Other #2; Attachment E is *Avoidance and Minimization Analysis for the Levy Nuclear Plant*).

As stated in Corps email to PEF dated 11/16/2011 and as discussed at the PEF/Corps/NRC/EPA meeting/teleconf on 11/22/2012, the blowdown pipeline must be installed a minimum of 4' below the bottom contour of the CFBC. PEF to provide modified drawings to show 4' minimum, signage.

Total wetland impact from Raw Water System outside of common route is 0.03 acre.

Question in regard to dewatering for pipeline installation – page 33 of 36 of Attachment E – use of BMPs to appropriately recharge – what BMPs? Please provide more information.

With exception of question above, explanations as to methods of installation and location of proposed pipelines, as currently proposed, appear acceptable to the Corps.

2. Provide more specific information on the wetland functions and values that would be impacted at the non-preferred alternative site locations. It is difficult to determine the quality of wetland impacts associated with the alternative sites when a reasonable wetland functional analysis has not occurred.

Corps's Note: Subsequent to receipt of the EPA's comments to the DEIS, representatives of the EPA, NRC and the Corps met at the EPA's Atlanta offices on April 6, 2011 to discuss EPA's comments. The Corps agreed with the EPA that inclusion of an evaluation of the relative quality of wetlands among the alternative sites, as a review factor, should be included in the alternative sites analysis. The EPA agreed with the Corps that it would be satisfactory for PEF to use a combination of Florida Land Use, Cover, and Forms Classification System (FLUCCS) data with aerial photography as the basis of the evaluation. The EPA and the Corps also agreed that for purposes of the comparison of wetlands acreages among the alternative sites, that the use of FLUCCS data along with land use information, soil maps, and historical and current photography, as described in *Levy Nuclear Plant Units 1 and 2 (LNP) Section 404(b)(1) Alternatives Analysis, June 2010*, is acceptable.

PEF Response #1, dated 09/20/2011 – PEF #L-0961 and Attachment 338884-THEM-130, *Functional Evaluation of Wetlands for the Alternative Sites, Levy Nuclear Plant, Florida.*
The analysis and conclusions provided by PEF appear acceptable to the Corps– LNP site would be LEDPA (assuming no impacts from groundwater withdrawals on wetlands/aquatic resources).

3. The EPA requests that PEF submit a CFBC and Withlacoochee River Survey and Monitoring Plan to the EPA for review prior to initiation of formal monitoring. EPA may have specific monitoring recommendations and/or requirements

Corps's Note: By cover letter dated February 15, 2011, NRC provided a copy of PEF's *Cross Florida Barge Canal and Withlacoochee River Survey and Monitoring Plan – Levy Nuclear Plant (November 2010)* to the EPA. The EPA may have subsequent comments after its review of this document, which may require additional correspondence and coordination amongst the EPA, NRC, PEF and the Corps.

PEF Response #1, dated 09/20/2011 – PEF #L-0962.
Monitoring plan reviewed by and appears acceptable to the Corps, but need comments from EPA, if any, for review and additional coordination if needed.

4. In order to protect high quality wetlands, transmission line right-of-ways (ROWs) should be reduced to as minimum dimensions, as practicable.

Corps's Note: During a teleconference amongst the EPA, NRC and the Corps on February 10, 2011, the EPA further identified that EPA concerns were not limited to fill impacts, but also impacts to vegetation in developing and maintaining the ROWs, such as trimming, mowing, use of herbicides, etc.

PEF Response #3 October 20, 2011 – PEF #L-0976 with *Attachment A, Levy Nuclear Plant – Transmission Lines – Alternative Analysis and Avoidance and Minimization, October 2011*.

Question: On page 22 of Attachment A identifies that areas of tall growing and incompatible plant species within transmission line ROWs may have vegetation removed by mechanical means – what does this mean? Root raking – change in contours? Please explain. Mechanical landclearing can be a fill discharge. If these activities comprise regulated work, then should be shown on drawings and included in tables as impacts.

Otherwise, overall explanation of minimization efforts and rationale appears acceptable.

5. Why was the detailed site layout, as it is presently configured, selected? It appears that by shifting the project further south, overall wetland impacts would be lessened. Moving the site layout southward appears to reduce the length of the transmission line corridor and reduces impacts to other onsite wetlands.

Corps's Note: Your response should address both the South and North parcels.

PEF Response #3 October 20, 2011 – PEF #L-0975
Response appears acceptable to the Corps.

6. The DEIS states that approximately 150 acres on the site would be disturbed for temporary facilities and are proposed to become open grassy areas after use of such facilities are completed. This would be a permanent conversion from pine plantations, forested wetlands, and mixed forested areas. These areas should be restored back to forested and mixed forested wetland systems, if there are no safety or other serious operational reasons that would require these areas to be open grassy areas.

PEF Response #5, dated 11/10/2011 – PEF #L-0980 – Temporary Impact Restoration Plan appears acceptable to the Corps, but appears more minimization of temporary impacts is possible – See Corps #3.

See Corps's specific comments in paragraph #3 on page 20 below in regard to this EPA comment.

7. Provide clarification and information as to what specific wetlands are associated with miscellaneous fill, pipelines, and structures, as identified in the DEIS.

See Corps's specific comments in paragraph #1 on page 20 below in regard to this EPA comment.

PEF Response #3 October 20, 2011 – PEF #L-0978. PEF's response and types of information provided appear acceptable to the Corps.

For Corps's specific comment #1 - PEF Response #3 October 20, 2011 - PEF#L-0967 with Attachments C and D, which show in detail, regulated impacts associated with plant facility (Attachment C) and transmission lines (Attachment D); see notes at Corps's #1.

8. EPA concurs that an alternate blowdown pipeline route should be established to avoid impacts to 4.5 acres of salt marsh wetland.

See Corps's specific comment in paragraph #2 on page 6 below in regard to this concern.

PEF Response #2 October 4, 2011 – PEF #L-0968.
Blowdown pipeline was rerouted, as requested by the EPA and Corps.

9. The DEIS states that impacts will temporarily occur to 149.6 acres of wetlands that will later be allowed to regenerate naturally from the existing wetland seed bank. These wetland impacts will likely become permanent if the forested systems are not replanted and restored to their original condition. The forested wetland systems should be replanted in order to insure impacts are temporary only.

See Corps's specific comments in paragraph #3 on page 20 below in regard to this concern.

PEF Response #5, dated 11/10/2011 – PEF #L-0981 –Temporary Impact Restoration Plan appears acceptable to Corps, but see Corps #3 – appears addtional minimization of temporary impacts is possible.

10. The DEIS states temporary dewatering of wetlands may occur in order to install the blowdown pipelines and other structures over a 2 to 4 year period, but that long-term effects on adjacent wetlands are anticipated. EPA recommends that a wetland functional analysis be conducted on the adjacent wetlands and any adverse wetland impacts that are identified due to dewatering be mitigated.

PEF Response #1, dated 09/20/2011 – PEF #L-0963 and Attachment 338884-THEM-131, *Effects of Temporary Dewatering on Wetlands for the Construction of the Levy Nuclear Plant, Levy County, Florida.*

1. Dewatering associated with pipelines will be on an 8-week staged work area several hundred feet long moving along pipeline routes. Appears that impacts from this dewatering on wetlands would be temporary, short-lived, tempered by discharge of the water on adjacent land and thus back into groundwater, and so minimal, as to not require specific compensatory wetland mitigation.

2. Dewatering associated with the two to four year excavation and filling for the nuclear islands would be controlled by methods identified by PEF, including that only the interior of the excavations would be dewatered due to the use of grouting/diaphragm walls, and pumped water discharged to close by infiltration basins. Also the nuclear islands are in the near middle of the construction zone with the distance to the closest wetlands not to be filled being about 800' with most of the undisturbed wetlands not to be filled over 2000' to more than 4000' distant. The CoCs require that PEF create and implement, subject to approval by FDEP and SWFWMD 6 months before start of dewatering, a construction dewatering plan for all dewatering for the facility, which would include a detailed dewatering system, discharge quantities and locations, BMPs, and a

monitoring plan. Submittal to the Corps of a copy of this plan and copies of the written approvals from the FDEP/SWFWMD to PEF may be required, as conditions of a DA permit.

Other dewatering associated with facility construction would be temporary and short duration.

11. Provide a detailed mitigation plan and the UMAM scores for the impact and mitigation sites.

Corps's Note: As stated in the second paragraph of this letter, the Corps has not yet engaged in detailed evaluation of the proposed mitigation plan. The Corps intends to coordinate with EPA in its review and evaluation of the mitigation plan. There may be subsequent requests for additional information by the Corps from PEF and coordination with PEF by the Corps during the Corps's detailed evaluation of the proposed mitigation plan.

PEF Response #2 October 4, 2011 – PEF #L-0969.

Revised mitigation plan received with this response – dated September 2011 – plan is under review.

12. The DEIS states that up to 2092.9 acres of wetlands could be adversely affected over the course of the 60 years that ground water is pumped to support the LNP project. Provide an analysis of other alternative sources of water to support the LNP project.

See Corps's specific comments in paragraph #2 on page 9 below in regard to this comment.

PEF Response #4, dated 11/01/2011 – PEF #L-0984

Acceptable in showing that there are practicable alternatives with very minor wetland impacts for alternate water sources to allow use of the LNP site, particularly desalination, if impacts from groundwater pumping at the LNP site.

13. The DEIS states that strategic considerations indicated the LNP site would be preferable to collocating at the Crystal River. The EPA believes a stronger narrative with more details, including additional technical rationale, regarding the strategic considerations for why the LNP site is preferable to collocating at the Crystal River Energy Complex location is needed, than that as was provided in the DEIS.

PEF Response #3, dated 10/20/2011 – PEF #L-0979.

Response appears acceptable to the Corps.

NMFS Comments Corps initial evaluation/comments in red. Coordination with NMFS is ongoing.

Based on the above concerns, the NMFS recommended that the following five EFH Conservation Recommendations be required for permitting of the proposed project:

1. A minimum five-year baseline survey should be developed and coordinated with state and federal natural resource agencies to determine site-specific, year-round impacts to fish and invertebrate resources present at the cooling water intake site following plant operation. Acquired data can then be used to quantitatively calculate potential impacts of LNP operations on identified fishery resources and, if determined necessary, to develop and implement Best Management Practices and adaptive management mitigation options to further reduce such impacts.

PEF Response #2 October 4, 2011 – PEF #L-0970.
Coordination of plan with NMFS for feedback/acceptance ongoing.

2. A minimum three-year SAV survey, conducted between June 1 through September 30, should be conducted in portions of the Gulf of Mexico offshore of the cooling water discharge canal at the Crystal River Energy Complex facility to determine if discharge of additional cooling water from LNP operations is resulting in adverse impacts to SAV. Following SAV sampling and if survey results indicate diminished SAV densities are occurring as a result of discharge of LNP cooling water, development of an SAV mitigation plan should be developed in consultation with state and federal natural resource agencies.

PEF Response #2 October 4, 2011 – PEF #L-0971.
Coordination of plan with NMFS for feedback/acceptance ongoing.

3. The filling of approximately 4.5 acres of estuarine emergent marsh habitats for proposed blowdown pipeline corridor routing between the LNP and existing Crystal River Energy Complex facility should not be authorized. Alternatively, necessary pipeline construction should be aligned through available upland areas between these sites.

PEF Response #2 October 4, 2011 – PEF #L-0972.
Rerouting appears acceptable by Corps – Coordination with NMFS for feedback/acceptance ongoing.

4. If it is determined there is a need for dredging portions of the Gulf of Mexico immediately offshore from the Cross Florida Barge Canal, then benthic surveys should be conducted. Such surveys should also include benthic habitat assessments to determine the presence and abundance of SAV and hardbottom habitats. Results of these surveys should be provided to NMFS staff for review and comment.

PEF Response #2 October 4, 2011 – PEF #L-0973.
PEF's study demonstrating that dredging is not required at this time appears acceptable to Corps – Coordination with NMFS for feedback/acceptance ongoing.

5. Provided unavoidable hardbottom and SAV impacts are expected to occur as a result of Item "4.", above, development of a conceptual compensatory mitigation plan for impacts to marine habitats should include the following elements: 1) description of the mitigation plan; 2) quantification of anticipated impact acreage versus proposed mitigation acreage and justification for the proposed mitigation acreage; 3) scientific criteria for determining mitigation success; 4) a

project and mitigation implementation schedule; 5) targeted climax communities expected in mitigation area(s), including their acreage and configurations; 6) materials and methods to be used to achieve the intended mitigation; 7) comprehensive five-year monitoring and reporting schedules; and 8) contingency plans by which equivalent mitigation would be completed if the proposed mitigation fails.

PEF Response #2 October 4, 2011 – PEF #L-0974.
PEF's study demonstrating that dredging is not required at this time appears acceptable to Corps; therefore, no mitigation required - Coordination with NMFS for feedback/acceptance ongoing.

The following are additional comments and information requests from the Corps related specifically to the above NMFS's comments, concerns and EFH Conservation Recommendations:

1. The Corps concurs with EFH Conservation Recommendations 1 and 2 above, and requests that PEF comply with these two recommendations, and requests information as to how these recommendations would be complied and/or implemented by PEF.

PEF Response #2 October 4, 2011 – PEF #L-0970 and PEF #L-0971.
Ongoing coordination of the two surveys and monitoring plans with NMFS for feedback/acceptance.

2. By letter to PEF dated January 3, 2011 the Corps approved a jurisdictional determination for PEF for an alternate blowdown pipeline route that does not transverse tidal wetlands. However, it appears that the Corps has no written record that PEF has formally modified the blowdown pipeline route for the Corps evaluation of PEF's Department of the Army permit application. If PEF has decided to pursue permitting of this alternate route, the Corps needs written affirmation with a map and drawings, which specifically show and describe the new route. If PEF has decided to continue permitting of the original blowdown pipeline route, the Corps continues to find the potential impact by construction of the blowdown pipeline through tidal wetlands to be problematic.

PEF Response #2 October 4, 2011 – PEF #L-0972.
Provided to Corps, as requested. See above.

3. The Corps has concerns in regard to whether there is a need to dredge the shallow nearshore portions of the CFBC access channel in the Gulf of Mexico for barges proposed to be used by PEF for this project. The Corps concurs with EFH Conservation Recommendations 4 and 5, if such dredging is needed. If PEF believes that dredging is not required for barges associated with this project to utilize the CFBC access channel, please provide information to demonstrate that conclusion. Information should include anticipated draft of barges and tugs to be used, and current water depths of the access channel to the CFBC. If dredging is required, additional information, including drawings showing the extent of dredging, will be required. Also, provide similar information to demonstrate that sufficient depths exist within the CFBC from its start at the access channel to the proposed barge slip.

PEF Response #2 October 4, 2011 – PEF #L-0973.
Provided to Corps, as requested. See above.

Corps's Comments in Regard to the Alternative Sites Analysis under Section 404 of the Clean Water Act

The Corps, after having reviewed the *Revised Section 404 Alternatives Analysis*, the comments received in response to the DEIS, information in the record for the DEIS, and additional information provided by PEF, has determined that the analysis, as currently provided by PEF in the *Revised Section 404 Alternatives Analysis* to demonstrate that PEF's preferred alternative at the LNP site is the Least Environmentally Damaging Practicable Alternative (LEDPA), does not appear to satisfy the requirement in the Guidelines at CFR Part 230.10(a)(3): "Where the activity associated with a discharge which is proposed for a special aquatic site (as defined in Subpart E) does not require access or proximity to or siting within the special aquatic site in question to fulfill its basic purpose (i.e., is not ``water dependent''), practicable alternatives that do not involve special aquatic sites are presumed to be available, unless clearly demonstrated otherwise. In addition, where a discharge is proposed for a special aquatic site, all practicable alternatives to the proposed discharge, which do not involve a discharge into a special aquatic site, are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise."

1. Wetland Delineations among the Alternative Sites:

As stated in the Corps's June 17, 2010 letter to PEF, "On the Levy site there is a large difference between the areal extent of wetlands, as determined from ground-truthed wetland delineations, in comparison to the areal extent of wetlands, as determined by use of FLUCCS data. The difference is that almost 80% more wetlands have been delineated, than identified by FLUCCS on the Levy site…..the alternative sites should be reviewed using other data, such as aerial photography and soils survey maps, along with FLUCCS data, in order to more accurately identify the extent of wetlands on the alternative sites in comparison with the Levy site. PEF should provide supporting information, which shows that the comparison of the areal extent of wetlands on all of the alternative sites is reasonable and defensible." As indicated above in the EPA comments, #2 on page 2, EPA and the Corps agreed that for purposes of the comparison of wetlands acreages among the alternative sites, that the use of FLUCCS data along with land use information, soil maps, and historical and current photography, as described in *Levy Nuclear Plant Units 1 and 2 (LNP) Section 404(b)(1) Alternatives Analysis, June 2010*, is acceptable. However, delineation of wetlands in compliance with the Corps's current wetland delineation manual and manual supplement is required for evaluation of minimization of wetland impacts on the site (including all ancillary components, such as the transmission line corridors) found to be the LEDPA. The Corps is working with PEF in finalizing approved wetland delineations associated with the LNP alternative.

PEF Response #1, dated 09/20/2011 – PEF #L-0964.

PEF's response appears acceptable. JD completed on plant site parcels and this JD was used for drawings to show project impacts in response to Corps's wetland impact minimization questions.

2. Plant Operation Groundwater Withdrawal Impacts:

As stated in the Corps's June 17, 2010 letter to PEF, "The potential impacts of groundwater drawdown on wetlands should be addressed and compared among the alternative sites (see item #8 on page 6 of the Corps' letter to PEF, referenced above and dated March 5, 2010). The drilling and use of water supply wells are proposed at the Levy site to supply groundwater for general plant use. It is the Corps understanding that no such wells would be required at the three alternative sites where reservoirs would be required. PEF has submitted two groundwater analyses, the first analysis showed the potential of up to 0.5' of drawdown of groundwater within areas of wetlands, and the second analysis showed the potential of up to 2.5' of drawdown within areas of wetlands."

PEF responded in the *Revised Section 404 Alternatives Analysis* that the ranking for LNP was reduced from 4 to 3 for the "Water Source Impacts" specific criterion due to LNP being the only site where withdrawal of groundwater would occur. PEF also responded that in accordance with the State of Florida's Conditions of Certification (COC), wetlands and other surface waters would not be adversely affected, as a result of authorized consumptive water use. However, the Corps notes that the COC does foresee the possibility of adverse impacts to wetlands and surface waters. The January 26, 2011 modification of the COC is specifically conditioned on pages 43 and 44 that if adverse impacts are detected or predicted through required environmental monitoring, aquifer performance tests, or groundwater modeling, the applicant must either mitigate for such adverse impacts or select and implement an alternate water supply project, subject to approval by the Southwest Florida Water Management District (SWFWMD). The record shows that implementation of an alternative water supply project has been identified as a possible alternative, which would be acceptable by PEF, if required by the SWFWMD. Thus implementation of an alternative water supply is a component of a practicable alternative for the LNP site.

On pages 5-23 thru 5-28 of the DEIS information in regard to the potential impacts of the four proposed production wells for plant operations to be located south of the LNP generating facility are discussed. The DEIS explains that PEF developed a local-scale groundwater model, as a requirement for the state's evaluation of the State of Florida Site Certification Application. The model was used to simulate both LNP and cumulative groundwater usage. The groundwater simulations used the SWFWMD's DWRM2 model, and indicated a potential drawdown impact on the surficial aquifer on the order of 0.4 to 0.5 ft in areas immediately adjacent to wellheads over 60 years of groundwater pumping. The DEIS review team requested that PEF recalibrate the model using site-specific and regional hydraulic head data to improve the model's goodness of fit. The recalibrated model indicated that annual average LNP groundwater usage from the Upper Floridan aquifer would, over 60 years of operation, result in surficial aquifer drawdowns of as much as 2.5 ft in areas near the wellheads with a drawdown of 0.5 ft extending up to 3 mi from the wellheads. This drawdown zone would encompass about half of the LNP site and substantial offsite areas, including many acres of wetlands. A report from the SWFWMD

suggests that extended drawdowns from 0.6 ft to 1 ft can result in substantial changes to vegetation composition and structure, and 1-ft decline can adversely affect seasonally and semi-permanently flooded wetlands (Mortellaro, S., S. Krupa, L. Fink and J. VanArman. 1995. *Literature Review on the Effects of Groundwater Drawdowns on Isolated Wetlands*. SWFWMD). Mapping of the zones of groundwater drawdown, as simulated by the recalibrated model, over FLUCCS mapping of the site and adjacent areas, showed a total area of approximately 7344 acres of uplands and wetlands could be impacted by groundwater drawdowns for over 60 years of pumping. Up to 2093 acres of wetlands could be adversely affected including cypress swamps (1017 acres), mixed forested wetlands (646 acres), and freshwater marshes (402.2 acres). The actual wetland impact would be considerably greater than 2093 acres, if the same difference between wetlands delineated using the Corps's manual is 80% greater than wetlands than identified by FLUCCS, as was demonstrated on the LNP site. Assuming an 80% correction factor, then wetlands affected by groundwater drawdown could total as much as approximately 3700 acres at the LNP site area.

As was stated above the Jacksonville District Engineering Division has conducted a technical review of the potential for adverse impacts resulting from groundwater withdrawal associated with plant operations at LNP, and a technical review of the two groundwater model simulations used to assess the potential for adverse impacts. As stated above a copy of the review is enclosed. Overall, the technical review found that there is a substantial lack of information and that it is not possible to quantitatively comment on the reliability of either model simulation, but that of the two model simulations, the 3-layer recalibrated model is better supported by available information.

There is a large degree of uncertainty associated with the two the model simulations; but that of the two, the 3-layer recalibrated model is better supported by available information. The Corps will assume the worst-case scenario in terms of groundwater and wetland impacts, as indicated by the recalibrated model, in evaluating the alternative sites for this project. Therefore, the Corps has determined to evaluate two scenarios at the LNP site as two different alternatives: PEF's proposed project, which includes groundwater withdrawals for plant operations, using the recalibrated model to quantify wetland impacts ("LNP/RM" alternative site); and an alternative at the LNP site, which would use an alternative water source, and thus no operational groundwater withdrawals ("LNP" alternative site). The Corps has determined that both of these alternatives are practicable.

STILL UNDER REVIEW

3. Alternative Sites Ranking Methodology:

The Corps does not support the use of quartiles in the ranking of the alternative sites for most of the specific criteria measured by quantifiable data, because quartiles can result in too large a range of impacts to be grouped together within any one level of ranking. The Corps supports the use of a decile ranking scale for specific criteria, which are evaluated using quantifiable data. The Corps can accept the use of quartiles for the ranking of the more subjective, qualitatively assessed specific criteria. The decile rankings can be adjusted, as will be demonstrated in the comments below, to use with the quartile rankings to determine the

consolidated scores. Attached is a copy of Table 5.0-1 with Corps changes in regard to rankings, calculation of consolidated scores, and total scores (Enclosure 4).

PEF Response #1, dated 09/20/2011 – PEF #L-0965.
PEF stated reviewed the Corps's scoring and had no further comment.

4. The following are the Corps's comments in regard to review factors and specific criteria, as referenced and discussed in the *Revised Section 404 Alternatives Analysis*:

Overall, the LNP site with an alternative water supply for plant operations scored the highest and is tentatively the LEDPA, subject to revision of the alternative sites analysis after evaluation of the relative functions and values of the wetlands, which would be impacted among the alternative sites. The LNP/RM, which uses groundwater for plant operations, scored the lowest.

PEF Response #1, dated 09/20/2011 – PEF #L-0966.
PEF reviewed the Corps comments and modifications, and had no comment in regard to the Corps's adjustments and rankings.

Other Corps's Comments and Questions

The following comments and questions are provided, even though the Corps at this time does not accept the project, as currently proposed by PEF at the LNP site with groundwater withdrawal for plant operations, as the LEDPA. However, the comments and questions below are applicable to both the LNP and LNP/RM alternatives.

1. Provide project plan drawings in sufficient detail to accurately show all impacts both permanent and temporary to wetlands and other waters associated with this proposed project, including the facility site, parking lots, stormwater facilities, laydown areas, buffers, fencing, blowdown pipeline, blowdown discharge structure/work, haul road, barge slip and associated components (i.e., boat docks, piers, pilings, boat ramps, dredging, filling, revetments, seawalls, dredge spoiling, etc.), water intake structure, utilities, water wells, access roads, transmission lines, switchyards, substations, etc. Cross-sectional drawings should be provided as appropriate. Wetland delineation lines on the drawings must be those most recently and specifically approved in writing by the Corps to PEF. Types of wetlands to be impacted should be accurately identified and impact quantified. Use of FLUCCS to identify wetland types would be acceptable. Examples of the level of detail required in the above drawings were provided to representatives of PEF by the Corps at a meeting in Panama City on November 18, 2010.

PEF Response #3 October 20, 2011 – PEF #L-0967 with Attachments C and D, which show in detail, regulated impacts associated with plant facility (Attachment C) and transmission lines (Attachment D).

However, the proposed substations do not appear to be completely shown. Are all fill impacts/development shown for all sub-stations?

Which wetlands are isolated (not JD) vs. which are JD, are not identified for the transmission lines in Attachment D (are identified in Attachment C for facility). **This Corps's concern subsequently met by tables submitted by email from PEF on December 15, 2011.**

Otherwise, drawings appear acceptable, as far as degree of detail and information provided.

2. PEF must demonstrate that impacts to wetlands and other waters have been minimized to the maximum extent practicable. The drawings referenced above should clearly show the identity and use of structures, fills, excavations, etc. Written justification as to why specific project components must be located in wetlands or other waters, rather than reconfigured so as to avoid wetlands and other waters, should be provided.

For plant site PEF# L-0977 with Attachment E, part of PEF Response #3 October 20, 2011:

Question in regard to dewatering for pipeline installation – See EPA #1 above.

Overall, explanations as to minimization of wetland impacts for plant site, as currently proposed, appear acceptable, except for "temporary impact areas".

- "Temporary impact areas" – Vary b/w ~25' to ~150' in width. Most are 50' or more. Seems excessive. Why is more than 20' at most required?

Review of Attachment C, part of PEF Response #3 October 20, 2011, drawings for plant facility: Overall acceptable with one modification:

- Figure 11, Sheet 13 – as email to Snead dated 11/18/2011 and discussion on 11/22/2011, need modified drawings for blowdown crossing of CFBC – 4' depth below contour, signs, etc.

For transmission lines PEF# L-0976 with Attachment A, part of PEF Response #3 October 20, 2011: Acceptable to Corps.

Review of Attachment D, part of PEF Response #3 October 20, 2011, drawings for transmission lines: Overall acceptable with following question (Corps will handle).

- Sufficient height per Corps regulations of transmission line heights over navigable waters:
- Common Route at the CFBC and Ingliss Bypass – sheets 1 & 2
- Common Route at Withlacoochee River – sheets 4 & 5
- Levy Central Florida South (LCFS) – Sheet 62
- PHP at Hillsborough River/Trout Creek – sheets 114, 115
- PHP at a large lake – sheet 143.

3. All temporary work/fill/excavation areas in wetlands and other waters should be minimized. Temporarily impacted wetlands should be restored at a minimum to their pre-impact condition. Provide a wetland restoration plan for all temporarily impacted wetlands, which would be restored. The plan should have drawings and be sufficiently detailed to show and describe type of wetlands to be temporarily impacted, the goals of the restoration, timing of

restoration, etc. The plan should be similar to a wetland mitigation plan. Explain in detail justification for any temporary wetland impact areas that PEF proposes not to restore to prior wetland conditions.

PEF Response #5, dated 11/10/2011 – PEF #L-0982
- "Temporary impact areas" – Vary b/w ~25' to ~150' in width. Most are 50' or more. Seems excessive. Why is more than 20' at most required?
Temporary Impact Restoration Plan appears acceptable to Corps.

4. As part of project minimization and assurance of minimization in terms of impacts to waters of the United States, including wetlands; all remaining wetlands associated with the plant site and support facilities (i.e. North and South parcels, access parcel) should be preserved under conservation easement granted to the Florida Department of Environmental Protection.

See Corps's letter dated 09/09/2011 for resolution acceptable to the Corps.

5. Construction of the proposed plant facility, and its ancillary components, including transmission lines and sub-stations in wetlands and surrounding uplands, will result in substantial land disturbance, which in Florida, often leads to the colonization of those disturbed areas by exotic and invasive plant species. In addition, substantial disturbance to plant communities in wetlands and adjacent uplands will be ongoing during the multiple-decade lifespan of the proposed project for the maintenance of the facility and ancillary components, particularly the maintenance of transmission line corridors, thus affording additional opportunity for impacts by invasive and exotic plant species. Please provide an enforceable exotic and invasive plant control plan, which will effectively monitor and control invasive and exotic species within areas to be impacted or otherwise disturbed by the proposed project.

PEF Response #5, dated 11/10/2011 – PEF #L-0983
PEF provided an acceptable Invasive and Exotic Species Management Plan.

Conclusions

As stated above, the Corps has tentatively identified the LNP site with implementation of an acceptable alternative water supply plan, as the LEDPA, subject to further analysis of wetland functions and values among the alternative sites. The use of groundwater for plant operations at the LNP site, as PEF has proposed, is problematic. The Corps believes that in order to fully and appropriately evaluate the potential impacts of operational groundwater withdrawals at the LNP site, Aquifer Performance Tests (APT) and other actions, as identified in the attached technical report, are required. If PEF wants to demonstrate that operational groundwater withdrawals would result in insignificant adverse impacts at the LNP site, and therefore, the LNP alternative with groundwater withdrawals could be acceptable as the LEDPA, then PEF should design and implement a plan, which would demonstrate the impacts of groundwater withdrawals, using APTs, etc., as advised in the technical report. The plan should be provided to the Corps for review, and be determined to be acceptable by the Corps in advance of its implementation by PEF.

STILL UNDER REVIEW

From Corps 09/09/2011 Interim Letter:

1) PEF has requested that the Corps issue a DA permit that would be valid for twenty years for the construction of LNP and it various associated components. To enable the Corps to assure that the appropriate scope of the proposed project has been identified for the alternative sites analysis, and for evaluation of minimization of wetland impacts on the project site, please verify whether PEF has identified, or will identify in the submittals identified in the schedule of deliverables, the total plan of development for the proposed project and its constituent components. In addition, please provide information as to potential future use of the project site beyond the twenty-year timeframe.

2) For our LEDPA evaluation the Corps needs additional information in regard to water supply alternatives for the provision of water for LNP operations. Specifically, the Corps requires information, and at a minimum a conceptual, comparative analysis of the potential impacts of the water supply alternatives on the environment, especially potential impacts on the aquatic environment. The State of Florida's Conditions of Certification, as modified on January 25, 2011, identified a list of potential water supply alternatives on page 43: seawater desalination, brackish surface or groundwater, reclaimed water, stormwater, and any other water supply source designated as non-traditional.

1) PEF Response #4 November 1, 2011 – PEF #1)
PEF's response is acceptable

2) PEF Response #4 November 1, 2011 – PEF #2)
PEF's response is acceptable -
Acceptable in showing that there are practicable alternatives with very minor wetland impacts for alternate water sources to allow use of the LNP site, particularly desalination, if impacts arise from groundwater pumping at the LNP site.

Miscellaneous:

1) During FEIS Writing Meeting, Dec. 12-15, request by Corps to PEF to provide tables, which group together wetland impacts on a parcel or project basis: North parcel, south parcel, blowdown pipeline, triangle parcel, access parcel. Purpose of request is to be able to account for "onsite" and "offsite" impacts, for the plant facility and ancillary components, as described in the FEIS.

2) From 11/22/2011 meeting, PEF to provide UMAM sheets for "project site." Note: Every wetland impact polygon should be associated with an UMAM sheet/score.

3) Transmission lines JD does not appear to include Kathleen Substation. Also should add BBW line in table to show that it was considered and no wetlands present.

4) PEF letter dated 12/13/2011 to Corps (PEF Letter #6) – in regard to Wetland Mitigation Plan Implementation on Government Land.

STILL UNDER REVIEW

5) Groundwater Withdrawals for Plant Operations – CORPS REVIEW ONGOING – the following discussion points are from Corps's review at this time of models and potential special conditions for a DA permit, if issued, to allow groundwater withdrawals at LNP; or LNP with alternate water supply/desalination:

a. PEF has submitted information that shows less than an acre of additional impacts would be required to construct and operate a two-unit desalination facility; i.e., appears that 1 acre or less is the limit of additional wetland impact that could be allowed for either alternative water supply/desalination or groundwater withdrawals for LNP to remain LEDPA.

b. Concern that the models used were average – do not account for seasonality – potential problems if high use/withdrawals occur during droughts/low-water seasons.

c. Reliability of the models is not high – how likely are impacts?

d. Combinations of desalination and groundwater withdrawals? – see "LNP Freshwater Alternatives Analysis" provided by PEF (09/01/11).

e. Potential impacts on the compensatory mitigation wetlands on the site.

f. If it is reasonable to believe that the proposed groundwater withdrawals would not likely impact wetlands; and that a sufficient testing/monitoring plan can be developed and implemented to assure no impacts to wetlands from groundwater withdrawals; then LNP with groundwater withdrawals may be permittable, if:

1) High assurance through strong special conditions/monitoring plan with measurable and appropriate thresholds.

2) The plan must be submitted and approved by the Corps before a permit could be issued.

3) If the monitoring plan and/or any tests, as required by special conditions exceed thresholds, then PEF must cease groundwater withdrawals and initiate approval process for and then construction of acceptable alternate water supply (probably no provision for compensatory mitigation for impacts, as in the State's CoC, since permanent impacts would be prohibited – maybe some temporary and reversible impacts from the time that the thresholds were exceeded to cessation of groundwater withdrawal).

From: PD-R (POC Susan K. Kemp)
To: RD-NP (POC Gordon A. Hambrick)

Attachment 4

13 Jan 2012

Levy Nuclear Plant Monitoring Plan Recommendations

Introduction

This document contains the collective recommendations from the Jacksonville District, Planning Division, RECOVER Branch (PD-R) to the Jacksonville District, Regulatory Division, North Permits Branch (RD-NP) for a comprehensive monitoring plan associated with the proposed expansion of the Levy Nuclear Plant (LNP) by Progress Energy Florida (PEF). The initial request from RD-NP to PD-R was to provide a groundwater withdrawal target which avoids impacts to the surrounding wetlands in excess of 1 acre. We have reviewed the following documents associated with the initial permit application to familiarize us with the project:

- DRAFT Environmental Impact Statement for Combined Licenses (COLs) for Levy Nuclear Plant Units 1 and 2 (DEIS), Draft Report for Comment.
- State of Florida, Department of Environmental Protection (FDEP), Conditions of Certification (CoC), Progress Energy Florida, Levy Nuclear Power Plant, PA08-51C, Modified January 25, 2011.
- Revised Conceptual Wellfield Layout and Evaluation of Simulated Drawdown Impacts, Levy Nuclear Plant, Technical Memorandum, October 27, 2008.
- Revised Groundwater Model Evaluations of Simulated Drawdown Impacts, Levy Nuclear Plant, Technical Memorandum, November 24, 2009.
- Progress Energy Florida (PEF)/Levy Nuclear Plant (LNP) – Review of Applicant's Groundwater Modeling, Memorandum for CESAJ-RD, 14 June 2011.
- Letter to Osvaldo Collazo from PEF dated July 22, 2011.
- Levy Nuclear Plant Powerpoint presentation by PEF for the US Army Corps of Engineers (USACE)/US Environmental Protection Agency (EPA)/US Nuclear Regulatory Commission (NRC) Meeting on July 28, 2011.
- Progress Energy Florida/Levy Nuclear Plant project – SAJ-2008-00490 Groundwater Hydrology/Water Withdrawal/Models, Teleconference Record, July 28, 2011.

The recommendations set forth in this document are based on the information contained within the above listed documents as well as additional information gathered from peer-reviewed literature (see Literature Cited).

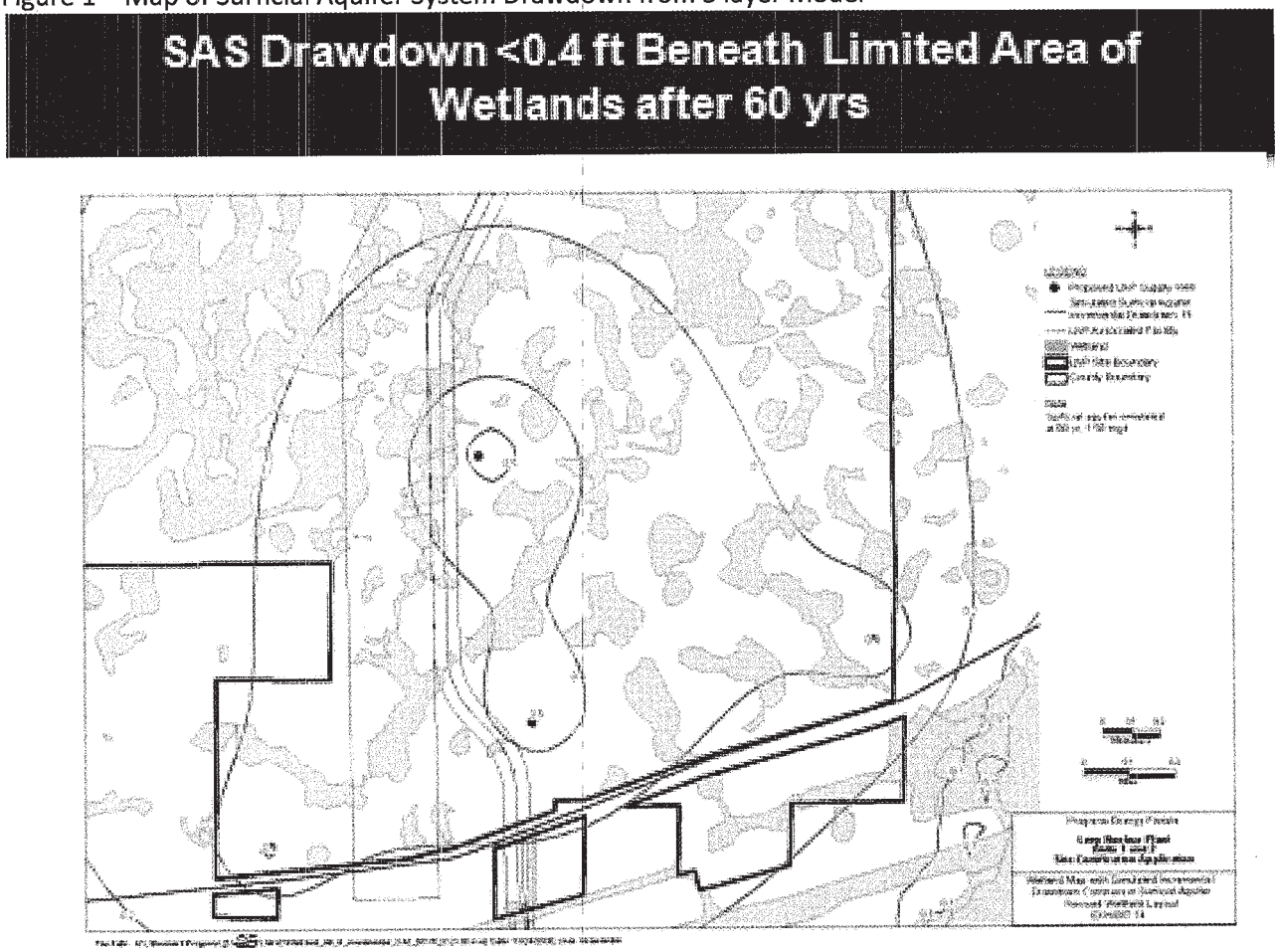
PEF proposes to have four water supply wells constructed (Figure 1) that will withdraw on average 1.5 million gallons per day (mgd) and up to 5.8 mgd during peak periods of energy use. Excessive groundwater withdrawals are known to have detrimental impacts on hydrology and the ecology of the overlying wetlands (Hoffstetter, 1990; Sonenshein, 1990). While the landscape in the project area of influence is not pristine and has been impacted by silviculture and the Cross Florida Barge Canal, areas within the project footprint have been categorized as wetlands and thus must be conserved in both form and function [Clean Water Act, Section 404(b)]. Modeling scenarios were completed by PEF at the direction of the Southwest Florida Water Management District (SWFWMD) to analyze potential hydrological changes to the aquifer underlying the site. The scenarios estimated that drawdowns would only depress the groundwater levels by 0.4 ft in a small area immediately surrounding the wellfield (Figure 1). This model scenario was considered by us as an approximation of the spatial extent and the severity of any potential impacts to the overlying wetlands in both form and function.

Our review of the modeling assumptions for this particular modeling scenario indicates that it does not provide sufficient information (low confidence) to make any definitive decisions on the type and extent of impact the proposed groundwater withdrawals would have on the overlying wetlands. The model results provide a very coarse temporal resolution of the drawdown effects because they are averaged over 60 years. This coarse resolution does not account for changes in inter-annual/decadal precipitation and annual groundwater hydrologic patterns that reflect normal fluctuations experienced by the natural system. The periodicity and magnitude (duration and depth) of the drawdown are strong drivers shaping wetland structure (Kirkman, et al., 2000). If groundwater usage is averaged during annual hydrological periods, then the seasonal effects of groundwater drawdowns can be missed. For example, the modeled scenario does not take into account the peak water usage of up to 5.8mgd in relation to the natural hydrologic cycle that could include an unusually dry precipitation year coupled with a higher than average temperature year. As peak energy use occurs during the summer, there is an increased draw on the groundwater in excess of the 1.58mgd average and approaching the 5.8mgd maximum. Due to the lack of a normal amount of rainfall to recharge the aquifer, the groundwater levels remain at levels below the average. As the winter months ensue, the energy use once again peaks and groundwater withdrawals increase greater than the average on an already depressed aquifer causing the groundwater levels to fall even lower. The current modeled scenario does not allow us to determine the extremes that can occur in the system. It is these extremes, although they may be few and far between, that must be taken into consideration, as they can be the "tipping points" that result in greater impacts (area and degree) to the natural ecosystem from which they can't recover.

An extensive literature search was also conducted to determine if there had been any new scientific information developed since the publication of Mortellaro, et al, 1995. This particular publication is used by the SWFWMD as guidance to set a target of less than 0.6' decrease in groundwater levels as a result of withdrawals. We were unable to locate any updated information providing additional guidance to support or refute the 0.6' scenario. We did find several articles which addressed the difficulty in developing an appropriate groundwater management plan. The complex interconnectivity of the groundwater system to the overlying wetland system makes it very difficult to determine a single target based solely on groundwater withdrawals. These articles suggested the use of a comprehensive monitoring program to holistically determine the effects of groundwater withdrawals on a wetland as opposed to a singular target (Bacchus, 1995; Buckland and Exarhoulakos, 1997; Eamus and Froend, 2006; Eamus, et al., 2006; MacKay, 2006).

In light of the insufficient temporal resolution in the modeled scenarios, the uncertainty inherent in models (Box, 1978; Hollings et al., 2002), and the guidance provided by several journal articles on the impacts to groundwater-dependent ecosystems (GDE); we recommend implementing a comprehensive ecological monitoring plan that complements the monitoring requirements set forth in the FDEP CoC and the DEIS and is used in an adaptive management context. This recommended monitoring plan is intended to monitor the actual effects of the water supply well use and determine whether they confirm expectations that there will be minimal impacts to wetlands or reveal impacts to wetlands that trigger the need to utilize alternative sources of water.

Figure 1 – Map of Surficial Aquifer System Drawdown from 5 layer Model



Monitoring plan

Wetlands, specifically GDEs, are dynamic and complicated systems driven primarily by hydrology. When the effects of project actions (e.g., LNP proposed water supply groundwater withdrawal) carry uncertainty related to avoiding risks, monitoring plans developed in an adaptive management context can help address key questions and inform action and licensee agencies on the need for additional measures to avoid deleterious impacts to the ecosystem. Key questions related to water withdrawal are associated with the uncertainty inherent in groundwater modeling and the drawdown threshold by which wetlands could be negatively affected. The interconnectivity of a GDE's ecology to the underlying hydrology makes it difficult to design an environmental monitoring plan that is simple in execution and interpretation. The following sections provide recommendations and guidance on what parameters should be monitored and the underlying reasons why, in order to determine the overall ecological impacts to the wetlands on the project site as a function of the proposed groundwater withdrawals.

The following sections attempt to outline and define the Management Objectives for the recommendations and guidelines provided in this document as per Elzinga, et al, 1998. Specific management objectives will clearly define to both the regulating agencies and the Liscensee the purpose and criteria of the comprehensive environmental monitoring plan for the site.

Objectives:

Levy Nuclear Plant Monitoring Plan Recommendations

1. Monitor and assess actual drawdowns from use of LNP production wells to confirm or refute expected drawdowns from modeling and understand extent wetland area to be affected.
2. Monitor and assess stress on wetlands to determine whether a threshold has been met that could affect wetlands long-term and requires implementation of alternative water supply measures.

Management Targets:

This list is a summary of the hydrologic and ecologic indicator effects described in more detail in the following sections. This information is also presented in Table 1. Evidence of any of these signs or combinations thereof should be considered the threshold at which an alternate groundwater supply should be implemented. Monitoring is recommended to initiate at least 2 years prior to any groundwater withdrawals from all production and construction wells associated with LNP, continue through construction, and remain in place minimally 10 years after all four production wells are operating at full capacity.

1. Subsidence
    a. Any measureable loss of land elevation per year that cannot be attributed to the natural wetland geologic or ecologic processes
    b. Formation of sinkholes
    c. Evidence of disturbed or oxidized sediments
2. Hydrology
    a. Average monthly standing water depth decreases by greater than 10cm that cannot be attributed to precipitation alone.
    b. Average number of days of inundation or dry down do not change more than 7 days from the baseline that cannot be attributed to precipitation alone.
    c. Date when the dry and wet seasons begin and end do not change to where there is a measureable shift in the anuran (frog) species composition and population that cannot be attributed to precipitation alone.
    d. A decrease in the monthly average groundwater level of greater than the 75^{th} percentile of the baseline.
3. Ecology
    a. Measurable mortality of *Taxodium* (Pond Cypress) seedlings and/or saplings that is attributed to increased length of submersion as a function of land subsidence.
    b. Measureable shift in the anuran species composition and population from baseline conditions that is attributed to decreased standing water depths or shifts in the length and/or initiation of inundation/dry down.
    c. Decline and death of canopy species in forested wetlands and replacement by sparse understory vegetation and shrub species that is attributed to changes in standing water depths or shifts in the length and/or initiation of inundation/dry down.
    d. Shift from wetland to upland ground cover species that is attributed to decreased standing water depths or shifts in the length inundation/dry down.
    e. Shift from wetland to aquatic ground cover species that is attributed to subsidence resulting in increased standing water depths.

Monitoring Plan Component Details

Based on the collective recommendations of Bacchus, 1995; Buckland and Exarhoulakos, 1997; Eamus and Froend, 2006; and Eamus, et al., 2006, the following components are recommended to be implemented in a comprehensive monitoring plan for the project site.

Measured Components

1. Subsidence
    a. Land elevation
    b. Subsidence
2. Hydrology
    a. Surface water/wetland stage
    b. Groundwater levels
    c. Periodicity of surface inundation
3. Ecology
    a. Vegetation species composition
    b. Anuran species composition

Spatial Sampling Design

The Wetland Assessment Procedure (WAP) recommended by FDEP, calls for information on historical wetland information, soils, and need information on wetland hydroperiods and vegetation changes (SWFWMD and TBW, 2005). What is missing from the WAP is a specification of the number of transects and samples needed to determine success to an acceptable level of statistical confidence and power. It is recommended the sampling design be based on a Generalized Random Tessellation Stratified Design (Stevens and Olsen, 2004). Boundaries of the Design should encompass the entire area located within the 0.1' SAS 60 year modeled drawdown contour and adjacent areas outside the 0.1' contour at least 5km away from the centroid of the 0.3' SAS 60 year modeled drawdown contour to encompass potentially non-impacted areas (Bacchus, 1995).

Environmental monitoring of the mitigation areas in the Goethe State Park and LNP site should be linked with these recommendations to monitor the possibility of the groundwater withdrawals negatively affecting these mitigation areas and decreasing the probability of mitigation success.

Each sampling point should consist of the following components:

1. A permanent vegetation transect set up in a direction that extends radially from the centriod of the 0.3' SAS 60 year modeled drawdown contour and starts in an upland area, travels through a wetland area, and terminates in an upland area. Once wetland areas are selected, the protocol in the WAP should be followed to establish Historic Normal Pool and wetland edge, as well as NP-6 and NP-12 sites as reference changes for elevation measurements in these wetlands sites (pg. 3 of WAP)
2. A permanent location to conduct anuran nighttime vocalization surveys
3. A stage gage installed along the vegetation transect in the historic deepest part of the wetland, as the wetland interior stated in WAP manual.
4. A groundwater well installed within the stratified random sampling grid to measure ground water levels. The preferable location would be a combined stage/water level meter installed at the historic deepest part of the wetland.

In addition to the individual sampling points, land elevation and vegetation coverage and structure should be measured over the entire site using remote sensing methods.

Duration of Monitoring Activities

Monitoring activities are recommended to commence a minimum of two (2) years prior to the start of any construction activities on the site to establish the existing conditions (or baseline) of the parameters of interest. As several of the Management Objectives require no change from existing conditions, the baseline information will provide a dataset to compare with all subsequent monitoring results. This baseline information can be combined with the Wetland history information required by the SWFWMD as part of the WAP. Two years will provide information to understand some of the intra- and inter-annual variability inherent in environmental monitoring data. Where possible and as recommended in the WAP, monitoring effort should attempt to include 10 years of information from regional SWFWMD data to add to baseline strength.

Monitoring activities are recommended to continue throughout the period of construction as there will be groundwater withdrawal activities associated with construction that may impact the overlying wetland community. Mitigation activities will also commence during the construction phase which will alter the hydroperiod of the monitored area. These activities include removal of barriers to sheet flow and pine thinning which can alter the overall evapotranspiration rates of the wetland and affect water levels. Without continued monitoring during construction, it will be difficult to determine what are groundwater withdrawal effects during full production vs. changes to the hydrology as a function of the mitigation or construction activities.

Post-construction activities are recommended to continue a minimum of ten (10) years after all groundwater wells are in full production. Changes to vegetative community structure may take much longer to realize, and could take up to 10 years, if using tree death as an indicator. Other vegetation thresholds should be used to visually identify stress on wetland species and trees. This is a change from the recommendation of the CoC which states PEF can request a release from monitoring after 5 years. The 5 year threshold assumes that long-term withdrawals will be under heterogenous meterological conditions and does not factor the risk associated with consecutive dry years or more homogenous/anisotropic conditions (Bacchus, 1995).

Hydrologic/Ecologic Indicator Specifics

Hydrology - It is recommended daily readings of groundwater level and stage be collected to establish the seasonality of water level, the length of time in days of wetland inundation, the magnitude of inundation or drawdown, and the magnitude of surface water depth. An decrease of surface water level depths greater than 10cm can result in a decrease in anuran populations (Bunnell and Ciraolo, 2006) and a shift in the vegetation structure to a more upland vegetation community structure (Casey and Ewel, 2006). Demaree (1932) documented mortality of *Taxodium* seedlings as quickly as 4 days when submerged at a depth of 30cm or less at temperatures above 80degF. As *Taxodium* seeds do not sprout when submerged and the seedlings require a period of little to no inundation to establish, this species in the seedling/sapling life stage makes a good indicator for timing and magnitude of wetland inundation. Extensive drawdown of the groundwater level can result in a permanent shift of the vegetation structure from predominantly wetland to upland (Hoffstetter, 1990, Sonenshein, 1990).

Levy Nuclear Plant Monitoring Plan Recommendations

As stated in page 5 of the WAP, hydrologic state will be monitored along the wetland transects established to also measure vegetation and subsidence. if there is not standing water in the wetland, an estimate of soil moisture or saturation, and depth to water should be made.

Land Elevation - Annual surveys of land elevation is recommended to document any changes in land surface elevation over time. Decreases to groundwater levels have been shown to result in subsidence of the overlaying wetland due to organic soil oxidation or sinkhole formation (Thompson). Subsidence as a function of groundwater withdrawals results in accelerated succession towards a more open water wetland community. Sinkhole formation in this area of Florida are catastrophic in magnitude. The change in land elevation can be on the order of 25-30' and can happen over the course of minutes (pers. communication). The recommendation to monitor any measurable change in land elevation at a quarterly timescale is to provide early indications of changes to the land elevation that may be a function of the groundwater withdrawals to avoid this catastrophic event. This is different than the criteria recommended in the WAP (Pg. 4):

- Substantial soil subsidence/oxidation -This condition occurs when subsidence greater than or equal to six inches is observed.
- Moderate soil subsidence/oxidation - This condition occurs when subsidence greater than two inches but less than six inches is observed.
- Little or no evidence of soil subsidence/oxidation - This condition occurs when subsidence less than two inches is observed, and when no other evidence of oxidized conditions is apparent.

Vegetation – The dry season in North Florida generally spans from September-April (Chen and Gerber, 1990). During the dry season, water level depths in cypress dominated wetlands decrease to the point where they go underground (Sun, et al, 1995). It is during this period of dry down that *Taxodium* seedlings can germinate (Demaree, 1932). Bi-annual sampling of vegetation timed for the end of the dry seasons will attempt to capture the number of *Taxodium* seedlings that have germinated and survived wet season inundation. Increased inundation periods and depth will result in an increased mortality of *Taxodium* seedlings (Demaree, 1932). Mortality of *Taxodium* seedlings/saplings can also be an indicator of possible land subsidence. As the land subsides, the duration and magnitude of inundation can increase to the point where a measureable amount of *Taxodium* seedling/saplings are recorded. This vegetation sampling is recommended in addition to the sampling procedures identified in the WAP manual pgs. 6-9 to determine vegetation changes along the wetland assessments.

Anurans - Many citations document the decline of anuran populations worldwide. Anuran connectivity with wetland hydrologic and ecologic characteristics make this faunal class an ideal ecological indicator of wetland health (Guzy, 2006). It is recommended that monthly monitoring of anuran populations start prior to the end of the spring dry season as water levels in the wetlands come back above ground and end after the start of the fall dry season when the water levels return below ground. This timing ensures the entire summer wet season is monitored for anuran breeding activity. Documentation of the species of anurans utilizing the wetlands will establish the ideal period of inundation required to maintain the existing anuran population. Deviations in the period of wetland inundation could result in a species shift in the population.

Table 1. Summary of Recommended Parameters, Sampling and Decision Criteria as discussed above

Monitored parameter	Attribute	Quantity	Status	Timeframe	Decision Criteria
Vegetation (see WAP page 6-16)	• Species composition • Tree mortality	% cover	Change in % cover	Bi-annual (end of the spring dry season and end of the fall dry season)	• After factoring in conditions from control sites, maintain existing/baseline % cover and # of individuals by species and density by size class. • Maintain baseline # of *Taxodium* seedling (new) • Show moderate to significant signs of stress: decline in canopy species, replacement by understory, shift from wetland to upland species; increased proliferation of reproductive structures.
		Density by size class (adult, sapling, seedling) of *Taxodium*	Loss of seedling (20-30cm tall) and sapling (2-4 year old) size classes (Demaree, 1932)		
		# of individuals	Decline of canopy species in forested wetlands		
			Replacement by sparse understory vegetation and shrub species		
			Shift from wetland to upland ground cover species		
			Shift from wetland to aquatic ground cover species		
	Signs of vegetation stress	• # of leaves on stems branches • # of leaves with chorosis wilting, leaf drop • # of reproductive structures	• Loss of leaves on branches, increased signs of chorosis • Increased proliferation of reproductive structures		
Anurans (New)	Species Composition	Presence/absence	# of breeding individuals by species	Monthly during breeding season	After factoring conditions from control sites, maintain existing/baseline species composition and numbers.
		# of individuals			
Surface Water Level (WAP pg. 5-6)	Depth	cm	Change in water depth no greater than 10cm (Bunnell and Ciraolo, 2006; Casey and Ewel, 2006)	Daily (minimum)	After factoring conditions from control sites, maintain existing/baseline water depths, and or saturation of soils. (No decision-criteria established in WAP)
Groundwater Level(New)	• Depth • Saturation	cm	No withdrawals that affect hydroperiod ((see Surface Water Level and Surface Inundation)	Daily (minimum)	After factoring conditions from control sites, maintain existing/baseline hydroperiod (see Surface Water Level and Surface Inundation).
Surface Inundation (New)	• Days inundated • % Area inundated	# of days	Change in # of days from existing/baseline no greater than 7 days (Demaree, 1932)	Daily (minimum)	After factoring conditions from control sites, maintain existing/baseline number of days.
	Date	Start/End dates	Change in initial date of drawdown/inundation not to deviate from the existing/baseline conditions which results in a species shift in the anuran population (see Anurans)		After factoring conditions from control sites, maintain existing/baseline seasonal timing.
Land elevation (WAP pg. 4)	Elevation	cm	Zero change in elevation from baseline/existing elevations	Quarterly (minimum)	After factoring conditions from control sites, maintain existing/baseline land elevation. (different than WAP criteria)

Levy Nuclear Plant Monitoring Plan Recommendations

Data Analysis

The following analyses minimally should be performed and reported on an annual basis:

1. Trend analysis
2. Ecologic change detection
3. Comparison of non-impacted areas to areas potentially affected by groundwater withdrawals. Additional data can include pumpage, wetland, and water level data collected from the aquifer and for the whole SWFWMD region, in addition to mitigation sites in the project area further away from the project area of influence. This could help determine whether changes observed in the project are solely due to the groundwater withdrawal or some other natural or anthropogenic effects.
4. Effects of precipitation. Regional precipitation amounts should be used in the analysis of the data to determine possible rainfall effects on the length and timing of the hydroperiod in the monitored areas.
5. Effects of fire. Documentation of prescribed burns or opportunistic fires in the monitored areas should be used in the analysis of the data to determine possible effects of fire (or lack thereof) on any perceived shifts in vegetation community structure (Casey and Ewel, 2006).
6. Reporting on other sources of groundwater withdrawals that could compound the withdrawal effects of the project.
7. Reporting on changes in land elevation within and adjacent to the project site.
8. Reporting on groundwater quality, specifically increases in salinity as a function of saltwater intrusion from the CFBC due to groundwater withdrawals.

Timeline for Monitoring, Aquifer Testing, and Alternative Water Supply Plan Products
(see CoC document FDEP, 2011)

1. Aquifer Performance Testing (APT) Plan (pg. 45 of CoC) shall be submitted to District 6 months prior to start of construction of first production well.
2. Aquifer Performance Testing (APT) - Step-drawdown and constant-rate tests conducted by Licensee within 6 months prior to start of construction of first production well or 6 months of the final APT plan approval. Tests must be completed 5 years prior to initial use of the first production wells in excess of 100,000 gallons per day. If values on transmissivity or leakance differ significantly from values used in modeling (*20 percent difference*), Licensee will revise its submitted focused telescoping mesh refinement ground water model of well field area based on results of aquifer test. The revised modeling shall determine whether the potential area of influence should be revised, as well as any estimates of wetlands that could be impacted. Annual Environmental Monitoring Report will take this information into account to understand wetland areas that can be potentially impacted.
3. Draft Environmental Monitoring Plan – Submit three years prior to production well use greater than 100,000 gallons per day (FDEP).
4. Alternative Water Supply Plan - Within 3 years of completion of site aquifer testing specified in Section C. Plant Specific Conditions, Condition II. Southwest Florida Water Management District, A.4.a. the Licensee shall submit for District approval, an Alternative Water Supply Plan. The Alternative Water Supply Plan shall evaluate, identify, and propose alternative water supply development of one million five hundred eighty thousand (1,580,000) gallons per day (gpd).

5. Preliminary Design of Approved Alternative Water Supply Project - Within 4 years of completion of site aquifer testing and modeling specified in Section C. Plant Specific Conditions, Condition II. Southwest Florida Water Management District, A.4.a., Licensee shall submit to the District, a preliminary design of the approved alternative water supply project that the Licensee will implement.
6. Application for Development of Alternative Water Supply - With 4 years of completion of site aquifer testing specified in Section C. Plant Specific Conditions, Condition II. Southwest Florida Water Management District, A.4.a., submit to the Florida Department of Environmental Protection and the District, applications for authorization to develop and use 1,580,000 gpd of alternative water sources for the project as appropriate, unless an extension of time or waiver has been granted by the District.
7. Alternative Water Supply Implementation Schedule - Within 4 years of completion of site aquifer testing specified in Section C. Plant Specific Conditions, Condition II. Southwest Florida Water Management District, A.4.a., submit to the District an alternative water supply implementation schedule detailing the dates when construction will begin and end, and the date when water will be delivered from the project for use by the Licensee. Compliance with the Alternative Water Supply Implementation Schedule is required by the Licensee, unless extended or otherwise modified in writing by the District. Each year, by March 1, after the triggers described above, the Licensee shall submit to the District a status report describing the progress made on the Alternative Water Supply Implementation Schedule, including the specific actions taken to meet the requirements set forth above. If the project has fallen behind schedule, Licensee shall provide just cause for the delay and/or explain how the Licensee will comply with the schedule described herein.
8. FDEP and SWFMD Approval of Monitoring Plan – At least one year prior to production well use greater than 100,000 gallons per day.
9. Baseline Monitoring – Installation of monitoring platforms and survey at least one baseline year of wetlands to be potentially affected (see modeling results of groundwater drawdown area of influence) using SWFWMD Wetland Assessment Procedure.
10. Water Supply Well Testing –Water supply wells will be implemented to gradually ramp up water supply from 100,000 gallons per day to 1.5 mgd. Monitoring will assess hydrology and wetland parameters to report observations annually, as required by FDEP/SWFWMD letter.
11. Within 3 years of groundwater use rising to more than 1.25 million gallons per day (average annual daily withdrawal quantity) from all the wells included in this site certification, the Licensee shall provide an analysis of environmental conditions as specified in Section C. Plant Specific Conditions, Condition II. Southwest Florida Water Management District, A.4.a. The Licensee may ask for a time extension or waiver for implementing the Alternate Water Supply project if the District confirms that adverse environmental impacts have not been detected or are not predicted to occur. The Alternate Water Supply project schedule shall be maintained unless the District confirms that adverse environmental impacts have not been detected or are not predicted to occur. If adverse environmental impacts are occurring or are predicted to occur, the Alternative Water Supply quantity required to be developed will be determined based upon a revised hydrogeologic evaluation performed by the Licensee and accepted by the District.
12. Monitoring Review – After five years the Licensee for LNP, may request from SWFWMD a release from monitoring. If SWFWMD concurs, then they will request DEP to modify the conditions and remove monitoring condition. If SWFWMD identifies unexpected results indicated adverse wetland impacts, then SWFWMD will coordinate with Liscensee and FDEP on appropriate steps to minimize impacts, such as utilizing alternative water supply technology.

Levy Nuclear Plant Monitoring Plan Recommendations

Reporting
(see Conditions of Certification document FDEP, 2011)

1. *Monthly Reporting of Water and Ground Levels* - Water levels and ground elevation for monitoring wells staff gauges and piezometers at all sites shall be reported to the District by the 10th day of each month for the preceding month, and will include the time and date the elevation was taken. Any changes to monitoring procedures must be coordinated with and approved by the District. In addition, the frequency of monitoring may be modified by the District as is determined necessary to protect the resource.
2. *Annual Environmental Monitoring Report (AEMR)* - annual environmental monitoring data shall be reported in three hard copies to District by January 1st of each year for the preceding water year (October 1 – September 30). Report will include raw data, essential graphs, tables, and text summarizing the data. AEMR shall assess relationship between water level changes, well pumpage, meterological conditions (evapotranspiration, rainfall), and drainage factors related to the environmental condition of the wetlands and surface waters in vicinity of LNP. This site specific information will be compared to pumpage data, wetland, water level data collected from the aquifer and for the region (use District information) to determine if changes seen in the project area of influence are different than those experience in the whole region (control sites). The following analyses shall be included to examine relationship between rainfall, pumpage, potentiometric levels, surface water and wetland water levels, rate of soil subsidence, and evidence of vegetation succession:
    a. *Statistical Trend Analysis, e.g., double –mass curve analysis*
    b. *Multiple linear regression*
    c. *Time series and/or factor analysis*

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TELECONFERENCE RECORD

DATE: January 19, 2012
TIME: 1000 EDT

SUBJECT: Progress Energy Florida/Levy Nuclear Plant project – SAJ-2008-00490
Meeting/Teleconference – PEF, NRC, EPA & Corps

PARTICIPANTS:
See Attachment 1 – Meeting Attendees List (the list includes participants who attended the meeting and participants who joined by teleconference).

PURPOSE: This meeting is one of a series of meetings in regard to position letters sent to PEF on 06/23/2011 and 09/09/2011, and PEF's written responses to those letters.

Attachment 2 is a copy of the agenda for the meeting that was provided by PEF and modified by the Corps.

DISCUSSION SUMMARY:

1) Introductions to the group were made by all participants.

2) Paul Snead, PEF, stated that the series of meetings held in Panama City and now in Jacksonville had been very helpful. Don Hambrick, Corps, agreed that the meetings and process had been helpful to the Corps, as well.

3) Doug Bruner, NRC, responded to Mr. Snead's question and agenda item in regard to the FEIS writing meeting last month (December 2011) in Richland, WA and the current status of the FEIS. Much accomplished in Richland. FEIS on schedule, which currently has FEIS issued at the end of April. Some more work needed on the responses to the comments, which were submitted by the public and various agencies when the DEIS was issued. The NRC's Mandatory Hearing is currently scheduled for June 2012, and the Contested Hearing is scheduled for October 2012.

4) David Pritchett, EPA, plans to provide by the end of February 2012 the outcome of his review of the submittals from PEF in response to comments by the EPA to the DEIS, as outlined by the Corps in its 06/23/2011 position letter and the comments from the Corps, as presented in Attachment 3.

5) Mr. Hambrick went through item by item marked in red in Attachment 3, "Position Letter Checklist – 06-23-2011 & 09-09-2011 for PEF/NRC/EPA/Corps Meeting on 01/19/2012." The attachment was provided to the group. The attachment documents the current status and initials evaluation of the various submittals from PEF by the Corps. See Attachment 3 for details.

6) Mr. Snead said that PEF will provide written responses to the questions or comments needing response in Attachment 3.

7) Ms. Sue Kemp and Mr. Andy Loschiavo of RECOVER Branch (PD-R), Corps, presented an overview of PD-R's "Levy Nuclear Plant Monitoring Plan Recommendations (13 Jan 2012)" to the participants (Attachment 4).

8) Mr. Hambrick stated that a monitoring plan for groundwater withdrawals would have to be developed by PEF, reviewed by the Corps, and approved by the Corps before a Department of the Army Permit could be issued. Mr. Snead acknowledged that PEF intends to work with the agencies in the development of a monitoring plan.

9) Mr. Snead clarified the assumption in PD-R's recommendations (Attachment 4) that seasonal variation in power generation was a factor in the potential for peak groundwater withdrawals of up to 5.8 mgd, is actually not a factor; rather that the peak demand above the expected average of 1.58 mgd would be the result of increased groundwater withdrawals during maintenance outages, and such increases would likely last no more than one week once a year.

10) The group discussed how to proceed in the development by PEF of a groundwater withdrawal monitoring plan and agency review of the plan. The group agreed that PEF will develop a draft plan that would be reviewed and discussed, as part as an onsite visit/meeting at the LNP site.

11) Mr. Hambrick and Mr. Osvaldo Collazo, Corps, explained that the Corps continues to work with the Seminole Tribe of Florida (STOF) in regard to cultural resources. The Corps believes that it has verbal acceptance by the STOF that if a permit is issued, it would be conditioned using the draft conditions that the Corps developed with help from PEF and NRC this past autumn. The Corps intends to confirm this in writing to the STOF. Mr. Bruner said that the NRC needs consultation to be concluded prior to COL issuance. Written confirmation as described by the Corps would constitute conclusion of consultation for permit issuance by the Corps, though coordination with the STOF would continue in the future as cultural resource surveys are completed by PEF and received for review by the Corps, in compliance with the draft permit conditions, if a permit is issued.

12) Mr. Collazo and Mr. Hambrick then explained that the Corps had reviewed PEF's letter in regard to wetland mitigation plan implementation on government lands. Overall the Corps believes that it can work with PEF to accept mitigation on government lands.

Initial Corps comments: 1) Corps would not be a party to MOAs. MOAs would be between PEF and the governmental entity owning land; 2) The construction and long-term management (in perpetuity) would be PEF responsibility, i.e. permittee-responsible mitigation, and a permit, if issued, would

be explicitly conditioned to assure PEF's responsibility; 3) PEF needs to provide to the Corps more information, including copies of conveyance/transfer documents of the lands to the governmental entities, and other documents such as management plans, to demonstrate that there are not requirements or plans that already require work that would be counted as mitigation (i.e. demonstrate no "double-dipping" of mitigation values), and that there are no required activities on the lands that are inconsistent with use of the land for compensatory mitigation.

PEF will draft MOAs and provide to Corps and EPA for review.

Mr. David Pritchett, EPA, emphasized the need for documented evidence that none of the mitigation work proposed by PEF would be work that the governmental entity was supposed to do or would have normally done anyway.

Ms. Theresa Hudson, Corps, reminded group that the compensatory mitigation plan must be in compliance with the federal mitigation rule.

PREPARED BY: Don Hambrick
Senior Project Manager
Panama City Section