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March 3, 2010

Mr. Robert Kitchen  
Manager-Nuclear Licensing  
Progress Energy Florida, Inc.  
P.O. Box 14042  
St. Petersburg, FL 33733

RE: Site Certification No. PA08-51A, Levy Nuclear Plant, Conditions of Certification:  
Plant and Associated Facilities and Transmission Lines, Levy Nuclear Plant  
Monitoring Plans Submittal to FWC, Levy County

Dear Mr. Kitchen:

The Division of Habitat and Species Conservation, Habitat Conservation Scientific Services Section, of the Florida Fish and Wildlife Conservation Commission (FWC), has coordinated our review of the proposed Cross Florida Barge Canal and Withlacoochee River Survey and Monitoring Plan as per Section B. XXIX. B. 1, and the proposed Levy Nuclear and Crystal River Energy Complex Combined Discharge Survey and Monitoring Plan as per Section B. XXIX. B. 2. Our review has indicated that we need the information listed in the enclosed requests for additional information (RAI) in order to complete the review of the proposed survey and monitoring plans. We encourage Progress Energy staff to contact us so that necessary revisions can be made to the plans that would allow FWC to approve them in an expeditious manner.

Theodore Hoehn has been our point of contact in reviewing these monitoring plans and has been working with a number of our subject matter experts. If you or your staff would like to coordinate further on the recommendations contained in this report, please contact him at 850-488-3831 or by email at [ted.hoehn@myFWC.com](mailto:ted.hoehn@myFWC.com).

Sincerely,

Mary Ann Poole  
Commenting Program Administrator

map/th

Progress Levy Nuclear\_1452\_SurveyMonitoringRAI\_1  
ENV 2-11-2/3

Enclosures (2)

cc: Paul Snead, Progress Energy Florida  
Mike Halpin, DEP-Siting Office  
Cindy Mulkey, DEP- Siting Office  
Marc Harris, DEP-NPDES  
Melissa Charbonneau, DEP-CAMA, Crystal River

## **FWC RAI #1 comments for Levy Nuclear Plant specific to the Cross Florida Barge Canal and Withlacoochee River Survey and Monitoring Plan**

- 1. Section 3.1 Neckton and Plankton Survey:** Thank you for providing the information on the sampling locations with the explanation of spatial randomization for sample collection as stated in section 3.1.1, and the stated desire to follow the Tampa Bay Water's Tampa Bypass Canal/Alafia River Water Supply Projects Hydro-biological Biological Monitoring Program (HBMP). The strata, as described in Section 3.1.1 and Figures 3-1 through 3-3, appear to be based upon linear distances as opposed to conditions within the units. Please describe how the strata were developed and the rationale for the strata.
- 2.** Thank you for following the recommended Fishery Independent Monitoring protocols as described in Section 3.2.1, Sampling Parameters and Methods. The sample size determinations and frequency are described in Section 3.1.3 and Appendices A & B. The proposed study has three reporting units (Cross Florida Barge Canal, Old Withlacoochee River, and Nearshore Gulf of Mexico) with a total of 24 nekton hauls each month. Based upon experience with the HBMP, there should be a minimum of 30 hauls per reporting unit/90 samples total (Cross Florida Barge Canal, Old Withlacoochee River, and Nearshore Gulf of Mexico) collected within a reasonable time frame. FWC staff is available to provide further guidance on sample size and frequency. We request that Progress Energy make the appropriate revisions to the sampling frequency.
- 3. Section 3.1.4, Sampling Schedule:** This section indicates that not enough information is available to conduct a statistical analysis towards determining the timeframe for the pre-operational surveys needed to conduct an impact assessment. Those surveys would establish baseline biological and water quality conditions of the project site, and monitor conditions in order to conduct an impact assessment. This proposal reverts to the original two years of pre- and post-operational baseline sampling, as contained in the Siting Office application. The FWC continues to objection to this arbitrarily short timeframe. This issue was a significant point of contention during the negotiations of the Conditions of Certification (COC). The COC states *"Pre-operational surveys shall be conducted for a period of time to be determined by statistical analysis in coordination between the FWC and Progress Energy in order to establish seasonal/climatological baseline, biological and water quality conditions. This timeframe will not exceed the period of time that is available prior to operation of the facility."* FWC staff has not been contacted, prior to this submission, in order to provide assistance or guidance on appropriate statistical methodologies necessary to make the determination for sampling timeframes. Before-After-Control-Impact (BACI) designs and the resulting analyses are typically used to quantitatively identify and assess the environmental effects of human interventions (activities) on the natural environment. The power of the analysis to detect impacts depends on the specific design for measurement collection. In general, long-term (multi-year) measurements are often required in order to accurately capture the natural temporal and spatial variability exhibited in the measurements. Data must be collected in consecutive years (or time periods) up to, during, and following the construction and operations of the facilities (human interventions). Sampling effort must be sufficient to

identify natural variability patterns in measurements. It should be noted that a minimum of three data points (equivalent to three years of data collection) are required to perform tests for both a linear and quadratic trend. Three years may not provide sufficient power to detect probable or possible effects. Conducting statistical power analysis after the three years will determine the duration of sampling necessary and to determine if adjustments in sampling frequency and duration are needed. We request that Progress Energy contact the FWC in order to make the appropriate revisions to the sampling schedule and duration.

4. Thank you for providing the information on the methods of data analysis as described in Section 3.1.5. While it may be implied, the analysis should also consider the abundance response to inflow changes. The abundance response is similar to the distributional response in which you calculate abundance for a species during a sampling period and regress that against inflow. Abundance responses to inflow may lag by a considerable time period because of generation time, so several different inflow lag periods need to be looked at. Appropriate multivariate statistical methods (e.g., principle component analysis, canonical correlation analysis, multidimensional scaling, etc.) will be used to identify correlations between abiotic and biotic parameters recorded during this monitoring program. Please clarify Section 3.1.5 to include not only the distributional response but also the abundance response and other appropriate multivariate statistical methods.
5. **Section 3.2 Hydrographic Survey** – Thank you for providing the information on the hydrographic survey, including locations, frequency, survey methods, and frequency. Progress Energy proposed in 2007, as part of NPDES Permit No. FL0000159, a “Thermal Plume Assessment Plan of Study.” Figure 3-4 indicates the temperature stations that are proposed, which are similar to the NPDES Thermal Plume study. Please indicate if the proposed Hydrographic Survey is a continuation of the 2007 proposed Thermal Plume Assessment Plan of Study or the same study.
6. Section 3.2.1 and Figure 3-4 indicates the monitoring station locations and the frequency of sampling. Figure 3-4 does not show a current probe north of the outer portion of the Cross Florida Barge Canal. One location should be located north of station C3 on the northern side of the Canal. Additional sites may be needed within the plume area and south of the CREC intake canal. We request that Progress Energy consult with the FWC and DEP in order to make necessary revisions to the Hydrographic Survey station locations.
7. Section 3.2.3 and Table 3-5 provide the proposed sampling schedule for the hydrographic survey. As stated earlier, a minimum of three data points (equivalent to three years of data collection) are required to perform tests for both linear and quadratic trends. Please provide a justification for the proposed sampling schedule and the sampling duration.

8. **Section 3.3 Impingement and Entrainment Study** - Thank you for providing the information on the Impingement and Entrainment Study. Section 3.3.2 describes the sampling parameters and methods that are proposed to be used. The entrainment sampling methods do not indicate how the conical net with flow-meter would be placed, depths of collection, or where the nets would be located. If the entrainment collections are to be made in front of the screen off a boat, please specify the distance from the intake structure. If the Levy Nuclear Plant (LNP) intake structure has a fine-mesh screen, we recommend taking the samples from behind the screen. Additional samples could also be taken from in front of the screen to demonstrate any difference in entrainment due to the fine-mesh screens. Please revise Section 3.3.2 to clarify this information.
9. Section 3.3.3, sampling frequency, indicates that if debris load becomes problematic, a subset of the six-hour samples would be sampled. The plan needs to be clear that if subsets are taken, that they are done both at night and at day to characterize diel differences.
10. Section 3.3.4 indicates that the Impingement and Entrainment Study will be conducted during the first two years of LNP unit 1 operation and 2 years following the commencement of LNP unit 2 operations. As indicated above, three data points are required to perform tests for both a linear and quadratic trend. Three years may not provide sufficient power to detect probable or possible effects. Please provide the statistical justification for anticipated monitoring timeframe.
11. Section 3.3.5 and Table 3-6 identify candidate representative important species. As noted at the bottom of page 26, "the list of candidate species may be refined based upon the sampling results of the pre-operational period..." The "important" species, especially the ecologically important ones, will be evident after analyzing the monitoring data. There are two species on Table 3-6 that should be corrected. *Gambusia affinis* does not occur in the area; this species should be *Gambusia holbrooki*. Sampling by staff from the Florida Fish and Wildlife Research Institute has indicated that *Eucinostomus argenteus* is not common in the study area.
12. **Section 3.4 Adaptive Management** - Thank you for providing Progress Energy's view on the adaptive management approach. We agree that it is often necessary to incorporate "adaptive monitoring" based upon the analysis of the data. As an example, the HBMP has collected eight years of data and has conducted power analysis that indicate that for some of our gears and reporting units, the original sample sizes were not adequate. In those cases, changes have been initiated to improve the probability of detecting changes by improving our stratification design. Progress Energy indicates that "power analysis will be performed at the end of each "pre-construction monitoring year to evaluate sample size and frequency." Only two years of proposed sampling prior to operation (or within 3 years of operation) does not leave time to modify procedures or protocols for the collection of additional data, if needed. As indicated in comment #3, we request that

Progress Energy contact FWC in order to make the appropriate revisions to the sampling schedule and duration.

13. **Section 4.0 QA/QC and Data management** - Thank you for providing the information on the QA/QC and data management procedures.
14. **Section 5.0 Reporting** - Thank you for providing the information on the proposed reporting procedures.



## **FWC RAI #1 comments for Levy Nuclear Plant and Crystal River Energy Complex Combined Discharge Survey and Monitoring Plan**

1. **Section 2.3, Historical Data:** Thank you for providing the overview of the water quality sampling being conducted under Project COAST. As indicated, the COAST data was used to help in determining the selection of stations for the Discharge Survey and Monitoring Plan (DMP); however, the summary did not include any water quality (WQ) or biological summary information that has been or is being collected by Progress Energy as part of National Pollutant Discharge Elimination System (NPDES) requirements for the Crystal River Energy Complex (CREC). Please provide a summary of this data and locations where data have been collected. Also, please provide the information on the existing data collection program and/or current proposal for water quality and biological sampling under the NPDES permits/permit applications for CREC.
2. Progress Energy submitted, in 2008, copies of previous seagrass monitoring reports and Remetrix's draft copy of the "Seagrass quantification report for the area adjacent to the Crystal River Power Generation Facility, Florida." Please provide a copy of the Remetrix report if it is final. Also, during the January 7, 2010, conference call with the NPDES permitting staff, Progress Energy indicated that a summary report is being generated for the NPDES permit processing. Please indicate the status of this report. If the draft report is not available, please indicate when you expect it should be completed.
3. **Section 3.0, DMP Monitoring:** Progress Energy indicates that "The purpose of this plan is to monitor for potential adverse changes in surface water quality that may be related to the Levy Nuclear Plant (LNP) discharge. In addition, there are requirements to survey seagrass, oyster, and hard bottom resources." It should be noted that the intent of the survey and monitoring plan is to identify potential adverse changes in water quality, seagrass, oyster and hard bottom resources that may be related to the combined LNP-Crystal River Energy Complex Discharge.
4. Thank you for providing information in Section 3.1.1 on the proposed seven locations that will be incorporated into the water quality survey and monitoring; however, Figure 3.1 provides only the locations within the expected discharge plume. There are no WQ locations indicated that are north and on the eastern side of the CREC discharge canal (shoreward of WITH-9 and north of CREC-7). Please provide information that indicates where the DMP and COAST sampling stations are to occur and the relationship with those other stations. Please provide the justification for the stations in the survey area. Please add additional stations shoreward of WITH-9 and north of CREC-7.

It may be beneficial to include in the discussion and as an attachment or appendix, the "Crystal Bay Surface Water Monitoring Plan" that is part of the DEP-CAMA Conditions of Certification. This would provide the broad-based approach and would help eliminate confusion between the various survey and monitoring requirements.

5. Figure 3-1 shows the proposed monitoring locations contour of simulated winter temperatures over ambient winter conditions. Please indicate if there is a reason that the

winter conditions were used instead of summer conditions or why both winter and summer conditions were not presented. Please provide a similar figure to Figure 3-1 that shows the expected summer conditions.

6. Figure 3-1 says the "plume isotherms are adapted from Stone and Webster, 1985." Are there recent data that could be used to support the location of the proposed stations? What is the probability of temperature increases beyond ambient for the proposed stations? What is the duration of temperature differences (weeks, months)?
7. Figure 3.1 presents plume isotherms of simulated temperature over winter ambient conditions, when the cooling effect of ambient water is expected to be high. Stations CREC-8, WITH-8, and WITH-10 are listed as outside the predicted plume area. Is there evidence that these stations are beyond the plume in summer as well?
8. In Attachment A, temperature data are not presented in this section. The thermal influence is of importance when identifying the sampling station locations. Please revise the appropriate section to include temperature data.
9. In Attachment A, Tables A-1 and A-2, why is WITH-10 included in both the North and South Groupings? Statistical comparisons cannot be made between groupings that contain the same data point. This is especially important if the data are being used to determine sampling frequency.
10. Thank you for providing the summary of water quality parameters that are proposed for sampling under the DMP (Section 3.1.2). Measurements of chlorophyll-a are a valuable indicator of water quality since concentrations may reflect the combined effect of many water quality factors. Adding the measurement of chlorophyll-a as a DMP parameter would provide consistency between the COAST and the DMP data sets. Total Nitrogen (TN) and Total Phosphorus (TP) methods measure both organic and inorganic forms as well as particle-associated (e.g., in cells, detritus, re-suspended sediments, etc.) N and P with no speciation or fractionation of the nutrients present. As such, this data do not provide information on whether the N or P is in the water or the plankton. In addition, Progress Energy has indicated that turbidity is a major problem in the area. We recommend that the following parameters be added for analysis: Total Dissolved Nitrogen (TDN), Total Dissolved Phosphorus (TDP), chlorophyll-a, and turbidity. Please revise the water quality parameters that are to be sampled to reflect these recommendations (Section 3.1.2).
11. Pending the results of the chlorophyll-a sampling, it may be necessary to evaluate added-nutrient impacts to be assessed at a number of sampling sites by collecting seagrass and macroalgal tissue for nutrient and stable isotope analyses (Section 3.1.2). We can advise on potential locations that are in conjunction with the water quality survey and monitoring sites. While this is not necessarily a need for an immediate revision of the sampling plan, it should be mentioned as a possible contingency and modification to the sampling protocols.

12. Thank you for providing the proposed seagrass, oyster, and hard bottom sampling grid (Figure 3-2) as part of Section 3.2. It is good in that the sampling grid has 141 proposed sites; however, it is skewed to the areas north of the discharge canal and does not have any reference/control sites indicated or sites south of the CREC intake canal. By widening the spacing among the sites, more information might be collected for the same amount of effort along with extending the grid south to the CREC intake canal. Has a plan and/or timeframe been established to establish successful completion of this task? Please indicate the justification for the spacing among the sites. Please revise the sampling grid to include potential reference/control sites.
13. While the Braun-Blanquet scale is an acceptable measure of seagrass or macroalgal cover to reduce observer bias and natural variability, it should be measured and interpreted as shoot basal area rather than areal cover of leaf and shoot material. Questions regarding the proper technique for assessing shoot basal area can be referred to Florida Fish and Wildlife Research Institute staff.
14. It is not clear if any water quality parameters via probes will be taken at the dive locations. We recommend that, at a minimum, temperature, dissolved oxygen (DO), salinity and either turbidity or secchi depth be collected. Please revise the sampling plan to accommodate these parameters and modify the sampling protocols.
15. The proposed seagrass, oyster, and hard-bottom sampling does not contain plans for conducting aerial photography for seagrass in conjunction with the diver surveys. We recommend that the seagrass monitoring plan be revised to include at least annual aerial photography of a 6 x 6-mile square area centered on the discharge point. We can advise on the proper timing to obtain optimal imagery. Please revise the survey and monitoring plan to incorporate the annual collection and analysis of aerial photography for seagrasses.
16. The proposed seagrass, oyster, and hard bottom sampling does not include assessment of oyster reef biota and viability and does not include scallops that may be in the area. While the proposed sampling grid survey will identify locations of scallop, oyster and hard-bottom areas, more targeted surveys are needed for these habitats. Most studies incorporate an abundance estimate, such as  $\#/m^2$ ,  $kg/m^2$  or  $cm^3/m^2$ , based on 0.25-meter quadrats placed in appropriate habitat, instead of using the Braun-Blanquet methodology. Survey and monitoring should include an estimate of the percentage of live and dead oysters, and have some estimate of the size frequency distribution. Oyster surveys in Florida typically are done in spring before spawning season and/or in fall after spawning season. Spring surveys give an idea of the spawning adult population; fall surveys give an indication of both adult survival through the summer as well as recruitment rate. Reference sites will also need to be identified. Please modify the survey and monitoring plan to more thoroughly address the scallop, oyster, and hard-bottom areas as described above.



17. Thank you for providing information on the proposed intensive DO survey and monitoring of the central predicted plume area, Section 3.3. Progress Energy proposed in 2007, as part of NPDES Permit No. FL0000159, a "Thermal Plume Assessment Plan of Study." Has this study been started or completed? If so, please provide a copy of the draft or final report.
18. The "intensive DO monitoring" anticipates a depth profile measurement at three (canal) sites (CREC-3, CREC-4 and CREC-7) three times a year (once a month summer) for two years pre-operation and post-operation of LNP. Two of the events already occur as part of the water quality monitoring portion of this plan. This appears to represent only one additional sampling event in July. This does not appear to be an adequate sampling coverage. We recommend taking the measurements at more sites at a frequency of greater than once a month to characterize the combined discharge.
19. The CREC-4 station may be in depths greater than the surrounding areas; therefore, the DO regime from a deeper canal is not necessarily representative of how the combined discharge is behaving in the shallower areas. We recommend placing additional sampling stations in the shoreward area.
20. Monitoring DO on the bottom at only one site, CREC-7, one time during each of three months is unlikely to provide enough detail to characterize the combined plume. What is the depth of this site? Please provide an explanation as to why this was the only site chosen for the overnight measurement.
21. The proposed design for the intensive DO study defines CREC-4 and CREC-7 sites along the canal as the "central area of the predicted combined discharge plume." The isotherms in Figure 3-1 and the data presented in the ReMetrix report suggest that the current discharge plume moves north along the coast. Please provide an explanation as to why these two particular sites were chosen to represent the "central area."
22. **Quality Assurance and Control, Section 4.0:** Thank you for providing the information on Quality Assurance and Control, Section 4.0. Please revise Section 4.0 to address the requested additional analysis: Total Dissolved Nitrogen (TDN), Total Dissolved Phosphorus (TDP), chlorophyll-a, and turbidity, as noted above.
23. Thank you for providing the information on Reporting Requirements, Section 5.0.
24. **Schedule for DMP Survey and Monitoring, Section 6.0:** Thank you for providing the information on the Schedule for DMP Survey and Monitoring, Section 6.0. Section 6.1, along with information contained in Appendix A, provides the information on how the water quality monitoring frequency was determined. The information indicates that there is a moderate amount of natural variability in the bimonthly data, which is in part due to the bi-monthly sampling frequency. Since TN and TP values are fairly low, it implies that the system is going to be sensitive to any inputs/perturbations. Pooling samples may not provide additional information since they are being collected at the same frequency

and may not be sensitive to temporal changes. We recommend that the sampling frequency for nutrients be increased to monthly samples. As indicated above, we also recommend changes in the frequency of DO measurements and the need for WQ probe measurements during the seagrass surveys. Please revise the survey and monitoring section to reflect these recommendations.

25. Section 6.1 did not indicate how the sampling frequency for the biological work was determined. Long-term monitoring frequency for scallops/oysters/hard-bottom surveys is required due to cyclical reproductive patterns (3-5 years). Oyster surveys are typically done twice a year; scallop sampling once a year after May 1. FWC staff recommends an "index period for seagrass sampling" to occur in July or August timeframes. Please provide the justification for the annual sampling for seagrasses and other benthic communities. Please revise the schedule to accommodate the more intensive scallop/oyster surveys.
26. Monitoring duration 6.2: The pre-operational sampling effort must be sufficient to identify natural variability patterns in measurements. It should be noted that a minimum of three data points (equivalent to three years of data collection) are required to perform tests for both a linear and quadratic trend. Three years may not provide sufficient power to detect probable or possible effects. We request that Progress Energy contact FWC in order to make the appropriate revisions to the sampling schedule and duration.