Florida Department of Environmental Protection

Northeast District
7825 Baymeadows Way, Suite B200
Jacksonville, Florida 32256-7590
Phone: 904/807-3300 ♦ Fax: 904/448-4366

August 20, 2010

Gary Frost
Vice President Manufacturing
Georgia-Pacific
Palatka Pulp and Paper Operations
P.O. Box 919
Palatka, Florida 32178-0919

RE: Administrative Order No. 039-NE
Request for Additional Information

Dear Mr. Frost:

The Department has received the Technical Memorandum No. 3 "Wastewater Treatment Alternatives Evaluation" and the Rice Creek Water Quality Report submitted on July 15, 2010 in accordance with the Department's letter of June 1, 2009. The reports are informative and the meetings we have had with your staff and consultants over the past year have helped to refine the alternatives evaluations.

Upon review, however, the Department has identified a number of questions to be answered and various aspects of the report that require further evaluation and, in some cases, data documentation. Our comments follow.

Cover Letter

1. Please provide details on the scope, schedule for installation, estimated costs, and how the improvements in effluent water quality were determined for the Planned 2010-2012 Environmental Investments. Additional comments on the Planned Investments follow.

2. Please discuss further the "proprietary raw water treatment plant modifications" and the parameters that are being targeted for reduction, from this proposed modification. Is the proprietary process intended to address the changes in chemistry of the water treatment plant discussed in sections 5.12 and 5.14 of the Technical Memorandum?

3. The proposed Planned Investments include a primary clarifier solids press. Section 5.3 of the Technical Memorandum, *Aerobic Handling and Dewatering of Primary Solids*, includes different press types and configurations based on whether coagulants are added. Please clarify whether coagulants are proposed to be added and the type and configuration of press to be installed.

4. The letter mentions the Optimization of secondary treatment operation (oxidation ponds). Can you please be more specific about what is being considered for optimization? Are these changes in pond operating depth and operations discussed in section 5.10 and 5.11 of the Technical Memorandum?

<u>Technical memorandum No. 3</u>
The following questions are listed in page order of the Technical Memorandum and therefore may have some duplication as they relate to similar topics.

1. On page 5, it states that the wastewater treatment evaluation focused on iron, color, aluminum, specific conductance, whole effluent toxicity, and dioxin. Table 1-1, and the revised Table 1-1 in Appendix A, however, do not include information on the current effluent characteristics for aluminum. Please provide any aluminum data that is available on the effluent.

2. On page 6, nine of thirteen alternatives that were described in Technical Memorandum 1 were selected for further development, as discussed in this report (shown in Table 3-1). In Section 4, a total of fifteen alternatives addressed in this report are listed. Additional explanation should be provided as to how the additional alternatives evolved.

3. On page 6, it discusses the use of data from DMRs for the parameters of interest, except for color and specific conductance. Color and specific conductance data used in the analysis were based on Mill operational data. Presumably, Mill operational data were frequently collected in conjunction with compliance

monitoring for DMRs. Please provide a summary table comparing operational data sampling and compliance monitoring using paired events for color and specific conductance.

4. On page 6, reference is made to recommendations made by Risk Sciences in May 2009 indicating that specific conductance and soluble aluminum concentrations in the final effluent needed to be reduced to 1,500 μS and 2 mg/L, respectively, to comply with WET limits. As the achievement of WET limits appears to be the most difficult parameter to address, please provide a copy of the Risk Sciences document.

5. On page 9, an updated effluent characterization table based on the October 2009 to May 2010 period was added as an Appendix A. According to the report, the average values for color, specific conductance, and iron are within 20 percent of the average values used in this study. There was a large improvement in the average chronic toxicity NOEC for *C. dubia*. Based on the revised table in Appendix A, the daily maximum color declined by nearly 25 percent and the daily maximum specific conductance declined by nearly 9 percent. According to the report, these effluent improvements would not appreciably change the conclusions reached. The cover letter for this submittal also identified planned environmental investments over the 2010 – 2012 period. Since they were presented as bullet items, it is unclear to what extent some of these upgrades are incorporated into some of the alternatives considered in this study and how the anticipated 20 percent reduction in conductivity and a 30 percent reduction in color were derived. Recent reductions in both color and specific conductance in the effluent and anticipated additional reductions with the planned environmental investments could influence the capital and operational costs associated with some of the alternatives that were evaluated in this study, yet no information was provided. If specific conductance was considered an important factor contributing to chronic toxicity, it would seem that the NOEC levels would also increase with the observed and projected declines in specific conductance. The improvements in the average chronic NOEC for *C. dubia* and the average and maximum chronic NOEC for *P. promelas* seen in Appendix A may support this, but please provide a more detailed discussion about how these improvements might impact the costs associated with the alternatives as well as the impact you might expect to see with whole effluent toxicity testing.

6. On page 10, the second bullet describes the procedure used to estimate TN and TP concentrations in each pond. Although nutrients were not a focus of this study, was sampling of TN and TP in each pond conducted over time that verified that this procedure yielded accurate concentrations for TN and TP? If

not, please explain how it was determined that 0.3 mg/l TP and 2.6 mg/l TN need to be added to PO4 and NH3 values.

7. On page 10, the fifth bullet stated that nutrient concentrations on average slightly increase across Pond 1. In the May 16th draft version of the report, it stated that TP removal was observed across Pond 1 (1.4 mg/L to 0.52 mg/L). Please explain.

8. On page 11, Table 2-1 summarizes wastewater treatment performance during the January through September 2009 period. Appendix A should include an update to this table, as was done for Table 1-1. It would also be informative to add specific conductance as a parameter in the tables. How does specific conductance vary from the clarifier inlet throughout the system? If specific conductance is reduced at the clarifier inlet, would that reduction progress through the treatment system?

9. On page 15, information is provided on typical operating depths for the ponds, as well as recommended depths to minimize sediment disturbance under high wind events. Some of the typical operating depths (Ponds 2 and 3) appear to be different from values presented on page 9. Please explain and modify any potential impacts that these changes may have on alternatives.

Pond	Page 9 typical/total depths (ft)	Page 15 typical depths (ft)	Page 15 recommended depths (ft)
1	5.8/6.7	5.7	4.0
2	3.3/6.4	3.8	4.3
3	3.3/6.1	3.8	3.5
4	4.2/7.2	4.2	3.25

10. On page 15, increased TSS levels associated with a 99th percentile wind event (hourly wind speed of 12.5 mph) is the basis for recommendations on changes to operational depths in the treatment ponds. The May 16th draft referred to the 1 percentile wind event (20 mph). Please provide details on the time period and location of the wind measurements, a cumulative frequency plot of the wind speeds, and data/plots illustrating the link between changes in TSS and wind events.

11. On page 15, the report states that results were inconclusive regarding the performance of the baffles in Pond 4 in reducing TSS under high wind events. As a result, the focus was directed toward depth increases in preference to baffle

installation. Do baffles provide improved treatment of TSS and other parameters of interest under the non high wind periods that represent 99 percent of the time? Please consider and explain.

12. On page 16, reference is made to discussions with Risk Sciences regarding the need to significantly reduce effluent specific conductance and aluminum to potentially comply with the WET limit. A concern was also expressed regarding likely ionic imbalances in the effluent. Since achievement of WET limits appears to be the most difficult parameter to address, please provide additional information regarding the basis for the specific conductance and aluminum concentrations Risk Sciences recommended to improve the NOECs. Similarly, what work has been completed to verify whether ionic imbalances are present in the discharge and what alternatives could be considered to minimize those imbalances? See question 4 as well.

13. On Page 17, in the third paragraph, you mention lab testing determined that a 500 dalton molecular weight cut-off filter was required to reduce color to less than 200 pcu. Please provide lab sheets on the color results for each of the UF filter sizes tested, or a graph that indicates the color reduction achieved for each size of filter.

14. On page 17, the first bullet states that baffles installed in Pond 4 have not reduced Pond 4 effluent TSS concentrations below those observed prior to installation. This statement appears to conflict with the statement on page 15 "Pond operations personnel have observed an improvement in Pond 4 effluent TSS control after installation." Explanation should be provided to reconcile these two statements.

15. On page 18, Table 3-1 includes a row at the top called status quo effluent characteristics. In the case of color and *C. dubia* chronic NOEC values, the status quo levels represent daily averages from Table 1-1. Status quo values in the table for specific conductivity and iron are daily maximums from Table 1-1. It is unclear whether the aluminum value represents a daily average or a daily maximum. Please provide an explanation as to why the daily average value was used for the alternatives comparison for certain parameters, while the daily maximum value was used for other parameters.

16. On page 18, Table 3-1 summarizes the response of each parameter of concern to each alternative. Results for a number of the alternatives are based upon some type of jar test or calculation. In the case of chronic toxicity for *C. dubia*, it appears that responses were based on whether the alternative reduced specific

conductance below 1,500 µS and aluminum below 2 mg/L. As noted throughout these comments, it appears that conclusions in this report were largely based on not achieving a NOEC of ≥72 percent. Were any chronic toxicity tests performed for any of these alternatives and, if not, is there a practical reason why they could not be performed on certain alternatives that achieved the other effluent targets? This is a critical element that requires additional justification and support.

17. Jar test results in Table 5-1 indicated that addition of 300 mg/L alum reduced true color from 1200 PCU to 182 PCU and an insignificant increase in conductivity from 1,730 µS to 1,735 µS. Table 5-2 provided a more detailed list of parameters and concentrations before and after addition of 300 mg/L to effluent from Pond 4. In Table 5-2 the true color of 1200 PCU was reduced to 62 PCU and conductivity was reduced from 1,730 µS to 1,710 or 1,720 µS. Was there something different in the type of tests, sample volumes, etc. that would explain why color was reduced to 182 PCU in Table 5-1 and 62 PCU in Table 5-2? Are results that variable? Although the issue, as noted on page 16, is to reliably and consistently achieve the NOEC level of ≥72%, it is interesting to note that both the specific conductance and aluminum concentrations were above the Risk Sciences thresholds in the effluent prior to addition of alum in Table 5-2 and the chronic toxicity NOEC for *C. dubia* was 100%. The NOEC was still 100% after alum addition and settling. Please consider this relationship as you answer the other questions in this comment.

18. On page 27, Table 5-6 indicates treatment of the primary clarifier influent by coagulation with 500 ppm Nalco 8140 followed by sedimentation, reduced color to 140 pcu with no increase in conductivity, which would allow the final effluent to meet water quality color standards with 66% reversion. The annual operating cost was estimated at ~$15 million, most from chemical costs. As mentioned in the cover letter the planned upgrades will reduce color by 30%, how might this project cost be impacted by the reduction in color going to the treatment system?

19. The aerobic handling and dewatering of primary solids alternative is described starting on page 29. Does the planned upgrade to use a "primary clarifier solids press" described in the July 15, 2010 cover letter represent this alternative or certain elements of this alternative? According to the study, it would reduce the final effluent color and offset downstream chemical addition. See question 3. on the Cover letter as well. With regards to aerobic handling, has a DO profile been done on the treatment ponds? Is there potential for incremental color improvement by increasing aeration to 2 ppm, as recommended by Lange?

20. On page 33, it describes the results from Pond 4 testing (Table 5-2), for evaluating the "flocculent addition to Pond 3 effluent" alternative. Three coagulants achieved the desired reductions in color, aluminum, and iron but increased Pond 4 effluent TSS (although Figure 5-7 does not indicate an increase in TSS). According to Table 3-1, however, the alternative has no effect on color. Table 5-12 includes an annual dredging cost of $4,693,720 for Pond 4. Does the cost actually represent an annual cost or the cost to dredge Pond 4 once every 2 years as implied in Table 5-12?

21. On page 42, the alternative of Pond 4 effluent pH adjustment, followed by filtration, is described. It concludes that it would likely provide some color reduction, but increase specific conductance. Table 5-17 suggests little change in aluminum or iron concentrations. It appears that these conclusions do not match the likely impacts for alternative 8 in Table 3-1. According to Table 3-1, color would be unchanged, specific conductance would be less, iron and aluminum would be reduced and the NOEC for *C. dubia* would be significantly improved. Please explain.

22. On page 47, under the "Dewatering Water Treatment Plant Sludge Separately", it states that the primary constituent identified in WET toxicity was soluble aluminum. What tests or studies have been performed that support that statement? If that is the case and the water treatment plant (WTP) is the source of 62 to 89 percent of the effluent aluminum, why haven't more alternatives considered the combination of dewatering of water treatment plant sludge or changing the chemistry used in the WTP with other alternatives? It appears that the effluent microfiltration and RO alternative described on page 37 was the only alternative that considered the combination of multiple options.

23. As described on pages 5 and 13, there is a 5 MGD withdrawal from Rice Creek at mile point 3.0 for use as cooling water. The report notes that this water is composed principally of effluent and has a specific conductance of 1,070 μS and a color of 525 PCU. The cooling water is combined with other process wastewaters and sent to the primary clarifier. Presumably, alternatives such as final effluent coagulation and sedimentation and the combination of effluent coagulation and sedimentation with microfiltration and RO would reduce color and specific conductance in Rice Creek. These should result in lower color and conductance levels in the intake water, as well as lower color and conductance levels going into the primary clarifier and Pond 1, especially if the discharge location is relocated from mile point 3.4 to mile point 2.4. There did not appear to be any quantification of the influence of some of these alternatives on the characterization of the 5 MGD withdrawal from Rice Creek and the impact to the

color and specific conductance characteristics of inflow to the primary clarifier or Pond 1. How much does this influence treatment costs associated with reducing color and specific conductance to achieve discharge limits? How are reductions in specific conductance and color at the primary clarifier or Pond 1 propagated through the rest of the treatment system?

24. On page 49, a cost estimate of $4.6 million is provided to dredge Pond 1 only. This estimate includes cost estimates for $1.22 million for the installation of power for dewatering. Also, in the appendix, you have included a table for dredging and dewatering cost estimates but with no other details included. Please provide a detailed estimate to support the $4.6 million cost as well as supporting information regarding the required solid concentration needed to transport and landfill the material.

25. On page 49, it is mentioned that dredging is not expected to improve average effluent quality. However, the solids in Pond 1 may be providing an area for anaerobic activity which might be contributing to incremental increases in color reversion. Would dredging pond 1 be expected to reduce color? This may be answered with a DO study across the treatment ponds as mentioned in question 20. Are there any other legacy chemicals that might be reduced by dredging? A sediment toxicity assay on pond solids might demonstrate whether legacy solids could be contributing to chronic toxicity.

26. On page 51, the second bullet states that the effluent WET standard cannot be reliably attained due to sensitivity of the test species at the water quality-based specific conductance limits and sensitivity to the ionic composition. The documentation supporting that statement is lacking in this study. See questions 4 and 12 as well.

27. Appendix A – With respect to chronic toxicity results for October 2009 through May 2010, we were unable to verify results when looking at the chronic toxicity results listed in table 5.1 on page 55 of the Rice Creek Water Quality Report. Please provide an explanation of this discrepancy.

<u>**Rice Creek Water Quality Report:**</u>

1. Table 2-1 describes three control sites and two sites at the discharge as sampling locations for biological sampling. Figure 2-1 illustrates two background sites (R7 and E2) and a final effluent site (M1). Are both discharge sites located at M1? Please provide another figure that illustrates the location of the third control site. Please provide additional information regarding station locations such as

latitude/longitude and a physical description of the sampling locations. For example, how wide is the stream at the sampling point, what is the average depth, and what types of substrate are present? If sites are tidally influenced what is the typical tidal range experienced at the site, did sampling occur during a specific tidal condition, etc.? These details may be present in the earlier plan of study or previous report; however, a brief characterization now is appropriate.

2. Hester-Dendy data from OD (downstream of the outfall) showed a diverse assemblage of sensitive taxa, including 3 mayfly species, 4 caddisfly species, a riffle beetle, and 2 sensitive midges. Compared to the other streams in the area not receiving the discharge, Shannon-Weaver diversity was actually a little higher at OD. In contrast, the dip net collected data from OD contained far fewer total species, and few sensitive species, meaning a there was a discrepancy in the results based on sampling method. The SCI results at OU, OD, and E4 (Etonia Creek) were in the impaired category. This presents another inconsistency, since Etonia Creek is a DEP reference site and OU should not receive the effluent. These observations, especially compared to the Hester-Dendy results, suggest that the SCI results are suspect. SCI procedures typically include a habitat assessment, as well as a drawing of the 100 meter segment of the stream detailing various habitat types and sampling locations. That information was not found in the report. Please provide field sheets from these biological surveys, as well as the staff conducting those sampling events. Please provide an explanation about why you feel the SCIs were valid or not to help explain the discrepancy between the Hester-Dendy data and the SCI data for the various locations. Also, were the samplers certified by FDEP for the SCI sampling?

3. Are the water quality conditions associated with SCI scores shown in Figure 4-1 current? Please confirm and discuss.

4. As described in the introduction, the monitoring program was first implemented in 2007 and a 2008 report summarized sampling conducted in 2007 – 2008. It would be very informative if a brief statistical and/or graphical summary of key background chemical and biological results from 2007 – 2010 were included. For example, specific conductance, color, and iron were key parameters that were evaluated in the treatment alternatives study. Please submit.

5. You mention on page 48 about submitting data from December 2009 and July 2010 samples. Please submit the analyses when they become available.

If helpful, the Department will arrange a meeting to discuss these comments in more detail. The Department cannot determine whether Georgia Pacific has met the requirements set forth in our June 1, 2009 letter without your responses. If you have any questions concerning this matter, please contact my office at (904) 807-3301 or by electronic mail at Melissa.M.Long@dep.state.fl.us.

Sincerely,

Melissa M. Long

Melissa M. Long, P.E.
Water Facilities Administrator

ec: Rodger Ferguson, Georgia Pacific
Jeremy Alexander, Georgia Pacific
Brad Purcell, Georgia Pacific
Wayne Magley, DEP Tallahassee
Phil Coram, DEP Tallahassee
Greg Strong, DEP Tallahassee
Lucy Sonnenberg, Jacksonville University