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March 10, 2006

Pete Oddi, P.E., PMP
U.S. Army Corps of Engineers
Savannah District
P.O. Box 889
Savannah, GA 31402-0889

Dear Mr. Oddi,

The Department received and reviewed the 7-year monitoring data and model output used to generate report Figures M-1 through M-4, which we requested by letter dated February 15, 2006, and we have completed our review of the report "Development of the Hydrodynamic and Water Quality Models for the Savannah Harbor Expansion Project—Final, January 30, 2006."

The January 30, 2006 report replaces the previous draft dated May 20, 2005. The Department provided comments on the previous draft by letter dated July 1, 2005. The purpose of the current review was to determine if the final report addresses previous comments and to give our position on whether or not the hydrodynamic and water quality models are acceptable tools to evaluate potential impacts of Savannah Harbor Expansion Project.

The final report addresses previous comments to varying degrees. In summary:

1. The EFDC hydrodynamic and salinity model continues to under-predict ebb flows on Back, Middle, and Little Back Rivers based on comparisons to discrete, short-term flow measurements. Improvement would likely require continuous, long-term flow data not currently available. The large amount of continuous water level and salinity data, and the overall agreement between this data and the model, appears to compensate for the limited flow data in demonstrating overall model performance. Thus, this issue is not considered significant for model calibration and for application to deepening impacts; however, application to mitigation scenarios that alter channel connections—and attempt to predict resulting changes to the flow regime and the effect on salinity—may require additional evaluation of model capability.

2. The EFDC model continues to under-predict salinity on Middle River; however, we agree with Tetra Tech that the model achieves a reasonable balance between

Middle River, Front River (where the model does well), and Little Back River (where the model tends to over-predict salinity). We also agree that the 7-year simulation results are evidence that the salinity model performs well over a wide range of conditions during 1997 through 2003. Notably, during the drought years 2000 through 2002 when salinity intrusion on Little Back River was greatest, model correlation to data increases and model percent error decreases as compared to the 1999 calibration and 1997 confirmation periods. Overall, the salinity model is performing well, and this issue is not considered significant.

3. The report documents the QA/QC screening of the dissolved oxygen (DO) data completed by USGS, and the WASP water quality model incorporates the new dataset. Results were mixed. In general, DO model statistics (Tables P-1 and P-2) did not improve; however, model-data comparisons are complicated by gaps in the DO data. Along the Front River, the model does not simulate the short-term fluctuations (< 24 hours) and associated instantaneous minima shown in the DO data (Appendix P). The model does a better job on average as indicated by comparisons of measured and simulated 50^{th} percentile DO, and it does a reasonable job of representing the spatial trends along Front River (Figures 9-1 and 9-2). Although DO data on the side channels are more limited, available data show the model over-predicts DO in these areas. Based on these characteristics, the model should do a reasonable job of predicting impacts in terms of relative change in DO. Impact evaluations involving predictions of absolute DO values would require consideration of, and accounting for, model bias.

4. The Corps has collected additional five-day BOD concentration data for confined disposal facility (CDF) discharges and provided the data along with estimates of BOD loading during the days sampling was performed. Estimated loads were relatively low for these days because effluent flows were relatively low; however, five-day BOD concentrations were relatively high (16 to 19 mg/L). Final impact analysis will require refined load estimates that take into account higher flow periods (including any increased flows expected to result from deepening and disposal activities) and the potential contribution of ammonia to the total oxygen demand.

5. We understand that development of the Model-to-Marsh (M2M) linkage and the Marsh Succession Model (MSM) continues. Ultimately, the plan is to use the M2M to connect the EFDC model to the MSM. We appreciate the Corps keeping us informed about these analyses. As indicated above, we believe the EFDC model is performing well; however, ultimately, it will need to be demonstrated that EFDC, M2M, and MSM together yield reliable predictions of wetland impacts.

6. We understand that adjustment of both the EFDC and WASP models continues. Impact analyses submitted to the Department for water quality certification for harbor deepening should be run on the final models.

Based on our review of the report and models, our position is the EFDC hydrodynamic and salinity model and the WASP water quality model are acceptable tools, subject to the comments above. As with any complex tool, issues may arise during application and interpretation. In this case, we would look forward to continued cooperation with the Corps and the other state and federal agencies involved with this project.

Thank you for the opportunity to participate in reviewing the modeling work. If we can be of any other assistance please contact me or, for modeling issues, please contact Wade Cantrell at (803) 898-3548.

Sincerely,

Alton C. Boozer

Alton C. Boozer
Chief, Bureau of Water

ACB/wmc