Coastal Georgia
Regional Development Center

FINAL PROJECT COMPLETION REPORT
SECTION 106 FFY 2006 GRANT

UPDATE OF WATER QUALITY MONITORING FOR FECAL COLIFORM SUPPORTING TOTAL MAXIMUM DAILY LOAD (TMDL) IMPLEMENTATION PLANS FOR TWO SEGMENTS OF JACKSON BRANCH, OGEECHEE RIVER BASIN

June 19, 2009

Project Summary

The Georgia Environmental Protection Division (EPD) contracted with the Coastal Georgia Regional Development Center (CGRDC) to update water quality data for previously prepared TMDL implementation plans or inventories, in October 2007. In accordance with said contract, CGRDC has completed the following project elements:

- Prepare a monitoring plan for Targeting Monitoring
- Conduct targeting sampling throughout the watershed
- Submit a State Sampling and Quality Assurance Plan (SQAP)
- Conduct 305(b)/303(d) monitoring and submit data to the Division for review

The two stream segments of Jackson Branch contracted to be monitored are: Downstream of King Finishing Company from SR17 to the Ogeechee River, Dover; and Upstream of King Finishing Company from SR17 to Co. Rd. 39, Dover. Both stream segments are located within the Ogeechee River Basin in Screven County, Georgia. Both stream segments were monitored for fecal coliform against state standards, and data was also collected on the presence of E. coli bacteria, as per contract amendment.

Under contract with CGRDC, the Ogeechee-Canoochee Riverkeeper® monitored the identified segments June 2008 through March 2009, consistent with the Sampling Schedule provided in the respective Sampling and Quality Assurance Plan (SQAP) completed in April 2008, and with the approved Targeting Monitoring Plan. The sampling locations are shown on the attached Google Earth map. The Ogeechee-Canoochee Riverkeeper® used the University of Georgia (UGA) Feed and Environmental Water Lab to run the fecal coliform samples, and UGA Marine Extension Service to run the E. coli samples.

Documentation of Outputs

The compilation of water quality sampling data acquired through the work of the Ogeechee-Canoochee Riverkeeper®, as lab-analyzed by UGA, is attached. For the purpose of data collection and analysis, the upstream monitoring station is identified as JB003, and the downstream monitoring station is identified as JB004, as shown on the attached map.

Data Analysis

The 30-day geometric means of fecal coliform levels were calculated specific to the two monitoring stations, one 30-day geometric mean each for the four samples taken at each station taken June 9, 2008 through June 23, 2008, September 23, 2008 through September 30, 2008, January 6, 2009 through January 14, 2009, and March 17, 2009 through March 30, 2009. The units are reported in *Most Probable Number* (MPN) of colonies per 100 milliliters of water (MPN/100 ml), also effectively represented by *colony forming units* (cfu) per 100 milliliters (cfu/100 ml).The time of year for the monitoring was chosen to correspond with the periods prescribed in the SQAP, conforming to the applicable state water quality standards. The samples originally scheduled to be taken in December 2008 were instead taken in early January 2009, adapting to unexpected constraints as a result of King Finishing Company's activities.

- A 30-day geometric mean of 362.57 MPN/100 ml was derived from the four samples taken in June 2008 at monitoring station JB003, and a 30-day geometric mean of 105.31 MPN/100 ml was derived from the samples taken in June 2008 at station JB004.

- A 30-day geometric mean of 558.79 MPN/100 ml was derived from the four samples taken in September 2008 at monitoring station JB003, and a 30-day geometric mean of 484.27 MPN/100 ml was derived from the samples taken in September 2008 at station JB004.

- A 30-day geometric mean of 84.92 MPN/100 ml was derived from the four samples taken in January 2009 at monitoring station JB003, and a 30-day geometric mean of 169.98 MPN/100 ml was derived from the samples taken in January 2009 at station JB004.

- A 30-day geometric mean of 111.33 MPN/100 ml was derived from the four samples taken in March 2009 at monitoring station JB003, and a 30-day geometric mean of 151.59 MPN/100 ml was derived from the samples taken in March 2009 at station JB004.

Water quality samples collected within a 30-day period having a geometric mean in excess of 200 MPN or cfu/100 ml during the period of May through October, or in excess of 1,000 cfu/100 ml during the period of November through April, are in violation of the state's bacterial water quality standard.

The 30-day geometric means of fecal coliform at the upstream station in June and September 2008 (362.57 MPN/100 ml and 558.79 MPN/100 ml) violated the state water quality standard of 200 cfu/100 ml for the period of May through October. The 30-day geometric mean of fecal coliform at the downstream station in September 2008 (484.27

MPN/100 ml) also violated the standard. However, the 30-day geometric mean of fecal coliform at the downstream station in June (105.31 MPN/100 ml) fell within the standard.

All 30-day geometric means of fecal coliform samples taken in January 2009 and March 2009 were well within the state water quality standard of 1,000 cfu/100 ml during the period of November through April. The 30-day geometric mean of fecal coliform specific to the upstream station in January was 84.92 MPN/100 ml, and in March it was 111.33 MPN/100 ml. The 30-day geometric mean of fecal coliform specific to the downstream station in January was 169.98 MPN/100 ml, and in March the 30-day geometric mean for the downstream samples was 151.59 MPN/100 ml.

Stream Condition Evaluation

The results of the water quality sampling data support the conclusion in the TMDL Implementation Plans developed for Jackson Branch, attributing the nonpoint source fecal coliform bacteria violations to wildlife. The upstream monitoring station (JB003) is located immediately north of the US17 crossing of Jackson Branch, a site where tree canopy does not exist to shade the stream from solar heating and the stream flow is partially impounded by wing walls and culverts associated with the engineered road crossing. The slowed flow of water in this open condition results in warmer conditions. The warmer water prolongs the life of the coliform bacteria originating significantly from natural causes. Thus, the lack of vegetative cover and restriction of stream flow at the upstream station (JB003) are substantial contributing factors to the higher 30-day geometric means characterizing the upstream reach, and to a lesser but significant extent the downstream reach, in June and September 2008. The lower than normal rainfall during that period is an exacerbating factor with respect to warmer water, slower flow and higher concentration of fecal coliform.

Recommendations

The hydrologic alterations and vegetative canopy removal at the upstream monitoring station should be addressed. Restoring flow during low-flow conditions under US Highway 17 will ensure that the ponding currently present during these times is relieved. Additionally, restoring the tree canopy should provide shade, thus lowering water temperature and promoting faster bacteria die-off.

Scope of Services Limitations

There are some limitations in the data analysis due to the need for more information. We assume within this paper that the source of the bacteria is wildlife. However, speciation to determine the animal(s) contributing to the bacteria levels was not conducted. In order to ensure that source of the bacteria is wildlife and not livestock or human, speciation should be conducted.

Additionally, the targeted monitoring, while adding an additional upstream site, was not conducted on a frequent enough basis for the information to be particularly useful. It is

recommended that targeted sampling plans in the future should be conducted on a more frequent basis during low flow conditions, when the bacteria levels in the stream are higher.

Final Project Budget

The final project budget was previously submitted on May 29, 2009.