
Bishop Harbor Water Quality Assessment

Manatee County, FL

GPI



Water Quality Assessment

Client/Owner: Florida Dept. of Environmental Protection

Project Location: Manatee County, FL

In February 2001, Piney Point Phosphates, Inc. notified the Florida Dept. of Environmental Protection (FDEP) that it was no longer able to maintain the Piney Point phosphate mining facility in Manatee County near Bishop Harbor. FDEP assumed responsibility for the environmental security of the facility, including the untreated wastewater stored at the facility. Long-term data relating to water quality in Bishop Harbor did not exist prior to 2001. In support of FDEP, Manatee County began collecting water quality data in October 2001 in Bishop Harbor. Unusually high rainfall in December 2002 caused concern that one of the wastewater containment berms might fail, resulting in a catastrophic release of highly acidic and nutrient-laden untreated wastewater into Bishop Harbor. Treated wastewater was discharged to the harbor to alleviate this possibility. FDEP requested an assessment of the potential water quality responses to the discharge of treated wastewater into Bishop Harbor. Because of the need for timely technical guidance on the most appropriate discharge strategy, Janicki Environmental provided this assessment through a three-step approach, with each additional step more complex.

- ❑ Empirical Loading Limit – The available chlorophyll data from Bishop Harbor were used along with the long-term chlorophyll data from nearby Terra Ceia Bay to develop a statistical model relating ammonia loads from the phosphate facility to chlorophyll levels in Bishop Harbor. This empirical model led to the identification of a daily ammonia loading limit from the phosphate facility to the harbor.
- ❑ Two-Dimensional Water Quality Box Model - A two-dimensional water quality box model of Bishop Harbor was developed to evaluate the findings of the empirical model. The results of this modeling effort supported the ammonia loading limit established via the empirical model.
- ❑ Three-Dimensional Water Quality Model – The most complex effort to estimate the effects of discharge to the harbor on water quality in the harbor and in Tampa Bay as a whole involved the development and calibration of a three-dimensional water quality model linked to the three-dimensional hydrodynamic model developed by USF for the bay and harbor.