BIOPHYSICAL AND ECONOMIC ANALYSIS OF GREAT MIAMI RIVER WATER QUALITY TRADING PROGRAM, OHIO

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Project Costs: **$38,000**

Project Completion: **2005 - Ongoing**

At the request of the Miami Conservancy District, KIESER & ASSOCIATES (K&A) conducted an analysis of biophysical and economic aspects of the Great Miami River basin, Ohio from 2004-2005 to assess water quality trading opportunities in this 3,800 square mile watershed (http://www.envtn.org/docs/Great-Miami_Trading_Analysis.pdf). The Miami Conservancy District is leading an effort to design and implement a water quality trading program to achieve significant nutrient load reductions in this tributary of the Ohio River. The Great Miami has over 80% of its land in agricultural uses and is among the top three nitrogen contributors to the Ohio River. Driven by the pending nutrient standards for the state's surface waters, this 10-year pilot trading program focuses on point source/nonpoint source trading for nutrients (total phosphorus and total nitrogen) between permitted wastewater dischargers and agriculture. It will be largest point source/nonpoint water quality trading program in the United States once underway.

To determine the potential viability of such a program, the K&A analysis focused on:

- Conducting a nonpoint source modeling analysis using SWAT to assess agriculture credit supply
- Assessing and comparing the costs of point source load reductions via traditional in-plant facility upgrades to the costs of comparable load reductions by agricultural
- Analyzing cost savings and load reductions achievable through trading

Results indicated that phosphorus credit demand and most of the nitrogen credit demand by point sources can be met by nonpoint sources through the implementation of the no-till management practices on 50% of the row crops in the watershed. Treatment plant upgrades to biological nutrient removal technologies for all point sources are estimated at $422.5 million. Costs for implementation of no-till practices to meet point source watershed demand are $37.8 million providing a $384.7 million savings compared to treatment plant upgrades. The analysis concluded that water quality trading in the Great Miami River watershed has the potential to provide significant cost savings over traditional command and control approaches. Kieser & Associates also defined ancillary trading program benefits including significant sediment loading reductions, reduced peak flows during spring runoff, and increased groundwater recharge resulting in increased summertime baseflow.

The Miami Conservancy District is securing final regulatory approval for this point source/nonpoint trading program. Various trading ratios will be applied for trades occurring in waters attaining designated use standards (1:1) and non-attaining waters (2:1) and before NPDES permits are modified to reflect new nutrient standards. For permittees seeking trading opportunities after permit modifications, trading ratios will increase to 2:1 and 3:1 for attaining and non-attaining waters, respectively. Kieser & Associates will continue to assist the Miami Conservancy District over the next three years to assess program performance, BMP efficiencies and costs.