Water Quality Trading in the Non-Tidal Passaic River Basin: Strategies for Water Quality Protection and Program Success Measurement

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Approximately one quarter of New Jersey's population lives in the Non-Tidal Passaic River Basin. The 803 mi^2 watershed is a major source of drinking water for two million New Jersey residents. The state's largest drinking water reservoir, the Wanaque Reservoir, is located in the watershed and is impacted by excessive phosphorus loading from upstream dischargers.

The New Jersey Department of Environmental Protection (NJDEP) has adopted a Total Maximum Daily Load (TMDL) for phosphorus in the Non-Tidal Passaic River Basin. Phosphorus loading is currently dominated by wastewater treatment plant (WWTP) point source discharges. TMDL allocations are based on a 0.4 mg/l long-term average discharge of total phosphorus from each WWTP in the basin.

Rutgers University received a Targeted Watershed Grant from USEPA to develop a water quality trading program to aid implementation of the Passaic TMDL for phosphorus. Rutgers University faculty with expertise in water quality modeling, wastewater treatment and environmental law and policy have partnered with Cornell University environmental economists to develop the Passaic trading program.

A central goal of the project is to develop a phosphorus point source to point source trading framework that optimizes WWTP controls to protect water quality throughout the basin, without creating hot spots -- locations where excessive loading of phosphorus can increase the risk of algal blooms.

Extensive watershed studies and modeling have identified where and under what conditions hot spots can occur within the basin. The analysis found two potential hot spots – the Wanaque Reservoir and Dundee Lake.

The team proceeded to design a user-friendly framework that addresses the physical boundaries for trading among dischargers. The framework aims to create opportunities for trading that ensure hot spot avoidance at both the Wanaque Reservoir and Dundee Lake, while accounting for complex surface water diversions that transform basic upstream and downstream relationships in the watershed.

The proposed framework establishes three "management areas" within the watershed. A management area is delineated so that its outlet represents the *only* hot spot concern in that management area. Bidirectional trades (i.e., seller can be upstream or downstream of the buyer) are allowed *within* the same management area. Inter-management area trades are restricted according to whether the seller can offset the buyer at common management area outlets under all diversion conditions. Of the six possible inter-management area trades identified, this constraint would allow only three to be executed (figure 1). In addition, trading ratios are applied in order to account for differences in attenuation and to equalize the load being traded.

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Targeted Watershed Grants

EPA is now accepting proposals for water quality trading and other market-based projects at www.epa.gov/waterqualitytrading. Projects must address reducing nitrogen, phosphorus, sediment, or other pollutant loadings that cause low oxygen levels in local waters and which enter the Mississippi River system. Projects must be located in one of the three Mississippi River sub-basins with the highest nutrient loads contributing to hypoxia in the Northern Gulf of Mexico: the Ohio River, the Upper Mississippi River, or the Lower Mississippi River. EPA will award up to $4.2 million to support approximately 15 to 25 outstanding proposals. Proposals are due September 9, 2008. For additional information, please contact Chris Lewicki at lewicki.chris@epa.gov or (202) 566 - 1293.

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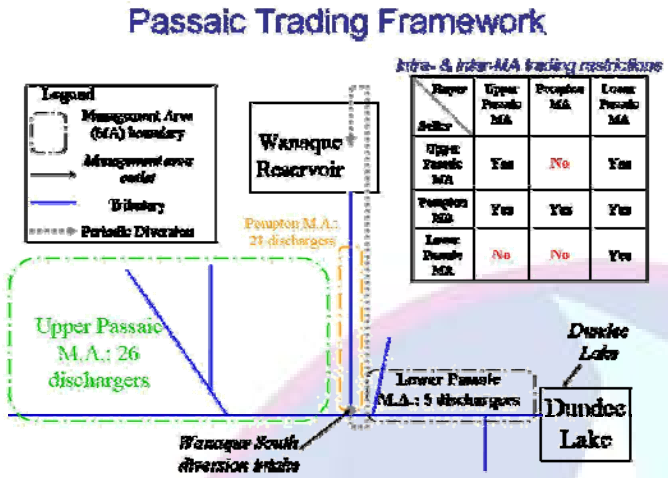

Figure 1

Measuring trading program success in a complex watershed requires consideration of important milestones in each stage of program development, from research, design and implementation planning -- toward facilitation of trades that reduce aggregate phosphorus loads and save money. To this end, the team has developed preliminary success measures that serve as indicators applicable to water quality trading in general, and to the unique challenges and aspects of this project. The measures address progress in research, team building, stakeholder engagement, program design, implementation planning, and ultimate water quality, economic and ancillary program results.

The preliminary measures of program success are organized by category of impact and divided into near-term and long-term results. For example, a near-term environmental measure of success is the degree of scientific basis and consensus for trading ratios. A long-term policy measure of success assesses whether the Passaic trading program stimulated any follow-on trading programs in other NJ watersheds and across the nation.

The recent adoption of the TMDL puts the Passaic trading program one step closer to implementation. The Rutgers and Cornell development team is now conferring with NJDEP, USEPA and other watershed stakeholders to present the details of the proposed Passaic trading framework within the context of the TMDL requirements. Please visit http://www.water.rutgers.edu/Projects/trading/WQTrading.htm for more information and updates on this project.

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MARYLAND

Maryland Department of the Environment has developed a Policy for Nutrient Cap Management and Trading (available online at: http://www.mde.state.md.us/Water/nutrientcap.asp). It is a creative and innovative approach to managing point sources nutrient load caps.

One aspect of Maryland's approach is unique. Other states allow trading in lieu of upgrading a WWTP. In Maryland, upgrade of major WWTPs is required and the Bay Restoration Fund was instituted to fully fund these upgrades. Trading is not available as a substitute for the upgrades, but rather as a mechanism to allow for future growth. The Maryland trading policy covers point source to point source trading, as well as trading involving onsite systems.

The Policy addresses both the need to achieve early nutrient load reductions from point sources through enhanced nutrient removal upgrades and the need to address new or increased point source nutrient loads associated with a growing population. The need to address planned growth is met through various environmentally sensitive offset/trading options and requirements outlined in the Policy. Under this policy, Maryland will continue to be a leader in the effort to restore the Chesapeake Bay while accommodating expected population growth.

UPDATES TO THE WATER QUALITY TRADING TOOLKIT

EPA will be adding an appendix to the Water Quality Trading Toolkit for Permit Writers on methodologies for trading programs which include onsite systems.

In addition, Appendix D of the Toolkit will be updated to reflect discussion of expanded State Revolving Fund (SRF) eligibility for facilities in trading programs.

Both updates are expected to be released in August 2008.