Great Miami River Watershed
Water Quality Credit Trading Program

Minnesota Water Quality Pollutant Trading Advisory Committee
April 17, 2007

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The Miami Conservancy District
Dayton, Ohio
Overview

• The Miami Conservancy District
• The Great Miami River Watershed
• Great Miami River Watershed Water Quality Credit Trading Program
  – Drivers
  – Partners & development process
  – Design
• Program status
The Miami Conservancy District

- Great flood of 1913
- Ohio Conservancy Act
  - Signed into law in 1914
  - Watershed-based political subdivision
  - Broad authority primarily for water-related purposes
- MCD established 1915
The Miami Conservancy District

- **Protecting** people and property from flooding
  - Five dry dams and levees
  - Floodplain preservation

- **Preserving** the quantity and quality of water
  - Aquifer protection
  - Stormwater collaboration
  - Water quality credit trading

- **Promoting** the enjoyment of waterways
  - Land and water trails
  - Parks and preserves
Great Miami River Watershed

- 4,000 mi²
- Major tributaries:
  - Stillwater River
  - Mad River
- 1.5 million residents
- Dayton is largest city
- Agriculture is dominant land use
Great Miami River Watershed

- Rural areas upstream
- Urban areas downstream
Great Miami River Watershed

- Are we meeting water quality goals?
  - Yes = 59%
  - Partial = 20%
  - No = 21%

- Sources of impairment
  - Hydromodification
  - Sediment
  - Nutrients (TP)
Great Miami River Watershed

Average peak season* total nitrogen loading per unit area on the lower Ohio tributaries


Value for Green River incorrect due to typographical error in ORSANCO report.
Trading driver - regulation

- Ohio EPA says TP is problem
- USEPA wants TN reduced
- Ohio EPA will promulgate TN and TP criteria
- New TN and TP restrictions on horizon for WWTPs
- Agriculture is mostly unregulated
Trading driver – economics

- WWTPs can reduce TP and TN with $$$$ treatment

- Agricultural producers can reduce TP and TN for a fraction of the cost
Trading driver - economics

Preliminary Economic Analysis of Water Quality Trading Opportunities in the Great Miami River Watershed, Ohio
July 23, 2004

Prepared by:
Kieser & Associates
536 E. Michigan Ave., Suite 300
Kalamazoo, Michigan 49007
20-Year economic projection

• WWTP upgrades = $422.5 million
• Trading = $46.5 million
  – Ag. practices = $37.8 million
  – Data collection & transaction costs = $8.7 million
• Citizens save $376 million
• Better environmental results!
## Trading driver - environmental results

<table>
<thead>
<tr>
<th></th>
<th>WWTP Upgrade</th>
<th>Ag. Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pollutant of concern</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Other pollutants</td>
<td>?</td>
<td>Yes</td>
</tr>
<tr>
<td>Habitat</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Canopy</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Stream bank</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Velocity</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Wetland</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Floodplain</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Assimilative capacity</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Partnership and program development

- More than 100 meetings – 2003/2005
  - Cities/counties with WWTPs
  - County soil and water conservation districts (SWCDs)
  - Agricultural producers
  - Ohio EPA and USEPA
  - Ohio Department of Natural Resources
  - Ohio Farm Bureau Federation
  - Chambers of commerce
  - USDA’s Natural Resource Conservation Service
  - Ohio Environmental Council
Program design

- Responsive
- Sensible
- Results oriented
- Manages liability
- Minimizes uncertainty
- Adaptable
Stewards of the Great Miami River Watershed

Responsive

Ohio EPA

County SWCDs
Sensible

- Minimum new bureaucracy
- Existing SWCD staff
  - Identify and submit projects
  - Quantify nutrient reductions with standardized approach
  - Validate project completion and ongoing implementation
  - Identify “failed” practices
Sensible

- The “straight face test”
  - Credits must be generated upstream from the WWTP that is using the credits for compliance
Results oriented

• What actions generate credits for WWTPs?
  – Agricultural practices funded by the Trading Program Project Fund - **YES**
  – Agricultural practices under contract with existing state & federal conservation incentive programs - **NO**
  – Any other required agricultural practice - **NO**
Stewards of the Great Miami River Watershed

Results oriented

Goal
Stewards of the Great Miami River Watershed

Results oriented

5 to 10% monitoring

Continuous flow and nutrient monitoring
Results Oriented

- **Stillwater Subwatershed**
  - TMDL says too much TP
  - Proposed reduction = 977,000 lbs./year
  - Agriculture is source of > 90%
  - TMDL seeks **75% voluntary reduction by agriculture**
Results oriented

- TMDL TP load est. = 1,446,000 lbs.
- Measured load 357,000 lbs. TP
- EPA’s discharge estimate too high by 400%
- EPA’s ag. reduction target too high
- Measured load is less than EPA’s TMDL goal!!
Water Quality Monitoring

![Graph showing water quality monitoring data with concentration (mg/l) on the y-axis and dates from July 12 to September 27, 2005, on the x-axis. The graph includes lines representing SRP, TP, and PRECIP.]
Results oriented

Estimated* impact of trading ratios

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Traditional Approach (lbs.)</th>
<th>Trading (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP</td>
<td>904,015</td>
<td>1,349,207 to 2,253,222</td>
</tr>
<tr>
<td>TN</td>
<td>4,475,978</td>
<td>6,380,721 to 10,865,700</td>
</tr>
</tbody>
</table>

*Kieser & Associates, 2004
Manages liability

- **Insurance Pool**
  - Provides “back-up” credits for WWTPs if a practice fails
  - Credits generated via ratios
Minimizing uncertainty

Addresses USEPA Trading Policy
√ Consistent with Clean Water Act  
√ Trade only within a watershed  
√ No net increase in pollutant or impairment (no “hot spots”)  
√ Consideration of uncertainty of agricultural practices  
√ Public participation  
√ Ancillary environmental benefit
Minimizing uncertainty

- Ohio EPA – Rulemaking
- Pilot projects critical
- Market instability???
- Legislative support for “grandfathering”
(D) For any water quality trading activities in effect prior to the effective date of this rule, a water quality trading management plan shall be submitted to the director as follows:

(1) For the great Miami river watershed water quality credit trading program, not later than ten years after effective date of this rule.
Adaptable

- Load Reduction Workgroup
  - Ohio DNR
  - Ohio EPA
  - USDA/NRCS

- Adaptive implementation
  - Collect data
  - Improve Load Reduction Spreadsheet
  - Update the Trading Program
Adaptable

- Adapt
  - Collect data
    - Inventory/allocate credits
- Capitalize Project Fund
- RFP
  - Select projects
    - Contract/implement projects
  - WWTPs CIG
Program status

• Three-year pilot project funded
  
  $1,200,000 WWTPs
  
  $\underline{937,000}$ USDA/NRCS
  
  $2,137,000$ total
Program status

- Two rounds of projects
  - Applications = 120+
  - Projects funded = 34
  - Nutrient reductions = 165 tons
  - Payments approved = $409,719
MCD’s VISION

Thriving communities, a healthy watershed, and a higher quality of life, sustained by well-managed water resources throughout the watershed.