Introduction to TMDLs with Examples from the Chesapeake Bay

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What is a TMDL?

A calculation of a pollutant load that assures that, when implemented, an impaired segment will attain and maintain all applicable water quality standards.
What is a TMDL?

TMDL = WLA + LA + MOS

WLA = Sum of all point sources

LA = Sum of all nonpoint sources including natural background

MOS = Margin of safety accounting for uncertainty about the relationship between loads and water quality
TMDL Allocation

Considerations when making allocation decisions:

– **Source** of the pollutant (point source or runoff)
– **Controllability** of the pollutant (i.e., atmospheric)
– **Regulatory authority** to control pollutant
– **Cost** of each allocation option
– **Certainty** of water quality impact in receiving water
– **Reasonable assurance** that allocation can be met
– **Stakeholders objectives**
TMDL Allocation (cont.)

• Each point source with an individual NPDES permit receives an individual wasteload allocation (WLA)

• Point sources covered under general permits may get a gross wasteload allocation (WLA)

• All other sources and background must be included in the load allocation (LA), which can be one gross number or subdivided among individual sources or categories.
TMDL Allocation

Point Source 1 (WLA)

Point Source 2 (WLA)

Point Source 3 (WLA)

NPS Source Category 1 (LA)

NPS Source Category 2 (LA)

NPS Source Category 3 (LA)

Explicit MOS

Reserve Capacity

Natural Background

Allocate Example
 Listing of Impaired Waters

1. **States identify waters** not meeting WQS based on “all existing and readily available information”
2. **States establish priorities** for TMDLs on basis of the use and severity of problem
3. **States develop schedule** of TMDLs to be developed within 2 years
4. **States provide long term plan** – complete TMDLs 8 to 13 years from first listing
5. **EPA has** 30 days to approve or disapprove list submitted April of each even year
   - If EPA disapproves State list, EPA has 30 days to develop list for the State
CWA Restoration Framework

- Adopt Water Quality Standards
- Monitor & Assess Waters
- List Impaired & Threatened Waters
- Develop Total Maximum Daily Loads (TMDL)
- Implement Point & Nonpoint Source Allocations
TMDL Implementation

• TMDLs are implemented through other sections of the Clean Water Act

• Point Sources:
  – Permit limits consistent with WLA are enforceable under CWA through National Pollutant Discharge Elimination System (NPDES)
    – Issued by EPA or States w/ delegated authority

• Nonpoint Sources:
  – No federal regulatory enforcement program
  – Primarily implemented through State/local NPS management programs (limited number w/regulatory enforcement)
Low to no dissolved oxygen in the Bay and tidal rivers every summer.
Impact of a Pound of Nitrogen/Phosphorus on Bay Water Quality
Relative effectiveness (Riverine * Estuarine Delivery)

Major Rivers by Jurisdiction Ranked by Pollution Impact on Bay
Dissolved Oxygen Criteria Attainment

Basin-wide load is 190 N and 12.7 P (MPY)
Setting the Pollution Diet

Nitrogen Loads by Sector and Scenario—CBP Watershed Model P5.3

Million lbs per year

1985 2009 Tributary Strategies July 1 Draft Allocation

150 109.4 71.5 187.4

Total Forest WWTP Developed Agriculture
Setting the Pollution Diet

Phosphorus Loads by Sector and Scenario—CBP Watershed Model P5.3

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www.epa.gov/chesapeakebaytmdl
8 Watershed Implementation Plan Elements

• Nutrient and Sediment Target Loads
• Current Program Capacity
• Mechanisms to Account for Growth
• Gap Analysis
• Commitment to Fill Gaps: Policies, Rules, Dates for Key Actions
• Tracking and Reporting Protocols
• Contingencies for Delayed or Incomplete Implementation
• Detailed Appendix Supporting Bay TMDL Allocations
Phase I: 92 Bay Segments
2010

Land Areas of the Chesapeake Bay Basin
Draining into the 92 303d Segments

Phase II: Counties
2011
Agriculture and TMDLs

- Ensures all sources get their share of the reduction responsibility
- Reasonable assurance puts focus on regulated point sources
- Has lead to efforts to fully account for and credit non-cost shared conservation practices
- Creates the potential for a large marketplace for nutrient trading
- Provides a measure of certainty for producers
Questions & Comments