Chesapeake Bay Program Water Quality Goal Implementation Team
September 29 – 30, 2009

ATTACHMENT K1

Chesapeake Bay TMDL Strawman Outline

Report Outline and Template for the Chesapeake Bay TMDL Document

This outline provides all headings and subheadings for which text is to be developed in completing the Chesapeake Bay Nutrients and Sediment TMDL documentation. It has been developed with the input of various Bay TMDL stakeholders including members of the Technical Re-evaluation Workgroup.

Note that adjacent to many section headings and/or subheadings are the names of individuals or teams of individuals who have been identified to take the lead in drafting those sections. For the aid of contributing writers, goal statements highlight the general content to be addressed and specific questions/issues that must be addressed in each section are listed.

The current schedule for developing the TMDL document is as follows:

11/5/2009	First Draft TMDL
12/31/2009	Second Draft TMDL
3/31/2010	Finalize Draft TMDL for WQSC
4/2010	Draft TMDL to WQSC
6/2010 - 9/2010	Public Comment Period
12/31/2009	EPA Establishes TMDL

To meet these deadlines, contributing writers are requested to submit draft sections to Teresa Rafi at the following email address: teresa.rafi@tetratech.com by **OCTOBER 19, 2009**.

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1. INTRODUCTION

Goal: To provide the geographic, environmental and political setting for the Bay TMDL by describing what is contained in the document, discussing the regulatory background of the TMDL, and providing context through a discussion of the history of Chesapeake Bay cleanup efforts.

This document presents the Total Maximum Daily Loads for Nutrients and Sediment for the Chesapeake Bay…

1.1. What is in this document/What is not in this document (Tt)

What you will find…

What you won't find….

Document describes history of the TMDL, the impairments, technical analysis used to develop allocations, TMDLs for impaired segments, major basin allocations by jurisdiction.

Detailed allocations and strategies are provided in individual state Implementation plans….

Technical reports related to modeling are referred to in appropriate sections

1.2. TMDL Background (Tt)

CWA Requirements… Section 303(d) of the 1972 Clean Water Act (CWA)[1] requires states, territories, and authorized tribes to develop lists of impaired waters. (40 CFR Part 130)…

TMDL Description

The equation

The process

The document

1.3. Chesapeake Bay TMDL History (Batiuk and Koroncai)

The goal of this section is to briefly explain 'how did we get here' from an environmental and political perspective.

Questions to answer:

- What events (environmental) lead up to the Bay TMDL
- What are the VA, DC, and DE Consent Decrees and their relevance to the TMDL (Sincock and Day)
- What is the MD/EPA TMDL MOU (Sincock and Day)

1.3.1. TMDL Coordination among partners (Batiuk and Koroncai)

The goal of this section is to describe the multi-stakeholder process that has been used to develop the TMDL.

Questions to answer:

- Who is lead agency?
- What process has been used to develop the TMDL and what agencies and stakeholder groups have been involved?
- What has been and will be the role of the states? The role of major committees and workgroups?
- How have the Bay modeling efforts been tied into the efforts to develop the TMDL? (see Bay TMDL website for potential language)

[1] EPA's regulations for implementing section 303(d) are codified in the Water Quality Planning and Management Regulations at 40 CFR Part 130, specifically at sections 130.2, 130.7, and 130.10. The regulations define terms used in section 303(d) and otherwise interpret and expand upon the statutory requirements.

1.3.2. Past Efforts (Koroncai)

The goal of this section is to discuss similar efforts completed in the past (i.e., the tributary strategies) and explain how the TMDL affects them.

Questions to answer:

- What are/were the Tributary strategies?
- How does the TMDL affect the trib strategies (i.e., supercedes)
- What is the difference between the tributary strategies and TMDLs
- Are modeling efforts going to be ongoing? What is/will be the nature of the Bay modeling activities?

2. SETTING AND IMPAIRMENT DESCRIPTION (TT AND EPA REGION 3)

2.1. General Setting (Possible Source for information: Chesapeake Bay.net; Bay Program for help with map development)

The goal of this section is to introduce the watershed and provide a description of its characteristics.

Characteristics to Discuss:

- Location/Geography
- Geology
- Major Tributaries
- Geopolitical (states, major cities, etc.)
- Landuses
- Growth and Population Trends
-

Suggested maps:

The Bay in relation to surrounding states and major centers of population, etc.
The Bay estuary and its major tributaries

2.2. TMDL Scope (Sincock)

The goal of this section is to describe what the TMDL applies to and where.

Questions to answer:

- Identify pollutants of concern
- Identify geographic extent of impaired sections and/or reductions (maps)

2.3. Impaired Waters (Sincock assisted by States)

The goal of this section is to present information regarding impaired waters for which the TMDL is going to be applicable.

Issues to Discuss:

- Current (2008) 303(d) listings for MD, VA, DE, DC
- Crosswalk with consent decree listings (VA and DC) MD MOU, DE consent decrees done
- Identification of impaired waters for which the TMDLs apply
- Water quality limited segment (92 segments) vs. Tributary implementation plan (JS)

3. WATER QUALITY STANDARDS (BATIUK)

The goal of this section is to discuss water quality standards relevant to the Bay TMDL, the regulatory basis for those standards and where they apply; describe the 1987 Chesapeake Bay Agreement and Living Resource Habitat Requirements; if applicable discuss the existence of the Bay wide Standards as well as any specific State WQ standards that may apply and where, (by reference, not necessary to recreate tables of state criteria). Section should end with a listing of all TMDL endpoints and general description of how attainment will be assessed.

3.1. Chesapeake Baywide Standards (TT)

The goal of this section is to describe water quality standards relevant to the TMDL that are applicable to the Bay.

Issues to Discuss:

- 2003 Basinwide Use Attainability Analysis
- Tidal Waters Designated Uses
- Water Quality Criteria
- Attainment Assessment Procedures (modeling?)
- Segmentation scheme and assessment units

3.2. State Water Quality Standards (TT VERIFIED BY STATES)

The goal of this section is to describe any state specific water quality standards that are relevant to the TMDL.

- MD
- VA
- DE
- DC

3.3. TMDL Endpoints Summary (LINKER)

The goal of this section is to present the parameters and values for which TMDL endpoints have been established and introduce concepts related to how attainment will be evaluated.

Issues to Discuss:

Summarize the pollutant specific TMDL endpoints (e.g., DO criteria that will form the basis for the load allocations)

Summarize the assessment of attainment (e.g., bioreference curves and when do we deem criteria to be met and uses supported) (Keisman, Bay Program)

4. SOURCE ASSESSMENT (ASSIGNMENTS?)

The goal of this section is to explain the role of the source assessment in the TMDL process; describe the source assessment activities conducted to support development of the Bay TMDL and to generally summarize the results.

4.1. Regulated Point Sources (Zhou and Trulear)

Point sources, according to 40 CFR § 122.3, are defined as any discernable, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. The National Pollutant Discharge Elimination System (NPDES) program, under Clean Water Act sections 318, 402, and 405, requires permits for the discharge of pollutants from point sources.

All facilities are listed in Appendix…

4.1.1. Municipal Wastewater Discharging Facilities

- General discussion of these facilities and their contribution of relevant parameters
- # by State and/or basin jurisdiction (?)
- Relative contribution to overall load

4.1.2. Industrial Discharge Facilities

- General discussion of these facilities and their contribution of relevant parameters
- # by State and/or basin jurisdiction (?)
- Relative contribution to overall load

4.1.3. Combined Sewer Overflows

- General discussion of these facilities and their contribution of relevant parameters
- # by State and/or basin jurisdiction (?)
- Relative contribution to overall load

4.1.4. Sanitary Sewer Overflows

- General discussion of these facilities and their contribution of relevant parameters
- # by State and/or basin jurisdiction (?)
- Relative contribution to overall load

4.1.5. Municipal Separate Stormwater Sewer Systems (Parrish and Goulet)

- General discussion of these facilities and their contribution of relevant parameters
- # by State and/or basin jurisdiction (?)
- Relative contribution to overall load

4.1.6. Stormwater (Industrial, Construction) (Parrish and Goulet)

- General discussion of stormwater (separate from MS4s) and its contribution of relevant parameters
- Relative contribution to overall load

4.1.7. CAFOs

- General discussion of these operations and their contribution of relevant parameters
- Geographic distribution; # by state and/or basin jurisdiction
- Relative contribution to overall load
- Identify reference materials/reports for this information

4.2. Nonpoint Sources (Sweeney and Hall)

Nonpoint sources represent contributions from diffuse, non-permitted sources. Typically, nonpoint sources are precipitation driven and occur as overland flow, which carries pollutants into streams. Nonpoint sources also include non-precipitation driven events such as contributions from groundwater, septic systems, or direct deposition of pollutants from wildlife and livestock. This section should introduce and discuss the major nonpoint source categories in the CB watershed and where possible, describe the prevalence/magnitude/estimates from each source. List actual figures within Appendices

4.2.1. Agricultural animals

- General discussion of agricultural animals and their contribution of relevant parameters
- Geographic distribution; # by state and/or basin jurisdiction
- Relative contribution to overall load
- Identify reference materials/reports for this information

4.2.2. Agricultural cropland and pasture

- General discussion of ag land as a source and its contribution of relevant parameters
- Geographic distribution; estimates of acreas by state and/or basin jurisdiction
- Description of changes in patterns throughout the analysis period
- Relative contribution to overall load
- Identify reference materials/reports for this information

4.2.3. Septic systems

- General discussion of septics as a source and their contribution of relevant parameters
- Geographic distribution; estimates "hot spots" (?) by state and/or basin jurisdiction
- Description of changes in patterns throughout the analysis period
- Relative contribution to overall load
- Estimates of failure rates by region?
- Identify reference materials/reports for this information

4.2.4. Urban Runoff (non MS4) (Parrish and Goulet)

- General discussion of urban runoff (separate from 'permitted' runoff) and its contribution of relevant parameters
- Relative contribution to overall load

4.2.5. Oceanic inputs

- General discussion of oceanic inputs as a source and their contribution of relevant parameters
- Relative contribution to overall load
- Estimates available?

4.2.6. Streambank and tidal shorelines

- Generally discuss prevalence of this source
- Contribution of relevant parameters
- Estimates of relative contribution to overall loading to the bay

4.2.7. Tidal resuspension

- Generally discuss the nature of tidal resuspension as it impacts the impairment
- What are the primary parameters involved
- How does tidal resuspension compare to other sources of loading
- (are there estimates from modeling exercises?)

4.2.8. Atmospheric deposition

- General discussion of atmospheric deposition as a source and key parameters
- Relative contribution to overall load
- Reference to external reports (??) related to analysis of atmospheric deposition as a source

4.2.9. Natural background

- Generally discuss natural background as a source
- What sources are included as background sources
- Relative contribution to overall loading

5. TMDL TECHNICAL APPROACH: MODELING FRAMEWORK (INTRO BY TT, SECTIONS BY VARIOUS WRITERS)

The goal of this section is to provide an overview of the technical modeling framework used to simulate loadings and responses for the TMDL; introduce the various components (airshed, watershed, bay water quality/sediment transport models, other); discuss linkages between and among the various model components and how they were applied in the context of the TMDL. This section is not the technical modeling documentation! It is a general description of the major processes simulated by models and how they were used to develop the TMDL.

5.1. Technical Modeling Requirements

This section should describe the technical goals of the modeling exercise as a setup to the discussion of the modeling components in the ensuing sections.

5.2. Phase 5 Community Watershed Model (LINKER OR SHENK)

- Watershed Model Summary (hotlink to full report for technical details)
- Discuss representation of pollutant sources within the model
- Model setup (time period, landuse, parameterization, time step, calibration, etc)

5.3. Airshed Model Summary (incorporated within Watershed Report) (LINKER)

- Airshed Model Summary (hotlink to appropriate section of Watershed Model report for technical details)
- Representation of Pollutant Sources within the Model
- Model setup (time period, parameterization, time step, calibration, etc)

5.4. Estuarine and Sediment Transport Model (CERCO)

- Estuarine and Sediment Transport Model Summary (hotlink to full report for technical details)
- Representation of Pollutant Sources within the Model
- Representation of filter feeders (oysters and menhaden)
- Model setup (time period, parameterization, time step, calibration, etc)

6. TMDL DEVELOPMENT (KORONCAI AND SHENK)

The goal of this section is to discuss how modeling results were used in developing the TMDL allocations. MANY OF THESE DETAILS HAVE NOT BEEN FINALIZED.

Issues to Cover:

- Analysis of various scenarios
- Describe criteria assessment procedures (e.g., When modeled values for DO in section CB4 remained equal to or greater than x mg/L for April to October, TMDL was considered met).
- Describe the reduction methodology/decision rules for allocation of allowable loads IN THE MODEL (e.g., loads from STPs reduced first, followed by, etc.,) (different from states' implementation strategies for the TMDLs).
- Discussion of how allocations are being made (i.e., by major tributary basin by jurisdiction)

6.1. Scenarios (Shenk)

- Describe the various loading scenarios evaluated
- Scenario results

6.2. Criteria Assessment (Keisman and Shenk)

- Describe procedures used in assessing attainment
- Refer to/Create technical memo or appendix related to attainment determination?

6.3. Allocation Framework (Koroncai and Shenk)

- Describe the systematic rules applied in reducing sources in the model(s)
- Discuss plans for identifying allocations at the state and municipal levels
- Gross or detailed allocations at state lines for major basins (WLA, LA, MOS)
- Allocations for each impaired segment (WLA, LA, MOS)
- Tributary Implementation Plans?

6.4. Important Considerations (Linker, some existing text already?)

- Critical Conditions
- Seasonal Variation
- Margin of Safety - implicit
- Daily Loads
- Modeling period

7. CHESAPEAKE BAY TMDLS

Allocated loads by Impaired Segment

8. TMDL IMPLEMENTATION AND REASONABLE ASSURANCE (ANTOS, BAY PROGRAM)

The Chesapeake Bay TMDL will be implemented at multiple levels using baywide, federal, state and local programs and authorities. The goal of this section is to describe the adaptive implementation strategy and provide summaries of each state's major implementation plan elements.

8.1. Baywide Adaptive Implementation Strategy (i.e., Phasing) (BAY PROGRAM)

- The Chesapeake Bay Program Partnership
- Chesapeake Bay Agreements
- Chesapeake Bay restoration efforts
- Innovative technologies e.g., nutrient removal by algal harvesting, to promote technology development
- Funding sources
- Near-term goals
- Long-term goals
- Future monitoring plans
- Model update plans

8.2. Watershed Implementation Plans (STATES)

Describe the major implementation goals/strategies for each state, including the basic allocation approach (e.g., detailed or gross, etc.)

8.2.1. MD

- Allocation strategy
- Targeted Reduction goals
- Implementation strategies
- Milestones
- Link to the state implementation plan

8.2.2. VA

- Allocation strategy
- Targeted Reduction goals
- Implementation strategies
- Milestones
- Link to the state implementation plan

8.2.3. DE

- Allocation strategy
- Targeted Reduction goals
- Implementation strategies
- Milestones
- Link to the state implementation plan

8.2.4. DC

- Allocation strategy
- Targeted Reduction goals
- Implementation strategies
- Milestones
- Link to the state implementation plan

8.2.5. WV

- Allocation strategy
- Targeted Reduction goals
- Implementation strategies
- Milestones
- Link to the state implementation plan

8.2.6. PA

- Allocation strategy
- Targeted Reduction goals
- Implementation strategies
- Milestones
- Link to the state implementation plan

8.2.7. NY

- Allocation strategy
- Targeted Reduction goals
- Implementation strategies
- Milestones
- Link to the state implementation plan

9. PUBLIC PARTICIPATION (SINCOCK AND DAMM)

- Describe the public participation strategy employed by EPA in developing the Bay TMDL
- Provide a specific listing of EPA and State public participation events
  - By state and category (e.g., public hearing, presentations, educational events, etc.)
- Summary of comments as an appendix

10. REFERENCES
11. GLOSSARY
12. ABBREVIATIONS

Appendices
A. Water Quality Standards (Batiuk)
B. Impaired Lists (Sincock and States)
C. PS Source Assessment (Zhou and Trulear)
D. NPS Source Assessment (Sweeney and Hall)
E. Modeling Documentation (Linker and Shenk)
F. Assessment of Attainment (???)
G. Daily Load Calculations (Sincock)
H. Implementation Plans (Antos and States)
I. ROD (Record of Decision) (EPA and Tt)
J. Summary of Public Comments