

Comment Response Document for the Nitrogen and Phosphorus TMDLs on the Transquaking River Dorchester County, MD

Introduction

The Maryland Department of the Environment (MDE) has conducted a public review of the proposed Total Maximum Daily Loads (TMDLs) to limit Nitrogen and Phosphorus loadings to the Transquaking River. The public comment period was open from November 12, 1999 through December 13, 1999. MDE received one set of written comments. Below is a list of commenters, their affiliation, and the date they submitted comments. In the pages that follow, comments are summarized and listed with MDE's response.

List of Commenters

Author	Affiliation	Date
James M. Stuhltrager, Susan D. Mack, & James Pew	Eastern Environmental Law Center on behalf of the Sierra Club and the American Littoral Society; and by the Earthjustice Legal Defense Fund on behalf of the Chesapeake Bay Foundation	December 13, 1999

Comments & Responses

1. The proposed TMDL fails to establish a total maximum *daily* load.

Response: The Code of federal Regulations (40 CFR 130.2(i)) states that "TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure." No explicit time period is required.

In this case, moreover, load limits expressed over a longer time period are more appropriate than daily loads. From a technical standpoint, nutrient loads are highly variable. Most of the loads are generated during a small number of storm events. However, nutrients do not have an impact on the temporal scale of a day; rather, they act over long periods of time. For these reasons, the Department has elected to establish the TMDLs on the timeframes that it has. Nevertheless, in order to assist the reader in understanding the magnitude of the loads involved, the TMDL is expressed within the TMDL documentation both as an annual load and an average daily load.

2. The commenters raise several implementation issues. First, questions are raised regarding the viability of achieving the NPS nutrient load reduction estimate that is provided in the TMDL document.

Second, the commenters express concern that the TMDL provides insufficient detail about how the three programs mentioned in the TMDL document— the Water Quality Improvement Act of 1998 (WQIA), the Clean Water Action Plan (CWAP), and the Tributary Strategies program—will meet the TMDL goal.

Third, the commenters argue that the TMDL fails to allocate the non-point source (NPS) loadings to the various non-point sources of phosphorus listed in the technical memorandum. They express concern that the illustrative distribution of NPS loads described in the technical memorandum associated with the TMDL, which subject to modification by MDE, are inadequate to assure implementation.

Finally, the commenters question whether the TMDL document provides sufficient information about implementation plans and compliance provisions that would provide reasonable assurances that the necessary reduction in point source discharges will be achieved.

Response: Neither the Clean Water Act nor EPA’s existing regulations direct states to develop a detailed implementation plan as part of the TMDL development and approval process. Implementation measures, therefore, are beyond the scope of this process. Maryland’s rationale for not including a detailed implementation plan within the TMDL documentation is to allow for a separate, thorough process, involving the appropriate stakeholders. Nevertheless, to advance the process of future implementation, several responsive points are highlighted below.

In response to the second point, under current federal regulation, an estimate of the reduction needed to achieve the TMDL is not a required element of an approvable TMDL. Nevertheless, MDE has provided a preliminary load reduction estimate to serve as a starting point for future dialogue on implementation matters.

In response to the third point, the calculated NPS allocation in the TMDL is implicitly the sum of the individual load allocations as required by current regulation. The sub-allocation of the allowable NPS load to individual sources is a detailed implementation issue, which is beyond the scope of a TMDL. Nevertheless, MDE has provided a technical memorandum, entitled *Significant Nutrient Point and Nonpoint Sources in the Transquaking River Watershed*, which describes viable individual allocations to each land use category that are consistent with the TMDL goal. The technical memorandum provides information that is intended to facilitate future stakeholder dialogue on detailed implementation planning.

In response to the final comment, the proposed TMDL provides sufficient information regarding assurances of implementation of point source nutrient controls. As stated in the TMDL document,

these controls will be executed through the use of NPDES permits. The NPDES permits in the Transquaking River will have compliance provisions that provide a reasonable assurance of implementation.

3. MDE currently establishes permit limits based on maintaining chlorophyll *a* concentrations below a maximum level of 100 µg/l with an “ideal goal” of less than 50 µg/l. The TMDL target water quality goal is to maintain chlorophyll *a* levels below 50 µg/l. Has MDE changed its permit goals for chlorophyll *a* concentration to match the goal specified in this TMDL?

Response: The chlorophyll *a* water quality endpoint expressed in the proposed TMDL is consistent with NPDES permitting practices. Hence, no “change” in general permit goals will be necessary. The point source implementation of this proposed TMDL will be consistent with the specific chlorophyll *a* goal.

4. The commenters question the basis for using the point source discharge data collected in July 1999 with other calibration data collected in 1998. The commenters also ask whether the July 1999 point source discharge data represented maximum point source loads and flows. If not, they contend “different data must be used for the calibration modeling and scenario modeling.” Finally, they solicit a description of the model validation procedures.

Response: For the purposes of model calibration, a limited amount of point source discharge data was collected in 1999 for use with the primary calibration data set collected in 1998. The reason for doing this was to achieve an estimate of specific parameters that were not available for 1998. This approach improves upon using the generally accepted practice of calculating the unknown values based on the known parameters and knowledge of the treatment plant processes. The underlying assumption upon which this approach was based, that the discharge data from 1999 was similar to that in 1998, was justified in two ways. First, plant operation did not change significantly over that time period. Second, the values of parameters that were available for both 1998 and 1999 were similar.

The modeling scenarios 1 & 2 are intended to demonstrate the expected water quality response for low-flow and average-flow conditions under estimates of the current loads. Given that the term “critical conditions” is commonly used with regard to low-flow conditions, the use of that term to describe scenario 1 & 2 in the proposed TMDL could be confusing and will be revised to clarify the presentation. For these cases, it was assumed that the Darling Plant was discharging at design flow with various parameter concentrations set to values observed in July 1999.

The model calibration was performed for both high-flow and low-flow conditions so that the model could be used to simulate a range of possible conditions. The model kinetic coefficients, which are fixed during the calibration process, are independent of season or loads. That is, these model coefficients, once fixed, are not expected to change with reasonable changes in flow, loadings, or seasonal conditions such as temperature and solar radiation. Although data was not available to

perform a formal validation process, sensitivity analyses were conducted to assure the model responded in a manner that provides sufficient confidence in the TMDL analysis.

5. The Department deemed it unnecessary to include a TMDL for CBOD because “the NPDES permits reflect limits that are protective of dissolved oxygen standards in the river.” Was any modeling done or analysis done to reach this conclusion? Part of the reason for developing TMDLs for nitrogen and phosphorus was to make sure DO standards were met. Why was it assumed that CBOD played a less significant role in impairing water quality than nitrogen and phosphorus, particularly during low-flow conditions when point source effluent dominates the water quality of the river? If the water is impaired due to CBOD, a TMDL must be developed for it.

Response: Only one point source which has BOD permit limits, discharges to the Transquaking River, The BOD effluent limit was established to protect localized water quality near the discharge, and appears to be doing so adequately. The TMDL analysis indicates that nutrients, rather than BOD, are the limiting factor in controlling the water quality problems for which the river was identified on Maryland’s 303(d) List, specifically, downstream DO and localized algal blooms. It is on this basis that the TMDL has been established for nutrients.

6. Commenters question the rationale for selecting 5% as the margin of safety (MOS) for the low-flow TMDL and 3% as the margin of safety for the average-flow TMDL. This comment is in view of the uncertainty of NPS loads and the challenge of meeting the reduction goal.

Response: The rationale for the two different margins of safety is somewhat counter-intuitive, and deserves more explanation in the proposed TMDL document than was provided in the draft put out for public comment. Briefly, the average-flow TMDL includes built-in conservative assumptions that are not included in the low-flow TMDL. Extended periods of high stream flow conditions, such as those represented by average flow, rarely occur during summer and early fall, the season associated with critical conditions for algal blooms and low dissolved oxygen conditions (low flow, high temperatures, and high amounts of solar radiation). Nevertheless, rather than using cooler temperatures and lower levels of solar radiation for the average-flow simulations, the critical season temperature and radiation values were used.

7. Table A5 (appendix) and Table 1C (technical memorandum) report inconsistent units for CBOD and DO. Also, Page 17 of the report specifies a reduction in NPS loads of 32%. Elsewhere, the report specifies 35%.

Response: The values of all the water quality parameters listed in Table A5 (appendix) and Table 1C (technical memorandum) should have been reported in kg/day not in mg/l. The correct units have been added to the table. In addition, the reduction figure has been corrected accordingly throughout the main document and the Appendix.