

**Comment Response Document  
Regarding the Total Maximum Daily Load of Fecal Coliform for the Restricted Shellfish Harvesting/Growing Areas of the Pocomoke River in the Lower Pocomoke River Basin and Pocomoke Sound Basin in Somerset and Worcester Counties, MD and Accomack County, VA**

The Maryland Department of the Environment (MDE) and The Virginia Department of Environmental Quality (VA-DEQ) have conducted a public review of the proposed Total Maximum Daily Loads (TMDLs) of Fecal Coliform for the Restricted Shellfish Harvesting/Growing Areas of the Pocomoke River in the Lower Pocomoke River Basin and Pocomoke Sound Basin in Somerset and Worcester Counties, MD and Accomack County, VA. The public comment period was open from October 23, 2008 through November 25, 2008. MDE received one set of written comments. Certain comments were directed specifically to a particular jurisdiction, while others are applicable to both jurisdictions. Of the latter, either a single response is given jointly for both, or, where the responses of the jurisdictions differ, separate responses are provided for each.

Below is a list of commentors, their affiliation, the date comments were submitted, and the numbered references to the comments submitted. In the pages that follow, comments are summarized and listed with MDE’s and VA-DEQ’s responses.

**List of Commentors**

Author	Affiliation	Date	Comment Number
Mary A. Jacobson and Daniel M. Moran	Mid-Atlantic Environmental Law Center/ Widener University School of Law	Nov. 25, 2008	1 through 6

**Comments and Responses**

1. The commentors referencing pages 31 and 32 of the draft document regarding point sources, state that it is unclear whether the TMDL considers the impact of combined sewer overflow (CSO) events from the point sources in the watershed. The commentors further state that overflow events occurring during critical conditions at point source facilities would raise the 0.01% estimate considerably and should be considered in the TMDL. The commentors continue because the point sources to which wasteload allocations (WLAs) are issued can be controlled, they are a key tool in meeting water quality standards (WQS). Best Management Practices (“BMPs”) are discussed extensively in regards to non-point sources, but go unmentioned in any discussion of point sources. The TMDL should more stringently monitor those known sources to assess effectiveness of the TMDL, and require reduction where possible in order to achieve mandated water quality standards. Without consideration of overflow events or BMPs at point sources, reasonable assurances of TMDL implementation may not be achieved.

**MD Response:** CSO spill events are unpredictable and reported to MDE as they occur. No CSO events have been reported in the MD portion of the watershed since 2005. CSOs occur in extreme conditions and therefore are implicitly included in the critical conditions scenario as part of the nonpoint source load.

The purpose of the TMDL development process is the determination of the assimilative capacity of the receiving water body. Providing a broad outline for implementation is also part of the development process, including the discussion of BMPs to control nonpoint sources. Neither the Clean Water Act nor current EPA regulations direct states to develop a detailed implementation plan as part of the TMDL development and approval process. Therefore, it must be understood that the details of achieving and documenting the implementation of the TMDL are beyond the scope of the TMDL development and documentation process.

**VA Response:** There is no Combined Sewer Overflow in the Virginia drainage portion of this watershed.

2. The commentors state that while the TMDL does take into account future growth, as required by the CWA, allocation is only applied to point sources. Future growth will likely also happen in the form of expanded non-point sources contributing to the total fecal coliform load in the restricted shellfish harvesting areas. Such future growth of non-point sources may include converting forested areas to pastures, croplands, or feedlots, all which would likely contribute to an increase in fecal coliform, thereby preventing attainment of water quality standards. To prevent such additional LAs, the TMDL should consider expanding existing riparian zones or making BMPs mandatory as opposed to aspirational. At a minimum, the TMDL should include an adequate explanation of why non-point sources are not addressed for future growth allocations.

**MD Response:** Land use changes are unpredictable and could result in either reduced or increased loads. MD and VA reserve the right to revise the allocations, provided the allocations are consistent with the achievement of water quality standards. Expanding existing riparian zones and making BMPs mandatory are implementation measures and beyond the scope of the TMDL development and documentation process.

**VA Response:** Virginia's allocation does include a component to allow for future growth as a conservative estimate of potential changes in land use (this may be seen in the draft TMDL report, page iv of executive summary has the equation, and explained in more detail on page 33, Section 4.9).

3. The commentor references Section 5, Assurance of Implementation, stating the TMDL mentions various possible modes of funding to achieve water quality standards, but provides no mandatory or verifiable data exhibiting an assurance of implementation of the required water quality standards. Throughout the TMDL,

best management practices are mentioned as possible modes of implementation. This is inadequate. BMPs should clearly be identified and included as mandatory avenues to control non-point sources.

**MD Response:** Please see the response to Comments 1 & 2.

**VA Response:** Virginia law requires the development of an implementation plan (IP) including reasonable assurance provisions discussed by the commentors (citation: §62.1-44.19:4 through 62.1-44.19:8 of the Code of Virginia, also known as the Virginia Water Quality Monitoring, Information, and Restoration Act, or WQMIRA).

4. The commentors expressed that the draft TMDL of fecal coliform for the Pocomoke Watershed does not contain an adequate margin of safety (MOS) that takes into account “any lack of knowledge concerning the relationship between effluent limitations and water quality.” 40 C.F.R. §130.7 (c)(1). To account for uncertainty related to the TMDL, two methods of incorporating the MOS into the TMDL are available. Protocols for Developing Pathogen TMDLs, First Edition, EPA 841-5-00-002, 3-6 (Jan. 2001). The TMDL should use either the explicit (calling for an actual loading capacity) or implicit (calling for conservative estimates to be used in the TMDL) MOS. Here, the MDE used the implicit MOS by relying on the fecal coliform decay rate in salt water. Although MDE’s use of the lower 0.7 per day calculation is conservative, there is no showing that the use of the conservative decay rate alone is sufficient to adequately address the MOS.

**Response:** TMDLs are required to include a MOS to account for uncertainties in a manner that is conservative toward protecting the environment. There are no strict guidelines or methodologies provided by the EPA for selecting a MOS, except to suggest that a MOS may be an explicit value held aside or conservative assumptions built into the analysis. The margin of safety proposed in this TMDL analysis is based on other TMDLs approved by EPA and was adopted in consideration of built-in conservative assumptions of the analysis.

A sensitivity analysis was conducted during development of the tidal prism methodology applied to the shellfish harvesting areas TMDLs (not for this specific area). The sensitivity analysis was performed by adjusting tidal prism model parameters (return ratio, boundary condition, decay rate, freshwater input and tidal range) by 20% and then calculating the corresponding change in estimated load and reduction. This analysis indicated that the decay rate was the most sensitive parameter for estimating the load. An environmentally conservative decay rate is used in the model, thereby estimating a conservative TMDL.

A value of 0.7 per day is on the lower end of the reported literature range for fecal coliform decay and estuary systems. Using this smaller value will allow for less bacteria loss in the system, thus estimating a lower watershed load that would

meet water quality criteria. Due to the model framework (inverse solution), adjustment in the decay factor would not allow for attainment in water quality standards since the same decay rate is used in both the baseline and TMDL scenario. (Inverse solution is defined as assigning the required water quality criterion and estimating the upstream load). The MOS for the TMDL was selected with the understanding that the analysis and the MOS may be revised in the future as better information comes available.

5. Related to comment #4, the commentor articulates the bacteria source tracking method relied on by MDE failed to identify 34% of the fecal coliform source in MD. Interestingly, there were no unknown sources in the Virginia waterways. There is no satisfactory explanation as to the discrepancy of testing between the two agencies and this should be addressed in the TMDL. Further, the lack of identification of nearly 34% of the fecal coliform contribution may indicate a need for testing perhaps beyond the 12-month period of November 2005 and October 2006. Such a large percentage unknown is considerable uncertainty and should be more closely addressed either through better identification efforts or a larger MOS, explicitly corresponding to the 34% uncertainty rate. Moreover, merely attributing the unknown sources to known sources in the TMDL without justification as to such reassignment does not give a reasonable path to compliance for several reasons. First, such weighted averaging does not satisfy TMDL requirements because it does not address 34% of the fecal coliform source in the Pocomoke Watershed. Second, there is no explanation for the particular distribution of these unknown sources; at best, it appears random. Third, any assignment of these unknown sources to the point source/WLA category means that these unknown sources (like the point sources) are not being further controlled by the TMDL. Finally, claiming that the unknown 34% is all uncontrollable load allocation is not determinative and does not provide the reasonable assurance required by the TMDL. Ultimately, the TMDL should be more definitive in the reasons for its use of the decay rate as a MOS. There is no showing that such MOS will address the unknown 34%, thereby failing the intent of the TMDL.

**MD Response:** BST is a new and innovative method of estimating bacterial sources and is based strongly on field collected information, laboratory and statistical analysis. There are several different BST methods to choose from. Maryland is using the Antibiotic Resistance Analysis (ARA) Bacteria Source Tracking methodology.

ARA uses enterococci patterns of antibiotic resistance for identifying bacteria sources. The premise is that human fecal bacteria will have a high level of resistance to certain types of antibiotics, while domestic animals will have lesser resistance, but to a different suite of antibiotics and concentrations. Wildlife is expected to have little resistance to any antibiotic, since they are usually not exposed to any.

For this method to be applied, a source library must be developed, using scat (feces) samples from potential contributors in the watershed (human, livestock, wildlife, etc). The known sources are analyzed for antibiotic resistance. The antibiotic resistance patterns in the source library are tested with known sources to calculate the “confidence” in the library, which is the rate at which the known bacteria sources are correctly classified. The unknown antibiotic resistance patterns in water samples are then compared to the source library to estimate the contributing sources in the water sample. It is important to note that ARA of water samples is not able to determine the specific geographic location of the source, only the relative contribution of sources in the water samples collected.

MD and VA use different source libraries and treat unidentified source samples differently. For MD, the term “unknown source” does not mean the source is unknown; it only means that the source could not be differentiated among the four source categories based on information in the BST library. Given this, and an absence of a competing rationale, apportioning the “unknown” samples as MD has done is a reasonable approach, and has been widely accepted in the past. A more detailed description of MD’s BST methodology may be found in Appendix B. VA uses a different methodology with statistical information and its own library for identifying their samples and the method does not utilize “unknown”.

The source assessment results provide some guidance for future implementation. Please also see the responses to Comments 1 & 2.

**VA Response:** Please, see also the response to Comment 3. Although some of the fecal contamination is attributed to point sources such as wastewater treatment plant effluents, non-point sources are believed to contribute substantially to water pollution. BST methods, such as ARA, are being used to help identify those non-point source contributors and used in TMDL and IP development to design and monitor BMP effectiveness. Although bacterial non-point sources are often associated with agricultural operations, urban pollution is also an important contributor. Some potential urban sources may include residential, commercial, and industrial development; the use of manure as fertilizers; and malfunctioning septic systems. Wildlife in urban watersheds often represents a significant contribution to the bacterial load.

6. The commentors discuss the need for an implementation plan to be added to the TMDL and claim that the TMDL is inadequate under the TMDL regulations. In this plan, timelines should be set. The commentors continue that an intention of implementation through an iterative process hardly meets the requirements of actual timelines and milestones.

**MD Response:** Please see the response to Comments 1 & 2.

**VA Response:** Please, see also the response to Comment 3.