

**Comment Response Document (CRD)
Regarding the Total Maximum Daily Loads of Fecal Coliform for Restricted Shellfish
Harvesting Areas in the South River, Duvall Creek, Selby Bay, and Ramsey Lake of the
South River Basin in Anne Arundel County, Maryland**

Introduction

The Maryland Department of the Environment (MDE) has conducted a public review of the proposed Total Maximum Daily Loads of Fecal Coliform for Restricted Shellfish Harvesting Areas in the South River, Duvall Creek, Selby Bay, and Ramsey Lake of the South River Basin. The public comment period was open from June 24, 2005 through July 25, 2005. MDE received two sets of comments during the comment period.

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 response.

List of Commentors

Author	Affiliation	Date	Comment Number
Mary Searing	Anne Arundel County Office of Environmental and Cultural Resources	July 6, 2005	1 through 8
Kincey Potter	President, South River Federation	July 25, 2005	9 through 13

1. The commentor asked when the Bacteria Source Tracking (BST) data will be available and requested that MDE share the information when it becomes available.

Response: MDE will share the BST results when they become available. The BST schedule is indicated in the following table:

Watershed	Station	2002 -	2003 -	2004 -	2005 -	2006 -	2007 -	2008 -	2009 -
		2003	2004	2005	2006	2007	2008	2009	2010
Patuxent River lower	26		MON	BST					
Potomac River L tidal	4			MON	BST				
St. Mary's River	7			MON	BST				
Breton Bay	2			MON	BST				
St. Clement Bay	6			MON	BST				
Wicomico River	2			MON	BST				
Honga River	1					MON	BST		
Little Choptank	1					MON	BST		
Lower Choptank	16					MON	BST		
Eastern Bay	2					MON	BST		
Miles River	3					MON	BST		
Wye River	7	BST							
Lower Chester River	1				MON	BST			
Corsica River	1				MON	BST			
Isle of Wight Bay	1				MON	BST			
Lower Pocomoke River	7				MON	BST			
Tangier Sound	2				MON	BST			
Manokin River	3				MON	BST			
Lower Wicomico River	5	MON	BST						
Monie Bay	1						MON	BST	
Nanticoke River	7	MON	BST						
Magothy River	10						MON	BST	
Severn River	9						MON	BST	
South River	11						MON	BST	
West River	4						MON	BST	
West Chesapeake Bay	2						MON	BST	

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Notes:

- MON = Monitoring year (Nov - Oct)
- BST = BST ARA analysis results due (March)
- STO = Isolates stored for future analysis

2. The commentor states that the County is currently developing countywide land use coverage and that the information will be available in late summer. At that time, the commentor states that the County will compare the land use distribution from the draft report for the subject areas with the newly developed land use coverage.

Response: MDE has requested that Anne Arundel County share the most updated land use information for the County with MDE when it is available. TMDL development of two restricted shellfish harvesting areas in Severn River basin will begin in October 2005 and MDE will use the most updated land use information for the TMDL development.

3. The commentor asks if sensitivity analysis was performed for the steady state tidal prism model. The commentor states that the draft report indicates that the most sensitive parameter in the analysis is the decay rate and uses the conservative value of 0.7 from the range of 0.7 and 3.0 per day in salt water from literature sources. The commentor further asks if the decay rate values between 0.7 and 3.0 were tested to determine what value of the decay rate provides for water quality attainment. The commentor states that the County would be interested in knowing this value.

Response: 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 rate in 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).

4. The commentor states that in previous correspondence, she asked for a clarification of the values of C and C_0 in Appendix A because she believed the values to be incorrect (see Magothy River TMDL for fecal coliform CRD). The commentor further states that it appears that the values have been corrected and the calculations are correct. The commentor requests confirmation of this clarification.

Response: When monitoring stations are not available directly outside the restricted shellfish area boundary, MDE assigns the boundary condition concentration the same value as the embayment concentration. In this assessment, the embayment concentration also represents the boundary concentration. This assumption is environmentally conservative for the TMDL since the transport through the boundary would typically dilute the embayment concentration. This assumption was applied to the baseline and TMDL calculations.

5. The commentor states that Appendix D lists the data sources used in the assessment. The commentor states that Anne Arundel County is continuing to refine its existing databases and to develop new datasets. The commentor requests that MDE contacts the County for data that might be applicable to this TMDL as well as other State assessments or analyses.

Response: MDE will contact Anne Arundel County for more information on the interested areas. As part of the 303(d) listing and TMDL development process, a data solicitation letter will be sent to watershed stakeholders asking for pertinent information to the specified analysis.

6. The commentor states that the TMDL does not account for source contribution from recreational vessels. The commentor asks if the State investigated other jurisdictions across the country to determine how this potential contribution has been addressed elsewhere. The commentor believes that it is not sufficient to state that the document will not attempt to quantify that source when other sources have largely been estimated themselves. The commentor further states that if the State has investigated this source then the document should provide examples of what documents were used to make the assumption to disquantify that source. The commentor states that she has briefly checked the Internet and

have found that other jurisdictions considered this parameter and include it as part of the waste load allocation.

Response: The State considered methods to include sources from recreation activity but decided the information required for the analysis was limited and the calculation would be very uncertain. Recall from the report that the source analysis methodology presented in this document is to provide a relative ranking of probable sources in the watershed, assuming all sources are contributing.

It is expected that the BST results will provide a more accurate estimate of bacteria sources within the embayment since sources are estimated from the water sample.

7. The commentor asks, "In calculating the septic loads as potential sources, was distance from the nearest stream investigated?" The commentor further states that areas on septic that are outside of 200 feet of a nearest waterbody may not be contributing to the waste load.

Response: Distance to the embayment was not considered in the calculation. Septic loads were estimated by first, determining the number of people per septic in the watershed (MDP data); second, estimating the percentage of septic systems that fail (based on MDE Shoreline Survey data); and third, assigning a daily load for each septic system.

As previously stated, the source analysis methodology presented in this document is to provide a relative ranking of probable sources in the watershed, assuming all sources are contributing. It is expected that the BST results will provide a more accurate estimate of bacteria sources within the embayment. The advantage of the BST results is that the uncertainty associated with modeling transport paths and kinetics will be removed because the source is estimated from the water sample.

8. The commentor asks, "Have best management practices (BMPs), such as stormwater management ponds, been taken into consideration to determine waste loads?" The commentor continues that BMPs such as stormwater detention ponds may allow for microbial processes to occur, thus reducing the potential waste load from surface runoff such as might be evidenced through pet contributions.

Response: The TMDL load is an estimate of the assimilative capacity of the system based on the water quality standard. This load is calculated independently of BMP practices. The current load is based on the most recent five-year period of water quality data. Given the five-year time period, this should reduce the likelihood of including long term changes associated with watershed improvements and therefore account for the current watershed condition.

Studies from EPA¹ suggest that structural BMP effectiveness on reducing bacteria loads is highly variable. Implementation planning should consider the source estimates within the TMDL and appropriate BMPs to meet the estimated reduction required.

1. USEPA. 1999. Preliminary Data Summary of Urban Storm Water Best Management Practices. EPA-821-R-99-012. U.S. Environmental Protection Agency, Washington, DC.

9. The commentor questions the land use classification assumed for the sub-basins and river and believe them to be out of date. The commentor continues with stating that the South River watershed is undergoing rapid transformation to urban/suburban residential and they think that the study does not reflect that reality. The commentor further questions whether there are 55 acres of cropland and pasture in the Duvall Creek watershed stating that based on an August 2002 report (Building Community Watershed Assessment Capacity in the South River Watershed, MD) completed by the Center For Watershed Protection indicates no acreage in Duvall Creek devoted to agriculture. The commentor summarizes with, “since the assumptions about land use drive the calculations of sources, these numbers need to be correct and the State should seek out the most current data”.

Response: MDE is using the best available data when developing these TMDLs. For this study, the TMDLs and current loads are estimated using the most recent water sample data and water quality criteria through a tidal prism model. The TMDLs are not expected to change with revised source estimates. The assimilative capacity of the waterbody is independent of the contributing sources. MDE used 2000 Maryland Department of Planning land use/land cover. MDE is aware that new land use coverage will be available later this year from Anne Arundel County.

MDE is contributing significant time, effort and money to increase the certainty and accuracy in the source estimates through the Bacteria Source Tracking (BST) monitoring program. MDE has significant demands on completing TMDLs in a reasonable timeframe and due to the schedule of our field and laboratory work, the BST results for most of the restricted shellfish harvesting areas could not be obtained before the development of fecal coliform TMDLs in these restricted areas. However, once the BST results become available and if the BST indicates significant differences in source loads, it is anticipated that the TMDL reports will be updated with a technical memorandum that will explain the BST results and include any source reallocation. Should this occur, a second public comment period will be held. The BST results for restricted shellfish harvesting areas in the South River watershed are expected to be available in year 2009.

10. The commentor states that the failure rate of septic systems in the affected areas is only 3% seems very low. The commentor states that they have seen statements by the State assuming failure rates of up to 20% throughout the State and that they are not aware of data that would show Anne Arundel County to be significantly better. The commentor also questions the low rate especially sine the watershed contains older homes built in the 40s and 50s whose systems have not been updated.

Response: For this study, MDE is using the best available information from MDE’s Shellfish Program shoreline survey. This estimate is based on the percent of homes surveyed that had septic violations. MDE applies this rate to all septics in the watershed, not just the ones located near the estuary, as a conservative assumption. When the BST results become available, the source contribution will be reassessed. See also the last paragraph of the Department’s response to Comment 9.

11. The commentor states that boat discharges were eliminated from consideration as a source of bacteria due to lack of data. The commentor continues with the South River is not only home to over 2,000 recreational boats, but attracts many others from adjacent areas. The commentor states that on weekend there are hundreds of boats in the South River and its creeks. The commentor continues that the requirement for holding tanks and pump-out is not enforced, and they can assume that large amounts of sewage and gray water are entering the South River on a regular basis. The commentor concludes that to discount boat discharge as a source of bacterial pollution is irresponsible and will not serve the objective of correcting the bacteria problems.

Response: Marinas and boat traffic are very difficult to accurately estimate for a particular region. There is tremendous uncertainty in this estimate as well as what may potentially be in the sediment. Routine monitoring cannot capture brief incidents of overboard discharges and they are impossible to quantify. This is another reason that we are following up with BST. See also the last paragraph of the Department's response to Comment 9.

12. The commentors believe that the conclusions reached, based on the above assumptions are faulty – namely that the South River's greatest source of bacterial pollution, 43% to 68% is from pets. The commentor continues that MDE has not corroborated the conclusion that only 1% to 2% of bacteria are from humans with sampling to accurately determine the source. The commentors state that tests of samples taken from the target areas should be conducted to determine the degree to which the bacteria come from human or animal sources.

Response: MDE is committed to developing TMDLs for all of its impaired waters on a schedule developed in cooperation with the U.S. Environmental Protection Agency (EPA). In keeping with that schedule, Maryland slated this and other fecal coliform/bacteria TMDLs to be completed in this timeframe. MDE's completion of BST analyses for these watersheds is constrained by the laboratory capacity with which the State has contracted to perform the work. This is a necessary constraint, given that BST is a new science. MDE is using one research laboratory to reduce possible discrepancies in source library building between multiple laboratories.

MDE has received approval from EPA to proceed in this manner, with the understanding that the TMDL reports will be revisited upon receipt of the BST results. In the mean time, the State is using the best available information to estimate the bacteria loading contributions by the four major source categories (human, pet, livestock and wildlife). It is expected that this data will be used as a tool to identify significant source contributions in the basin. Please note that the TMDL is an estimate of the assimilative capacity of the water body and is based on the water quality criteria. We typically estimate the current condition (baseline) to give an approximation of the reduction that will be required for attainment of water quality standards. Therefore, the BST source information will not change the estimated assimilative capacity, but will provide more precision and accuracy to the current source distribution.

MDE has an on-going shellfish program that conducts shoreline surveys to identify actual and potential pollution sources impacting shellfish water quality. Where possible, the

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shellfish program works with other programs at MDE, local health departments, and the Soil Conservation Service to mediate any actual sources identified. This program has been successful in preventing illnesses associated with Maryland shellfish for over 50 years, and has resulted in upholding over 90% of shellfish waters in the “open” status.

13. The commentors conclude that there are serious flaws in MDE’s proposed TMDLs for bacteria on the South River and ask that these problems be corrected.

Response: See Response to Comment 12.