

**Comment Response Document**  
**Regarding the Total Maximum Daily Load of Sediment in the Non-Tidal Baltimore Harbor Watershed, Baltimore City, Baltimore and Anne Arundel Counties, Maryland**

The Maryland Department of the Environment (MDE) has conducted a public comment period of the proposed Sediment TMDL for the Non-Tidal Baltimore Harbor Watershed. The comment period was from August 24, 2020 to September 22, 2020. MDE received two sets of written comments.

Below is a list of the commenters, their affiliations, the date comments were submitted, and the number referenced to the comments. In the pages that follow, comments are summarized along with MDE’s responses.

**List of Commenters**

<b>Author</b>	<b>Affiliation</b>	<b>Date</b>	<b>Comment Number</b>
Ms. Christine Vaccaro	National Oceanic and Atmospheric Administration	Sept. 2, 2020	1
Mr. Robert Hirsch	Baltimore County Department of Environmental Protection and Sustainability	Sept. 22, 2020	2-13

**Comments and Responses**

1. The commenter provides information such as types of impairments and recommendations for thresholds to protect endangered species in the Baltimore Harbor Watershed, Atlantic sturgeon and Shortnose sturgeon.

**Response:** MDE appreciates the information provided regarding endangered species in the Baltimore Harbor watershed. The TMDL anticipates having a beneficial effect on the environment in which these endangered species live.

2. The commenter states Baltimore County has been developing, implementing and tracking progress on non-tidal sediment TMDLs for more than 6 years. This experience has raised concerns among County watershed management staff that the 8-digit watershed and similar land-river segment geographies used by MDE to develop non-tidal sediment TMDLs are too large relative to the impaired non-tidal streams and their drainages. Most 8-digits watershed scale takes this important variation out of focus. The commentor believes that everyone would be better served by a more realistic representation, one that is focused on the impaired streams that need the restoration a TMDL is designed to bring about. This geographic over-generalization contributes to several problems, including biased calculations and inflated sediment reduction requirements. Biased calculations can threaten the efficacy of non-tidal

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sediment TMDLs. Inflated reduction requirements threaten to impose excessive opportunity costs on MS4 permittees restoration programs, costs which take resources away from addressing the many other water quality impairments facing MS4 permittees in Maryland. In sharing our concerns via these comments, the commentor hopes to encourage MDE to investigate ways to address these concerns and arrive at improved data and methods for use in both writing new and revising existing non-tidal sediment TMDL. The commentor understands that this draft TMDL is the last one MDE intends to develop using the Phase 5.3 Chesapeake Bay Watershed Model. This is an excellent opportunity to review and improve other aspects of non-tidal sediment TMDL. As always, Baltimore County offers to assist by sharing relevant data and collaborating with MDE and other water quality professionals.

**Response:** MDE recognizes and appreciates the work that Baltimore County has done over the past 6+ years on non-tidal sediment impairments. MDE also recognizes and understands Baltimore County's concern with the scale at which non-tidal sediment TMDLs are completed, the MD 8-digit watershed scale.

The MD 8-digit scale was selected to be used for sediment TMDLs for several reasons. First, the MBSS dataset is used in the IR listing and TMDL processes because it is robust and available statewide. It also evaluates a watershed at the MD 8-digit scale. MBSS uses a stratified random sampling design and Primary Sampling Units that approximate MD 8-Digit watersheds as the strata for selecting monitoring stations. Therefore IR listings and TMDLs can be created equitably and reliably across the State but only at the 8-digit scale.

Second, MDE wanted the sediment TMDLs to be consistent with The Chesapeake Bay TMDLs. To achieve this the sediment loading rates used in the TMDL are from the Chesapeake Bay Model. MDE worked with the CBP during model development to ensure that the CBP model segments would aggregate to the MD 8-digit scale specifically so that these loads could be used in MD TMDL development.

MDE acknowledges that it may be beneficial to list and address listings at a smaller scale in the future. MDE is currently working on policies and methods to incorporate biological monitoring data from MD's local jurisdictions at a higher spatial resolution into future IR listing processes. This should enable MD to drill down in listing and TMDL scale in the future, on an as needed basis and when technically justified to do so.

At the current point in time, MDE recommends that the most appropriate place for addressing individual stream level impairments is via the implementation planning process. MDE is currently revising our Implementation Guidance documents available on our TMDL Data Center website, <https://mde.maryland.gov/programs/Water/TMDL/DataCenter/Pages/index.aspx>. MDE will continue to work with Counties and provide technical guidance for the implementation of non-tidal sediment TMDLs and in particular, how any inconsistencies in scales and allocations should be handled via this process.

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3. The commentor references pages 16-18, Section 2.3, Table 6 and Figure 3, stating Baltimore County acknowledges that the biological dataset used to develop this TMDL contained no data generated within Baltimore County. What other assessments of non-tidal streams, if any, were conducted within Baltimore County to confirm impairment of those waterways.

**Response:** MDE acknowledges that none of the MBSS sites used in this analysis were located in Baltimore County. The MBSS uses a probabilistic, random site selection methodology that is designed to provide unbiased estimates of stream conditions with known precision at various spatial scales ranging from large 6-digit river basins and medium-sized 8-digit watersheds. County boundaries within the 8-digit watershed are not taken into account in the sample design. Therefore, if multiple counties are located within the 8-digit watershed, there may not be MBSS sampling sites within each county but the average condition of the entire 8-digit watershed is captured.

No further assessments of specific Baltimore County non-tidal streams were conducted for the development of this TMDL. In this particular scenario, since the majority of the watershed is located in Anne Arundel County, the bulk of MBSS sampling sites are located in that jurisdiction. While no Baltimore County streams were included in the MBSS sampling, the magnitude of the required reductions from each jurisdiction reflects this.

4. The commentor references page 19, 1<sup>st</sup> paragraph, section 2.4 stating lands discharging directly to tidal waters: this TMDL is specific to the non-tidal portions of Back River (sic). How does the pollutant loading analysis account for areas of the watershed discharging directly to tidal waters?

**Response:** As stated in the response to comment 2, the TMDL is presented at the MD 8-digit scale due to the use of MBSS data and CBP model loads, both of which can be evaluated at the 8-digit scale. This gives consistency with the non-tidal sediment TMDLs and the Chesapeake Bay TMDL. Additionally, the reference watershed methodology was developed at the 8-digit scale. Several of the reference watersheds in both the Eastern Shore and Western Shore reference groups contain both tidal and non-tidal drainage acres. Because the TMDL endpoint is based on targets from the reference watersheds it is important that both reference and impaired watersheds contain similar hydrology. MDE has also previously completed five sediment TMDLs that contain both tidal and non-tidal drainage.

Outside the 8-digit scale issue, there are additional issues confounding the designation of tidal drainage areas. First, there are two datasets used in the TMDL development – MBSS and the CBP model. Each of these datasets have defined tidal and non-tidal drainage acreage differently, mostly based on scale. DNR was also consulted regarding defining tidal and non-tidal drainage and confirmed that there can be multiple interpretations based on geological and meteorological conditions.

Second, there is a difference between natural and anthropogenic drainage patterns. This occurs when Municipal Separate Storm Sewer System (MS4) drain land areas that are not tidal but sewer connections are made directly to tidal waters. MDE does not currently have a

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data set that accounts for land areas that have been piped to drain directly to tidal waters versus non-tidal waters. If this data becomes available to Baltimore County or MDE in the future, MDE will review the information and evaluate its impact on the TMDL.

For the reasons specified, the TMDL analysis was completed with the best data currently available and direct to tidal drainage areas were not taken out of the sediment loading calculations. MDE recommends that the most appropriate place for addressing direct to tidal drainage is during the implementation process. Since the TMDL is designed to be protective of nontidal streams in the watershed, MDE would not anticipate the county implementing practices to achieve the required reductions in areas draining directly to tidal waters.

Additionally, implementation of the Baltimore Harbor sediment TMDL is expected to occur in parallel with implementation efforts for the 2010 Chesapeake Bay TMDL for nutrients and sediment. This implementation process should be designed to achieve both the sediment reductions needed within the Baltimore Harbor watershed and to meet target loads consistent with the Chesapeake Bay TMDL, established by EPA in 2010 (US EPA 2010a) and scheduled for full implementation by 2025. The Bay TMDL requires reductions of nitrogen, phosphorus, and sediment loads throughout the Bay watershed to meet water quality standards that protect the designated uses in the Bay and its tidal tributaries. The sediment reductions for the Bay TMDL are independent of those needed to implement any TMDLs developed to address sediment-related impairments in Maryland's non-tidal waterbodies, however, their reduction goals and strategies do overlap. For example, the implementation planning framework, developed by the Bay watershed jurisdictions in partnership with EPA, provides a staged approach to achieving Bay TMDL sediment reduction goals that is also applicable to implementation of sediment TMDLs in local non-tidal watersheds. In short, sediment reductions required to meet the Chesapeake Bay TMDL will also support the restoration and protection of local water quality.

5. The commentor references the fact sheet page 1 stating, lands discharging to streams of 5<sup>th</sup> order or larger: this TMDL is specific to 1<sup>st</sup> through 4<sup>th</sup> order streams. The TMDL document itself should specify this important fact more clearly. How does the pollutant loading analysis account for areas of the watershed discharging directly to streams of 5<sup>th</sup> order or larger?

**Response:** Language has been added to the TMDL document to clarify that it is only applicable to 1<sup>st</sup> through 4<sup>th</sup> order streams. MDE is not aware of any 5<sup>th</sup> order or large streams in the non-tidal portion of the watershed.

6. The commentor states this TMDL, as with other local sediment TMDLs, is developed on the 8-digit watershed scale, matching the 8-digit scale of the 303(d) impairment listing. Within that watershed, biological monitoring data may show that there are unimpaired subwatersheds that do not discharge to impaired watersheds. Such unimpaired and isolated subwatersheds do not require a TMDL and sediment loads from them are not applicable to the TMDL. How does the pollutant loading analysis account for areas of the watershed discharging directly to unimpaired and isolated subwatersheds?

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**Response:** As stated in the comment, the TMDL is calculated on the 8-digit watershed scale. The TMDL endpoint is expressed as an average annual load over the entire watershed. As with any average calculation, some values will be higher than the average and some lower. Additionally, the TMDL endpoint is based on a reference watershed methodology, which uses the 8 digit scale. In order to make the reference endpoint applicable, both the reference and impaired watersheds must be evaluated at the same scale.

The TMDL is not designed to capture specific subwatersheds that may not be impaired or are isolated. The MBSS data used for the IR listing and the BSID are designed to give an overall assessment of the stream conditions in the 8-digit watershed. It does not capture every individual stream within the watershed. As stated in Section 2.4 of the TMDL document, approximately 71% of the watershed is impaired (IBI < 3.0). Therefore, the TMDL does acknowledge that the entire watershed is not impaired.

MDE recommends that the most appropriate place for addressing individual subwatersheds is during the implementation process. If Baltimore County has more specific data than was used for the development of the TMDL, MDE encourages that it be used to prioritize implementation. Furthermore, MDE would not expect the county to implement practices to achieve the required load reductions in watershed draining to an unimpaired stream reach.

7. The commentor references Section 2.2 and Section 4 stating including land areas that are not applicable to this TMDL causes the baseline sediment load and TMDL sediment load presented by MDE to be inflated. This also causes the sediment load reductions required to meet the load and waste load allocation to be inflated. A TMDL with inflated loads and load reductions may impose inflated compliance costs on permittees assigned WLAs. Such excessive costs would impose harmful opportunity costs, reducing resources available to the permittees to address their many other water quality protection and restoration obligations. Therefore, these loads should be reduced to reflect only the stormwater from land areas that are applicable to this impairment and TMDL.

**Response:** See response to Comment #4

8. The commentor states if there exists systematic differences between the sediment loading characteristics of those land areas that are not applicable to the TMDL and those that are, then the analyses presented by MDE are systematically biased. Systematic differences in factors relevant to stormwater sediment loading such as land use, topography, and geology, are particularly likely to exist between tidal and non-tidal areas, and between unimpaired and impaired subwatersheds. MDE should either explain how the inclusion of lands not applicable to the TMDL does not introduce systematic biases, or remove such non-applicable lands from the TMDL analyses.

**Response:** The land-use framework used to develop this TMDL was that of the Chesapeake Bay Program Phase 5.3.2 (CBP P5.3.2) Watershed Model. The CBP 5.3.2 calculates sediment erosion rates based on a variety of factors. Edge-of-field loads are calculated at the county level and do not include differences for tidal versus non-tidal land areas. However, as

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the commentor references, P5.3.2 Edge-of-stream sediment loads are representative of variable topographies, geologies, and soil conditions across watersheds. Additionally, based on Table 2 and Figure 2, the land use of the Baltimore Harbor Watershed is overwhelmingly urban in both the tidal and non-tidal areas.

9. The commentor references page 21, Section 3.0, last paragraph stating Baltimore County appreciates MDE's acknowledgement that achievement of the numerical loading goals of the TMDL will not necessarily result in achievement of biological endpoints, which are the prime determinants of this impairment, and MDE's acknowledgement that additional causes of impairment will also need to be addressed to achieve the biological endpoints.

**Response:** MDE appreciates Baltimore County's recognition that the biological endpoints of the Baltimore Harbor watershed may not be achieved through sediment reductions alone and that additional causes of impairment may need to be addressed before biological sustainability is achieved.

10. The commentor states Baltimore County acknowledges that after achievement of numerical loading goals for this TMDL, an "Attainment Plan" will be developed to ensure continued conformity with those goals in support of the designated uses of this waterbody.

**Response:** MDE appreciates Baltimore County's acknowledgement of the possible future need to develop an Attainment Plan.

11. The commentor states Baltimore County appreciates the work of MDE on this TMDL and looks forward to continued implementation of water quality Best Management Practices in the Baltimore Harbor watershed with this document or subsequent revisions as guidance. Thank you.

**Response:** MDE appreciates Baltimore County's recognition of MDE's effort taken to complete this TMDL. We look forward to working with Baltimore County, and all affected jurisdictions, on the implementation of this TMDL.