

Technical Memorandum

Significant Sediment Point Sources in the Upper Pocomoke River Watershed

The U.S. Environmental Protection Agency (EPA) requires that Total Maximum Daily Load (TMDL) allocations account for all significant sources of each impairing pollutant (CFR 2012a). This technical memorandum identifies the significant point sources of sediment in the Maryland 8-Digit (MD 8-Digit) Upper Pocomoke River watershed. Detailed allocations are provided for those point sources included within the MD 8-Digit Upper Pocomoke River Process Water Wasteload Allocation (WLA) and National Pollutant Discharge Elimination System (NPDES) Regulated Stormwater WLA. These are conceptual values that are designed to meet the TMDL thresholds. The State reserves the right to allocate the TMDLs among different sources in any manner that is reasonably calculated to protect aquatic life from sediment related impacts.

The MD 8-Digit Upper Pocomoke River Sediment TMDL is presented in terms of an average annual load established to ensure the support of aquatic life. The watershed was evaluated using two TMDL segments. TMDL Segment 1 represents the sediment loads generated in the Delaware portion of the Upper Pocomoke River watershed. TMDL Segment 2 represents the sediment loads generated in the Maryland portion of the Upper Pocomoke River watershed (i.e., the MD 8-Digit Upper Pocomoke River watershed). It has been determined that sediment is only impairing aquatic life in the 1st through 4th order tributary streams within the MD 8-Digit Upper Pocomoke River watershed and is not impairing aquatic life in the watershed's mainstem. Since the Delaware portion of the watershed drains to the Upper Pocomoke River mainstem in Maryland, the TMDL is being developed solely for the 1st through 4th order tributaries in the MD 8-Digit watershed, and no reductions are being applied to the Delaware portion of the Upper Pocomoke River watershed. Therefore, the Delaware portion of the watershed is only provided with an informational allocation equivalent to its baseline load, presented as an aggregate Upstream Delaware Load Allocation (LA) (see Sections 2.4, 4.2, and 4.5 for further details).

WLAs have been calculated for NPDES regulated individual municipal permits, general mineral mining permits, general industrial stormwater permits, and the general permit for stormwater discharges from construction sites in the MD 8-Digit Upper Pocomoke River watershed. The permits can be grouped into two categories, process water and stormwater.

The process water category includes those loads generated by continuous discharge sources whose permits have total suspended solids (TSS) limits (i.e., contributors to the watershed sediment load). Other permits that do not meet these conditions are considered *de minimis* in terms of the total watershed sediment load. There are two municipal Wastewater Treatment Plants (WWTPs) and one mineral mine within the MD 8-Digit Upper Pocomoke River watershed that contribute to the overall sediment load. There are no individual industrial process water permits.

FINAL

The WLAs for these three process water permits are calculated based on their TSS limits and corresponding flow information (See Sections 2.2.2 and 4.6 of the main report for further details). The process water permits can be further divided into minor and major facilities, based on whether their design flow is greater or less than 1.0 Millions of Gallons per Day (MGD). However, within this watershed, all of the process water point sources have design flows less than 1.0 MGD, and therefore, only an aggregate allocation is provided.

The stormwater category includes all NPDES regulated stormwater discharges. There are two NPDES stormwater permits identified within the MD 8-Digit Upper Pocomoke River watershed. One is an industrial facility that is permitted for stormwater discharge and the other is Maryland Department of the Environment's (MDE) General Permit to Construct. The permits are regulated based on Best Management Practices (BMPs) and do not include TSS limits. In the absence of TSS limits, the baseline loads for these NPDES regulated stormwater discharges are calculated using the nonpoint source loads from the urban land-use associated with these permits within the watershed. These calculations are described in more detail below.

Since there are no individual or general Phase I or II municipal separate storm sewer system (MS4) permitted jurisdictions or state/federal entities within the watershed, the only applicable NPDES regulated stormwater permits within the basin are MDE's General Permit to Construct and one facility with an industrial stormwater permit. Thus, an aggregate WLA only has been calculated for these NPDES stormwater permits. MDE collectively refers to the types of NPDES regulated stormwater permits identified within the watershed as "Other" NPDES regulated stormwater permits, and the aggregate WLA assigned to the permits is termed the "Other NPDES Regulated Stormwater" WLA.

The computational framework chosen for the MD 8-Digit Upper Pocomoke River Sediment TMDL was the Chesapeake Bay Program Phase 5.3.2 (CBP P5.3.2) watershed model 2010 Progress Scenario *edge-of-stream* (EOS) sediment loads. Within this TMDL, the NPDES regulated stormwater baseline sediment loads are represented by the urban land-use EOS loads associated with the NPDES stormwater permits within the watershed. Urban land-use EOS loads are calculated within the CBP P5.3.2 watershed model as a product of the land use area, land use target *edge-of-field* (EOF) loading rate, and loss from the EOF to the main channel (i.e., sediment delivery factor). For the 2010 Progress Scenario, BMP data and reduction efficiencies are then subsequently applied to the EOS loads (US EPA 2010). Further details regarding general nonpoint source sediment load calculations can be found in Section 2.2.1 of the main report.

In order to calculate the NPDES stormwater WLA, MDE further refined the CBP P5.3.2 urban land-use. For any given watershed, the refined CBP P5.3.2 land-use contains the specific level of detail needed to determine individual and aggregate WLAs for county Phase I jurisdictional MS4s, the State Highway Administration (SHA) Phase I MS4, Phase II jurisdictional MS4s, and "Other NPDES Regulated Stormwater" entities. The methods used by MDE to refine the CBP P5.3.2 urban land-use are described within MDE's documentation, *CBP P5.3.2 Land-Use and MDE Urban Source Sector Delineation - Development Methodology* (MDE 2011).

FINAL

In order to attain the TMDL loading cap calculated for the watershed, constant reductions were applied to the predominant controllable sources (i.e., significant contributors of sediment to the stream system), independent of jurisdiction. If only these predominant sources are controlled, the TMDL can be achieved in the most effective, efficient, and equitable manner. Predominant sources typically include urban land, high till crops, low till crops, hay, and pasture, but additional sources could be controlled as well, in order to ensure that the TMDL is attained. High till crops, low till crops, hay, and urban land were identified as the predominant controllable sources in the watershed. Thus, constant reductions were applied to these sources. Forest is the only non-controllable source, as it represents the most natural condition in the watershed, and no reductions were applied to permitted process load sources, since such controls would produce no discernable water quality benefit when nonpoint sources and regulated stormwater sources comprise greater than 99% of the total watershed sediment load. Only a portion of the urban land-use within the watershed is associated with the applicable NPDES stormwater permits, and therefore only this portion of the urban sediment load is assigned to the WLA. The remainder of the urban sediment load is assigned to the LA.

Table 1 identifies the individual process water facilities that contribute to the watershed sediment load, provides the permitted flows and TSS concentrations for these facilities, and provides the aggregate baseline load and allocation assigned to these facilities. Table 2 identifies all of the applicable NPDES stormwater permits in the MD 8-Digit Upper Pocomoke River watershed. Table 3 provides the distribution of the NPDES Regulated Stormwater WLA in the MD 8-Digit Upper Pocomoke River watershed amongst the permits identified in Table 2.

Table 1: MD 8-Digit Upper Pocomoke River Sediment TMDL Process Water Point Source WLAs

Facility Name	NPDES #	Permit Type	WLA Type	Baseline Load (ton/yr)	WLA (ton/yr)
PITTSVILLE WWTP	MD0060348	Municipal	Aggregate	8.9	8.9
WILLARDS WWTP	MD0051632	Municipal	Aggregate		
HARKINS READY MIX	MDG499796	Mining	Aggregate		

Table 2: MD 8-Digit Upper Pocomoke River Watershed NPDES Stormwater Permits

NPDES Permit # ¹	Facility Name	NPDES Regulated Stormwater WLA Sector
N/A - 02SW1672	FOREST PRODUCTS, INC.	OTHER NPDES REGULATED STORMWATER
N/A	MDE GENERAL PERMIT TO CONSTRUCT	OTHER NPDES REGULATED STORMWATER

Note: ¹N/A: Permit does not have an NPDES number. For the industrial stormwater permits, the permit number listed is the MDE permit application number.

FINAL

Table 3: MD 8-Digit Upper Pocomoke River Sediment TMDL NPDES Regulated Stormwater WLAs

NPDES Regulated Stormwater Sector	NPDES #	Baseline Load (lbs/yr)	WLA (lbs/year)	Reduction (%)
"Other NPDES Regulated Stormwater"	N/A	1.8	1.7	5.5
Total		1.8	1.7	5.5

REFERENCES

CFR (Code of Federal Regulations). 2012a. *40 CFR 130.2(i)*.
http://edocket.access.gpo.gov/cfr_2011/julqtr/40cfr130.2.htm (Accessed April, 2012).

MDE (Maryland Department of the Environment). 2011. *CBP P5.3.2 Land-Use and MDE Urban Source Sector Delineation - Development Methodology*. Baltimore, MD: Maryland Department of the Environment.

US EPA (U.S. Environmental Protection Agency). 2010. *Chesapeake Bay Phase 5.3 Community Watershed Model*. Annapolis, MD: U.S. Environmental Protection Agency, Chesapeake Bay Program Office. Also available at
<http://ches.communitymodeling.org/models/CBPhase5/documentation.php#p5modeldoc>.