

Technical Memorandum

Significant Sediment Point Sources in the Potomac River Montgomery County 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 2010). This technical memorandum identifies the significant point sources of sediment in the Maryland 8-Digit (MD 8-Digit) Potomac River Montgomery County watershed. Detailed allocations are provided for those point sources included within the Process Water Waste Load Allocation (WLA) and National Pollutant Discharge Elimination System (NPDES) Regulated Stormwater WLA of the MD 8-Digit Potomac River Montgomery County Watershed Sediment TMDL. These allocations are designed to meet the TMDL threshold. The State reserves the right to allocate the TMDLs among different sources in any manner that protects aquatic life from sediment related impacts.

The MD 8-Digit Potomac River Montgomery County Watershed Sediment TMDL is presented in terms of an average annual load established to ensure the support of aquatic life. The watershed was evaluated using a single TMDL segment (See Sections 2.3, 2.4, and 4.2– 4.6 of the main report for further details). It was determined that the MD 8-Digit Potomac River Montgomery County mainstem is not impaired by sediment (See Sections 2.3, 2.4, 3.0 and Appendix D). Therefore, this sediment TMDL will be restricted to the tributaries in the MD 8-Digit watershed draining to the Potomac River and will exclude the mainstem of the Potomac River itself.

WLAs have been calculated for NPDES regulated individual industrial, individual municipal, individual municipal separate storm sewer systems (MS4s), general mineral mining, general industrial stormwater, and general MS4 permits in the MD 8-Digit Potomac River Montgomery County 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. There are seven process water permits in the MD 8-Digit Potomac River Montgomery County watershed that contribute to the watershed sediment load. These include three industrial discharges, three municipal discharges, and one mineral mine discharge. The WLAs for these seven process water permits are calculated based on their TSS limits and corresponding flow information (See Sections 2.2.2, 4.6, and Appendix B of the main report for further details). Three facilities, the Kunzang Odsal Palyul Changchub Choling (NPDES #: MD0067539), National Institute of Health (NIH) Animal Center (NPDES #: MD0020931), and Mirant-Dickerson Generating Station (NPDES #: MD0002640), discharge directly to the MD 8-Digit Potomac River Montgomery County mainstem and have been given WLAs for informational purposes only based on their design flow and permitted sediment concentrations. The process water permits are further divided into

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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 nine NPDES Phase I and Phase II stormwater permits identified throughout the MD 8-Digit Potomac River Montgomery County watershed. These include the Montgomery County Phase I jurisdictional MS4 permit, the Frederick County Phase I jurisdictional MS4 permit, the Phase I State Highway Administration (SHA) MS4 permit, two general Phase II jurisdictional MS4 permits, and other general Phase I and II stormwater permits. These stormwater 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 within the watershed. The associated WLAs are calculated by applying reductions to the urban land use. These calculations are described in more detail below.

Individual WLAs have been calculated for the Montgomery County Phase I jurisdictional MS4 permit, the Frederick County Phase I jurisdictional MS4 permit, and the SHA Phase I MS4 permit. Aggregate WLAs have been calculated for: 1) the Phase II jurisdictional MS4s; and 2) the other general Phase I and II NPDES stormwater permits. Other NPDES regulated Phase I and Phase II stormwater permits include non-jurisdictional general MS4s, all industrial facilities permitted for stormwater discharges, and general construction permits. This aggregate WLA is referred to as the “Other NPDES regulated stormwater” WLA.

The computational framework chosen for the MD 8-Digit Potomac River Montgomery County watershed TMDL was the Chesapeake Bay Program Phase 5.2 (CBP P5.2) watershed model. Within this TMDL, the NPDES regulated stormwater baseline sediment loads are represented by the urban land use nonpoint source loads. These loads are calculated as the sum of the applicable urban land use *edge-of-stream* (EOS) loads and represent a long-term average loading rate. Urban land use EOS loads are calculated as a product of the land use area, land use target loading rate, and loss from the *edge-of-field* (EOF) to the main channel (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 attain the TMDL loading cap calculated for the watershed, reductions were applied equally to the predominant controllable sediment sources, which were identified as urban land, high till crops, low till crops, hay, and pasture. Since the entirety of the urban land use in the MD 8-Digit Potomac River Montgomery County watershed is considered to be representative of the regulated stormwater sources (i.e., all urban stormwater is regulated in some fashion via a permit), the NPDES stormwater WLA is equivalent to the urban land use loads resultant from applying reductions to all of the predominant land uses.

Relative to the estimated sediment load reductions applied to urban land, which are necessary to achieve the TMDL, the current Montgomery County Phase I MS4 permit requires the

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jurisdiction to retrofit 20% of existing impervious area where there is failing, minimal, or no stormwater management (estimated to be areas developed prior to 1985) every permit cycle (five years) (i.e., the jurisdiction needs to install/institute stormwater management practices to treat runoff from these existing impervious areas) (MDE 2010). Theoretically, extending these permitting requirements to all urban stormwater sources (i.e., not solely those sources regulated via the Montgomery County Phase I MS4 permit) would require that all impervious areas developed prior to 1985 be retrofit at this pace. Additionally, MDE estimates that future stormwater retrofits will have, on average, a 65% TSS reduction efficiency (Claytor and Schueler 1997; Baldwin et al. 2007; Baish and Caliri 2009). By default, these retrofits will also provide treatment of any adjacent urban pervious runoff within the applicable drainage area (See Sections 4.5 and 4.6 of the main report for further details).

In order to determine the individual and aggregate WLAs for the Montgomery County Phase I jurisdictional MS4, the Frederick County Phase I jurisdictional MS4, the SHA MS4, the Phase II jurisdictional MS4s, and “Other NPDES regulated stormwater”, Maryland Department of Planning (MDP) urban land use was applied to further refine the CBP P5.2 urban land use. This methodology associates MDP urban land use classifications with the different types of NPDES regulated stormwater Phase I and II permits (MDE 2009).

In addition to the WLA value, a Maximum Daily Load (MDL) is also presented in this document for process water and NPDES stormwater sources. The calculation of the MDL is explained in Appendix C of *Total Maximum Daily Load of Sediment in the Potomac River Montgomery County Watershed, Montgomery and Frederick Counties, Maryland*.

Tables 1 and 3 provide one possible scenario for the distribution of the average annual point source loads attributed to the process water and NPDES regulated stormwater point sources, respectively, in the MD 8-Digit Potomac River Montgomery County watershed. The reductions from the urban sector required to meet this TMDL would entail that at a 65% TSS reduction efficiency, approximately 88% of the urban area (impervious and pervious) developed prior to 1985 would need to be retrofit or an equivalent reduction in sediment loads from other types of stormwater retrofits is necessary (see Section 5.0 of the main report for a detailed description of the other types of stormwater retrofits). Table 2 identifies the individual process water facilities included in the aggregate allocation.

Table 1: MD 8-Digit Potomac River Montgomery County TMDL Allocations for Process Water Point Sources

Process Water Point Source	Baseline Load (ton/yr)	WLA (ton/year)	Reduction (%)	WLA (ton/day)
Minor Facilities ¹	95.5	95.5	0.0	0.60

Note: ¹ All process water facilities in the Potomac River Montgomery County watershed are considered to be minor (i.e. design flow less than 1.0 MGD). Therefore, the daily and average annual WLA values are reported as an aggregate.

Table 2: Facilities Included in Minor Process Water Point Source WLAs

Process Water Point Source ¹	NPDES Permit #
KUNZANG ODSAL PALYUL CHANGCHUB CHOLING	MD0067539
NIH ANIMAL CENTER	MD0020931
MIRANT - DICKERSON GENERATING STATION	MD0002640
MIRANT - WESTLAND FLYASH SITE	MD0057584
BRETTON WOODS RECREATION CENTER	MD0064777
MONTGOMERY COUNTY RESOURCE RECOVERY FACILITY	MD0065447
AGGREGATE INDUSTRIES - ROCKVILLE QUARRY	MDG491365

Note: ¹Washington Suburban Sanitary Commission (WSSC) – Potomac River Water Treatment Plant (NPDES # MD0051586) does not require a specific allocation in this TMDL because they have reported that their average net TSS discharge is zero (i.e., the overall combined result of their river water intake and their effluent discharge is not net addition of TSS to the Potomac River).

Table 3: MD 8-Digit Potomac River Montgomery County TMDL Allocations for NPDES Regulated Stormwater Point Sources

NPDES Regulated Stormwater Point Sources	NPDES Permit Number	Baseline Load (ton/yr)	WLA (ton/year)	Reduction (%)	WLA (ton/day)
Montgomery County Phase I MS4	MD0068306	4,365.0	2,783.2	36.2%	7.51
Frederick County Phase I MS4	MD0068357	2.3	1.5	34.8%	0.004
Phase II Jurisdictional MS4s	MDR055500	1,328.2	846.9	36.2%	2.29
SHA Phase I MS4	MD0068276	394.7	251.7	36.2%	0.68
“Other NPDES Regulated Stormwater”	N/A	1,409.7	898.8	36.2%	2.43
Total		7,499.9	4,782.0	36.2%	12.91

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