

Technical Memorandum

Point Sources of Sediment in the Non-Tidal Back River Watershed

The U.S. Environmental Protection Agency (USEPA) requires that Total Maximum Daily Load (TMDL) allocations account for all sources of each impairing pollutant (CFR 2012). This technical memorandum identifies the point sources of sediment in the Maryland 8-Digit (MD 8-Digit) Back River watershed. Detailed allocations are provided for those point sources included within the Back River Wastewater Wasteload Allocation (WLA) and National Pollutant Discharge Elimination System (NPDES) Stormwater WLA. 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 Back River Watershed sediment TMDL is presented in terms of an average annual load established to ensure the support of aquatic life. In the Back River watershed, WLAs have been calculated for NPDES regulated individual permits, individual and general municipal separate storm sewer systems (MS4) permits, the general permit for stormwater discharges from industrial activities, and the general permit for stormwater discharges from construction sites. The permits can be grouped into two categories, wastewater and stormwater.

The wastewater 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). Wastewater permits that do not meet these conditions are considered *de minimis* in terms of the total watershed sediment load. There is one municipal water treatment facility within the Back River watershed that contains TSS limits in its permit. There are no wastewater treatment plants (WWTPs) with permits allowing the discharge of sediment within the non-tidal Back River watershed. The Back River Wastewater Treatment Plant (WWTP) is not included in this TMDL because it discharges into the tidal portion of the watershed, which is not included in this TMDL. This facility has been addressed by the 2010 Chesapeake Bay TMDLs for nutrients and sediment in the Back River Oligohaline segment (BACOH). The WLA for wastewater permits is calculated based on their TSS limit and corresponding flow information (See Sections 2.2.2 and 4.6 of the main report for further details).

The stormwater category includes all NPDES regulated stormwater discharges, both general and individual. In the Back River watershed, these include the Baltimore City and Baltimore County Phase I jurisdictional MS4 permits, the Phase I State Highway Administration (SHA) MS4 permit, and other general NPDES 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 based on the loads from the urban land use within the watershed. The associated WLAs are calculated by applying reductions to the urban land use loads. These calculations are described in more detail below.

FINAL

Individual WLAs have been calculated for the Baltimore City and Baltimore County Phase I jurisdictional MS4 permits and the SHA Phase I MS4 permit. Aggregate WLAs have been calculated for other general NPDES stormwater permits. Other NPDES regulated 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 watershed model chosen for the non-tidal Back River Sediment TMDL was the Chesapeake Bay Program Phase 5.3.2 (CBP P5.3.2) watershed model 2009 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). BMP data and reduction efficiencies are then subsequently applied to calculate the final EOS loads (USEPA 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 Phase I jurisdictional MS4s, the State Highway Administration (SHA) Phase I MS4, and Phase II jurisdictional MS4s, and an aggregate WLA for “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).

In order to achieve the estimated sediment load reductions applied to urban land, which are necessary to meet the TMDL, current Phase I MS4 permits require the jurisdictions to retrofit 20% of existing impervious area where there is failing, minimal, or no stormwater management (estimated to be areas developed prior to 1985). That is, the jurisdiction needs to install/institute stormwater management practices to treat runoff from these existing impervious areas (MDE 2009). Extending these permitting requirements to all urban stormwater sources (i.e., not solely those sources regulated via Phase I MS4 permits) 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, Weammert, and Simpson 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).

Table 1 identifies the individual wastewater facilities that contribute to the watershed sediment load and provides the baseline load and allocation assigned to these facilities. Table 2 identifies all of the applicable NPDES stormwater permits in the Back River watershed. Table 3 provides the distribution of the NPDES Regulated Stormwater WLA in the Back River watershed amongst the permits identified in Table 2.

Table 1: Back River Sediment TMDL Wastewater Point Source WLAs

Facility Name	NPDES #	Permit Type	Baseline Load (ton/yr)	WLA (ton/yr)	Reduction (%)	MDL ton/day
Montebello Filtration Plant	MD0003042	Municipal	114	114	0	1

Table 2: Back River Watershed NPDES Stormwater Permits

NPDES Permit #	Facility Name	NPDES Regulated Stormwater WLA Sector
MD0068292	Baltimore City	City Phase I MS4
MD0068314	Baltimore County	County Phase I MS4
MD0068276	State Highway Administration	SHA Phase I MS4
MDR002123	Baltimore City, DGS, Fleet Maintenance	Other NPDES Regulated Stormwater
MDR001970	Baltimore County Bureau of Highways - Shop 7-1	Other NPDES Regulated Stormwater
MDR000254	Bowleys Lane Sanitation Yard	Other NPDES Regulated Stormwater
MDR001905	CCBC – Essex	Other NPDES Regulated Stormwater
MDR002130	Schmidt Baking Co	Other NPDES Regulated Stormwater
MDR000745	U.S. Postal Service - Parkville Auxillary VMF	Other NPDES Regulated Stormwater
MDRC ¹	MDE General Permit to Construct	Other NPDES Regulated Stormwater

Note: ¹N/A: Permit does not have an NPDES number.

Table 3: Back River Sediment TMDL Allocations for NPDES Regulated Stormwater WLAs

NPDES Regulated Stormwater Sector	NPDES #	Baseline Load (ton/yr)	WLA (ton/year)	Reduction (%)	MDL (ton/day)
Baltimore City Phase I MS4	MD0068292	1,560	391	75	1.7
Baltimore County Phase I MS4	MD0068314	1,847	462	75	2.1
SHA Phase I MS4	MD0068276	180	45	75	0.2
“Other NPDES Regulated Stormwater”	N/A	546	376	31	1.5
Total		4,133	1,274	69	5.5

FINAL

REFERENCES

- Baish, A. S., and M. J. Caliri. 2009. *Overall Average Stormwater Effluent Removal Efficiencies for TN, TP, and TSS in Maryland from 1984-2002*. Baltimore, MD: Johns Hopkins University.
- Baldwin, A. H., S. E. Weammert, and T. W. Simpson. 2007. *Pollutant Load Reductions from 1985-2002*. College Park, MD: Mid Atlantic Water Program.
- CFR (Code of Federal Regulations). 2012. *40 CFR 130.2(i)*.
http://edocket.access.gpo.gov/cfr_2011/julqtr/40cfr130.2.htm (Accessed April, 2012).
- Claytor, R., and T. R. Schueler. 1997. *Technical Support Document for the State of Maryland Stormwater Design Manual Project*. Baltimore, MD: Maryland Department of the Environment.
- 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.
- _____. 2009. *Maryland's NPDES Municipal Stormwater Permits – Phase I*.
http://www.mde.state.md.us/Programs/WaterPrograms/SedimentandStormwater/storm_gen_permit.asp (Accessed December, 2009).
- USEPA (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>