

Technical Memorandum

Significant Sediment Point Sources in the non-tidal Gwynns Falls 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) Gwynns Falls watershed. Detailed allocations are provided for those point sources included within the Gwynns Falls Process Water 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 Gwynns Falls Sediment TMDL is presented in terms of an average annual load established to ensure the support of aquatic life. WLAs have been calculated for NPDES regulated individual municipal permits, municipal separate storm sewer system (MS4) permits, and the general permit for stormwater discharges from construction sites in the Gwynns Falls 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 six process water facilities within the Gwynns Falls watershed that contribute to the overall sediment load. These include one municipal process water facility, one industrial process water facility, and nine general mining facilities.

The WLAs for these 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). Municipal process water permits can be further divided into minor and major facilities, based on whether their design flow is greater or less than 0.5 Millions of Gallons per Day (MGD).

The stormwater category includes all NPDES regulated stormwater discharges, both general and individual. In the Gwynns Falls 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 Phase 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.

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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 the other general Phase II NPDES stormwater permits. Other NPDES regulated 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 watershed model chosen for the non-tidal Gwynns Falls Sediment TMDL was the Chesapeake Bay Program Phase 5 (CBP P5) watershed model *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 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 (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 urban land-use. For any given watershed, the refined CBP P5 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 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 10% 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 2009a). 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 *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).

Table 1 identifies the individual process water facilities that contribute to the watershed sediment load and provides the aggregate baseline load and allocation assigned to these facilities. Table 2 identifies all of the applicable NPDES stormwater permits in the Gwynns Falls watershed. Table 3 provides the distribution of the NPDES Regulated Stormwater WLA in the Gwynns Falls watershed amongst the permits identified in Table 2. Tables 4 and 5 provide possible scenarios for the distribution of the annual point source loads attributed to the NPDES regulated stormwater point sources in both TMDL Segments 1 and 2 (See Sections 4.2 - 4.6 of the main

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report for further details).

Table 1: Gwynns Falls Sediment TMDL Process Water Point Source WLAs

Facility Name	NPDES #	Permit Type	WLA Type	Baseline Load (ton/yr)	WLA (ton/yr)	Reduction (%)
Ashburton Water Filtration Plant	MD0003034	WMA2	Individual	152	152	0
Envirotech Consultants, LLC	MD0071641	WMA1	Aggregate	61	61	0
Arundel Corporation – Delight Quarry	MDG490975	WMA5	Aggregate			
Larry E Knight, Inc	MDG499722	WMA5	Aggregate			
S&G Concrete - Grantley	MDG499831	WMA5	Aggregate			
AJO Concrete Contracting, Inc.	MDG499866	WMA5	Aggregate			
Daniel G Schuster, LLC – Owings Mills	MDG491398	WMA5	Aggregate			
P. Flanigan & Sons, Inc	MDG490864	WMA5	Aggregate			
Patuxent Materials, Inc – Baltimore	MDG491836	WMA5	Aggregate			
Penn-Mar Wilbert	MDG490868	WMA5	Aggregate			
Ready Mix Concrete Plant	MDG499866	WMA5	Aggregate			
TOTAL				213	213	0

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Table 2: Gwynns Falls Watershed NPDES Stormwater Permits

NPDES Permit #¹	Facility Name	NPDES Regulated Stormwater WLA Sector
MD0068292	Baltimore City MS4	County Phase I MS4
MD0068314	Baltimore County MS4	County Phase I MS4
MDR068276	State Highway Administration	SHA Phase I MS4
MDR001138	ALL SUPPLIES & PARTS, INC. - ASAP COMPRESSORS	Other NPDES Regulated Stormwater
MDR000705	BALTIMORE CITY DPW - NORTHWESTERN SUBSTATION	Other NPDES Regulated Stormwater
MDR000703	BALTIMORE CITY DPW - WESTERN SUBSTATION	Other NPDES Regulated Stormwater
MDR001964	BALTIMORE COUNTY BUREAU OF HIGHWAYS - SHOP 2	Other NPDES Regulated Stormwater
MDR001272	CONOPCO, INC.	Other NPDES Regulated Stormwater
MDR001492	CRUSADER CHEMICAL COMPANY, INC.	Other NPDES Regulated Stormwater
MDR001016	Capitol Cake Company	Other NPDES Regulated Stormwater
MDR000805	GEORGE G. RUPPERSBERGER & SONS, INC.	Other NPDES Regulated Stormwater
MDR001053	LIGON AND LIGON, INC.	Other NPDES Regulated Stormwater
MDR000628	MARYLAND CHEMICAL COMPANY, INC.	Other NPDES Regulated Stormwater
MDR001375	MR. MARTIN L. REESE	Other NPDES Regulated Stormwater
MDR001673	MTA - METRO WABASH MAINTENANCE FACILITY	Other NPDES Regulated Stormwater
MDR001307	NORTHWEST TRANSFER STATION	Other NPDES Regulated Stormwater
MDR001677	Northwest Bus Division	Other NPDES Regulated Stormwater
MDR000779	SAFETY-KLEEN SYSTEMS, INC. - BALTIMORE	Other NPDES Regulated Stormwater
MDR002009	SHA - OWINGS MILLS SHOP	Other NPDES Regulated Stormwater
MDR002114	WASBASH BUS LOT	Other NPDES Regulated Stormwater
MDR002119	WINDSOR MILL BUS LOT	Other NPDES Regulated Stormwater
MDR001137	WOODLAWN MOTOR COACH, 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.

Table 3: Gwynns Falls Sediment TMDL Allocations for NPDES Regulated Stormwater WLAs

NPDES Regulated Stormwater Point Source	NPDES Permit Number	Baseline Load (ton/yr)	WLA (ton/year)	Reduction (%)
Baltimore County Phase I MS4	MD0068314	7,844.2	5,025.5	35.9
Baltimore City Phase I MS4	MD0068292	7,205.4	3,813.2	47.1
SHA Phase I MS4	MD0068276	648.9	412.5	36.4
“Other NPDES Regulated Stormwater”	N/A	4,377.4	2,948.5	32.6
Total		20,076.0	12,199.7	39.2

Table 4: Gwynns Falls TMDL Segment 1 Allocations for NPDES Regulated Stormwater Point Sources

NPDES Regulated Stormwater Point Source	NPDES Permit Number	Baseline Load (ton/yr)	WLA (ton/year)	Reduction (%)
Baltimore County Phase I MS4	MD0068314	5,271.0	3,618.6	31.3
SHA Phase I MS4	MD0068276	408.8	281.0	31.3
“Other NPDES Regulated Stormwater”	N/A	1,287.9	1,074.6	16.6
Total		6,967.7	4,974.2	28.6

Table 5: Gwynns Falls TMDL Segment 2 Allocations for NPDES Regulated Stormwater Point Sources

NPDES Regulated Stormwater Point Source	NPDES Permit Number	Baseline Load (ton/yr)	WLA (ton/year)	Reduction (%)
Baltimore County Phase I MS4	MD0068314	2,573.2	1407.0	45.3
Baltimore City Phase I MS4	MD0068292	7,205.4	3,813.2	47.1
SHA Phase I MS4	MD0068276	240.1	131.4	45.3
“Other NPDES Regulated Stormwater”	N/A	3,089.5	1,873.8	39.3
Total		13,108.3	7,225.5	44.9

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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). *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>