

Piscataway Creek and Mattawoman Creek Tidal Fresh Chesapeake Bay Segments PCB TMDL

Source Document: MDE (Maryland Department of the Environment). 2018. *Total Maximum Daily Loads of Polychlorinated Biphenyls in the Piscataway Creek and Mattawoman Creek Tidal Fresh Segments, Prince George's and Charles Counties, MD*. Final Draft, Document Version December 2018.

Water Body Type: Tidal segments of Piscataway Creek and Mattawoman Creek

Pollutant: Polychlorinated biphenyls (PCBs)

Designated Uses: Use II – Support of Estuarine and Marine Aquatic Life and Shellfish Harvesting

Size of Watershed: Piscataway Creek – 180 square kilometers
Mattawoman Creek – 251 square kilometers

Water Quality Standards: Human Health – 0.64 ng/L Total PCB
Fish tissue threshold 39 ng/g

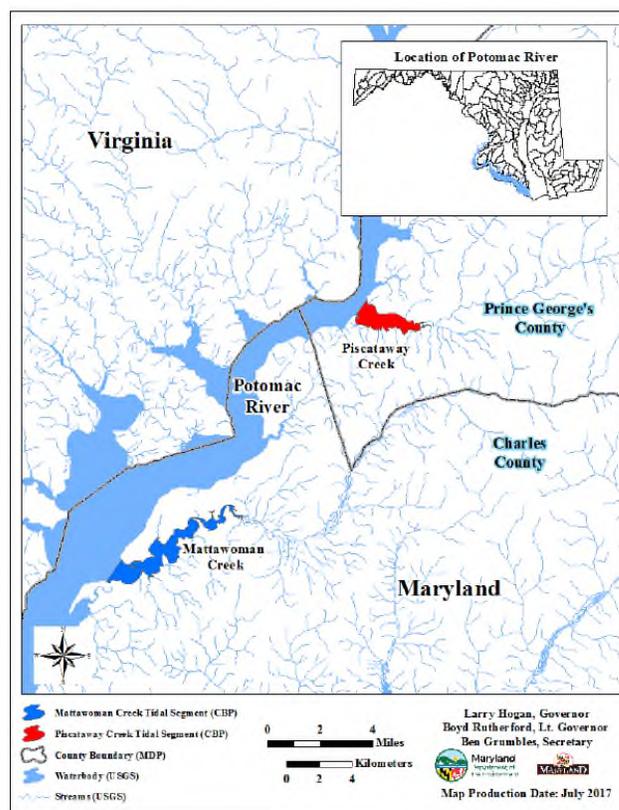
Indicators: Total PCBs

Analytical Approach: A linked hydrodynamic and PCB transport and fate model (PotPCB) was built and calibrated to existing data.

Date Approved: Final Draft February 19, 2019

listed as impaired at the time and thus did not receive TMDLs, although were given load reduction allocations. In this TMDL, MDE states that the TMDL report “will demonstrate that the allocations assigned in the TPAR TMDL will result in the attainment of water quality standards in the Piscataway Creek and Mattawoman Creek tidal segments.” Analysis for this TMDL applied the methodology identified in the TPAR TMDL and further identified allocations to source categories.

This fact sheet provides summary data related to the TMDL and includes specific information related to allocations made for Prince George’s County, Maryland, regulated stormwater sources.



Source: MDE 2018.

Figure 1. Piscataway Creek and Mattawoman Creek watersheds.

Introduction

This Total Maximum Daily Load (TMDL) was developed to address the 2014 listing of the tidal fresh segments of Piscataway Creek and Mattawoman Creek (Figure 1) for impairment due to PCBs. These segments were previously modeled to support the Tidal Potomac and Anacostia River (TPAR) TMDL, developed in 2007, but were not

Problem Identification and Basis for Listing

Water column data collected between 2005 and 2006 demonstrated that the human health criterion (0.64 ng/L) was exceeded in both Piscataway Creek and Mattawoman Creek (Table 2). Fish tissue data collected between 2009

and 2011 showed mean total PCB (tPCB) concentrations above the fish tissue threshold (39 ng/g) for blue catfish and northern snakehead in Piscataway Creek tidal segment and for blue catfish in the Mattawoman Creek tidal segment. Appendix B of the TMDL report provides detailed information regarding the PCB data collected to confirm the impairment and support the TMDL development.

Table 2. Mean tPCB levels from monitoring data

Tributary	Mean tPCB (ng/L)
Piscataway Creek (non-tidal)	0.53
Mattawoman Creel (tidal)	0.92
Mattawoman (non-tidal)	0.32

Source: MDE 2018.

Note: tPCB = total PCB.

Applicable Data

The TMDL relied on modeling conducted to support the Tidal Potomac and Anacostia PCB TMDL. Both Piscataway Creek and Mattawoman Creek were included in the TPAR PCB TMDL. Historical water quality data and fish tissue monitoring data were used to characterize the impairment and support modeling in the TMDL and are presented in Appendix B. The TMDL development effort used monitoring data from the water column, wastewater treatment plants (WWTPs), and combined sewer overflows, in addition to atmospheric deposition, tributary, and direct discharge contributions as determined by the Chesapeake Bay Watershed Model (WM5).

Sources

The Piscataway Creek and Mattawoman Creek Tidal Segments PCB TMDL provided baseline and allocated loads (Table 3).

Table 3. Piscataway Creek and Mattawoman Creek PCB TMDL allocations

Tributary	Baseline (g/yr)	Allocation (g/yr)	MOS (g/yr)
Piscataway Creek	82.2	58.0	2.4
Mattawoman Creek	88.1	53.5	2.7

Source: MDE 2018.

Note: MOS = margin of safety.

The TMDL further subdivides the allocations among the following sources:

- WWTPs
- Contaminated sites
 - 1 in Mattawoman drainage
- Regulated stormwater

- Phase I and II municipal separate storm sewer systems (MS4s)
- Phase I State Highway Administration MS4
- Industrial stormwater discharges
- Construction sites
- Nonregulated stormwater
- Atmospheric deposition

State and federal properties were not explicitly considered in the TMDL; however, if they are permitted to discharge stormwater they appear in Appendix A. Their loads are inherently considered in the regulated stormwater load, which has not been broken out by permittee.

Baseline loads for NPDES regulated stormwater were based on calculations in the TPAR TMDL using the land use percentages from 2006 USGS spatial land cover data. The percentage of regulated urban land use area within the regulated county portions of Piscataway Creek and Mattawoman Creek watersheds were multiplied by the county portions of the watershed tPCB baseline loads.

Technical Approach

This TMDL used the results of the water quality model and the hydrodynamic simulation model developed for the TPAR PCB TMDL. The results from the water column and sediment tPCB concentrations from the TPAR TMDL scenario for the Piscataway Creek and Mattawoman Creek tidal segments were compared with the new TMDL endpoints established for the current TMDL. The water column and sediment tPCB concentrations for these segments in the TPAR TMDL scenario are less than the current TMDL endpoints, so the TPAR TMDL is protective of the designated uses in Piscataway Creek and Mattawoman Creek. The modeling also demonstrated that load reductions were only required upstream of the Piscataway Creek and Mattawoman Creek, and none were required within these two tidal segments. However, due to tidal exchange between the tidal segments and the Potomac River, the upstream load reductions are necessary to meet Piscataway Creek and Mattawoman TMDL endpoints.

Allocations

The Piscataway Creek and Mattawoman Creek PCB TMDL allocations are presented for each waterbody, with County-specific allocations for NPDES regulated stormwater. The regulated stormwater allocation refers to all known NPDES stormwater dischargers within the County's portions of the Piscataway Creek and Mattawoman Creek drainages (identified in Appendix A). Piscataway Creek is entirely within Prince George's County; however, the Mattawoman Creek watershed

spans both Prince George’s and Charles County. The nonpoint source allocations for Mattawoman Creek are not broken out by county. The only known contaminated site is not located in Prince George’s County.

Table 4 shows the regulated stormwater baseline load and the regulated stormwater TMDL allocations for the County. For implementation of the County’s MS4 allocations, additional analysis will be needed to calculate the County’s Phase I MS4 portion of the regulated stormwater allocation, which includes County, state, industrial, and construction allocations. The County’s MS4 load could be calculated if the areas covered by construction and industrial stormwater permits and the State Highway Administration permit are identified and subtracted from the total Phase I MS4 area and applying the formula for stormwater loads and runoff. This TMDL includes a 5% as an explicit margin of safety (MOS) to account for uncertainty in load estimation methods.

Table 4. Piscataway Creek and Mattawoman Creek PCB TMDL – Prince George’s County MS4 baseline and WLAs

Regulated Stormwater Loads	Baseline (g/yr)	TMDL (g/yr)	% Reduction
Piscataway Creek	19.5	18.5	5.0
Mattawoman Creek	3.1	3.0	5.0

Source: MDE 2011.

The TMDL concluded that the proposed 93% reduction in atmospheric deposition of PCBs should adequately address the reductions in the non-regulated and regulated stormwater loads, which do not need to be addressed directly.

Reference

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