

## Technical Memorandum

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### *Nutrient Point Sources in the Upper and Middle Chester River Watersheds*

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The U.S. Environmental Protection Agency requires that Total Maximum Daily Load (TMDL) allocations account for all significant sources of the impairing pollutant or pollutants. The TMDL analysis for the Upper and Middle Chester River Watersheds addresses the total nitrogen (TN) and total phosphorus (TP) loads during the growing season conditions (May – October) and average annual flow conditions. This technical memorandum identifies, the significant surface water discharges of TN and TP used as modeling input when computing the TMDLs. The Maryland Department of the Environment (MDE) expressly reserves the right to allocate the loads among different sources in any manner that is reasonably calculated to achieve water quality standards. Tables 1(a) through 2(b) provide the allocations of nutrients attributed to NPDES permitted municipal and industrial PSs and the urban land use loads from Kent and Queen Anne’s counties that discharge into the Upper and Middle Chester Rivers.

Waste load allocations have been assigned to NPDES-regulated wastewater treatment plants in the Upper and Middle Chester River Watersheds. The Upper Chester River Watershed has two municipal point sources (PSs): Millington and Sudlersville WWTPs. The Middle Chester River Watershed has three municipal PSs a single industrial PS: Worton-Butlertown, Kennedyville and Chestertown WWTPs, and Chestertown Foods, Inc. The waste load allocations are based on permitted flow rates.

To remain consistent with the EPA policy regarding stormwater load quantification, MDE has accounted for the nutrient loads generated from urban land uses during storm events by assigning the load to the waste load allocation portion of the TMDL. Kent County (MD) and Queen Anne’s County are not NPDES stormwater permitted jurisdictions. Presently, the counties are not required to address these loads via a permit based approach. However, if either or both Kent and Queen Anne’s Counties receive Municipal Separate Storm Sewer System (MS4) permits in the future, then either or both counties will address the urban nutrient load through the MS4 permit process.

**Table 1(a)**  
**Loads Attributed to Point Sources Used to Compute the Growing Season TMDL (May 1<sup>st</sup> - October 31<sup>st</sup>) for the Upper Chester River**

<i>Point Source Name</i>	<i>Permit Number</i>	<i>Nutrient Loads (lbs/season)</i>		<i>Flow (MGD)</i>	<i>Concentration (mg/l)</i>	
		<b>TN</b>	<b>TP</b>		<b>TN</b>	<b>TP</b>
Millington WWTP	MD0020435	2,896	483	0.105	18	3
Sudlersville WWTP	MD0020559	2,068	345	0.075	18	3
Kent County	N/A	1,431	111	N/A	N/A	N/A
Queen Anne's County	N/A	5,288	410	N/A	N/A	N/A
Upstream	N/A	229	18	N/A	N/A	N/A
<b>Total</b>		11,912	1,367			

**Table 1(b)**  
**Loads Attributed to Point Sources Used to Compute the Growing Season TMDL (May 1<sup>st</sup> - October 31<sup>st</sup>) for the Middle Chester River**

<i>Point Source Name</i>	<i>Permit Number</i>	<i>Nutrient Loads (lbs/season)</i>		<i>Flow (MGD)</i>	<i>Concentration (mg/l)</i>	
		<b>TN</b>	<b>TP</b>		<b>TN</b>	<b>TP</b>
Worton-Butlertown WWTP	MD0060585	0	0	0.00	0	0
Kennedyville WWTP	MD0052671	827	138	0.03	18	3
Chestertown WWTP	MD0020010	4,137	414	0.90	3	0.3
Chestertown Foods, Inc.	MD0002232	5,121	1,179	0.23	14.4	3.3
Kent County	N/A	6,507	393	N/A	N/A	N/A
Queen Anne's County	N/A	2,684	162	N/A	N/A	N/A
<b>Total</b>		19,276	2,286			

**Table 2(a)**  
**Loads Attributed to Point Sources Used to Compute the Average Annual Flow TMDL for the Upper Chester River Watershed.**

<i>Point Source Name</i>	<i>Permit Number</i>	<i>Nutrient Loads (lbs/year)</i>		<i>Flow (MGD)</i>	<i>Concentration (mg/l)</i>	
		<b>TN</b>	<b>TP</b>		<b>TN</b>	<b>TP</b>
Millington WWTP	MD0020435	5,744	957	0.105	18	3
Sudlersville WWTP	MD0020559	4,510	752	0.09*	18	3
Kent County, MD	N/A	3,337	433	N/A	N/A	N/A
Queen Anne's County	N/A	12,326	1,599	N/A	N/A	N/A
Upstream	N/A	535	69	N/A	N/A	N/A
<b>Total</b>		26,452	3,810			

\*Sudlersville WWTP has growing season flow of 0.075 MGD

**Table 2(b)**  
**Loads Attributed to Point Sources Used to Compute the Average Annual Flow TMDL for the Middle Chester River Watershed.**

<i>Point Source Name</i>	<i>Permit Number</i>	<i>Nutrient Loads (lbs/year)</i>		<i>Flow (MGD)</i>	<i>Concentration (mg/l)</i>	
		<b>TN</b>	<b>TP</b>		<b>TN</b>	<b>TP</b>
Worton-Butlertown WWTP	MD0060585	4,069	678	0.15*	18	3
Kennedyville WWTP	MD0052671	1,641	274	0.03	18	3
Chestertown WWTP	MD0020010	10,919	821	0.9	5/3**	0.3
Chestertown Foods, Inc.	MD0002232	10,159	2,338	0.23	14.4	3.3
Kent County	N/A	14,711	1,471	N/A	N/A	N/A
Queen Anne's County	N/A	6,067	607	N/A	N/A	N/A
<b>Total</b>		47,566	6,189			

\*Worton-Butlertown WWTP has no discharge during growing season

\*\*Non-growing season concentration 5mg/l, growing season is 3 mg/l

The nutrient limits for point sources, reflected in the TMDL analysis, are designed to protect water quality in the Upper and Middle Chester Rivers, Morgan Creek and the Chesapeake Bay. It is likely, however, that future Chesapeake Bay Agreement nutrient reduction goals will entail more ambitious point source nutrient limits to protect the water quality of the Bay.