

## Technical Memorandum

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### *Nutrient Point Sources in the Northeast River Watershed*

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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 Northeast River addresses the total nitrogen (TN) and total phosphorus (TP) loads during the low flow conditions (May – October) and average annual flow conditions. This technical memorandum identifies, in detail, the significant surface water discharges of TN and TP used as modeling input when computing the TMDL. 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.

Waste load allocations have been made to NPDES-regulated wastewater treatment plants and municipal separate stormwater discharges on Northeast River Watershed. There are two wastewater treatment plants contributing nutrient loads to the Northeast River: the Northeast River WWTP and the Morning Cheer WWTP. Waste load allocations have been made to these point sources based on their approved water and sewerage plan discharge flow. Annual waste load allocations are also given to one jurisdiction with municipal stormwater discharges in the Northeast River Watershed to address nutrient loads from urban sources during storm events. Cecil County is not covered under NPDES phase I stormwater permits. It will be covered under a future phase II permit currently under development. Annual waste load allocations have been made to these stormwater discharges based on the observed 1999 data collected by MDE. The loads were computed as the product of the observed concentrations and estimated average flow. The nutrient loads account for contributions from atmospheric deposition, septic tanks, cropland, pasture, feedlots, forest, and urban land. The percentages of these loads by landuse were determined using ratios of land use percentages and loading coefficients by landuse from the Chesapeake Bay Program. The land use information was based on 1997 Maryland Department of Planning data. These percentages were then applied to the TMDL loads estimated from MDE observed data.

Table 1 below provides the allocation of the nutrients - nitrogen and phosphorus - attributed to the point sources in the Northeast River used in the Northeast River Eutrophication Model (NREM) simulation for low flow and average annual flow conditions.

**Table 1**

**Loads Attributed to Point Sources Used to Compute the  
Low Flow TMDL (May-October) and the Average Annual Flow TMDL**

<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>
Northeast River WWTP	MD0052027	48,737	6,092	0.5	8	1
Morning Cheer WWTP	MD0052299	3,016	503	0.055	18	3
Cecil County* For Average Annual Flow TMDL Only	N/A	32,515	1,311	N/A	N/A	N/A
<b>Total</b>		84,268	7,906			

\* Allocation reserved for future NPDES Phase II stormwater permits

The nutrient limits for point sources, reflected in the TMDL analysis, are designed to protect local water quality. 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. Nonpoint sources were estimated on the basis of observed in-stream data. The nonpoint source loads used in the model account for both “natural” and human-induced components.