Technical Memorandum

Significant CBOD and NBOD Point and Nonpoint Sources in Antietam Creek Watershed

EPA requires that Total Maximum Daily Load (TMDL) allocations account for all significant sources of the impairing pollutant. The TMDL analysis for Antietam Creek addresses biochemical oxygen demand (BOD) loads during low-flow conditions (May - October). This technical memorandum identifies the significant point and nonpoint sources of BOD used as modeling input for simulating all potentially significant sources when computing the TMDL. BOD reflects the amount of oxygen consumed through two processes: carbonaceous biochemical oxygen demand (CBOD) and nitrogenous biochemical oxygen demand (NBOD). The water quality goal of the TMDL is to establish allowable CBOD and NBOD inputs at a level that will ensure the maintenance of the dissolved oxygen standard. The Maryland Department of the Environment (MDE) expressly reserves the right to allocate the TMDLs among different sources in any manner that is reasonably calculated to achieve water quality standards. The tables below provide CBOD and NBOD load distributions for point sources for 7Q10 low-flow conditions.

Point Sources

Table 1 provides the key point source CBOD effluent inputs used in the water quality model to determine the maximum CBOD loads that Antietam Creek can accept during low-flow conditions. Table 2 provides the key point source NBOD effluent inputs used in the water quality model to determine the maximum NBOD loads that Antietam Creek can accept during low-flow conditions. Both tables show an estimate of the current load, a future allocation, and the total load attributed to each point source for computing the low-flow TMDL.

Table 1
CBOD Loads Attributed to Significant Point Sources Used to Compute the Low-Flow TMDL (May – October)

Point Source Name	Permit Number	CBOD Load *lbs/month*	Future Allocation *lbs/month*	Total Load *lbs/month*	CBOD Conc. *mg/l*	Permitted Flow *mgd*
Hagerstown Fiber Limited Partnership WWTP	MD0066974	7,506	2,349	9,855	15	2.0
Hagerstown Water Pollution Control Facility	MD0021776	36,029	3,393	39,422	18	8.0
Funkstown WWTP	MD0020362	1,689	0	1,689	45	0.15
Maryland Correctional Institute WWTP	MD0023057	18,014	5,639	23,653	45	1.6
Antietam WWTP	MD0062308	1,801	564	2,365	45	0.16
TOTAL	N/A	65,039	11,945	76,984	N/A	11.91

Table 2
NBOD Loads Attributed to Significant Point Sources Used to Compute the Low-Flow TMDL (May – October)

Point Source Name	Permit Number	NBOD Load *lbs/month*	Future Allocation *lbs/month*	Total Load *lbs/month*	NBOD Conc. *mg/l*	Permitted Flow *mgd*
Hagerstown Fiber Limited Partnership WWTP	MD0066974	2,302	720	3,022	4.6	2.0
Hagerstown Water Pollution Control Facility	MD0021776	36,829	647	37,476	18.4	8.0
Funkstown WWTP	MD0020362	4,316	0	4,316	115	0.15
Maryland Correctional Institute WWTP	MD0023057	36,829	6,692	43,521	92	1.6
Antietam WWTP	MD0062308	4,604	1,441	6,045	115	0.16
TOTAL	N/A	84,880	9,500	94,380	N/A	11.91

It should be noted that various other point source allocations are feasible within the bounds of the TMDL. The loadings, concentrations, and flows represented in the table above are for illustrative purposes only. Actual effluent limits and related permit conditions will be established at the time of permit issuance or renewal and will be based upon conditions present at that time, as reflected in population projections, infrastructure needs, and appropriate concentrations and loadings needed to assure the maintenance of water quality standards.

Nonpoint Sources

Nonpoint sources were estimated on the basis of observed in-stream data. Thus, it is not possible to show a distribution between different land uses. The nonpoint source loads that were used in the model account for both "natural" and human-induced components.