



Managing Stormwater to Meet the Chesapeake Bay Total Maximum Daily Load

by Heather Cisar and Mary L. Shively

On May 12, 2009, President Obama signed Executive Order (EO) 13508, Protection and Restoration of the Chesapeake Bay, renewing our commitment to restoration of the Bay. To implement the EO and meet the requirements of two consent decrees, the Environmental Protection Agency (EPA) published their intent to establish a Bay wide Total Maximum Daily Load (TMDL) for nitrogen, phosphorus and sediment in the September 17, 2009 issue of the Federal Register. The TMDL denotes the maximum amount of a contaminant a water body can receive and still achieve desired water quality standards. The Bay TMDL, as it is referred to, is comprised of both wasteload allocations for point sources such as treatment plants and load allocations for non-point sources such as polluted rainfall runoff from agricultural lands and impervious surfaces, and a margin of safety. As the first watershed-wide TMDL in the nation, the Bay TMDL addresses all segments of the Chesapeake Bay and tidal tributaries identified in the 2008 Clean Water Act (CWA) Section 303(d) list of impaired waters for nitrogen, phosphorus and sediment. The Bay TMDL addresses 92 impaired segments within the 64,000 square mile Chesapeake Bay watershed.

By 2012, EPA required each of the six watershed states and the District of Columbia to develop and submit a Watershed Implementation Plan (WIP)

Acronyms and Abbreviations	
BMPs	Best Management Practices
CWA	Clean Water Act
DoD	Department of Defense
EO	Executive Order
EPA	Environmental Protection Agency
GIS	Geographic Information System
MS4s	Municipal Separate Storm Sewer Systems
TMDL	Total Maximum Daily Load
WIP	Watershed Implementation Plan



Aberdeen Proving Ground, MD

in support of the Bay TMDL and an implementation framework. These plans outline how the states and the District of Columbia will achieve and maintain the nitrogen, phosphorus, and sediment loadings. Many of them are planning to utilize existing stormwater programs like the Municipal Separate Storm Sewer Systems (MS4s) program to implement and enforce the TMDL by revising MS4 permits to include load allocations and/or treatment of a percentage of impervious land use. WIPs identify specific pollutant reduction target goals by location and sector, as well as a description and schedule of actions that the states, the District and local governments will implement to achieve the reductions. Federal facilities

such as DoD installations and National Guard properties are included in this Bay TMDL.

For the Department of the Army sites that are located in the Chesapeake Bay watershed, obtaining wasteload information for permitted point sources was fairly easy because sampling data is typically available due to permit requirements. Non-point source loading was a more difficult undertaking. To develop the specific installation and facility loads, first the Army calculated a basic “No Action” baseline; a loading condition based solely upon boundaries and land use, without including removal efficiencies for any existing Best Management Practices (BMPs). ➤



(continued from previous page)

Once the Army calculated the baseline loading conditions, the Army then conducted an inventory and inspection of all existing stormwater BMPs, developed BMP associated GIS layers (drainage area and point location), modeled using GIS information and water quality modeling software removal efficiencies for each stormwater BMP. From this information, a BMP database was developed to manage the inventory, inspections, operations and maintenance for each BMP. This BMP database is used by installations and facilities to store stormwater BMP information in order to manage, track and report Bay TMDL related data to the states and the District of Columbia as required. The BMP database contains the following data:

- (1) Type of stormwater BMP installed
- (2) Geographic location (hydrographic unit code)
- (3) Waterbody the BMP is discharging into
- (4) Number of acres treated
- (5) Whether or not the BMP is inspected or maintained and
- (6) Visual condition assessment

The next phase of the Army's project is to develop a stormwater BMP opportunity assessment plan for installations. The Army will determine BMP design size and cost for future implementation and budgeting. The BMP database has the ability to estimate cost for design an implementation of future stormwater BMPs, as well as the ability to calculate expected load reductions. Army installations and facilities can use this information to identify the most cost efficient way to achieve their load allocations.

The Army documented the process used to meet the Bay TMDL in a document entitled "A Guide to Total Maximum Daily Implementation" (March 2013,

Army Chief of Staff for Installation Management- Environmental) for installations and facilities across the nation to consider as a guide for meeting TMDLs. A tutorial for the BMP database is also included in the Guide to assist facility managers in how to maintain stormwater management BMPs long term.

POC is Elisa Ortiz, (210) 466-1898, elisa.a.ortiz.civ@mail.mil U.S Army Environmental Command

Heather Cisar works for the US Army Corps of Engineers, Baltimore District, Planning Division and Mary L. Shively, works for the Army Installation Management Command, U.S. Army Installation Management Command Atlantic Region, Environmental & Natural Resources Branch.



Fort Meade, MD