

**EXECUTIVE SUMMARY**

On December 31, 2010 the U.S. Environmental Protection Agency (EPA) set limits on the amount of nutrients and sediment that can enter the Chesapeake Bay. In addition to setting these limits, known as Total Maximum Daily Loads (TMDLs), EPA required the Bay watershed jurisdictions to develop statewide Watershed Implementation Plans (WIPs). WIPs are the first phase of a major initiative to create a road map and accountability framework that will lead to the restoration of the Chesapeake Bay and clean local streams. Maryland's Phase I WIP, completed in December 2010, allocates allowable loads of nitrogen, phosphorus and sediment among different sources and identifies statewide strategies for reducing the levels of these pollutants that are impairing the Chesapeake Bay. The [Executive Summary of Maryland's Phase I WIP](#) further explains the rationale for the plan.

Maryland's Phase II WIP is the second part of a three-phased planning process that extends to 2017, with a final implementation target date of 2025. The Phase II WIP is intended to provide more geographic detail to the implementation. EPA guidance for Phase II places a strong emphasis on working with key local partners to ensure that they are aware of their roles and responsibilities in contributing to the planning and implementation process. To that end, Maryland developed the Phase II WIP in a year-long collaboration with local partners at the county-geographic scale, including county and municipal government staff, soil conservation managers and other local decision makers, as well as a variety of stakeholder organizations and business interests. Federal and State agency partners also participated to incorporate their contributions toward meeting Maryland's Phase II WIP goals.

In August 2011, EPA provided revised nutrient and sediment target loads to Maryland and other Bay jurisdictions, based on the updated Chesapeake Bay Program (CBP) Phase 5.3.2 Watershed Model. The Final Targets were provided at the scale of the five major basins in Maryland, which are the Potomac River basin, Eastern Shore, Western Shore, the Patuxent River basin and Maryland's portion of the Susquehanna River basin as shown in the table below.

**Final Target Loads for Maryland's Major Basins\***  
(Million pounds per year)

<b>Maryland Major Basin</b>	<b>Nitrogen</b>	<b>Phosphorus</b>	<b>Sediment</b>
<b>Susquehanna</b>	<b>1.19</b>	<b>0.06</b>	<b>64</b>
<b>Eastern Shore</b>	<b>11.82</b>	<b>1.02</b>	<b>189</b>
<b>Western Shore</b>	<b>9.77</b>	<b>0.55</b>	<b>243</b>
<b>Patuxent</b>	<b>3.10</b>	<b>0.24</b>	<b>123</b>
<b>Potomac</b>	<b>15.29</b>	<b>0.94</b>	<b>731</b>
<b>Total</b>	<b>41.17</b>	<b>2.81</b>	<b>1,350</b>

\* Maryland's basin allocations differ slightly from these due to the equitable allocation method used to partition loads among local areas and source sectors. This approach was used in Phase I, which met the necessary water quality response.

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**Total Nitrogen**

	<b>2010 Progress</b>	<b>Final Target</b>	<b>% Reduction from 2010</b>
<b>Source Sector</b>	<b>Million Lbs/Yr</b>	<b>Million Lbs/Yr</b>	<b>%</b>
Agriculture	19.95	15.22	23.7%
Forest	5.29	5.31	(0.2%)
Non-Tidal Atm <sup>a</sup>	0.66	0.66	NA
Septic	3.00	1.85	38.2%
Stormwater	9.48	7.55	20.3%
Wastewater	14.37	10.58	26.4%
<b>Total</b>	<b>52.76</b>	<b>41.17</b>	<b>22.0%</b>

**Total Phosphorus**

	<b>2010 Progress</b>	<b>Final Target</b>	<b>% Reduction from 2010</b>
<b>Source Sector</b>	<b>Million Lbs/Yr</b>	<b>Million Lbs/Yr</b>	<b>%</b>
Agriculture	1.64	1.45	11.5%
Forest	0.15	0.15	(0.1%)
Non-Tidal Atm <sup>a</sup>	0.04	0.04	NA
Septic	NA	NA	NA
Stormwater	0.72	0.50	30.3%
Wastewater	0.75	0.67	11.2%
<b>Total</b>	<b>3.30</b>	<b>2.81</b>	<b>14.9%</b>

**Total Suspended Solids**

	<b>2010 Progress</b>	<b>Final Target<sup>b</sup></b>	<b>% Reduction from 2010</b>
<b>Source Sector</b>	<b>Million Lbs/Yr</b>	<b>Million Lbs/Yr</b>	<b>%</b>
Agriculture	696	-	-
Forest	126	-	-
Non-Tidal Atm	NA	NA	NA
Septic	NA	NA	NA
Stormwater	543	-	-
Wastewater	11	-	-
<b>Total</b>	<b>1,376</b>	<b>1,350</b>	<b>1.9%</b>

a. This air deposition is only direct deposition to non-tidal waters, a very small component of the total air deposition and is included solely for completeness. Since the larger overall deposition of atmospheric nitrogen will be reduced by national programs, EPA did not allocate or assign that to the States.

b. Maryland did not set individual sector targets for sediment.

Maryland further sub-allocated the Final Target loads by county-geographic area and by source sector using an equity-based allocation process consistent with the process used in the Phase I WIP<sup>1</sup>. The primary source sector categories addressed in the WIP are waste water treatment plants (point sources), agricultural sources, stormwater and septic systems. Atmospheric sources, which contribute a significant fraction of the nitrogen load to the Bay, will be reduced

<sup>1</sup> See Appendix A of Maryland's Phase I WIP.

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by existing State and federal programs and thus are not addressed in detail in this plan. A statewide summary of the Final Target allocations for nitrogen and phosphorus by major source sector are provided in the tables above.

The Phase II WIP provides implementation strategies for the five major basins in Maryland. Originally, the WIP was intended to be developed at the county geographic scale; however, EPA decided in October 2011 to scale back its expectations for geographic specificity due to current data and model limitations. Although the plans are documented at the major basin scale, most local partners provided the State information at a county scale that formed the basis of the basin scale plans. The county analyses were supported by the State's further sub-allocation of the stormwater source sector to a finer level than is available in the EPA Bay watershed model (See "Target Loads" subsection in Section 2.6). Analysis at that finer scale was supported by a load reduction analysis model called the Maryland Assessment and Scenario Tool (MAST), which mimics the results of the Bay watershed model. Because the MAST analyses must be validated by the Bay model, the stormwater results provided in this report are at a coarser scale consistent with the Bay model. The underlying county scale of planning provides further assurance of implementation beyond that of the Phase I WIP, because many of the implementation actions will be conducted by county governments and soil conservation district offices, which operate at that scale.

For the point source, stormwater, and septic components of the plan, the State organized local teams, led in most cases by local government partners and coordinated by State agency liaisons. The State liaisons facilitated the local teams through a series of steps leading to the development of three key planning products:

- The first are quantitative reduction strategies to meet the Interim Target and Final Target loads. The Interim Target, set at 60% of Final Target statewide, is to be achieved by 2017. The Final Target is to be achieved by 2025. These strategies describe *what* can be implemented to achieve the reduction targets.
- The second are narrative strategies describing *how* the implementation actions will be achieved. This addresses issues like new local ordinances and revenue sources.
- The third are two-year milestones that reflect near-term implementation actions and program enhancement steps to be taken between July 1, 2011 and June 30, 2013.

In parallel with the local teams, agricultural work groups organized for each soil conservation district developed implementation strategies. These plans reflect the highly specialized nature of agricultural natural resource practices and the close operational relationship with the Maryland Department of Agriculture (MDA). These plans were combined with the local team plans by staff at the Maryland Department of Environment (MDE) to create the final plan. For more information about the agricultural plan development process, please see Section 2.4.

In cases where local team strategies were not submitted, or fell short of the Final Target, the State supplemented the plans. In addition, some elements of the WIP reflect existing State policies that will be implemented through permitting processes, such as reductions from various industrial point sources, and the long-standing upgrades of major municipal waste water treatment plants using enhance nutrient removal (ENR) technology. Finally, the State has

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included stormwater management reduction strategies on behalf of federal and state facilities, as well as a number of small municipalities, that are covered by federal NPDES stormwater permits. These generic plans, which mirror urban stormwater strategies the State provided for Phase I MS4 jurisdictions that did not submit strategies, are subject to refinement in the future.

Maryland's 2017 Interim Target strategy is projected to achieve the following levels of implementation statewide:

- Nitrogen: 89% of the Final Target
- Phosphorus: 119% of the Final Target
- Sediment: 409% of the Final Target

The progress is not the same for each pollutant because they may be reduced at different rates by each sector. Wastewater, for example, is making extraordinary reductions in nitrogen due to the Bay Restoration Funds for upgrades to enhanced nutrient removal (ENR). Septic systems control only nitrogen, as phosphorus is trapped in the soil around the septic field. Fortunately, rapid progress in the wastewater sector will balance a slower start in the other sectors.

Maryland's 2025 Final Target strategy is expected to meet water quality standards. To reach this conclusion MDE conducted an evaluation using an analytical framework provided by EPA. This analysis predicts the Bay's expected water quality response to load reductions and accounts for different levels of nitrogen and phosphorus reductions. The evaluation shows that, although Maryland's basin target loads differ slightly from those provided by EPA, the Final Target strategy is meets water quality standards, as confirmed by EPA's models. The evaluation is described in the Introduction, which references a technical memorandum in Appendix H.

In addition to the technical challenges of the Bay restoration effort are the challenges of funding the restoration. One commitment identified in the Phase I WIP was to refine the cost estimates for adding stormwater controls to previously developed land with little or no controls. During 2011 the State commissioned a study to refine the unit costs of various types of controls. Also during 2011, the Governor of Maryland established the Task Force on Sustainable Growth and Wastewater Disposal to study legislation that was tabled during the 2010 State General Assembly session. The Task Force broadened its mandate to evaluate options for funding key elements of the WIP and produced recommendations that have great promise. The recommendations provide a road map for fully funding the remaining upgrade of major waste water treatment plants, funding a substantial portion of the septic system upgrades, and funding a substantial portion of stormwater retrofits. The recommendations would establish a cost-sharing arrangement between the State and local governments, thereby leveraging the establishment of new local revenue sources.

The Maryland General Assembly adopted legislation in 2012 reflecting several of the Task Force's key recommendations. With passage of the Water Protection and Restoration Program Act of 2012, and other legislative actions (see Section 1.9), local teams had a strong incentive to revisit and refine their plans during the spring and early summer of 2012. Refinements made by local WIP teams to their county-scale plans during this period were submitted to MDE in July

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2012 and have been incorporated into this revised final Maryland Phase II WIP, an update of the previous March 30, 2012 version.

Submission of this plan to EPA is the beginning of a complex process to be implemented between now and 2025, which will continue in “maintenance mode” beyond 2025. Even when we achieve our reductions, we will need to maintain those caps on loads permanently. Maryland’s commitment to establish an offset strategy, described in Section 1.8, addresses this critical aspect of the plan.

The two-year milestones incorporated into the watershed plan will also be critical to establishing the near-term accountability necessary to ensure implementation progress. The most important aspect of the 2013 Milestones will be the establishment of the necessary sources of revenue to enable future acceleration of implementation.

Continuing communication between federal, state and local governments is an essential component of the new accountability framework. While the plan is complete in that it details the implementation practices necessary to achieve water quality standards, there are still many issues to resolve including funding, staffing, development and adoption of innovative practices, identifying and crediting voluntary practices, developing better accounting and tracking processes, and refining the analytical tools by which we evaluate our progress and adapt as needed.

Restoring the Chesapeake Bay is vital to our economy, public and environmental health and the quality of life for future Marylanders. The benefits to Marylanders that come as a result of this implementation plan include local jobs generated by environmental restoration projects, improvements to our neighborhood streams, protection and recharge of our drinking water sources, increased tourism, more abundant and healthy crabs, oysters and fish, improved property values, better public understanding of environmental issues, and most importantly, a proud legacy for our grandchildren.