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# Target nutrient load figures released for Bay's rivers, states

~ Failure to stay on track with goals will incur consequences.

By KARL BLANKENSHIP

State and federal agencies in October took the first step toward setting what they hope will be the final nutrient reduction targets for the Chesapeake Bay.

If they achieve the goals, huge areas of water will again be clear enough for underwater grasses to grow, oxygen-starved dead zones should largely disappear and algal blooms will be a thing of the past.

While states have missed past goals, the EPA said it would impose stinging consequences if they fail to keep on track with their new goals.

And their tougher stance was on display at an Oct. 23 meeting of senior officials from all states in the watershed, the District of Columbia and the EPA where the new targets were approved, despite some concerns.

"If we don't, then our most benevolent friends at EPA will do it for us," said Preston Bryant, Virginia Secretary of Natural Resources, chair of the Bay Program Principals' Staff Committee, which took the action.

Indeed, EPA officials had warned that had the committee failed to set a target, the agency would have acted on its own to set one by the end of the month.

The timely action was needed to keep the development of a Total Maximum Daily Load for the Bay on schedule. A TMDL is a pollution budget that establishes the maximum amount of pollution a body of water can receive and still meet its water quality standards. That pollution "load" is then assigned to different sources.

Because of the failure to meet past cleanup goals, the EPA is under a court order to complete a TMDL by May 2011, although the agency has said it plans to complete the job by the end of next year.

The TMDL, which has more regulatory clout than past cleanup plans, is anticipated to finally complete the job of cleaning the Bay—something the EPA and states agreed to do in 1983.

"The allocations that have tentatively been approved today will get the TMDL process started in earnest," Bryant said after the meeting.

The figures provide the first look at the

magnitude of the job ahead. According to computer estimates, enough nutrient control actions had been taken through last year to reduce the amount of nitrogen entering the Bay annually to about 283.5 million pounds and phosphorus to about 16.3 million pounds.

To achieve Bay water quality standards, computer model estimates suggest nitrogen needs to be reduced to about 200 million pounds a year and phosphorus to about 15 million pounds.

That means nutrient control efforts are already more than halfway there: In 1985, the Bay Program estimates 397 million pounds of nitrogen and 28 million pounds of phosphorus entered the Bay. But, at least for nitrogen, the pace of nutrient reductions will have to be accelerated to meet the 2025 deadline.

Controlling the amount of nitrogen and phosphorus entering the Bay has long been the cornerstone of cleanup efforts. Excess amounts

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of the nutrients fuel algal blooms, which block sunlight from underwater grass beds which provide critical habitat for juvenile crabs, fish and waterfowl. When the algae die, they sink to the bottom and are decomposed in a process that removes oxygen from the water. Sediment entering the Bay adds to the problems by further clouding the water, and smothering

bottom habitats.

Goals will also be set for sediment, but those numbers will not be available for several months.

The numbers are tentative because they will almost certainly change. The overall target is a number that computer models indicate would improve oxygen levels in the deepest part of the Chesapeake Bay.

Those nutrient reductions would also improve water quality throughout the Chesapeake. But the Bay and the tidal portions of its tributaries are divided into 92 distinct segments, each of which must attain water quality standards tailored to protect each habitat. In some areas, such as small creeks and coves with poor circulation, or areas which severe water clarity problems, the reductions set in October may not be enough to meet water quality standards and more efforts will be needed.

Also, states have the option to tweak how and where they achieve reductions. They can choose to put more emphasis on areas where efforts will be most economic or effective, and

**ALLOCATE continues on page 2**

NITROGEN LOADS TO THE BAY BY STATE (Annually, in millions of pounds)			
State	1985	2008	Target
District of Columbia	12.57	3.54	2.37
Delaware	9.10	9.91	5.25
Maryland	89.07	58.01	41.04
New York	18.09	16.71	10.54
Pennsylvania	156.11	114.79	73.64
Virginia	102.28	72.82	59.22
West Virginia	10.02	7.78	5.71
<b>Total</b>	<b>397.24</b>	<b>283.55</b>	<b>197.76</b>

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reduce their efforts elsewhere, as long as Bay water quality goals are met. Likewise, states may be able to make trade-offs between nitrogen and phosphorus reductions in some places as long as Bay water goals are met everywhere.

Also, the computer models used to estimate the amount of nutrients washing off the watershed, and their impact on the Bay, are still in the final stages of completion and final versions of both models will likely cause some revisions to the numbers.

"I think the good news is the six states and the District of Columbia have a rough target to shoot for in the next generation of implementation plans," said Jeff Lape, director of the EPA Bay Program Office.

Indeed, while not final, the numbers are close enough for states and the District to begin the job of writing the watershed implementation plans that the EPA is requiring as part of the final Bay TMDL.

Unlike the old tributary strategies written to achieve previous goals set in 1992 and then updated in 2003, the agency is requiring the new plans to have much more detail. States are expected to subdivide the allocations by pollutant source sector (ie. wastewater, stormwater, septic, agriculture, etc.) The reductions are to be distributed by county or other more localized scales.

By setting more local goals, EPA officials say local governments, conservation districts and watershed organizations will be more engaged in taking nutrient and sediment reduction actions, and it will be easier to track the implementation of those actions, improving accountability.

The implementation plans will also be the basis for milestones the six states and the District must set detailing specific actions that they will take in two-year increments through 2025. States are expected to outline contingency actions they will take if efforts are falling short.

Also, the EPA has indicated in a letter to each state that it expects 60 percent of the nutrient reduction goals to be achieved by 2017, the halfway point to 2025.

Some expressed reservations about the target, though. James Tierney, assistant commissioner for water resources with the New York Department of Conservation, said the goals and implementation plans were designed more to clean up "the ring around the Bay" than address local water quality issues. He also contended that states were being asked to commit to nutrient reductions and a deadline "in the dark" before knowing how much they would cost, or who would pay.

"We're being asked to write a blank check without all the information," Tierney said.

Representatives from the District of Columbia, who face a hugely

NITROGEN LOADS TO THE BAY BY RIVER (Annually, in millions of pounds)			
River	1985	2008	Target
Eastern Shore			
-- Delaware	9.10	9.91	5.25
-- Maryland	23.24	19.11	12.81
-- Virginia	2.83	2.75	1.61
Total Eastern Shore	35.17	31.77	19.68
James	46.39	33.85	28.49
Patuxent	5.16	3.58	3.15
Potomac			
-- District of Columbia	12.57	3.54	2.37
-- Maryland	30.93	18.92	14.10
-- Pennsylvania	10.22	7.23	4.83
-- Virginia	31.51	19.40	16.09
-- West Virginia	10.02	7.78	5.71
Total Potomac	95.25	56.87	43.10
Rappahannock	11.85	8.42	6.49
Susquehanna			
-- Pennsylvania	145.90	107.56	68.81
-- Maryland	2.17	1.28	0.83
-- New York	18.09	16.71	10.54
Total Susquehanna	166.16	125.55	80.18
Western Shore	27.57	15.12	10.15
York	9.70	8.39	6.53
<b>Total All Rivers</b>	<b>397.24</b>	<b>283.55</b>	<b>197.76</b>

expensive program, also expressed concerns about the costs.

"We all share those concerns on some levels," Bryant said. But the Bay Program has been increasingly criticized for delays and missed targets, and most states indicated they wanted to keep the TMDL process on schedule—the first round of TMDL public meetings across the watershed are set to begin in November.

Final nutrient and sediment loads are expected for each of the 92 tidal Bay segments at the end of April and states are expected to submit preliminary watershed implementation plans to the EPA by June 1.

By mid-August, the EPA expects to publish a draft TMDL for a 60-day public review period and to conduct another round of public meetings. States are to submit final watershed implementation plans by Nov. 1.

The EPA expects to publish a final Bay deadline by the end of December 2010.

Bryant, who will be leaving his position as secretary of natural resources and was chairing his final Bay meeting, said he was pleased that the process to get to the December 2010 deadline—and hopefully setting the last Bay cleanup goal—is now in motion. "It was a nice meeting to end on, having taken this significant step," he said.

PHOSPHORUS LOADS TO THE BAY BY STATE (Annually, in millions of pounds)			
State	1985	2008	Target
District of Columbia	1.28	0.14	0.13
Delaware	0.53	0.34	0.28
Maryland	6.27	3.10	3.04
New York	1.26	0.83	0.56
Pennsylvania	5.73	3.98	3.16
Virginia	12.42	7.18	7.05
West Virginia	0.93	0.72	0.62
<b>Total</b>	<b>28.42</b>	<b>16.29</b>	<b>14.84</b>

PHOSPHORUS LOADS TO THE BAY BY RIVER (Annually, in millions of pounds)			
River	1985	2008	Target
Eastern Shore			
-- Delaware	0.53	0.34	0.28
-- Maryland	2.25	1.14	1.24
-- Virginia	0.28	0.16	0.15
Total Eastern Shore	3.07	1.64	1.68
James	6.98	3.60	3.50
Patuxent	0.49	0.28	0.24
Potomac			
-- District of Columbia	1.28	0.14	0.13
-- Maryland	1.67	0.84	0.89
-- Pennsylvania	0.70	0.53	0.47
-- Virginia	2.53	1.91	1.97
-- West Virginia	0.93	0.72	0.62
Total Potomac	7.11	4.14	4.08
Rappahannock	1.42	0.85	0.82
Susquehanna			
-- Pennsylvania	5.03	3.46	2.69
-- Maryland	0.11	0.05	0.05
-- New York	1.26	0.83	0.56
Total Susquehanna	6.40	4.33	3.29
Western Shore	1.74	0.79	0.62
York	1.20	0.66	0.61
<b>Total All Rivers</b>	<b>28.42</b>	<b>16.29</b>	<b>14.84</b>

## FIGURING OUT THE NUMBERS

The figures to the right reflect current model estimates for the amount of nitrogen and phosphorus entering the Bay from major tributaries. (For large areas or tributaries—Susquehanna, Potomac and the Eastern Shore—the numbers are also subdivided by state.) The tables at the bottom show total nutrient and phosphorus figures by jurisdiction.

The figures are computer model estimates of the amount of nitrogen and phosphorus that would have reached the Bay in 1985 and 2008 under average hydrological conditions, based on watershed population, land use and the number of nutrient control actions implemented at these times. The target load is the preliminary estimate of the nutrient levels each tributary will have to reach to attain Bay water quality standards.

Sharp-eyed readers will note that the 1985 figures are significantly higher than previous estimates, especially for nitrogen (previously estimated to be about 335 million pounds). Several factors contribute to that change. First, the Bay Program is using a new computer model to estimate the amount of nutrients reaching the Bay, which officials say more realistically moves nitrogen and phosphorus through the watershed and includes previously unaccounted for pollutant sources. The largest single factor, though, is that the old model used meteorological data that turned out to be 5 percent drier than normal. Using realistic meteorology is important because wet conditions drive more nutrients off the land. When that was corrected, the modeled amount of nutrients reaching the Bay increased.

Also, the cleanup targets have changed from 175 million pounds for nitrogen and 12.8 pounds for phosphorus. A number of factors contribute to those changes. Scientists determined that previous estimates used a wetter than normal period, with more severe storms, as the basis on which to assess the achievement of water quality standards. Also, the process for determining whether an area meets water quality standards was refined based on recommendations from an independent scientific review panel. Both of those changes had the effect of increasing the amount of nutrients the Bay could receive.

Both the river target numbers and the ultimate cleanup goal numbers will almost certainly change in coming months as the states and the District develop cleanup plans and the models are further refined, but these figures likely approximate final numbers.

Note that the 1985 figures are not the actual figures from that year.

They are computer estimates based on what would have entered the Bay that year under average hydrologic conditions based on the watershed's population and land use at that time. It serves as a baseline from which all subsequent nutrient reduction efforts are measured.

### WATER QUALITY, NOT GOALS, THE OBJECTIVE

Chesapeake Bay goals are often thought of as the amount of nitrogen, phosphorus and sediment that must be reduced. But nutrient and sediment reductions are only a means to getting to the actual goal, which is achieving water quality standards in the 92 distinct "segments" that make up the Bay and its tidal rivers. Those standards set the minimum levels of dissolved oxygen and water clarity needed to support aquatic life and underwater grasses in different parts of the Chesapeake. The standards also set maximum amounts of chlorophyll *a*, a measure of algae in the water. Regardless of the amount of nutrient reductions achieved, the Bay will not be considered cleaned up—and removed from the impaired waters list—until those goals are achieved. That could mean revising nutrient and sediment reductions in the future if needed.