Approach for Simulating Atmospheric Deposition in the Phase II WIPs If a New Ozone Standard is Established

Introduction

The purpose of this paper is to let our state partners know how EPA intends to address atmospheric deposition of nitrogen in the Chesapeake Bay Phase II Watershed Implementation Plan (WIP) process. EPA is planning to revise the current ozone standard by July 2011. These new standards, if established, could result in less nitrogen deposition both to the watershed and to tidal waters by 2025. Meeting the TMDL allocations will not be easy in any jurisdiction. If the current ozone standard of 0.075 parts per million (ppm) is revised to 0.070 ppm or less before the Phase II WIP process is completed in late 2012, EPA is planning to use an alternative air Scenario in its allocations that will reduce nitrogen deposition across the watershed and make it easier to achieve the TMDL allocations.

Background

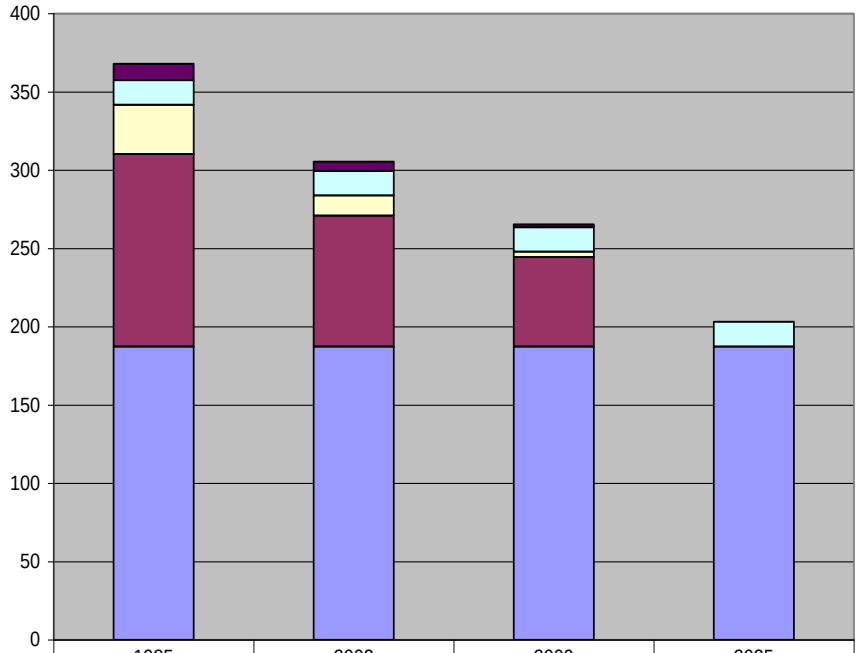
The Chesapeake Bay TMDL allocations for land-based sources assume reductions in atmospheric nitrogen deposition that are based on control programs to meet EPA's national ambient air quality standards required by the Clean Air Act. The 2010 Bay TMDL assumes reductions in atmospheric deposition to the watershed based on the **CMAQ 2020** Scenario. This scenario provides EPA's best estimate of air loads in 2025 based upon the ozone standard in place in 2007 (0.084 ppm). The CMAQ 2020 Scenario is the basis for EPA's explicit allocation of 15.7 million pounds of nitrogen deposited directly to the tidal Bay.

The current ozone standard, established in 2008, is 0.075 ppm. EPA plans to revise the ozone standard by July 2011. The revised standard is expected to be in the range of 0.060 to 0.070 ppm. EPA will start updating the CMAQ model to provide estimates of the nitrogen deposition reductions resulting from the new standard after it is finalized. The earliest CMAQ modeling results of the new standard will be available is 2013, after completion of the Phase II WIPs. However, EPA expects to be able to provide some credit to the states for the planned atmospheric deposition reductions resulting from the new standard in the Phase II WIPs by using the 2020 "**Maximum Feasible" Scenario** once the new ozone standard is finalized and it is at least as protective as the Maximum Feasible Scenario.

Approach

EPA can provide the States with credit toward the revised ozone standard by replacing the **CMAQ 2020** Scenario with the 2020 **Maximum Feasible** Scenario that was developed to account for more aggressive EGU, industry, and mobile source controls. This scenario was designed to achieve, but did not quite achieve, an ozone standard of 0.070 ppm. **If the revised ozone standard is finalized in July and if it is within the expected range of 0.060 to 0.070 ppm, then the Maximum Feasible Scenario could provide a conservative estimate of the reduction in nitrogen deposition resulting from the new ozone standard.** In other words, the **Maximum Feasible Scenario** provides more reductions in atmospheric deposition than the **2020 CMAQ** Scenario used in the 2010 TMDL, but results in less reductions than would occur with the least aggressive option (0.070 ppm) under consideration for the new ozone standard. However, EPA will **not** use the Maximum Feasible Scenario when running the Phase II WIP scenarios **until** the ozone standard is finalized.

Figure 1 represents estimated nitrogen loads delivered to the Bay from 1985 to 2025. The allocation nitrogen loads in the watershed and tidal Bay are applied in all years to give a relative sense of these loads compared to the estimated atmospheric deposition loads reduced in the watershed (yellow) and atmospheric deposition loads reduced to tidal waters (purple). The use of the Maximum Feasible Scenario would increase the atmospheric deposition loads reduced in the watershed (yellow) and atmospheric deposition loads reduced to tidal waters (purple) but would not change the allocations. The net effect of using the Maximum Feasible Scenario in the Phase II WIPs would be to make achieving the allocations easier by all Bay Program partners.



	1985	2002	2009	2025
What EPA is responsible for in atmo dep nitrogen reductions to tidal water.	10.38	5.89	1.72	0
EPA allocation to tidal water.	15.7	15.7	15.7	15.7
EPA's contribution in reducing atmo dep nitrogen in the watershed*	31.43	12.78	3.45	0
What the States are responsible for in PS and NPS reductions in the watershed	122.97	83.65	57.05	0
States watershed allocation	187.44	187.44	187.44	187.44

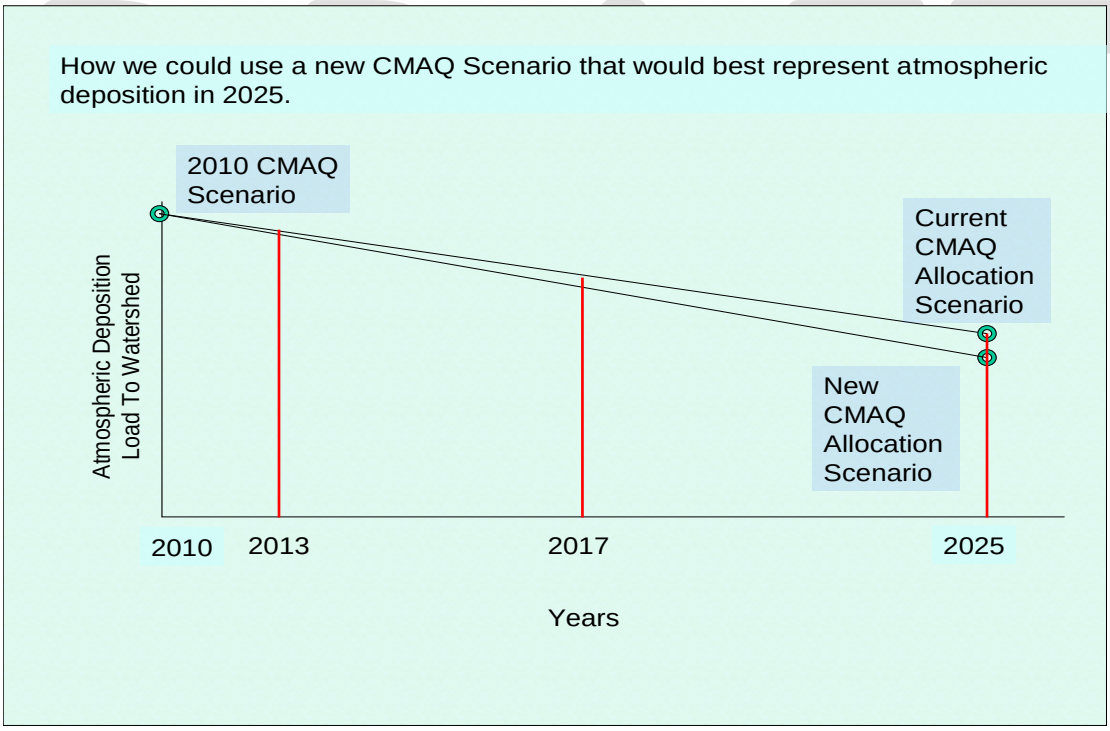
* As delivered nitrogen loads to the Bay.

Substitution of the 2020 Maximum Feasible Scenario for the 2020 CMAQ Scenario will 1) reduce nitrogen deposition loads delivered to the Bay from the watershed's land area by about 2.0 million pounds, and 2) reduce atmospheric deposition directly to the tidal Bay by about 0.8 million pounds. That is, if the revised ozone standard is within the expected range of values and timeframe, EPA can run the Phase II WIPs using the 2020 Maximum Feasible Scenario in place of the CMAQ 2020 (CAIR) Scenario. This will distribute the 2.0 million pounds of atmospheric nitrogen reductions to land to all of the jurisdictions consistent with the revised watershed model.

However, EPA will set aside the 0.8 million pounds deposited directly to the tidal waters (EPA's allocation). This substitution will not affect the 19 basin allocations.

Figure 2 is a representation of how the Maximum Feasible Scenario would not effect the nitrogen allocations, but could be used in the WIPs and 2-year milestones to reduce the nitrogen load to the watershed, making it easier for the Bay States to achieve their allocations. The 2020 Maximum Feasible Scenario would simply replace our 2020 CMAQ Scenario as the best representation of atmospheric loads in 2025 (because the ozone standard is not to be exceeded despite growth).

While we could calculate the additional reductions that all Bay Program states would realize in their Phase II WIPs now, that analysis would disrupt the critical path of the Watershed Model calibration effort. The additional reductions of delivered loads that each of the states will realized in their Phase II WIPs through application of the Maximum Feasible Scenario will be available in July.



Expected Questions

The Maximum Feasible Scenario comes close to, but does not meet the 0.070 ozone standard. How will the states receive full credit for the new ozone standard if it ends up in the expected range of 0.06 - 0.07 ppm?

Once the ozone standard is finalized, EPA will run the CMAQ model with the new standard. This is expected to take one to two years. When these results are available, the states will be able to receive credit for any additional reductions resulting from the full accounting for the final standard in their milestone or progress reports. This would be done by running a Progress Scenario representing the milestone year with the updated CMAQ Scenario of the new ozone

standard. Because this is expected to result in decreased loads of atmospheric loads to the watershed, the loads that the state partners need to reduce by BMPs becomes less.

Why isn't EPA using the version of the Maximum Feasible Scenario that assumes 15% reduction of ammonia emissions?

This version of the Scenario was developed for use in the E3 Scenario. However, there are no national CAA regulations requiring ammonia controls. If states chose to require this level of control, credit can be provided for resulting reductions.

What is the latest date the ozone standard can be revised and EPA still use this approach in Phase II?
EPA expects the new ozone standard to be in place by July 2011. The decision to use the 2020 CMAQ or Maximum Feasible Scenario for Phase II WIPs will be made ***after*** *the standard is finalized and could be made up to the date that any changes to the TMDL allocations go out for public notice. This would be after the final Phase II WIPs are submitted in March 2012***.**