

EPA Evaluation of the Draft Conowingo Watershed Implementation Plan

Background

The U.S. Environmental Protection Agency (EPA) is providing this evaluation of the draft Conowingo Watershed Implementation Plan (CWIP) to the Chesapeake Bay Program (CBP) partnership and the public in accordance with its oversight role and responsibility under the CBP partnership's accountability framework and the CBP Principals' Staff Committee's (PSC) framework for the CWIP.

When the Chesapeake Bay Total Maximum Daily Load (Bay TMDL) was established in 2010, it was estimated that the reservoir behind the Conowingo Dam would trap sediment and associated nutrients through 2025. The trapping of pollutants by the Conowingo reservoir over the past 80 years has not only benefitted the water quality of the Chesapeake Bay, but it has also benefitted the Bay jurisdictions to varying degrees by lessening load reduction responsibilities under the Bay TMDL. Had the reservoir reached trapping capacity prior to the Bay TMDL being established, the Bay jurisdictions would have had a greater lift to meet their respective Bay TMDL allocations. However, studies conducted over the last several years demonstrated that the reservoir has reached dynamic equilibrium. The reservoir is near full capacity and is no longer trapping pollutants. The CBP partnership estimates that an additional reduction of 6 million pounds of nitrogen and 0.26 million pounds of phosphorus is needed to mitigate the water quality impacts of Conowingo Dam infill. This additional reduction must be addressed to attain applicable state water quality standards in the Chesapeake Bay.

The CBP partnership's PSC agreed to develop a separate and collaborative CWIP that would outline the programmatic and numeric commitments that could be taken to reduce the adverse water quality impacts to the Chesapeake Bay resulting from Conowingo Dam infill, as well as a timeline at which those reductions could be achieved. In addition, PSC members agreed to pool resources and to identify a process to fund and implement the CWIP.

To assist in this effort, the PSC established the Conowingo WIP Steering Committee (Steering Committee), which is composed of a representative from each Bay watershed jurisdiction and the Chesapeake Bay Commission. This Steering Committee is responsible for coordinating the development and implementation of the CWIP, with oversight and direction from the PSC.

EPA is funding three cooperative agreements to provide the Steering Committee and the PSC with third-party assistance to bring highly specialized scientific, technical, and programmatic support in the development and implementation of the CWIP and future two-year milestones. This support also includes:

- Developing and implementing the CWIP and two-year milestones, including targeting implementation of cost-effective and efficient pollutant reduction practices and technologies to achieve the Conowingo planning targets, working directly with federal, state, regional, and local governmental and non-governmental implementation efforts in (but not limited to) the most effective basins;
- Developing, building, and implementing a financing strategy and associated implementation plan, which may include funding for Best Management Practice (BMP) installation and innovative approaches for raising, allocating, and disbursing funds; and

- Tracking, verifying, and reporting the implementation of practices providing nutrient and sediment pollutant load reductions.

EPA evaluated the draft CWIP to assess whether the BMP implementation scenario achieves the nitrogen¹ target of 6 million pounds and whether the draft CWIP included sufficient programmatic information to provide confidence that the plan will be fully implemented to achieve the CWIP nitrogen target. While EPA does not approve or disapprove a WIP, EPA provides its evaluation for the benefit of the CBP jurisdictions and, as appropriate, may provide recommendations for strengthening a WIP.

Executive Summary

The draft CWIP provides an initial strategy that focuses on the implementation of (primarily) agricultural BMPs to reduce 6 million pounds of nitrogen in the Susquehanna River Basin. The CBP partnership's Phase 6 suite of modeling tools indicates that BMP implementation in the Susquehanna River Basin of New York, Maryland, and Pennsylvania would be the most effective in reducing nitrogen loads to the Conowingo Dam.

EPA commends the Center for Watershed Protection and the seven Bay watershed jurisdictions for developing a BMP implementation scenario that meets the necessary nitrogen reductions and focuses implementation in the most effective areas of the Susquehanna River Basin. The draft CWIP proposes a comprehensive process for identifying, selecting, and implementing BMPs through a tiered system and technical review team. Also, considerable effort has been expended to conduct local engagement and outreach with affected communities to educate stakeholders about the CWIP process and establish preliminary expectations for implementation efforts that go above and beyond what is reflected in the jurisdictions' Phase III WIPs.

EPA recognizes that the CWIP will continue to evolve based on implementation successes and challenges. However, critical to the successful implementation of the CWIP is to ensure that the plan *complements* and does not *compete* with the jurisdictions' Phase III WIPs in terms of opportunities for BMP implementation and resources, including technical assistance, staffing, and funding. Given the technical assistance gaps and resource needs expressed through the jurisdictions' Phase III WIPs, it is currently unclear from the draft CWIP how resources, funding, and BMP implementation will be focused on meeting the CWIP nitrogen target, as opposed to meeting the jurisdictions' Phase III WIPs. While it is noted in the draft CWIP that further work is needed to determine the specific local and regional geographic areas targeted for BMP implementation, the final CWIP should provide more detail on where exactly implementation will be targeted and identify the affected stakeholders.

In addition, while it is understood that the CWIP financing strategy is still under development, EPA has little confidence that the CWIP will be fully implemented to meet the necessary nitrogen reductions without dedicated funding mechanisms in place and the commitment from the public sector to provide an initial investment to initiate CWIP implementation.

Finally, the BMP implementation scenario in the draft CWIP is based on having practices in place by 2025 to achieve the nitrogen target. However, the CBP partnership has not yet decided what the target date for implementation of the CWIP will be.

¹ The CBP partnership decided to focus on nitrogen load reductions since the phosphorus target of 260 thousand pounds could be met through the exchange ratios of nitrogen and phosphorus that have been previously approved by the CBP partnership.

Load Reduction Review

When evaluating the draft CWIP numeric commitments, EPA modeled implementation scenarios through the CBP partnership's Phase 6 suite of modeling tools. The BMP implementation scenario achieves the nitrogen target of 6 million pounds, with 89% of the nitrogen reductions planned to come from the agriculture sector, 10% from the developed sector, and 1% from the natural sector.

The planned CWIP agricultural nitrogen load reduction for the area of implementation in the Susquehanna River Basin is about 2.5 pounds per acre of agricultural land. The rate of agricultural nitrogen load reduction for the Chesapeake Bay watershed as a whole between the current condition (2019) and the Phase III WIPs (2025) is about 4.6 pounds per acre of agricultural land. Therefore, the rate of agricultural implementation called for in the draft CWIP is about half the rate of agricultural implementation reflected in the jurisdictions' Phase III WIPs. In other words, the level of effort necessary to meet the agricultural goals in the draft CWIP is less than what is required in the jurisdictions' Phase III WIPs.

BMP Review

The change in planned BMP implementation rates for the draft CWIP versus what has been reported to-date, as well as compared to the jurisdictions' Phase III WIPs, is reflected in the table^{2, 3, 4} below. The information provides a sense of the level-of-effort planned for the draft CWIP versus the history of BMP implementation and the jurisdictions' Phase III WIPs.

² The columns are implementation rates for three periods that have been annualized so comparisons are relevant. The first period is the annualized implementation rate from 2009 (the starting point for the Bay TMDL) and the current year of record (2019). This represents implementation that has occurred in the identified areas over the last 10 years. The second period is the annualized rate from current (2019) to the jurisdictions' Phase III WIPs (2025). This represents the implementation needed over the next 5 years. The last column represents the annualized rate of new implementation that is required to meet the goals of the draft CWIP between 2019-2025.

³ The BMPs listed are solely those that are needed for the draft CWIP in addition to what is reflected in the jurisdictions' Phase III WIPs.

⁴ The BMP numbers in the table summarize what has been reported and what is planned solely for the area of implementation defined for the draft CWIP in Pennsylvania, New York, and Maryland.

			Annualized Implementation in the CWIP Geography 2009 - 2019	Annualized Implementation in the CWIP Geography 2019 - 2025 Jurisdiction WIPs	Annualized Implementation in the CWIP Geography 2025 Jurisdiction WIPs - CWIP
Agriculture Practices	Duration	Unit			
Nutrient Application Management Core Nitrogen	annual	Acres	20,700	183,200	32,800
Nutrient Application Management Rate Nitrogen	annual	Acres	4,300	42,500	101,400
Nutrient Application Management Placement Nitrogen	annual	Acres	1,500	37,600	33,200
Nutrient Application Management Timing Nitrogen	annual	Acres	1,200	56,000	101,700
Conservation Tillage	annual	Acres	-26,600	-3,800	36,500
High Residue Tillage	annual	Acres	51,800	24,000	8,800
Low Residue Tillage	annual	Acres	19,800	-32,700	1,600
All Tillage Types			45,000	-12,500	46,900
Prescribed Grazing	cumulative	Acres	100	15,500	11,300
Forest Buffers	cumulative	Acres	-1,700	8,500	3,800
Wetland Restoration	cumulative	Acres	-100	500	1,900
Grass Buffers	cumulative	Acres	900	4,900	3,400
Soil and Water Conservation Plan	cumulative	Acres	2,900	211,800	13,000
Manure Incorporation	annual	Acres	400	3,900	31,300
Barnyard Runoff Control + Loafing Lot Management	cumulative	Acres	200	100	100
Urban Practices	Duration	Unit	2009 - 2019	2019 - 2025 Jurisdiction WIPs	2025 Jurisdiction WIPs - CWIP
Urban Forest Buffers	cumulative	Acres	30	500	2,900
Urban Forest Planting	cumulative	Acres	20	500	8,100

Generally, the table provides an indication of the significant increase in implementation needed from what has been accomplished since the establishment of the 2010 Bay TMDL. Comparing the draft CWIP to the jurisdictions' Phase III WIPs in the same region of the Susquehanna River Basin, the results vary as to the planned level of effort. Where the BMP rates in the draft CWIP are considerably higher than both the BMP implementation history (2009–2019) and the jurisdictions' Phase III WIPs, it is important to note the fact that the CWIP design was constrained to only considering implementation beyond what is already planned in the jurisdictions' Phase III WIPs.

The following [BMPs](#) account for 60% of the draft CWIP nitrogen load reduction, in order from greatest to least. This includes the inspection and maintenance of these BMPs currently on the ground:

- Forest Buffers
- Nutrient Management Core Nitrogen
- Soil Conservation and Water Quality Plans
- Tillage Management-Low Residue
- Loafing Lot Management
- Tillage Management-Continuous High Residue
- Nutrient Management N Placement
- Manure Incorporation Low Disturbance Early

These practices are some of the most cost-effective across all sectors and are among those BMPs and programs most available after the constraining assumption that jurisdictions will fully implement their Phase III WIPs and achieve their respective Phase III WIP planning targets (practices on the ground) by 2025. In addition, the planned placement of the BMPs considers geographies that have a greater effect on meeting the dissolved oxygen standard in the Chesapeake Bay estuary.

Programmatic Commitments

Key Strengths

Key strengths in the draft CWIP include:

- Targets BMP implementation in the most effective areas in the Susquehanna Basin and plans to implement cost-effective BMPs to achieve the nitrogen targets.
- Commits to monitor progress and update the CWIP, as necessary, to ensure BMP implementation goals are achieved.
- Identifies existing cost-share programs, partnerships with the ability to finance projects, and performance-based contracting as possible ways to implement projects.
 - For example, the draft CWIP identifies New York's Agricultural Non-Point Source Abatement and Control Program as an existing cost-share grant program to provide funding for implementation.
- Establishes a comprehensive review process that will help ensure only technically sound BMP projects with clear and accurate credit calculations will be considered for funding and implementation.
 - The technical review approach could be adopted to the Pennsylvania Nutrient Trading Program and the Chesapeake Bay Nutrient Trading Tool (CBNTT) once it reaches completion or the Maryland Water Quality Trading Program, which utilizes uncertainty ratios and Edge-of-Tide ratios to adjust for specific project types and locations.
- Provides assurance and accountability through the existing reporting and tracking protocols that the load reductions associated with practices implemented in the selected geographies are credited towards the CWIP while the tools will help streamline the process across multiple geographic scales that align with the Bay TMDL.
 - The practices reported through FieldDoc as a part of the CWIP, will be reviewed by the Chesapeake Conservancy and reported to the jurisdictions and the EPA separately from other programs and funding sources.

Key Enhancements to Address in the Final CWIP

EPA recommends that the following enhancements be addressed in the final CWIP to strengthen confidence that the CWIP nitrogen target will be achieved:

- Identify new programs, policies, and/or other programmatic commitments that will demonstrate how the CWIP nitrogen target will be achieved given existing resource constraints. The draft CWIP notes it will utilize existing programs to implement the WIP, however it does not explain which programs will be targeted and how to balance resource and technical assistance needs with the existing jurisdictions' Phase III WIPs.
- Include some or all of the financing strategy in order to provide confidence that the proposed suite of BMPs can be implemented. Additional detail on how the CWIP will address existing resource and funding shortfalls should be included.
- Provide more clarity and explanation on the proposal to utilize trading programs to achieve the CWIP nitrogen target. Questions to consider include what are the potential market drivers that would create a need for credits?
- Include further information is needed on the project tier ranking description to better understand whether Maryland, Pennsylvania, and New York would need to agree on the proposed tiered system.
- Clarify the steps that will be taken in Figure 4 to identify the priority geographic areas for implementation and Figures 5 and 6 include implementation opportunities outside of the areas in Figure 4. Clarity should be provided on the specific geographic areas of focus, the steps that will be

taken to broaden the geographic area, if necessary, and how the plan would be updated to address any changes in nitrogen reductions.

- Include a “Total” line at the bottom of Table 6 to summarize the costs, as it is unclear what information is expected to be gained from this table.
- Include the specific end date expected for the BMP implementation scenario proposed in the draft CWIP, which is currently based on an end date of 2025, once the CBP partnership decides what that target date will be.
- Update the CWIP two-year milestone schedule to reflect the most current PSC-approved schedule, which provides draft milestones to EPA by January 15 each even numbered year, and final milestones provided within 60 days of receiving EPA’s comments on the draft milestones. There is also an expectation for milestone progress reporting by January 15 of each year.
- Provide supporting information to justify 100% implementation of those applicable BMPs listed in Table 8 of Appendix E, as well as associated verification of those practices.
- EPA recognizes the interest of some jurisdictions to utilize the CBP partnership’s expert panel processes to determine whether dredging is a viable BMP. However, until the CBP partnership approves that BMP and determines appropriate efficiency values it is inappropriate to include it as a part of the WIP.

Preliminary Financing Strategy Information

Key Strengths

Key strengths in the draft CWIP include:

- Outlines the financing strategy into three phases which articulates how the financing strategy will be developed and later implemented. Along with the description of the three phases, timelines are provided, although the time approximations appear to be estimated by year, as opposed to a shorter time frequency. The three phases include a launch phase that includes a built-in opportunity to identify the strengths and weaknesses of the strategy.
- Describes and takes into consideration the current financing circumstances of the Chesapeake Bay watershed. For example, mitigating the pollutant loads attributed to the Conowingo Dam will need to be made by the Bay jurisdictions, in addition to the Phase III WIPs, and the economic forecast of a recession with lower revenues for jurisdictions.
- Identifies three key outcomes (efficiency, scale, and duration) as a foundation in order for the financing strategy to be successful. The longevity of the strategy relies on duration as a key outcome, which also would require a revenue stream. Identifying a revenue stream is critically important to the cashflow and ensuring this strategy will be successful.
- Recognizes that reduced administrative and implementation costs will need to be made to make the financing system efficient and thus more attractive than traditional practices.
- Addresses the risk tolerance associated with investing in practices to meet the CWIP nitrogen target.
- Discusses the limitations of depending on public sources (i.e., revenues) of funding and the need to engage the private sector to leverage private capital by focusing on structural practices first as a payment for an ecosystem services model, with the public sector then paying for the restoration activities.

Key Enhancements to Address in the Final CWIP

EPA recommends that the following enhancements be addressed in the final CWIP to strengthen confidence that the CWIP nitrogen target will be achieved:

- Provide more detail on revenues, sources, amounts, and timelines for implementing the strategy and the institutions (i.e., financing institutions, private capital investors, public sector entities, etc.) to be involved.
- Include the findings of the due diligence on the financing capacity of the existing institutions (i.e., PennVest, Chesapeake Bay Trust, etc.) and other innovative financing processes in the final CWIP financing strategy.
- Provide clarification on the funding role – if any – from USDA since a significant number of activities relate to agricultural BMP implementation.
- Provide additional details on the return expected on private investment and how it will be funded.
- Show comparison of private capital compared to public debt finance, sources, and availability of funds.
- Clarify whether performance-based contracting has the potential to deliver funding to the highest performing projects in the most cost-effective manner. What risk transfers are being considered. In addition, provide examples of successful performance-based contracting to increase confidence that this approach can be implemented.
- Include additional detail on what benefit the jurisdictions' nutrient trading programs (e.g., Pennsylvania Nutrient Trading Program) can provide to the proposed financing approach.
- Clarify whether options have been explored on issuing bonds, leveraging credit, or other debt-structured financing mechanisms.
- Provide a breakdown of capital cost and operating expenses from the projected annual cost of \$52,148,734.

Local Engagement Strategies

Key Strengths

Key strengths in the draft CWIP include:

- Commits to integrate its local engagement efforts with existing jurisdictional outreach opportunities to communicate goals and work in partnership with New York, Pennsylvania, and Maryland.
- Targets more in-depth stakeholder outreach in priority areas (e.g., most effective sub-basins) where nutrient reductions are expected to have the greatest impact.
- Commits to provide a mechanism to track implementation to identify BMPs supporting the CWIP.
- Identifies key partners and organizations, such as the Upper Susquehanna Coalition and local conservation district staff, as the primary audiences for stakeholder engagement workshops; communication will take place through web-based meetings and conference calls.
- Commits to continued outreach through CWIP implementation and future two-year milestone development and implementation.

Key Enhancements to Address in the Final CWIP

EPA recommends that the following enhancements be addressed in the final CWIP to strengthen confidence that the CWIP nitrogen target will be achieved:

- Identify key areas to target engagement in each of the three jurisdictions.
- Explain the BMP implementation levels expected from each jurisdiction to inform local engagement necessary to meet the expected levels of implementation.

- The draft CWIP identifies the BMPs for expected reductions in Table 2 and Table 3 includes the summary of reductions expected by each jurisdiction, but it does not provide this additional explanation.
- Identify an approach for how to address communication needs and concerns about implementing BMPs to credit a jurisdiction's Phase III WIP versus the CWIP.
- Include commitments or processes for additional outreach and public notice procedures if CWIP amendments are deemed necessary beyond the PSC and the CWIP Steering Committee.
- Identify clearly the responsible party or parties for tracking, verifying, and reporting BMPs to the jurisdiction and the CBP partnership.

EPA Oversight and Assistance

As it has done since the release of the Bay TMDL, EPA will continue to commit staff, contractual, and funding resources to support the implementation of the CWIP and future two-year milestones. This support includes continued financial support and grant oversight and management of the three cooperative agreements; modeling analysis and technical assistance, particularly with geographic and BMP targeting; communications and facilitation support between the CWIP team, Pennsylvania, Maryland, and New York; and coordination with other federal agencies to maximize collaboration and funding opportunities (e.g., ways to expand use of State Revolving Funds).

In addition, EPA will use its evaluations of the CWIP and future two-year milestones to determine if corrections or adjustments are necessary to attain the goals of the CWIP (e.g., whether the nitrogen target needs to be re-evaluated or assigned to specific jurisdictions).