

EPA EVALUATION OF VIRGINIA'S 2020-2021 and 2022-2023 MILESTONES

Executive Summary

The Chesapeake Bay Program (CBP) partnership established the goal to have all practices and controls in place by 2025 that were necessary to meet applicable water quality standards in the Chesapeake Bay (Bay) and its tidal tributaries (“2025 Goal”). The seven jurisdictions (Delaware, the District of Columbia, Maryland, New York, Pennsylvania, Virginia, and West Virginia) in the CBP partnership agreed to develop and implement a framework for holding each partner accountable for reducing nitrogen, phosphorus, and sediment loads to meet water quality standards in the Bay and its tidal tributaries. The U.S. Environmental Protection Agency (EPA) is providing this evaluation of Virginia's 2020-2021 and 2022-2023 milestones to the CBP partnership and the public in accordance with its oversight role and responsibility under the CBP partnership's accountability framework.

In that role, EPA has evaluated Virginia's progress toward attaining its portion of the 2025 goal. This evaluation includes an assessment of progress toward attaining nutrient and sediment goals at the state and state-basin level and progress toward meeting sector-specific programmatic commitments for the 2020-2021 milestone period. This evaluation also provides an assessment of sector-specific programmatic and numeric commitments (e.g., Best Management Practices (BMP) or BMP implementation targets) for the 2022-2023 milestone period and the status of the relevant water quality monitoring trends.

In reviewing Virginia's final programmatic progress for the 2020-2021 milestones, the 2021 numeric progress, and the final 2022-2023 milestone commitments, EPA identified sector-by-sector strengths as well as areas for enhancement. According to the data provided by Virginia for the 2021 progress run, Virginia achieved its statewide 2021 target for sediment but did not meet its statewide targets for nitrogen and phosphorus. EPA stands ready to assist Virginia with implementing its 2022-2023 two-year milestone commitments.

Some notable strengths identified in this evaluation of Virginia's 2020-2021 milestones and the final 2022-2023 milestones include:

- Passed legislation to reach its goals of 85 percent implementation of nutrient management plans on cropland and livestock exclusion from all perennial streams and completed a plan for implementing this legislation.
- Completed a State Lands Watershed Implementation Plan and established an interagency technical team to guide implementation of activities to reduce nutrient and sediment pollution originating from the lands and activities of Virginia agencies and public institutions.
- Reissued the Virginia Pollution Abatement Regulation and General Permit for Poultry Waste Management and included reporting requirements for poultry litter transport activities.
- Exceeded forest harvesting practices goals and maintains strong programs for supporting and tracking timber harvest BMPs and post-harvest water quality monitoring.

Some key areas that EPA expects Virginia to address in the 2022-2023 milestone period include:

- Reissue Phase I Municipal Separate Storm Sewer System (MS4) permits for Prince William, Chesterfield, Fairfax and Henrico Counties, and the Cities of Chesapeake, Hampton, Newport News, Norfolk, Portsmouth, and Virginia Beach.
- Accelerate BMP implementation in the agricultural sector, including BMPs for soil and water conservation plans, forest buffers, livestock and poultry waste management systems, cover crops, and nutrient management.

Detailed Evaluation of Overall Load Reductions and Source Sectors

Load Reduction Review

When evaluating Virginia's 2020-2021 milestone implementation, EPA simulated nutrient and sediment loads simulated using the Chesapeake Assessment Scenario Tool 2019 (CAST-19)¹ and wastewater discharge data reported by Virginia, and compared those simulated loads to Virginia's statewide and state-basin Phase III Watershed Implementation Plan (WIP) planning targets.

According to the data provided by Virginia for the 2021 progress run², Virginia achieved its statewide 2021 target for sediment but did not achieve its statewide 2021 targets for nitrogen and phosphorus. Virginia achieved its 2021 nitrogen targets for the James River basin but did not achieve its 2021 targets for nitrogen in all other major basins (Potomac, Rappahannock, York, Eastern Shore). Virginia achieved its 2021 phosphorus targets for the York River basin but did not achieve its 2021 targets for phosphorus in all other major basins (Potomac, Rappahannock, James, Eastern Shore). Virginia achieved its 2021 sediments targets for all of its state-basins.

Table 1. Loads and Targets for Virginia based on CAST-19 and reported wastewater data.

Pollutant	2009 Progress Loads (M lbs/year)	2021 Progress Loads (M lbs/year)	2025 Target (M lbs/year)
Nitrogen	67.91	56.64	52.95
Phosphorus	6.985	6.028	5.583
Sediment	6,557	6,392	6,872

Virginia developed specific BMP implementation targets for the 2020-2021 and 2022-2023 milestones for those practices identified in Virginia's Phase III WIP that account for the majority of the nitrogen reductions. Table 2 provides a summary of Virginia's 2021 progress compared to the 2009 baseline and the 2025 targets, as well as the 2022-2023 commitments, for these priority BMPs.

¹ CAST-19 is part of the Phase 6.0 suite of modeling tools for the Chesapeake Bay.

² Each year, jurisdictions in the CBP partnership report on the BMPs installed, tracked and verified and the pollutant load reductions from wastewater treatment plants. Using the Chesapeake Assessment Scenario Tool (2019), this information (or "annual progress runs") provides an estimate of how much nitrogen, phosphorus and sediment has been reduced.

Table 2. Progress toward Targets for Virginia's priority BMPs (those that account for the majority of the nitrogen reductions).

BMP³	2009 Progress	2021 Progress	2022-2023 Milestone Target	2025 WIP Target
Animal Waste Management Systems (animal units)	1,448,824	481,003	300 new facilities	2,228,900
Cover Crops (acres)	77,290	153,488	225,000	384,396
Soil Conservation and Water Quality Plans (acres)	None reported ⁴	7,250	300,000	1,183,460
Forest Harvesting Practices (% of area, unless otherwise noted)	78.8%	90.8%	95.5%	95.5%
Nutrient Management Core Nitrogen (acres)	543,549	584,909	700,000	951,395
Forest Buffers ⁵ (acres)	12,248	3,589	153	21,965
Grass Buffers – Streamside with Exclusion Fencing (acres)	5,262	17,149	4,800	45,766
Forest Buffer-Streamside with Exclusion Fencing (acres)	None reported	172	70	26,390
Agricultural Drainage Management (Denitrifying Ditch Bioreactors)	None reported	244	Not identified. Seeking funding for bioreactors in Shenandoah Valley	164,186
Nutrient Management Nitrogen Rate (acres)	None reported	207,951	110,000	758,474
Nutrient Management Nitrogen Timing (acres)	None reported	141,048	55,000	427,076

³ BMP levels are units reported or planned by the jurisdiction. The levels are calculated using the Phase 6.0 suite of modeling tools and include everything established or installed, reported, and functioning through the particular year, e.g., through 2009, or through 2021, etc., not just new reported implementation, unless otherwise noted.

⁴ CBP partnership modeling tools evolve based on CBP partnership decisions. As a result, some BMPs have “none reported” listed since those particular BMP names were not available for reporting. These practices were often included in another BMP category before the refinement to be more specific in the naming convention.

⁵ Virginia reported forest buffer on fenced pasture as forest buffers BMP in 2009.

The summary progress from the CBP partnership's modeling tools for 2009 and 2021 incorporate BMP credit duration. The CBP partnership decided to remove reported BMPs from the model simulation at the end of their established lifespans unless verified by the state as inspected and continuing to function as designed. Virginia is expected to provide detailed programmatic milestones to support these BMP implementation targets. In the sector-specific sections below, EPA provides its evaluation of these programmatic milestones and the connection to increased implementation.

Looking Forward for Future Reviews of Progress

The CBP partnership is just a few years away from the 2025 date that has been agreed upon for several of the goals and outcomes under the [2014 Chesapeake Bay Watershed Agreement](#), including the 2025 Goal. Given the changing conditions (e.g., human and animal population growth, 2025 and 2035 climate impacts, model updates) that have and will continue to impact progress and the level of effort towards meeting these goals, it is critical to begin planning for the future.

Source Sector Review

Agriculture

Virginia is predominantly relying on agriculture BMP implementation to meet its 2025 targets according to its Phase III WIP. Virginia continues to make incremental progress toward its goals however, the current pace of implementation is not on track to meet its overall nutrient targets. EPA expects Virginia to accelerate BMP implementation in the agricultural sector.

2020-2021 Milestone Achievements

- Finalized the Virginia Pollution Abatement Regulation and General Permit for Poultry Waste Management, which became effective on February 17, 2021.
- Passed legislation to reach its goals of 85 percent implementation of nutrient management plans on cropland and livestock exclusion from all perennial streams and completed a plan for implementing this legislation.
- Completed the Chesapeake Bay Voluntary Agricultural BMP Farmer Survey and released a summary report.
- Directed increased cost-share funding to key soil and water conservation districts.
- Completed a pilot study that examined the extent of perennial streams in the Bay watershed excluded from livestock.

2020-2021 Milestones Not Achieved

- Does not provide information on the number of evaluations completed under the Small Animal Feeding Operation (AFO) Assessment Strategy, per EPA's evaluation of Virginia's 2018-2019 and 2020-2021 Milestones.

2022-2023 Milestone Strengths

- Commits to publish the Notice of Intended Regulatory Action by the end of 2022 and complete the Technical Advisory Committee meetings by the end of 2023 to reissue the Virginia Pollution Abatement Regulation and General Permit for Animal Feeding Operations and Animal Waste Management, which expires in 2024.
- Appropriated record funding for agricultural BMPs for FY 2023-2024, fully funding the Agricultural Needs Assessment for the first time.

- Provides quantitative implementation goals for priority conservation practices and information regarding funding source(s) for these practices.
- Continues its plan to conduct Agricultural Needs Assessment and report funding needs to the Governor and Virginia Assembly.
- Commits to implement the Virginia Pollution Abatement Regulation and General Permit for Poultry Waste Management and improve poultry litter transport accounting.
- Commits to conduct cross-training with partners, agencies, and organizations that assist farmers and to continually pursue opportunities to improve coordination.
- Commits to propose revisions to Resource Management Plan and Nutrient Management Plan regulations that would increase certified planner capacity.

Key Areas to Address in the 2022-2023 Milestone Period

- Provide updates on the acreage and the associated conservation practices and implementation levels under Resource Management Plans (RMPs) that were developed in 2020-2021 and projected to be developed in 2022-2023.
- Continue to take meaningful action to accelerate BMP implementation in the agricultural sector, especially since several BMP implementation targets were not met in 2020-2021 milestone period, with a focus on increasing implementation of soil and water conservation plans, forest buffers, livestock and poultry waste management systems, cover crops, and nutrient management.
- Provide information on the number of evaluations completed under the Small Animal Feeding Operation (AFO) Assessment Strategy.

Urban/Suburban Stormwater

Virginia is expecting additional nutrient reductions from the stormwater sector by 2025 according to its Phase III WIP. EPA expects Virginia to accelerate BMP implementation in the urban/suburban stormwater sector.

2020-2021 Milestone Achievements

- Issued the Arlington County Phase I MS4 permit with an effective date of July 1, 2021.
- Reviewed all Phase II MS4 Total Maximum Daily Load (TMDL) Action Plans.
- Finalized the revision of Guidance Memo No. 15-2005 “Chesapeake Bay TMDL Special Condition Guidance” for MS4 permittees.
- Established an advisory group and held meetings to develop a protocol for re-evaluating post-construction water quality design criteria requirements.
- Drafted an annual report for the Governor and General Assembly that included Stormwater Local Assistance Fund (SLAF) requests and estimates.

2020-2021 Milestones Not Achieved

- Did not reissue the Phase I MS4 permits for Prince William, Chesterfield, Fairfax and Henrico Counties, or the Cities of Chesapeake, Hampton, Newport News, Norfolk, Portsmouth, and Virginia Beach.
- Did not expand the Healthy Virginia Lawns Program or meet the goal of 20 percent growth of clients, plans, or acres under urban nutrient management.
- Did not establish stakeholder advisory group and evaluate nutrient management planning under the Erosion & Sediment Control Regulations.

2022-2023 Milestone Strengths

- Secured grant funding and contractor assistance to assist in the development and reissuance of expired Phase I MS4 permits.
- Commits to continue to support implementation of voluntary urban stormwater BMP retrofits through the Virginia Conservation Assistance Program (VCAP).
- Commits to evaluate and potentially designate new MS4s with the publication of the 2020 Census Urban Areas Maps in conjunction with the reissuance of the Phase II MS4 general permit in 2023.
- Commits to update water quality design criteria requirements under Virginia Stormwater Management Program Regulations to incorporate the use of future projected design storms for managing stormwater.
- Commits to evaluate nutrient management planning under the Erosion & Sediment Control Regulations and amend regulations as necessary.
- Commits to develop a collaborative structure for multiple agencies and organizations implementing urban BMPs in non-MS4 areas to coordinate efforts, improve reporting, accelerate implementation, and verify existing practices.

Key Areas to Address in the 2022-2023 Milestone Period

- Reissue the remaining Phase I permits during this milestone period, since the pollutant reductions to be achieved in the developed sector rely on implementation of practices required by the MS4 permits.
- Provide the expected date by which the Virginia Department of Transportation (VDOT) individual MS4 permit will be reissued. The current permit expired June 2022. The 2022-2023 milestone (D10) indicates that this permit will be reissued in the next milestone period beginning in 2024.

Wastewater Treatment Plants and Onsite Systems

2020-2021 Milestone Achievements

- Reissued the watershed general permit.
- Published Notice of Intended Regulatory Action (NOIRA) to amend Water Quality Management Planning Regulation (9VAC25-720) to (1) include Chlorophyll-a based wasteload allocations for significant James River dischargers, (2) re-evaluate industrial significant wasteload allocations, and (3) establish floating wasteload allocations for significant municipal dischargers. Virginia Department of Environmental Quality (VADEQ) is still waiting on executive review.
- Continued implementation of septic BMPs to address local impairments within the Chesapeake Bay watershed in priority project areas.

2020-2021 Milestones Not Achieved

- VADEQ did not meet its proposed timeline for establishing a regulatory advisory panel and developing proposed regulatory amendments for consideration by State Water Control Board to amend the Sewage Collection and Treatment Regulations (9VAC25-790).

2022-2023 Milestone Strengths

- Commits to develop considerations of the impacts of climate change on proposed treatment works for inclusion in the Sewage Handling and Disposal Regulations.
- Commits to install at least 100 new onsite sewage system or public sewer connections to

replace failing onsite sewage systems, straight pipes, and pit privies.

- Commits to complete amendments to the Water Quality Management Planning Regulation (9VAC25-720) to include Chlorophyll-a based wasteload allocations for significant James River dischargers and re-evaluate industrial significant wasteload allocations.

Key Areas to Address in the 2022-2023 Milestone Period

- None.

Growth, Offsets, and Trading

2020-2021 Milestone Achievements

- Published annual reports on watershed general permit nutrient loads by April 1, 2020, and April 1, 2021, as required by state code.
- Published annual reports on watershed general permit trades by July 1, 2020, and July 1, 2021, as required by state code.

2020-2021 Milestones Not Achieved

- None.

2022-2023 Milestone Strengths

- Finalized protocol for re-evaluating post-construction water quality design criteria requirements by Jan.1, 2022.
- Commits to submit for executive review a Notice of Intended Regulatory Action to amend Virginia Stormwater Management Program Regulation (9VAC25-870) to update the water quality design criteria requirements, if necessary.
- Commits to submit for executive review a Notice of Intended Regulatory Action to amend Virginia Stormwater Management Program Regulation (9VAC25-870) to incorporate the use of future projected design storms for managing stormwater.
- Commits to establish Regulatory Advisory Panel and develop proposed amendments for consideration by State Water Control Board by January 1, 2023.
- Commits to publish annual reports on watershed general permit nutrient loads as required by state code.
- Commits to publish annual reports on watershed general permit as required by state code.

Key Areas to Address in the 2022-2023 Milestone Period

- Continue to work with EPA in offsetting any new or increased nutrient and sediment loads in Virginia's portion of the Chesapeake Bay watershed.

Climate

In 2020, the Principals' Staff Committee (PSC) issued a directive that by 2022 all jurisdictions would account for the additional nutrient loads due to 2025 climate change conditions in a Phase III WIP addendum, or in the two-year milestones, if they had not already done so in their Phase III WIP. Virginia addressed the 2025 climate change loads through its 2019 Phase III WIP. Therefore, this evaluation reflects the work and effort that Virginia put toward addressing the 2025 climate loads understanding that expectations related to 2025 climate change conditions could change as a result of future PSC decisions and future model updates.

At its August 29, 2022 meeting, the PSC decided to address "unaccounted additional loads" after

2025. The CBP partnership will define “unaccounted additional loads” and will determine how to address them. This decision came after Virginia completed the work and effort noted in this section to address the 2025 climate loads.

2020-2021 Milestone Achievements

- Completed Tidal Wetlands Guidelines which promote the protection and conservation of tidal wetlands.
- Completed the Virginia Coastal Resilience Master Plan.

2022-2023 Milestone Strengths

- Met the 2020 PSC directive to address the additional nutrient loads due to 2025 climate change conditions by including a CAST scenario in its 2019 Phase III WIP that demonstrates an ability to account for the additional nutrient pollutant loads.
- Includes a narrative in its 2022-2023 two-year milestones to describe the current understanding of the 2035 climate change conditions.
- Commits to submit for executive review a Notice of Intended Regulatory Action to amend Virginia Stormwater Management Program Regulation (9VAC25-870) to incorporate the use of future projected design storms for managing stormwater.
- Commits to incorporate practices and/or bundles of practices that provide climate change benefits, such as soil health, and improve water quality into the Virginia Agricultural Cost Share (VACS) program.
- Commits to develop considerations of the impacts of climate change on proposed treatment works for inclusion in the Sewage Handling and Disposal Regulations.
- Commits to increase Virginia's resilience to sea level rise and natural hazards, including by mapping failed, failing and threatened onsite septic systems at risk to sea level rise and taking steps to increase the resiliency of Northern Neck communities disproportionately vulnerable to flood impacts.
- Commits to develop guidance and decision support tools to support implementation of Chesapeake Bay Preservation Act amendments addressing coastal resilience and adaptation to sea-level rise and climate change.

Key Areas to Address in the 2022-2023 Milestone Period

- None.

Forestry

2020-2021 Milestone Achievements

- Passed legislation to facilitate implementation of Virginia Department of Forestry (VDOP) Healthy Watershed Initiative pilot.
- Planted 186 acres of riparian forested buffers in the Middle James River watershed and an additional 257 acres in Chesapeake Bay watershed, under the Virginia Environmental Endowment.
- Conducted 29 classes with 976 loggers, foresters and forest practitioners on harvest planning and BMP implementation. Created four new programs for the Sustainable Harvesting and Resources Professional (SHARP) Logger Program.
- Forest Harvesting Practices BMP compliance results for the Chesapeake Bay watershed exceeded implementation target.

- Funded and hired a watershed coordinator position to oversee programs and strategic initiatives that support urban canopy retention and establishment.
- Developed “My Tree Counts” application to allow for self-reporting of tree establishment projects.

2020-2021 Milestones Not Achieved

- Did not meet implementation targets for Forest Buffers, Urban Forest Buffers, Urban Tree Planting, and Urban Forest Planting.

2022-2023 Milestone Strengths

- Commits to continue tracking timber harvest BMPs and monitoring of water quality post-harvest.
- Commits to increase staffing and pursue funding to support forest buffer, tree planting, urban tree canopy, and forest harvesting practices goals.
- Commits to implement Healthy Watershed Initiative pilot with a locality or localities within the Rappahannock River Basin study area.

Key Areas to Address in the 2022-2023 Milestone Period

- None.

Other (Multiple Sectors; Reporting, Verification, and Accountability; James River Phased Implementation/Chlorophyll Study)

2020-2021 Milestone Achievements

- Completed State Lands Watershed Implementation Plan and established interagency technical team to guide implementation of activities to reduce nutrient and sediment pollution originating from the lands and activities of Virginia agencies and public institutions.
- Secured \$6,650,000 in new funding for the acquisition of over 9,800 acres of forested wetlands on the Eastern Shore of Virginia.
- Developed oyster restoration plans for Chesapeake Bay tributaries and met restoration construction targets in the Piankatank, Great Wicomico, Lafayette, and Elizabeth Rivers.
- Completed the Virginia Coastal Resilience Master Plan.

2020-2021 Milestones Not Achieved

- Explain why Virginia reported 0 acres of Oyster Reef Restoration BMP implementation for the 2021 progress period, despite reporting completion of reef restoration projects in several Chesapeake Bay tributaries in the 2020-2021 programmatic progress report.

2022-2023 Milestone Strengths

- Commits to develop guidance and decision support tools to support implementation of Chesapeake Bay Preservation Act amendments addressing coastal resilience and adaptation to sea-level rise and climate change.
- Commits to develop a pay-for-performance pilot program that would incentivize installation of nutrient removal technologies such as bioreactors.

Key Areas to Address in the 2022-2023 Milestone Period

- None.

Potential Federal Actions and Assistance

As noted in its Phase III WIP evaluations, EPA remains prepared to assist each of the seven watershed jurisdictions in implementing the 2022-2023 milestones. EPA will work with each jurisdiction to develop a specific oversight and assistance activities to provide prioritized support for implementation efforts, including funding, technical assistance and analysis, training, and regulatory reviews.

EPA plans to continue to commit staff, contractual and funding resources to support the seven watershed jurisdictions in implementing the 2022-2023 milestones and future two-year milestones. This support includes evaluation of the most-effective practices and locations, annual funding assistance to address priority implementation needs, evaluation of Bay jurisdictions' implementation capacity under various staffing, funding, regulatory and programmatic scenarios, local planning outreach, legislative and regulatory gap analysis, and monitoring trend analyses.

In addition, EPA will continue to work with federal partners to provide leadership and coordinate with Bay jurisdictions on WIP and two-year milestone implementation to reduce pollutants from federal lands. EPA will continue its commitment to track annual progress of the Bay jurisdictions and make those results available to the partnership and the public. [See: <https://www.epa.gov/chesapeake-bay-tmdl/epa-oversight-watershed-implementation-plans-wips-and-milestones-chesapeake-bay> and <https://www.chesapeakeprogress.com/>]

Monitoring Trends Summary

The CBP partnership's Chesapeake Bay Program Nontidal Water Quality Monitoring Network, supported by EPA, the U.S. Geological Survey (USGS), the Susquehanna River Basin Commission (SRBC), and the Bay jurisdictions, generates water quality monitoring data in freshwater rivers and streams throughout the watershed that is analyzed by USGS for nutrient and sediment loads and trends. The most recent USGS results (www.usgs.gov/CB-wq-loads-trends) over the long-term period 1985-2020 and the short-term period 2009-2020 for most stations were made available in September 2020. New nutrient and suspended-sediment load and trend results became available for the nine River Input Monitoring (RIM) stations for the long-term period 1985-2020 and short term 2011-2020.

While identifying drivers behind individual trends is often complex, the monitoring results are worthy of Virginia's consideration as it develops the programs and BMPs planned for the next two years. EPA's initial summary of how the monitoring results in Virginia's watersheds can potentially inform planning are below.

- Trends are improving in the majority of Virginia's highest loading monitored watersheds for phosphorus. Of the two highest loading watersheds for nitrogen, one is improving (Muddy Creek at Mount Clinton, VA) and the other shows no trend (Smith Creek near New Market, VA). Implementing efforts in high loading areas can potentially yield the greatest nutrient reduction benefits.
- Trends in Virginia's monitored agricultural watersheds show that most stations are improving for phosphorus. More exploration on what is occurring in these monitored watersheds can potentially reveal successful programs, policies, or practices. For nitrogen, equal proportions of monitored agricultural watersheds are improving and degrading.

While more information would be needed to determine what is driving individual trends, this suggests agricultural areas should be a continued focus.

- Trends at the North and South Fork Shenandoah Rivers are improving for nitrogen and phosphorus, and the majority of monitored Shenandoah River tributaries are improving for nitrogen. More exploration on what is occurring in these monitored watersheds can potentially reveal drivers of these improving trends.
- Trends at the Rappahannock, Pamunkey, Mattaponi, and Appomattox Rivers are degrading for both nitrogen and phosphorus. All stations monitored in the Mattaponi River show degrading trends for nitrogen or phosphorus. These areas should be explored for potential focus in future milestones.