REPORT OF THE SECRETARY OF NATURAL AND HISTORIC RESOURCES

FY 2023 CHESAPEAKE BAY AND VIRGINIA WATERS CLEAN-UP PLAN

TO THE GOVERNOR AND THE CHAIRMEN OF THE SENATE AGRICULTURE, CONSERVATION AND NATURAL RESOURCES COMMITTEE; THE HOUSE AGRICULTURE, CHESAPEAKE AND NATURAL RESOURCES COMMITTEE; THE SENATE COMMITTEE ON FINANCE AND APPROPRIATIONS; AND THE HOUSE COMMITTEE ON APPROPRIATIONS

COMMONWEALTH OF VIRGINIA
RICHMOND

Contents

Preface

This Chesapeake Bay and Virginia Waters Clean-Up Plan Report was developed to comply with consolidated water quality reporting requirements set forth in § 62.1-44.118 of the *Code of Virginia*. This section requires the Secretary of Natural and Historic Resources to submit a progress report on implementing the impaired waters clean-up plan as described in § 62.1-44.117 of the *Code of Virginia*. This consolidated report also includes the *"Annual Report on the Water Quality Improvement Fund"* by the Department of Conservation and Recreation (DCR) and Department of Environmental Quality (DEQ) pursuant to § 10.1-2134 of the *Code of Virginia* and incorporates the reports on "*Cooperative Nonpoint Source Pollution Programs"* required in subsection D of § 10.1-2127 and the *"Watershed Planning and Permitting Report"* required in subsection B of § 10.1-1193 of the *Code of Virginia*. The report also encompasses DCR's report of *"Annual Funding Needs for Effective Implementation of Agricultural Best Management Practices"* pursuant to subsection C of § 10.1-2128.1 of the *Code of Virginia*. The 2023 report includes the "*Water Quality Improvement Fund Requests Estimate Report"* required by § 10.1-2134.1 of the *Code of Virginia* and the "*Stormwater Local Assistance Fund Requests Estimates Report*" required by § 62.1-44.15:29.2 of the *Code of Virginia*. This consolidated report also includes the "*2014 Chesapeake Bay Watershed Agreement Progress Report: State of the Chesapeake Bay Program Report to the Chesapeake Bay Executive Council*," as required in § 2.2-220.1. This consolidated report also addresses Item 361.A. originally required by the 2018 Special Session I Budget.

Executive Summary

The Commonwealth's Progress on Federal Planning Targets

The Commonwealth has made significant and substantial progress towards meeting the Chesapeake Bay Total Maximum Daily Load (TMDL). Virginia's reported pollution controls achieved 100% of the 2025 federal planning target reduction goal for sediment, 84% of the reduction goal for nitrogen, and 70% of the reduction goal for phosphorous according to a press release from the Chesapeake Bay Program highlighting modeled pollution load estimates generated through the 2019 version of the Chesapeake Assessment Scenario Tool (CAST-19) of the Watershed Model. Furthermore, modeled pollution load estimates for phosphorous will be even lower once the model is adjusted to account for 2011 legislation (HB 1831 and SB 1055, 2011 Va. Acts Chs. 341 and 353) that limited the sale, distribution, and use of lawn fertilizer containing phosphorous in Virginia after December 31, 2013. Based on evaluation by the Department of Environmental Quality (DEQ), the modeled pollution load reduction for phosphorous in Virginia could be on the order of 100% of the federal planning target when adjusted for the reductions achieved by the 2011 law change and 2010 WIP requirement to eliminate phosphorous in most lawn fertilizers. The 2023 version of CAST (CAST-23) is currently under development by the Environmental Protection Agency, but is unlikely to be updated to reflect these modeled pollution load reductions for phosphorus until after 2025. Modeled phosphorus reductions under CAST-23 will account for a variety of factors such as land use changes and previously unaccounted loads; therefore, future modeled progress may vary from DEQ's estimate.

Chesapeake Bay and Virginia Waters Clean-Up Plan Report

The Chesapeake Bay and Virginia Waters Clean-Up Plan Report articulates Fiscal Year (FY) 2023 activities and progress on implementing the impaired waters clean-up plan, including progress outlined under Virginia's Chesapeake Bay Watershed Implementation Plan. During FY 2023, many strategies were implemented in the Commonwealth to reduce pollutants entering the Chesapeake Bay tributaries and Southern Rivers basins. Significant progress was made in reducing point source pollutant discharges from sewage treatment plants, installing agricultural best management practices (BMPs) with a continuing focus on livestock exclusion practices, the reissuance of administratively continued Phase 1 Municipal Separate Storm Sewer System (MS4) permits, and implementing revised Stormwater Management Regulations. Virginia agencies submitted progress reports demonstrating progress in the Chesapeake Bay Clean-Up for the 2022-2023 Watershed Implementation Plan (WIP) milestones period.

In FY 2023, DEQ made significant progress on the development of Total Maximum Daily Load (TMDL) equations in complex watersheds addressing polychlorinated biphenyls (PCBs), sediment, and nutrients and completed one Implementation Plan covering 13 waterbody impairments. BMP data reported by the Nonpoint Source (NPS) program is delayed by one fiscal year due to the limited availability of BMP data at the time of the Clean-Up Plan reporting deadline. In FY 2022, a total of 225 small TMDL Implementation Watersheds saw BMP activity resulting in over 3,600 BMPs installed.

Water Quality Improvement Fund and Cooperative Nonpoint Source Pollution Programs

For FY 2023 (the period July 1, 2022 – June 30, 2023), the Virginia Soil and Water Conservation Board allocated $116.3 million in agricultural cost-share and $15.1 million in technical assistance funds to Soil and Water Conservation Districts (SWCDs or Districts). An additional $6.6 million, and the associated technical assistance funds, were set aside for SWCDs that implemented the Whole Farm Approach. For FY 2023 and FY 2024, $6 million is available for the Conservation Reserve Enhancement Program (CREP) cost-share funds for disbursement to Districts as state match for new projects. Practices installed on farms during FY 2023 will result in estimated edge-of-field nitrogen reductions of approximately 11.5 million pounds, phosphorus reductions of approximately 3.9 million pounds, and sediment reductions of approximately 1,000,000 tons.

Under the Water Quality Improvement Fund (WQIF) Point Source Program, since 1998, 101 point source WQIF grant agreements obligating $1.03 billion have been signed. The construction project grants range from 35% to 95% cost-share for the design and installation of nutrient reduction technology at Chesapeake Bay watershed point source discharges. WQIF point source grants provide critical support for compliance with the nutrient discharge control regulations and achieving Chesapeake Bay nitrogen and phosphorus wasteload allocations (WLAs). Ninety-two of the projects have been completed and are operational. For calendar year 2022, facilities registered under the Chesapeake Bay Watershed Nutrient Discharge General Permit reported discharged loads that, in the aggregate, were significantly below the total WLAs currently in effect for all Chesapeake Bay tributary basins. Tables of discharged and delivered loads for each individual facility and basin totals are available online from DEQ.

With nonpoint source funding made available through the WQIF, along with matching funds, DEQ has worked with local government and state agency partners to implement a wide range of actions to reduce nonpoint source pollution that contributes to water quality problems.

Although there has been no additional WQIF Nonpoint Source Program funding since 2016, implementation activities continue under a Request for Assistance (RFA) made available to local government (cities, towns, counties, SWCDs, and Planning District Commissions (PDCs)) and state agency applicants. DEQ continues to manage projects awarded through the $3.4 million RFA. These nonpoint source pollution implementation projects are at various stages of completion.

Within the Chesapeake Bay watershed, projects that maximize the reduction of nitrogen, phosphorous, or sediment were a funding priority. Projects with the highest pollution reduction relative to dollars requested were given priority. These projects implement pollution control actions that will have a significant and lasting impact on local and state water quality. Overall, pollution reductions are expected to be in line with original reduction estimates.

Funding Needs for Effective Implementation of Agricultural Best Management Practices

The funding projections for the effective implementation of best management plans were determined using a revised formula for FY 2022 and were updated for inflation in FY 2023. These projections for the Chesapeake Bay were developed based on a detailed analysis of practices identified in the Chesapeake Bay Phase III WIP. This included a review of progress made in implementing the WIP through 2022 and assumes the practices included in the WIP are implemented.

A FY 2023 estimate of over $2.7 billion may be required from state and federal funds as well as farmer financial contributions to meet water quality goals. Approximately 38.5% of this total (slightly over $1.0 billion) could be needed from state sources, the vast majority of which is direct funding of the Virginia Agricultural Cost-Share (VACS) Program and support for Soil and Water Conservation Districts that implement the VACS program.

Actual FY 2023 allocations from state sources for implementation of agricultural BMPs had the following breakdown:

FY 2023 (Program Name – amount):

VACS Cost-Share program funding - $116.3 million

District Technical Assistance - $15.1 million

District Financial Assistance - $9.8 million

FY 2023 support figures exclude engineering support via DCR staff, IT support, and training assistance (*e.g.*, Conservation Planning Certification). These have been itemized separately.

Projected funding needs from state sources for implementation of agricultural BMPs through FY 2023-2030 are estimated in the 2023 Agricultural Needs Assessment Table on page 72. A comprehensive

review of the VACS Program that began in 2019 has led to improved program efficiency, increased flexibility in agricultural practice standards and specifications, and other significant programmatic revisions. Additional efforts are focused on methods to improve tracking of voluntarily installed practices and bundling several practices into one VACS application.

Chapter 1 - Chesapeake Bay and Virginia Waters Clean-up Plan Report

This chapter is submitted to fulfill the progress reporting requirements of § 62.1-44.117 and § 62.1-44.118 of the *Code of Virginia* which calls on the Secretary of Natural and Historic Resources to plan for the cleanup of the Chesapeake Bay and Virginia's waters designated as impaired by the U.S. Environmental Protection Agency (EPA). This chapter also incorporates the reports on "*Cooperative Nonpoint Source Pollution Programs"* required in subsection D of § 10.1-2127 and the *"Watershed Planning and Permitting Report"* required in subsection B of § 10.1-1193 of the *Code of Virginia*.

Upgrades to wastewater treatment facilities in the Chesapeake Bay watershed

2023 Progress Report

Nutrient load reductions from the point source sector have been the most reliable reductions achieved under the Chesapeake Bay Total Maximum Daily Load (TMDL). Significant dischargers are regulated under the Chesapeake Bay Watershed Nutrient Discharge General Permit. The general permit includes wasteload allocations (WLAs) and schedules of compliance when necessary to phase in the necessary treatment facility upgrades. The general permit also allows point sources to trade nutrient credits so that facility upgrades can be phased in over several years while still meeting TMDL nutrient reduction goals. The permit was first issued on January 1, 2007 and reissued on January 1, 2012, January 1, 2017, and January 1, 2022. Upgrades implemented to date have reduced the annual point source nutrient load delivered to the Chesapeake Bay and tidal rivers by approximately 11.9 million pounds of nitrogen (59% reduction) and 744,000 pounds of phosphorus (54% reduction) compared to the 2009 loads.

The current Chesapeake Bay Watershed General Permit includes additional nutrient reductions for significant dischargers in the James River basin (nitrogen and phosphorus) as required by the Chesapeake Bay TMDL. Point source nutrient loads are dominated by the James River facilities that accounted for 71% of the statewide point source nitrogen loads and 77% of the statewide point source phosphorus loads in 2022. Delivered nutrient loads from point sources in the James River basin declined by 15% for nitrogen (1.0M pounds) and 10% for phosphorus (52,000 pounds) in 2022 alone.

Appendix X of the TMDL identified two phases of additional Total Nitrogen (TN) and Total Phosphorous (TP) reductions necessary in the James River Basin to meet the dissolved oxygen (DO) criteria. These reductions have been implemented in the last two phases of the Watershed General Permit and are currently incorporated in 9VAC25-820-80. It should be noted that through a combination of facility upgrades, overperformance, and flows remaining below design capacity, the Virginia point sources have met the DO-based WLAs in aggregate since 2012.

Appendix X to the TMDL also included a staged implementation strategy to give the Commonwealth time to identify what additional point source reductions would be necessary to meet water quality criteria for chlorophyll-*a* in the tidal portions of the James River Basin. DEQ took the opportunity provided by the staged implementation schedule to further evaluate and refine the existing chlorophyll-*a* criteria.

On September 20, 2018, the State Water Control Board gave approval for DEQ to go to public hearing and comment on amendments to the Water Quality Standards Regulation (9VAC25-260-310 (bb)), addressing the numeric chlorophyll-*a* criteria applicable to the tidal James River. The proposed amendments were the outcome of a seven-year-long effort to update the regulation with the best available science, evaluate the protectiveness of the current criteria, determine if revisions were appropriate, as well as modify the methods used to assess criteria attainment. The new criteria and assessment method take into consideration the recommendations of a scientific advisory panel (SAP) and a regulatory advisory panel (RAP). The final chlorophyll criteria amendments were presented to the State Water Control Board for adoption at its June 27, 2019 meeting, with additional text included in response to comments received, to describe additional lines of evidence that would be examined to render an appropriate assessment determination for the aquatic life use if "back-to-back" seasonal mean exceedances were to occur. EPA subsequently approved the new James River numeric chlorophyll criteria, and they became effective on January 6, 2020.

In addition, during the James River chlorophyll study, an enhanced water quality model was developed to simulate chlorophyll concentrations in response to varying levels of point source nutrient reduction. Through the spring and into the early summer of 2020, the model was updated with adjusted climate change factors, and a set of point source nutrient reduction scenarios was re-run to test chlorophyll criteria attainment. Results indicated that water quality conditions protective of the revised chlorophyll criteria can be attained with the point sources controlling total phosphorus to near state-of-the-art treatment levels. Numerous scenarios evaluating various levels of phosphorus reductions in the tidal fresh and free-flowing portions of the James River were evaluated by DEQ with input from a RAP. In December 2020, the State Water Control Board authorized DEQ to publish a notice of public comment and hold a public hearing on Scenario “3-B(i),” which reduces phosphorus WLAs for six publicly owned treatment works (POTWs) and one industry discharging to the tidal freshwater estuary in order to meet the newly adopted chlorophyll-*a* water quality criteria. The reduced phosphorus WLAs were subsequently approved by the State Water Control Board in December 2021 following a public hearing and comment period.

The Water Quality Management Planning (WQMP) Regulation (9VAC25-720) amendments authorized for public notice in December 2020 also included the implementation of floating WLAs for 36 significant municipal wastewater treatment plants (WWTPs). The floating WLAs were proposed to meet the commitment to achieve additional nutrient reductions from the wastewater sector included in Initiative #52 of Virginia’s Chesapeake Bay TMDL Phase III WIP. The floating WLA approach was subsequently superseded by HB 2129 and SB 1354, which were enacted following Special Session 1 of the 2021 General Assembly (2021 Special Session I Va. Acts Chs. 363 and 364). HB 2129 and SB 1354 eliminated the floating WLA concept and established the Enhanced Nutrient Removal Certainty (ENRC) Program. The ENRC Program includes established schedules for nutrient upgrades and/or consolidation projects at 13 POTWs and reduced WLAs at 7 Hampton Roads Sanitary District treatment plants in the James River and York River Basins. The State Water Control Board approved amendments to the WQMP Regulation (9VAC25-720) to incorporate the reduced WLAs in June 2021. The General Assembly expanded the ENRC Program to include the expansion and upgrade of the Fredericksburg WWTP with the passage of HB 1067 and SB 355 in the 2022 Session (2022 Va. Acts Chs. 127 and 128).

TMDL development and implementation for waters impacted by toxic contamination

2023 Progress Report

Bluestone River: The Virginia portion of the Bluestone River watershed has impairments for Polychlorinated Biphenyls (PCBs) in fish tissue and violations of the total PCB water quality criterion in water. To address these impairments, Virginia and West Virginia are collaborating on the development of an interstate PCB TMDL. High PCB concentrations detected in the water column during an earlier multistate collaborative TMDL source investigation study triggered an EPA study and a cleanup effort. For example, a former Superfund site known as Lin Electric was remediated for extremely high levels of PCBs in sediment/sludge. Beginning in 2016, Virginia performed a PCB source identification component of a TMDL study that included instream monitoring during base flow and high flow conditions. The EPA Superfund program followed with additional monitoring in 2021 at a site known as the Bluefield Beacon PCB Groundwater Site in Bluefield, West Virginia. The results, which were reported in 2023, corroborated DEQ's findings that suggest PCBs are likely originating from West Virginia. The TMDL project should commence during the first quarter of 2024.

Elizabeth/tidal James Rivers: A PCB fish consumption advisory extends from the fall line in Richmond, Virginia to the mouth of the James River, and includes the Elizabeth River and its tributaries. A PCB TMDL, currently under development and scheduled for completion in 2024, will establish reductions needed to attain the fish consumption use within these impaired waters. A large component of the TMDL includes a PCB source investigation study, also currently under development, that will tabulate PCB sources from each category, from which allocations and reductions will be assigned. Example categories consist of point sources such as industrial and municipal outfalls, regulated stormwater from urbanized areas as well as known PCB-contaminated sites. Contaminated sediment, contributions from atmospheric deposition, and PCB loads from above the fall line are also considered for this study. A PCB fate and transport model will be utilized by the Virginia Institute of Marine Science (VIMS) to link available PCB sources to the contaminated fish. PCB loadings from the upstream (non-tidal) James River, which is currently under development, are vital to completing this study.

James (non-tidal)/Jackson/Maury Rivers: The non-tidal James River basin is located in Central Virginia. Five river segments were listed for PCB fish consumption advisories beginning in 2004 with the most recent occurring in 2020. Initial TMDL studies to delineate the geographic distribution and possible sources of the PCB contamination began in 2017 and continued through 2019. The purpose of this intensive monitoring effort was to identify sources of PCBs throughout the impaired watershed in addition to informing the fate and transport of PCBs to assist with the TMDL model development. TMDL development is planned for completion during the first quarter of 2024.

Levisa Fork: A PCB TMDL was completed in April 2010 for the Levisa Fork watershed, which is part of the Tennessee/Big Sandy River basin. Since PCB monitoring had not revealed a viable source(s) of the contaminant, the study was submitted to EPA as a phased TMDL. The Virginia Department of Energy developed an EPA-approved monitoring plan to evaluate PCBs, total suspended solids (TSS), and total dissolved solids (TDS). Funding to support monitoring was limited, and PCB monitoring was de-

prioritized to concentrate efforts on monitoring of TSS and TDS for completion of the phased TMDL. Existing monitoring results for instream concentrations suggest focusing future PCB monitoring on Dismal Creek and Slate Creek will aid in TMDL implementation. It is noteworthy that Virginia Pollutant Discharge Elimination System (VPDES) permitted facilities that were assigned a PCB wasteload allocation (WLA) under the TMDL continue to implement pollutant minimization plans (PMPs).

Lewis Creek: Lewis Creek is in the Potomac-Shenandoah River Basin in western Virginia. The impaired segment of Lewis Creek was first listed for fish consumption advisories in 2004. Initial TMDL studies to delineate the geographic distribution and possible sources of the contamination were performed during 2017 into 2019. The results were used to identify sources of PCBs throughout the study watershed and inform the fate and transport model. The TMDL was completed and approved by EPA in early 2022. A former metal recycling site identified as a significant source of PCBs within the TMDL is scheduled for additional remediation efforts in late 2023 and 2024. Finally, a post-TMDL sampling effort that was designed to locate previously unidentified PCB contamination within the Lewis Creek watershed did not identify a new source of appreciable PCBs.

Mountain Run: The Mountain Run PCB impairment extends from the Route 15/29 bridge crossing near Culpeper, approximately 19 miles to the confluence with the Rappahannock River. This waterbody was listed in 2004, although PCB contamination was originally identified during studies performed back in the 1970s. PCB monitoring was initiated in 2013 as part of the source investigation study for TMDL development. Additional rounds of monitoring also occurred during 2014, 2015, 2018, and 2021 with the results pointing toward the identification of possible source areas in the Culpeper area, as well as an old waste disposal site. A PCB TMDL study is on track to be completed during the fall of 2023.

New River: The New River, beginning at the I-77 bridge and extending to the West Virginia line, has been the focus of an extensive PCB source investigation study due to fish consumption use impairments. The study was initiated in 2010 and included several iterations of ambient river PCB monitoring within the impairment. Large tributaries such as Peak Creek have also been investigated. In addition, PCB monitoring of permitted VPDES facilities has occurred along with the identification of other prospective sources such as contaminated sites, atmospheric deposition, and contaminated sediment. The TMDL that was developed to restore the fish consumption use was completed during the summer of 2018. As allowed by available resources, DEQ intends to develop a TMDL implementation approach to identify and reduce PCB loadings from non-point source TMDL categories with an emphasis on the "Uncategorized" category. Additionally, VPDES permits that were assigned WLAs within the TMDL are in the process of implementing PMPs as appropriate.

North Fork Holston River: The North Fork Holston River mercury TMDL was completed in 2011. A fish consumption advisory for mercury extends approximately 81 miles from Saltville, Virginia to the Tennessee state line. While most of the mercury in the river originated from the Olin plant site, this contaminant has been distributed throughout the floodplain downstream. The TMDL identified that most of the current mercury loadings come from the watershed and floodplain with lesser amounts from the former plant site. Apart from the Olin WWTP, the current assumption is the permitted sources contribute a nonsignificant load to the mercury impairment. Currently, the Water Planning Division intends to initiate the process to withdraw or modify the TMDL. Dating back to 2018, under the authority of the Superfund Program, EPA performed additional instream mercury monitoring to reassess the mercury

loadings from the former Olin plant site. There are indications that additional mercury loads not originally captured in the TMDL may be coming from the contaminated site. As such, EPA is in the process of reviewing updated information to determine future remedial steps at the former Olin site.

Potomac River: A multi-jurisdictional PCB TMDL was completed in 2007. TMDL implementation activities have been ongoing within the Virginia embayments. The VPDES municipal wastewater treatment facilities that discharge to the embayments have been monitored for the presence of PCBs. PMPs are utilized at those VPDES-permitted facilities where reductions are needed to meet the assigned TMDL WLAs.

Roanoke (Staunton) River: A PCB TMDL was completed in 2010 for the Roanoke River that included drainage areas from the headwaters and extended as far downstream as the Dan River (Kerr Reservoir). The Roanoke TMDL source investigation study identified two noteworthy PCB sources in the downstream (Staunton River) portion of the river. One facility successfully eliminated 10% of the ongoing PCB load to the river by identifying, treating, and eliminating the source. TMDL implementation continues at the other significant source where site modifications are underway to address the contamination. A PCB monitoring requirement is also applicable for an extensive list of VPDES permits throughout the watershed. Moreover, the permitted facilities with existing loads greater than the assigned WLA have submitted PMPs to address the PCB contamination. PMP implementation will continue until appreciable PCB reductions identified within the TMDL are achieved.

South and Shenandoah Rivers: The South River and Shenandoah River mercury TMDL was completed in 2010. The South River has a fish consumption advisory that extends about 150 miles from Waynesboro to the West Virginia state line via the South River, the South Fork Shenandoah River, and the mainstem Shenandoah River. The primary source of mercury deposited in the river and floodplain was from releases that occurred during the 21 years that DuPont used mercury in the production of rayon at the facility (1929-1950) in Waynesboro. Atmospheric deposition was not identified as a significant mercury source. Fish tissue data from a reference site upstream of the former DuPont plant site shows safe mercury levels, while fish tissue samples below the plant contain elevated amounts of mercury.

Unfortunately, mercury levels in fish tissue from this portion of the river have not shown a decline since the mercury was discovered in the river in 1976. Remediation and restoration efforts to reduce or eliminate mercury contamination continue through DEQ's TMDL and Resource Conservation and Recovery Act and Natural Resource Damage Assessment (NRDA) regulatory programs, and a significant non-regulatory, science-based initiative through the South River Science Team that has been in place since 2000. As part of a $50 million settlement approved by a federal court in August 2017, DuPont has agreed to mitigate the environmental harm, including water quality, caused by the mercury contamination. Corrective actions on the DuPont site, which included soil removal, capping, sewer abandonment, cleaning, and lining, were completed in October 2021, and the Corrective Measures Implementation Report was approved by DEQ on June 15, 2022.

Ongoing offsite activities have included bank stabilizations and soil removal and capping. Remediation has been completed in the first two miles of river with the completion of removals and bank stabilization of 4,000 feet of riverbank. Modeling has predicted this work will reduce mercury loading from the riverbanks in this part of the river by 90%. Monitoring is occurring to assess the effectiveness of this

work on reducing mercury concentrations in the river and biota. Preliminary data is showing decreases in young of the year smallmouth bass mercury concentrations. During the reporting period, investigations have continued with an evaluation of the riverbanks two to four miles downstream of the former DuPont facility for potential remediation activities. NRDA activities to date have included land protection, habitat restoration, bank stabilizations, stream exclusion and animal waste control projects, mussel restoration, and improving and creating new access for recreational fishing.

Dan River Coal Ash Spill and State Response

On February 2, 2014, about 39,000 tons of coal ash and 25 million gallons of ash storage pond water were released into the Dan River from the Duke Energy facility in Eden, North Carolina. Coal ash is the residue generated from burning coal and is typically stored at power plants or placed in landfills. Coal ash has a large variety of components – mostly silicon oxide, iron oxide, and aluminum oxide, with trace amounts of arsenic, selenium, mercury, boron, thallium, cadmium, chlorides, bromine, magnesium, chromium, copper, nickel, and other metals.

EPA, DEQ, U.S. Fish and Wildlife Service, North Carolina Department of Environmental Quality, and Duke Energy conducted emergency response monitoring to detect any acute effects to aquatic life over the following 10-12 months. Analytical results for water samples taken by DEQ staff at four river and two reservoir stations located in Virginia's portion of the Dan River showed no exceedances of water quality standards for the protection of aquatic life. Sediment taken from the same locations showed elevated levels of trace metals, but not above any freshwater ecological screening levels that DEQ uses to indicate potential concerns. In addition to the emergency response environmental monitoring, to protect human health, the Virginia Department of Health (VDH) was involved in finished drinking water testing with the localities that draw their water from the Dan River (Danville, South Boston, and Clarksville). All finished water met state and federal drinking water standards throughout the emergency.

Following the release, the ash was distributed by river flow over the entire length of the Dan River and into Kerr Reservoir, a distance of about 70 miles. Longer-term environmental monitoring, aimed at detecting any trends in sediment or water column concentrations of trace metals associated with the ash, was done from 2015 to 2017. This trend monitoring plan was composed of several elements (Figure 1.1):

- Monthly water column and sediment sampling at four river stations and two Kerr Reservoir stations.
- Fish tissue collection at eight sites, once at each location annually, during the period September - October.
- "Boatable Probabilistic" monitoring (habitat, macroinvertebrates, fish community structure, and expanded chemical testing) at two stations; sampling done annually in late summer.

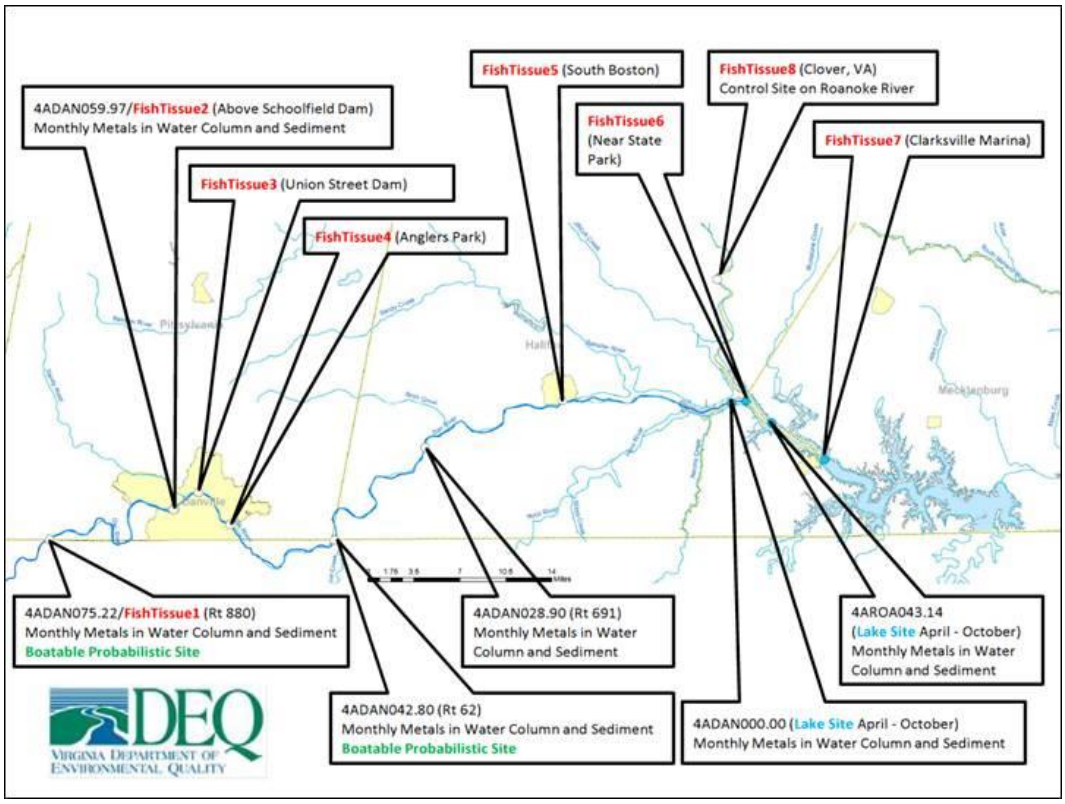

Figure 1.1: Map of Dan River Monitoring Program Sites

Because the accumulated results indicate that impacts were minimal and trends were essentially in a positive direction (*i.e.*, decreasing concentrations), the Dan River monitoring program has been scaled back to a few sentinel sites periodically sampled for sediment and water column metals levels. Fish tissue collection continued at a slightly expanded scope, with the addition of five more stations located within the larger Roanoke and Yadkin River basins, under a five-year grant (through 2022) from the National Fish and Wildlife Foundation (using a portion of the penalty settlement funds paid by Duke Energy to the federal government).

The 2022 fish tissue results will be available in late 2023. Following is a summary of the results from the 2014 to 2021 monitoring program:

- Sediment monitoring occurred from 2014 to 2017 only. Sediment metals levels remained low, below thresholds of potential concern, and the ash continued to be mixed with and covered by native sediment to non-detectable levels in the biologically active layer throughout the river.
- Water column dissolved metals monitoring occurred from 2014 to 2017 only. Water column dissolved metals levels remained below water quality standards for both aquatic life and human health protection.
- Fish tissue collection and analysis has been completed for all samples taken (897 total) from 2014 through 2021. Lab results indicate that uptake by fish does not appear to be a concern for metals associated with the coal ash. There were no major differences or significant variations across the

six years of monitoring, except for chromium in the 2017 results. There was a notable uptick in the number of samples in which chromium was detected above the Method Detection Limit of 0.01 parts per million (ppm), but only one concentration in 160 samples was above the Practical Quantification Limit of 0.50 ppm. Even with this result for chromium in 2017, the reported concentrations of all the metal analytes were below DEQ's screening values for levels of concern. However, for fish taken in the region of the river where there is an existing consumption advisory due to legacy mercury contamination not associated with the Duke Energy release, the need for the advisory was confirmed. The 2022 results will be available in fall 2023.

- The uptick in chromium concentration observed during the 2017 monitoring season was not present in 2018, 2019, 2020, or 2021.

Regarding state-level compliance actions, at its June 25, 2015 meeting, the State Water Control Board approved an enforcement Consent Order negotiated with Duke Energy that included a $2.5 million settlement. Under the Order, Duke Energy has agreed to undertake $2.25 million in environmental projects that benefit Virginia localities affected by the spill. The remaining $250,000 was placed in a fund DEQ uses to respond to environmental emergencies.

The monitoring data was used in a basin-wide Natural Resources Damage Assessment and Restoration (NRDAR) process led by the Dan River Natural Resource Trustee Council, a group composed of state and federal natural resources trustees. The Council finalized an early-restoration plan and solicited public input on specific projects that Duke Energy could undertake for environmental improvement and enhancement in the Dan River basin. A report entitled "Restoration Plan Environmental Assessment for the Dan River Coal Ash Spill" was released for public review in April 2019 and was finalized in June 2019. This report provides information on quantifying the injuries to natural resources and resource services (*e.g.*, human recreation) resulting from the ash release, as well as a summary of restoration alternatives that have either been completed or are underway, including:

- Mayo River Park Expansion and Land Protection – land along the Mayo River corridor was conserved and transferred to the State Park Systems in North Carolina (404 acres) and Virginia (214 acres).
- Pigg River Power Dam Removal – this defunct dam has been removed, reopening 75 miles of river to protect federal, state, and local trust resources, including the Roanoke Logperch (a threatened/endangered species), the Trout Heritage Waterway, and a historic dam powerhouse. The dam removal was the last obstacle to completing Franklin County's Pigg River Blueway. Environmental monitoring is ongoing to assess the effect dam removal has on the watershed.
- Abreu-Grogan Park Improvements – completed; added a bathroom, deck, handicap access pier, bank stabilization, and other enhancements to expand river-centered opportunities for public recreation and wildlife viewing.
- Public Boat Ramp (location to be determined, planning in progress) – this will improve recreational access to the Dan River for motorboats, canoes, and kayaks.

The proposed NRDAR Consent Decree was lodged with the federal court on July 19, 2019. The Trustees held two information sessions regarding the Restoration Plan on August 6, 2019 and August 7, 2019 in Danville, Virginia and Eden, North Carolina. The sessions provided an overview of the proposal and projects and were held in conjunction with the public comment period for the proposals. Approximately

15-25 citizens attended each event, with one media outlet at each session. On September 21, 2020, the Trustees filed a Motion to Enter the Consent Decree with the court for final approval.

Regulation and Management of Coal Ash Impoundments in Virginia

In response to the Eden, North Carolina coal ash release into the Dan River, DEQ conducted a review of coal ash impoundment operations along Virginia's waterways. EPA had previously concluded a review of the structural integrity of Virginia's coal ash impoundments in 2013. None of the units were found to have an unsatisfactory rating.

There are currently 17 active coal ash impoundments located at nine facilities. The map below identifies the locations and owner/operators of these units. DEQ shares regulatory oversight with DCR, with DCR having statutory authority over the permitting, operation, maintenance, and decommissioning of impoundment berms under its Dam Safety Program.

Coal Ash Impoundments in Virginia

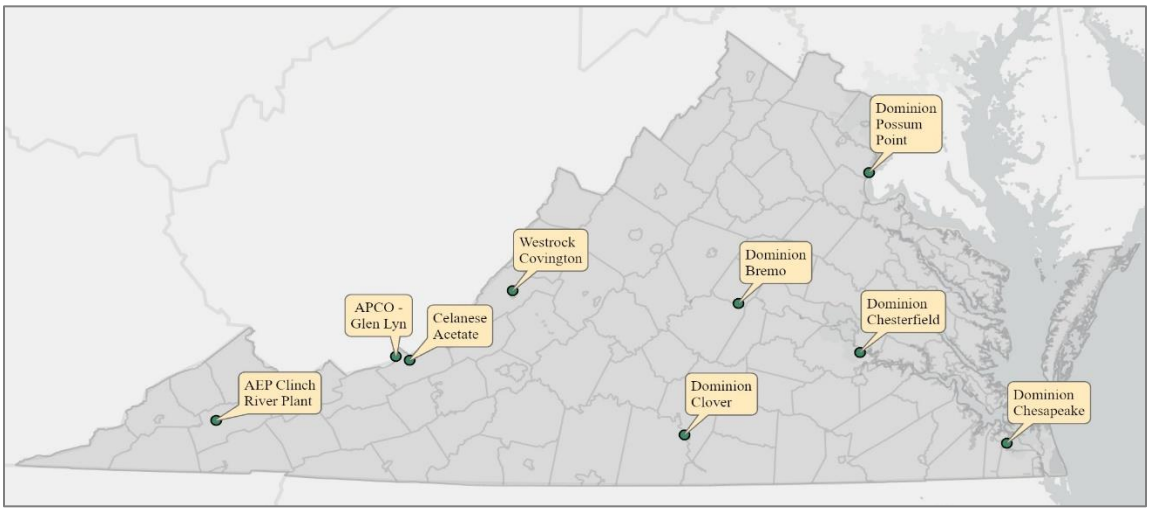

Figure 1.2: Map of Coal Ash Impoundments in Virginia

EPA's final rule on the Disposal of Coal Combustion Residuals from Electric Utilities became effective on April 17, 2015. The federal requirements were adopted into Virginia's Solid Waste Management Regulations effective January 27, 2016. The state and federal rules require closure or retrofit of existing wet ash handling impoundments at six electric generating utilities in Virginia (AEP's Clinch River Plant and Dominion's Clover, Bremo, Possum Point, Chesterfield and Chesapeake Plants) (Figure 1.2). Additionally, the General Assembly passed legislation regarding the closure of coal ash units (including impoundments) in the Chesapeake Bay Watershed. HB 2786 and SB 1355 (2019 Va. Acts Chs. 650 and 651) effective July 1, 2019, require that coal ash impoundments at power stations in the Chesapeake Bay Watershed (Bremo, Chesterfield, Chesapeake, and Possum Point) must be closed by removal and the coal ash either recycled or disposed of in a modern, lined landfill. Additionally, the legislation requires that a minimum of 6.8 million cubic yards must be recycled from at least two of the four sites. The legislation also includes additional requirements related to transportation, public water connection, and continued

efforts to recycle. The General Assembly passed additional legislation regarding the closure of coal ash units (including impoundments) located in Giles and Russell counties. House Bill 443 (2020 Va. Acts Ch. 563), effective July 1, 2020, requires that coal ash units at power stations in the named counties (Clinch and Glen Lyn) must be closed by removal, and the coal ash either recycled or disposed of in a modern, lined landfill, unless all units completed closure prior to January 1, 2019. The legislation also includes additional requirements related to transportation, public water connection, and continued efforts to recycle.

In response to these requirements and to facilitate unit closures, VPDES permits have been issued for the drawdown and dewatering of the AEP Clinch River, Dominion Bremo, Dominion Chesterfield, and Dominion Possum Point facilities. The VPDES permits include monitoring requirements; limitations for whole effluent toxicity and metals associated with coal combustion residuals; and other necessary conditions. Closure of the ash impoundments also includes DEQ oversight through waste permitting requirements including plan reviews, groundwater and surface water monitoring, post-closure care requirements, and other necessary conditions.

Impoundments at the AEP Clinch River facility were dewatered and closed in place in accordance with the EPA final rule. The Bremo and Possum Point facilities have dewatered and consolidated ash from smaller onsite impoundment units to a single remaining impoundment at each site. Future planning and permitting is in process to address dewatering and ash removal from the remaining impoundments into lined landfills. The wastewater treatment system for the Chesterfield facility has been constructed and ash removal activities have commenced. Ash is either being sent offsite for beneficial use or disposed of in the onsite landfill. Additional planning and permitting are still needed to address the closure of coal ash units at the Chesapeake and Glen Lyn facilities. Solid waste staff are in contact with facilities impacted by these federal regulations and legislative actions and working to issue permits covering these required actions. Other ash impoundments have either received solid waste permits related to closure (Celanese Acetate) or are in the process of evaluating final closure.

Harmful Algal Blooms

Harmful algal blooms (HABs) produce toxins that may cause skin, eye, and digestive tract irritation, kidney and liver damage, and neurotoxic effects. DEQ and the Virginia Department of Health (VDH) serve as lead partners on the HAB task force, along with Old Dominion University, Virginia Institute of Marine Science, and members from other local, state, and federal agencies, and universities. The HAB task force responds to public complaints, conducts scientific investigations on potential HAB events, and provides information to the public on HAB events and their associated health risks. These investigations inform VDH health advisories and DEQ water quality assessments. DEQ serves the HAB task force primarily by conducting field investigations of potential HABs in freshwater systems. The aim of these investigations is to determine if cyanobacteria cell counts or toxin concentrations in water samples exceed VDH safe swimming thresholds, which may trigger VDH swimming advisories and DEQ assessments that a waterbody is impaired for the recreational designated use. DEQ also serves in an advisory role to task force partners on technical issues and policies related to HABs. As resources and staff availability allow, DEQ also responds to reports in marine waters and may provide limited support for drinking water authorities.

For complete information on freshwater thresholds and advisories, see VDH's Guidance for Cyanobacteria Bloom Recreational Advisory Management.

For information on DEQ water quality assessments, see the DEQ's Water Quality Assessment Guidance Manual.

In DEQ's 2022 303(d)/305(b) Integrated Water Quality Assessment Report to EPA (2022 IR), the agency began using information on VDH HAB advisories to assess Virginia waters against the recreational designated use. For the calendar years 2019 and 2020 (the last two years of the six-year 2022 IR assessment cycle), seven waterbodies for which VDH HAB advisories persisted for 30 days or longer were assessed as impaired, and not meeting the recreational designated use due to HABs. All impairments were due to cyanobacteria blooms in the following fresh waterbodies: Lake Anna (Spotsylvania, Louisa, and Orange Counties), Mint Springs Lake (Albemarle County), Aquia Creek (Stafford County), Wilcox Lake (City of Petersburg), Woodstock Pond (James City County), Prince Edward Lake (Prince Edward County), and an unnamed tributary of the Chickahominy River (Henrico County).

The VDH Division of Shellfish Safety and other HAB task force partners also conduct routine investigations for marine HABs and associated toxins. These investigations are primarily conducted to determine if health criteria associated with algae and algal toxins in shellfish tissue are exceeded. Although toxin-producing algae do occur in Virginia's marine waters, to date there have been no exceedances of the VDH shellfish thresholds, no human illnesses attributed to HABs in shellfish, and no recreational advisories due to HABs in marine waters.

In 2021, DEQ led an effort in collaboration with VDH and the Virginia Department of Agriculture and Consumer Services, to develop a report to the Virginia General Assembly entitled: "Harmful Algal Blooms in Virginia". For more information on the programs described above, and more detailed information on HABs in the commonwealth, please reference the final collaborative report and the supplemental information listed below.

In 2022, the Virginia General Assembly allocated $3.5 million to the Commonwealth's 2022-2024 biennium budget to investigate potentially harmful algal blooms observed in Lake Anna and the Shenandoah River (see: 2022 Special Session I Virginia Acts Of Assembly, Chapter 2, Item 374, B.1, page 429). The agency has partnered with VDH, the United States Geologic Survey (USGS), and the Interstate Commission on the Potomac River Basin (ICPRB) on the studies, and contracts were issued in spring 2023. Project study plans and updates are available on the DEQ's Harmful Algal Blooms webpage.

No Discharge Zone (NDZ) designations

2023 Progress Report

Federal law prohibits the discharge of untreated sewage from vessels within all navigable waters. A "No Discharge Zone" (NDZ) is an area in which both treated and untreated sewage discharges from vessels are prohibited. In 2021, EPA provided an affirmative determination for the establishment of an NDZ for Sarah Creek and Perrin River in Gloucester County, Virginia. The NDZs were finalized in Virginia regulations in June 2021. Implementation efforts in the form of signage and outreach continues in 2023.

DEQ is in the process of completing an NDZ application for many of the tidal waters in the four counties of Virginia's Northern Neck: Richmond, Lancaster, Northumberland, and Westmoreland counties. The tidal waters included are tributaries of the Rappahannock River, Potomac River, or Chesapeake Bay.

In 2022, DEQ completed an investigation of options for additional NDZs in the Chesapeake Bay's tidal tributaries as a part of the strategy in Virginia's Phase III WIP, which provides that "[t]he Commonwealth, in consultation with stakeholders, will consider options available under the Clean Water Act to apply to the Administrator of the EPA for a No Discharge Zone (NDZ) for all or portions of the Chesapeake Bay mainstem and its tributaries." As a result of this investigation, DEQ is developing a strategy for additional NDZ development in the Chesapeake Bay's smaller and secondary tidal tributaries. The development of the strategy will include the collection and analysis of a multitude of datasets and performing stakeholder outreach.

Onsite septic systems

2023 Progress Report

The VDH, through its Office of Environmental Health Services and 35 local health districts, implements and oversees the state onsite wastewater program to protect public health and groundwater quality. Across the state, there are approximately 1.1 million onsite sewage systems, including approximately 32,000 alternative onsite sewage systems (AOSS). Roughly 550,000 of the total onsite sewage systems in Virginia are in the Chesapeake Bay watershed.

House Bill 769 (2022 Va. Acts Ch. 486), which transitions oversight authority of onsite sewage system pump-outs within certain localities, was passed by the General Assembly during the 2022 session and signed by Governor Youngkin in April 2022. Effective July 1, 2023, VDH now manages and enforces onsite sewage system pump-out compliance for Accomack, Essex, Gloucester, King and Queen, King William, Lancaster, Mathews, Middlesex, Northampton, Northumberland, Richmond, and Westmoreland counties and the incorporated towns within those counties. Licensed operators conducting pump-outs in these localities are required to provide a report on these system visits using the updated online maintenance portal developed by VDH. As of August 2, 2023, VDH has received 369 conventional maintenance reports through the conventional maintenance portal launched July 1, 2023.

In accordance with § 62.1-223.3, of the *Code of Virginia*, VDH partnered with DEQ to estimate the amount of wastewater infrastructure funding that is (i) necessary to implement the policy of the Commonwealth articulated in § 62.1-223.1 and (ii) not eligible to be covered by grant funding pursuant to the Virginia Water Quality Improvement Act of 1997 (§ 10.1-2117 et seq.). VDH used historical permitting data and available information on the cost of onsite sewage system repairs to estimate the total need for onsite sewage system funding over the next 20 years. The assessment includes a breakdown of funding needs by locality. This assessment will assist VDH in seeking additional grant and loan funding to repair failing onsite sewage systems and ensure proper maintenance of existing systems.

VDH received the Strengthening Environmental Health Capacity grant from the United States Centers for Disease Control and Prevention's Agency for Toxic Substances and Disease Registry (CDC-ATSDR) in order to: 1) use environmental health (EH) data and information for data-driven decision making, (2)

identify and address EH hazards, and (3) assess the effectiveness and impact of EH services and interventions. One component of this grant involved the creation of a GIS mapping tool to locate private and community wells that are vulnerable to EH hazards like pollutants or climate change hazards like flooding and sea level rise. This tool is available statewide and includes well location and onsite sewage disposal system location information from permit records in VDH's Environmental Health Database and records received from some localities in an effort to inventory all septic and well systems in the state. It has been shared with local health district staff, Planning District Commissions (PDCs), and other partners to identify vulnerable wells and plan for safe and equitable future drinking water supplies. These septic systems can also be assessed to see if they are vulnerable to EH or climate change hazards. Other components of the Environmental Health Capacity grant include improving the inventory for private wells and onsite sewage disposal systems, providing support to the septic tank pump-out programs, and improving data collection and use for the Division of Onsite Water and Wastewater Programs.

In 2018, VDH was awarded $300,000 from the Virginia Environmental Endowment (VEE), with an additional $200,000 from the Smithfield Foundation, the philanthropic arm of Smithfield Foods, Inc., for a total of $500,000, to assist in the repair of failing onsite sewage systems. These funds are targeted to repair failing septic systems and remediate illicit sewage discharges (*i.e.*, straight pipes) from homes in portions of James City, Isle of Wight, and Surry counties within the James River watershed. VDH has provided reimbursement for 22 projects thus far totaling $348,709 for the installation of nitrogen reducing repair systems and has obligated over $462,000 in total funding to date. The COVID-19 pandemic and related impacts to supply chains has created a delay in the installation of systems currently obligated funding under the program.

In August 2021, the General Assembly also approved $11.5 million in funding from the American Rescue Plan Act (ARPA) for improvements to private well and septic systems for homeowners at or below 200% of the federal poverty guidelines. VDH established the Septic and Well Assistance Program (SWAP) to distribute these funds to approved applicants. VDH began accepting applications from homeowners in need of private well and septic repairs in January 2022, and VDH had to close the application process by September 2, 2022 due to the overwhelming demand. VDH received 270 direct project applications for 344 projects (some owners apply for both well and septic assistance) totaling an estimated $7,204,100. VDH has also provided nearly $1,800,000 in funding to local government partners and non-profits to implement the SWAP program in their area. VDH has completed the installation of 136 repairs thus far.

VDH has continued to maintain and modify the online Operations and Maintenance (O&M) portal for uploading AOSS maintenance reports. VDH has also developed an Application Programming Interface (API), allowing third party vendors with databases used by septic system operators and other professionals to interface with and upload maintenance reports to the maintenance portal. As of August 2, 2023, local health district staff have reviewed 11,108 of the 17,744 completed O&M reports received during the 2023 fiscal year.

VDH is in the process of filling gaps in its inventory of septic systems using real estate data that includes septic information. This data is collected from local county governments and compared with the existing inventory of septic systems to identify any new septic systems and confirm the accuracy of records found in both datasets. As of July 2023, VDH has collected and analyzed real estate data from 85 counties in Virginia and identified over 1,200,000 new potential septic system locations not in the septic inventory.

The real estate data consists only of the location of a septic system without any information on the system itself, but with more funding VDH can collect this information with fieldwork, surveys, and other techniques and confirm the validity of the real estate data. Additional funding would also allow VDH to upload these real estate records into the existing septic system database maintained by VDH. Collecting these datasets is still ongoing, but there are some limitations, as not all county governments collect septic information when performing their real estate assessments. In addition, not all land parcels have data in the real estate datasets, leaving some addresses with unknown septic/sewer information remaining. To fill in the remaining gaps in the inventory, VDH is investigating machine learning models that can predict if a property is likely to have a septic system based on different variables.

DEQ grant funding for repairing/replacing failing on-site septic systems and straight pipes

2023 Progress Report[1]

DEQ continues to work with organizations and localities across Virginia to fund projects that correct failing septic systems or straight pipes. Most of these projects are part of larger watershed restoration and implementation efforts in TMDL implementation areas. During FY 2022, DEQ provided $442,930 from state and federal funding and landowner contributions to address failing or failed septic systems (Table 1.1). Please note that the information covered here does not include septic activity associated with the Chesapeake Bay Preservation Act.

[1] Due to the availability of BMP data at the time of the report deadline, the NPS program is not able to provide a FY 2023 programmatic report. The full BMP data for the reporting fiscal year is not received by the report deadline. Beginning in FY 2020, the BMP data included in this report section is one fiscal year behind the other report content."

Table 1.1: Residential Septic Program – Grant Funded BMPs (7/1/2021 – 6/30/2022)

BMP Practice Code	Name of BMP	Number of BMPs Installed	Pounds of Nitrogen Reduced	CFU* of Bacteria Reduced	Total Amount of Cost-share Provided	Total Cost of Practice
RB-1	Septic Tank Pump-out	189	529	9.41E+11	$36,065	$79,739
RB-2	Connection to Public Sewer	6	185	2.99E+11	$17,328	$57,185
RB-2P	Connection to Public Sewer with Pump	1	31	4.98E+10	$14,400	$19,735
RB-3	Septic Tank System Repair	12	277	4.48E+11	$29,893	$53,685
RB-3M	Conventional Onsite Sewage System Full Inspection and Maintenance	31	716	1.16E+12	$27,154	$68,490
RB-4	Septic Tank System Replacement	26	601	9.70E+11	$123,669	$231,594
RB-4P	Septic Tank System Installation/Replacement with Pump	7	162	2.61E+11	$58,865	$88,690
RB-5	Installation of Alternative Waste Treatment System	8	185	2.98E+11	$135,547	$246,510
Total	**--**	**280**	**2686**	**4.42E+12**	**$442,920**	**$845,629**

*CFU = colony forming units

The grant funds were utilized in seven different river basins throughout Virginia. Generally, SWCDs facilitate septic repair and replacements along with overall TMDL implementation; however, in a few cases, not-for-profits, PDCs, and localities assisted with the projects.

Adoption of cost-effective agricultural best management practices

2023 Progress Report

Agricultural Cost-Share Programs

DCR administers funds for conservation programs that SWCDs deliver to the agricultural community. Some of these programs include the Virginia Agricultural Best Management Practices Cost-Share, Agricultural BMP Tax Credit, and Conservation Reserve Enhancement Programs. Details on cost-share allocations to SWCDs are summarized in Chapter 5 of this report.

Through funding provided by the General Assembly, Virginia developed and is working to expand a computerized BMP tracking program, the Conservation Application Suite, to record the implementation and financial data associated with all implemented BMPs. Both the Virginia Department of Agriculture and Consumer Services implemented Agricultural Stewardship Act (ASA) and DEQ's TMDL programs utilize modules of the BMP tracking program to administer these programs. During the last fiscal year, DCR continued to enhance this application. The Conservation Application Suite has integrated modules that now have the added capacity to interface with those state agencies that protect cultural and historic resources as well as threatened and endangered species. DCR received funding in FY 2023 to develop a new version of the Conservation Application Suite that will take advantage of technological advances that have taken place since the original version of the application was launched in 2009. The requirements for

the new version of the application are planned to be released to allow bidding from qualified contractors in fall 2023.

Agricultural Stewardship Act Program

The ASA program is a complaint-based program by which the Commissioner of Agriculture and Consumer Services receives information alleging water pollution from agricultural activities. The Commissioner receives complaints alleging that a specific agricultural activity is causing or will cause water pollution. If a complaint meets the criteria for investigation, the Commissioner (through the ASA program staff) contacts the appropriate SWCD about investigating the alleged water pollution problem. If the SWCD declines, the ASA program staff conducts the investigation on behalf of the Commissioner. In most cases, a joint investigation involving local SWCD staff and ASA program staff is performed.

The purpose of the investigation is to determine whether the agricultural activity is causing or will cause water pollution. If no causal link is found, the Commissioner decides that the complaint is unfounded. If the Commissioner determines that the activity is the cause of pollution, the farmer is given up to 60 days to develop an agricultural stewardship plan to correct the identified water pollution problems. The local SWCD typically reviews the plan, and the Commissioner will approve the plan when it is determined that it meets the necessary requirements to solve the water pollution problem.

The ASA provides the farmer up to six months from the date of the Commissioner's determination that a complaint is founded to start implementing the agricultural stewardship plan and up to 18 months from that date to complete plan implementation. The timing allows the farmer to take advantage of suitable weather conditions for outside work or required construction. If a farmer fails to submit a plan for approval or implement a plan within the given timeline, the Commissioner takes enforcement action.

The ASA program received numerous inquiries regarding possible agricultural pollution during the program year of April 1, 2022, through March 31, 2023. Forty-six of these cases became official complaints. The official complaints fell into 14 categories according to the type of agricultural activity: beef (15); equine (7); land conversion (7); dairy (3); swine (3); beef, dairy (2); cropland (2); orchard (1); cropland, other (1); beef, dairy, goats, poultry, sheep (1); beef, equine (1); poultry (1); equine, goats (1); and other (1).

The ASA addresses water pollution problems caused by nutrients, sediment, and toxins entering state waters from agricultural activities. The ASA program received complaints based on the following five pollution categories during the program year of April 1, 2022, through March 31, 2023: sediment (12); nutrients, sediment (11); bacteria, nutrients (9); bacteria, nutrients, sediment (8); nutrients (2); bacteria (1); bacteria, toxins (1); bacteria, nutrients, toxins (1); and nutrients, toxins (1).

During the program year, 11 (24%) of the 46 official complaints were determined to be founded and required agricultural stewardship plans to address water pollution problems. In each founded case, there was sufficient evidence to support the allegations that the agricultural activities were causing or would cause water pollution.

18 (39%) of the 46 official complaints received during the program year were determined to be unfounded because there was either insufficient evidence or no evidence of water pollution. In some

instances, farmers involved in the unfounded complaints voluntarily incorporated BMPs into their operations to prevent more complaints or to prevent potential problems from becoming founded complaints.

17 (37%) of the 46 official complaints received during the program year were dismissed for various reasons. Many of the complaints that were dismissed were situations where a water quality concern existed but was remedied prior to the completion of the investigation process. Others were cases in which the ASA program had no jurisdiction in the matter, were withdrawn by the complainant, or were dismissed because insufficient information was provided by the complainant.

With the assistance of DCR, the ASA program can use a geographic information system (GIS) to track and report certain BMPs implemented to address water pollution on founded complaint sites. This GIS tracking module will assist ASA staff in the verification process and contribute to the goals outlined in the Chesapeake Bay Phase III WIP. The ASA program has prioritized visiting past complaint sites to measure, document, and verify the livestock exclusion fencing that was implemented as a result of stewardship plan implementation prior to the ASA program having the GIS capability to track BMPs. During the 2022-2023 program year, the ASA program staff recorded a total of 8,504 feet of livestock exclusion fencing and 23 acres of stream bank buffer implemented from current and past complaint sites. Within the Chesapeake Bay watershed, 7,124 linear feet of exclusion fencing, and 20.5 acres of buffer were recorded. These figures include only the livestock exclusion fencing and buffer acres installed without cost-sharing assistance involving past ASA complaints.

Department of Forestry Implementation of Silvicultural Regulation and Strategic Water Quality and Watershed Protection Initiatives

2023 Progress Report

The mission of the Virginia Department of Forestry (DOF) is protecting and managing healthy, sustainable resources for all Virginians. Managing the state forests and working with private forest owners and communities to assure that the forests of the Commonwealth are major contributors to water quality and healthy watersheds aligns with DOF's core mission, with its current strategic plan, and with its Forest Action Plan. Forests provide superior watershed benefits over nearly every other land use. Silvicultural water quality enforcement, fire suppression, riparian buffers, conserving forested headwaters, providing for adequate water supplies to downstream communities, land conservation, restoring Longleaf and Shortleaf pine and American chestnut, wildlife habitat management, prescribed fire, urban and community forestry, and conservation education are key DOF programs.

Silvicultural Water Quality Law Enforcement Actions

In July 1993, the General Assembly of Virginia – with the support of the forest industry – enacted the Virginia Silvicultural Water Quality Law, § 10-1-1181.1 through § 10.1-1181.7 of the *Code of Virginia*. The law authorizes the State Forester to assess civil penalties to owners and operators who fail to protect water quality in their forestry operations. Virginia is the only state in the southeastern United States that grants enforcement authority under such a law to a state's forestry agency. In FY 2023, the DOF was involved in 106 water quality actions initiated under the Silvicultural Law. Of these actions, two resulted

in a Special Order being issued during the period for violations of the law. In addition, there were 11 failure to notify violations by timber harvesting contractors during the fiscal year.

Forestry Best Management Practices (BMPs) for Water Quality

DOF has been a leader in the conservation of forested watersheds since the early 1970s when it published its first set of Forestry Best Management Practices for Water Quality. The fifth and current edition of those guidelines came out in 2011. A statewide audit system has been in place since 1993 to track trends in BMP implementation and effectiveness. The entire BMP Implementation Monitoring effort has also been automated to be compatible with DOF's IFRIS (Integrated Forest Resource Information System) enterprise database system. The information compiled serves as the basis for DOF reporting under Virginia's WIP. In calendar year 2022, 97.7 percent of the timber harvest acres in Virginia conducted within the boundaries of the Chesapeake Bay watershed were under BMPs and 96.8% of the timber harvest acres statewide were under BMPs. The audit also showed that only three (1.25%) of the sites visited had any sign of active sedimentation present after the closeout of the harvesting operation. The BMP goal for WIP III is to achieve a 95% implementation rate by 2025.

Harvest Inspection Program

DOF's harvest inspection program began in the mid-1980s, and provides DOF an opportunity to educate forestland owners and operators about BMPs and water quality protection techniques. In FY 2023, DOF field personnel conducted 6,672 inspections on 1,510 timber harvest sites within the Chesapeake Bay watershed on 67,898 acres (Figure 1.3).

The backbone for the Department's water quality effort is the harvest inspection program, which began in the mid-1980s. This program provides DOF one-on-one contact with harvest operators and a welcomed opportunity to educate them on BMPs and the latest water quality protection techniques.

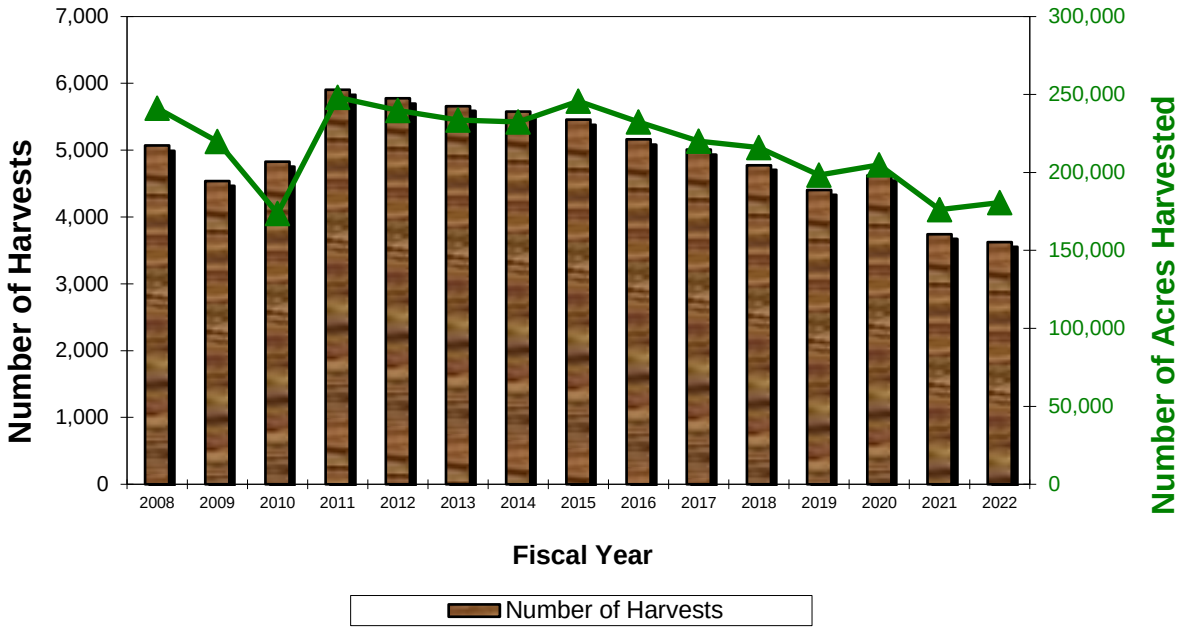

Figure 1.3: Number of harvests inspected and total number of acres harvested: 2008 through 2022

Cost-Share Assistance

DOF offers cost-share assistance to timber harvest operators through a program funded by the WQIF. This program shares the cost of the installation of forestry BMPs on timber harvest sites by harvest contractors. Eighty-two stream protection projects were funded using FY 2023 funds that are using portable bridges and mats to provide stream crossing protection across the site during and after harvesting.

DOF also offers tree-planting grants using the Virginia Trees for Clean Water (VTCW) Program promoted through an RFP process. The 2022 cycle allocated $1,045,977 to 63 projects utilizing funds from the WQIF. Most of the projects completed are in the Chesapeake Bay watershed with a smaller percentage of planting projects completed outside the watershed. Technical assistance and application review was provided by DOF International Society of Arboriculture (ISA) Certified Arborist staff and community engagement is required as part of the review process. Projects funded include establishing riparian forest buffers, school and park plantings, re-greening efforts to combat urban heat islands, and stormwater retrofits that incorporate the use of trees. Some changes were made to the VTCW Program for FY 2023 including moving all DOF grant opportunities online. This was a significant administrative lift, but the goal was to shorten processing time and streamline document collection. DOF also changed its deadlines to rolling deadlines to allow potential applicants and DOF staff more time to submit and review projects. DOF has assisted in planting more than 142,000 urban trees in Virginia communities since the program's inception. These tree-planting activities are being tracked using DOF's "My Trees Count" application.

James River Buffer Program

The James River Buffer Program was established in December 2018 and is funded through the Virginia Environmental Endowment's (VEE) James River Water Quality Improvement Program. The Commonwealth specifically targeted the James River to meet Virginia's 2025 WIP III goals. To meet these goals, riparian forest buffers need to be installed in the James River basin in the coming years. The James River Buffer Program will help meet goals through forest buffer establishment along streams and associated land and through BMPs to mitigate concentrated flow bypassing those buffers. The Buffer Program is designed to work in tandem with existing programs and seeks to target currently unengaged landowners that have not participated or who do not qualify for existing programs. The Buffer Program provides essential BMPs and more flexibility to meet the targets set by the Phase III WIP.

Two partners, the DOF and the James River Association, carry out the James River Buffer Program within the Middle James River Watershed. In spring of 2021, a new partner, the Chesapeake Bay Foundation, joined as a partner to serve landowners in the Upper James River watershed.

In FY 2023, DOF has carried out 16 buffer projects, adding 60.2 acres of riparian buffers within the Middle James River watershed. Table 1.2 below shows the associated pollutants and sediment reductions linked to these established buffer acres.

Table 1.2: Riparian buffer accomplishments by the Virginia Department of Forestry's James River Buffer Program for FY 2023

Total Buffer Acres	Approx. no. of trees planted	lbs. of N reduced	lbs. of P reduced	lbs. of TSS reduced
60.2	24,842	3505.2	999.2	1,109,441.9

Environmental Impact Reviews

In its role as a reviewing agency for DEQ's and the Virginia Department of Transportation's (VDOT) environmental impact review processes, DOF evaluates proposed projects to identify the forest resources that may be impacted; provides assessments; and provides recommendations and comments pertaining to forest health, conservation, management, and mitigation needs aimed at conserving Virginia's forest resources in keeping with state executive policy and/or as part of the federal consistency determination/certification process. These reviews have resulted in the modification of project footprints to avoid forest loss and to commitments by project sponsors to follow DOF Forestry BMPs for Water Quality in numerous cases. DEQ has also included special forestland mitigation guidance to project sponsors that was developed by DOF in its environmental impact review instructions.

DOF has also been partnering with the Commonwealth's other natural resources agencies to look beyond the direct footprints of proposed long, linear infrastructure projects to measure the indirect impacts of forest fragmentation. DOF was instrumental in creating the Virginia Forest Conservation Partnership (VFCP). This partnership was forged to better leverage agency and organization missions, forest conservation and forest mitigation initiatives, and available conservation financing. The group most recently provided analysis to state executive offices on the potential impact on Virginia's forest resources of the construction of multiple proposed projects to assist in refining potential mitigation options. DOF also collaborated with VDOT in identifying potential projects on public lands in the Shenandoah/

Potomac River watershed where VDOT could undertake conservation projects to offset the TMDL impact of proposed road project construction. In the first quarter of 2021, DOF also coordinated a series of four meetings to discuss a desire to create a path for renewable energy projects (solar) that would minimize the impacts on land use and forest conversion of the Commonwealth's natural resources. The group was comprised of Fellows from the Virginia Natural Resources Leadership Institute (VNRLI) and was a cross representation of people from non-profits, non-governmental organizations, and state agencies. The group, titled the "Policy Action Work Group" or PAWG, had a shared goal to ensure the balanced and equitable development of solar energy to meet Virginia's clean energy goals while incorporating environmental justice, protecting Virginia's natural resources, addressing land ownership concerns, and supporting local economic benefits. The University of Virginia's Institute for Engagement and Negotiation facilitated these meetings and activities.

Logger Education

DOF was involved in 14 logger education programs in FY 2023 educating 504 timber harvesting professionals through the Virginia SHARP Logger Program in cooperation with Virginia Tech and the Sustainable Forestry Initiative (SFI®) State Implementation Committee. This program has enabled DOF to offer 385 programs related to water quality protection with a cumulative attendance of 11,647 at these classes. Figure 1.4 exhibits historical levels of participation in DOF logger education programs since 2009.

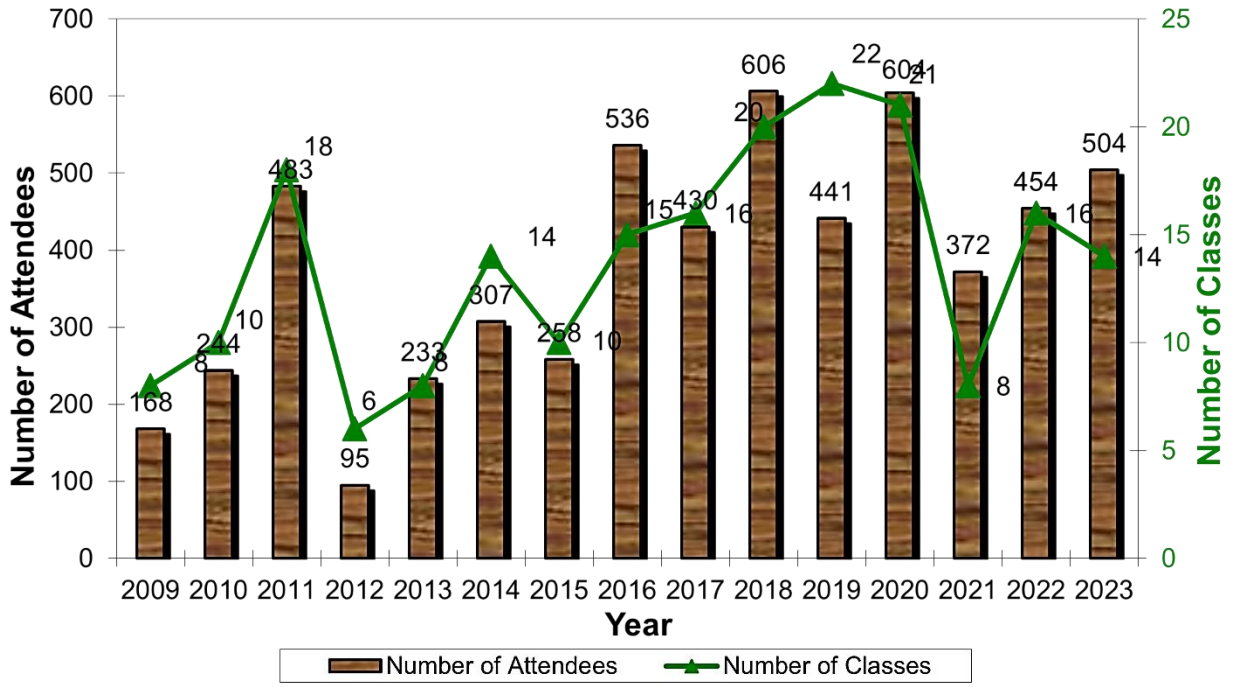

Figure 1.4: DOF logger education 2009 – 2023

Riparian Forest Buffers Technical Assistance

Riparian forest buffers (RFB) provide particular and critical protection for Virginia's waters. They provide shade that cools water, capture sediment, store and utilize nutrients, mitigate floodwaters, and provide essential food and habitat for both aquatic and terrestrial life. Riparian forest buffers serve as one of the most effective and cost-effective water quality improvement practices. Because of this, state and federal agencies, landowners, and contractors work together to establish and expand buffers for multiple values. DOF has technical assistance responsibility for planning, coordination, and certification of riparian forest buffer establishment in federal, state, and privately funded programs. DOF foresters meet with landowners, assess sites, develop site-specific recommendations, and coordinate with contractors and owners to establish buffers through tree planting or natural means.

The Commonwealth still has significant progress to make to reach its WIP III buffer establishment goals. To support this effort, DOF's Watershed Program, established in 2021, implements several strategies to increase buffer establishment within the Bay and across the Commonwealth.

These include:

- Setting specific, numeric, and realistic goals for field staff
- Tracking quarterly progress towards meeting those goals and offering support and technical assistance as needed
- Offering new buffer training opportunities to increase staff's ability to plan, plant, and maintain buffers
- Exploring new funding opportunities to support buffer establishment and maintenance
- Creating a buffer cost-share portal and internal flow-chart to better match landowners with a best-fit funding program
- Improving internal recording and reporting protocols
- Coordinating with other governmental agencies and nonprofit partners to improve outreach and reporting efforts
- Continuing to actively participate in the Virginia Bay Interagency Team (BIT), State Lands WIP, Virginia Association of Soil and Water Conservation Districts (VASWCD) meetings, the James River Consortium, the Friends of the Rappahannock's Roundtable, among many other governmental and non-profit led forums.

In FY 2023, DOF recorded riparian buffer establishment on 183 sites for a total of 471.1 acres within the Chesapeake Bay Watershed.

Riparian Forest Buffer Tax Credits

For Tax Year 2022, DOF issued Riparian Forest Buffer tax credits on 63 applications covering 1,222 acres of retained forested buffers. The tax benefit to forest landowners was $554,536.08 on timber valued at $2,654,919.59.

Easement Program

DOF administers a conservation easement program to assure a sustainable forest resource. Because larger blocks of forest potentially provide the greatest range of functions and values, DOF easements focus on keeping the forest land base intact, unfragmented, keeping the forest in larger, more manageable and functional acreages. DOF holds 205 conservation easements in 63 counties and the City of Suffolk that permanently protect over 94,000 acres of vital forest and farmland. Of these, 121 easements consisting of 33,959 acres lie within the Chesapeake Bay watershed.

In FY 2023, DOF permanently protected 4,108 acres of open space and nearly 19 miles of water courses through six conservation easements. One of the easements, comprising 370 acres and protecting approximately 2.4 miles of water courses, is within the Chesapeake Bay watershed.

Forest Management Planning

DOF has a strong role in forest management planning for Virginia landowners. Forest management plans are a foundational element in meeting the needs of landowners and meeting the broader resource objectives of the Commonwealth. Because forests are long-term by nature, proper planning and implementation of plans will help meet a variety of goals, including water quality. Specifically, DOF professional foresters prepare multi-resource forest management plans that address forests, timber, wildlife habitat, water quality, soils, and recreation. One of the flagship programs for these plans is the Forest Stewardship Program, a cooperative effort with the United States Forest Service (USFS) Cooperative Forestry section. It is delivered by DOF to non-industrial private landowners, who own the majority of Virginia's forests. Private consulting foresters prepare similar, equivalent plans, like the American Tree Farm Program certification, or plans assisted by the United States Department of Agriculture (USDA) Natural Resources Conservation Service. All these multi-resource management plans address forests and water quality as a required element. Additionally, DOF and private foresters prepare forest stand-level practice plans for more direct landowner needs for specific forest management projects, and land use plans that meet county and state requirements for the use-value taxation program. DOF field staff also prepare pre-harvest plans to assist loggers in planning and strategies for specific areas to be harvested. These all aid in comprehensive resource and watershed management. In FY 2023 DOF recorded 2,245 plans for 104,642 acres in the Chesapeake Bay watershed.

Forest management plans lead to implementation of forest management practices. These practices are the very essence of forestry and natural resource management in Virginia. They are action-based, designed to meet landowner and resource needs and include harvesting, tree planting, preparing sites, improving forests, controlling erosion and sedimentation, establishing new forests, controlling invasive species, and helping to heal streams and watersheds. DOF field staff provide technical assistance and administer financial assistance programs in implementing some of these practices. In FY 2023, DOF recorded 2,031

forest management projects on approximately 67,414 acres in the Chesapeake Bay watershed. More specifically, DOF reported tree planting on 812 sites on 29,277 acres in the Chesapeake Bay watershed. Of this, nearly 1,190 acres were established on previously non-forested open land.

DOF manages 26 State Forests that cover 74,968 acres. These operational, working forests are managed for multiple uses including demonstration, research, watershed protection, timber, wildlife, and recreation. They have recently been certified by SFI® and the American Tree Farm System standards, which includes rigorous water quality and BMP Standards. Additionally, DOF operates two tree seedling nurseries, offering over 40 species of trees and shrubs that meet Virginia's needs for reforestation, afforestation, water quality, wildlife, and aesthetics. Each year, the nurseries produce approximately 30 million seedlings.

In the FY 2023 Virginia State Budget, DOF received $2,085,860 in general funds to significantly increase hardwood seedling production. When this project is completed, it is anticipated DOF will be able to produce an additional 6 to 9 million seedlings per year.

Urban Tree Canopy Program

The Virginia Urban Tree Canopy program assists communities by providing both cost-share funding and technical assistance to plant and maintain more trees on both public and private land. These trees provide green stormwater infrastructure benefits, thereby improving water quality across Virginia and specifically, in the Chesapeake Bay. The USFS Urban and Community Forestry Program (U&CF) also financially supports and provides technical assistance for Urban Tree Canopy (UTC) analyses, tree inventories, and urban forest management plans to give communities better data and encourage better management of existing canopy. With the newly added Tree Planting – Canopy BMPs for the WIP III, a tracking platform for both communities and private citizens has been developed to make it easier to report these plantings using ESRI® software. This tracking application, known as "My Trees Count", is serving a valuable function of tracking planting projects on multiple scales from individual trees to partner group multi-acre projects. Currently, My Trees Count is being upgraded with hopes to launch before the end of the calendar year. The U&CF Program is also supporting citizen-science-based urban heat island studies across the state. DOF has supported studies in 11 communities across the Commonwealth in 2020 and 2021. In 2022 and 2023, DOF worked with 11 colleges and universities to install 2,764 trees in urban heat islands identified as part of the study. The projects involved DOF staff, professors, staff from the Virginia Foundation of Independent Colleges, and more than 100 students.

Healthy Watershed Forest/TMDL Project

Since 2015, DOF has partnered with other Chesapeake Bay jurisdictions and internally within Virginia with the Rappahannock River Basin Commission and other partners in leading a landscape-scale, Chesapeake Bay-wide initiative called the Healthy Watershed Forest/TMDL project. In Phase I of the project, Virginia successfully quantified that the value of retaining more forestland to meet Chesapeake Bay TMDL requirements could offset TMDL management investments and, thereby, save up to $125 million in the pilot study area alone. In Phase II, Virginia partnered with Pennsylvania, which peer-reviewed and validated Virginia's Phase I quantification methodology by applying it to a Pennsylvania watershed study area. In Virginia, the project team engaged in more than 60 discussion and discovery

sessions in the field over a year-long period to determine what is needed from the perspective of local leaders and landowners to prioritize forestland retention as a land-use planning option to meet Chesapeake Bay watershed goals. The findings of Phases I and II of the project contributed significantly to the December 2017 decision of the Chesapeake Bay Program (CBP) Management Board to credit forestland retention as a BMP in the 6.0 version of the TMDL model. In addition, the Virginia General Assembly in its 2018 session legislated some of the changes recommended by the localities in Phase II aimed at prioritizing forestland retention to meet water quality objectives.

Phase III of the project began in the spring of 2018 and continued for two years. Funding is provided by the CBP through the Chesapeake Bay Trust and the U.S. Endowment for Forests and Communities. Phase III has three tasks: (1) work with three primary Virginia counties (Fauquier, Orange, and Essex) to revise policies and ordinances to incentivize retention of forest and agricultural lands; (2) create a working financial model to incentivize private sector investment ($50 million+) in land conservation on a landscape scale and on a long-term sustainable basis: and (3) coordinate with other CBP workgroups to integrate findings with those of other initiatives to institutionalize results across all Bay jurisdictions.

Carbon values have been selected as a water quality proxy to provide income streams and incentives for landowners and rural localities. Carbon offers the potential for aggregating interested landowner holdings so they can be offered at scale and with the market convenience required to attract large-scale private capital investments. Further, the project is focusing on Virginia's Economic Development Authorities (EDAs) as an aggregating mechanism. Adapting the EDA structure to carbon as a proxy for water quality enables a role for counties, combined by choice, into a regional (watershed basin) entity to exercise the authority granted within the EDA. The General Assembly passed legislation signed by the Governor following the 2019 legislative session to enable EDAs to serve such an aggregating role.

The findings and recommendations of the Healthy Watersheds/Forest project have been incorporated into Virginia's WIP III strategies. Outcomes in 2021 are the creation and inclusion of the legal framework to complete the aggregation of landowners within the EDA, as well as the addition of Fauquier County to the process. Additional changes to the *Code of Virginia* were identified and deemed necessary to remove barriers to implementation of the program. In the 2021 General Assembly session, SB 1343 was introduced and passed. The bill, titled "The Virginia Freedom of Information Act; proprietary records and trade secrets; carbon sequestration agreements" excludes from the mandatory disclosure provisions of the Virginia Freedom of Information Act proprietary information, voluntarily provided by a private business under a promise of confidentiality from a public body, used by the public body for a carbon sequestration agreement. The bill requires the private business to specify the records for which protection is sought before submitting them to the public body and to state the reasons why protection is necessary. This bill took effect July 1, 2021. In support of this effort and in the interest of sustainable management and market expansion, DOF hosted a Forest Carbon Symposium. This symposium brought speakers from around the nation to share information about their programs, market forecasts and the role of Carbon Verification Standards.

Assessments of Forestland Change

DOF is compiling and incorporating assessments of forestland change from other agencies, states, universities, and conservation groups to better inform urban forestry policies, including state forest resources assessments, wildlife action plans and eco-regional assessments.

Implementation of Nutrient Management Planning

2023 Progress Report

There were over one million acres of active nutrient management plans prepared for Virginia agricultural land during the program year from July 1, 2021 through June 30, 2022. (Table 1.3) This includes the acreage in nutrient management plans prepared by private sector nutrient management planners, in addition to the acreage covered by plans prepared by DCR staff. This was an increase of over 66,000 acres from the previous reporting cycle. The data for the program year ending June 30, 2023 is currently being submitted by private-sector certified nutrient management planners and will be compiled later this year.

Table 1.3: DCR Nutrient Management Planning

	Crop Acres	Hay Acres	Pasture Acres	Specialty Acres	Total Acres
Chesapeake Bay Watershed	567,280	106,017	61,249	3,932	738,478
Outside the Chesapeake Bay Watershed	296,449	32,046	29,792	1,030	359,317
Totals	**863,729**	**138,063**	**91,041**	**4,962**	**1,097,795**

All golf courses are required by § 10.1-104.5 of the *Code of Virginia* to obtain and implement nutrient management plans. Nutrient management plans for golf course acreage comprise 25,599 acres representing 266 courses for a compliance rate of 86%. DCR continues to work with the golf courses to ensure the nutrient management plans are updated and revised as required by law.

Total urban areas with nutrient management now exceed 35,953 acres. Language in the 2018 MS4 general permit did not adequately convey to localities operating under the permit that they must continue to maintain and implement nutrient management plans for all locality-managed lands that receive fertilizer. This requirement has been clarified in the current MS4 general permit draft and it is anticipated that the localities will adhere to this requirement once the new permit is issued. Currently, there are 1,565 acres of nutrient management plans implemented in response to the requirements of the MS4 general permit.

Currently, there are 2,039 acres of state-owned lands contained in turf and landscape nutrient management plans. Because of rising fertilizer costs, some agencies have opted to eliminate turf fertilization from their management practices, reducing the acres of land that need nutrient management plans. DCR's Green & Clean initiative is a voluntary initiative that encourages lawn care companies to adhere to the fertilizer rates established in the Nutrient Management Training and Certification

Regulations (4VAC50-85). Lawn care companies that participate in this initiative, report all acreages in amounts higher than 50 acres treated per season to Virginia Department of Agriculture and Consumer Services (VDACS). However, any acreages treated that fall below that threshold are reported to DCR. For FY 2023, lawn care companies reported 79 acres to DCR. There were an additional 59 voluntary turf and landscape nutrient management plans prepared, including 36 acres prepared by Virginia Cooperative Extension's Healthy Virginia Lawns program.

Section 3.2-3602.1 of the *Code of Virginia* applies to the application of regulated products (fertilizer) to nonagricultural property. It calls for training requirements, establishment of proper nutrient management practices (according to Virginia's Nutrient Management Standards and Criteria), and reporting requirements for contract-applicators who apply fertilizer to more than 50 acres as well as for employees, representatives, or agents of state agencies, localities, or other governmental entities who apply fertilizer to nonagricultural lands. The total acreage reported to VDACS for the 2022 calendar year was 71,473 acres and can be viewed on the Certified Fertilizer Applicator (CFA) Program website.

During the most recent General Assembly Sessions, funding was provided for nonpoint source reduction projects including the poultry litter transport incentive program. Utilizing the additional funding provided, DCR has expanded the transport program to include Accomack County while still maintaining programs in Page and Rockingham counties. An agreement with the Virginia Poultry Federation allows DCR to leverage the state funding provided. As a strategy in WIP III, poultry litter transported from these three key counties needs to increase from 5,000 – 6,000 tons annually to approximately 89,000 tons annually by year 2025, and each year thereafter. For FY 2023, 7,349.67 tons of litter were transported out of Accomack County, totaling $220,490.10 in payments. Out of Rockingham County, 21,549.07 tons of litter were transported, totaling $523,279.50 in payments. To date, there has been no participation in Page County. FY 2023 contracts requested a total of 64,926 tons of litter be moved; however, most of these requests were unable to be filled due to the limited availability of litter for the applicants.

To continue progress toward meeting goals for the Chesapeake Bay TMDL, DCR has dedicated two certified nutrient management staff to work exclusively with small dairies and other small farms to develop nutrient management plans. There are 376 dairies in Virginia, a reduction from more than 500 in recent years. Forty-four of these permitted operations have current nutrient management plans. DCR staff develops nutrient management plans for most of the animal operations in the Commonwealth. All nutrient management plans involving the use of biosolids meeting specific criteria must be approved by DCR as well as many of the nutrient management plans that utilize manure as a fertilizer.

DCR has developed a new module, the Nutrient Management Planning (NMP) Module, which is completely integrated with the existing Conservation Application Suite. The Module is an online program that nutrient management planners can use to write comprehensive NMPs. The module collects data in a more systematic and thorough manner and allows for more accurate reporting and data collection on nutrient management. All DCR nutrient management planners utilize the NMP Module; DCR is currently working with select private nutrient management plan writers to test the Module for use by the private sector plan writers. Once feedback has been received and any concerns have been appropriately addressed, the Module will be released for use by any Virginia certified NMP planner.

The Virginia Nutrient Management Direct Pay Program continues to expand. This Program is an incentive program paying certified Virginia nutrient management planners to prepare, revise, and certify the implementation of nutrient management plans that cover acres within certain counties in Virginia's Chesapeake Bay watershed or required by other DCR programs. For FY 2023, 187,386 acres of nutrient management plans were prepared, revised, and certified with $518,068 of state funds. Similarly, 28,339 acres were prepared revised, and certified utilizing federal CBRAP grant funds in the amount of $99,670.02 for 28,339 acres. Since its inception in FY 2019 the Program has been provided total funding of $1.85 million, which has led to 368,282 acres of preparation, revision, and certification of nutrient management plans.

Implementation of and compliance with erosion and sediment control programs

2023 Progress Report

The continued focus of DEQ central and regional office staff was assisting local governments with the implementation of their local stormwater management programs, which includes addressing erosion and sediment control in a manner that is consistent with the Erosion and Sediment Control Law and attendant regulations. DEQ regional office staff continued to visit small and large construction activities to perform site inspections for compliance with the 2019 Construction General Permit, which includes addressing erosion and sediment control in a manner that is consistent with the Erosion and Sediment Control Law and attendant regulations.

Implementation of stormwater management programs

2023 Progress Report

During the reporting period, no local governments requested or received approval to manage local stormwater management programs. Ninety-four local governments continued to implement their previously approved local stormwater management programs with the assistance of DEQ central and regional office staff. In addition, DEQ central office staff and local governments continued to process coverage under the 2019 Construction General Permit using the Stormwater Construction General Permit System. This online system enables local stormwater management programs to continue to coordinate their efforts with DEQ's issuance, modification, transfer, and termination of Construction General Permit coverage. From July 2021 through June 2022, new (*i.e.*, first-time) coverage under the 2019 Construction General Permit was approved for 369 land-disturbing activities where DEQ is the local Virginia Stormwater Management Program (VSMP) authority, and new coverage under the 2019 Construction General Permit was approved for 1,393 land-disturbing activities statewide. DEQ regional office staff continued to visit small and large construction activities to perform site inspections for compliance with the 2019 Construction General Permit. On July 1, 2019, the 2019 Construction General Permit became effective replacing the 2014 Construction General Permit. The 2019 Construction General Permit expires on June 30, 2024.

Authorization of Stormwater Local Assistance Fund Project Funding List

To reduce nonpoint source pollution from stormwater runoff, the Virginia General Assembly included Item 360 in Chapter 806 of the 2013 Acts of Assembly (the Commonwealth's 2013 Budget Bill) which created and set forth specific parameters for the administration of the Stormwater Local Assistance Fund (SLAF). The purpose of the SLAF is to provide matching grants to local governments for the planning, design, and implementation of stormwater BMPs that address cost efficiency and commitments related to reducing pollutant loads to the state's surface waters. In accordance with that legislation, the State Water Control Board approved Guidelines for the implementation of the SLAF program. The Guidelines call for an annual solicitation of applications, an application review and ranking process, and the authorization of a Project Funding List by the DEQ Director.

The General Assembly has provided a total of $210 million in funds for the SLAF Program since it began in FY 2014. A total of $171 million in SLAF funding has been authorized for 331 projects through eight solicitation cycles.

Virginia Clean Water Revolving Loan Fund

For FY 2023, the Virginia Clean Water Revolving Loan Fund (VCWRLF) allocated roughly $305 million in loan funds to 64 localities for wastewater and stormwater infrastructure projects, sanitary sewer evaluation surveys, one living shoreline, and one onsite septic local program. The VCWRLF was created in 1987 and DEQ, on behalf of the State Water Control Board, manages the VCWRLF. The VCWRLF was initiated to provide financial assistance in the form of low-interest loans to local governments for needed improvements at publicly owned wastewater treatment facilities and collection systems. Since the program's inception, the State Water Control Board has expanded the scope of VCWRLF activity and DEQ implemented additional programs to provide low-interest loans related to agricultural and other non-point source water quality issues.

From 1988 to 2022, under the VCWRLF Program, DEQ has authorized over 1,300 projects, providing over $4.33 billion in subsidized loan funds for projects in the Chesapeake Bay watershed and Southern Rivers. Eligible costs include the planning and design to upgrade, rehabilitate, and/or expand wastewater treatment plants; the remediation of brownfields; purchase of land for the purpose of conservation; installation of living shorelines; and construction of stormwater BMPs and agricultural BMPs.

Local government implementation and compliance with requirements of the Chesapeake Bay Preservation Act

2023 Progress Report

Chesapeake Bay Preservation Act (CBPA) compliance reviews continue to be conducted for the Tidewater localities subject to the CBPA. DEQ Local Government Assistance Program staff have been working to ensure that a periodic (every five years) compliance review is completed for all local programs in the 84 CBPA localities. If a DEQ review reveals conditions that must be addressed by a locality for its program to come into compliance with the CBPA and the locality does not meet the conditions by an established deadline, a warning letter is issued with a short deadline to comply. The review is passed on to

DEQ's Enforcement Division if the locality does not comply with the conditions after the established deadline.

During these compliance reviews, staff assess whether the locality is implementing soil and water quality conservation assessments for all active agricultural lands, the status of the water quality provisions of the local comprehensive plans, how well local governments are ensuring that impervious cover is minimized, indigenous vegetation is maintained, and land disturbance is minimized on approved development projects, and septic tank pump-out requirements are met. As part of the compliance review process, localities are required to submit annual reports on their continued implementation of the CBPA. Based on the 2022 annual report cycle (January 1, 2022 – December 31, 2022), 55 soil and water quality conservation assessments on agricultural land were conducted and 8,564 septic systems were pumped out.

Chesapeake Bay Total Maximum Daily Load Implementation

2023 Progress Report

The following graphs show the modeled annual nitrogen, phosphorus, and sediment loads reaching the Chesapeake Bay from Virginia based on the Phase 6 Chesapeake Bay Watershed model (Figures 1.5-1.7) Chesapeake Assessment and Scenario Tool (CAST) Version 2019. Each of the bars represents the estimated annual loads reaching the Chesapeake Bay from Virginia for 2009-2022[2]. The last bar on the right shows the model-estimated annual loads that would result from full implementation of the BMPs identified in Virginia's Phase III WIP in 2025. Each of the colors stacked in the bars represents the annual loads from the various sectors (natural, agriculture, developed, septic, and wastewater). The green line on each graph represents the 2025 planning target.

[2] The 2022 progress year reflects the information submitted by Virginia to the U.S. EPA Chesapeake Bay Program; it has not yet been evaluated and approved by EPA and should be considered provisional.

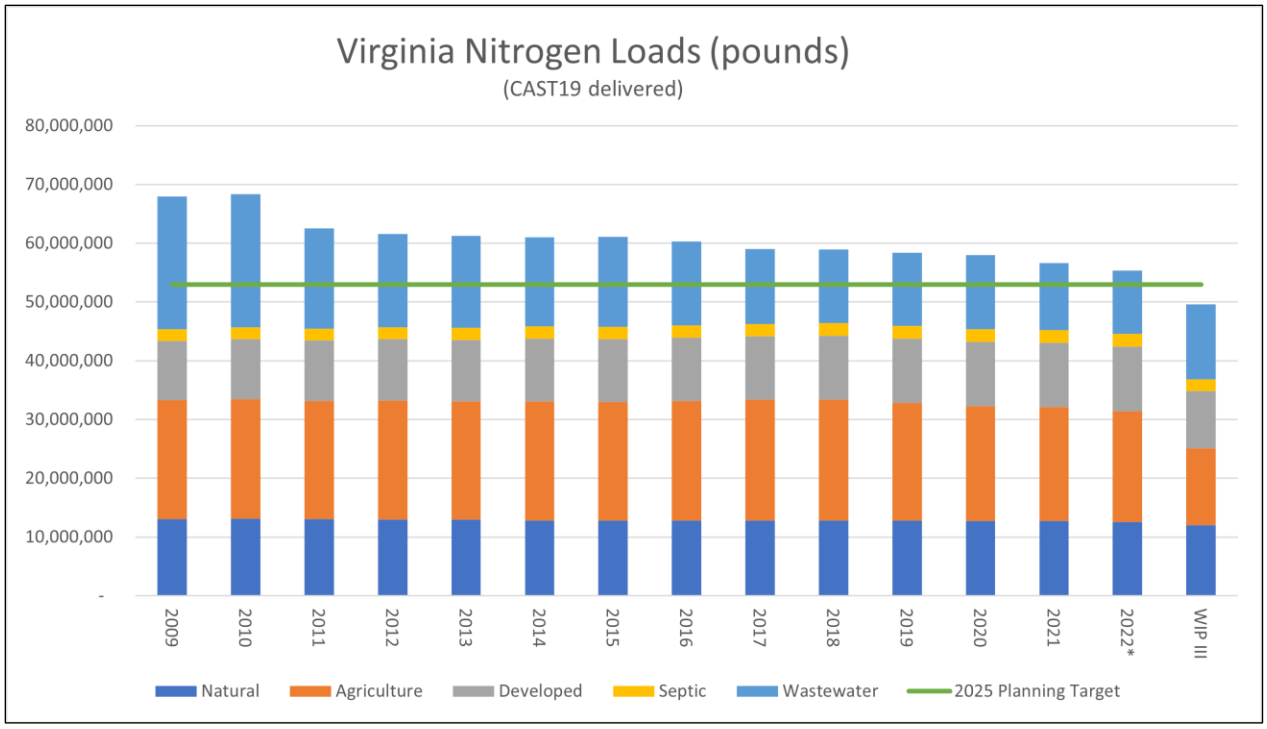

Figure 1.5: Virginia's Annual Nitrogen Progress Loads for 2009-2022 with WIP III Planned 2025 Loads[3]

[3] The 2022 progress year reflects the information submitted by Virginia to the U.S. EPA Chesapeake Bay Program; it has not yet been evaluated and approved by EPA and should be considered provisional.

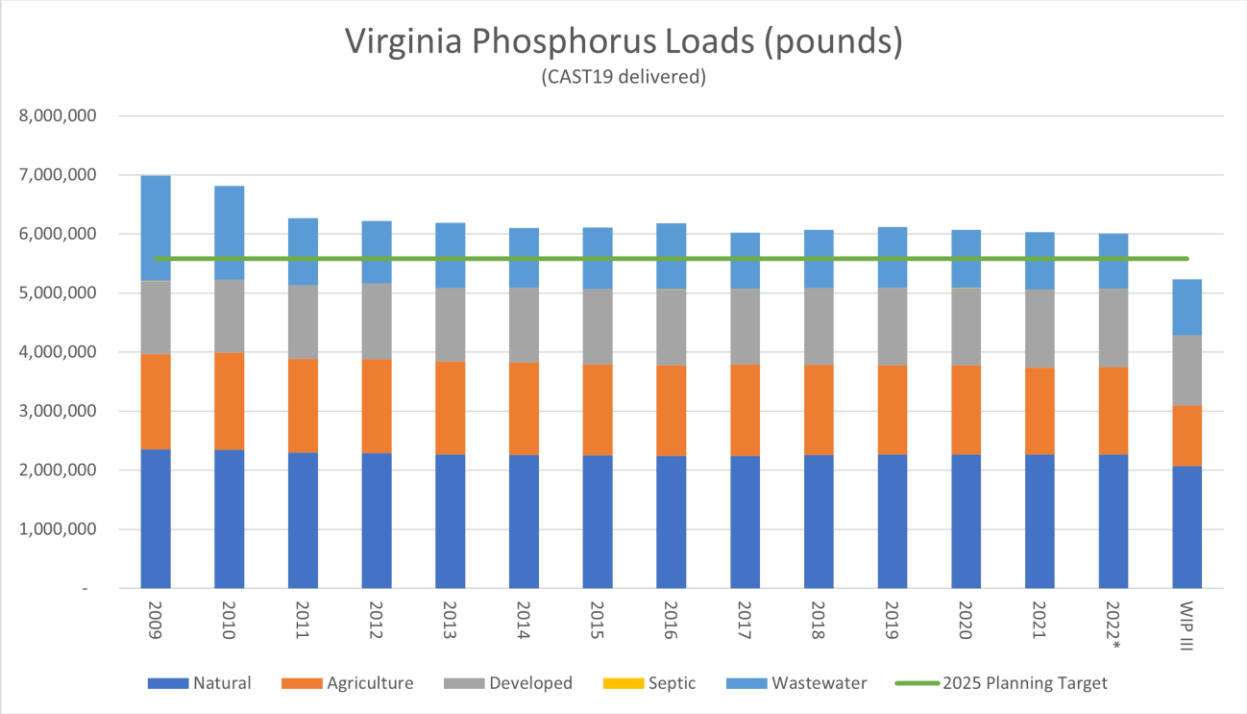

Figure 1.6: Virginia's Annual Phosphorus Progress Loads for 2009-2022 with WIP III Planned 2025 Loads[4]

[4] The 2022 progress year reflects the information submitted by Virginia to the U.S. EPA Chesapeake Bay Program; it has not yet been evaluated and approved by EPA and should be considered provisional.

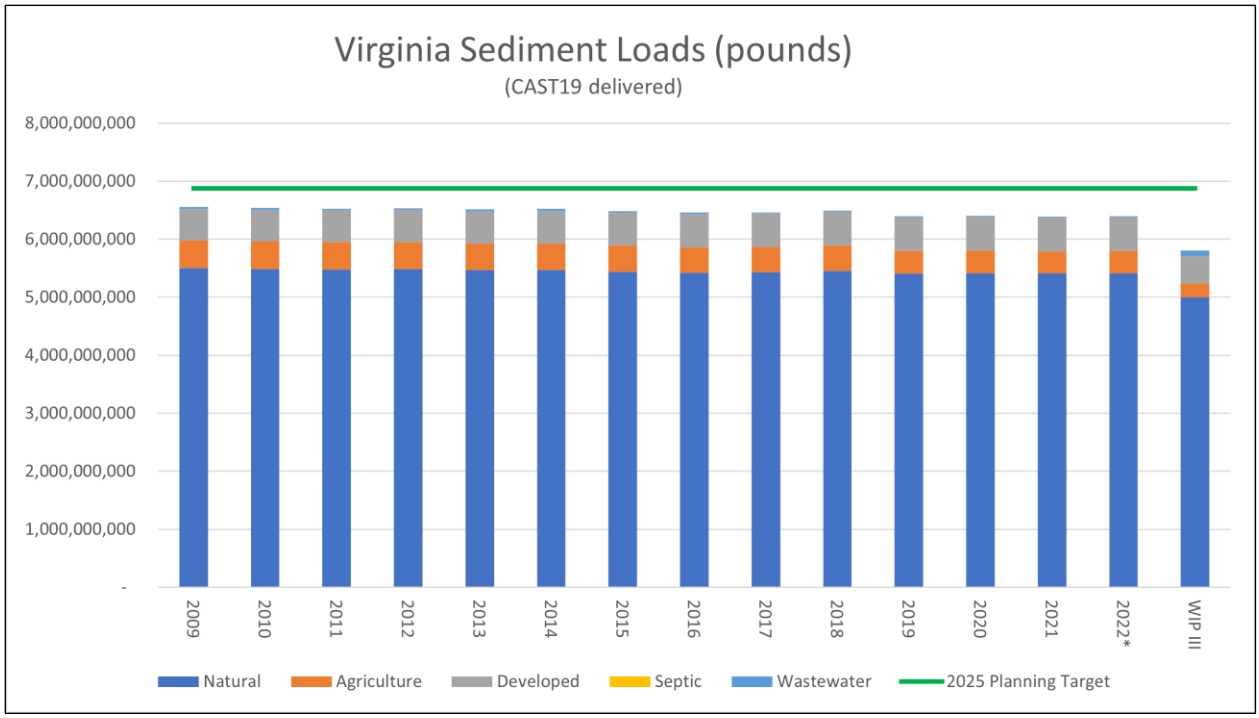

Figure 1.7: Virginia's Annual Sediment Progress Loads for 2009-2022 with WIP III Planned 2025 Loads[5]

[5] The 2022 progress year reflects the information submitted by Virginia to the U.S. EPA Chesapeake Bay Program; it has not yet been evaluated and approved by EPA and should be considered provisional.

The remaining nitrogen reductions needed by sector for Virginia to meet its WIP III goal by 2025 are presented in Figure 1.8.

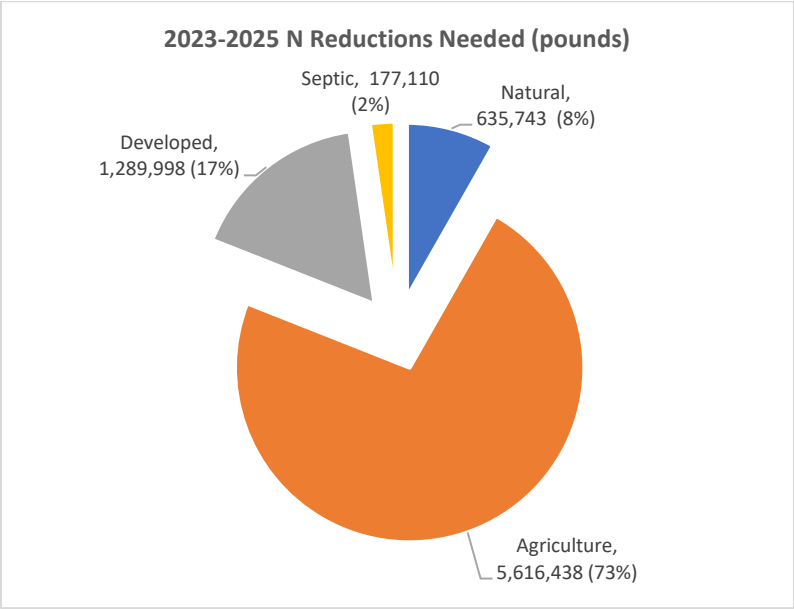

Figure 1.8: Virginia's Remaining Nitrogen Reductions Needed for 2023-2025 (pounds)

The remaining phosphorus reductions needed by sector for Virginia to meet its WIP III goal by 2025 are presented in Figure 1.9.

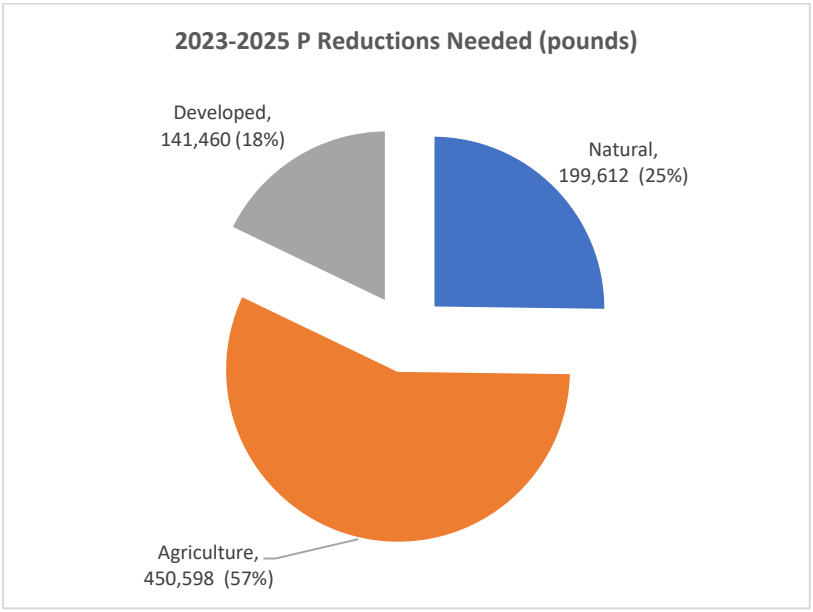

Figure 1.9: Virginia's Remaining Phosphorus Reductions Needed for 2023-2025 (pounds)

Tables 1.4-1.5 summarize the pounds per year of nutrient reductions achieved by sector by Virginia in 2022 compared to the WIP III target loads. The tables also include the remaining gap needed to achieve Virginia's nitrogen and phosphorus WIP III goals.

Table 1.4: Comparison of Virginia's 2022 Total Nitrogen Reductions and Remaining Loads to Achieve WIP III Goals by 2025

TN (lbs/yr, delivered)	Natural	Agriculture	Developed	Septic	Wastewater	Total
2022*	12,608,301	18,761,046	11,013,802	2,155,687	10,822,935	55,361,771
WIP III	11,972,558	13,144,607	9,723,804	1,978,577	12,753,717	49,573,264
Gap	635,743	5,616,438	1,289,998	177,110	-1,930,782	5,788,508
% of Total Gap	11%	97%	22%	3%	-33%	

* The 2022 progress year reflects the information submitted by Virginia to the U.S. EPA Chesapeake Bay Program; it has not yet been evaluated and approved by EPA and should be considered provisional.

Table 1.5: Comparison of Virginia's 2022 Total Phosphorus Reductions and Remaining Loads to Achieve WIP III Goals by 2025

TP (lbs/yr, delivered)	Natural	Agriculture	Developed	Septic	Wastewater	Total
2022*	2,264,979	1,478,101	1,331,343	1,243	929,131	6,004,797
WIP III	2,065,367	1,027,503	1,189,883	1,243	945,985	5,229,981
Gap	199,612	450,598	141,460	0	(16,854)	774,816
% of Total Gap	26%	58%	18%	0%	-2%	

* The 2022 progress year reflects the information submitted by Virginia to the U.S. EPA Chesapeake Bay Program; it has not yet been evaluated and approved by EPA and should be considered provisional.

For additional information on the Chesapeake Bay TMDL, associated implementation efforts, and progress, please visit the DEQ Chesapeake Bay Programs webpage and the Chesapeake Bay Program's Chesapeake Stat website.

Development of TMDL reports, implementation plans, and implementation projects

Development of Total Maximum Daily Load Reports

2023 Progress Report

The figure below shows the number of TMDL equations by pollutant set across Virginia since the inception of the TMDL program (Figure 1.10). During the past fiscal year, DEQ has progressed with the development of TMDLs addressing more complex impairments, many of which are in large-scale watersheds. Though this has necessitated the deferment of EPA approvals for new TMDL equations this past fiscal year, DEQ has been able to make significant strides in the development of PCB, sediment, and nutrient TMDLs in watersheds with fish consumption and aquatic life use impairments.

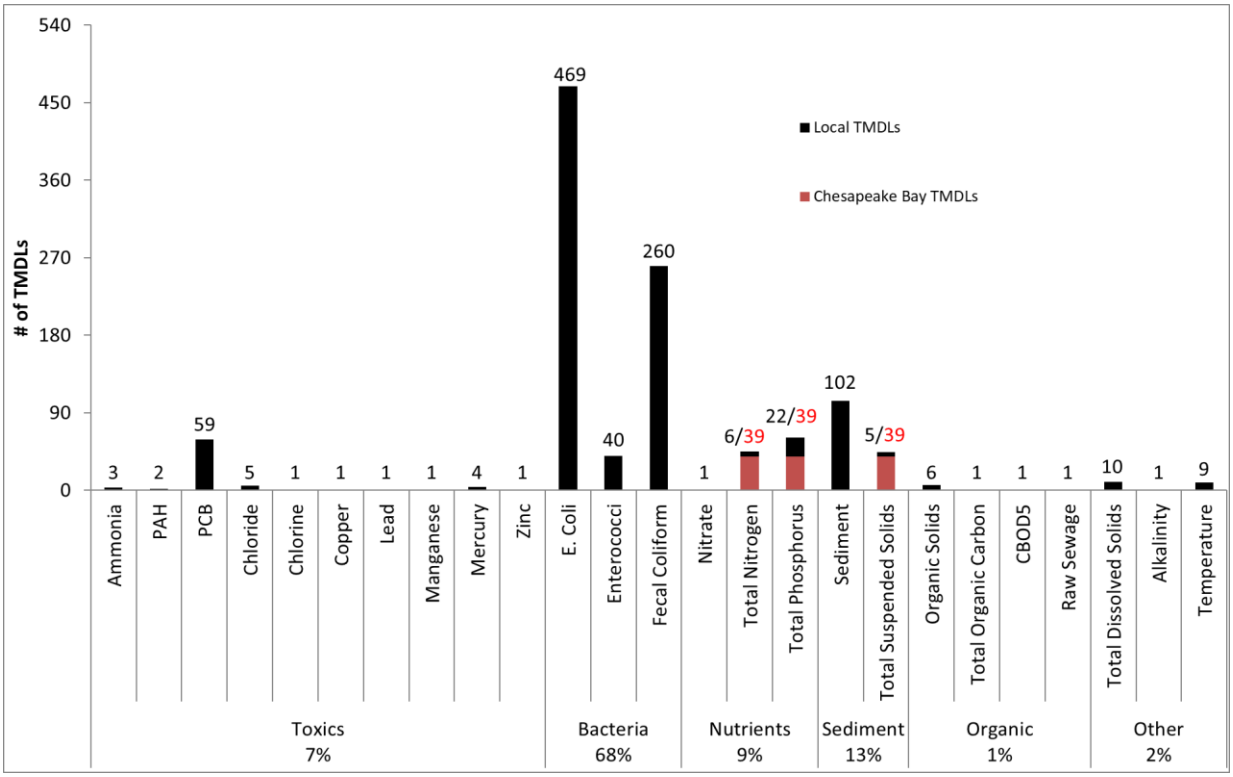

Figure 1.10: TMDL Equations by Pollutant[6]

Based on the 2022 Integrated Report, Virginia estimates that 8,470 miles of rivers, 85,368 acres of lake, and 2,060 square miles of estuary will require TMDL development in the coming years. To maintain a robust pace of TMDL development with level funding, Virginia has developed several strategies including: a) developing TMDLs using a watershed approach to address multiple impairments in watersheds with similar characteristics; b) developing TMDLs in-house; c) identifying non-TMDL solutions, such as plans that outline BMP implementation strategies in predominantly nonpoint source (NPS) polluted watersheds; and d) developing TMDLs that are more easily implemented. Virginia continues to explore tools and options for restoring and protecting water quality, both for environmental benefit and efficient program management.

DEQ is implementing EPA's national 2022-2032 Vision for the Clean Water Act Section 303(d) Program which is the culmination of EPA's collaboration with states, territories, and tribes to renew and update the original 2013 Vision. The intent of the 2022 Vision is to identify opportunities for states to effectively manage their own 303(d) programs and achieve their unique water quality objectives through a set of

[6] The graph includes TMDL equations reported previously and newly adopted equations. In some instances, previously established TMDLs were superseded by revised TMDLs. Supersession can be one equation replacing another or one equation replacing many equations. Note that 39 of the Total Nitrogen, Total Phosphorus, and Total Suspended Sediments equations are for the Chesapeake Bay TMDL. The remainder are for local TMDLs.

goals and focus areas. A key component of the 2022-2032 Vision calls for each state to develop a Prioritization Framework that describes its long-term planning priorities and that outlines a general strategy for implementing the goals and focus areas of the 2022-2032 Vision. DEQ is in the process of developing Virginia's Framework which will be included in Virginia's 2024 Integrated Report. The 2022-2032 Vision also calls for states to develop a prioritization of waterbodies to be addressed over shorter increments (every two years) through 2032. These lists of impaired waterbodies are considered commitments wherein DEQ plans to address impairments through the development of TMDLs or Advance Restoration Plans. The two-year commitments will be included in Integrated Reports through 2032. DEQ is currently addressing its two-year commitments for the 2022-2024 period. That list can be found in Appendix 1 of the 2022 Integrated Report.

Development of Implementation Plans

2023 Progress Report

Virginia law (1997 Water Quality Monitoring, Information, and Restoration Act, § 62.1- 44.19:4 through § 62.1-44.19:8 of the *Code of Virginia*, or WQMIRA) requires the development and implementation of a plan (including a TMDL when appropriate) to achieve fully supporting status for impaired waters. The development of an Implementation Plan (IP) is Virginia's mechanism for addressing nonpoint sources of pollution in impaired watersheds. The IP report includes, at a minimum: water quality goals, control measure goals, a schedule of corrective actions, monitoring strategy, and associated costs and benefits of implementation. DEQ, along with other agency and non-agency partners, continues to develop and implement IPs throughout Virginia. In FY 2023, DEQ and partners completed one IP covering 13 impairments. In addition, three IPs covering 19 impairments were under development at the end of the fiscal year. The map below shows areas that are covered under an IP (Figure 1.11).

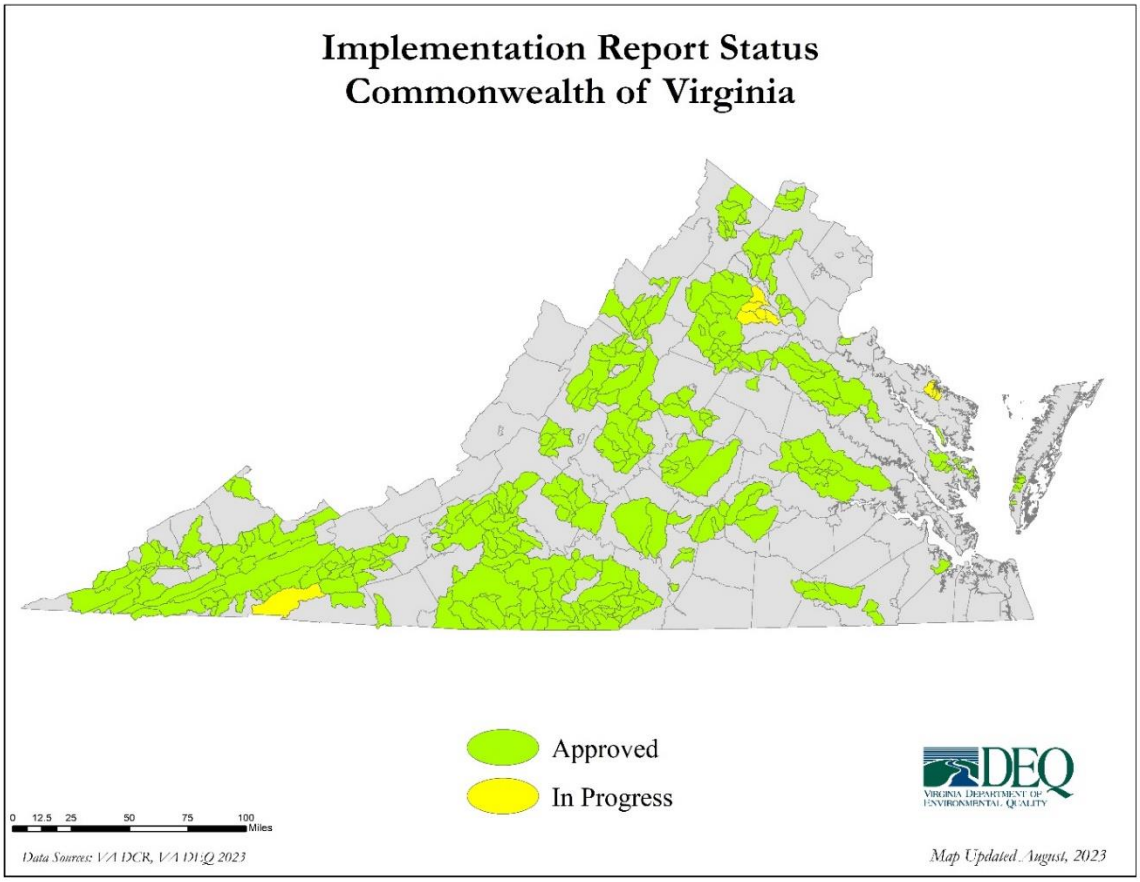

Figure 1.11: Implementation Report Status

The graph below summarizes implementation planning progress since the program's inception. Since 2001, Virginia has completed 100 IPs, addressing 648 impairments (Figure 1.12).

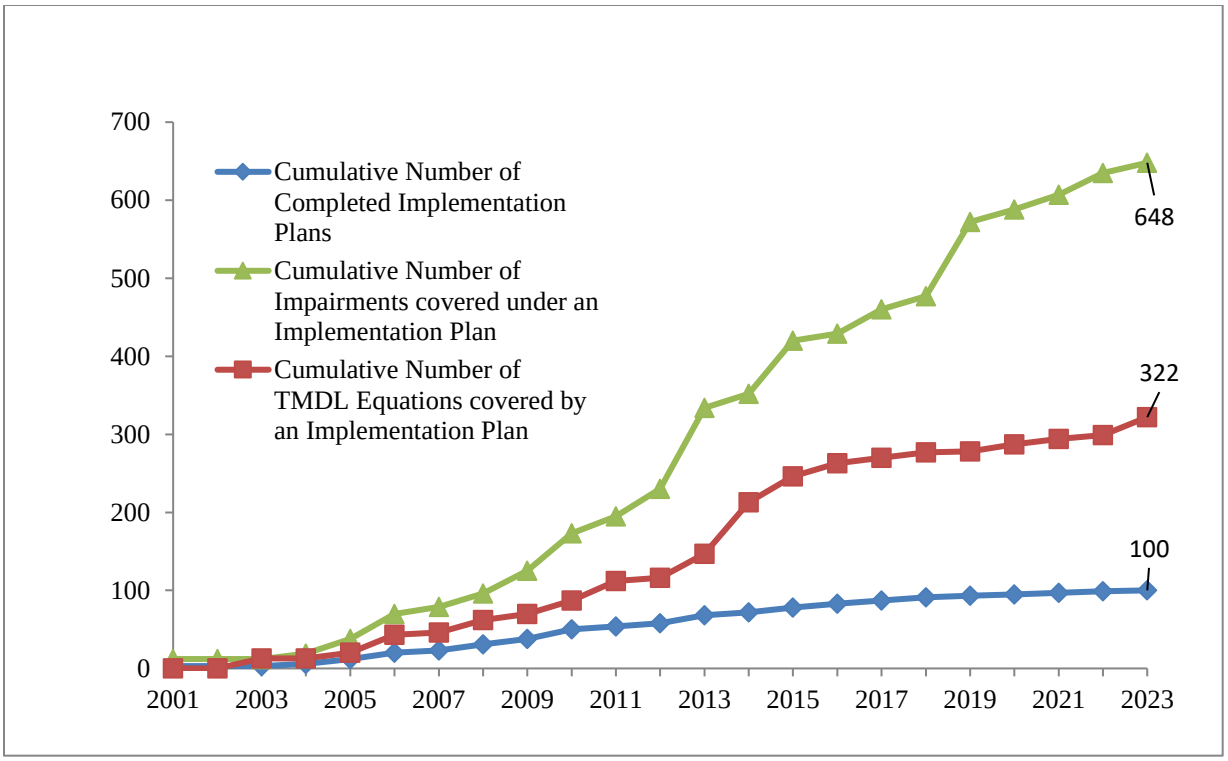

Figure 1.12: Cumulative Summary of Implementation Plan Development (July 2001 – June 2023)

As funding limitations have continued over the years, it has become increasingly important to evolve the implementation planning program. DEQ is continuing to evaluate the prioritization methods of developing implementation plans, as well as how these plans are written. More efforts are being placed on producing joint TMDL-IP reports, exploring TMDL alternatives, evaluating larger watershed areas, pursuing more watershed-based plans, and simplifying modeling efforts. These efforts have allowed the implementation planning program to seek new opportunities, including performing more development work in-house. Sediment/benthic impairments were prioritized in FY 2022 in the development of IPs following suit to FY 2022 TMDL priorities. Bacteria impairments continue to be the most common pollutant to Virgina waterbodies and are addressed through many already approved IPs developed since 2001.

More information on IPs (under development or approved) can be found on DEQ's Implementation Planning webpage.

Watershed Restoration and TMDL Implementation

2022 Progress Report[7]

The goal of the TMDL Implementation Program is to implement targeted, on-the-ground activities, identified in TMDL IPs, which will result in water quality improvements and subsequent delisting of impaired streams. Virginia uses a staged approach that provides opportunities for periodic evaluation of the effectiveness of the implementation actions and adjustment of efforts to achieve water quality objectives in a timely and cost-effective manner. Virginia's TMDL Implementation Program was developed by DCR in 2001 and has been funded by a mix of federal and state funds. In June 2013, the responsibility for program administration was moved to DEQ. From July 1, 2022 through June 30, 2023, DEQ managed 18 implementation projects funded partially or fully with Federal Section 319(h) funds. Additional information and data on the Commonwealth's overall Nonpoint Source Management Activity can be found in DEQ's 2022 Annual Nonpoint Source Point Report submitted to EPA.

The map below depicts the overall status of nonpoint source TMDL implementation in Virginia since 2001 (Figure 1.13). It includes watersheds where TMDL implementation plans have been developed and TMDL implementation projects have been active that have received strategic funding. It should be noted that DCR administers a statewide agricultural cost-share program that resulted in BMP installation and implementation in various implementation plan areas and although not reflected on the maps, the information is presented in the remaining part of this section.

[7] Due to the availability of BMP data at the time of this reporting deadline, the NPS program is not able to provide a FY 2023 programmatic report. The FY 2022 Clean-Up Plan Report had the same deadline issue. Subsequent reports will cover the period one year delayed. The program data included in this report is for FY 2022 activity (7/1/2021-6/30/2022).

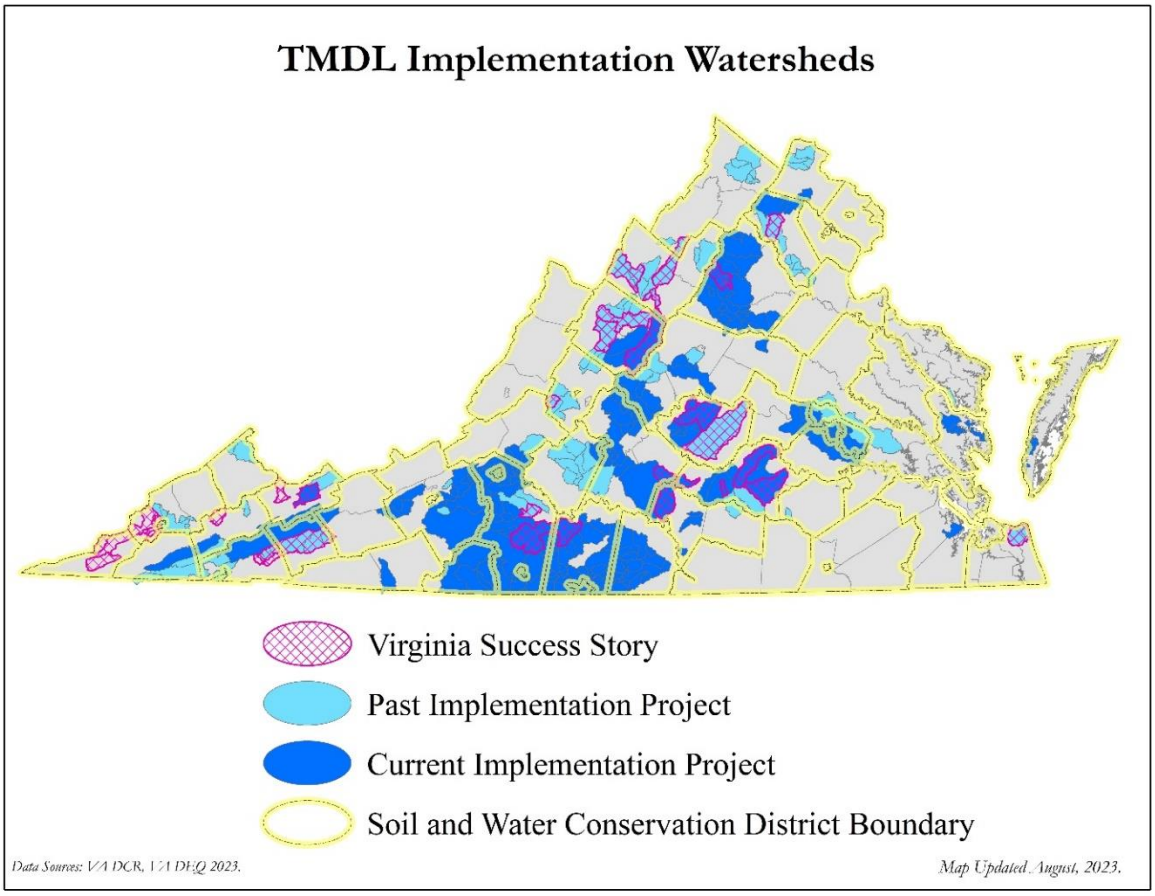

Figure 1.13: Status of NPS TMDL Implementation Projects by Watersheds in Virginia (2001 – June 2023)

The map below identifies the specific watersheds with section 319(h)-funded active NPS implementation projects in Virginia in FY 2023 (Figure 1.14).

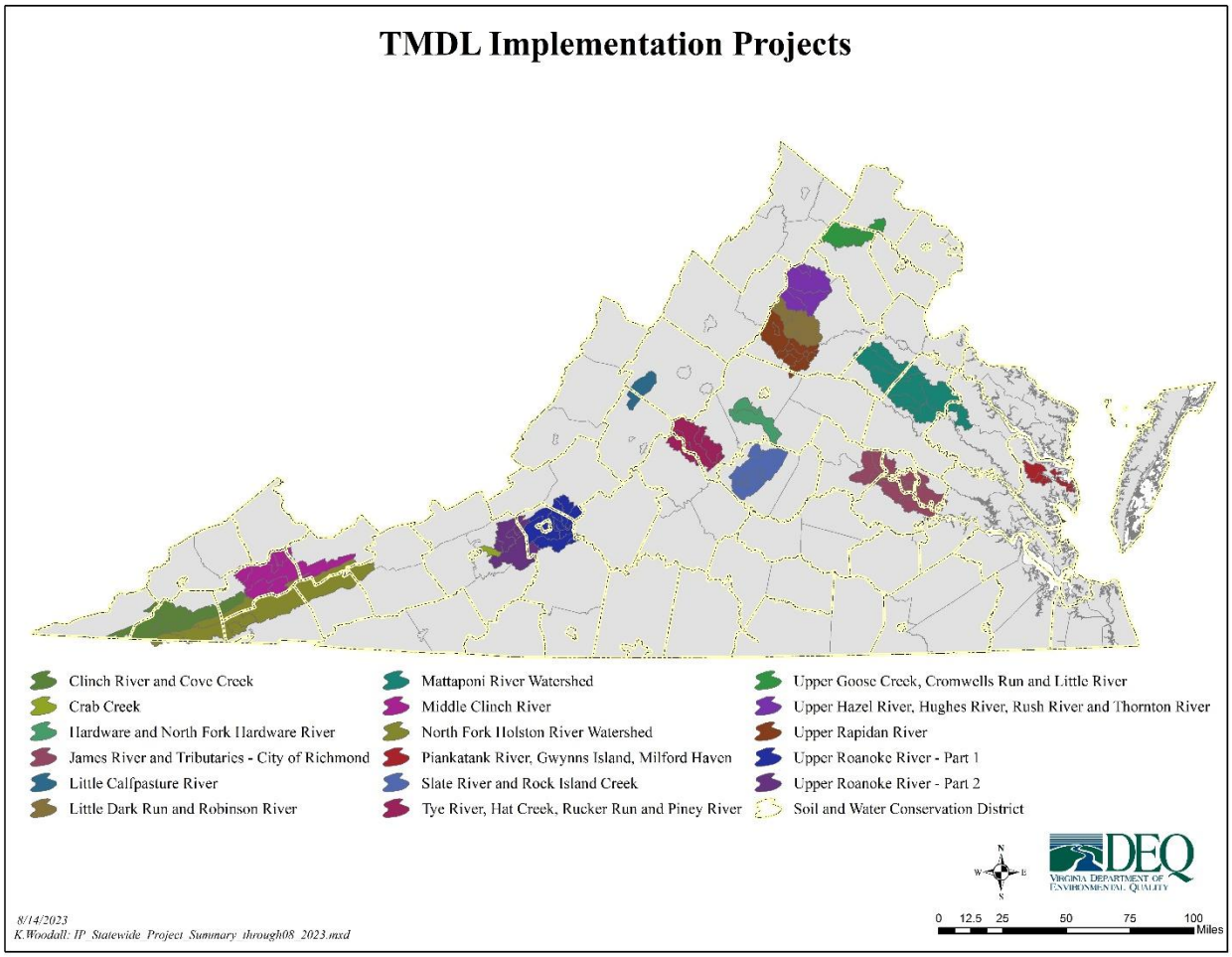

Figure 1.14: 319(h)-funded NPS TMDL Implementation Projects in Virginia as of June 30, 2023

Past TMDL Implementation Projects with Continued Implementation Activity during FY 2023

Funding of Implementation

As the lead agency in TMDL implementation, DEQ utilizes both federal section 319(h) and Chesapeake Bay Implementation Grant (CBIG) Program grant funds to pay for staff that provide project management and technical support to watershed stakeholders implementing projects. In addition, Virginia runs a comprehensive cost-share program for BMP implementation utilizing both federal (section 319(h) and CBIG) grants and state resources (from the WQIF, the Virginia Natural Resources Commitment Fund, and the Virginia Agricultural Cost-Share program).

Overall, DEQ and its agency partners utilized over $80 million of state and federal (excluding federal Natural Resource Conservation Service (NRCS)) sources of funding to implement BMPs throughout the Commonwealth.

BMP Implementation and Pollutant Reductions

Tracking both BMP implementation and water quality improvements in TMDL watersheds is critical in measuring the success of the TMDL program. BMPs are effective and practical ways to prevent or reduce pollutants from nonpoint sources to protect and restore water quality. While highly effective BMP tracking programs are in place to account for BMPs installed using state or federal cost-share funds, tracking BMPs installed voluntarily (without government assistance) has proven challenging. DEQ, along with partner agencies, is planning mechanisms by which voluntary practices can be accounted for; however, BMP implementation and associated pollutant reductions reported to date are mostly practices installed with government cost-share funds.

The residential septic and agricultural BMPs implemented within IP areas in FY 2022 resulted in the protection of streams and the exclusion of livestock access. In addition, hundreds of homes had their septic systems pumped or had straight pipes or failing septic systems addressed. The tables below provide a summary of BMP-related information, pollutant reductions achieved, and a detailed accounting of the type of BMPs installed in TMDL watersheds (Tables 1.6 and 1.7).

Table 1.6: Summary of BMP-related information achieved in TMDL Implementation Plan Areas (7/1/2002 - 6/30/2022)

Metric	VA FY 2022	FY 2002-2022
#BMPs Installed	3,602	39,133
Stream Protected (Linear Feet)	1,114,622	13,097,088
Stream Exclusion Buffer Created (Acres)	3,253	15,254
Animal Units Excluded	10,899	558,013
Residential Septic Systems	251	5,669
Bacteria (CFU)	4.98E+16	5.98E+17
Total Nitrogen (lbs/yr)	3,319,209	21,099,999
Total Phosphorous (lbs/yr)	46,577	382,754
Total Sediment (Tons/yr)	58,634	461,035

Table 1.7: BMPs Installed in TMDL Implementation Areas (7/1/2020 – 6/30/2022)

BMP Name	# BMPs	Extent Installed	Unit
Alternative or Extension of Watering System	34	1,748	Acres
Animal Waste or Composter Facilities	19	19	Count
Cover Crops	2,736	124,947	Acres
Equine Manure Composting	1	1	Count
Farm Road, Animal Travel Lane, Heavy Use Area Stabilization	2	0	Acres
Loafing Lot Management System	1	1	Count
Long-Term or Permanent Cover	164	8,551	Acres
No-Till or Minimal Till	18	756	Acres
Pasture or Grazing Land Management	27	2,357	Acres
Pasture Management Calculated from Grazing Stream Exclusion	N/A	10,045	Acres
Stand-alone Riparian, Forested, or Vegetated Buffer Created	49	138	Acres
Riparian Buffers Created from Stream Exclusion Practices	N/A	3,227	Acres
Roof Runoff Management System	1	5,379	Sq. Feet
Sediment Retention, Erosion, or Water Control Structures	0	0	Count
Septic Connection to Public Sewer	5	5	Count
Septic System Alternative system	8	8	Count
Septic System Repair	43	43	Count
Septic System Replacement	33	33	Count
Septic Tank Pump-out	162	162	Count
Sod Waterway	10	2	Acres
Stream Crossing and Hardened Access	0	0	Count
Stream Exclusion, Grazing Land Management or Stream Protection and Stream Exclusion Maintenance	272	1,097,292	Lin. Feet
Streambank Stabilization	0	0	Lin. Feet
Tree Planting (crop, hay, and pasture)	14	242	Acres
Woodland erosion stabilization	3	21	Acres
Total	**3602**		

Virginia Water Quality Improvements and Success Stories

The success of Virginia's Nonpoint Source Management Program and the TMDL Implementation Program is also documented by describing the improvement of water quality conditions via NPS Success Stories. Through Section 319 Nonpoint Source Success Stories, EPA and DEQ document progress of partially or fully restoring waterbodies associated with NPS implementation actions.

Since 2002, Virginia's Nonpoint Source Management Program and associated TMDL Implementation Program and its partners have written 38 success stories that address delisting and/or water quality improvement of 53 impaired stream segments. These stories are classified into two types: Type 1 stories are related to partial or full restoration (delisting of impairments), and Type 2 indicates significant water quality improvement. The map above shows the location of success stories in Virginia (Figure 1.12).

Healthy Waters

2023 Progress Report

The Healthy Waters Program (HWP) is an inter-agency program led by the DCR Natural Heritage Program (NHP) and Virginia Commonwealth University (VCU) in partnership with DEQ to identify and maintain watersheds with high ecological integrity. Virginia defines "ecologically healthy waters and watersheds" as those that maintain high ecological integrity when viewed in a holistic assessment approach that addresses in-stream habitat, stormwater inputs, invasive species, and natural flows.

Utilizing field-based, empirically collected data, the HWP is a non-regulatory conservation program that benefits water quality. Ecologically healthy streams in Virginia are identified and ranked through a stream ecological integrity assessment known as the Interactive Stream Assessment Resource (INSTAR), as "outstanding," "ecologically healthy," "restoration candidate" or "compromised," with methods developed and conducted by VCU. DEQ has provided funding from EPA Section 319, CBIG, and the National Oceanic and Atmospheric Administration Coastal Zone Management (CZM) program to support the Program with ongoing partnerships with DOF, nongovernmental organizations, and the private sector assisting in broadening the applicability of the HWP. VCU has provided the majority of the significant technical field data collection, model development and data management services. Highlights of activities include:

- The HWP has garnered support from DCR, DEQ, and VCU to increase on-the-ground capacity to develop a Healthy Waters Program Field Coordinator to take those tools created at the NHP and work closely with conservation partners to advance those conservation actions from planning tools into tangible implementation. The position will leverage the application of agricultural or forestry BMPs to meet local TMDL WIP measures in impaired but ecologically healthy waters. The intent of the position is to work with the eight Coastal PDCs to assist coastal communities, SWCDs, DOF, land trusts, the Nature Conservancy, and private land brokers and coordinate with other agencies on HWP community-based natural resource identification and protection and target areas in the Chesapeake Bay watershed in both the upper and coastal region.

- The HWP Manager outlined three years of funding from Virginia's CZM program, EPA 319 grant funds, and CBIG funds to support the Healthy Waters Field Coordinator to be housed at the DCR NHP but employed by VCU as a grant-fund obligated employee to Virginia.

- The HWP met with the DCR and NHP management to identify the on-the-ground conservation strategies and practices to meet the Chesapeake Bay Goals, as identified under the 2015 Bay Agreement for Healthy Watersheds. The intended outcome is a targeted conservation strategy informed by a crosswalk of the 303(d) TMDL Impaired Waters list, the state identified HWs, Agricultural Cost-Share and agricultural priority areas, and DOF WIP III forestry measures to maximize the efficiency and effectiveness of the HWP.

- VCU and NHP have targeted the continuation of the field effort to collect aquatic integrity data as it relates to Interactive Stream Assessment Resource (INSTAR) data to inform the HWP, enhance the *ConserveVirginia* tool, refine the watershed models, and guide actions to conserve ecologically healthy waters.

- To achieve a Chesapeake Bay Program goal of *100 percent of state-identified (as submitted in 2014) healthy waters and watersheds to remain healthy by 2025*, HWP reached an understanding to direct the HWP Field Coordinator to develop criteria and model those areas most suitable for conservation based on TMDL WIPs, agricultural cost-share programs, and Coastal Program priorities. These criteria and models would also be informed by the Bay Program's suggested approach to identifying and conserving healthy watersheds based on the Chesapeake Healthy Watersheds Assessment (CWHA).

- The NHP continues to refine the polygon referred to as a Stream Conservation Unit (SCU) to be defined as an NHDPlus-HR catchment area. This is similar to that used in the watershed-based conservation planning model and would align with the CHWA.

- The HWP Manager continued to serve as the Virginia Chair for the CBP Goal Implementation Team Four (GIT4; Healthy Watersheds). The team includes various state programs and partners in the Chesapeake Bay watershed.

Chapter 2 - Annual Report on Water Quality Improvement Fund Grants

The purpose of the Virginia Water Quality Improvement Act of 1997 (the "Act") is "to restore and improve the quality of state waters and to protect them from impairment and destruction for the benefit of current and future citizens of the Commonwealth" (§ 10.1-2118 of the *Code of Virginia*). The Act created the Water Quality Improvement Fund (WQIF); its purpose is "to provide Water Quality Improvement Grants to local governments, soil and water conservation districts, state agencies, institutions of higher education and individuals for point and nonpoint source pollution prevention, reduction and control programs" (§ 10.1-2128.B of the *Code of Virginia*). In 2008, the General Assembly created a sub-fund of the WQIF called the Virginia Natural Resources Commitment Fund (VNRCF) (§ 10.1-2128.1 of the *Code of Virginia*) that is to be used for agricultural best management practices (BMPs) and associated technical assistance.

During the 2013 General Assembly session, legislation was passed (Chapters 756 and 793 of the 2013 Acts of Assembly) which designated, effective July 1, 2013, the Virginia Department of Environmental Quality (DEQ) as the lead agency for nonpoint source programs in the Commonwealth in addition to its responsibility for point source programs. As such, DEQ has the responsibility to provide technical and financial assistance to local governments, institutions of higher education, and individuals for point and nonpoint source pollution prevention, reduction, and control programs. The Department of Conservation and Recreation (DCR) plays a role, providing technical and financial assistance to Soil and Water Conservation Districts (SWCDs or Districts), institutions of higher education, and individuals for nonpoint source pollution controls. Because of the nature of nonpoint source pollution controls, DEQ sought the assistance and support of other state agencies, such as the Department of Forestry and the Department of Mines, Minerals and Energy (since renamed the Department of Energy), to provide the necessary expertise and resources to implement the nonpoint source elements of the Act. DCR and DEQ continue to work cooperatively on nonpoint source water quality initiatives.

This report section fulfills a legislative requirement under § 10.1-2134 of the Act for DEQ and DCR to report on the WQIF. Specifically, the mandate is for an annual report to be submitted to the Governor and the General Assembly specifying the amounts and recipients of grants made from the WQIF and pollution reduction achievements from these grants. Information on WQIF grants awarded is provided in this report, along with available data on pollutant reductions achieved and estimated pollutant reductions to be achieved from recently funded grant projects.

WQIF & VNRCF Nonpoint Source Programs

The WQIF and its sub-funds have served as the principal funding source for nonpoint source pollution control projects in Virginia. The goal of the nonpoint source grant component of the WQIF is to improve water quality throughout the Commonwealth and in the Chesapeake Bay by reducing nonpoint source pollution. Nonpoint source pollution is a significant cause of degradation of state waters. Within the Chesapeake Bay watershed, the immediate priority is to implement the Chesapeake Bay Total Maximum Daily Load (TMDL) Watershed Implementation Plans (WIP) developed by the Commonwealth and evaluated by the U.S. Environmental Protection Agency (EPA). The Chesapeake Bay Watershed

Agreement, signed in 2014, renewed the commitments made in the 2010 TMDL to, "By 2025, have all practices and controls installed to achieve the Bay's dissolved oxygen, water clarity/submerged aquatic vegetation and chlorophyll-*a* standards as articulated in the Chesapeake Bay TMDL document."

For watersheds outside of the Chesapeake Bay watershed, the goal is to achieve measurable improvements in water quality, which can include nutrient and sediment reductions, as well as reduction of other pollutants including bacterial contamination. Other uses of grant funds may include providing protection or restoration of other priority waters such as those containing critical habitat, serving as water supplies, or that target acid mine drainage or other nonpoint source pollution problems.

DCR distributes the nonpoint WQIF and VNRCF funds pursuant to § 10.1-2132 of the *Code of Virginia* and the Appropriation Act. This includes managing the allocation of funding to the Agricultural Cost-Share Program and the federally funded Conservation Reserve Enhancement Program (CREP). These funding sources also provide cost-share funds to Virginia Agricultural Cost-Share (VACS) program participants to fund 100% of the cost of implementing qualifying livestock stream exclusion best management practices (BMPs). DEQ is responsible for soliciting applications for Water Quality Initiative grants and Cooperative Nonpoint Source Pollution Program Projects with local governments and managing the distribution of those nonpoint WQIF grants.

Agricultural Best Management Practices Cost-Share Program

Agricultural BMPs that are most effective in reducing excess nutrients and sediment from agricultural lands are implemented through the VACS program managed by DCR under the Virginia Soil and Water Conservation Board's (VSWCB) allocation policy and guidance. BMPs installed through the program must be implemented in accordance with the Virginia Agricultural BMP Manual. Virginia's 47 SWCDs administer the local implementation of the VACS program with funding from DCR to cover the cost-share expenditures, the technical assistance to administer the program, and essential funding for district operations. State financial support for FY 2023 was approximately $141.2 million.

Conservation Reserve Enhancement Program

WQIF and VNRCF funds support Virginia's commitment for participation in the U.S. Department of Agriculture's (USDA) CREP. Under the USDA-administered CREP, which is implemented through the SWCDs, eligible landowners may receive cost-share incentives for eligible BMPs for restoration of riparian buffers and wetlands, as well as rental payments (up to 15 years) for removing environmentally sensitive land from agricultural production and planting grasses or trees that will improve water quality and waterfowl and wildlife habitat. Virginia doubled its cost-share contributions for the restoration of forested riparian buffers adjacent to both pastureland and cropland from July 1, 2015 to February 28, 2017. This enabled the USDA Farm Service Agency to receive an additional $1 million with which to establish the Chesapeake Bay Incentive Payment for CREP participants within Virginia's portion of the Chesapeake Bay watershed. Due to limited CREP appropriations, DCR returned to a 25% state match of eligible cost for CREP contracts approved after March 1, 2017. With the additional funding provided for CREP over this biennium, the state CREP match has been increased to 50%.

Water Quality Initiatives

In FY 2014, DEQ became the lead nonpoint source (NPS) agency in the Commonwealth for Section 319 of the Clean Water Act. DEQ and DCR work collaboratively to fund water quality initiatives to manage other NPS pollution priority needs. These projects focus on priority, cost-effective, and innovative initiatives that further advance Virginia's NPS programs and provide for measurable water quality improvements. These include initiatives with other state agencies, SWCDs, Planning District Commissions (PDCs), local governments, educational institutions, and individuals on nonpoint source pollution reduction, education, research, and other NPS reduction activities such as acid mine land reclamation and nutrient management.

2023 WQIF & VNRCF Nonpoint Source Program Funds

Agricultural Cost-Share Allocations

DCR's emphasis for agricultural BMP implementation focuses on efficient nutrient and sediment reduction and includes priority practices such as cover crops, conservation tillage, nutrient management, livestock exclusion from streams, the establishment of vegetative riparian buffers, and animal waste facilities. Historical, annual cost-share totals are summarized below (Table 2.1).

Annual state cost-share allocations are based upon the Agricultural Nonpoint Source Assessment and VSWCB policy. Hydrologic units with the highest potential to contribute agricultural NPS pollution to surface and ground waters receive the highest amounts of cost-share funds. SWCDs then rank cost-share applications and fund those applications that will provide the greatest amount of local water quality benefit.

Table 2.1: Historical Cost Data for Agricultural BMPs Completed by Fiscal Year

Program Year	Actual BMP Cost	Total Cost-Share Paid	State Cost-Share Paid	Non-State Cost-Share Paid	Other Funding Amount	Farmer Cost Before Tax Credit	Tax Credit Amount Issued
1998	$6,578,361.37	$4,085,435.66	$3,147,431.74	$938,003.92	$327,558.37	$2,165,367.34	$416,228.26
1999	$5,914,553.56	$4,438,993.05	$4,027,564.92	$411,428.13	$213,319.44	$1,262,241.07	$350,507.40
2000	$13,657,918.11	$8,301,893.63	$8,241,147.70	$60,745.93	$906,150.61	$4,449,873.87	$825,490.56
2001	$15,853,406.58	$7,850,195.91	$6,526,498.00	$1,323,697.91	$2,572,224.08	$5,430,986.59	$806,364.22
2002	$23,087,719.72	$8,332,302.53	$6,574,669.62	$1,757,632.91	$6,513,049.74	$8,242,367.45	$889,307.04
2003	$13,719,527.33	$3,188,213.34	$2,355,360.91	$832,852.43	$4,936,562.95	$5,594,751.04	$984,731.44
2004	$10,016,920.07	$2,771,069.24	$2,391,617.08	$379,452.16	$3,333,439.92	$3,912,410.91	$535,905.53
2005	$11,220,639.44	$4,317,587.05	$3,681,507.66	$636,079.39	$2,207,948.41	$4,695,103.98	$605,437.00
2006	$19,293,786.17	$9,591,063.03	$8,849,243.92	$741,819.11	$2,835,516.06	$6,867,207.08	$856,239.37
2007	$24,497,548.48	$15,208,729.37	$14,170,526.24	$1,038,203.13	$3,521,520.45	$5,767,298.66	$934,154.01
2008	$24,399,169.67	$13,892,012.86	$12,851,741.10	$1,040,271.76	$3,138,890.66	$7,368,266.15	$1,057,741.83
2009	$31,350,056.35	$16,068,967.68	$15,211,981.85	$856,985.83	$5,893,277.13	$9,387,811.54	$1,327,632.62
2010	$36,615,674.26	$23,173,103.26	$22,208,726.43	$964,376.83	$4,405,407.71	$9,037,163.29	$1,423,437.52
2011	$17,658,621.05	$10,691,395.59	$10,243,464.57	$447,931.02	$1,911,467.12	$5,055,758.34	$965,986.81
2012	$32,119,243.94	$21,467,712.08	$21,261,749.33	$205,962.75	$2,817,437.00	$7,834,094.86	$1,383,236.37
2013	$36,904,472.76	$28,039,751.62	$27,718,830.78	$320,920.84	$4,016,926.86	$4,847,794.28	$1,072,168.37
2014	$39,761,200.98	$30,736,978.26	$28,732,795.53	$2,004,182.73	$3,975,330.01	$5,048,892.71	$971,193.35
2015*	$78,400,828.68	$66,257,156.62	$62,491,498.14	$3,765,658.48	$5,426,665.05	$6,717,007.01	$1,063,843.96
2016	$17,067,019.82	$10,284,552.33	$9,918,670.07	$365,882.26	$1,081,809.23	$5,700,658.26	$886,529.47
2017	$27,597,218.62	$18,227,488.89	$17,637,165.93	$590,322.96	$2,583,765.91	$6,785,963.82	$844,763.48
2018	$31,936,655.73	$17,734,464.21	$14,731,908.68	$3,002,555.53	$4,525,790.75	$9,676,400.77	$1,781,877.40
2019	$28,972,012.28	$19,022,754.54	$17,740,186.69	$1,282,567.85	$3,593,009.63	$6,356,248.11	$1,123,366.14
2020	$60,733,349.69	$49,594,173.99	$48,155,172.68	$1,439,001.31	$3,078,996.67	$8,060,179.03	$1,148,612.41
2021	$46,708,074.45	$37,024,153.88	$36,254,540.08	$769,613.80	$1,657,890.40	$8,026,030.17	$593,470.50
2022	$52,479,042.03	$44,902,614.59	$44,450,308.13	$452,306.46	$889,406.95	$6,687,020.49	$449,951.34
2023**	$63,648,929.90	$59,192,959.07	$58,891,633.94	$301,325.13	$694,159.03	$3,761,811.80	$192,375.34
State Totals	**$770,191,951.04**	**$534,395,722.28**	**$508,465,941.72**	**$25,929,780.56**	**$77,057,520.14**	**$158,738,708.62**	**$23,490,551.74**

*2015 figures will be adjusted each year as SL-6(T) BMPs that were obligated under the 100% SL-6 funding programs are completed. Significant funding from FY 2016-2022 was transferred to FYs 2013, 2014, and 2015 to cover 100% SL-6s.

**2023 figures do not include approved BMPs carried forward into FY 2024 that are awaiting completion.

There are certain BMPs that are allowed to be implemented over more than one program year (July through June). Certain agronomic practices require actions to be taken in the spring and the fall to be deemed complete. Structural practices may be delayed by material or contractor shortages. The VACS Agricultural Program Manual allows up to four program years for practices to be fully implemented and only under certain conditions. For FY 2023, there are a significant number of carryover practices, reflecting the increasing workload for contractors and the increased demand for materials (Table 2.2).

Table 2.2: Cost of Approved Carryover Practices by Fiscal Year

Program Year	Approved Carryover Remaining
2019	$35,901.78
2020	$829,700.38
2021	$4,391,422.00
2022	$16,001,310.33
2023	$41,236,953.14
State Totals	**$62,792,128.72**

Conservation Reserve Enhancement Program

The Virginia CREP is divided into two regions. The Chesapeake Bay CREP targets Virginia's entire portion of the Chesapeake Bay watershed and is aiming to restore 22,000 acres of riparian buffers and filter strips and 3,000 acres of wetlands. The Southern Rivers CREP aims to restore 13,500 acres of riparian buffers and filter strips and 1,500 acres of wetland restoration. A summary of Virginia CREP cost-share assistance to farmers during the period from July 2000 to June 2023 is provided in the following table (Table 2.3).

Table 2.3: CREP Summary FY 2001-2023 by Drainage by Fiscal Year

Drainage	Fiscal Year	Total Cost Share Payment	Area Buffer Restored (acres)	Miles Stream Bank Protected
Chesapeake Bay	2001	$321,247.50	1325.90	50.76
Chesapeake Bay	2002	$1,462,116.90	5032.10	258.35
Chesapeake Bay	2003	$602,270.38	1716.10	164.05
Chesapeake Bay	2004	$331,743.07	1965.40	101.30
Chesapeake Bay	2005	$219,240.64	1130.50	77.93
Chesapeake Bay	2006	$237,156.47	1609.94	84.79
Chesapeake Bay	2007	$228,218.64	545.20	50.10
Chesapeake Bay	2008	$354,493.72	1468.04	94.66
Chesapeake Bay	2009	$467,225.79	1411.70	97.53
Chesapeake Bay	2010	$646,097.21	1580.80	81.54
Chesapeake Bay	2011	$444,625.29	575.50	50.67
Chesapeake Bay	2012	$477,040.35	442.00	51.81
Chesapeake Bay	2013	$129,214.22	159.00	11.65
Chesapeake Bay	2014	$115,096.92	176.90	6.94
Chesapeake Bay	2015	$115,683.77	99.40	12.78
Chesapeake Bay	2016	$415,908.36	199.74	23.14
Chesapeake Bay	2017	$438,476.05	133.03	22.02
Chesapeake Bay	2018	$127,888.28	75.03	16.09
Chesapeake Bay	2019	$39,049.75	21.53	2.92
Chesapeake Bay	2021	$35,792.35	20.04	3.34
Chesapeake Bay	2022	$2,184.83	1.90	0.17
Chesapeake Bay**	2023	$0.00	0.00	0.00
Chesapeake Bay Totals:		**$7,210,770.49**	**19,689.75**	**1,262.54**
Southern Rivers	2001	$275,966.34	606.80	41.98
Southern Rivers	2002	$1,011,454.63	2638.90	184.75
Southern Rivers	2003	$381,269.67	1964.40	102.79
Southern Rivers	2004	$391,879.34	1666.00	124.33
Southern Rivers	2005	$346,378.31	2207.90	145.18
Southern Rivers	2006	$226,412.45	1519.36	121.46
Southern Rivers	2007	$195,951.05	541.50	153.77
Southern Rivers	2008	$267,733.17	845.30	203.61
Southern Rivers	2009	$250,768.21	1787.96	98.33
Southern Rivers	2010	$388,281.49	481.00	42.73
Southern Rivers	2011	$343,089.67	295.70	28.56
Southern Rivers	2012	$405,606.84	535.10	33.90
Southern Rivers	2013	$271,355.39	516.18	23.69
Southern Rivers	2014	$244,332.22	151.80	28.69
Southern Rivers	2015	$314,990.14	228.10	28.78
Southern Rivers	2016	$670,504.24	225.90	30.29
Southern Rivers	2017	$624,115.05	247.81	31.41
Southern Rivers	2018	$289,739.91	87.58	21.94
Southern Rivers	2019	$144,444.82	64.84	10.91

Southern Rivers***	2020	$81,096.27	16.87	2.54
Southern Rivers	2021	$336,562.17	107.16	19.60
Southern Rivers	2022	$287,765.56	301.92	15.05
Southern Rivers	2023	$64,819.81	10.90	1.82
Southern Rivers Totals:		**$7,814,516.75**	**17,048.98**	**1,496.11**
Statewide Totals:		**$15,025,287.24**	**36,738.73**	**2,758.65**

*Prior years' figures are adjusted each year as CREP practices that were previously obligated are completed.

**While there are no completed CREP practices in the Chesapeake Bay drainage area in 2023, there are currently 19 projects that are being carried over to FY 2024 with an estimated cost of $126,747.

***Due to the delay in restarting the CREP Program 2020 signups were significantly lower than in previous years; there were no completed BMPs in the Chesapeake Bay drainage for the year 2020.

Strategic Water Quality Initiatives

Resource Management Plans

The Commonwealth's Resource Management Plan (RMP) Program provides a voluntary way to promote the use of BMPs that improve water quality and agricultural operations. RMPs are designed to encourage producers to implement a high level of BMPs to reduce pollution and, in many instances, to increase the producer's profitability, in many instances. By participating in the RMP Program and fully implementing an RMP, the producer is considered to be in compliance with any new state nutrient, sediment, and water quality standards for a period of nine years. As of June 30, 2023, 202 RMPs, including over 49,000 acres, have been certified as fully implemented. Additionally, 362 RMPs, including nearly 68,750 acres, are included in an RMP that is currently being implemented (*i.e.*, not yet certified). The certified RMPs within the Chesapeake Bay watershed include over 48,000 acres. Nearly 60,000 additional acres within the Chesapeake Bay watershed are included in an RMP that is currently being implemented. There are nearly 6,000 acres outside of the Chesapeake Bay watershed that are certified and approximately 7,000 acres are included in an RMP that is currently being implemented. Many of the RMPs currently being developed or certified are incentivized through the direct pay initiative DCR began in FY 2021. This successful initiative does not require RMP developers to respond to a Request for Applications (RFA) but instead provides payment for RMP development on a first-come, first-served basis until available funding has been obligated.

Beginning in April 2021, and utilizing Most Effected Basin (MEB) funds provided by EPA, the Department incentivized RMP development and certification in identified basins, including the Bay portion of the Eastern Shore and Great Wicomico in the Northern Neck. Twenty RMPs were written and certified as implemented through this special project, covering just over 6,000 acres. Engineered erosion projects were completed this year in the Northern Neck, resulting in 3 more certified RMPs covering just more than 800 acres.

Livestock Stream Exclusion in Virginia

Starting in FY 2020, the VACS stream exclusion options were widely expanded, giving farmers a variety of cost-share options including continued funding for up to 100% of the practice cost based upon buffer width and contract lifespan (*i.e.*, 5 to 15 years). Wide width buffers greater than or equal to 35 feet also

receive a per-acre buffer payment to incentivize these most effective practices. The wide variety of options and buffer payment has led to increased farmer sign-ups. In FY 2022, a portable stream fencing practice became eligible for state cost share for the first time.

Begun as a pilot program in FY 2021, the Small Herd Initiative provides cost-share funding to small producers that choose to implement one of the VACS livestock stream exclusion practices. In FY 2023, $7 million was provided in the state budget for this Initiative, enabling the pilot to be expanded statewide. This Initiative is for producers who meet all the VACS eligibility requirements and who manage between 20-49 bovines. Producers are eligible to receive up to 100% of the cost of the practice, up to $50,000.

Whole Farm Approach Pilot Project

DCR, with approval from the VSWCB, developed a Whole Farm Approach (WFA) pilot project that began in 2019 in one SWCD. This pilot allows a farmer to submit a single cost share application for a bundle of agricultural BMPs, including their choice of nutrient management, precision nutrient management, and cover crop practices; this significantly simplifies the process for the producer. This pilot has increased producer participation and provides information on all the BMPs implemented or installed on the agricultural operation, not just information on the BMPs funded by WFA. The WFA was slightly expanded in FY 2021 to include the Chesapeake Bay watershed portion of the Eastern Shore. In FY 2023, the WFA was expanded to include seven SWCDs: Eastern Shore (Accomack and Northampton counties), Halifax (Halifax County), Holston River (Washington County), New River (Carroll and Grayson counties and the City of Galax), Shenandoah Valley (Rockingham County), Tidewater (Gloucester, Mathews, and Middlesex counties), and Three Rivers (Essex, King and Queen, and King William counties). This very successful pilot will be further expanded in FY 2024 to include an additional five SWCDs.

Increased Tax Credit

Actions taken during the 2021 Special Session I (HB 1763 and SB 1162) both increased the tax credit amount a producer is eligible to claim for implementation or installing a BMP and created an enhanced tax credit for the implementation of agricultural BMPs that are part of an approved RMP. The credit allows for a 50% tax credit (up to a $50,000 cap) per entity for agricultural BMPs implemented on acreage included in a SWCD-approved RMP. For BMPs not included in an RMP, the producer is eligible to claim 25% (up to $25,000) of the total out-of-pocket expense of the implementation and installation of the BMP. The Virginia Department of Taxation administers an annual cap on these credits of $2 million (for all participants). This additional financial incentive may encourage more producers to implement RMPs on their operations.

DCR continues to work on ways to better track and encourage reporting of voluntary BMPs. Since January 1, 2021, approximately $1.8 million in tax credits have been approved by the SWCDs for producers; these practices are tracked and reported, if needed, in the same manner as BMPs implemented using VACS cost-share funds.

Additional actions taken during the 2021 Special Session 1 (Chapter 272) increased the tax credit available to producers who purchased or upgraded conservation tillage and precision application equipment. The tax credit increased from $3,750 or $4,000 to $17,500 for eligible equipment. The

VSWCB establishes the parameters for what equipment or upgrades are eligible for the tax credit. Purchasing or upgrading these types of equipment are significant financial investments for producers. The increased amount of tax credits now available recognizes these investments and incentivizes the purchase of equipment that increases soil health and assists with applying the appropriate levels of fertilizer.

Updates to the Virginia Nutrient Management Training and Certification Program

The Virginia Nutrient Management Training and Certification Program (NMTC) has been certifying qualifying individuals to prepare nutrient management plans since 1996. In FY 2023, DCR took actions to better integrate technology into the Program with the goal of reaching a broader audience of individuals interested in being certified to prepare nutrient management plans. These actions included: setting up online registration for the training classes attached to the certification process; streamlining and branding required forms for both planner certification and plan reporting; providing the forms on the DCR website, as well as allowing the forms to be completed electronically. Additionally, the Program has assisted the State of Delaware in offering its nutrient management certification exam online. These are significant advances in collecting accurate and detailed data from certified nutrient management planners and making the certification process more user friendly to those who wish to become certified.

Virginia Conservation Assistance Program

The Virginia Conservation Assistance Program (VCAP) was established to assist the Commonwealth in meeting its reduction targets for urban and residential areas as established in the Chesapeake Bay TMDL, including localities with Municipal Separate Storm Sewer Systems (MS4). VCAP provides cost-share and technical assistance to address natural resource and stormwater concerns by assisting in the voluntary installation of certain BMPs on land for which there is no other cost-share program assistance available. VCAP is also intended to retrofit existing infrastructure.

The VASWCD administers VCAP. Virginia's SWCDs, with qualified, trained, and experienced staff, implement the voluntary stormwater BMPs and cost-share program for public, private, and non-profit landowners. Since March 2016, $6,261,379 has been allocated through VCAP and $492,400 has been provided for technical assistance. Projects have been completed across a wide variety of properties, with the support of partner agencies, educators, and contractors. Most practices are eligible for 75% cost share and some practices provide a flat incentive payment up to the cost of installation.

In FY 2023, $4 million was provided in the state budget for VCAP. A minimum of 25 percent of the funding provided must be used in low-income geographic areas. VASWCD continues to work with the VCAP Steering Committee to develop and implement strategies to reach applicants in low-income geographic areas. A pilot project is underway that will allow payment of certain BMP costs upfront in order to offset an applicant's out-of-pocket expenses, as well as encourage more contractors to participate in the Program. Additional outreach events to encourage projects located on community properties, such as churches, community meeting facilities, and schools, are also underway.

Increased Marketing and Outreach Efforts to Small Farms and Minority Producers

In FY 2022, DCR and Virginia State University – Small Farms Outreach Program (SFOP) established a partnership to increase the awareness of smaller acreage producers and minority producers of the

opportunities available from DCR and SWCDs. As part of this partnership, a survey was conducted of producers to determine how many producers were aware of both state and federal cost-share programs. A large majority of the producers surveyed were unaware of VACS and the other programs offered such as nutrient management planning. As a first step towards addressing this, SWCDs were required to conduct an outreach event, and invite SFOP to participate, as one of their grant deliverables for FY 2023. For many SWCDs, conducting outreach events is a routine part of assisting producers; however, there are many SWCDs that do not have a robust outreach program. This grant deliverable was continued in FY 2024 as well.

Coordinating with DCR, SFOP conducted four small farm events in late spring 2023. These events encouraged producers to discuss what BMPs and management techniques have worked well for their operations, rather than having resource agencies lead the discussion. DCR has dramatically increased its outreach activities. DCR staff has attended Virginia's Ag Expo, agricultural organization conferences (such as the Virginia Beef Expo and Virginia Dairy Expo), Women in Agriculture conference, and Virginia's State Fair in addition to others. This direct contact with producers and partners led to enhanced awareness and participation in VACS with more than 705 new participants in the PY 2023 as well as expanded interest in other agriculture programs. DCR continues to seek opportunities to increase market penetration and participation in all of its agricultural programs.

Increased Training Efforts

DCR, working with the VASWCD, has continued to offer and expand the training offered to SWCDs and other partners. Both in-person and virtual trainings and informational sessions are routinely offered. DCR has prioritized providing the courses required for individuals to become certified conservation planners; all required courses to achieve certification will be offered during calendar year 2023.

Continued trainings have been offered on the revisions to the VACS Program as well as trainings for individual BMPs. Sessions on best practices for engineered BMPs have been routinely offered as well.

A unique training opportunity was provided for DCR, SWCDs, VASWCD, Cooperative Extension, NRCS, SFOP, and other partners earlier this year. In a round-robin format, each entity provided a general overview of its key programs and priorities. This training was especially valuable for new staff at all participant organizations.

WQIF Point Source Program

Since 1998, 101 point source WQIF grant agreements obligating $1.03 billion have been signed. The construction project grants range from 35% to 95% cost-share for design and installation of nutrient reduction technology at Chesapeake Bay watershed point source discharges. The WQIF point source grants provide critical support for compliance with the nutrient discharge control regulations and achieving Chesapeake Bay nitrogen and phosphorus waste load allocations. Ninety-two of the projects have been completed and are operational.

Since its formation in 1998, the WQIF Point Source Program has received a total of $1.067 billion in appropriations, bond proceeds, monetary assessments, and accrued interest. Part of that total was in the General Assembly's most recent WQIF point source commitment in FY 2020; authorization was given

for up to $100 million in bonds to be issued to support point source nutrient reduction projects in the Chesapeake Bay watershed. Approximately $95.3 million of the $1.0595 billion total funding was used for 24 grants prior to the adoption of nutrient discharge control regulations in late 2005. A total of $4.01 million was awarded for 39 technical assistance grants, including Basis of Design Reports, Interim Optimization Plans, and startup support for the Nutrient Credit Exchange Association; all have been completed. In 2011, $3 million was set aside for the James River Chlorophyll Study, which has been completed with revised water quality criteria and assessment methods adopted by the State Water Control Board on June 27, 2019. EPA subsequently approved the new criteria, and they became effective on January 6, 2020. A relatively small balance of WQIF funds remained after the James River Study ended and were targeted for the Virginia Institute of Marine Sciences (VIMS) for modeling work for the James River. The model has been used, with updated climate change factors, to evaluate point source nutrient reduction scenarios and chlorophyll criteria attainment and is the basis of revised wasteload allocations being considered for selected significant discharges in the James River basin.

The balance of the WQIF grants have been awarded for the design and installation of nutrient reduction technology needed to meet the total nitrogen and total phosphorus waste load allocations assigned to the significant dischargers in the Chesapeake Bay watershed under the EPA–adopted Chesapeake Bay TMDL. As of June 30, 2023, the grant amount owed under existing, signed WQIF agreements was $131,458,341.

It should be noted that all grantees are obligated to complete their projects regardless of the amount of grant funds received. The Commonwealth commits to fully funding all projects, subject to the availability of funds.

Legislation enacted following the 2019 General Assembly session added the design and installation of certain wastewater conveyance infrastructure as an eligible project type for WQIF point source funding provided certain conditions established in the *Code of Virginia* are satisfied. DEQ drafted guidance for evaluating and implementing those projects with stakeholder input and provided the guidance for a 30-day public review period. No comments were received, and the guidance became effective on August 15, 2021.

WQIF & Virginia Natural Resources Commitment Fund Nutrient Reductions

Estimated Nutrient Reductions from Nonpoint Source WQIF-Funded Projects

During FY 2023, WQIF and VNRCF funding supported agricultural BMPs that are expected to reduce edge of field nutrient and sediment losses by approximately 11.5 million pounds of nitrogen, 3.94 million pounds of phosphorus, and 1,000,000 tons of sediment (Table 2.4). CREP implementation is included in the above reductions. A table of nutrient and sediment reductions resulting from the implementation of agricultural BMPs is provided below.

Table 2.4: Historic Edge of Field Nutrient/Sediment Reductions Resulting from Agricultural BMP Implementation by Fiscal Year – State Funding Only

Program Year	Actual BMP Cost	Total Cost-Share Paid	State Cost-Share Paid
1998	$6,578,361.37	$4,085,435.66	$3,147,431.74
1999	$5,914,553.56	$4,438,993.05	$4,027,564.92
2000	$13,657,918.11	$8,301,893.63	$8,241,147.70
2001	$15,853,406.58	$7,850,195.91	$6,526,498.00
2002	$23,087,719.72	$8,332,302.53	$6,574,669.62
2003	$13,719,527.33	$3,188,213.34	$2,355,360.91
2004	$10,016,920.07	$2,771,069.24	$2,391,617.08
2005	$11,220,639.44	$4,317,587.05	$3,681,507.66
2006	$19,293,786.17	$9,591,063.03	$8,849,243.92
2007	$24,497,548.48	$15,208,729.37	$14,170,526.24
2008	$24,399,169.67	$13,892,012.86	$12,851,741.10
2009	$31,350,056.35	$16,068,967.68	$15,211,981.85
2010	$36,615,674.26	$23,173,103.26	$22,208,726.43
2011	$17,658,621.05	$10,691,395.59	$10,243,464.57
2012	$32,119,243.94	$21,467,712.08	$21,261,749.33
2013	$36,904,472.76	$28,039,751.62	$27,718,830.78
2014	$39,761,200.98	$30,736,978.26	$28,732,795.53
2015*	$78,400,828.68	$66,257,156.62	$62,491,498.14
2016	$17,067,019.82	$10,284,552.33	$9,918,670.07
2017	$27,597,218.62	$18,227,488.89	$17,637,165.93
2018	$31,936,655.73	$17,734,464.21	$14,731,908.68
2019	$28,972,012.28	$19,022,754.54	$17,740,186.69
2020	$60,733,349.69	$49,594,173.99	$48,155,172.68
2021	$46,708,074.45	$37,024,153.88	$36,254,540.08
2022	$52,479,042.03	$44,902,614.59	$44,450,308.13
2023**	$63,648,929.90	$59,192,959.07	$58,891,633.94
State Totals	**$770,191,951.04**	**$534,395,722.28**	**$508,465,941.72**

*2015 figures will be adjusted each year SL-6(T) BMPs that were obligated under the 100% SL-6 funding program are completed

**2023 figures do not include approved BMPs carried forward into FY 2024 that are awaiting completion

***Total N and P Reduction numbers now include estimates for Nutrient Management BMPs

Estimated Nutrient Reductions from Point Source WQIF-Funded Projects

To date, 69 of the 78 construction projects with signed grant agreements after 2007 for the installation of nutrient reduction technology have initiated operation. With these projects coming on-line, annual nutrient loads discharged from wastewater plants in the Chesapeake Bay watershed have declined dramatically. From 2009 to 2022, annual nitrogen discharges were reduced by about 10,896,178 pounds; phosphorus annual loads were reduced by almost 694,602 pounds, exceeding the milestone commitments set in Virginia's WIP for both nutrients. Because of these ongoing nutrient control upgrades and facilities operating below their design capacity, point source loads continue to be below the allocations called for in the WIP and TMDL.

Chapter 3 - Water Quality Improvement Fund Requests Estimates Report

The Water Quality Improvement Fund (WQIF) is a special permanent, nonreverting fund established to provide Water Quality Improvement Grants in accordance with the provisions of the Virginia Water Quality Improvement Act of 1997. In accordance with § 10.1-2134.1 of the Code of Virginia, DEQ in consultation with stakeholders, including representatives of the Virginia Association of Municipal Wastewater Agencies (VAMWA), local governments, and conservation organizations, is required to annually determine an estimate of the amount of Water Quality Improvement grant funding expected to be requested by local governments for projects that are related to point source pollution and are eligible for grant funding. For FY 2024 to 2028, an estimate of $3 billion may be required from state funds, as well as locality financial contributions to meet water quality goals. Approximately 42% of this total ($1.274 billion) could be needed from the WQIF (see Figure 3.1 and Table 3.2).

In addition to the WQIF funding needs reported in this year's needs assessment, it is important to note the current state of the fund (see Table 3.1). The unobligated WQIF fund balance totals approximately $33 million. There are ten active grant agreements and eleven funding applications under evaluation. Of the eleven applications currently under review, seven did not report to the needs survey. Their impact to the fund is listed in the table below in "WQIF Application Future Obligations."

Table 3.1: Current WQIF Account Balance

Unobligated WQIF balance	$33 million
WQIF Application Future Obligations (based on estimated grant amounts in applications)	($74 million)
WQIF Additional Future Obligations (based on estimated grant amounts in the needs survey)	($1.274 billion)
Current Estimated WQIF Shortfall	**($1.315 billion)**

Utilizing the WQIF funding needs reported in this year's needs assessment and estimated grant amounts from current applications not represented in the needs assessment, the estimated shortfall for WQIF point source projects for FY 2024 through FY 2028 is $1.315 billion (see Table 3.1).

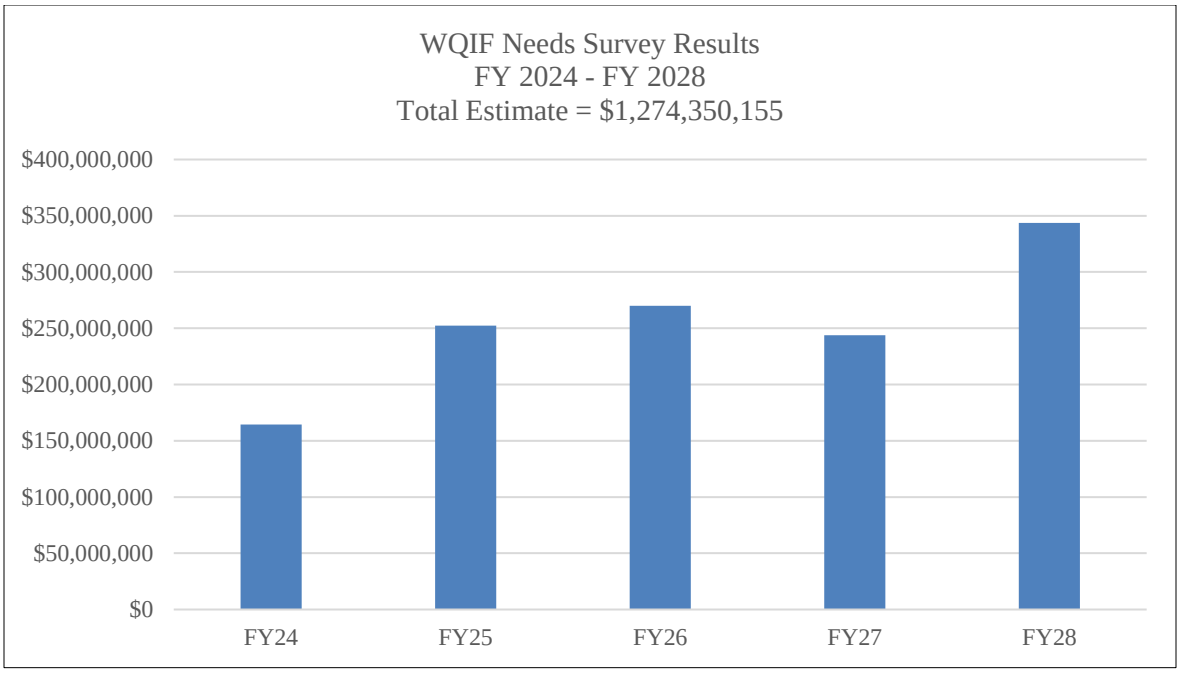

Figure 3.1: WQIF Needs Survey Results (FY 2024 - FY 2028)

The methodology for estimating the amount of WQIF grant funding expected to be requested by local governments was established by DEQ in consultation with wastewater stakeholders from VAMWA. An electronic survey was created in consultation with stakeholders and distributed to significant dischargers in the Chesapeake Bay watershed. The survey requested: 1) general information, 2) programmatic information, and 3) total project cost with no time horizon. General information included facility name and contact information. Programmatic information was requested on future WQIF funding needs over a five-year time horizon (FY 2024 to FY 2028). This timeframe was selected because it generally aligns with the time horizons of typical Capital Improvement Plans. Total estimated project costs were also requested with no specified time horizon. This amount is assumed to include costs needed for the entire project beyond FY 2028. The survey format will remain consistent for next year to allow for multi-year comparisons, with updated questions relating overall need to new regulatory changes.

A total of 21 survey responses from 10 prospective grantees were received identifying a programmatic funding need over the five-year time horizon and total project costs. Programmatic funding need amounts were then multiplied by the estimated eligible grant percentage for each survey respondent to determine the WQIF-eligible funding need. The grant percentage from a previous WQIF grant or current application for each locality was utilized for the calculation. Total estimated project costs were also multiplied by the estimated eligible grant percentage for each locality to determine the total WQIF-eligible funding need.

The eligible project costs for those anticipating requesting WQIF funds total $1,707,933,726 through FY 2028. Based on the estimated eligible grant percentage for each respondent, the amount of programmatic WQIF point source funding needed through FY 2028 is $1,274,350,155 (see Figure 3.1 and Table 3.2). The following is a breakdown of WQIF point source funding need by fiscal year:

FY 2024 – $164,342,164
FY 2025 – $252,379,395
FY 2026 – $270,041,871
FY 2027 – $243,866,943
FY 2028 – $343,719,782

These amounts include estimated WQIF funding needed for facilities to complete projects necessary to meet permit limits under the Enhanced Nutrient Removal Certainty (ENRC) Program established in § 62.1-44.19:14 of the *Code of Virginia* (2021 Special Session I Va. Acts Chs. 363 and 364 and amended by 2022 Session Va. Acts Chs. 127 and 128). WQIF funding needs identified for ENRC Program projects total $1,228,290,656 through FY 2028.

Table 3.2: 2023 WQIF Needs Survey Results

WQIF Grants	2024	2025-2026 Biennium		2027-2028 Biennium		Total Need (2024 – 2028)
	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	
Applicant	$164,342,164	$252,379,395	$270,041,871	$243,866,943	$343,719,782	$1,274,350,155
TOTALS	**$164,342,164**	**$522,421,266**		**$587,586,725**		**$1,274,350,155**

The total estimated project costs identified by survey respondents both within and beyond the FY 2024 to FY 2028 time horizon total $3,014,375,279 (Table 3.3). Of that total, the amount of WQIF-eligible project costs is estimated to be $1,711,783,735. Based on the estimated eligible grant percentage for each survey respondent, the amount of WQIF point source funding needed with no specified time horizon totals $1,278,257,662. The portion of WQIF point source funding needed for ENRC Program projects with no specified time horizon totals $1,235,985,663.

Table 3.3: 2023 WQIF Needs Survey Results – Total Project Costs (no time horizon)

Estimated Total Project Costs	WQIF-Eligible Project Costs	Estimated Eligible Grant Amount
$3,014,375,279	$1,711,783,735	$1,278,257,662

Chapter 4 - Stormwater Local Assistance Fund (SLAF) Requests Estimates Report

The purpose of the Stormwater Local Assistance Fund (SLAF) is to provide matching grants to local governments for the planning, design, and implementation of stormwater best management practices and for nonpoint source nutrient credit purchases. In accordance with § 62.1-44.15:29.2 of the *Code of Virginia* DEQ in consultation with stakeholders, including representatives of the Virginia Municipal Stormwater Association (VAMSA), local governments, and conservation organizations, is required to annually determine an estimate of the amount of stormwater local assistance matching grants expected to be requested by local governments for projects that are related to planning, designing, and implementing stormwater best management practices (BMPs) and nonpoint source nutrient credit purchases that are eligible for funding from the SLAF. For FY 2024 to 2028, it is estimated that approximately $132 million could be requested from the SLAF program (see Figure 4.1). Because the SLAF is a matching grant program, this total represents up to 50% of the total funds expended on stormwater BMPs and nonpoint source nutrient credit purchases, with the other portion being made up by financial contributions from localities.

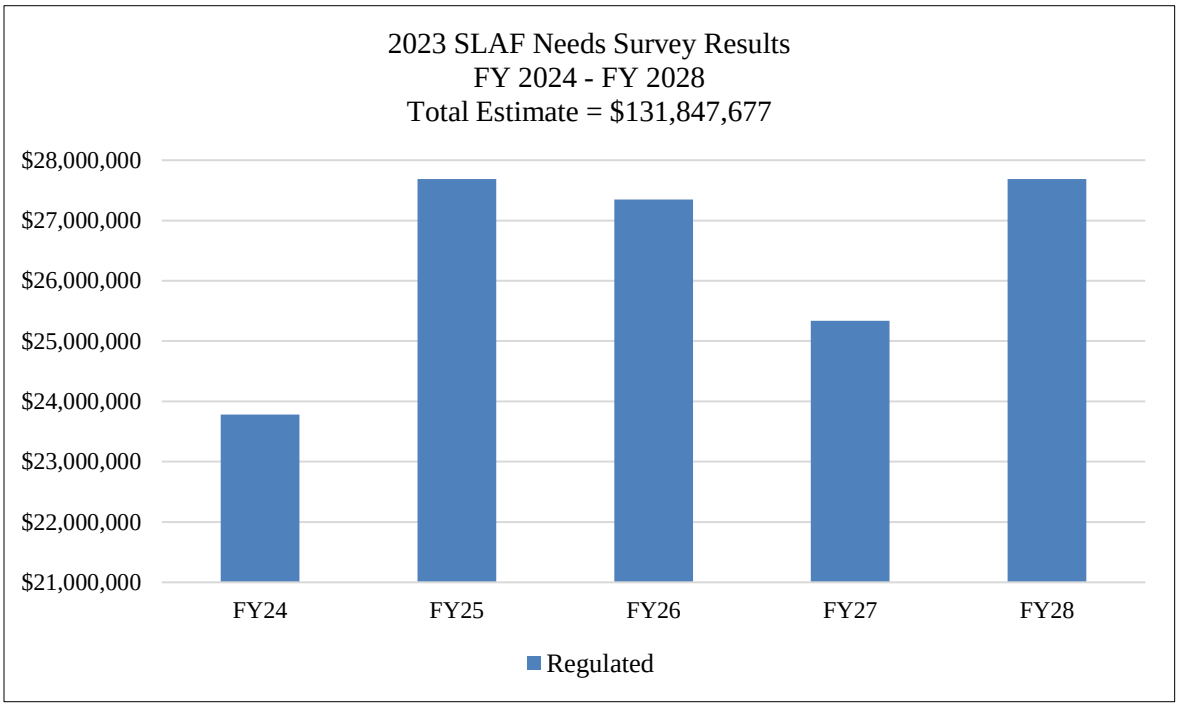

Figure 4.1: 2023 SLAF Needs Survey Results (FY 2024 – FY 2028)

The methodology for estimating the amount of stormwater local assistance matching grants expected to be requested by local governments was established by DEQ in consultation with stormwater stakeholders, including VAMSA, Virginia Municipal League (VML), Virginia Association of Counties (VACO), Chesapeake Bay Foundation (CBF), Northern Virginia Regional Commission (NVRC), Hampton Roads Planning District Commission (HRPDC) and the James River Association (JRA). An electronic survey was created in consultation with these stakeholders and distributed to localities. The survey requested: 1)

general, 2) programmatic, and 3) project specific information from localities. General information included the locality name and contact information. Programmatic information was requested on future SLAF funding needs over a five-year time horizon (FY 2024 to FY 2028). This timeframe was selected because it generally aligns with the time horizons of typical local Capital Improvement Plans (CIP) and Municipal Separate Storm Sewer System (MS4) Permit TMDL Action Plans. Project-specific information supporting the FY 2024 SLAF funding need was requested based on the assumption that planning or design information would be available for projects that are likely to be the subject of an FY 2024 SLAF grant application.

A total of nine complete responses to the survey were received. All nine localities identified a programmatic funding need over the five-year time horizon. Responses from seven of those localities identified project-specific funding needs for FY 2024. Of the survey respondents that identified a programmatic need, all are regulated as MS4s.

The total amount of SLAF funding needed through FY 2028 to fully fund all needs identified in the survey is $131,847,677 (see Table 4.1). The following is a breakdown of funding need by fiscal year:

FY 2024 – $23,784,000
FY 2025 – $27,688,949
FY 2026 – $27,347,125
FY 2027 – $25,337,750
FY 2028 – $27,689,853

Table 4.1: 2023 SLAF Needs Survey Results

Applicant	FY 2024	2025-2026 Biennium		2027-2028 Biennium		Total Need
	FY 2024*	FY 2025	FY 2026	FY 2027	FY 2028	
Regulated	$23,784,000	$27,688,949	$27,347,125	$25,337,750	$27,689,853	$131,847,677
Unregulated	$0	$0	$0	$0	$0	$0
FY Totals	$23,784,000	$27,688,949	$27,347,125	$25,337,750	$27,689,853	$131,847,677
TOTALS	**$23,784,000**	**$55,036,074**		**$53,027,603**		**$131,847,677**

*Need amount for FY 2024 was taken from FY 2024 programmatic data.

For the FY 2024 funding need, two localities either did not provide project-specific data or provided programmatic and project-specific data that were inconsistent. The total funding need of regulated localities for FY 2024, when calculated based on the FY 2024 input in the project-specific section, is $20,619,000. Using programmatic data, the total FY 2024 need is $23,784,000. Because the programmatic data for regulated localities represents the most complete data set, this figure was used to determine the anticipated total need for FY 2024 of $23,784,000.

The survey format will remain consistent for next year to allow for multi-year comparisons, with updated questions relating overall need to new regulatory changes.

Chapter 5 - Annual Funding Needs for Effective Implementation of Agricultural Best Management Practices

In accordance with subsection C of § 10.1-2128.1 of the Water Quality Improvement Act, the Department of Conservation and Recreation (DCR), in consultation with a stakeholder advisory group (SAG), including representatives of the agricultural community, the conservation community, and the Soil and Water Conservation Districts (SWCDs or Districts), determines the funding needs for effective SWCD technical assistance and implementation of agricultural best management practices (BMPs). Pursuant to § 2.2-1504 of the *Code of Virginia*, DCR must provide to the Governor the annual funding amount needed for each year of the ensuing biennial period. For Fiscal Years (FY) 2023-2030 a revised estimate of over $2.7 billion may be required from state and federal funds as well as farmer financial contributions to meet water quality goals (Figure 1 and Table 1). Approximately 38.5% of this total (slightly over $1.0 billion) could be needed from State sources, the vast majority of which is direct funding of the Virginia Agricultural Cost-Share (VACS) Program and support for SWCDs that implement the VACS program.

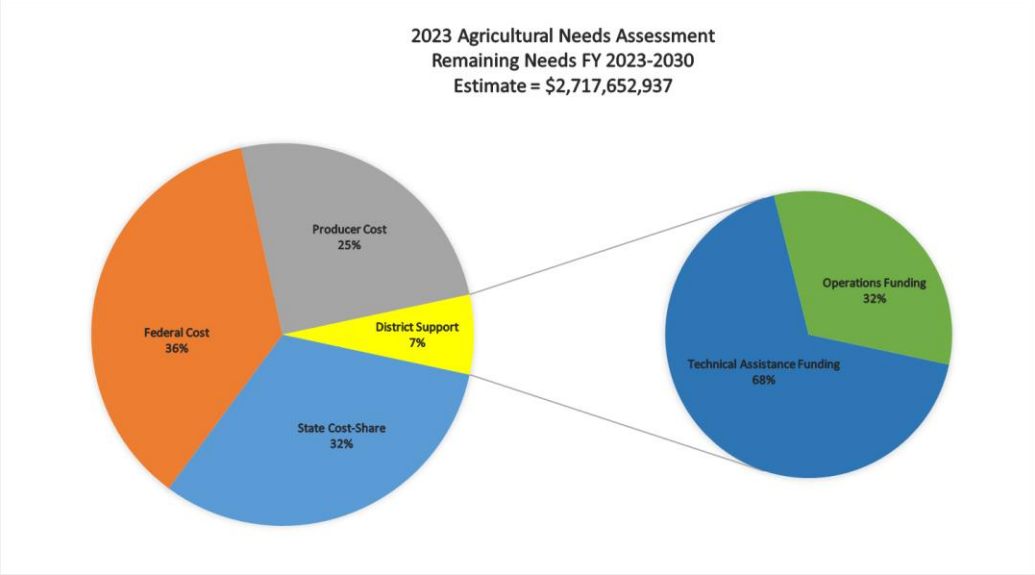

Figure 1: 2023 Agricultural Needs Assessment Summary[8]

Virginia's Phase 3 Chesapeake Bay Total Maximum Daily Load (TMDL) Watershed Implementation Plan (WIP III) was finalized on August 23, 2019. The methodology for the Agricultural Needs Assessment was

[8]The pie chart reflects progress made against the WIP commitment from FY2021.

revised in 2020 to accurately reflect the commitments made by Virginia in WIP III. Although Virginia made excellent progress towards the 2025 nutrient reduction goals as of the FY 2022 progress report, significant investments in agricultural BMP implementation continue to be needed, most notably for nutrient management on cropland, cover crops, animal waste storage, poultry litter transport, conservation planning, including Resource Management Plans, both grass and forested riparian buffers, and additional livestock stream exclusion. Using BMP cost data from Virginia and where BMP data was lacking in Virginia, from the Chesapeake Bay Program (CBP), the following table shows the revised funding needs for agricultural BMP implementation. These funding needs are based on Commonwealth-specific estimated costs and Commonwealth-specific BMP standards and specifications.

For the Southern Rivers areas, the needs assessment is based on the Chesapeake Bay annual cost estimates and a revised split of 70% to the Chesapeake Bay watershed and 30% to lands outside of the Chesapeake Bay watershed (the Southern Rivers watershed). Recognizing that implementation in the Southern Rivers is not affected by the 2025 deadline associated with the Chesapeake Bay TMDL, the comparison showed that using the revised 70/30 split as an approximation of the long-term Southern Rivers implementation needs is sufficient. As additional TMDL implementation plans are developed in the Southern Rivers area, this analysis will be reevaluated.

The total annual implementation costs are then divided between the various funding sources: federal (35% [assumed]), state (40%) and agricultural producer (25%). In developing the 2023 Agricultural Needs Assessment, the Agricultural Needs Assessment Workgroup held significant discussion and raised concerns about the divisions between the funding sources. While the 2023 Assessment continues to assume 35% of the necessary funding will be provided from federal sources, recent federal funding appropriations indicate that this estimate may be too high. In 2022, there was nearly a $92.7 million shortfall between the estimated need from federal sources and the federal funding received. The Workgroup discussed reducing the percentage of funding that is received from federal sources or including the “gap” between the estimated need and the actual funding received in the state’s portion of the Assessment. No consensus about how to address this gap was reached by the Workgroup; for this Assessment the federal shortfall is left as a federal responsibility. Table 1 below has been modified to show the calculated federal funding needs for each biennium as well as the federal shortfall. Regardless of federal funding levels, Virginia is responsible for achieving the Chesapeake Bay WIP III goals. With that in mind, future federal funding shortfalls may need to be accounted for at the state level. The Agricultural Needs Assessment for FY 2023 – 2030 uses the VACS Program cost-share payment rates for cover crop and nutrient management practices that were increased in FY 2023 in recognition of the rising costs to implement these practices. DCR used the implementation progress made by Virginia through FY 2022, which has been accepted by EPA’s CBP, to calculate the additional practices needed to fulfill the WIP III Agricultural BMPs and achieve the expected reductions for the agricultural sector.

Costs through June 2022 were not adjusted; however, estimated costs for all remaining agricultural practices needed through FY 2030 were revised as follows:

- The agricultural BMP implementation "delta" between CBP approved FY 2022 progress and the WIP III Agricultural BMPs was determined.
- Remaining implementation costs for each BMP were divided equally among the five years left to the 2027 WIP completion timeline for all practices. The 2027 goal WIP completion date was based on the changes enacted in Chapters 735 and 736 of the 2023 Session Acts of Assembly.

- Practice costs were calculated for all remaining implementation using 2021-2023VACS average costs or the VSWCB-approved increased practice rates where applicable, with an additional 4.93% inflation adjustment based on 2023 projected inflation.
- The actual FY 2023-2024 VACS Program funding received and actual federal 2021 and 2022 funding was documented.
- For years following full implementation of the WIP, post 2027, a 3% annual repair and replacement rate for structural practices was assumed.
- The revised FY 2024 budget included an additional $286.7 million in funding for the cost-share program and technical assistance for SWCDs. This funding reduced the 2025-2026 biennial state funding needs by the same amount.
- The technical assistance funding percentage has been increased from the previous years' versions of the worksheet. The percentage was increased to reflect the percentage amount provided in Chapter 1 of the 2023 General Assembly Acts of Assembly.

Table 1: 2023 Agricultural Needs Assessment – Biennial Needs Summary with All Data

2023 Agricultural Needs Assessment - Biennial Needs Summary with All Data

Estimated Costs			2021-2022 Biennium		2023-2024 Biennium		2025-2026 Biennium		2027-2028 Biennium		2029-2030 Biennium		2031-2032 Biennium	
									2027 Target Year					
2019-2025	FY19 Funding*	FY20 Funding*	FY 21 Funding*	FY 22 Funding*	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
CHESAPEAKE BAY STATE COST SHARE	**$14,384,534**	**$39,486,279**	**$26,466,959**	**$48,860,000**	**$119,545,650**	**$121,713,372**	**$123,881,094**	**$126,048,816**	**$128,216,538**	**$48,460,684**	**$48,460,684**	**$48,460,684**	**$48,460,684**	**$48,460,684**
CHESAPEAKE BAY TECHNICAL ASSISTANCE	**$2,141,348**	**$6,367,656**	**$3,883,068**	**$6,351,800**	**$15,540,935**	**$15,822,738**	**$18,582,164**	**$18,907,322**	**$19,232,481**	**$7,269,103**	**$7,269,103**	**$7,269,103**	**$7,269,103**	**$7,269,103**
CHESAPEAKE BAY PRODUCER PORTION					$74,716,031	$76,070,857	$77,425,684	$78,780,510	$80,135,336	$30,287,928	$30,287,928	$30,287,928	$30,287,928	$30,287,928
CHESAPEAKE BAY FEDERAL PORTION	$15,960,273	$15,401,409	$20,641,081	$22,174,025	$104,602,444	$106,499,200	$108,395,957	$110,292,714	$112,189,470	$42,403,099	$42,403,099	$42,403,099	$42,403,099	$42,403,099
OCB STATE COST SHARE	**$9,613,603**	**$17,608,120**	**$12,697,099**	**$20,940,000**	**$51,233,850**	**$52,162,874**	**$53,091,897**	**$54,020,921**	**$54,949,945**	**$20,768,865**	**$20,768,865**	**$20,768,865**	**$20,768,865**	**$20,768,865**
OCB TECHNICAL ASSISTANCE	**$1,431,125**	**$2,890,794**	**$1,966,931**	**$2,722,200**	**$6,660,401**	**$6,781,174**	**$7,963,785**	**$8,103,138**	**$8,242,492**	**$3,115,330**	**$3,115,330**	**$3,115,330**	**$3,115,330**	**$3,115,330**
OCB PRODUCER PORTION					$32,021,156	$32,601,796	$33,182,436	$33,763,076	$34,343,715	$12,980,540	$12,980,540	$12,980,540	$12,980,540	$12,980,540
OCB FEDERAL PORTION	$18,964,850	$19,008,462	$15,739,229	$23,572,978	$44,829,619	$45,642,514	$46,455,410	$47,268,306	$48,081,202	$18,172,757	$18,172,757	$18,172,757	$18,172,757	$18,172,757
SWCD OPERATIONS FUNDING	**$6,209,091**	**$6,209,091**	**$6,209,091**	**$6,209,091**	**$9,809,091**	**$9,809,091**	**$9,809,091**	**$9,809,091**	**$9,809,091**	**$9,809,091**	**$9,809,091**	**$9,809,091**	**$9,809,091**	**$9,809,091**
	* Actual state and federal funding in FFY19-22 has been updated. Federal projected for 2023 is shown on the NRCS Funding Tab and the federal shortfall in 2023 is shown to the 2023-2024 Funding Gap below.													
TOTALS	$68,704,824	$106,971,811	$87,603,458	$130,830,094	$458,959,176	$467,103,617	$478,787,518	$486,993,893	$495,200,269	$193,267,396	$193,267,396	$193,267,396	$193,267,396	$193,267,396
CS + TA STATE NEEDS	**$27,570,610**	**$66,352,849**	**$45,014,057**	**$78,874,000**	**$192,980,835**	**$196,480,158**	**$203,518,940**	**$207,080,197**	**$210,641,454**	**$79,613,981**	**$79,613,981**	**$79,613,981**	**$79,613,981**	**$79,613,981**

	FY23 VACS Allocated	FY24 VACS Allocated
Bay CS	**$81,404,841**	**$78,644,889**
OCB CS	**$34,889,744**	**$33,704,953**
WFA Set Aside	**$6,639,483**	**$20,000,000**
Bay & OCB TA	**$15,979,030**	**$17,396,050**
Total CS+TA	**$138,913,098**	**$149,745,892**
Admin & OPS	**$9,809,091**	**$9,809,091**
CS + TA Gap	**$54,067,737**	**$46,734,266**

Includes VNRCF deposits and recordation revenue appropriation

NOTE: Does not include FY24 WQIF/VNRCF amendments

2023-2024 Funding Gap		
	State Gap	**$100,802,003**
	2023 Federal Gap	**$92,677,263**
	2024 Federal Need	**$152,141,715**

Revised state cost share and technical assistance (15% of CS starting in 2025) needs and federal funding need will be adjusted annually based on actual budgets and gaps.

2025-2026 State Funding Need	
State Gap	$67,201,335
2025-2026 CS + TA	$410,599,137
2025-2026 State Funding Need	**$477,800,472**
FY24 Amendments	**$286,714,688**
FY25-26 Request	**$181,876,028**

2027-2028 State Funding Need	
State Gap	$33,600,668
2027-2028 CS + TA	$290,255,436
2027-2028 State Funding Need	**$323,856,104**

2029-2030 State Funding Need	
State Gap	$0
2029-2030 CS + TA	$159,227,963
2029-2030 State Funding Need	**$159,227,963**

2031-2032 State Funding Need	
State Gap	$0
2029-2030 CS + TA	$159,227,963
2029-2030 State Funding Need	**$159,227,963**

2025-2026 Federal Need	**$374,197,229**

2027-2028 Federal Need	**$251,738,948**

2029-2030 Federal Need	**$121,151,711**

2030-2031 Federal Need	**$121,151,711**

AG BMP FUNDING NEEDED TO MEET WIP III	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	
CHESAPEAKE BAY CUMULATIVE BMP COST	**$247,176,242**	**$247,176,242**	**$247,176,242**	**$247,176,242**	**$247,176,242**	**$47,786,609**	**$47,786,609**	**$47,786,609**	**$47,786,609**	**$47,786,609**	Bay Total Costs based on 2022
CHESAPEAKE BAY ANNUAL BMP COST	**$51,687,884**	**$57,107,188**	**$62,526,493**	**$67,945,797**	**$73,365,102**	**$73,365,102**	**$73,365,102**	**$73,365,102**	**$73,365,102**	**$73,365,102**	Progress and WIP III calculated in
CHESAPEAKE BAY STATE SHARE 40%	$119,545,650	$121,713,372	$123,881,094	$126,048,816	$128,216,538	$48,460,684	$48,460,684	$48,460,684	$48,460,684	$48,460,684	2023
CHESAPEAKE BAY PRODUCER PORTION 25%	$74,716,031	$76,070,857	$77,425,684	$78,780,510	$80,135,336	$30,287,928	$30,287,928	$30,287,928	$30,287,928	$30,287,928	
CHESAPEAKE BAY FEDERAL PORTION 35%	$104,602,444	$106,499,200	$108,395,957	$110,292,714	$112,189,470	$42,403,099	$42,403,099	$42,403,099	$42,403,099	$42,403,099	
TOTAL OCB BMP COST	**$128,084,625**	**$130,407,184**	**$132,729,743**	**$135,052,302**	**$137,374,862**	**$51,922,162**	**$51,922,162**	**$51,922,162**	**$51,922,162**	**$51,922,162**	Total OCB cost based on
OCB STATE SHARE 40%	$51,233,850	$52,162,874	$53,091,897	$54,020,921	$54,949,945	$20,768,865	$20,768,865	$20,768,865	$20,768,865	$20,768,865	30%/70% WIP need calculated in
OCB PRODUCER PORTION 25%	$32,021,156	$32,601,796	$33,182,436	$33,763,076	$34,343,715	$12,980,540	$12,980,540	$12,980,540	$12,980,540	$12,980,540	2023
OCB FEDERAL PORTION 35%	$44,829,619	$45,642,514	$46,455,410	$47,268,306	$48,081,202	$18,172,757	$18,172,757	$18,172,757	$18,172,757	$18,172,757	

Annual BMPs include cover crops, nutrient management, poultry litter transport

DCR has two Professional Engineers (PE) and three Engineering Specialists to assist SWCDs and farmers. The total cost related to providing these services is part of the DCR budget and therefore has been excluded from the revised agricultural needs assessment.

During the 2020 General Assembly, a base technical assistance amount of $4.55 million was provided to SWCDs as part of the SWCDs' reoccurring base budget. This budget action recognized consistent funding is necessary for SWCDs to adequately provide technical assistance to their agricultural producers. During the 2022 General Assembly Special Session 1, an additional $3.6 million in administration and operational funding was provided to SWCDs. These stable funds will allow SWCDs to hire additional employees, including administrative employees, provide appropriate training for employees, and address increased expenses related to the day-to-day operations.

Chapter 1 of the 2023 General Assembly Acts of Assembly (Appropriation Act) fully funded the agricultural needs assessment developed in 2022. During last year's review of the funding needs, an additional $73.8 million was determined to be needed to offset the impacts of inflation ($65.3 for the implementation of best management practices and $8.5 million for technical assistance funding for Districts). This is reflected as a "State Gap" of $100.8 million in the agricultural needs worksheet. The amended 2023 budget adopted on September 14, 2023 provided $286.7 million in additional funding for the VACS program and technical assistance funding for the SWCDs, fully funding the program for FY2024.

Chapter 6 - 2014 Chesapeake Bay Watershed Agreement Progress Report

State of the Chesapeake Bay Program Report to the Chesapeake Bay Executive Council, August 2023

Pursuant to § 2.2-220.1

The Chesapeake Bay Program (CBP) is a regional partnership that works across state lines to protect and restore the Chesapeake Bay watershed. The partners include the U.S. Environmental Protection Agency, the Chesapeake Bay Commission, the District of Columbia, and all six watershed states. Through the Bay Program, federal, state, and local agencies, non-profit organizations, academic institutions, and citizens come together to secure a brighter future for the Bay region. Learn more at www.chesapeakebay.net.

The CBP is guided by the goals and outcomes of the *Chesapeake Bay Watershed Agreement*. Signed on June 16, 2014, this agreement commits the partners to protecting and restoring the Bay, its tributaries, and the lands that surround them. Our environment is an interconnected system and achieving the goals and outcomes of this agreement will support improvements in the health of the watershed and the people who live here. Track progress toward the *Chesapeake Bay Watershed Agreement* at www.chesapeakeprogress.com.

Completed outcomes include blue crab management and 2017 Watershed Implementation Plans. Outcomes considered to be "on course" include blue crab abundance, fish habitat, forage fish, oysters, fish passage, stream health, water quality standards attainment and monitoring, toxic contaminants research, land use methods and metrics development, land use options evaluation, protected lands, public access site development, sustainable schools, local leadership outcome, and climate monitoring and assessment. Outcomes considered to be "off course" include brook trout, forest buffers, submerged aquatic vegetation, tree canopy, wetlands, 2025 Watershed Implementation Plans, toxic contaminants policy and prevention, diversity, and climate adaptation. Outcomes considered to be "uncertain" include black duck, healthy watersheds, environmental literacy planning, student, and stewardship. More details on these outlooks can be found at https://www.chesapeakeprogress.com/outcome-status.

At this time, it is generally accepted by the partners that the 2025 Bay goals will not be accomplished on schedule. During the October 19, 2023 Chesapeake Executive Council meeting, partners in attendance acknowledged this fact and expressed a desire to continue to work together to make progress. Conversations continue to occur regarding what will happen post 2025. CBP has established a "Beyond 2025 Steering Committee" to address the future direction and goals of the Program.

The Chesapeake Bay watershed is a dynamic ecosystem. Tracking changes in its health over time allows scientists to understand the effects of management actions and progress toward meeting health and restoration goals. The data in this report reflect just some of the conditions that are monitored to better understand the Bay and how to protect and restore it.