

A LAND OF RIVERS

FY 2026 REPORT



Anne Arundel County
Bureau of Watershed
Protection
& Restoration

AARivers.org



A LAND OF RIVERS

FY 2026 REPORT

Dear Anne Arundel County Resident,

In the thirteenth year of our watershed restoration efforts and our fifth and final year into the County's 5-year State-issued stormwater permit, we have made strides to meet, and even exceed in some places, our current clean water goals. Our implementation progress over the past few years has positioned us to comply fully with our current permit, position the County well for our next permit, and to go above and beyond in accelerating the recovery of our local waterways.

The Bureau of Watershed Protection & Restoration (the Bureau), within the Department of Public Works, leads these efforts in its role to provide clean water under its Municipal Separate Storm Sewer System (MS4) permit and the Chesapeake Bay Total Maximum Daily Load (TMDL). To date, the County has completed over 345 restoration projects and over 1,600 stormwater infrastructure projects to preserve our waterways for future generations.

In Fiscal Year 2026, public education and implementation of sustainable infrastructure were continued priorities of the Bureau. In recent years, Anne Arundel County has creatively re-invested local dollars to maximize adaptive management with native wildlife, including pond levelers and tree caging to coexist with beavers - a keystone species in the Chesapeake region. This investment aims to allow native wildlife to heal the environment in the ways they do best, while also allowing humans to continue thriving in the surrounding communities. Additionally, innovative investments in long-term infrastructure protection, such as cured-in-place-pipe (CIPP) and using stream and wetland restoration to protect vulnerable pipe infrastructure from erosion, have proven to save local dollars, minimize disturbance, and optimize environmental benefits.

The Bureau's 2026 Anne Arundel County *A Land of Rivers* report summarizes the watershed protection and restoration actions initiated by the County and our partners during fiscal year 2026 (July 1, 2025 - June 30, 2026). These actions, combined with those from previous years and work by countless community groups and individual residents, will continue to restore our waterways and protect our communities.

In Anne Arundel County, we are inexorably tied to these streams, wetlands, rivers, and the Chesapeake Bay. This *A Land of Rivers* report continues to document the conditions of our waterways, describe solutions and communicate the urgent need to protect our County's waters, and live up to our promise to make Anne Arundel County *The Best Place - For All*.

Sincerely,

Stuart Pittman
County Executive



Watershed Health

Anne Arundel County's residents are inherently connected to local waterways via watersheds. A watershed is the land area that drains into a body of water, and everyone lives in one - find your watershed at aarivers.org. As our County's population continues to grow, our watersheds continue to face greater pressures impacting downstream water quality, such as development activities that disturb sediment, agricultural and lawn care activities that deposit excess nutrients, and poor waste management behaviors that pollute our streams. Nonetheless, access to high-quality waterways continues to draw residents and visitors to Anne Arundel. To ensure access to high-quality waterways downstream for generations to come, a holistic restoration and conservation approach must be applied upstream that engages residents in the process.

The Department of Public Works Bureau of Watershed Protection & Restoration is the primary local government office in Anne Arundel County responsible for leveraging local dollars to implement cost-effective water quality improvement projects, but by no means does this Bureau operate alone. Intergovernmental partnerships, as well as public-private partnerships, are the key to maximizing impact potential and minimizing costs for each restoration project. And, as we continue to improve our outreach and engagement methods, each project becomes more enmeshed within, and therefore stewarded by, the surrounding community. Watershed health is about more than high-quality waterways; it's about investing in sustainable infrastructure, protecting public health and safety, and fostering a shared feeling of connection to the water.



Regulatory Drivers

There are two (2) major regulatory drivers behind our work: the National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System (NPDES-MS4) permit and the Chesapeake Bay Total Maximum Daily Load (TMDL). The NPDES-MS4 permit is a State-issued permit that requires Anne Arundel County to develop and implement a robust stormwater management program that addresses the harmful effects of stormwater runoff pollution. Additionally, the Chesapeake Bay TMDL sets limits of nitrogen, phosphorus, and sediment that are allowed to reach the bay and still meet water quality standards.

When it rains on *impervious surfaces* like roads, parking lots, and buildings, the water picks up and transports trash and other pollutants into storm drains. This polluted stormwater travels through the storm drains and is discharged directly into local waterways. The MS4 permit authorizes the County to discharge this polluted stormwater into local waterways under certain conditions; some activities required by the permit include implementation of stormwater management practices, illicit discharge detection and elimination, and water quality monitoring. Under the previous MS4 permit term (2014-2019), the County treated stormwater runoff from the equivalent of 4,996 acres of impervious surface. The current MS4 permit requires

the management of stormwater runoff from an additional 2,998 acres of impervious surface.

Anne Arundel County is also required to reduce the amount of nitrogen, phosphorus, and sediment reaching waterways for compliance with the Chesapeake Bay TMDL and several local TMDLs. A TMDL can be thought of as a “pollution diet”; it is the maximum amount of a pollutant allowed to enter a waterway that will still allow it to meet water quality standards. Nitrogen, phosphorus, and sediment are considered pollutants when they reach levels that disrupt the natural balance of aquatic ecosystems. For example, excessive nutrients can trigger massive algal blooms. As algae dies and breaks down it consumes the oxygen in the water and can cause dead zones. Sediment can increase the cloudiness of the water, blocking sunlight for plants, clogging the gills of fish, and smothering bottom-dwelling habitats.

Progress toward meeting the MS4 permit required activities and the Chesapeake Bay TMDL is reported in the County’s MS4 annual report to the Maryland Department of the Environment. Many of the elements provided in this *A Land of Rivers* report will also be included in the MS4 annual report later this year.



The Restoration Plan

In 2025, a revised Chesapeake Bay Watershed Agreement including new restoration goals and targets was put into place, steering our regional community toward a more sustainable future for local waterways. The primary goals and intended outcomes for this revised agreement are: thriving habitat, fisheries, and wildlife; clean water; healthy landscapes; and engaged communities. Anne Arundel County's restoration plan has not wavered much since the inception of our Watershed Restoration Program 16 years ago - restore waterways and encourage pro-environmental behaviors in a cost-effective manner. The way we realize that plan, though, matures over time and is guided by current best practices in equitable engagement and implementation, as explored in the revised Chesapeake Bay Watershed Agreement.

Much like the revised Chesapeake Bay Watershed Agreement, Anne Arundel County's restoration and conservation strategy is multi-pronged, focusing not only on downstream waterways, but also on upstream communities and infrastructure. The Water Reclamation Facility (WRF) upgrades that Anne Arundel County completed in 2018, and the stormwater restoration work that the County has done over the last decade, have helped the County lead the way in Chesapeake Bay clean-up. Additionally, partnerships with the Department of Health supporting septic upgrades and connection to public sewer work to chip away at the nutrient pollution from septic systems. More information about this multi-pronged water quality improvement strategy can be found at www.ourwAater.org.



Water Reclamation Facilities

While the health of the Chesapeake Bay itself is integrally tied to inputs from the region's largest waterways, such as the Susquehanna and Potomac Rivers, the health of our rivers and creeks has been demonstrated to be largely driven by activities – both past and present – in our own, local watersheds. Sediment and nutrients delivered from the impervious surfaces around our businesses and homes, septic system discharges, and nutrient discharges from our water reclamation facilities are the drivers of our local impairments. Our restoration work, paired with what is required of the other bay jurisdictions, can ensure that our creeks and rivers, as well as the Chesapeake Bay, are on the path to recovery.

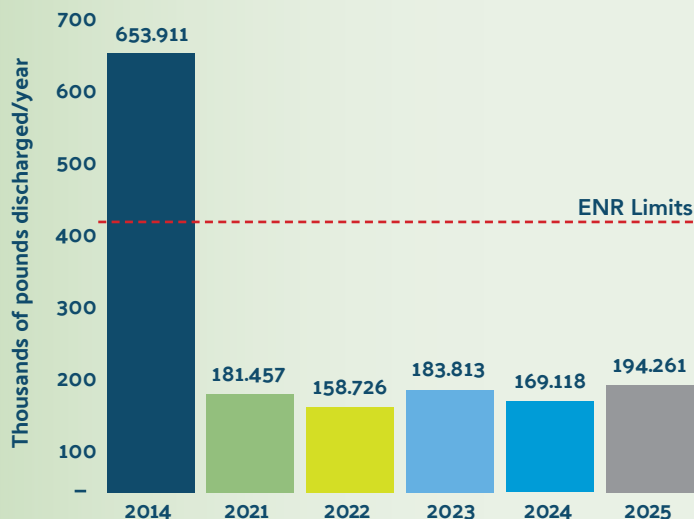
Water Reclamation Facilities / Enhanced Nutrient Removal - Anne Arundel County's \$249 million investment to upgrade each of its six Water Reclamation Facilities (WRF) with Enhanced

Nutrient Removal (ENR) technology was completed in July 2017. These ENR upgrades have enabled each plant to remove a far greater amount of nutrients, like nitrogen and phosphorus, from treated wastewater discharged to our rivers, creeks, streams, and the Chesapeake Bay after the treatment process.

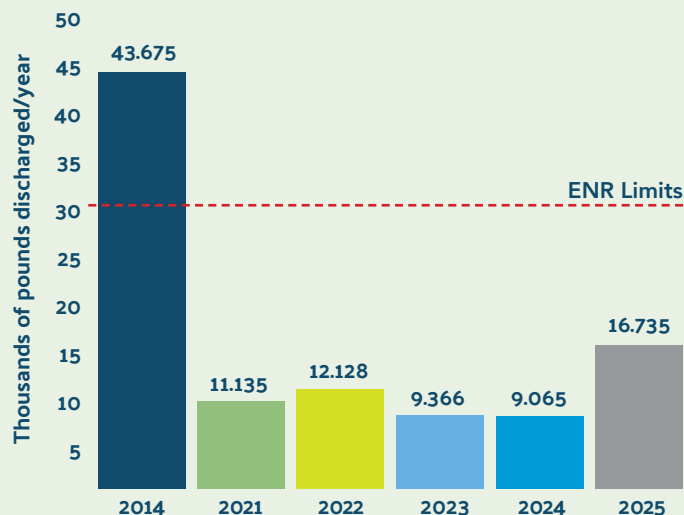
All County-owned facilities have been upgraded to achieve annual average nutrient goals of wastewater effluent quality of Total Nitrogen (TN) at 4 mg/l and Total Phosphorus (TP) at 0.3 mg/l. Over the past six years, the upgraded facilities have been performing at a level well below the required limits for Total Nitrogen and Total Phosphorus discharge concentrations.

DPW will be examining ways to further improve performance and reliability at the facilities to ensure continued excellent performance into the future.

Anne Arundel County Permitted Nitrogen Discharge Limits



Anne Arundel County Permitted Phosphorus Discharge Limits



MS4 5th Generation Permit Goals

Stormwater Remediation – As of the end of FY20, the County met the primary restoration goal of its fourth-generation MS4 permit by restoring the equivalent of 4,996 acres of impervious surface. The County's fifth-generation MS4 permit was issued in November 2021 and set a new goal requiring the restoration of an additional 2,998 acres of impervious surface by November 4, 2026. The County has been making excellent progress and by the end of FY26 restored the equivalent of 3,979 acres of impervious surface and met its permit goal well before the permit deadline.

Septic System Conversions – There are approximately 41,500 septic systems in Anne Arundel County. Of these, nearly 14,000 are located within the "Critical Area," land within 1,000 feet of tidal waters. A typical septic system is fairly ineffective at removing nitrogen, and instead delivers about 23.2 pounds of nitrogen per year to the groundwater, which eventually makes its way to our streams and rivers.

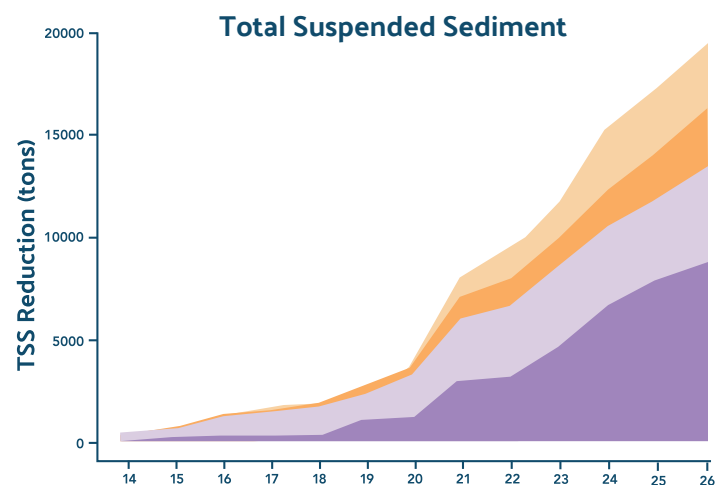
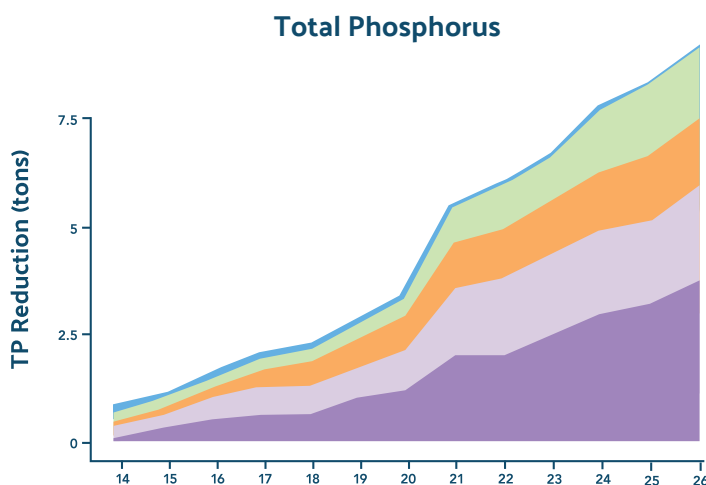
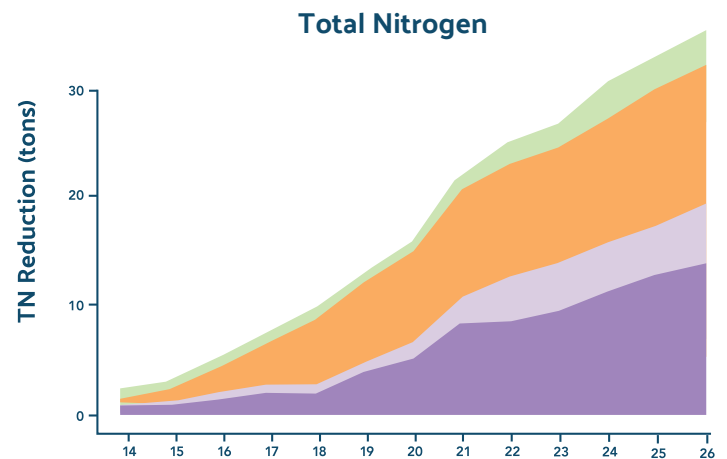
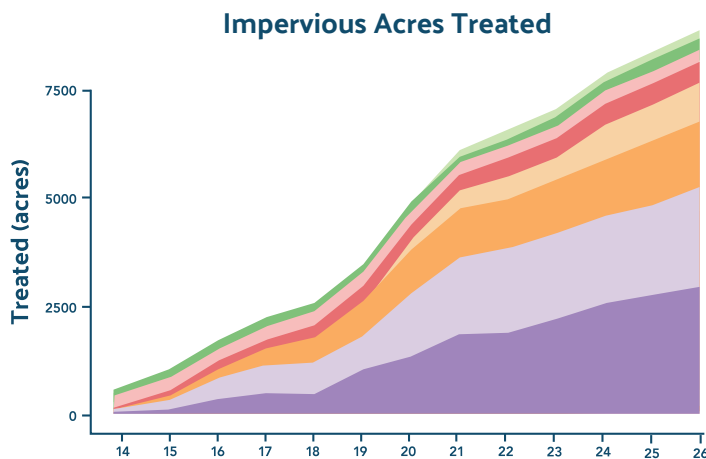
The Anne Arundel County Department of Health locally administers the Bay Restoration Fund (BRF). The BRF is a state-supported initiative that provides funding to replace conventional septic systems with nitrogen-reducing technology. The units reduce the amount of harmful nutrients, such as nitrogen, that septic systems discharge. An upgraded, nitrogen-removing septic system cuts a system's nitrogen load in half. The Department of Public Works and the Department of Health continue to work closely together to direct Bay Restoration Funds for septic conversions and septic-to-sewer connections, as revenues are available. Subject to available funds, property owners in Anne Arundel County with septic systems may be eligible for grant-supported upgrades to their septic systems. In FY26, BRF funds were leveraged to cost-share 148 pretreatment units and 8 connections to public sewer. For more information on the BRF grant program, visit www.aahealth.org.



Progress toward MS4 Goals

While the primary metric of the County's MS4 permit is "impervious acres treated," that number represents the nutrient and sediment pollution reduced by those water quality practices. Both through its stormwater permit, and as a condition of the Chesapeake Bay TMDL, the County is required to reduce those pollutants to local waterways, such as the Patapsco and Severn Rivers, and to

the Chesapeake Bay. The MDE has assigned each jurisdiction within Maryland a pollution allocation to address. The following figures demonstrate the County's progress towards reducing nitrogen, phosphorus, and sediment in local waterways through its clean water efforts associated with the stormwater sector. Each figure also indicates the share of pollutants reduced by various sorts of practices.



- | | |
|------------------------|------------------------------|
| Land Cover Conversions | Inlet Cleaning |
| Street Sweeping | Septic to Sewer Connections |
| Septic Pumping | Septic Denitrification Units |
| Outfall Stabilizations | Upland BMPs |
| Shoreline Restorations | Stream Restorations |

The Funding History

The majority of the County's stormwater-related work is funded through the Watershed Protection and Restoration Fee (WPRF), which was established in 2015. This impervious surface-based fee on properties throughout the County provides dedicated funding for MS4-permit required activities. The types of activities funded by the WPRF include designing and installing clean water restoration projects, maintaining and replacing existing drainage infrastructure, inspecting public and private stormwater facilities, and monitoring restoration projects to evaluate their success. As detailed in this report, the WPRF supports staff in the Department of Inspections and Permits, the Department of Public Works Bureau of Highways, the Anne Arundel County Soil Conservation District, and the Department of Public Works Bureau of Watershed Protection and Restoration that are working to protect and restore the County's watersheds.

As required by Anne Arundel County's NPDES-MS4 permit, the FY24 Financial Assurance Plan was passed on November 4, 2024 at the Anne Arundel County

Council Meeting. The FY24 Financial Assurance Plan was submitted to the State on December 31, 2024 and MDE ratified their recognition of the Financial Assurance Plan data on May 1, 2025. The FY26 Financial Assurance Plan will be presented before the Anne Arundel County Council in September of 2026.

How is the fee calculated? The Department of Public Works utilizes Geographic Information Systems (GIS) technology along with parcel data collected from the Consolidated Property File and County Zoning Maps to estimate the imperviousness of residential properties in the various zoning districts. This information was used to determine a baseline Equivalent Residential Unit (ERU) of impervious surface of 2,940 sq. ft., which is the approximate average of impervious area for properties in County residential zones R1, R2, and R5. An ERU is the base unit for calculating the annual charge for residential and non-residential properties. Currently, the charge is \$98.40 per ERU, per year. The fee structure varies between land use type and intensity as seen in the table below:

Annual Watershed Protection And Restoration Fee Rates		
Zoning	Rate Calculation	Current Fee
R10, R15, R22	$\$98.40 \times 0.4$	\$39.36
R1, R2, R5	\$98.40	\$98.40
RA, RLD	$\$98.40 \times 2$	\$196.80
Non-Residential	Actual sf of impervious surface divided by 2,940 x \$98.40	Varies

Bureau of Watershed Protection & Restoration – Carrying out the Plan

The Bureau of Watershed Protection and Restoration develops and delivers technical environmental assessment, restoration planning and implementation information, and regulatory support to the Departments of Public Works, Inspections and Permits, and the Office of Planning and Zoning. This support enables these agencies to carry out their responsibilities for successfully managing delegated programs outlined in the County's NPDES-MS4 Permit, the State's Critical Area program, and the State Forest Conservation Act, as well as their responsibilities for land use decisions set forth in the County Code. Implementation of the BWPR stormwater restoration strategy is focused on three key areas:

Stormwater Pond Retrofits – Existing facilities, such as dry ponds, detention ponds, or infiltration basins that have failed or are outdated are rebuilt to optimize their pollution reduction capacity.

Stormwater Outfall Repairs – Eroded or failing stormwater outfalls – locations where drainage systems discharge onto erosive soils – are reconstructed into systems that can both safely convey high flows and provide water quality benefits.

Stream & Wetland Restoration – Stream erosion is the largest contributor of sediment and phosphorus to our local rivers, and the County's strategy to stabilize and re-hydrate valley bottoms by spreading out storm flows across a reconnected floodplain.

In addition to the work above, funds from the WPRF are used to address a multi-million-dollar portfolio of stormwater infrastructure repairs and replacement, ensuring that the County's culverts and drainage infrastructure are functioning properly and are not a threat to public health and safety.

FY26 BWPR Restoration Project Pipeline:

As of FY26, the County has treated over 100% (3,979 out of 2,998) of the required equivalent impervious acres under the current NPDES-MS4 permit - but the work is

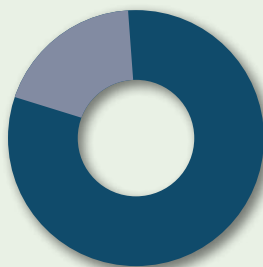
never done! The charts below depict the number of projects completed under the current NPDES-MS4 permit, as well as those currently in the pipeline.

BWPR Restoration Project Goals

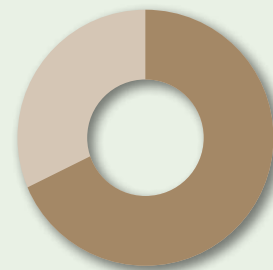
Number of Projects Completed and Anticipated Under Current Permit



Stream & Shoreline Restoration
64 out of 120 completed



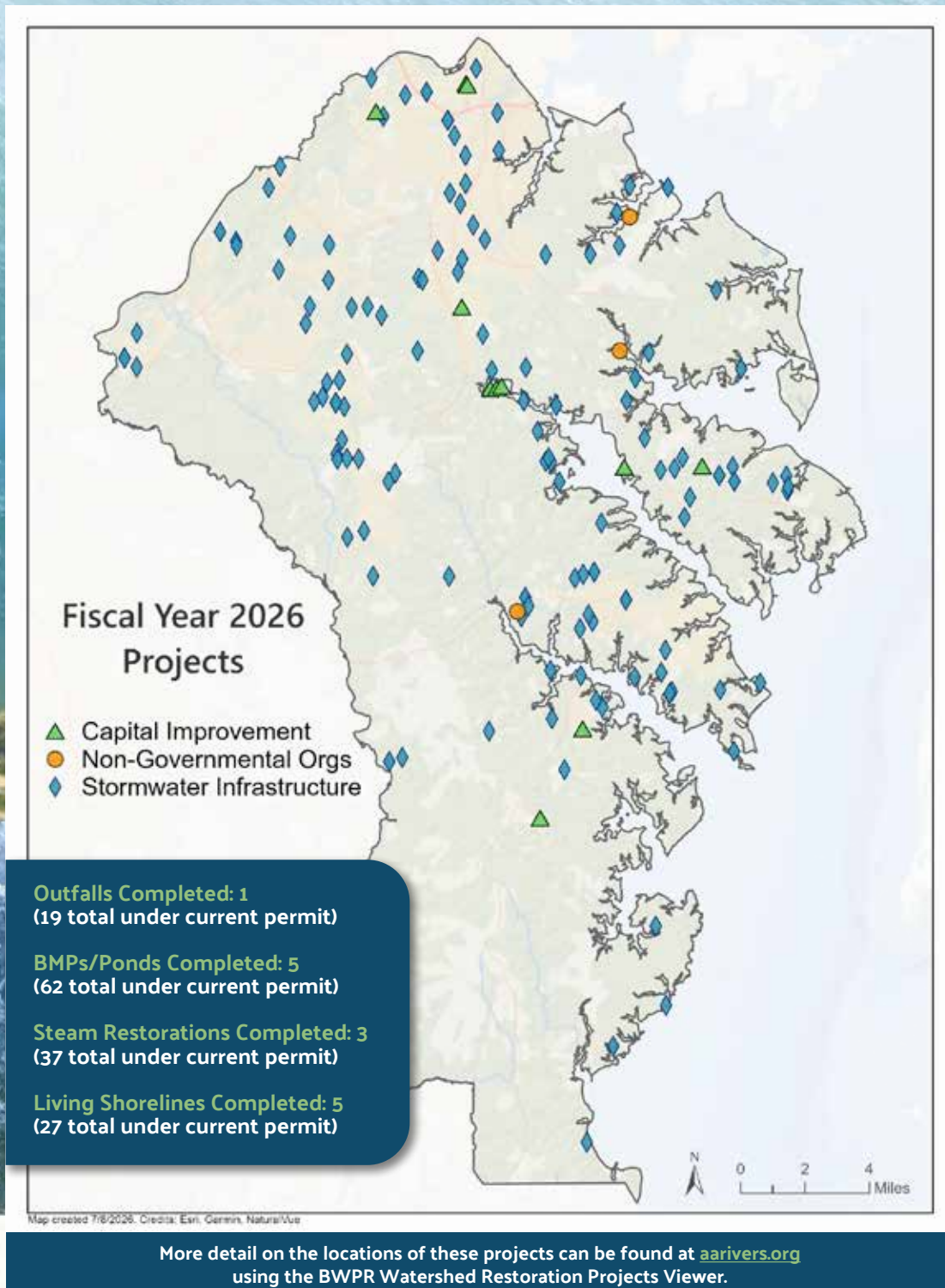
Stormwater Management
62 out of 75 Completed



Outfall Stabilizations
19 out of 27 Completed

BWPR Restoration Projects Completed in FY26

Projects at the following locations were constructed to meet multiple objectives including water quality enhancement, infrastructure protection, flood attenuation, improved native habitat, and healthier riparian functions.



Highlighted Restoration Project

The Bureau of Watershed Protection and Restoration (BWPR) is excited to announce the successful completion of the Foxmoor Pond and Stream Restoration. The project involved the decommissioning of a failing stormwater management pond and restored approximately 2,450 linear feet of stream outfall channel in the Foxmoor neighborhood within the Forked Creek tributary of the Magothy River watershed.

This project was identified in 2017 during a comprehensive assessment of the Magothy River watershed initiated by Anne Arundel County DPW BWPR. In the assessment, one-third of the perennial streams in the Forked Creek subwatershed were rated as “Medium High” or “High” for restoration priority. Additionally, the County’s Stormwater Infrastructure Program requested to prioritize the project because the pond was failing. Prior to restoration, the compounding effects of development within the watershed led to severe degradation of the streams in the Foxmoor neighborhood. Much of the development in the nearly 70-acre watershed lacked proper stormwater controls resulting in excessive bank erosion, up to 10 feet in some places and excess sedimentation filling in an old, abandoned stormwater pond.

The selected design approach included Regenerative Stream Conveyance (RSC) and Valley Restoration techniques. RSCs consist of a series of stone riffle weirs that provide stable conveyance of storm flows separated by shallow wetland pools to dissipate energy, promote filtration, and convert surface water to shallow groundwater. Valley restoration improves system stability by connecting streams to broad floodplain wetlands. The failing stormwater pond was decommissioned within the RSC portion of the restoration.

During the design process, the County’s Bureau of Utility Operations, Systems Evaluation & Rehabilitation Division assessed the condition of the sewer infrastructure within the site. Their assessment determined that the utilities were functioning properly but 4 manholes required additional riser rings, grade rings, and waterproof frames and covers to raise them above the proposed 100yr water surface elevation. These modifications were completed during construction and will reduce future risk of infiltration and inflow as water surfaces rise from the project and potential beaver activity in the stream valley.

Existing walking and biking trails were maintained to allow community members to enjoy the site

post-construction and to keep the area connected to trails on adjacent, protected properties. A portion of the project is located on the property of the Providence of Maryland Greenhouses. This plant nursery provides vocational training and employment for people with intellectual and developmental needs. All of the plants for this project were purchased through Providence in order to stabilize and beautify the project while supporting a local nonprofit and an underrepresented community. Providence staff were invited out for a site tour and volunteer planting event in May 2026. Additionally, the County is partnering with the Arlington Echo Outdoor Education Center to bring out students to plant additional native trees and shrubs this fall.

The project was a collaboration between Anne Arundel County’s Bureau of Watershed Protection and Restoration, Providence of Maryland Greenhouse, Underwood & Associates, the Maryland Department of Natural Resources, and Bayland Consultants and Designers, Inc. The completed project is expected to generate 38.9 MS4 Impervious Acre Credits and reduce an estimated 176 pounds per year of total nitrogen (TN), 136 pounds per year of total phosphorus (TP), and 183 tons per year of total suspended solids from flowing into the Chesapeake Bay.

To learn more about this project, please visit www.aarivers.org.

BEFORE



AFTER



Stormwater Infrastructure Program (SIP)

Effective operations and maintenance practices are critical to watershed health. The County operates and maintains a wide range of infrastructure to protect public health and safety, water quality, and property. It is important to ensure operations and maintenance activities not only keep those assets in good working order, but also protect water quality and habitat functions.

The Stormwater Infrastructure Program (SIP) is responsible for managing the inventory, inspection, and development of the County's Stormwater Infrastructure Capital Program. This program aims to repair and/or replace aging, damaged storm drain systems, culverts, and public best management practices (BMPs) throughout the County, as well as address any associated design and permitting requirements. These projects are normally identified through routine inspections by both DPW-BWPR SIP as well as DPW Road Operations Division, and are scheduled in a worst-first priority order.

Funds from the Bureau of Watershed Protection and Restoration are used to address stormwater infrastructure repairs and replacements, ensuring that the County's culverts and drainage infrastructure are functioning properly and are not a threat to public health and safety.



Stormwater Infrastructure Program Projects Budgeted In FY26	
Culvert & Closed Storm Drain Repair	\$8,000,000
Emergency Storm Drain	\$4,000,000
Storm Drain/SWM Infrastructure (BWPR)	\$1,000,000
TOTAL	\$13,000,000

FY26 Stormwater Infrastructure Program BWPR Capital Projects	
Council District	# of SIP Projects
1	19
2	12
3	9
4	18
5	28
6	22
7	18
135	124

SIP & Road Operations Division Milestones

The Stormwater Infrastructure Program is also responsible for managing the inventory, inspection, and maintenance of over 1,250 stormwater management facilities that are collectively referred to as Best Management Practices (BMPs). In addition, SIP

works alongside the Road Operations Division to sweep County roads to remove loose materials, litter, and other debris that is unsightly, hazardous, or could cause possible drainage obstructions.

2026 Milestones	
Action	Result
BMPs Inspected	455
Curb Miles Swept	6,695
Tons of Litter Collected (Street Sweeping)	199
Storm Drain Structures Cleared	2,984
Linear Feet of Drain Pipe Cleared	43,572
Linear Feet of Ditch Cleaned	17,135



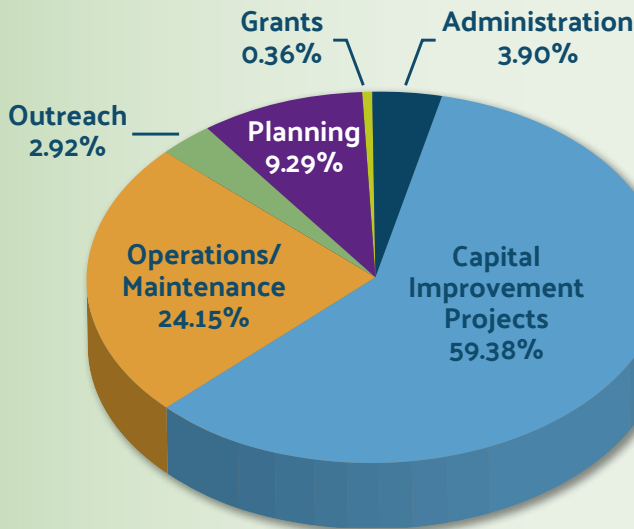
Watershed Protection & Restoration Fund Revenue and Expense Report

Maryland Environment Code Ann §4-202.1 (2013) requires that a county make a report publicly available, beginning on July 1, 2014, and every two years thereafter. This requirement was amended in FY15 to require annual reporting of operating expenditures. The following report is being issued to meet these revised requirements, and includes revenues and expenses for FY26, the tenth year of implementation for the Watershed Protection and Restoration Fund in Anne Arundel County, Maryland. This report includes expenses incurred beginning July 1, 2025 through June 30, 2026.

Revenues – The Stormwater Fee was first billed on property taxes on July 1, 2013. There were 225,114 properties in Anne Arundel County that were subject to the fee. For FY26, Anne Arundel County has received \$27,127,459 in revenues as of June 30, 2026. In addition to the Stormwater Fees, the County has received \$1,946,358 to fund watershed protection and restoration projects from other sources.

Expenditures – Operating expenditures for FY26 totaled \$32,441,965. It should be noted that beginning in FY20, the County has taken a more aggressive approach to debt service. In FY26, the County has paid \$16,587,908 out of the total operating expenditures directly towards debt service. Of the remaining operating expenditures, \$7,836,212 was spent on operations and maintenance activities for the county's stormwater infrastructure. An additional \$3,015,269 was spent for planning for future improvements to these systems.

FY26 Operating Expenditures



Monitoring Stream Health Across the County

An important component of the County's watershed restoration plan is monitoring stream health. Monitoring allows the County to evaluate if stormwater management and habitat restoration projects are achieving their intended results and provides the opportunity to apply adaptive management as needed. The County has been monitoring non-tidal waterways to assess aquatic insect communities, water quality, and habitat health since 2004, and added fish monitoring in 2017.

This Countywide Biological Stream Survey has helped establish a general baseline of knowledge upon which continued assessments can be compared to evaluate how stream health has changed over time.

Aquatic Insect and Fish Surveys – The Ecological Assessment and Evaluation team within BWPR is responsible for monitoring biological health of the County's streams. The County's NPDES-MS4 permit requires assessment of macroinvertebrate (aquatic insect) communities, but BWPR also voluntarily conducts fish surveys. These biological assessments are a highly effective, scientifically validated approach to understanding the overall health and quality of streams.

While taking a water quality sample can provide useful information about the stream at that point in time, surveying streams for the types of aquatic insects and fish they support can provide a more holistic, longer-term picture of that stream's health. Since these organisms live their lives completely in the water, they're

exposed to that stream's full suite of environmental conditions, not just those water chemistry parameters that are easy to monitor.

Some insect and fish species are more tolerant of pollutants than others, so knowing which species are present and in what numbers is extremely important. If a stream has mostly insects and fish that are tolerant to pollutants, that probably means the stream is in poor health. However, when streams start to support higher species diversity and intolerant species, that's a good indication of a healthy stream!

From 2023 through 2027, BWPR will be conducting the fourth round of the Countywide Biological Monitoring program, focusing on randomly selected sampling areas each year. In 2025, forty aquatic insect and fish surveys were completed across 5 sampling areas including Hall Creek, Stocketts Run, Upper and Lower North River (both locally known as the South River), and Upper Magothy. Using Maryland Biological Stream Survey protocols, BWPR's researchers found 30 species of fish in those 5 sampling areas. The most frequently found species included American Eel, Blacknose Dace, and Eastern Mudminnow. Additionally, a Maryland State Rare, Threatened, or Endangered species, the Warmouth, was found at 2 sites in the Upper Magothy!

Learn more about the Ecological Assessment and Evaluation team and related environmental monitoring programming at www.aarivers.org.



Using Innovative Technology to Detect Freshwater Fish and Amphibian Species

BWPR's Ecological Assessment and Evaluation team is regularly looking for ways to use new and innovative scientific methods to meet restoration and monitoring priorities. In 2024, staff began an environmental DNA pilot study to test the collection and analysis of eDNA from select sites across the County. This promising new method includes collecting genetic material directly from streams, sending those samples to a laboratory, and comparing the DNA results against a comprehensive list of species that are likely to be found in the County.

Thanks to our team of scientists, the pilot study was successful and yielded several interesting and useful results that are guiding continued research.

- Smith-Root 1.2-micron filters (disc filters) generally recovered significantly more DNA sequence copies and resulted in more species detections than large filters. The County's future eDNA studies will use these more effective disc filters.
- When compared to the traditional jab sampling technique, macroinvertebrates were not effectively identified using eDNA. Our scientists are considering if/how to incorporate macroinvertebrates into future eDNA research.
- In contrast, when compared to the traditional electrofishing technique, eDNA proved to be as effective for identifying fish species (as well as amphibians). Future eDNA studies will focus on fish and amphibians.
- Of the three vertebrate DNA primers selected for investigation (12SVert, MiFishU, BatR01), the 12SVert and MiFishU were most effective for detecting fish and amphibians. The County will be using those 2 primers for future research.

The study report is currently being prepared and will be posted to the BWPR website when complete.



Highlighted Partnerships

BWPR values its partnerships with academic institutions and other governmental agencies. Bureau staff work closely with a variety of Federal, State, and local governmental agencies and various non-governmental organizations to further its mission. By working closely with partners, the Bureau can participate in cutting edge research and monitoring work, encourage stream and wetland restoration, and support other cost-effective research opportunities.

PCB Monitoring in the Sawmill Creek Watershed -

As introduced in the FY25 *A Land of Rivers* report, BWPR has been carrying out elements of the PCB TMDL Restoration Plan to identify and ultimately reduce PCBs in the County's portion of the Baltimore Harbor drainage. In 2020, BWPR partnered with the University of Maryland Baltimore County (UMBC) and MDE to begin a multi-phase PCB source identification project; this project initially focused on the Sawmill Creek portion of the Curtis Creek watershed with the expectation that it would eventually expand to the other waterbodies.

Phase I (2020) - Using innovative passive sampling technology, elevated water column PCB concentrations were identified in two tributaries of Sawmill Creek (Ferndale Branch and North Glen Branch).

Phase II (2022) - Decreased PCB concentrations from Phase I were observed in both Ferndale and North Glen Branch. Concentrations in lower Ferndale Branch sampling locations were below the TMDL endpoint.

Phase III (2024) - Results received in 2025 verified those from Phase II; Ferndale Branch PCB concentrations met the TMDL endpoint of 0.27 ng/L. While PCB concentrations in North Glen Branch did exceed the TMDL endpoint, they are significantly lower than the results from Phases I and II. *Overall, the PCB contribution of the Sawmill Creek subwatershed is now below the TMDL endpoint!*

PCB monitoring has also expanded into other subwatersheds in the Baltimore Harbor PCB TMDL area. In 2024, monitoring in the Marley and Furnace Creek watersheds revealed that PCB levels in both watersheds were below the TMDL endpoint. In 2026, samplers were deployed in 10 additional subwatersheds - results of this monitoring are expected in early 2027.

Updates on future PCB source tracking efforts will be available in MS4 annual reports.



Heritage Office Complex BMP Refresh - In 2025, BWPR partnered with the Office of Central Services Facilities Management Division to deliver some much needed maintenance at the Heritage Complex's parking lot stormwater facilities. Old, compacted soils and accumulated sediment were removed from the bioretention and sand filter BMPs on the west side of the complex and replaced with fresh substrate. All of the BMPs, excluding the grass swale along Riva Rd, also received new plantings with native trees, shrubs, and flowers. Additionally, new interpretive signage was installed at some of the BMPs and at the entrance of Building 2664. This maintenance resulted in both improved aesthetics and optimized stormwater management.

Good Housekeeping Inventory & Training - The County's most recent MS4 Permit (covering the period of FY22-FY26), included a new programmatic requirement - the development and implementation of a Good Housekeeping Program for select County-owned properties. Under this new program, County-owned properties that are not covered under a General Discharge Permit, and that meet other specific criteria, are required to have Good Housekeeping Plans which identify potential pathways for pollutant discharge to the stormwater system, and prescribe actions that property managers can take to prevent pollutant discharges from occurring. In all, 83 County-owned properties were identified that meet the criteria for justification of Good Housekeeping Plan development. Draft plans were submitted to Maryland Department of Environment for final approval in the FY24 and FY25 annual MS4 Report submissions. Additionally, an annual training was developed for County staff responsible for maintenance at these properties, which covers best practices for prevention and elimination of pollutant discharges during property activities. The training was launched in early 2026, and was completed by 45 staff by the end of FY26.

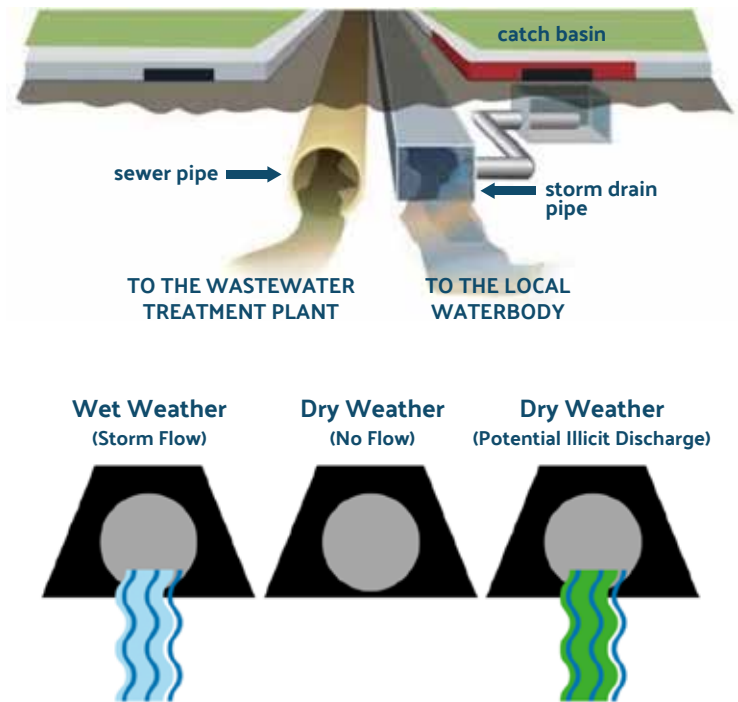
Illicit Discharge Detection & Elimination (IDDE) Program

BWPR is responsible for implementing the County's Illicit Discharge Detection and Elimination (IDDE) Program, which focuses on identifying and eliminating illicit discharges to the County's storm drain system. The disposal of anything other than stormwater into and through the storm sewer system is illegal, so any non-stormwater flow from an outfall is called an "illicit discharge" (unless otherwise allowed by an issued permit). Some examples include when wastewater pipes are accidentally or deliberately connected to the storm sewer, the improper disposal of commercial or industrial hazardous waste into a storm drain, septic tank seepage into the storm sewer, and many other scenarios. BWPR collaborates with other County agencies that have the legal authority to inspect and enforce any identified illicit discharges.

The County screens a minimum of 150 outfalls yearly for dry-weather flow conditions; if dry-weather flow is observed, the discharge is tested for pollutants, and the source of the pollution is investigated. The County's IDDE program has been successful in the identification and removal of a wide variety of sources of pollutants, including illicit wastewater connections, upland pollutant sources, illegal dumping, and spills. In addition to illegal discharge identification, the outfall screening process also entails a structural condition assessment of the stormwater infrastructure. Reports of infrastructure concerns such as pipe or storm drain damage, excessive debris jams, scour holes, and channel erosion, are investigated and evaluated for repair by BWPR's Stormwater Infrastructure Program (SIP).

Five Year Programmatic Review

The County's current MS4 Permit covers the five-year period from FY22 through FY26. Over that span, the County assessed 812 stormwater outfalls for dry-weather discharge. Through the required outfall screening process, 13 illicit discharges were discovered. Sources of these illicit discharges varied, including treated cooling tower discharge from a hospital, a chemical dye spill from a cosmetics warehouse, a failed water capture system at a commercial car wash, potable water line leaks, and wash water from commercial vehicle washing. The identification and subsequent correction of these discharges prevented the further input of excessive ammonia, chlorine, phosphates, and other pollutants to the waterways of the County.



Watershed Restoration Grants

Successful conservation and preservation of Anne Arundel County's watersheds takes teamwork. In 2014 the Anne Arundel County Department of Public Works, in partnership with the Chesapeake Bay Trust, created the Anne Arundel County Watershed Restoration Grant Program, a community grant program to support watershed restoration activities throughout the County to improve water quality in local streams and rivers. The grant program was created to engage local nonprofit organizations, landowners, and communities in efforts to restore the County's waterways; to provide resources to these groups to enable them to implement greening and water quality projects; and to assist Anne Arundel County's efforts to meet the requirements of its

state and federal stormwater permit and local waterway cleanup plans. This program encourages on-the-ground restoration activities that reduce stormwater flow and pollutants and engage Anne Arundel County residents in these activities.

For more information about the Anne Arundel County Watershed Restoration Grant Program, please visit www.cbtrust.org.

Below is a list of organizations that were awarded funding from Anne Arundel County for water quality restoration projects in 2026:

Organization	Project Description	Watershed	Funding Amount	Match Amount	Impervious Acres Treated
Alliance for the Chesapeake Bay	Community-Driven Restoration in Cape St. Claire	Magothy	\$81,865.00	\$118,926.00	TBD
Severn River Association	Kensington Severndale	Severn	\$96,018.00	\$15,000.00	5.6
Severn River Association	HOSIA Tasks 3-5	Severn	\$87,958.00	\$58,268.00	33
Friends of Jug Bay Wetlands Sanctuary	Jug Bay Wetlands Sanctuary Stream Restoration Implementation	Patuxent	\$349,984.00	\$6,996,447.00	193
Arundel Rivers Federation	Annapolis Waterworks Park Stream Restoration	South	\$349,948.00	\$1,557,271.00	21
Arundel Rivers Federation	Cassia Drive Stream Restoration	South	\$349,784.00	\$127,453.00	11
Anne Arundel Watershed Stewards Academy	Prince of Peace Rain Garden Implementation	Patuxent	\$24,530.00	\$7,875.00	0.35
Arundel Rivers Federation	Anchor Yacht Basin Impervious Removal	South	\$33,721.00	\$0.00	0.22
TOTAL			\$1,373,808.00	\$8,881,240.00	264.17

Anne Arundel County Watershed Stewards Academy (WSA)

Established in 2009 as a collaborative initiative between the Arlington Echo Outdoor Education Center and the Anne Arundel County Department of Public Works, the Watershed Stewards Academy (WSA), now a standalone 501c nonprofit organization, empowers local communities to minimize pollutants entering waterways through stormwater runoff. The Bureau of Watershed Protection and Restoration provides vital, ongoing support to the program by linking volunteer Stewards and neighborhoods with essential watershed studies, planning resources, and restoration projects.

To achieve these goals, the WSA provides Anne Arundel County residents with hands-on training to tackle pollution in local streams, creeks, and rivers. The program focuses on turning good intentions into meaningful grassroots action by teaching Stewards how to educate and assist their neighbors in environmental conservation. These trained participants collaborate with their communities to install effective stormwater management systems, such as rain gardens and conservation landscapes, which naturally capture and filter polluted runoff. Ultimately, these individual and collective community efforts drive significant improvements in the overall health of local waterways and the broader Chesapeake Bay.

2026 WSA Successes at a Glance:

- Certified 25 new Watershed Stewards in Class 17, featuring a 92% retention rate and a record-breaking young graduate from Severna Park High School
- Reached 43,601 Anne Arundel County residents, providing technical assistance or environmental education
- The WSA Staff hosted an additional 76 outreach/continuing education events and short courses, including their annual “Spring into Action” Conference, engaging over 300 participants
- Supported 439,055 square feet of new restoration projects
- Planted 30,581 native perennials, shrubs, and trees, including...
 - 1,477 trees planted through RePlant Anne Arundel
 - 1,776 trees planted through Backyard Buffers
 - 1,076 trees planted by Tree Troopers and Tree Ambassadors
 - 401 trees planted through Groves of Gratitude
 - 1,900 perennials planted through RePlant Anne Arundel
 - 743 trees planted by Stewards through Action Events
 - 4,257 perennials, grasses, shrubs, and trees planted through Chestnut Hill Cove Stream Restoration
 - 2,290 plants and 181 trees replanted through Maintenance Corps
 - Additional plantings across 698 local Action Events led by Stewards

Replant Anne Arundel: WSA continued the Replant model to implement new tree planting projects across the county in fall 2024 and spring 2025. The RePlant program incorporates the following programs into one cohesive effort: Backyard Buffers, Tree Troopers and Tree Ambassadors, and Groves of Gratitude. A summary of Replant Anne Arundel can be found at www.aawsa.org/replant-2.

RePollinate Anne Arundel: Inspired by the Replant Anne Arundel Program, Watershed Stewards, in collaboration with Anne Arundel County Master Gardeners and the USGS Bee Lab, the RePollinate Anne Arundel program aims to support communities in Anne Arundel County with their community greening and environmental efforts, resulting in the reintroduction of numerous genus and species vital to the county’s ecological services. In FY26, RePollinate grew 1,900 native plants that were planted at 75 projects across the County. More information about the RePollinate Program may be found at www.aawsa.org/repollinate.

Save Our Trees: The Save Our Trees (SOT) program continued its vital work of removing invasive vines from mature trees across Anne Arundel County and the City of Annapolis. Serving as a critical partner to the Anne Arundel County Inspection and Permits invasive work group, SOT achieved significant milestones during FY26 by saving 4,448 trees and engaging 620 community volunteers across 38 different events. To accomplish this, the program partnered directly with Annapolis High School, Broadneck High School, Anne Arundel County Recreation and Parks, and Quiet Waters Park. Furthermore, SOT continued to build and strengthen collaborative relationships with a wide network of local and state organizations. This extensive coalition includes the City of Annapolis (including its Recreation and Parks Department, Conservancy Board, and Environmental Commission) as well as the Friends of Quiet Waters Park, Friends of Anne Arundel County Trails, the Severn River Association, Scenic River Land Trust, Spa Creek Conservancy, and the Maryland Department of Natural Resources. More information on Save Our Trees can be found at www.aawsa.org/save-our-trees.

Rooted in Community: WSA piloted 3 newly created workshops as a part of a grant from the National Fish and Wildlife Foundation. These workshops focus on container gardening for native plants, how to lead litter clean ups, and climate change for communities in Northern and Western Anne Arundel County. This program is a part of WSA’s strategic effort to provide environmental education on topics that are important and of interest to community members in Northern and Western regions of the County.

For more information about WSA, please visit www.aawsa.org.

Public-Private Partnership - Full Delivery of Water Quality Improvements Contract

Stoney Beach Living Shorelines and Stockett's Run Stream Restoration - Launched in 2016, the County's "Full Delivery of Water Quality Improvements" contract was designed to increase the county's environmental restoration capacity. The contract is structured to help Anne Arundel County meet its federal pollution reduction permits and goals by partnering with the private sector to implement cost-effective restoration projects that reduce runoff. Specifically, the work supports the County's Municipal Separate Storm Sewer System (MS4) permit and Chesapeake Bay Total Maximum Daily Load (TMDL) requirements.

During FY26, the Bureau of Watershed Protection and Restoration awarded nearly \$4 million through its innovative Full Delivery of Water Quality improvements contract for the restoration of multiple eroding shorelines on the Patapsco River, as well as the restoration of a deeply eroded tributary - Stockett's Run - to the Patuxent River. Two separate design-build teams, BayLand Consultants & Designers, Inc. and Ecotone, were awarded contracts and will undertake the landowner coordination, design, permitting, and construction for both sets of projects.

The Stoney Beach project is located in two distinct shoreline areas within the Stoney Beach Community. Area 1 includes approximately 810 LF of community-owned shoreline along the southeastern edge of the property fronting Stoney Creek and the Patapsco River. Area 2 encompasses approximately 1,870 LF of shoreline along the northern and western perimeter of Cox Creek, divided into two project reaches proposed for protection and restoration. These combined areas represent the most erosion-prone portions of the community shoreline and provide the greatest opportunity for water quality and habitat improvement.

Area 1 is community-owned property along the southern shoreline of Stoney Beach, fronting Stoney Creek and the Patapsco River. The parcel was acquired by the community in 2019 and has since undergone significant restoration following decades of prior commercial and industrial use. Community members led an extensive cleanup, removing large quantities of debris, obsolete equipment, and invasive vegetation. Native buffer plantings were installed to stabilize the upland and restore natural cover. The site now includes walking trails and recreation areas that are regularly maintained and actively used by residents.

The shoreline consists of a narrow, eroding marsh and low sand beach with visible loss of mature trees due to saltwater intrusion and undercutting of the root zone. Repeated flooding occurs during high tides and storm events, further accelerating shoreline retreat and marsh degradation. The ongoing loss of protective vegetation, reduced storm buffering capacity, and vulnerability of adjacent community assets underscore the need for the proposed living shoreline measures to restore stability and ecological function.

Ecotone's project will involve the restoration of part of Stockett's Run, a tributary to the Patuxent River. It will consist of a stream wetland complex, designed to reduce bank heights and maintain grade control to reduce any potential for future erosion. The goal will be to maximize the extent of the site that can be stabilized with vegetation and focus the transition from raised bed to restored floodplain with constructed weirs conservatively sized to ensure stability.

A floodplain restoration project that includes the removal of accumulated floodplain sediments will be completed and a new baseflow channel will be established. Grade control will be established throughout the stream channel and floodplain to ensure vertical stability, and the stream will be graded away from Harwood Road, to enhance public safety.

The full award will only be paid upon completion of the project and verification of the projects' benefits, which is anticipated to be completed in the fall or winter of 2027.



Anne Arundel County Soil Conservation District

Soil Conservation Districts were formed in response to the dust storms and economic devastation of the 1930s Dust Bowl, creating a system where local landowner boards could convey agricultural needs to the federal government. Following this national initiative, the Anne Arundel District was established in 1946. To accomplish its mission of keeping soil and nutrients on the land, the District's office houses both state and federal employees who work in close partnership with Anne Arundel County, the Maryland Department of Agriculture (MDA), the Natural Resources Conservation Service (NRCS), and the Southern Maryland Resource Conservation and Development (RC&D).

The District provides critical guidance and engineering services for both rural and urban environments. It currently works with approximately 510 agricultural cooperators across the county, developing tailored Soil Conservation and Water Quality Plans that outline existing and proposed conservation practices for every farm a cooperator manages. Furthermore, because of the Districts' historical expertise in agricultural soil management, the 1970 Maryland Sediment Control Law assigned them the task of reviewing sediment and erosion control plans for urban development. Today, the Anne Arundel District is responsible for reviewing the sediment and erosion control portions of grading plans submitted to both Anne Arundel County and the City of Annapolis.

A top priority for the District is meeting the EPA's federally mandated Chesapeake Bay Total Maximum Daily Load (TMDL). In partnership with the MDA, the District helps landowners install from a list of 125 structural and agronomic Best Management Practices (BMPs). Thanks to these efforts, Anne Arundel farmers have successfully met the 2025 Watershed Implementation Plan (WIP) goals by utilizing BMPs to reduce nitrogen, phosphorus, and sediment pollutants. Moving forward under Maryland's Phase III WIP and the revised Chesapeake Bay Agreement, the District will continue assisting both urban and agricultural communities with BMP installations to target nonpoint pollution sources and maintain state pollutant-reduction goals through 2030.

To learn more about the Anne Arundel County Soil Conservation District, visit www.aacounty.org/soil-conservation-district.





A LAND OF RIVERS

FY 2026 REPORT



Anne Arundel County
Bureau of Watershed
Protection
& Restoration

AARivers.org

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