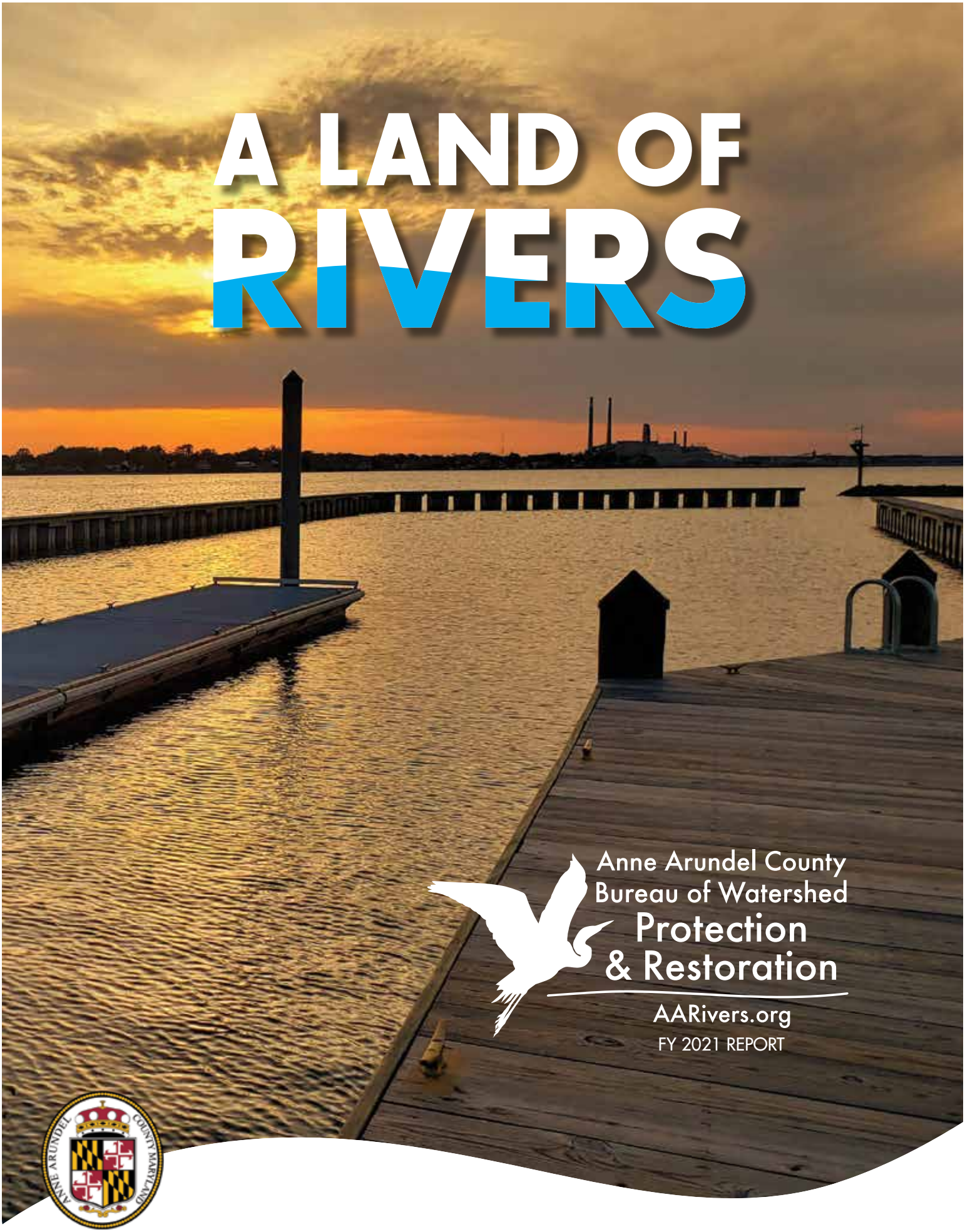


A LAND OF RIVERS

Anne Arundel County
Bureau of Watershed
Protection
& Restoration

AARivers.org

FY 2021 REPORT

Introduction

Dear Anne Arundel County Resident,

Nearly eight years after the creation of a dedicated program tasked with improving the health of our local waterways, we're witnessing the fruits of our labor. We're seeing dramatic reductions in nutrients and sediments reaching our local rivers, like the Magothy, Severn, Patuxent, and Patapsco, through the implementation of award-winning environmental projects that are at the leading edge of restoration science.

We're restoring fish migration patterns by removing blockages to their passage that existed for decades on Cowhide Branch, North River, and Lower Mill Creek. Now, species like yellow perch, chain pickerel, and others can migrate and breed more effectively in our local streams and wetlands, bolster our rivers' ecosystems, and provide opportunities for recreational anglers.

In addition to our continued restoration efforts, we recently created a "stormwater strike team" to track down and eliminate stormwater problems. The team is composed of staff from the Department of Public Works and the Department of Inspections and Permits, who work to minimize new stormwater problems through well-coordinated design review of development projects, track down stormwater problems in existing communities, and propose solutions to fix flooding and water quality caused by all types of stormwater.

The Bureau of Watershed Protection and Restoration, 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 133 restoration projects and over 800 stormwater infrastructure projects to preserve our waterways as a special place for future generations.

This Bureau's 2021 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 2021 (July 1, 2020 –June 30, 2021). 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, 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,

Steuart Pittman
County Executive

Watershed Health

Over the last few decades, Anne Arundel County residents have consistently made clear that they want healthy watersheds, rivers, and streams. At the same time, regulatory mandates have increased pressure to address evolving ecological problems. As Anne Arundel County continues to grow, it will be possible to protect and restore water quality and habitat and prevent further degradation of our waterways through a watershed-based approach to protection and restoration.

Solutions that promote healthy watersheds while also addressing other infrastructure objectives are often the most cost-effective approaches. The County defines a healthy watershed as one where hydrology, water quality, and habitat are suitable to protect human health, maintain viable watershed and other ecological functions and processes, and support healthy populations of native aquatic and terrestrial species. Improving watershed health is truly a county-wide effort. Anne Arundel County is committed to managing County operations in a manner that sustains our quality of life and economy while protecting the viability of our natural resources.

This watershed-based approach reflects and implements core Anne Arundel County values. In addition to protecting and improving watershed functions such as providing clean water and habitat, these projects promote improved public safety, economic vitality, and community stewardship. This approach relies on integrating the activities of multiple County departments, and maximizes the use of limited resources by implementing solutions that meet multiple objectives. The County works with regional watershed groups, community associations, business organizations, and individual citizens to accomplish its goals. This collaborative approach enables entities to share resources, combine efforts, and address watershed issues that require a comprehensive approach. By prioritizing improvements that achieve multiple benefits to watersheds and infrastructure, we can cost-effectively meet our regulatory obligations while also achieving a net benefit to the long-term health and livability of our County.

Solutions that promote healthy watersheds while also addressing other infrastructure objectives are often the most cost-effective approaches.

Regulatory Drivers

Anne Arundel County's National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System (NPDES-MS4) permit and the Chesapeake Bay Total Maximum Daily Load (TMDL) set forth rigorous goals for controlling stormwater pollution and improving water quality. The NPDES-MS4 attainment goal tracks the restoration of 20% of Anne Arundel County's impervious surface area, such as roads, sidewalks, and driveways, which have little or no stormwater management. The County's Phase III Watershed Implementation Plan (WIP) tracks the nutrient and sediment load reductions allocated to the County by the State for achieving the Chesapeake Bay TMDL. Progress toward meeting the Chesapeake Bay TMDL is reported in the County's NPDES MS4 Annual Report to the Maryland Department of the Environment.

The seven jurisdictions (Delaware, the District of Columbia, Maryland, New York, Pennsylvania, Virginia, and West Virginia) in the Chesapeake Bay Program (CBP) partnership agreed to develop Watershed Implementation Plans (WIPs) in three phases to provide a framework for reducing nitrogen, phosphorus, and sediment loads to meet water quality standards in the Chesapeake Bay and its tidal tributaries. The Phase III WIPs provide a road map for the numeric and programmatic commitments the jurisdictions intend to implement between 2019 and 2025 so that all practices are in place by 2025 to achieve the Bay's dissolved oxygen, water clarity/submerged aquatic vegetation, and chlorophyll-a standards.

2020 – 2021 2-Year Milestone Highlights (Stormwater, Wastewater, Septic)

- **28** – BWPR stormwater management restoration projects completed
- **4** – NGO stormwater management projects funded
- **9** – NGO stormwater management projects completed
- **134** – culverts and storm drains repaired or replaced
- **6,654** – curb miles swept
- **226** – nitrogen reducing septic systems installed
- **12** – septic systems connected to sewer

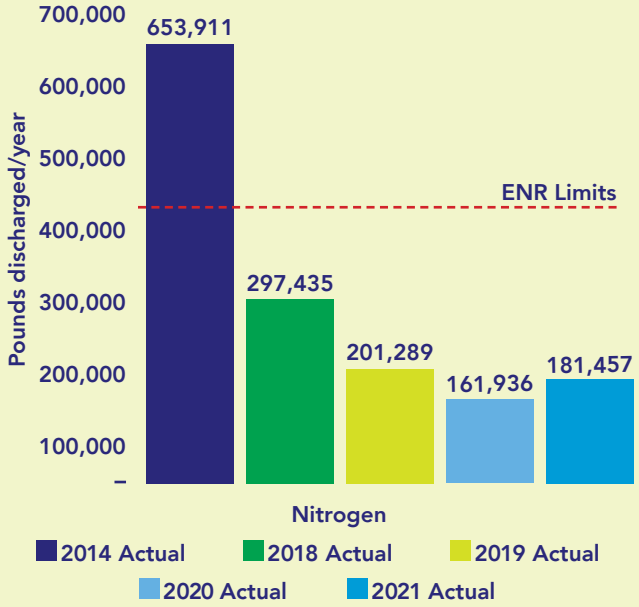
The Restoration Plan

Anne Arundel County is committed to helping Maryland meet its Chesapeake Bay clean-up goals by 2025. The County has already upgraded its six Water Reclamation Facilities (WRFs) to the highest level of wastewater treatment technology, dramatically reducing the amount of nitrogen and phosphorus to local waterways and the Chesapeake. In addition, the BWPR continues to provide treatment for stormwater runoff from those areas of the County developed prior to modern stormwater management regulations. Finally, the County is pursuing innovative strategies to deal with additional wastewater pollution from the septic sector, in concert with the Anne Arundel County Health Department and Maryland Department of the Environment. More information can be found at *ourwAAter.org*

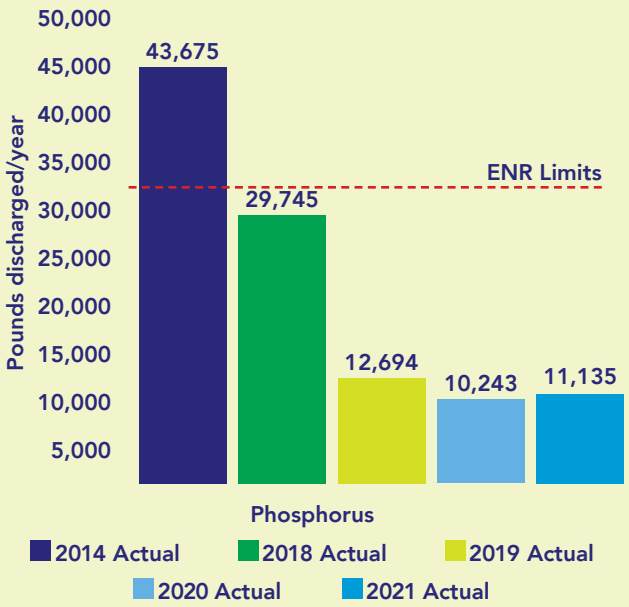
Water Reclamation Facilities – Enhanced Nutrient Removal
Anne Arundel County's $249 million investment to upgrade each of its six Water Reclamation Facilities (WRF) with Enhanced Nutrient Removal (ENR) technology was completed in July 2017. These ENR upgrades have enabled each plant to remove a far greater amount of nutrients, like nitrogen and phosphorus, from treated wastewater discharged to our rivers, creeks, streams, and 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 three years, the new facilities have been performing at a level well below the required limits for Total Nitrogen and Total Phosphorus discharge rates.

Anne Arundel County Permitted Nitrogen Discharge Limits



Anne Arundel County Permitted Phosphorus Discharge Limits



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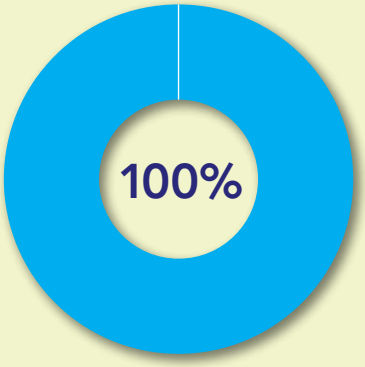
Stormwater Remediation

As of the end of FY21, the County had achieved over 100% of the restoration requirements under its current MS4 permit, with the rest of the required work in the procurement, design, and construction pipeline. The County has continued its restoration implementation with the expectation that this work will be applied to its pending stormwater permit.

BWPR MS4 Attainment Goals

(acres to date/required acres)



MS4 Permit Progress Tracking
4996 out of 4996 Completed

Septic System Conversions

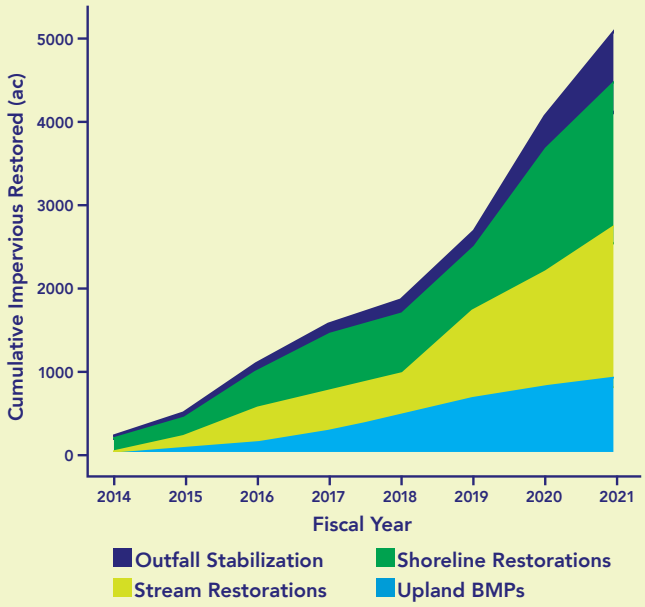
There are approximately 41,000 septic systems in Anne Arundel County. Of these, several thousand are located within the "Critical Area," land within 1,000 feet of tidal waters. The typical septic system does not remove nitrogen, instead delivering about 23.2 pounds of nitrogen per year to the groundwater, which eventually makes its way to our streams and rivers.

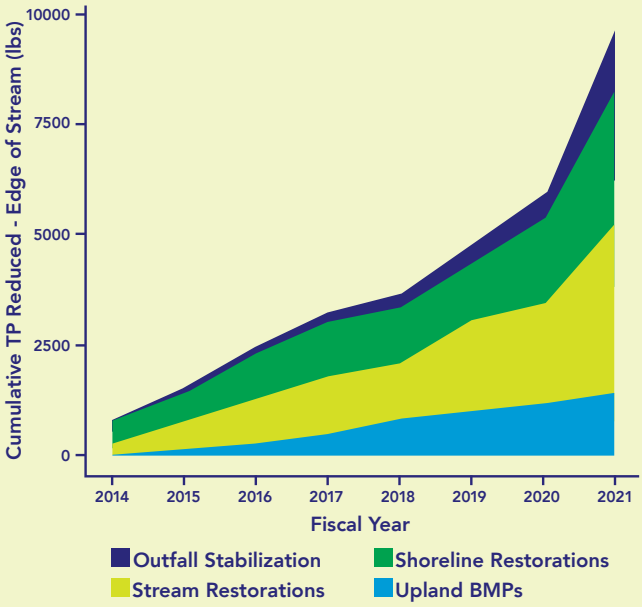
The Anne Arundel County Department of Health locally administers the Bay Restoration Fund (BRF). The BRF is a state-supported initiative that provides funding to replace conventional septic tanks with nitrogen-reducing technology. The units reduce the amount of harmful nutrients, such as nitrogen, that septic systems discharge into the Chesapeake Bay and its tributaries. An upgraded, nitrogen-removing septic system cuts a system's nitrogen load in half. The Department of Public Works and Health Department continue to work closely together to direct Bay Restoration Funds for septic conversions and septic-to-sewer connections, as revenues are available.

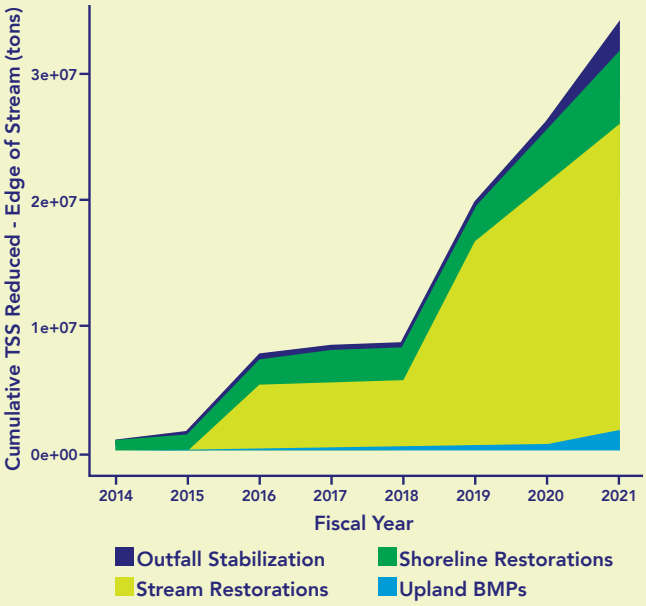
In FY21 the Department of Health improved water quality through the BRF, which cost-shared 226 pretreatment units and 12 connections to public sewer. For more information on the BRF grant program, visit www.aahealth.org.

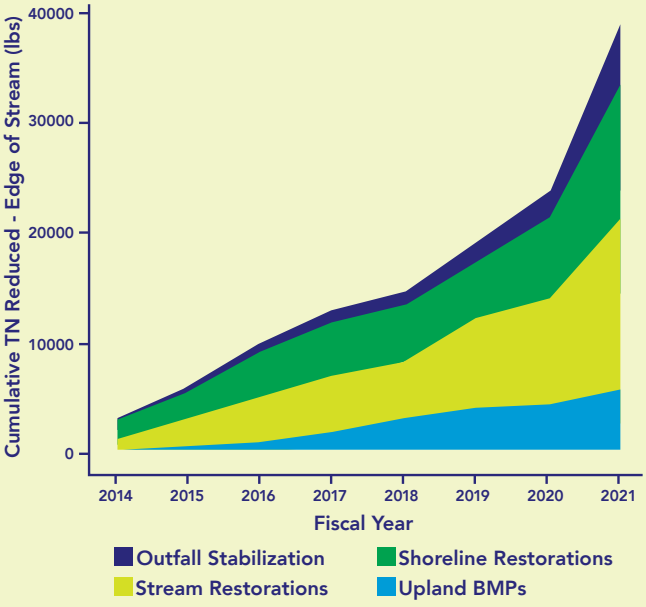
While the currency of the County's MS4 is "impervious acres treated," that number is really a stand-in for nutrient and sediment pollution reduced by those water quality practices. Both through its stormwater permit, and as a condition of the Chesapeake Bay Total Maximum Daily Load (TMDL), the County is required to reduce those pollutants both to local waterways, such as the Patapsco and Severn Rivers, and to the Chesapeake Bay. Each jurisdiction within Maryland has been assigned by MDE a pollution allocation to address.

The following figures demonstrate the County's progress towards reducing nitrogen, phosphorus, and sediment to local waterways through its clean water efforts associated with the stormwater sector. Each figure also indicates the share of pollutant reduced by various sorts of practices.









Funding History

Through fiscal year 2021, the majority of the County's stormwater-related work was funded through the Watershed Protection and Restoration Fee (WPRF), an impervious surface-based fee on properties throughout the County. That work includes not only the County's clean water restoration projects, but also the maintenance and replacement of existing drainage infrastructure, the inspection of public and private stormwater facilities, and key programmatic efforts around environmental education, illicit discharge detection and elimination (IDDE), and monitoring of restoration projects to evaluate their success. As detailed in this report, the WPRF supports staff in the Department of Inspections and Permits, Department of Public Works Bureau of Highways, Anne Arundel County Soil Conservation District, and the Department of Public Works Bureau of Watershed Protection and Restoration working to protect and restore the County's watersheds.

As required by Anne Arundel County's NPDES-MS4 permit, the proposed 2021 Financial Assurance Plan was introduced at the January 4, 2021 Anne Arundel County Council Meeting as Resolution 4-21. The Resolution was passed February 1, 2021.

How is the fee calculated?
The Department of Public Works utilized 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. An ERU is the base unit for calculating the annual charge for residential and non-residential properties. Currently the charge is $89.25 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	$89.25 x .4	$35.70
R1, R2, R5	$89.25	$89.25
RA, RLD	$89.25 x 2	$178.50
Non-Residential	Actual sf of impervious surface divided by 2,940 x $89.25	Varies

To view the WPRF for your property, visit ***www.aarivers.org***.

Healing Our Rivers

The health of Anne Arundel County's waterways is tied to the health of its watersheds. 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. Nutrient discharges from our water reclamation facilities and septic systems, and sediment and nutrient runoff from our businesses and homes are the drivers of our local impairments. Our restoration work, paired with that being 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.

Bureau of Watershed Protection and Restoration - Carrying Out the Plan

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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 and provide an array of ecosystem benefits.

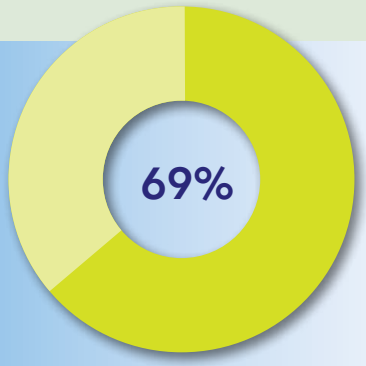
- **Stormwater Outfall Repairs -** Eroded or failing stormwater outfalls – locations where drainage systems discharge onto erosive soils – are reconstructed into systems that can both safely convey high flows as well as provide water quality benefits and habitat.

- **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 through restoration will provide water quality, flood plain connection, and ecological benefits on a broad scale.

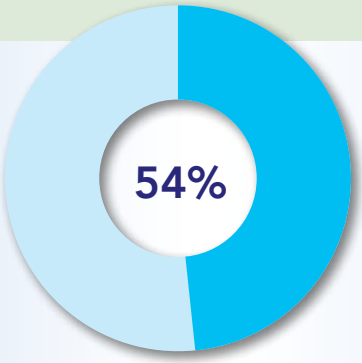
In addition to the work above, funds from the WPRF are used to address a multi-million dollar backlog of stormwater infrastructure repairs and replacement, ensuring that the County's culverts and drainage infrastructure are functioning properly and are not a threat to public health and safety.

BWPR Restoration Project Goals

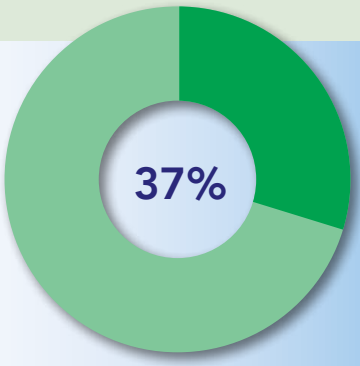
(Number of projects completed/anticipated)



Stormwater Pond Retrofits
91 out of 132 Completed



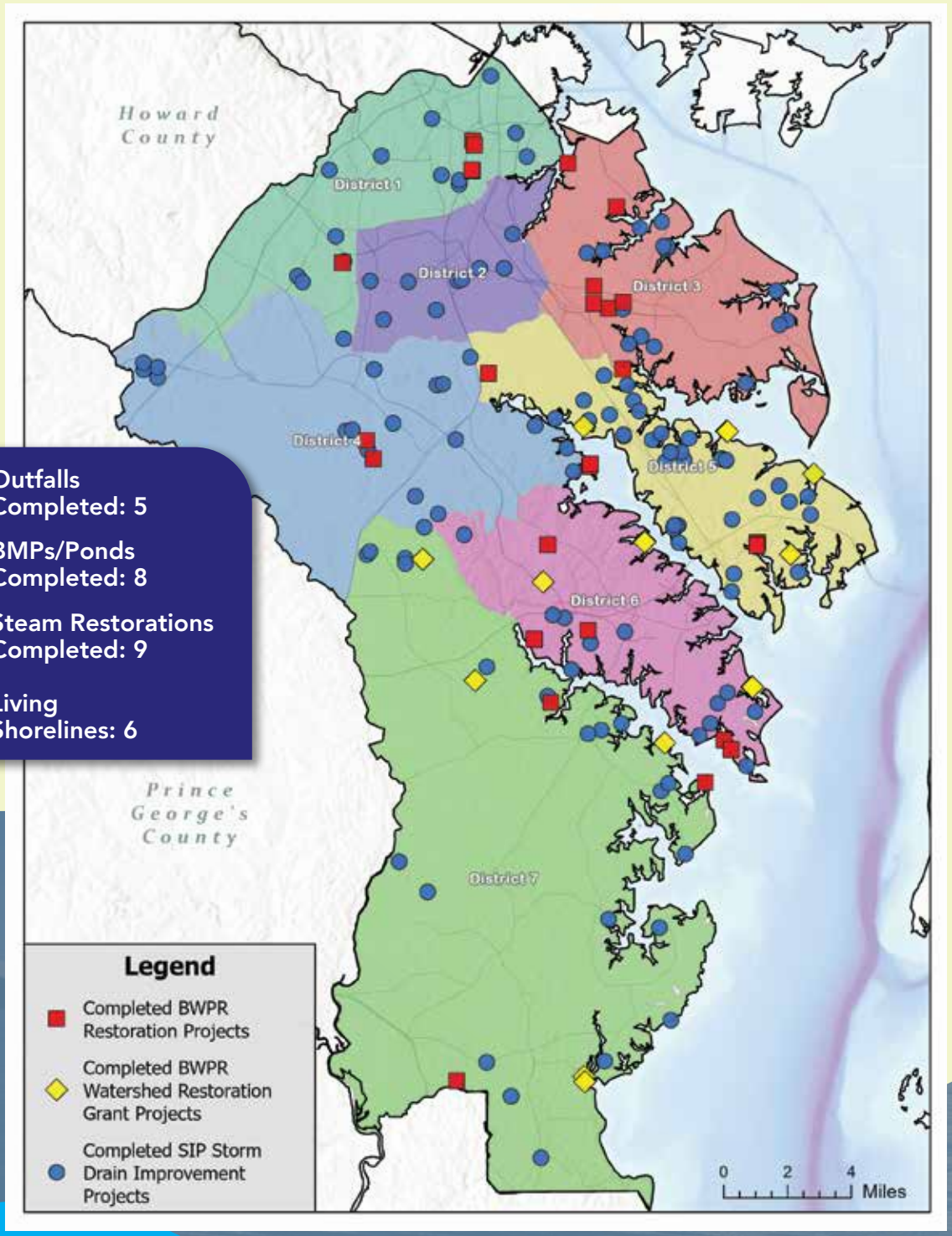
Stormwater Outfall Repairs
21 out of 39 Completed



Stream & Wetland Restoration
19 out of 52 Completed

BWRP Restoration Projects Completed in FY21

The following projects were constructed to meet multiple objectives including: water quality enhancement, infrastructure protection, improved flood attenuation, improved fish habitat, and improved riparian functions.



Outfalls Completed: 5

BMPs/Ponds Completed: 8

Steam Restorations Completed: 9

Living Shorelines: 6

Highlighted Project

The Preserve at Eisenhower Golf Course Stream and Wetland Restoration:
The Anne Arundel County Bureau of Watershed Protection and Restoration (BWPR) worked in concert with the Department of Recreation and Parks and Billy Casper Golf Management to provide environmental improvements at the golf course as part of its overall reconstruction. That environmental work included the restoration of the eroded stream channel and outfall network on the golf course property, as well as the creation and enhancement of wetlands throughout the site.

The project involved the restoration of Broad Creek and its tributaries to a fully integrated floodplain wetland system incorporated into the golf course landscape. Two branches of Broad Creek flow through the golf course as well as several tributaries, totaling approximately 5,840 linear feet of stream channel. The project also included plantings for stormwater treatment around the perimeter of the irrigation pond and boardwalk crossings of several of the channels that were incorporated into the golf course amenities.

Highlights of the project include:

- 13.23 acres of wetland creation and enhancement
- 790 linear feet of stream day-lighting and culvert removal
- 1,266 linear feet of boardwalk to protect natural resource areas and allow floodplain connection
- 6,255 linear feet of stream restoration
- 1,352 lbs/yr of prevented Total Suspended Solids (TSS) to Broad Creek, which is one of the most impaired tributaries to the South River according to the Arundel Rivers Federation
- 4.5 acres of invasive species removal (Black Fountaingrass and Phragmites)
- Over 20 different species of pollinator plants included in the planting plan

By restoring the eroded, channelized stream segments into meandering wetland complexes that not only filter runoff from the golf course and nearby General's Highway, the project has prevented further erosion of the stream banks, reduced sediment contamination into Broad Creek, and improved water quality. The stabilized banks and native vegetation also offer a more reliable habitat for wildlife such as birds, butterflies, frogs, and other animals. In addition, the improvements should enhance the playing experience at the course.

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 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 and culverts throughout the County, as well as address any associated design and permitting requirements. These projects are normally identified and transferred to the SIP by the 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 FY21	
Culvert & Closed Storm Drain Repair	$4,767,000
Emergency Storm Drain	$2,350,000
Storm Drain/SWM Infrastructure (BWPR)	$1,000,000
TOTAL	**$8,117,000.00**

FY21 STORMWATER INFRASTRUCTURE PROGRAM BWPR CAPITAL PROJECTS	
Council District	# of SIP Projects
1	13
2	9
3	16
4	20
5	39
6	14
7	23
TOTAL	**134**

SIP & Road Operations Division Milestones

The Stormwater Infrastructure Program is also responsible for managing the inventory, inspection, and maintenance of over 850 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.

2021 MILESTONES	
ACTION	**RESULT**
BMP's Inspected	386
Curb Miles Swept	6,654
Tons of Litter Collected (Street Sweeping)	28.15
Storm Drain Structures Cleared	4,084
Linear Feet of Drain Pipe Cleared	90,979
Linear Feet of Ditch Cleaned	68,528
Storm Drains Cleared	4,274

Watershed Protection and 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 FY21, the eighth year of implementation for the Watershed Protection and Restoration Fund in Anne Arundel County, Maryland. This report includes expenses incurred beginning July 1, 2020 through June 30, 2021.

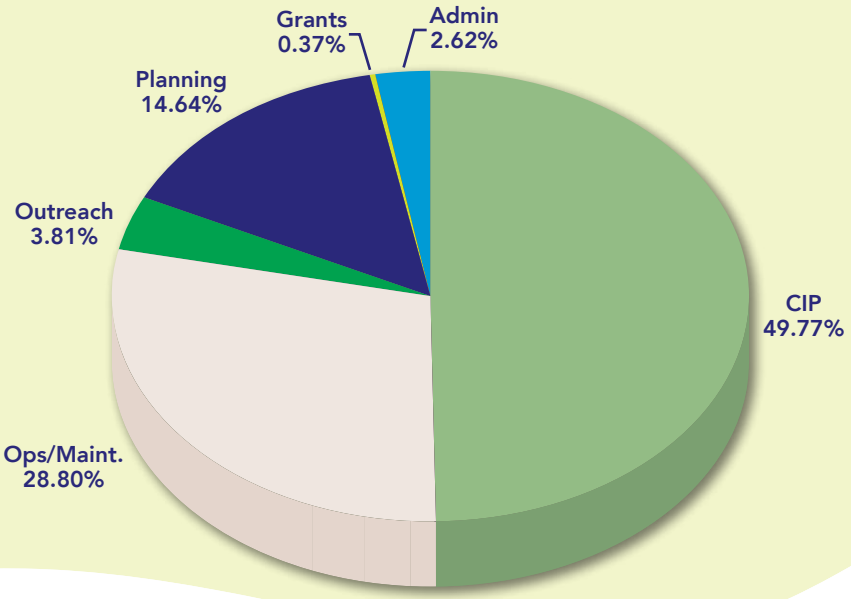
Revenues

The Stormwater Fee was first billed on property taxes on July 1, 2013. There were 222,860 properties in Anne Arundel County that were subject to the fee. For FY21, Anne Arundel County has received $23,619,000 in revenues as of June 30, 2021. In addition to the Stormwater Fees, the County has received $986,000 to fund watershed protection and restoration projects from other sources.

Expenditures

Operating expenditures for FY21 totaled $22,595,000. It should be noted that beginning in FY20, the County has taken a more aggressive approach to debt service. In FY21, the County has paid $8,567,000 out of the total operating expenditures directly towards debt service. Of the remaining operating expenditures, $6,506,000 was spent on operations and maintenance activities for the county's stormwater infrastructure. An additional $3,307,000 was spent for planning for future improvements to these systems. The fund balance of $2,010,000 will be used to pay debt payments associated with the capital improvement projects required to update the aging infrastructure and the construction of best management practices for locations that do not meet current requirements.

FY21 Operating Expenditures



Surface Water Monitoring Program

The Surface Water Monitoring Program is responsible for evaluating the in-stream water quality of the County's non-tidal streams and rivers. The program monitors the health and water quality of the County's streams and rivers in a variety of ways and for a variety of reasons, including:

Biological Health - What's the best way to determine the overall health of the County's streams and rivers? Biological assessments are a highly effective, scientifically validated approach to understanding the overall health and quality of streams. Since 2004, the County has monitored the biological health of its non-tidal streams and rivers for two overarching purposes: to establish a general baseline of knowledge regarding stream health and to compare future conditions over the long term to see if management actions are successful in restoring watershed health to degraded systems.

Fish and aquatic insect communities are the stream communities the County uses to understand overall stream health. Aquatic insects are somewhat stationary and integrate a whole season of water quality impacts in a way that a single water sample or short series of water samples simply cannot do.

Fish use different kinds of stream habitat and are mobile, providing a different understanding of stream health. Changes in biological communities from their known and well-studied natural condition can indicate impairment in stream health.

BWPR finished its third round of sampling in 2021, affording us for the first time a complete baseline of fish distribution across the County and continuing the on-going assessment of aquatic insect communities performed since the program's inception in 2004.

Monitoring for Restoration Success

To determine if a stream restoration project is meeting its objectives, before and after monitoring are performed. Water quality, biological, and stream channel stability measurements are performed both before and after restoration activities, ensuring that funds are spent in effectively and efficiently. Currently, detailed monitoring to characterize pre-restoration conditions has been completed in both the Cowhide Branch and Furnace Branch watersheds. In Furnace Branch, the County will begin collecting post-restoration water samples and will continue sampling the aquatic insect population now that restoration work is complete to determine how effective the project is at enhancing ecological conditions. Similar characterization work is underway in Cowhide Branch where, in conjunction with a stream restoration project, a large dam was removed to restore the free movement of fish within the watershed. Physical stability assessments and fish population sampling have been performed in the reaches upstream of the project area so that the actual level of fish habitat restoration can be determined during the post-restoration monitoring period.

Illicit Discharge Detection and Elimination (IDDE) Program

The BWRP 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. An illicit discharge is defined as any discharge to the storm sewer system that is not composed entirely of stormwater (except where allowed by a discharge permit). BWPR collaborates with other County agencies that have the legal authority to inspect and enforce any identified illicit discharges. The County's IDDE program has been successful in the identification and removal of a wide variety of sources of pollutants, including illicit connections, upland pollutant sources, illegal dumping, and spills. During the course of the County's annual outfall field screening, observed flow during dry weather conditions is tested for pollutants and the source of flow is investigated. During FY21, 155 outfalls were successfully inspected and one (1) potential source of illicit discharge was identified. The discharge was later confirmed as illicit, with elevated levels of chlorine present. The illicit discharge was found to be the result of washing of commercial vehicles. By the end of the fiscal year (June 30, 2021), the Department of Inspection and Permits (I&P) had resolved this incident. To report a potential illicit discharge or other environmental violation contact the Anne Arundel County Environmental Hotline at 410-222-7171.

Case Study

In April 2021, the County's IDDE consultant observed dry-weather flow at a storm drain outfall in Linthicum Heights Business Park. The discharge was chemically tested and results revealed a level of chlorine exceeding the IDDE threshold.

A follow-up visit to the outfall later that day confirmed the results of the initial tests. The field team conducted a thorough investigation of the source of the discharge, observing flowing water in connected stormwater pipes but ultimately unable to locate the source of the flow. The field team immediately reported their findings to the County's environmental hotline. Upon receiving the report of the illicit discharge, the County's Inspections and Permits (I&P) inspectors began their investigation. Upon initial inspection, I&P inspectors observed the flow and confirmed that chlorine levels were in excess of the IDDE threshold, but were not able to locate an upstream source of the flow. Suspecting a leaking potable water line, the County's Bureau of Utilities was called upon to investigate a possible water leak. After the Bureau of Utilities confirmed that there were no leaking water lines, a correction notice was sent to the property owner to locate the source of chlorine in the storm drain system and make the necessary corrections. I&P inspectors received a response from the property owner and met with the property's maintenance manager on-site. On this visit, discharge at the outfall was again observed, along with the smell of chlorine, but no source could be found. During a follow-up inspection six days later I&P inspectors observed a nearby soft wash company was washing vehicles in the parking lot. Analysis of the wash water in the parking lot and discharge at the outfall showed elevated levels of chlorine. I&P inspectors spoke with managers at the soft wash company to inform them of the illicit discharge and instructed them to cease vehicle washing in the parking lot; managers of the company expressed that they would comply. Subsequent follow-up inspections by I&P revealed that chlorine was absent from water at the outfall and no evidence of vehicle washing in the parking lot was observed.

Watershed Partnerships

Successful conservation and preservation of Anne Arundel County's watersheds takes teamwork. To that end, 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 in order 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.

Below is a list of organizations that were awarded funding from Anne Arundel County for water quality restoration projects in 2021:

ORGANIZATION	PROJECT DESCRIPTION	WATERSHED	FUNDING AMOUNT	MATCH AMOUNT	IMPERVIOUS ACRES TREATED
Severn Riverkeeper	Belvoir Farm Pond SPSC Retrofit	Severn	$274,880	$328,787	4
Arundel Rivers Federation	St. Mark UMC Stormwater Restoration	South	$298,665	$142,260	5.47
Arundel Rivers Federation	Quiet Waters - Caffrey Run Stream Restoration	South	$221,960	$531,770	41.81
Arundel Rivers Federation	Broad Creek Valley West Stream Restoration	South	$302,569	$838,373	58.17
TOTAL			**$1,098,074**	**$1,841,190**	**109.45**

Success Story

St. Dixon Farm Restoration – Chesapeake Rivers Association, Inc. (The Severn Riverkeeper)
2020 BWPR Grant Award Amount: $242,567.00

The St. Dixon Farm Restoration project, constructed in December 2020, is situated on an operating sod farm located in the Whitehall peninsula between Mill Creek and Whitehall Creek in the Severn River watershed. SRK partnered with Design/Build Firm Underwood & Associates, Inc. to implement the project, and SRK was awarded funding for construction through the Anne Arundel Watershed Restoration Grant in spring of 2020. The Regenerative Stormwater Conveyance (RSC) design approach – an innovative technique to apply on agricultural land – was implemented to enhance an ephemeral flow path extending approximately 700 LF from the existing farm to a sediment catch basin on-site. Overall, this project captures and treats 0.64 acres of impervious runoff, resulting in annual pollutant load reductions of 26 pounds total nitrogen, 2.5 pounds total phosphorus, and 0.46 tons total suspended sediments.

In addition to stormwater treatment and habitat enhancement, a driving goal of this project was to achieve approval of RSC as a NRCS Conservation Practice Standard, which would enable Federal cost-sharing and make the practice more accessible and affordable to agricultural landowners nationwide. As part of this forward-thinking partnership, NRCS awarded funding for pre- and post-construction water quality monitoring with goals to document a measurable change in impervious runoff as a result of the restoration project. This data will ultimately help to strengthen the justification for making this practice a standard for agricultural BMPs.

The project team made concerted efforts to maximize the outreach potential and efficiency of this project. In light of the COVID-19 pandemic, the project team hosted a COVID-friendly Earth Day Community Planting event that was enthusiastically attended by students from Archbishop Spalding High School, in addition to State Senator Sarah Elfreth, County Executive Steuart Pittman and staff, as well as Claudia Donnegan, Director of DNR's Center for Habitat Restoration and Conservation. Additionally, permitting costs and timeline were both significantly reduced due to the fact that the project was included in an Agricultural Farm Plan, only requiring permitting by the Anne Arundel County Soil Conservation District rather than the full Grading Permit process.

According to 2015 estimates from the Chesapeake Bay Program, "agriculture contributes 42% of the nitrogen, 55% of the phosphorus, and 60% of the sediment entering the Bay." With over 80,000 acres of agricultural land in Anne Arundel County, there is immense opportunity for measurable restoration in this local close-knit industry. Through the St. Dixon Farm Restoration, SRK and Underwood & Associates are showcasing that the goals of agricultural stormwater management and those of regional Watershed Implementation Plans can truly complement one another. Anne Arundel County is very excited about the opportunity to support more local farms through the Watershed Restoration Grant Program, and we commend this project team on their dedication to strengthening these meaningful relationships and restoring our local waterways!

More information about the grant program can be found at *www.cbtrust.org*.

Anne Arundel County Watershed Stewards Academy (WSA)

The Anne Arundel County Watershed Stewards Academy was created in 2009 out of a partnership between Arlington Echo Outdoor Education Center and the Anne Arundel County Department of Public Works to build capacity within communities to reduce pollutants entering our waterways via stormwater runoff. The Bureau of Watershed Protection and Restoration continues to provide critical support in connecting Stewards and communities with watershed studies, planning, and restoration efforts.

WSA trains citizens in Anne Arundel County to help neighbors reduce pollution in our local streams, creeks, and rivers. WSA's hands-on training course gives Stewards the tools to bring change to their communities, by turning knowledge and good intentions into action. Stewards work with communities to install projects such as rain gardens or conservation landscapes that capture polluted runoff. Collectively, these community and individual actions add up to better health for our local waterways and the Chesapeake Bay.

2021 WSA Successes

- Reached **9,775** residents, providing technical assistance or environmental education. *(Note: It was difficult to measure how many residents were reached through various web based communications and outreach. This number represents only in person or virtual participation of both people in the events above, and in events and engagements organized by Watershed Stewards.)*
- Planted **17,457** Native Plants and Shrubs and **4,375** Trees for a total of **21,832 plants in the ground**.
- Led more than **330 Restoration Projects**.
- Stewards donated **10,265** volunteer hours towards restoration, education, and outreach in their communities
- Removed **50,005+ square feet** of invasive species
- Removed **280 pounds** of trash

For more information about WSA visit www.aawsa.org

Public-Private Partnerships - A Win-Win Situation

During FY21, the Bureau of Watershed Protection and Restoration awarded $1.615 million to restore 2,906 linear feet of stream through its innovative Full Delivery of Water Quality improvements contract.

Launched in 2016, this is the county's "Full Delivery of Water Quality Improvements" contract, 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 will support the county's Municipal Separate Storm Sewer System (MS4) and Chesapeake Bay Total Maximum Daily Load (TMDL) permits.

The winning design-build team, Wildlands Engineering, Inc., will undertake the landowner coordination, design, permitting, and construction of the stream restoration project. The project is located in Friendship on a tributary that flows to the lower Patuxent River, and will reduce bed and bank erosion, expand the riparian forested corridor and riparian wetlands, and improve water quality by reducing agricultural runoff from the adjacent watershed.

The full award will only be paid upon completion of the project and verification of the project's benefits. The County's capital program intends to make an additional solicitation in the fall of 2021.

Anne Arundel Soil Conservation District -

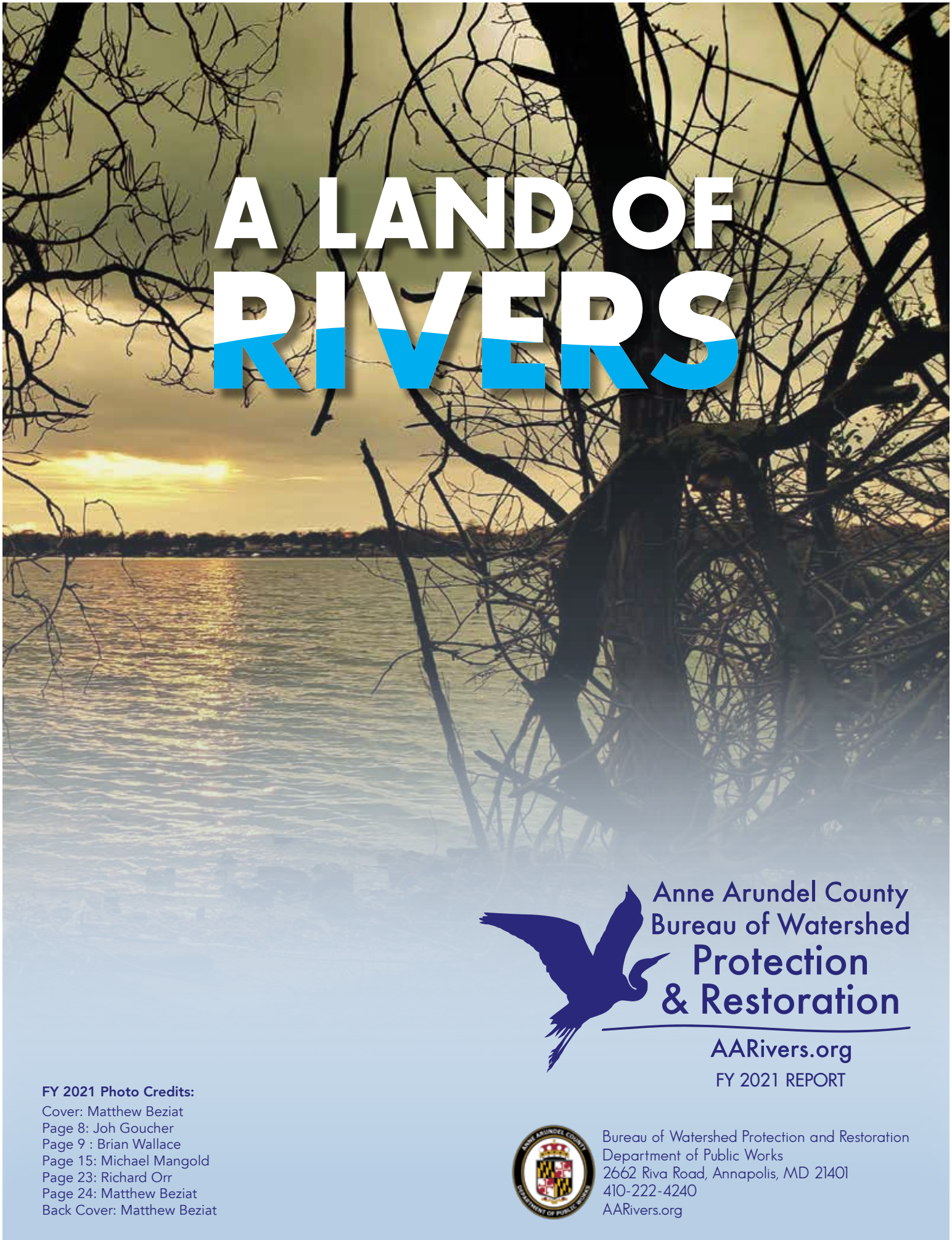
Partnering with Anne Arundel County to protect our water resources.

Soil Conservation Districts were formed in response to the Dust Bowl that occurred in the 1930s, when eroding land led to dust storms and economic devastation. There was an initiative to form Soil Conservation Districts throughout the country and local landowners made up a Board of Supervisors that could convey to the federal government the needs of the local agricultural community. Each county in Maryland has a Soil Conservation office with Frederick County having two. The Anne Arundel District was formed in 1946. Working with agricultural landowners, the District provides guidance as well as engineering services to keep soil and nutrients on the land. The District partners 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) to accomplish its mission. The office houses both state and federal employees, all working together to accomplish the same goals. The office currently works with approximately 400 agricultural cooperators throughout the County.

Since Soil Conservation Districts have experience with controlling soil on agricultural land, when the Maryland Sediment Control Law was passed in 1970, the state assigned the Districts with the task of reviewing all sediment and erosion control plans for urban development. Thus, the Anne Arundel Soil Conservation District reviews the sediment and erosion control portion of a grading plan that is submitted to the county.

A high priority mission of the District is to meet the federally mandated Chesapeake Bay Total Maximum Daily Load (TMDL) by 2025. These goals have been set by the Environmental Protection Agency and reaching these goals in the agricultural community of the County is the responsibility of the Maryland Department of Agriculture. Soil Conservation Districts throughout the state have partnered with MDA to accomplish this task. Districts accomplish this by installing Best Management Practices (BMPs) on agricultural land. There are 122 BMPs, both agronomic and structural each having their own standard and specification. One of our more recent tools to combat eroding stream on agricultural properties are Step Pool Storm Conveyance systems (SPSC) that, until recently, have only been installed on urban sites.

With Anne Arundel County working with the urban community and Soil Conservation working with the agricultural community, we are working together to meet our TMDL goals and thus improving the water quality in the Chesapeake Bay.



A LAND OF RIVERS

Anne Arundel County
Bureau of Watershed
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FY 2021 REPORT

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