

# Utilizing Innovation to Achieve Nutrient and Sediment Reductions for the Chesapeake in Anne Arundel County, MD

Anne Arundel County Department of Public Works

October 28, 2021



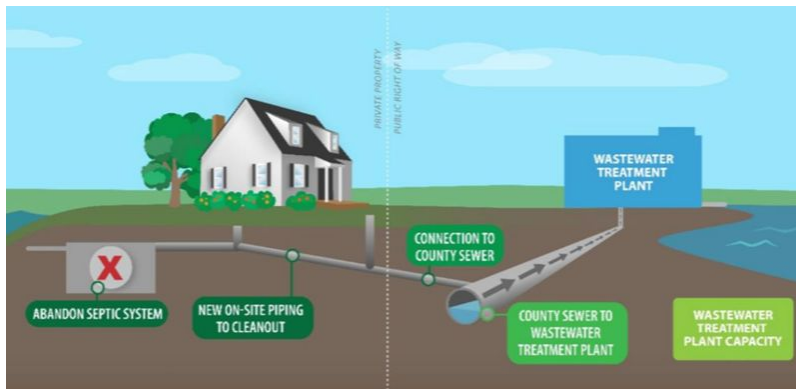
[www.aarivers.org](http://www.aarivers.org)



# Four Legs for Water Quality



- Land Use Policies
- Wastewater Treatment Plants
- Septic Connections
- Stormwater Projects



# The County's Regulatory Mandates



## MS4 Permit

- Municipal Separate Storm Sewer System (MS4) Permit (issued by MDE).
- 5-year cycle, current permit issued in February 2014. Next permit will be issued in winter 2021.
- Required treatment of 20% of the untreated impervious area in the county during the permit cycle. (4,996 acres)
- Used TN/TP/TSS credits generated at the County's WWTPs to achieve permit compliance. Burned off nutrient trade in fall 2020
- Next permit will likely require the treatment of another 2,998 acres.
- A key component of the Chesapeake Bay TMDL



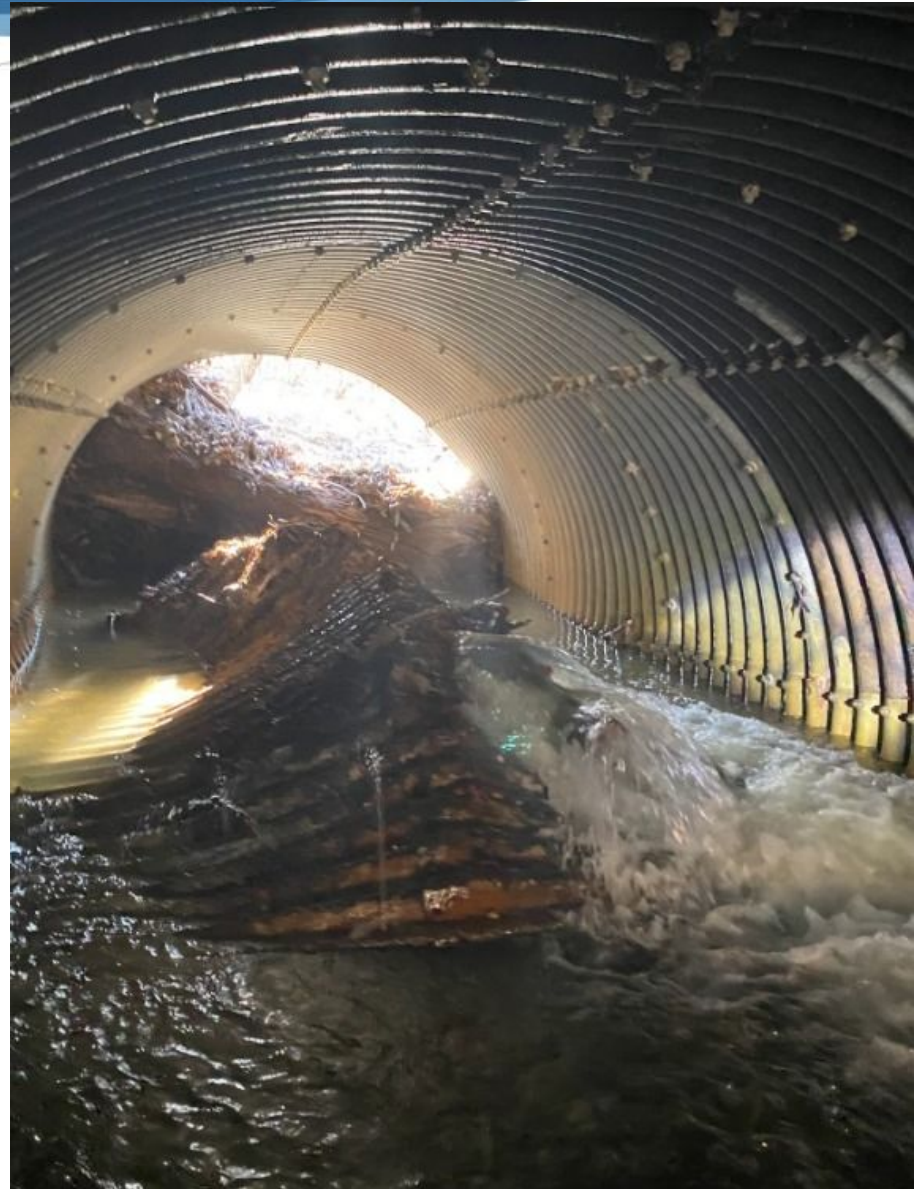
# Re-building Resiliency: Our Progress to Date



# Current Status of BWPR-Funded Projects

- 800+ Culvert & Storm Drain projects completed. (\$7M/year)
- 135 Water Quality Improvement Projects completed thus far in permit term.
- Over 5,000 impervious acres treated.
- ~90 additional projects underway.
- Over \$250M authorized for clean water projects.
- Includes stormwater retrofits, outfall restoration, as well as stream and wetland restoration.

# SANDS ROAD - BEFORE (PATUXENT WATERSHED)





SANDS ROAD - AFTER





# STORMWATER POND RETROFIT - COUNTY OFFICE COMPLEX





# DRY POND RETROFIT - SEVERN WATERSHED





TOWSER'S OUTFALL - BEFORE





# TOWSER'S OUTFALL - AFTER





CAT BRANCH - BEFORE (EXPOSED SEWER LINE)





CAT BRANCH - AFTER





# DAIRY FARM ROAD OUTFALL













# Design/Bid/Build Contracting Efficiencies

## Design Side

- Open end contracts (Up to \$250k per contract)
- Task order contracts by watershed (Up to \$1M/yr (5 yrs))

## Construction Management

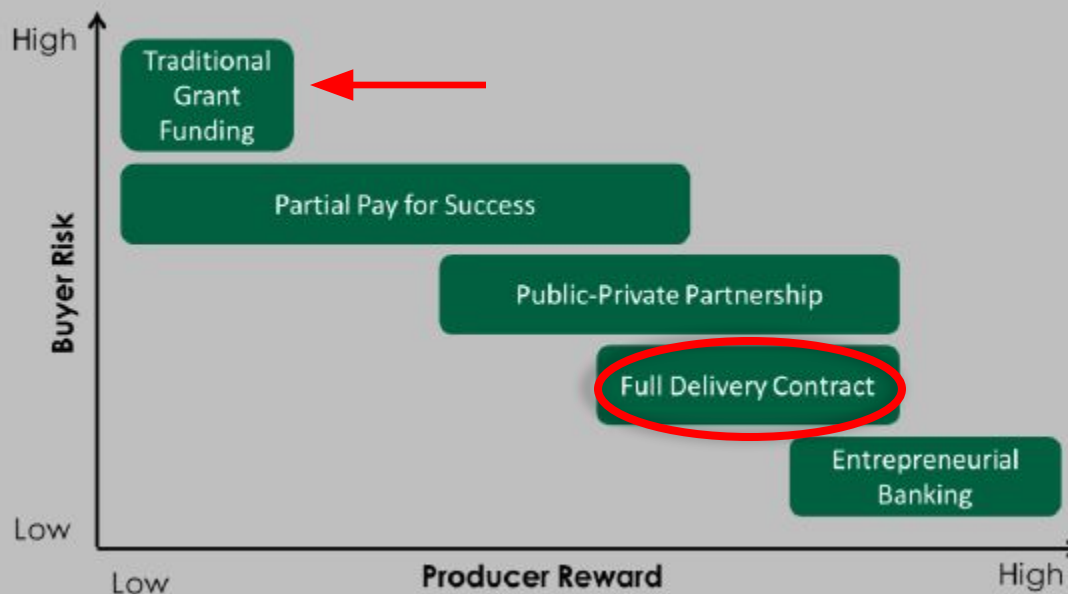
- Task order CMI contracts (Up to \$1M/yr (5 yrs))

## Construction

- Blanket order contracts for different sorts of restoration practices, or in different parts of the County. (Up to \$5M/yr (5 yrs))
- Blanket contracts for planting and maintenance.

# PAY FOR PERFORMANCE CONTRACT MECHANISMS FOR STORMWATER MANAGEMENT

## PAY FOR SUCCESS STRATEGY RISK-REWARD SPECTRUM





# FISHING CREEK FARMS LIVING SHORELINE



Before Construction – December 2018



Immediately After Construction – October 2020



# KYLE POINT LIVING SHORELINE



## I97 - SEPTIC TO SEWER



## HERITAGE HARBOR STREAM







HOLLY BEACH FARM LIVING SHORELINE

# Costs Per Acre Treated

Practice	Cost per Acre Treated
Bioretention retrofits	~\$200k
Stormwater pond retrofits	~\$75k
Stream restoration	~\$50k
Full Delivery award, Cycle 1	~\$16k
Full Delivery award, Cycle 2	~\$15k
Full Delivery award, Cycle 3	~\$21k
Full Delivery award, Cycle 4	~\$26k
Full Delivery award, Cycle 5	~\$12k

Treated acres provided through the Full Delivery award:

Cycle 1: ~131 for \$2.1M

Cycle 2: ~113 for \$1.7M

Cycle 3: ~255 for \$5.4M

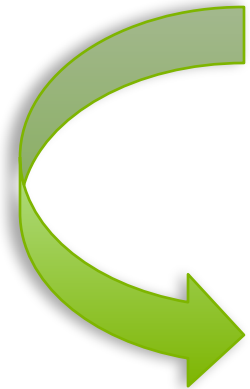
Cycle 4: ~115 for \$3M

Cycle 5: ~137 for \$1.6M





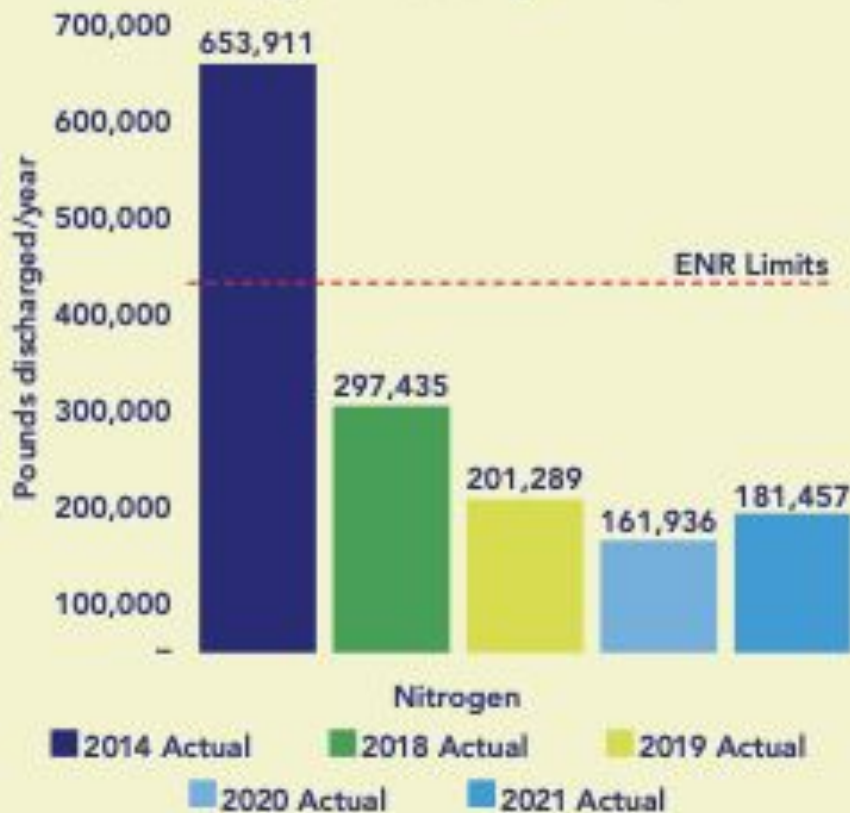




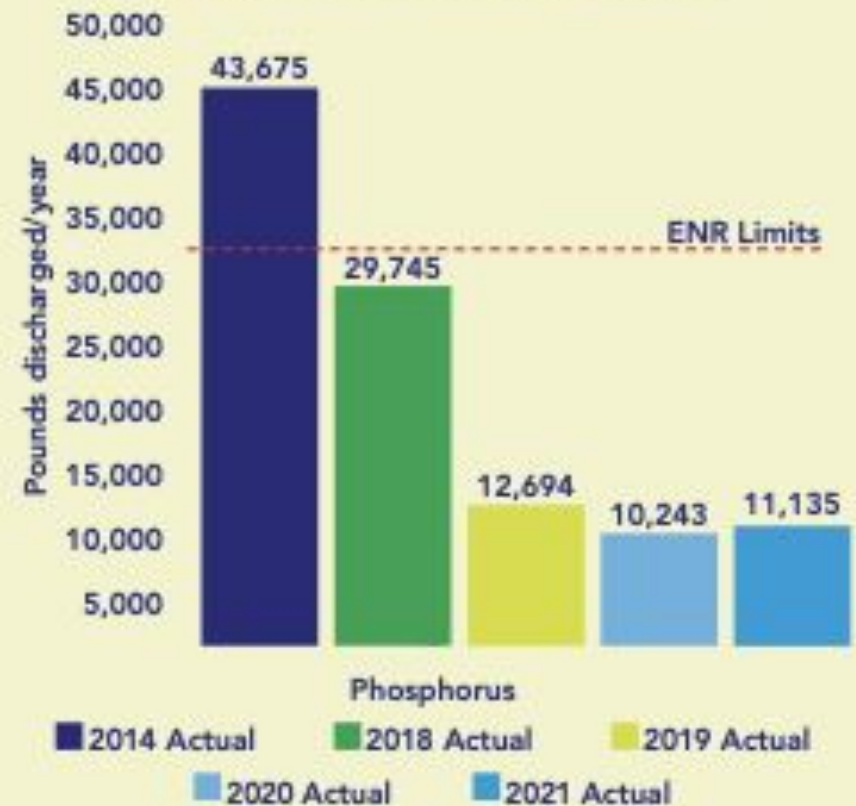


# Aggregate County WWTP Discharges

## Anne Arundel County Permitted Nitrogen Discharge Limits



## Anne Arundel County Permitted Phosphorus Discharge Limits







*Image via Delaware Sea Grant*



# Anne Arundel County Restoration Grant Program

- Open to non-profit partners
- Administered through CBT ([www.cbtrust.org](http://www.cbtrust.org))

Cycle	Award Amount	Leverage	\$/Acre
1	\$444,108	\$572,428	\$14,125
2	\$900,000	\$1,135,000	\$41,000
3	\$1,000,000	\$645,301	\$16,900
4	\$671,000	\$862,294	\$12,900
5	\$1,117,528	\$3,089,548	\$9,391
6	\$1,098,074	\$1,841,190	\$10,167



# Anne Arundel County Watershed Restoration Grant Program Projects – FY20



**Ulmstead Community Park Rain Garden**  
Awardee: Ulmstead CIA



**Loch Haven Living Shoreline**  
Awardee: Loch Haven Civic Association



**Broad Creek Park Stream Restoration**  
Awardee: Arundel Rivers Federation



**Beards Creek/Annapolis Landing Stream Restoration**  
Awardee: Arundel Rivers Federation



**West Severna Park Living Shoreline**  
Awardee: Severn River Association



**St. Dixon/Central Sod Farm Restoration**  
Awardee: Severn Riverkeeper



**Broad Creek/Camp Woodlands Restoration**  
Awardee: Arundel Rivers Federation





# ULMSTEAD BIORETENTION



## ST. DIXON FARM RSC





# The dead can rest in peace again at Broadneck church after stormwater project addresses flooding cemetery



By RACHAEL PACELLA

STAFF WRITER | JUN 27, 2019 | 5:00 AM



## Asbury UMC stream and graveyard protection

Children and adults crowd a new bridge over a new stream bed as they celebrate the completion of a stormwater project at Broadneck Methodist Church. Prior to the project, a stream had been flooding the cemetery.

ADVERTISEMENT

Meet your **printing** department

marketing

copy

**W**  
workonomy.

## LATEST NEWS

NATION AND WORLD NEWS

'Basic and fundamental errors' in Russia investigation, government watchdog tells Congress

12m

NATION AND WORLD NEWS

Which members of Congress back



# Floodprone Property Acquisition Program



*(Photo Not from Anne Arundel County)*



# Supporting the Anne Arundel County Watershed Stewards Academy (WSA)



## 2020 WSA Successes

- Installed 96,655 square feet of new-in-the-ground projects
- Reached 8,422 County residents, providing technical assistance or environmental education
- Planted 9,390 Native Plants and Trees
- Stewards donated 9,929 volunteer hours towards restoration, education, and outreach in their communities
- Removed 23,670 square feet of invasive species
- Removed 14,640 pounds of trash

For more information about WSA visit [www.aawsa.org](http://www.aawsa.org)





# A LAND OF RIVERS



Anne Arundel County  
Bureau of Watershed  
Protection  
& Restoration

[AARivers.org](http://AARivers.org)  
FY 2021 REPORT





# Questions?

Matt Johnston  
Environmental Policy Director, Anne Arundel County  
[exjohn00@aacounty.org](mailto:exjohn00@aacounty.org)

Erik Michelsen  
Deputy Director, Bureau of Watershed Protection & Restoration  
[pwmich20@aacounty.org](mailto:pwmich20@aacounty.org)

[aarivers.org](http://aarivers.org)