

Learning from Challenges Faced by Others – Reflections for Ohio MS4s

OHIO STORMWATER CONFERENCE

MAY 10, 2018

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CHESAPEAKE BAY TMDL

Established by U.S. EPA in 2010

Encompasses a 64,000-square-mile watershed

Set annual Bay watershed limits:

—185.9 million pounds of nitrogen

—12.5 million pounds of phosphorus

—6.45 billion pounds of sediment per year

Limits are further divided by jurisdiction and sector

Accountability framework includes the WIPs and two-year milestones

Designed to ensure all pollution control measures needed to fully restore the Bay by 2025



MARYLAND MS4 PROGRAMS

General Requirements

- Public Education and Outreach
- Public Involvement and Participation
- Illicit Discharge Detection and Elimination
- Construction Site Stormwater Runoff Control
- Post Construction Stormwater Management
- Pollution Prevention and Good Housekeeping

Chesapeake Bay Restoration

- Restore 20% of existing developed lands that have little or no stormwater management
- Address the water quality goals of the Chesapeake Bay TMDL by 2025
- Demonstrate progress toward meeting local stormwater wasteload allocations (WLAs)

MONTGOMERY COUNTY, MARYLAND

507 square miles

Over 1,000,000 residents

Near Washington DC & Baltimore

Incorporated cities –

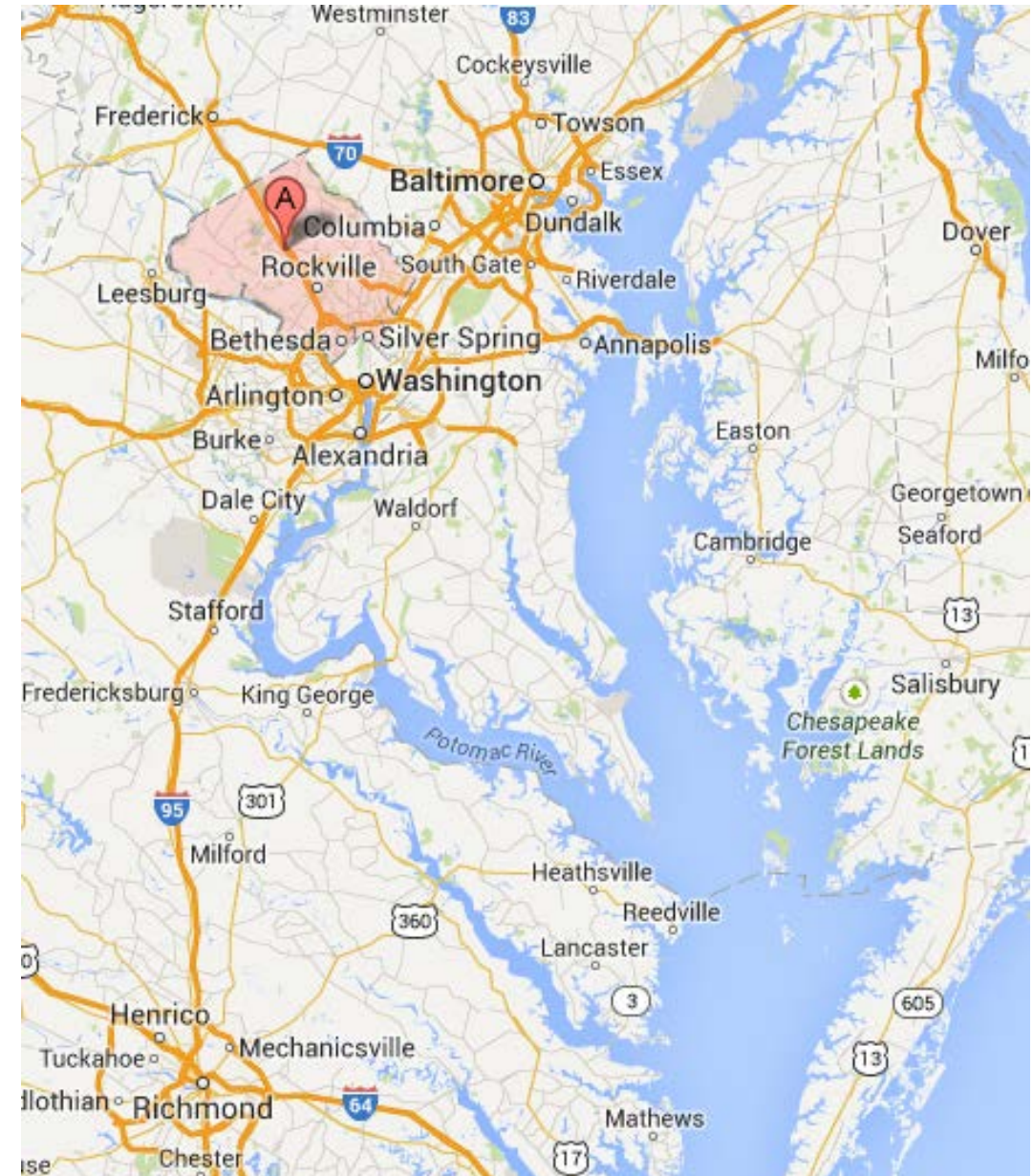
Rockville, Gaithersburg

Unincorporated locales –

Bethesda, Silver Spring, Germantown

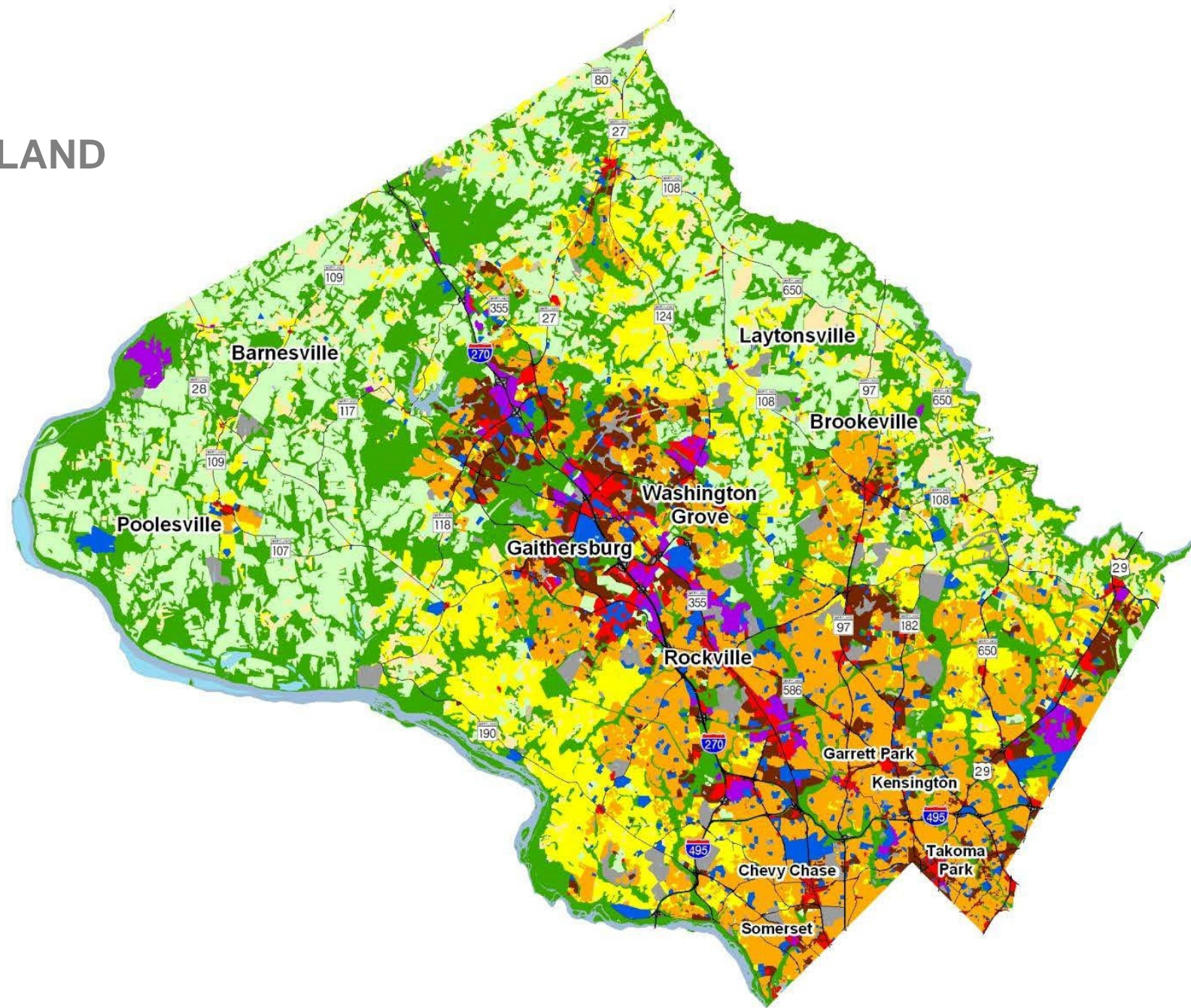
About 12% imperviousness

Over 1,500 miles of streams







MONTGOMERY COUNTY, MARYLAND





2010 Land Use / Land Cover



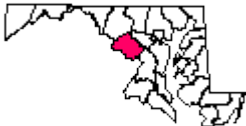



MONTGOMERY COUNTY, MARYLAND

	County	Area (sq mi)	Population (2013)
	Montgomery County	507	1,016,677
	Cuyahoga County	1,246	1,263,154
	Franklin County	543	1,212,263
	Hamilton County	413	804,520

MONTGOMERY COUNTY, MARYLAND

County		
	Montgomery County	<ul style="list-style-type: none"> • 1 Phase 1 MS4 Permit with co-permittees (MCPS, 5 towns, 1 village) • 3 Phase II MS4 Permits
	Cuyahoga County	<ul style="list-style-type: none"> • 58 Small MS4 General Permits • 1 Individual MS4 Permit
	Franklin County	<ul style="list-style-type: none"> • 24 Small MS4 General Permits
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MONTGOMERY COUNTY'S "STORMWATER PERMIT"

Issued by Maryland Department of the Environment

NPDES MS4 Phase 1 permit

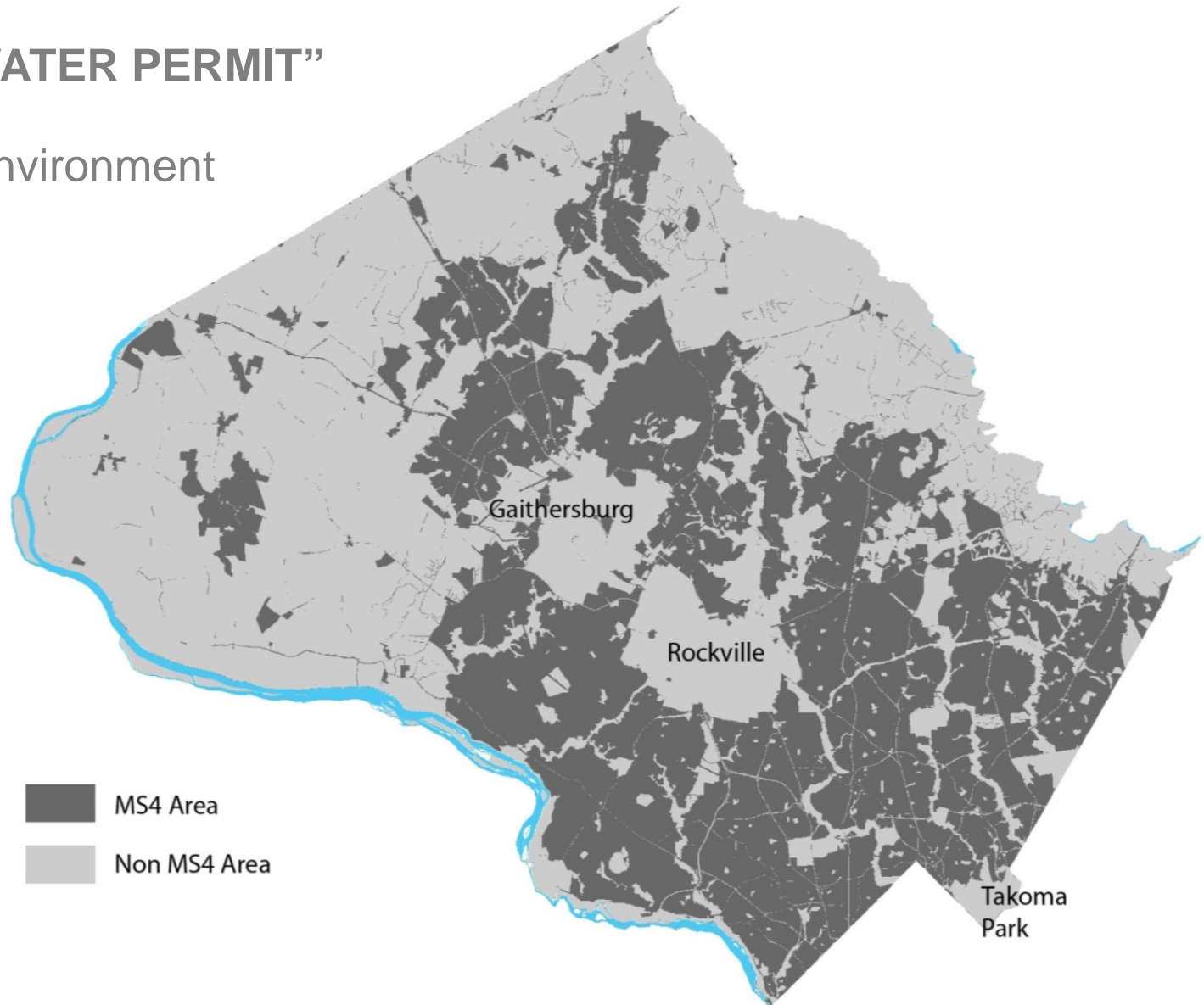
Permit term of five years

First permit issued in 1996

Third permit issued in 2010

Applies to entire County,
including public schools,
excludes agricultural lands
and areas covered under
other MS4 permits

Model for subsequent
"3rd generation" permits
in Maryland



REQUIREMENTS FOR CURRENT STORMWATER PERMIT

Accelerate watershed restoration

Achieve reductions for Total Maximum Daily Loads (TMDLs)

Use Environmental Site Design (ESD) to the maximum extent practicable (MEP)

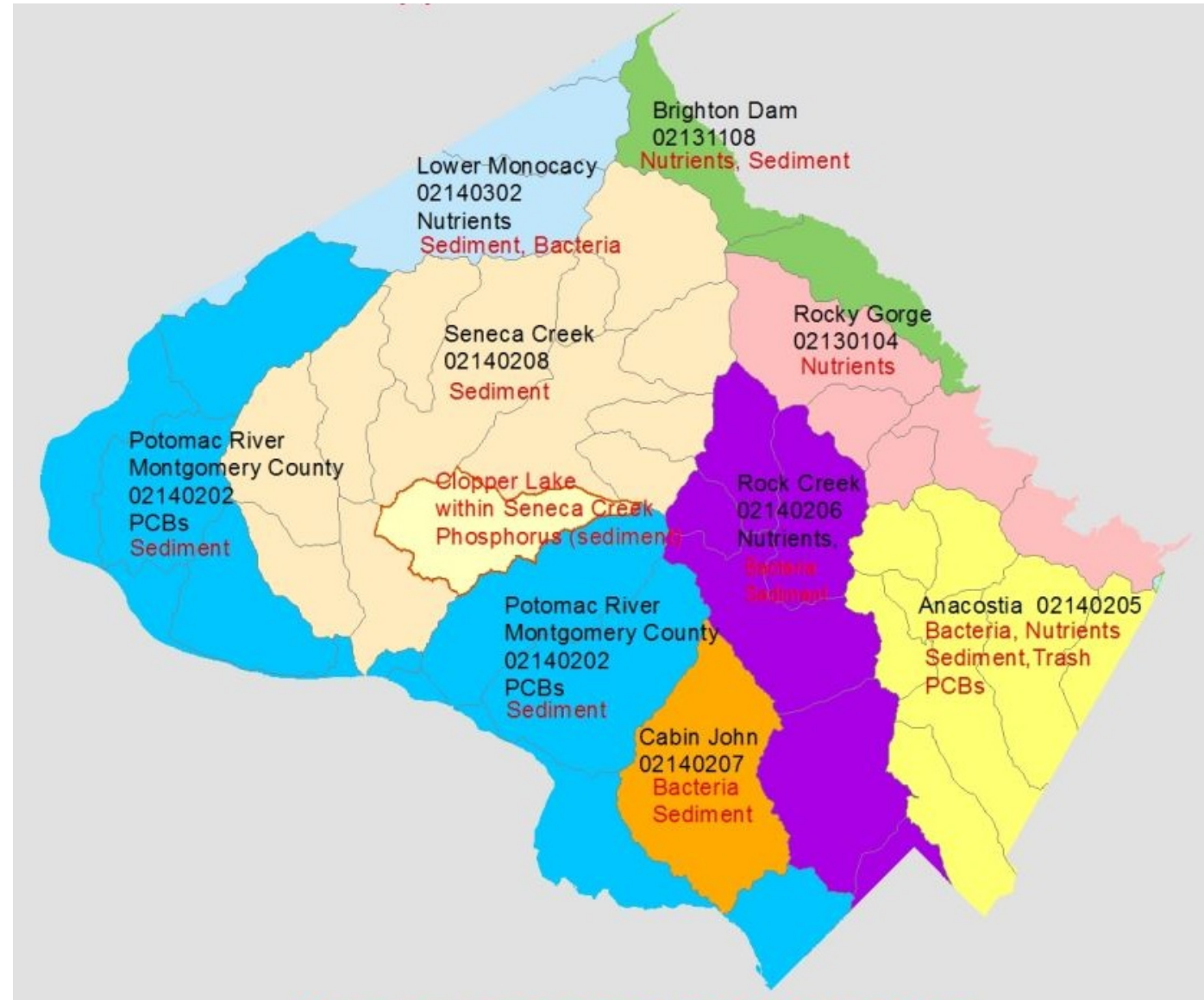
In addition to assuring public input and stewardship opportunities, interagency coordination, annual reporting, source identification, discharge characterization, monitoring, stormwater facility inspection and maintenance enforcement, and illicit discharge detection and elimination

ACCELERATING WATERSHED RESTORATION

Restore 20% of existing impervious area that is not currently treated

Description	Area (acres)	Area (sq mi)
Total County Area	324,552	507
Total Impervious Surface	35,965	56.2
County Area Subject to Stormwater Permit	138,649	216.6
Impervious Cover Subject to Stormwater Permit	25,119	39.2
County MS4 Area with MEP Stormwater Management	6,235	9.7
Under/Uncontrolled Impervious Area Subject to MS4 Permit	18,884	29.5
Impervious Area to Restore During Current Permit Cycle	3,777	5.9

ACHIEVING REDUCTIONS FOR TMDLS



Montgomery County watersheds on Maryland's Impaired List
EPA approved TMDLs shown in red
(January 2013)

USING ENVIRONMENTAL SITE DESIGN (ESD) TO THE MEP

Preserve natural features

Better site planning and design

Minimize development footprint

Mimic natural hydrology

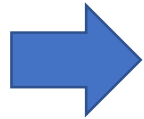
Slow down and break up runoff

Infiltrate and evapotranspire

Small scale stormwater management
practices distributed across sites



Typical Centralized Detention Pond

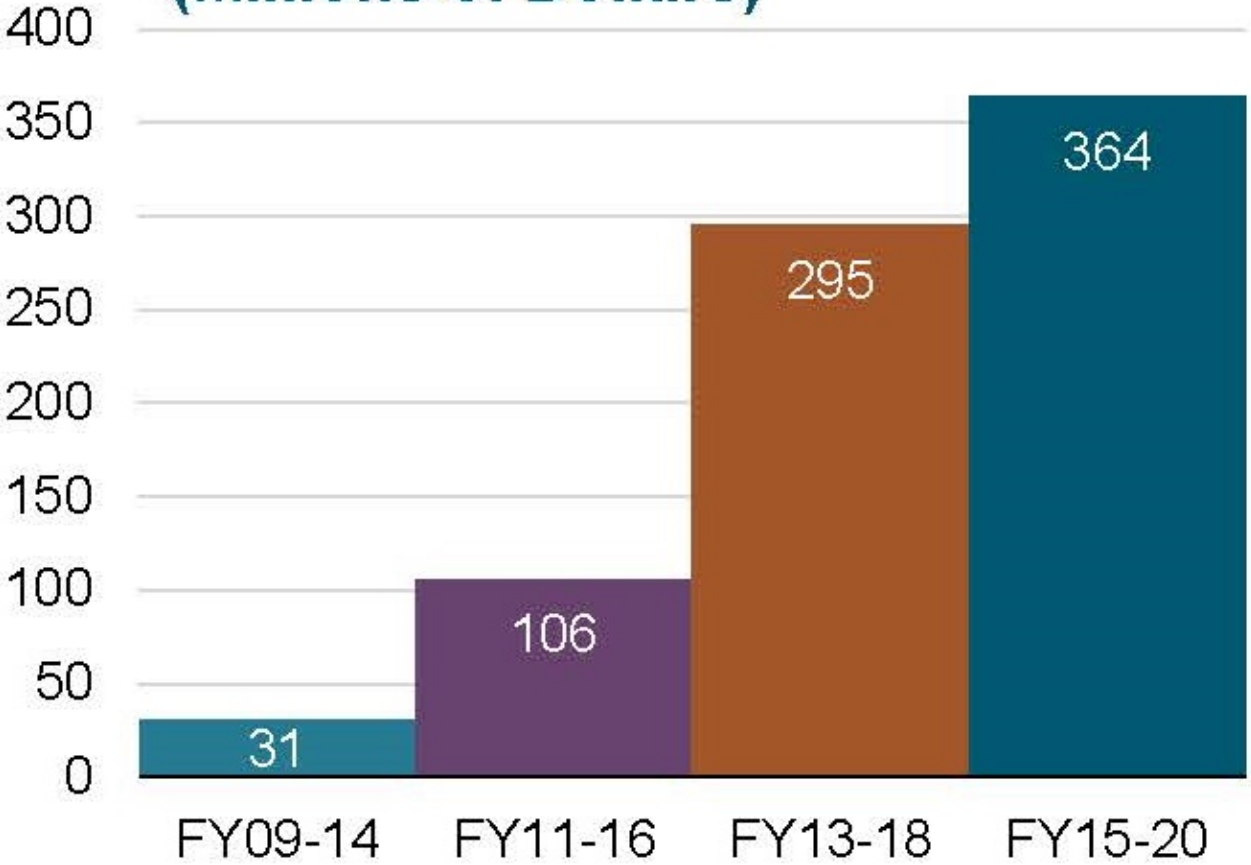


Small Scale, Integrated ESD Practices

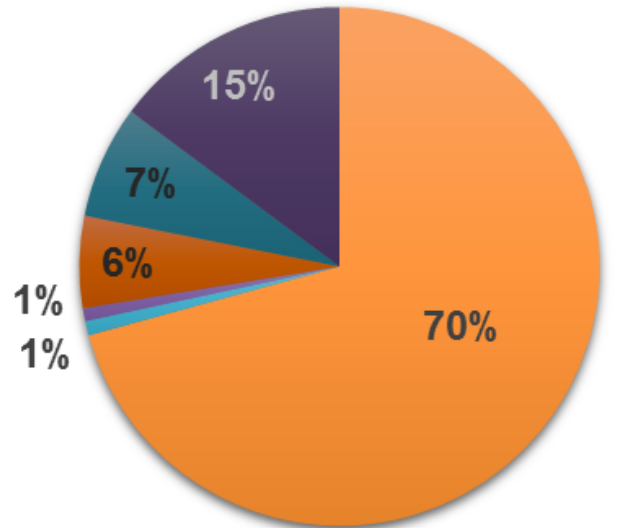
COUNTY PROGRESS TO DATE

- Departmental restructuring
- Increased internal staff capacity
- Dedicated funding source
- MS4 program management consultant
- Eight on-call “WREs”
(water resource engineering teams)
- Six on-call construction contractors
- Maintenance contractors
- Three pay-for-performance contracts
- 160+ projects in design and construction







CIP Budget for 5-year Periods
(Millions of Dollars)



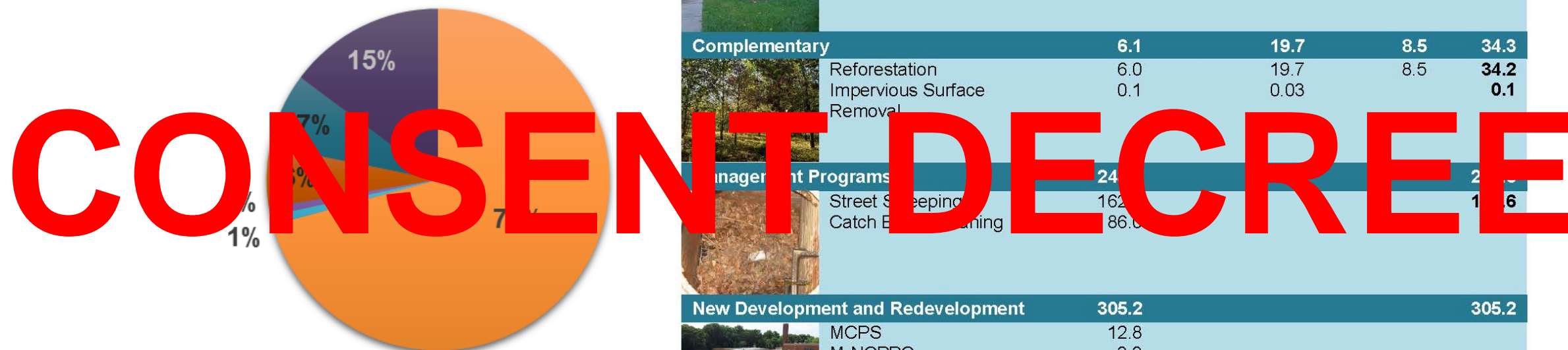
COUNTY PROGRESS



- Capital Improvements Program Projects
- RainScapes and WQPC Credits
- Complementary Restoration Projects
- Management Programs
- New Development and Redevelopment
- Agency and Department Partnerships

	Complete	In-Construction	In-Design	Total
Capital Improvement Projects	663.6	152.2	2268.8	3084.6
 Stream Restoration	88.7	57.5	510.2	656.4
Green Streets	19.1	0.6	91	110.7
Government Facilities	3.2		34.1	37.3
Stormwater Retrofits	552.6	94.1	1633.5	2280.2
RainScapes and WQPC Credits	38.8			38.8
 RainScapes	15.8			15.8
WQPC	23.0			23.0
Complementary	6.1	19.7	8.5	34.3
 Reforestation	6.0	19.7	8.5	34.2
Impervious Surface Removal	0.1	0.03		0.1
Management Programs	248.6			248.6
 Street Sweeping	162.6			162.6
Catch Basin Cleaning	86.0			86.0
New Development and Redevelopment	305.2			305.2
 MCPS	12.8			
M-NCPPC	3.3			
Private	53.4			
New BMPs Treating Existing Impervious	235.7			
Agency Partnerships	463.5	25.5	153.3	642.3
 ICC	252.7	16.9	58.8	328.4
WSSC	23.2	8.6	94.5	126.3
DGS	0.9			0.9
MCPS	0.7			0.7
DOT	50.0			50.0
USACE	136.0			136.0
Total	1725.8	197.4	2430.6	4353.8

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Management Programs	24.0			24.0
 Street Sweeping	162.0			162.0
Catch Basin Cleaning	86.0			86.0
New Development and Redevelopment	305.2			305.2
 MCPS	12.8			12.8
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IT'S NOT JUST MONTGOMERY COUNTY

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DEPARTMENT OF
THE ENVIRONMENT

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HOME ABOUT MDE AIR LAND WATER MARYLANDER PERMITS NEWSROOM

Stormwater Management Program

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- › [Plan Review for State and Federal Projects](#)
- › [NPDES MS4 Permits](#)
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Maryland's NPDES Municipal Separate Storm Sewer System (MS4) Permits

The Environmental Protection Agency's (EPA) National Pollutant Discharge Elimination System (NPDES) stormwater regulations were published in 1990. Phase I of these regulations require large urban jurisdictions to control pollution in stormwater to the maximum extent practicable (MEP). For permitting purposes, municipalities with populations of greater than 250,000 are considered "large" and those with populations of between 100,000 and 250,000 as "medium." Municipalities with less than 100,000 are handled separately under Phase II NPDES stormwater rules discussed here ([click here to learn more about Phase II](#)). After receiving applications from Phase I municipalities in 1991 and 1992, MDE began issuing NPDES municipal stormwater permits in 1993. These permits are updated every five years. The following provides information on the most current activities on the Phase I permits.

- › Final Determination to Issue Stormwater Permit to Anne Arundel County (February 12, 2014)
- › Final Determination to Issue Stormwater Permit to Baltimore City (December 27, 2013)
- › Final Determination to Issue Stormwater Permit to Baltimore County (December 23, 2013)
- › Final Determination to Issue Stormwater Permit for Carroll County (December 29, 2014)
- › Final Determination to Issue Stormwater Permit for Charles County (December 26, 2014)
- › Final Determination to Issue Stormwater Permit for Frederick County (December 30, 2014)
- › Final Determination to Issue Stormwater Permit for Harford County (December 30, 2014)
- › Final Determination to Issue Stormwater Permit for Howard County (December 18, 2014)
- › Final Determination to Issue Stormwater Permit to Prince George's County (January 2, 2014)
- › Final Determination to Issue Stormwater Permit for the Maryland State Highway Administration (October 9, 2015)

IT'S NOT JUST MONTGOMERY COUNTY

Maryland's NPDES Municipal Separate Storm Sewer System (MS4) Phase II General Permits

Minimum Control Measures

Chesapeake Bay Restoration and Meeting Total Maximum Daily Loads

*—commence restoration efforts for twenty percent of existing
developed lands that have little or no stormwater management*

*—perform watershed assessments, identify water quality
improvement opportunities, secure appropriate funding, and
develop an implementation schedule to show the twenty
percent impervious area restoration requirement will be
achieved by 2025*



MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATER AND SCIENCE ADMINISTRATION

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM GENERAL PERMIT FOR DISCHARGES FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS

GENERAL DISCHARGE PERMIT NO. 13-IM-5500
GENERAL NPDES NO. MDR055500

Final Determination: April 27, 2018
Effective Date: October 31, 2018
Expiration Date: October 30, 2023

This National Pollutant Discharge Elimination System (NPDES) general permit covers small municipal separate storm sewer systems (MS4s) in certain portions of the State of Maryland. MS4 owners and operators to be regulated under this general permit must submit a Notice of Intent (NOI) to MDE by October 31, 2018. An NOI serves as notification that the MS4 owner or operator intends to comply with the terms and conditions of this general permit.

CHALLENGES FROM THE BEGINNING

- Jurisdictional buy-in
- Internal program capacity
- External capacity – design and construction
- Permitting agencies capacity
- Procurement process
- Design – permitting – construction timeline
- Untested and “young” technologies
- Stakeholder concerns (private property owners, public scrutiny)
- Future maintenance burden
- \$

HERE'S HOW MARYLAND MS4S ARE SUCCEEDING

They are taking a **watershed approach** –
applying a **wide range of management practices**,
while relying on **alternative delivery mechanisms**
and **external partnerships**,
to implement projects that will be evaluated through
robust **monitoring and assessment programs**.

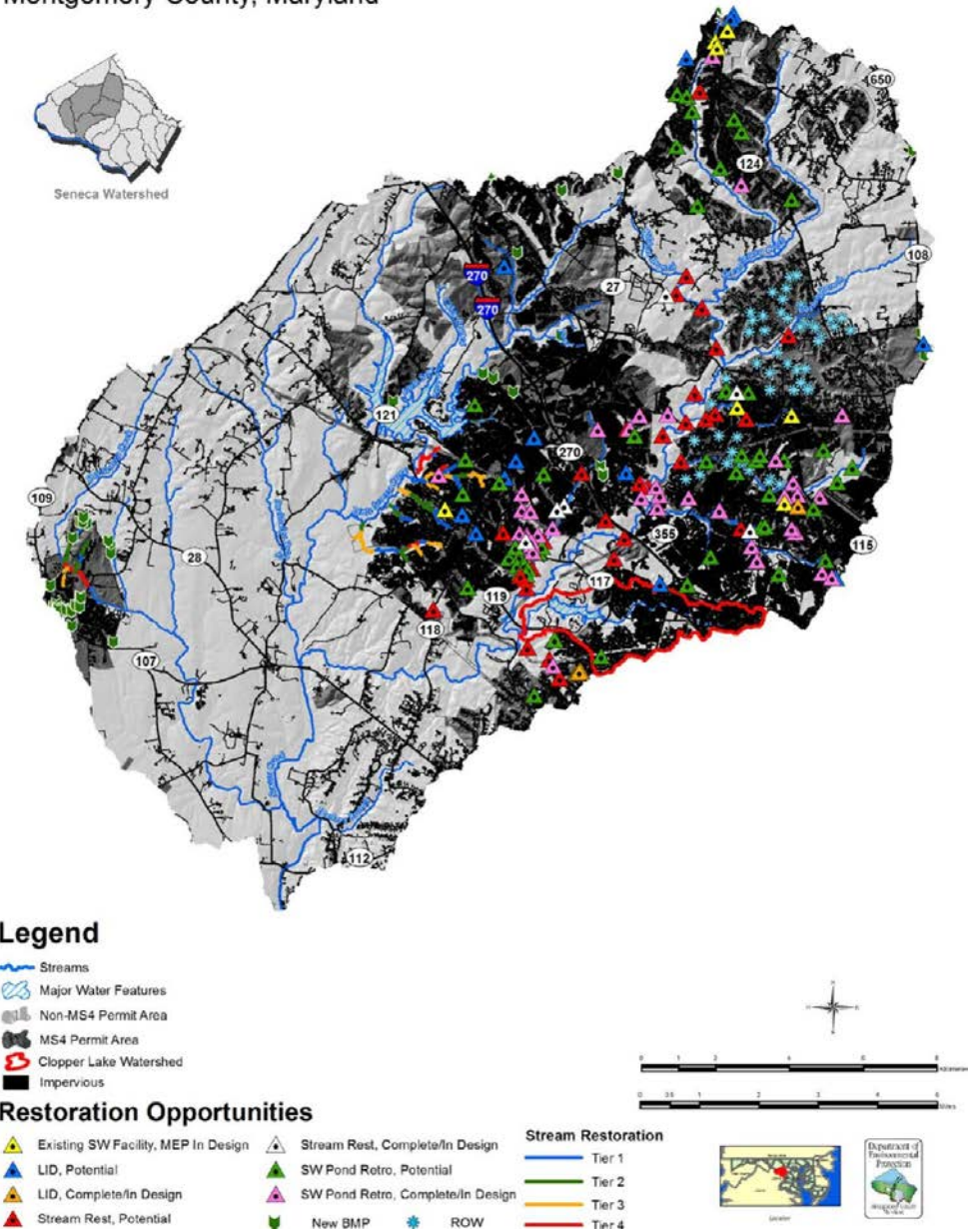
WATERSHED PLANNING

Identifies stormwater management projects, watershed restoration projects and programmatic actions

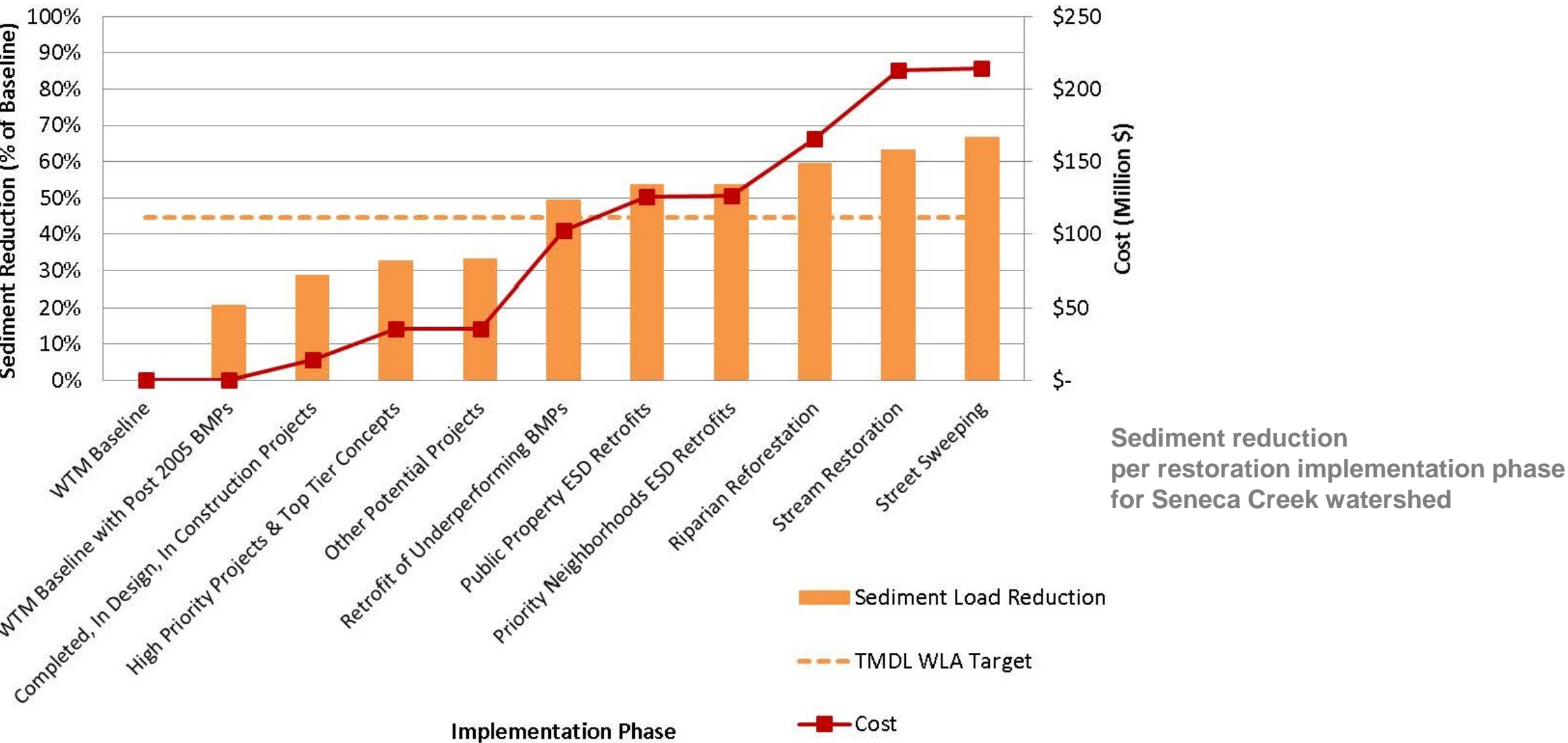
Estimates potential pollutant load reduction

Determines ability to meet applicable TMDLs and watershed restoration requirements

Provides a schedule and cost estimate



WATERSHED PLANNING



QUESTIONS FOR DISCUSSION

Take a watershed approach

—What are the drivers for watershed planning? How will projects be implemented? How can the watershed plan output facilitate project implementation?

Apply a wide range of management practices

—What mix of projects will provide the most benefit? Are you considering projects at a variety of scales?

Explore alternative delivery mechanisms

—Have you streamlined permitting? Have you streamlined procurement? Are you entering a race to the bottom?

Nurture external partnerships

—Are the local NGOs your friend or foe? Have you built partnerships with those who have common interests?

Develop robust monitoring and assessment programs

—Are you monitoring the BMP? Or the improved health of the receiving waters?

MANAGEMENT PRACTICES

Green Infrastructure

Rainwater harvesting

Rainwater interception

Functional landscapes
and conveyance

Green parks and public spaces

Outfall treatment

Riparian corridor restoration



MANAGEMENT PRACTICES

Riparian Corridor Restoration



MANAGEMENT PRACTICES

Outfall Restoration



BEFORE



AFTER

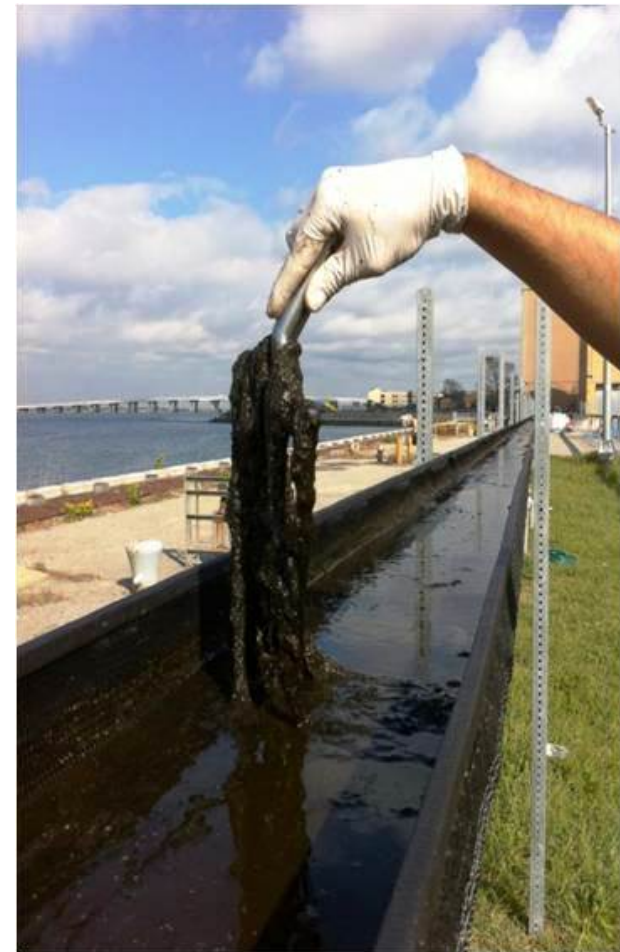
MANAGEMENT PRACTICES

Floating Wetlands



MANAGEMENT PRACTICES

Algal Turf Scrubbers



MANAGEMENT PRACTICES

Mr. Trash Wheel



MANAGEMENT PRACTICES

U.S. EPA Chesapeake Bay Program “Expert Panels”

Urban Stormwater Retrofits

Urban Stream Restoration

Urban Nutrient Management

Urban Street Sweeping

Enhanced Erosion and Sediment Control

Urban Filter Strips

Floating Treatment Wetlands

Illicit Discharge Detection

Shoreline Management

Crediting Residential BMPs

https://www.chesapeakebay.net/who/group/urban_stormwater_workgroup

Recommendations of the Expert Panel to Define Removal Rates for Individual Stream Restoration Projects

Joe Berg, Josh Burch, Deb Cappuccitti, Solange Filoso, Lisa Fraley-McNeal,
Dave Goerman, Natalie Hardman, Sujay Kaushal, Dan Medina, Matt Meyers, Bob Kerr,
Steve Stewart, Bettina Sullivan, Robert Walter and Julie Winters

Accepted by Urban Stormwater Work Group: **February 19, 2013**
Approved by Watershed Technical Work Group: **April 5, 2013**
Final Approval by Water Quality Goal Implementation Team: **May 13, 2013**
Test-Drive Revisions Approved by the Expert Panel: **January 17, 2014**



Prepared by:
Tom Schueler, Chesapeake Stormwater Network
and
Bill Stack, Center for Watershed Protection

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ALTERNATIVE DELIVERY

Prince George’s County: Public-Private Partnership



In 2014, Prince Georges County was faced with an enormous regulatory challenge in the management of its National Pollutant Discharge Elimination System and its Municipal Separate Storm Sewer System (MS4) Permit that needed an innovative solution.

Traditional project delivery methodologies and procurement could have been utilized; however, given the magnitude of the challenge of retrofitting 2,000 impervious acres with Green Infrastructure, with the flexibility to potentially grow to 15,000 acres of untreated impervious area by 2025, and an estimated cost of \$100 million, an alternative solution was sought. The County's elected political leaders including the County Executive; Legislative Branch; and sponsoring agencies--Department of the Environment and Department of Central Services collaborated for the development of an alternative solution. That alternative solution was a Community Based Public Private Partnership or CBP3. As a result of the courage and leadership of the County's elected officials Prince Georges County is the first municipality to utilize the CBP3 model as a solution to the challenges that are facing many jurisdictions across the US in meeting federal regulatory stormwater compliance requirements.

How was Corvias Solutions Selected?

Prince George's County utilized a Request for Qualification (RFQ) process in order to avoid the expensive upfront Request for Proposal (RFP) process that are typically overly prescriptive on the technical design and construction that favors firms experience in government contracting versus their ability to innovate and think outside of the box. The Request for Qualifications process focused on a company's financial stability, management capabilities, experience with complex problem solving, and proven commitment and success with local small business utilization and creation. Instead of a traditional client-contractor relationship, the RFQ process allowed for the development of a business partner that shares in the risk and invests in the County's goals.

RFQ Process Evaluation Criteria

ALTERNATIVE DELIVERY

Anne Arundel County: Pay for Performance

www.aacounty.org/news-and-events/news/county-executive-steve-schuh-announces-5-million-for-waterway-improvement-public-private-partnership

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County Executive Steve Schuh Announces \$5 Million for Waterway Improvement Public Private Partnership

Tours \$1.9 million Gambrills Waterway Improvement Project

Annapolis, MD (August 10, 2016) – Touring the site of a future waterway improvement project in Gambrills, County Executive Steve Schuh today announced funding for a new, innovative public private partnership program to assist Anne Arundel County in cleaning up its more than 530 miles of shoreline.

"The waterways of Anne Arundel County are part of our heritage, and we are committed to securing them for the next generation," said Schuh. "Despite much progress, we need to pursue innovative and creative strategies to supplement our current waterway improvement program, and we are excited to explore a public-private partnership with Resource Environmental Solutions."

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19	20	21	22	23	24
25	26	27	28	29	30
31					

News / Government

First water quality partnership signed under new Schuh initiative



County Executive Steve Schuh surveys a watershed improvement project in Gambrills. (Amanda Yeager / Capital Gazette)



By Amanda Yeager · Contact Reporter

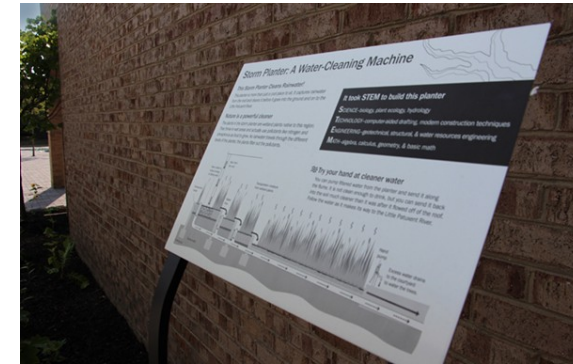
MAY 5, 2017, 12:42 PM

Anne Arundel County is contracting with the private sector to strengthen water quality protections for the Severn Run, Patapsco and Patuxent waterways, County Executive Steve Schuh announced Friday.

Schuh said the county has signed a \$3.8 million agreement with Resource Environmental Solutions, a national firm with a regional office in Odenton that will pay for restoration of 2,500 linear feet of stream

ALTERNATIVE DELIVERY

Howard County: Design-Build



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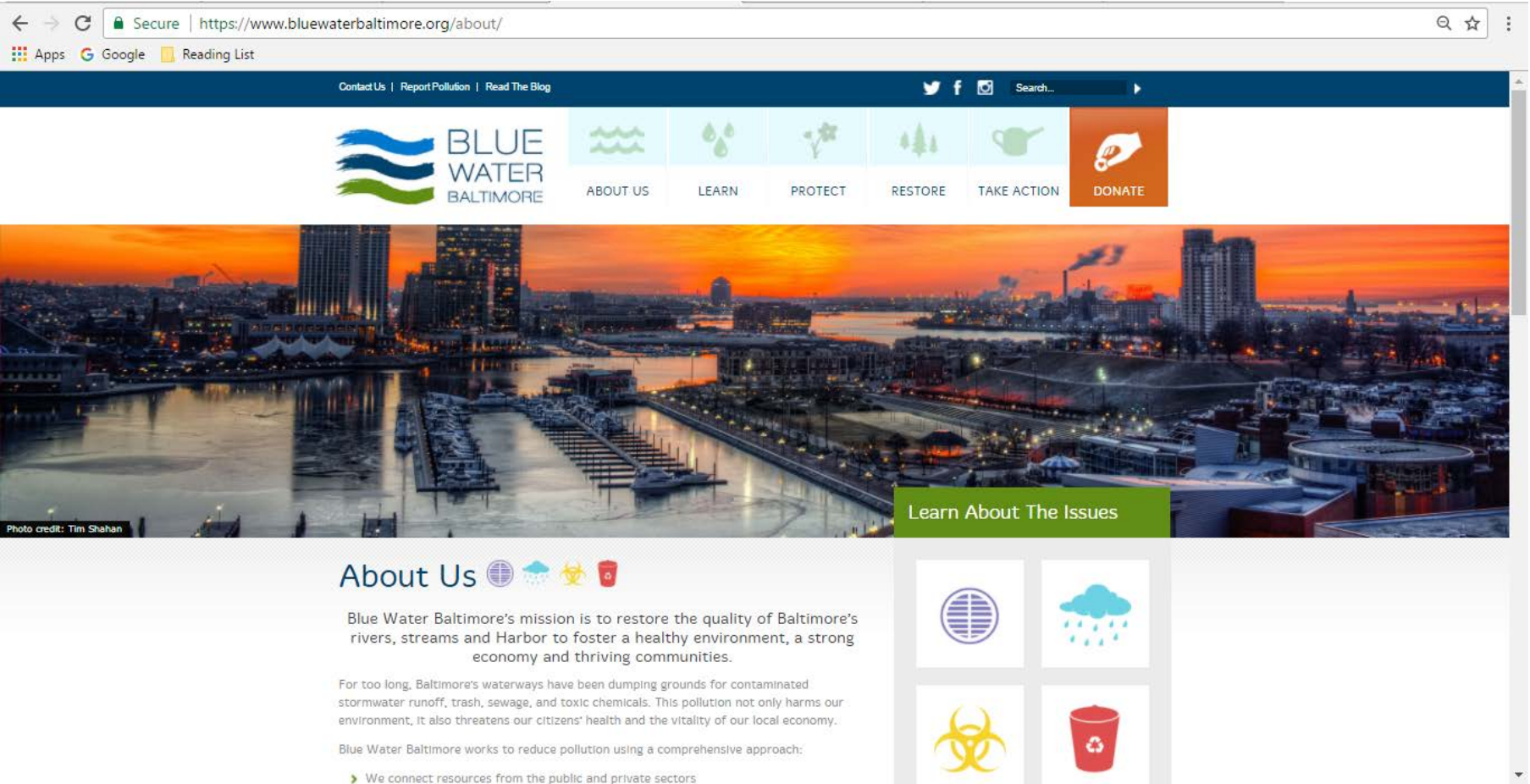
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EXTERNAL PARTNERSHIPS

Baltimore City + Blue Water Baltimore



EXTERNAL PARTNERSHIPS

Howard County + READY Program

←

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path-iaf.org/ready/

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READY

Restoring the Environment and Developing Youth

READY

Milestones

2010

Chesapeake Bay "Pollution Diet"


2012

READY Begins Work

In its first year, READY employs 31 young adults to build rain gardens and

READY employs Howard County residents ages 16-26 to build rain gardens and conservation landscapes that filter stormwater runoff and alleviate flooding from pavement and other impervious surfaces.

The investment Howard County makes in READY yields returns in four ways:

 Biohabitats

LEARNING FROM CHALLENGES FACED BY OTHERS – REFLECTIONS FOR OHIO MS4S

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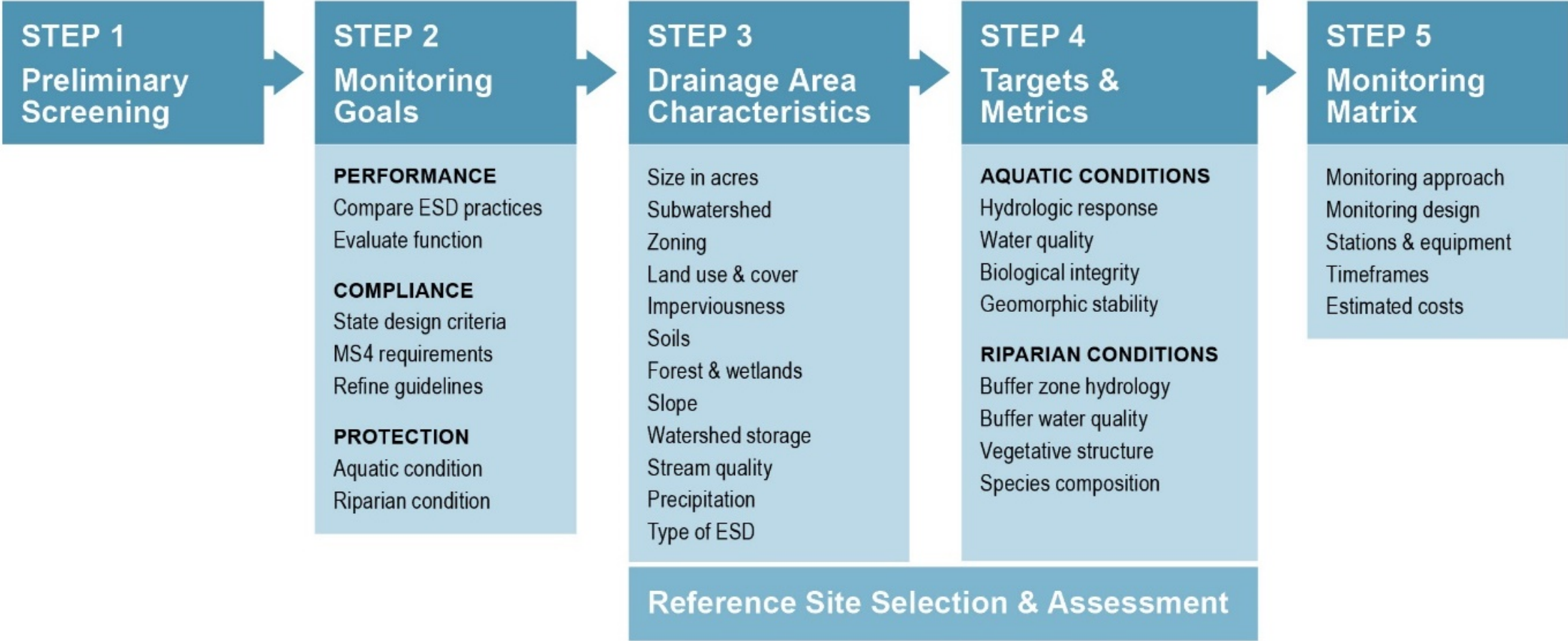
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MONITORING AND ASSESSMENT

Montgomery County Special Protection Area (SPA) Program



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LESSONS LEARNED FOR OHIO MS4s

Take a **watershed approach**

Apply a **wide range of management practices**

Explore **alternative delivery mechanisms**

Nurture **external partnerships**

Develop robust **monitoring
and assessment programs**

Don't forget about **maintenance
and dedicated funding**



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THANK YOU

Jennifer Zielinski Missett, PE
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