

Maryland Department of the Environment
National Pollutant Discharge Elimination System (NPDES)
Municipal Separate Storm Sewer System (MS4)

Permit Number 11-DP-3310 (MD0068268)



Bynum Run Stream Restoration
(3 months post-construction)



Barry Glassman
County Executive

Harford County, Maryland
Department of Public Works
Watershed Protection and Restoration Office

2019 Annual MS4 Report

	Page
Table of Contents.....	i
List of Appendices.....	iii
Introduction.....	1
PART I - IDENTIFICATION.....	2
PART II - DEFINITION.....	2
PART III – WATER QUALITY.....	2
PART IV – STANDARD PERMIT CONDITIONS.....	4
A. <u>Permit Administration</u>	4
B. <u>Legal Authority</u>	5
C. <u>Source Identification</u>	6
1. Stormdrains.....	6
2. Industrial Commercial Properties.....	7
3. Stormwater Management.....	8
4. Impervious Surfaces.....	9
5. Monitoring Locations.....	9
6. Watershed Restoration Projects.....	10
D. <u>Management Program</u>	12
1. Stormwater Management.....	12
2. Erosion and Sediment Control.....	15
3. Illicit Discharge Detection and Elimination.....	17
4. Litter and Floatables.....	24
5. Property Management and Maintenance.....	27
6. Public Education.....	33
E. <u>Restoration Plans and Total Maximum Daily Loads</u>	40
1. Watershed Assessments.....	41



2.	Restoration Plans.....	45
3.	Public Participation.....	58
4.	TMDL Compliance.....	60
F.	<u>Assessment of Controls</u>	61
1.	Watershed Restoration Assessment.....	61
2.	Stormwater Management Assessment.....	74
G.	<u>Program Funding</u>	76
PART V – PROGRAM REVIEW AND ANNUAL PROGRESS REPORTING.....		78
PART VI – SPECIAL PROGRAMMATIC CONDITIONS.....		82
PART VII – ENFORCEMENT AND PENALTIES.....		83



List of Appendices

Appendix A – Permit Administration

Appendix B – Legal Authority

Appendix C – Source Identification

Appendix C1 – Stormdrains

Appendix C2 – Industrial/Commercial Properties

Appendix C3 – Stormwater Management

Appendix C4 – Impervious Surfaces (*Intentionally Blank*)

Appendix C5 – Monitoring Locations

Appendix C6 – Watershed Restoration Projects

Appendix D – Management Programs

Appendix D1 – Stormwater Management

Appendix D2 – Erosion and Sediment Control

Appendix D3 – Illicit Discharge Detection and Elimination

Appendix D4 – Litter and Floatables

Appendix D5 – Property Management and Maintenance

Appendix D6 – Public Education

Appendix E – Restoration Plans and Total Maximum Daily Loads

Appendix E1 – Watershed Assessments

Appendix E2.a – Impervious Area Assessment

Appendix E2.b – Restoration Plans for TMDLs

Appendix E3 – Public Participation

Appendix E4 – TMDL Compliance

Appendix F – Assessment of Controls

Appendix F1 – Watershed Restoration Assessment

Appendix F2 – Stormwater Management Assessment

Appendix G – Program Funding



Introduction

The Clean Water Act adopted in 1972, established the National Pollutant Discharge Elimination System program, or NPDES for industrial facilities that discharge process wastewater to receiving streams or groundwater. Before discharging process wastewater, the industrial facility must apply for and receive an NPDES permit.

The 1987 Clean Water Act amendments updated the NPDES regulations to include discharge from stormdrain pipes, or Municipal Separate Storm Sewer Systems (MS4). Jurisdictions nationwide with populations over 100,000 were required to submit a two-phase application for an individual five-year NPDES MS4 permit.

In Maryland, the Maryland Department of the Environment (MDE) was delegated the program by the U.S. Environmental Protection Agency (EPA). Harford County received its first permit on May 17, 1994 and reissued permits on August 13, 1999, November 1, 2004 and December 30, 2014.

As established in the MS4 permit, annual reports are due on the anniversary of the effective date of the permit. The information contained in the annual reports document activities completed towards meeting the requirements of the permit.

This document is the fifth annual report since the issuance of Harford County's MS4 permit on December 30, 2014. The current permit requires annual reports to be submitted for the fiscal year (July 1 through June 30). The reporting period for this annual report is July 2018 through June 2019.

The language from the permit is repeated in this annual report to compare each permit requirement with the activities completed to address the requirement. The permit language is shown within gray text boxes. The remaining text is Harford County's response to each permit requirement.



MARYLAND DEPARTMENT OF THE ENVIRONMENT
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
MUNICIPAL SEPARATE STORM SEWER SYSTEM DISCHARGE PERMIT

PART I. IDENTIFICATION

A. Permit Number 11-DP-3310 (MD0068268)

B. Permit Area

This permit covers Stormwater discharges to and from the municipal separate storm sewer system owned and operated by Harford County, Maryland.

C. Effective Date December 30, 2014

D. Expiration Date December 29, 2019

PART II. DEFINITIONS

Terms used in this permit are defined in relevant chapters of Title 40 of the Code of Federal Regulations (CFR) Parts 122-124 or the Code of Maryland Regulations (COMAR) 26.08.01. Terms not defined in CFR or COMAR shall have the meanings attributed by common use.

PART III. WATER QUALITY

The permittee must manage, implement, and enforce a Stormwater management program (SWMP) in accordance with the Clean Water Act (CWA) and corresponding Stormwater National Pollutant Discharge Elimination System (NPDES) regulations, 40 CFR Part 122, to meet the following requirements:

1. Effectively prohibit pollutants in Stormwater discharges or other unauthorized discharges into the MS4 as necessary to comply with Maryland's receiving water quality standards;
2. Attain applicable wasteload allocations (WLAs) for each established or approved Total Maximum Daily Load (TMDL) for each receiving water body, consistent with Title 33 of the U.S. Code (USC) §1342(p)(3)(B)(iii); 40 CFR §122.44(k)(2) and (3); and

3. Comply with all other provisions and requirements contained in this permit, and in plans and schedules developed in fulfillment of this permit.

Compliance with all conditions contained in PART's IV through VII of this permit shall constitute compliance with §402(p)(3)(B)(iii) of the CWA and adequate progress toward compliance with Maryland's receiving water quality standards and any EPA approved Stormwater WLAs for this permit term.

Harford County recognizes the need to improve water quality in the Chesapeake Bay and local Harford County streams. We also recognize through the MS4 permitting program, the responsibility of local governments to participate in the restoration of our waters.

Harford County, however, has reiterated throughout the permit issuance process, that the permit requirements listed herein exceed Harford County's maximum extent practicable (MEP), considering both limited financial capabilities and short timeframes for implementation. MEP is the legal compliance standard for MS4s established by the Clean Water Act. Additionally, although Part I.B. of the permit correctly defines the MS4 Permit Area, outside of the permit MDE expressed a more expansive interpretation of the regulated permit area.

The County expressly reserves its rights to reduce the acreage associated with the impervious surface area assessment in Part IV.E.2.a. of the permit, which in turn impacts the County's restoration efforts during this permit term under Part IV.E.2.a., to the minimum acreage required by the permit. The County expressly reserves its rights to make refinements to its assessment as necessary in the future based upon new or additional information consistent with an adaptive management approach.

In April 2019, Harford County requested a major permit modification to allow for nutrient and sediment trading in accordance with the Water Quality Trading Regulations finalized on July 16, 2018. On August 22, 2019, MDE held a public hearing and approved the permit modification on November 8, 2019 (Appendix B).

Part IV. STANDARD PERMIT CONDITIONS

A. Permit Administration

Harford County shall designate an individual to act as a liaison with the Maryland Department of Environment (MDE) for the implementation of this permit. The County shall provide the coordinator's name, title, address, phone number and email address. Additionally, the County shall, in its annual report, submit to MDE an organizational chart detailing personnel and groups responsible for major NPDES program tasks in this permit. MDE shall be notified of any changes in personnel or organization relative to NPDES program tasks.

With the issuance of this permit, Harford County has increased both staff and financial capacity for the implementation of the MS4 program.

In order to accelerate permit requirements, Harford County continues to utilize and expand the use of open-end contracts including six consultants under contract for design and assessment, three consultants under contract for monitoring and assessment, six contractors under contract for landscaping and maintenance, and two contractors under contract for design – build. During this reporting period, the County continued contracts for a consultant project manager, a GIS programmer, and a program management assistant. Additional on-call contracts were also continued with Steve Stewart, retired Baltimore County MS4 Program Manager, and consultants from RKK.

The MS4 program is administered through the Department of Public Works, Office of Watershed Protection and Restoration, here forward called MS4 staff (listed below) with support from other departments throughout the county government (Appendix A). Additionally, Harford County utilizes various partnerships with outside agencies to accomplish permit requirements.

Department of Public Works
Office of Watershed Protection and Restoration
212 South Bond Street
Bel Air, MD 21014
(410) 638-4109

Joseph Siemek, P.E. (Director, Public Works), (410) 638-3285
Scott Kearby (Deputy Director, Construction Management), extension 1252
*Christine Buckley, P.E. (MS4 Program Manager, **primary liaison**) extension 1176*
*Michele Dobson (MS4 Monitoring Manager, **alternate liaison**), extension 1247*
Laura Coste (MS4 Outreach Coordinator), extension 2448
Dominic Jenkins (MS4 Capital Projects Manager), extension 1394
Megan Greene (GIS Aide), 1 day per week
Betsy Collins (MS4 Capital Projects Reviewer), 2 days per week

Kyle Bucher, AECOM (MS4 Capital Projects Reviewer), 2 days per week
Marla Johnson, EA (MS4 GIS Database Management), 2 days per week
Danielle Hankins, RKK (MS4 Program Scheduling), 1 day per week

Kristianne Sandoval, RKK (MS4 Capital Projects Reviewer), on-call
Steve Stewart, Independent Contractor (MS4 Watershed Assessment Reviewer), on-call

B. Legal Authority

Harford County shall maintain adequate legal authority in accordance with NDPEs regulations 40 CFR Part 122.26 throughout the term of this permit. In the event that any provisions of its legal authority is found to be invalid, the County shall notify MDE within 30 days and make the necessary changes to maintain adequate legal authority. All changes shall be included in the County's annual report.

Harford County Code Chapter 214 and Chapter 109 provide adequate legal authority for the implementation of this permit.

During this reporting period, Harford County adopted one resolution related to the implementation of this permit (Appendix B).



Resolution 013-18 (10/16/2018) Financial Assurance Plan

This resolution approves the financial assurance plan required by the Annotated Code of Maryland ENV 4-202.1(j).

C. Source Identification

Sources of pollutants in stormwater runoff countywide shall be identified and linked to specific water quality impacts on a watershed basis. The source identification process shall be used to develop watershed restoration plans. The following information shall be submitted annually for all County watersheds within the permit area in geographic information system (GIS) format with associated table as required in PART V of this permit.

In May 2017, MDE distributed an updated *MS4 Geodatabase Design and User's Guide*. The updated documentation was the result of collaboration between MDE and the Phase I MS4 jurisdictions to address concerns from the jurisdictions. This geodatabase structure is very robust with multiple relational tables. Migration of existing data into this format will be labor intensive.

The County has begun to populate many of the feature classes and tables and is working towards developing an asset management program for the stormwater management facilities to accommodate MS4 reporting and management of triennial maintenance inspections.

1. Stormdrain system: all infrastructures, major outfalls, inlets and associated drainage areas delineated;

Stormdrains

New stormdrains were installed associated with the 3.01 miles of roadway accepted by Harford County during this reporting period.



All stormdrain features, including point features (i.e. outfalls, manholes, inlets, etc.), stormdrain pipes, and stormdrain drainage areas were entered into the County geodatabase, Stormdrains.mdb.

The locations for the point features were input into the County geodatabase by georeferencing stormdrain design drawings. Associated attributes for the point features were also entered.

Point Features - 128

Outfalls (Closed Systems) - 15

Outfalls (Culvert) - 1

Inlets - 69

Inflows - 3

Manholes - 40

Using the point features, lines for the stormdrain pipe were added to the County geodatabase and the associated attributes were entered.

Drainage Areas

There were no major, non-industrial outfalls (36" or larger in diameter), however, there were nine (9) industrial outfalls (12" or larger in diameter) for roads accepted during this reporting period.

A map of the outfalls and table of attributes are included in Appendix C1. The spatial and tabular data for the outfall locations (Outfall point feature class) was imported into the MDE geodatabase and submitted with this report.

2. Industrial and commercial sources: industrial and commercial land uses and sites that the County has determined have the potential to contribute significant pollutants;

The selection of the businesses to survey for potential impact to water quality is based on locations within commercial and/or industrial parks and parcels with an industrial or commercial landuse as noted in the State tax assessment records. During this reporting period, the spatial and tabular data for all commercial and industrial businesses investigated was input into the County geodatabase, Hotspots.mdb. A map of the businesses and table of attributes

are included in Appendix C2. A copy of the County geodatabase was submitted with this report. The MDE geodatabase contains no features classes or tables for hotspot investigations.

3. Urban best management practices (BMPs): stormwater management facility data including outfall locations and delineated drainage areas;

Stormwater Asset Management

During this reporting period, the County continued to update existing BMPs to align with MDE's geodatabase and accommodate the County's development of a stormwater management maintenance inspections application.

During this reporting period, the County merged all stormwater management BMPs into one file geodatabase, HCBMP. This data had previously been stored in four separate geodatabases as discussed in the previous annual report. All 826 BMPs stored only as point features were buffered to create temporary circles within the polygon feature class. These features will be updated to create polygons that match the footprint of the BMPs.

The features for BMP, POIs and POI drainage areas have been created for FY2010 through FY2019. The associated non-technical attributes for these features have also been completed. Engineer review and technical attributes have been complete for FY2017 through FY2019 (Appendix C3).

Stormwater Management Facilities

During this reporting period, 46 stormwater management projects were as-built for a total of 125 practices; 1 project was an MS4 retrofit and no projects were repairs. The limits for each BMP were digitized into the County file geodatabase, HCBMP, by georeferencing stormwater design drawings. The associated attributes were also entered which will be used to create the BMP table in the MDE geodatabase.

Stormwater Management Drainage Areas

Points of interest and drainage areas for all facilities as-built during this reporting period were delineated and the associated attributes entered into the County file geodatabase, HCBMP.

A map of the stormwater locations and table of projects are included in Appendix C3. A copy of the County file geodatabase was submitted with this report.

Stormwater Management Waivers, Exemptions, and Fees in Lieu

During this reporting period, 33 projects were not required to provide stormwater management. The spatial and tabular data for all stormwater waivers, exemptions and fees in lieu is maintained in the County geodatabase, Stormwater.mdb.

Stormwater Management- 33

Waivers – 15

Exemptions – 18

Fees in Lieu – 0

A map of the waivers, exemptions and fees in lieu and table of attributes are included in Appendix C3. The totals for each were entered into the MDE geodatabase (SWM table) and submitted with this report.

4. Impervious surfaces: public and private land use delineated, controlled and uncontrolled impervious areas based on, at a minimum, Maryland's hierarchical eight-digit sub-basins;

No changes were made to the GIS data for impervious surfaces during this reporting period.

5. Monitoring locations: locations established for chemical, biological, and physical monitoring of watershed restoration efforts and the *2000 Maryland Stormwater Design Manual*; and

During this reporting period, there were 85 monitoring sites active including the 14 locations required as listed above. No new monitoring sites were added during this reporting period. The spatial and tabular data for all active and inactive monitoring sites is maintained in the County geodatabase, Monitoring.mdb.

Monitoring Sites - 85

Chemical - 30

Biological – 36

Flow - 9

Physical - 8

Rainfall – 2

A map of all active monitoring locations and table of attributes are included in Appendix C5. The spatial and tabular data for the 14 required monitoring locations (MonitoringSite point feature class) and associated drainage areas (MonitoringDrainageArea polygon feature class), were imported into the MDE geodatabase and submitted with the previous report.

6. Water quality improvement projects: projects proposed, under construction, and completed with associated drainage areas delineated.

During this reporting period, there were 21 watershed restoration projects active or completed. The spatial and tabular data for all restoration projects is maintained in the County geodatabase, CIP.mdb.

Watershed Restoration Projects - 21

Completed - 2

Under Construction – 1

Under Design - 18

Maps of the completed and active watershed restoration project locations and table of attributes are included in Appendix C6. A copy of the County geodatabase was submitted with this report. The spatial and tabular data for all completed stream restoration projects were also entered into the MDE geobasebase (AltBMPLine line feature class and AltBMPLineInspctions table).

During this reporting period, there were 18 septic systems upgraded. A map of the septic upgrades and table of attributes are included in Appendix C6. The spatial and tabular data for was entered into the MDE geodatabase and submitted with this report (AltBMPPoint point feature class).

Septic Upgrades using Best Available Technology (BAT) - 243

2019 - 18
2018 - 18
2017 – 41
2016 – 69
2015 – 56
2014 - 41

During this reporting period, there were six septic systems abandoned and connected to the wastewater treatment plant. A map of the septic systems abandoned and connected to the wastewater treatment plant and table of attributes are included in Appendix C6. The spatial and tabular data was entered into the MDE geodatabase and submitted with this report (AltBMPPoint point feature class).

Septic Systems Abandoned & Connected to WWTP - 77

2019 - 6	
2018 – 9	2013 – 1
2017 – 8	2012 – 10
2016 – 9	2011 – 9
2015 – 3	2010 – 9
2014 – 2	2009 - 11

An inventory of the locations of septic systems pump outs was developed during this reporting period. Locations and volumes were taken from the manifests created for each truck that dropped off at Sod Run Wastewater Treatment Plant. The addresses were then used to match the location to the parcel data. A summary of the process to create this data is included in Appendix E2a. During this reporting period, 4,972 septic systems were pumped out.

A map of the septic pumpouts and table of attributes are included in Appendix C6. The spatial and tabular data was entered into a database, SepticPumpOut, and submitted with this report.



D. Management Programs

The following management programs shall be implemented in areas served by Harford County’s MS4. These management programs are designed to control stormwater discharges to the maximum extent practicable (MEP) and shall be maintained for the term of this permit. Additionally, these programs shall be integrated with other permit requirements to promote a comprehensive adaptive approach toward solving water quality problems. The County shall modify these programs according to needed program improvements identified as a result of periodic evaluations by MDE.

1. Stormwater Management

An acceptable stormwater management program shall continue to be maintained in accordance with the Environment Article, Title 4, Subtitle 2, Annotated Code of Maryland. Activities to be undertaken by the County shall include, but not be limited to:

- a. Implementing the stormwater management design policies, principles, methods, and practices found in the latest version of the 2000 Maryland Stormwater Design Manual. This includes:
 - i. Complying with the Stormwater Management Act of 2007 (Act) by implementing environmental site design (ESD) to the MEP for new and redevelopment projects;
 - ii. Tracking the progress toward satisfying the requirements of the Act and identifying and reporting annually the problems and modifications necessary to implement ESD to the MEP; and
 - iii. Reporting annually the modifications that have been made or need to be made to all ordinances, regulations, and new development plan review and approval processes to comply with the requirements of the Act.

Under Bill 10-11, Harford County updated Chapter 214 in February 2010 to comply with the Stormwater Management Act of 2007.

During this reporting period, there were no modifications to Chapter 214.

- b. Maintaining programmatic and implementation information including, but not limited to:
 - i. Number of Concept, Site Development, and Final plans received. Plans that are re-submitted as a result of a revision or in response to comments should not be considered as a separate project;
 - ii. Number of redevelopment projects received;
 - iii. Number of stormwater exemptions issued; and
 - iv. Number and type of waivers received and issued, including those for quantity control, quality control, or both. Multiple requests for waivers may be received for a single project and each should be counted separately, whether part of the same project or plan. The total number of waivers requested and granted for qualitative and quantitative control shall be documented.

Stormwater program data shall be recorded on MDE's annual report database and submitted as required in PART V of this permit.

For this reporting period, the following information was entered into the MDE geodatabase (SWM table) and submitted with this report.

Stormwater Management Program

Concept Plans Received - 39
Site Development Plans Received - 31
Final Plans Received - 49
Redevelopment Project Received - 4
Stormwater Exemptions Issued - 18
Stormwater Waivers Issued – 15



- c. Maintaining construction inspection information according to COMAR 26.17.02 for all ESD treatment practices and structural stormwater management facilities including the number of inspections conducted and violation notices issued by Harford County.

For this reporting period, the following information was entered into the MDE geodatabase (SWM table) and submitted with this report.

Stormwater Management Construction

Construction Inspections - 733

Construction Violations - 210

- d. Conducting preventative maintenance inspections, according to COMAR26.17.02, of all ESD treatment systems and structural stormwater management facilities at least on a triennial basis. Documentation identifying the ESD systems and structural stormwater management facilities inspected, the number of maintenance inspections, follow-up inspections, the enforcement actions used to ensure compliance, the maintenance inspection schedules, and any other relevant information shall be submitted in the County's annual reports.

Four hundred thirty-four (434) stormwater facilities were inspected for triennial inspections during this reporting period. Twenty (28) of these facilities were not compliant at the end of this reporting period.

SWM Facilities Inspected for Preventative Maintenance (triennial) - 434

Compliant – 406

Non-Compliant – 28

Sixteen of the fifty-five (55) facilities non-compliant in previous reporting periods were inspected during this reporting period. Nine (9) of these facilities were not compliant at the end of this reporting period.



SWM Facilities Inspected for Preventative Maintenance (carryover) - 55

Compliant – 9
Non-Compliant – 7
Under Repair – 3
Under Design for Retrofit - 2
Not Inspected - 34

During this reporting period, major repairs were completed for 3 facilities.

Major Stormwater Management Facility Repairs - 3

BGE Forest Hill Substation UGS pipe replacement
BGE Level Substation dredging and reconstruction
Crisfield Crossing principal spillway replacement

A summary of preventative maintenance inspections is included in Appendix D1.

2. Erosion and Sediment Control

An acceptable erosion and sediment control program shall continue to be maintained and implemented in accordance with the Environment Article, Title 4, Subtitle 1, Annotated Code of Maryland. Activities to be undertaken by the County shall include, but not be limited to:

- a. Implementing program improvements identified in any MDE evaluation of the County's erosion and sediment control enforcement authority;

On December 6, 2018, MDE conducted a delegation review for erosion and sediment control. On March 19, 2019, the County received program delegation through June 20, 2021 (Appendix D2).



- b. Ensure that construction site operators have received training regarding erosion and sediment control compliance and hold a valid Responsible Personnel Certification as required by MDE;

Harford County conducts a pre-construction meeting prior to the issuance of grading permits. Contractors are required to provide a copy of the valid Responsible Personnel Certification for the onsite field supervisor.

- c. Program activity shall be recorded on MDE’s annual report database and submitted as required in PART V of this permit; and

For this reporting period, the following information was entered into the MDE geodatabase (ErosionSedimentControl table) and submitted with this report.

Erosion and Sediment Control Program

Active Permits - 144

Disturbed Area – 1,888 acres

Number of Inspections – 3,771

Number of Violations – 1,380

Number of Stop Work Orders - 36

- d. Reporting quarterly, information regarding earth disturbances exceeding one acre or more. Quarters shall be based on calendar year and submittals shall be made within 30 days following each quarter. The information submitted shall cover permitting activity for the preceding three months.

Thirty-six (36) of the 52 grading permits issued during this reporting period exceeded one acre of earth disturbance. Quarterly reports were submitted as required. The spatial and tabular data for grading permits one acre or more is maintained in the County geodatabase, Grading.mdb.

A map of the grading permit locations and table of attributes are included in Appendix D2. The spatial and tabular data for the grading permit location (QuarterlyGradingPermits point feature class) and attributes (QuarterlyGradingPmtInfo table) were imported into the MDE geodatabase and submitted with this report.

3. Illicit Discharge Detection and Elimination

Harford County shall continue to implement an inspection and enforcement program to ensure that all discharges to and from the MS4 that are not composed entirely of stormwater are either permitted by MDE or eliminated. Activities shall include, but not be limited to:

- a. Field screening at least 100 outfalls annually. Each outfall having a discharge shall be sampled using a chemical test kit. Within one year of permit issuance, an alternative program may be submitted for MDE approval that methodically identifies, investigates, and eliminates illegal connections to the County's storm drain system;

Outfall Screening Program

During this reporting period, Harford County utilized its contractor, Versar, Inc. to conduct outfall screenings. The outfalls were selected and screened following the protocols outlined in the *Harford County Illicit Discharge Monitoring Program: Site Selection, Screening and Quality Assurance Protocols*, Versar, Inc. 2010. Additional outfalls were screened by Harford County Inspectors, using an outfall screening app described in the FY2018 Annual Report.

Outfall Screening Activities

During this reporting period, Versar, Inc. performed 103 outfall screenings. County Inspectors screened an additional 33 outfalls. Thirty-three outfalls exhibited dry weather flow. Versar, Inc. tested and re-tested dry-weather flow at the 33 outfalls and performed source tracking according to protocol.

Using the criteria established in the 2010 Harford County Illicit Discharge Monitoring Program: Site Selection, Screening, and Quality Assurance Protocols, two outfalls had a high likelihood of

illicit discharge. One outfall had a moderate likelihood of illicit connection. Fifteen outfalls had a low likelihood of illicit discharge. A table summarizing the outfall screenings in which an action criteria was exceeded and the likely source or outcome is provided in Appendix D3.

Two outfalls with a high likelihood for illicit discharge exceeded the action criteria for color and surfactants. Outfall OF001775 resulted in a Hotspot investigation at Adam’s Chevrolet and is described in the Hotspot Investigation Program section of this report. As a result of the Hotspot Investigation, this illicit discharge has been eliminated. Outfall OF000153 requires follow-up, but was not completed during this reporting period.

One outfall had a moderate likelihood for illicit discharge and exceeded the action criteria for color and chlorine. Follow-up is required but was not completed during the reporting period.

Fifteen outfalls had a low likelihood for illicit discharge. One outfall, OF000188, resulted in a Hotspot investigation at Advanced Granite and is described in the Hotspot Investigation section of this report. As a result of the Hotspot Investigation, this illicit discharge has been eliminated. Four outfalls exceeded the action criteria for color. The sources were determined iron floc, pollen, and recent outfall stabilization. No source could be determined for the parameter exceeding the action criteria at ten of the outfalls.

The remaining 15 outfalls tested did not exceed the action criteria for any parameter.

Harford County Illicit Discharge Inspection Program, Monitoring Period July 2018 - June 2019, Versar, Inc. (2019) describing the outfall screening protocol and findings is provided in Appendix D3.

A map of the inspected outfalls and table of attributes are included in Appendix D3. The tabular data (IDDE table) were input into the MDE geodatabase and submitted with this report.

Outfalls Screened – 136
No Flow – 103
Dry Weather Flow – 33
Illicit Discharges Detected – 2
Illicit Discharges Eliminated - 2



- b. Conducting annual visual surveys of commercial and industrial areas as identified in PART IV.C.2 above for discovering, documenting, and eliminating pollutant sources. Areas surveyed shall be reported annually;

Hotspot Investigation Program

Windshield Surveys

Windshield surveys are performed at commercial and industrial properties by Versar Inc. Versar, Inc. and MS4 Staff jointly select locations within business parks, industrial parks, or properties identified within the tax records as commercial or industrial. Surveys are completed using datasheets from the *Center for Watershed Protection's Unified Subwatershed and Site Reconnaissance: A User's Manual (2005)*. Hotspots are characterized as "severe hotspot", meaning actively polluting, "confirmed hotspot", meaning the site has a high potential for polluting", potential hotspot", meaning the site has a moderate potential for polluting" and "not a hotspot".

Locations with active pollution discharges (severe hotspots) are reported immediately to MS4 staff or Harford County HAZMAT depending on the severity of the discharge. Discharges reported to Harford County HAZMAT are investigated immediately. Non-emergency discharges are investigated by MS4 staff within the same business day.

Confirmed hotspots, without active pollution discharge, are reported to MS4 staff monthly.

Reported Hotspots

Reported hotspots are identified by citizens or County employees who report an issue via telephone, email or Facebook. Reported hotspots determined as an emergency are forwarded to Harford County HAZMAT. All other reported hotspots are investigated by MS4 staff.



Confirmed Hotspots

MS4 staff visits confirmed hotspots and reported hotspots to verify the site as a hotspot.

Confirmed hotspots with active NPDES industrial permits or confirmed hotspots with activities that may require an NPDES industrial permit are forwarded to the MDE Compliance Hotline (866) MDE-GOTO. Confirmed hotspots that discharge into another jurisdiction's MS4 system are forwarded to that jurisdiction (MD State Highway, City of Aberdeen, Town of Bel Air, City of Havre de Grace).

For each confirmed hotspot not referred to another jurisdiction, a case is opened, and the property owner is contacted by mail. The letter documents the issues and lists the recommended remediation to be completed within a designated timeframe, typically 30 days. Follow-up with the property owner continues until the remediation is completed, and the case is closed.

Potential Hotspots

During Versar's windshield survey, a portion of the sites are classified as Potential Hotspots. Based on MDE's comments of the County's 2018 Annual Report, the County will initiate an education program aimed at these businesses. The County will mail appropriate guidelines for good housekeeping measures to these businesses. Once the materials are mailed, the case will be closed.

Hotspot Geodatabase

Harford County developed a geodatabase to more efficiently track the status of hotspot investigations. The location, date and category for all hotspot investigations are entered into the County geodatabase, Hotspot.mdb. For confirmed hotspots, a case file is opened, and a record is added to a case file for each date and action taken, such as letter to owner, email from owner, or site visit. The County geodatabase allows for the visual assessment of the locations of hotspot investigations and easily documents open cases for follow-up.

Hotspot Investigation Activities

During this reporting period, 54 sites were inspected, and eight new confirmed hotspot cases were opened. Six confirmed hotspot cases were closed. Eight confirmed hotspot cases remained open at the end of this reporting period.

Six of the confirmed hotspots were reported hotspots, either by citizens or County staff. One confirmed hotspot case was opened as a result of both a citizen complaint and outfall screening. One confirmed hotspot was located as a result of outfall screening.

Twenty-five potential hotspots were identified and will receive good-housekeeping educational materials by mail.

The Hotspot Activity Report for this reporting period is provided in Appendix D3.

Harford County Illicit Discharge Inspection Program, Monitoring Period July 2018 - June 2019, Versar, Inc. (2019) describing windshield survey protocol and findings is provided in Appendix D3.

The MDE geodatabase contains no features classes or tables for hotspot investigations.

- c. Maintaining a program to address and, if necessary, respond to illegal discharges, dumping, and spills;

MS4 staff continues to implement and improve initiatives to address illegal discharges, dumping and spills through coordination with Harford County Emergency Services, Harford County Division of Water and Sewer, Harford County Division of Environmental Services and Harford County Health Department.

Illegal Discharges, Dumping and Spills Program

Reporting

The public has several avenues by which to report these activities. The numbers listed below are published in water and sewer bills, the Harford County website and public outreach literature.



Emergency Services (911) and Non-Emergency (410.638.3400)

Both phone numbers are monitored 24 hours a day and answered by trained public safety dispatchers. For spill response throughout the county including the municipalities, the HAZMAT Team responds to each incident.

Office of Watershed Protection and Restoration (410.638.3217)

All reports of illegal discharges, dumping and spills are transferred to the appropriate phone number listed above based on the level of imminent emergency.

You Click, We Fix

(<http://www.harfordcountymd.gov/1737/You-Click-We-Fix>)

Harford County provides a web form for citizens to report issues. Harford County Department of Governmental and Community Relations reviews the submissions and directs the request to the appropriate agency.

Emergency Services

The HAZMAT Team operates 24 hours a day and consists of 31 certified Hazardous Materials technicians and 5 primary response vehicles. Training occurs continuously throughout the year. The HAZMAT Team responds to each call directed from the public safety dispatcher. Every attempt is made to recover spill materials before the spill reaches a stormdrain or waterway unless weather or terrain prohibits the recovery. All spills that reach a stormdrain or waterway are reported to Maryland Department of the Environment, Emergency Response. All spills that reach a navigable waterway are reported to the National Response Center. A HAZMAT Incident report is created for each response and contains a summary of the actions taken.

Local Emergency Planning Committee (LEPC)

The Local Emergency Planning Committee (LEPC) meets bi-monthly. One of several topics on the agenda includes the review of incidents of illegal discharges, spills and dumping to determine if enforcement action is warranted. The LEPC also conducts the investigative hearings and assesses fines as appropriate. During this reporting period, the LEPC met three times. Meeting minutes are provided in Appendix D3.



Division of Water and Sewer

The Harford County Health Department assists the Division of Water and Sewer with sanitary sewer overflows (SSOs). They determine appropriate forms of public notification, identifying downstream users, directing stream testing and assessing adequacy of site cleanup.

Health Department

The Health Department responds to citizen reports of leaking or overflowing septic systems and private sewer lines. Most of these calls are placed directly to the Health Department offices. A portion of citizen reports are routed from Emergency Operations. MS4 staff continues to work with the Bureau of Environmental Health to coordinate preventive and clean-up protocols regarding discharges (oil, grease, leaky dumpsters) from restaurants that impact the stormdrain system.

Illegal Discharges, Dumping and Spills Activities

The following is a summary of Harford County’s HAZMAT team responses, investigations and enforcement activities related to illegal discharges, dumping and spills that occurred during this reporting period. Beginning in January 2016, the HAZMAT team added a field to their records indicating if the pollutant entered a waterway.

HAZMAT Team Responses

Total responses – 185

Potential water quality impact responses – 87

Incidents where pollutants reached a waterway– 12

Number of Notices of Violation – 0

Fines Assessed - \$0

LEPC Meetings

January 16, 2019

March 20, 2019

May 15, 2019



Detailed information for HAZMAT responses is included in Appendix D3.

d. Using appropriate enforcement procedures for investigating and eliminating illicit discharges, illegal dumping, and spills. Significant discharges shall be reported to MDE for enforcement and/or permitting; and

e. Reporting illicit discharge detection and elimination activities as specified in PART V of this permit.

For this reporting period, activities for outfall screenings, hotspot investigations and spill response are listed above.

4. Litter and Floatables

This section of the permit requires Harford County to address problems associated with litter and floatables in waterways that adversely affect water quality. Increases in litter discharges to receiving waters have become a growing concern both nationally and within Maryland and cannot be ignored. Harford County needs to evaluate current litter control problems associated with discharges from its storm drain system and develop and implement a public outreach and education program as needed on a watershed by watershed basis.

The Division of Environmental Services implements the County's environmental, solid waste management and recycling programs. This includes managing the following operations: the Harford Waste Disposal Center, including landfill, homeowner drop-off, Mulch & Compost Facility and Recycling Transfer Station, the Roadside Litter Control Program, the Used Oil & Anti-freeze Program and Noxious Weed Control Program. A detailed list is included in Appendix D4.



The Division of Environmental Services prepared a comprehensive update to the Solid Waste Management Plan for the 2015 – 2024 planning period. The new Plan was introduced by the County Council under Bill No. 15-004. A public hearing was held on February 17, 2015, and the Council approved the Plan as amended on March 3, 2015. In May 2015, MDE’s Land Management Administration completed a review of the Plan and determined that the adopted Plan satisfied the requirements of Section 9-503(a) of the Environment Article and Code of Maryland Regulation 26.03.03. In accordance with Section 9-507(a) of the Environmental Article, Annotated Code of Maryland, and the Plan was approved.

- a. As part of Harford County’s watershed assessments under PART IV.E.1 of this permit, Harford County shall document all litter control programs and identify potential sources, ways of elimination, and opportunities for overall improvement.

The Litter Control Program consists of staff picking up blown litter at the Harford Waste Disposal Center and along County roadways, as well as cleaning up of illegal dumpsites throughout the County. Staff is also assisted by Community Service workers and citizens participating in the Absent Parent Program. During this reporting period, the Litter Control Program reported the following:

Litter Control Program

Trash Collected – 138,535 lbs.
Recycling Collected – 38,473 lbs.
Miles Cleaned – 792 miles

The County has a very successful Adopt-A-Road program, whereby County residents or groups of residents adopt a portion of a roadway in their community and agree to collect roadside litter at a specified frequency. The County provides supplies, materials and removal of roadside litter collected for these residents. During this reporting period, the Adopt-A-Road Program reported the following:



Adopt-A-Road Program

Trash Collected – 3,301 lbs.

Recyclables Collected – 2,012 lbs.

Roads Cleaned – 51 miles

Adopt-A Road Signed Contracts – 103

Both groups combined collected 311 tires.

- b. Within one year of permit issuance, as part of the public education program described in PART IV.D.6., Harford County shall develop and implement a public education and outreach program to reduce littering and increase recycling. This shall include:
 - i. Educating the public on the importance of reducing, reusing, and recycling;
 - ii. Disseminating information by using signs, articles, and other media outlets; and
 - iii. Promoting educational programs in schools, businesses, community associations, etc.

Harford County’s Office of Recycling currently administers a public education and outreach program to reduce littering and increase recycling through media outlets, school, community, business, parks and recreation, computer and electronic, and household waste programs.

During this reporting period, the Office of Recycling reported the following:

Public Education and Outreach

Recycling Education and Outreach to County Residents – 10,777

Tours of the Harford Waste Disposal Center – 15

School Presentations – 28

Public Outreach events – 20

Social Media Postings - 700

Published 6 advertisements in local papers, magazines, mailings, and website.



- c. Evaluating annually the effectiveness of the education program.
- d. Submit annually, a report which details progress toward implementing the public education and outreach program. The report shall describe the status of public outreach efforts including resources (e.g., personnel and financial) expended and the effectiveness of all program components.

The success of the recycling education and outreach program is measured by the compilation and the submittal of two annual reports to the MDE. These include the Maryland Recycling Act Report and the County Source Reduction (SR) Credit Report.

Although Harford County has been a leader in its recycling rates, significant amounts of recyclables are observed daily within the solid waste loads disposed of at the landfill. The County devotes significant resources in its annual budget to public outreach and education programs. It is believed that, no matter how many resources are utilized in public outreach and education, at some point a plateau is reached in its effectiveness. No matter how much effort is put into this endeavor, there will always be residents who refuse to participate in recycling. Funding, education, and outreach alone cannot change an individual person's behavior.

5. Property Management and Maintenance

- a. Harford County shall ensure that a Notice of Intent (NOI) has been submitted to MDE and a pollution prevention plan developed for each County-owned municipal facility requiring NPDES stormwater general permit coverage. The status of pollution prevention plan development and implementation for each County-owned municipal facility shall be reviewed, documented, and submitted to MDE annually.

Notice of Intent (NOI) for County Owned Property

NOIs and pollution prevention plans for all County owned properties requiring coverage under the general stormwater permit (12SW) have been submitted and approved.

County Owned Property 12SW General Permit

- Abingdon Highway Maintenance Facility – 12SW1271
- Fallston Parks and Recreation Maintenance Facility – 12SW2095
- Hickory II Highway Maintenance Facility – 12SW1714
- Jarrettsville Highway Maintenance Facility – 12SW2474
- Jarrettsville Parks and Recreation Maintenance Facility – 12SW2094
- Public Schools Maintenance Facility – 12SW2084
- Harford Waste Disposal Center – 12SW0028
- Sod Run Waste Water Treatment Plant – 12SW1727
- Whiteford Highway Maintenance Facility – 12SW1847

Annually, MS4 staff sends notices to facilities 12SW permits to review the individual SWPPPs and to provide any necessary updates. Each facility is required to perform all necessary inspections and trainings and to keep the records on site. The Sod Run Waste Water Treatment Plant, Harford County Board of Education and the Scarboro Landfill, operated by Maryland Environmental Services, conduct their own inspections, as required by their 12SW permits.

As requested by Highways and Parks & Recreation, the MS4 Office assists in conducting annual inspections of those facilities. During this reporting period, the MS4 office assisted in completing annual inspections for six facilities (Appendix D5). The MS4 Office along with each facility manager inspected the site and reviewed the pollution prevention plan for completeness. Minor housekeeping improvements were noted and implemented.

Annual Pollution Prevention Inspections conducted by the MS4 Office

- Abingdon Highway Maintenance Facility – 12SW1271
- Hickory II Highway Maintenance Facility – 12SW1714
- Jarrettsville Highway Maintenance Facility – 12SW2474
- Whiteford Highway Maintenance Facility – 12SW1847
- Fallston Parks and Recreation Maintenance Facility – 12SW2095
- Jarrettsville Parks and Recreation Maintenance Facility – 12SW2094

A map of the County owned properties with 12SW permits and table of attributes are included in Appendix D5. The spatial and tabular data (MunicipalFacilities point feature class) were input into the MDE geodatabase and submitted with this report.

- b. The County shall continue to implement a program to reduce pollutants associated with maintenance activities at County-owned facilities including parks, roadways, and parking lots. The maintenance program shall include these or MDE approved alternative activities:
 - i. Street sweeping;
 - ii. Inlet inspection and cleaning;
 - iii. Reducing the use of pesticides, herbicides, fertilizers, and other pollutants associated with vegetation management through increased use of integrated pest management;
 - iv. Reducing the use of winter weather deicing materials through research, continual testing and improvement of materials, equipment calibration, employee training, and effective decision-making; and
 - v. Ensuring that all County staff receives adequate training in pollution prevention and good housekeeping practices.

The County shall report annually on the changes in any maintenance practices and the overall pollutant reductions resulting from the maintenance program. Within one year of permit issuance, an alternative maintenance program may be submitted for MDE approval indicating the activities to be undertaken and associated pollutant reductions.

During this reporting period, Harford County Highways Division continued its road maintenance operations to ensure public safety in a cost-efficient manner.

During the FY16 reporting period, Harford County Highways Division implemented a new system to maximize the efficiency of equipment usage. The *PreCise*® *Mobile Resource Management* is designed to track the location of all vehicles to maximize equipment uptime,

redeploy equipment where it will be more effective, track salt usage and adhere more easily to environmental policies. The system produces reports for vehicle travel patterns, down time, break-downs and travel speed.

Street Sweeping

Harford County maintains 1,072.82 miles of roadway. Approximately 80% of all public streets are swept annually with a mechanical brush vacuum truck. Additionally, certain major collector roads may be swept monthly. During this reporting period, 1,648 lane miles of hard surface roads were swept. The street sweeping practice collected 54 tons of material. Material collected during street sweeping is disposed of in the local landfill or maintenance yard. Dirt roads are not swept.

Street Sweeping

1,648 lane miles

54 tons

Inlet Inspection and Cleaning

Inlets are scheduled to be inspected and cleaned at a minimum of every three years. Inlets may be cleaned more frequently if needed. There are approximately 12,000 inlets throughout Harford County. Inlets are assigned to each of the four Highways Districts, according to snow routes. All inlets along a specified snow route are inspected and the snow routes are rotated over a three-year period. Inlets may be cleaned with vacuum sweepers, backhoes, or manually. During this reporting period, 7,575 inlets were inspected and were cleaned as needed resulting in 82 tons of material removed from the stormdrain system.

Inlet Inspections and Cleaning

7,575 inlets

82 tons



Vegetation Management

Mowing and trimming are the primary means of managing roadside vegetation. During this reporting period, Harford County Highways Division mowed 1,749 road miles, trimmed 176,824 feet of guardrail, and trimmed around 7,180 road signs. Additionally, the County employs contractors to mow medians, mow County-owned stormwater management ponds, trim around guardrails and remove trees. County-owned parks and recreation complexes are maintained by mowing and trimming.

The County ensures pesticides and fertilizers are applied appropriately by requiring all contractors who perform such work to be licensed by Maryland Department of Agriculture in aquatic weed control, right-of-way weed control and to have a Professional Pesticide Application License. The County does not track herbicide and fertilizer use by contractors, as the contractors must report this information to Maryland Department of Agriculture annually.

County-owned stormwater wet ponds are treated with Aquashade as needed for algae control. The County also applies weed control at Recreation & Parks facilities if needed. Noxious weeds are also treated with herbicides at various County-owned property as needed. Chemical application data for County-applied algaecides and herbicides (ChemicalApplication table) was input into the MDE geodatabase and submitted with this report. Reporting logs are included in Appendix D5.

Harford County Environmental Services Division is responsible for administering the Noxious Weed Control in accordance with Maryland Department of Agriculture's requirements for complying with the Maryland Weed Control Law. Herbicide application for noxious weed control is provided in Appendix D5.

Deicing

All dump trucks are calibrated to deliver 300 pounds of salt per lane mile. County staff evaluates road conditions for each storm to determine the most effective treatment for the conditions of the particular storm and for the area of the County affected. During the previous reporting period, Harford County purchased equipment to be able to pre-treat the roadways with a brine solution. Salt brine trucks are calibrated to deliver 40 gallons per lane mile. During



this reporting period, 40,410 gallons of brine were applied to road surfaces. Salt usage for the winter of 2018 – 2019 was 13,519 tons. Salt usage (ChemicalApplication table) was input to the MDE geodatabase and submitted with this report.

Deicing Application

Brine - 40,410 gallons

Salt – 13,519 tons

Employee Training

Harford County Highways Division and the Department of Parks and Recreation conduct monthly safety training for its staff. At a minimum, the topics of spill response and reporting and good housekeeping practices are covered annually. Training topics also include snow removal, equipment inspection, and material safety data sheets (MSDS). Equipment operators are trained and tested annually. Harford County Public Schools, the Sod Run Wastewater Treatment Plant and Scarboro Landfill also train employees in good housekeeping practices. Training dates, locations and number of attendees are provided in Appendix D5.

Employee Training

Number of training sessions: 14

Number of employees receiving training: 475



6. Public Education

Harford County shall continue to implement a public education and outreach program to reduce stormwater pollutants. Outreach efforts may be integrated with other aspects of the County's activities. These efforts are to be documented and summarized in each annual report. The County shall continue to implement a public outreach and education campaign with specific performance goals and deadlines to:

- a. Maintain a compliance hotline or similar mechanism for public reporting of water quality complaints, including suspected illicit discharges, illegal dumping, and spills.

Reporting mechanisms are described in Section D. 3. c.

- b. Provide information to inform the general public about the benefits of:
 - i. Increasing water conservation;
 - ii. Residential and community stormwater management implementation and facility maintenance;
 - iii. Proper erosion and sediment control practices;
 - iv. Increasing proper disposal of household hazardous waste;
 - v. Improving lawn care and landscape management (e.g., the proper use of herbicides, pesticides, and fertilizers, ice control and snow removal, cash for clippers, etc.);
 - vi. Residential car care and washing; and
 - vii. Proper pet waste management.



Public Outreach Events

Harford County continues to engage and educate the public as described below. A summary of these events, including number of participants reached and hours spent is included in Appendix D6.

MS4 staff continued the annual “Harford Streams Summer Adventure” program which runs from Memorial Day through Labor Day and the annual “Poker Run” event held on July 14, 2018. The Summer Adventure Program and Poker Run’s intent is to encourage the community to explore the County’s local waterways, to understand their importance as part of the Bay’s ecosystem, and to promote awareness and support to protect them. Public participation has increased each year and feedback from participants continues to be positive.

In September 2018, MS4 staff was invited to participate in Aberdeen Proving Ground’s (APG), Pollution Prevention Open House. The target audience was the workforce and residents at APG. During this event, staff promoted the importance of healthy watersheds, the need for proper erosion and sediment control measures, the impacts of impervious surfaces, the importance of the Critical Area Program, the benefits of recycling, native plants, proper lawn care, best management practices, and rain gardens, the importance of proper disposal of hazardous household materials and pet waste, along with additional nonpoint source pollution and stormwater related materials.

In March 2018, MS4 staff hosted our second annual Open House at the McFaul Activities Center for citizens to learn about and join in Harford County’s efforts to protect local streams and clean up the Chesapeake Bay. The evening began with a brief overview from the County’s Office of Watershed Protection and Restoration followed by an opportunity to visit different stations where staff provided information and answered questions. The stations included information about restoration projects and plans; recently completed stream monitoring and related studies; outreach efforts and opportunities for citizen involvement; the Watershed Stewards Academy; and navigating the Harford Streams pages on the County website.

In March 2018, the Harford County Bureau of Stormwater Management Office conducted a Stormwater Management Maintenance Workshop at Harford Community College (HCC). The workshop was designed for contractors, landscapers, homeowner associations, and management companies. The class covered legal mandates for the maintenance of stormwater management facilities, recognition of the various types of facilities, and the development of maintenance schedules to fulfill requirements. Inspections were performed on various types of



stormwater management facilities, including environmental site design systems, located on the HCC campus.

In May 2018, MS4 staff, University of Maryland Sea Grant Ext. staff, and Master Watershed Stewards hosted an information session for potential applicants for the upcoming Watershed Stewards Academy at the McFaul activities Center.

In June 2019, MS4 staff participated in the Upper Western Shore Wade-In held at the Anita C. Leight Estuary Center. During this event, staff promoted the importance of healthy watersheds, the need for proper erosion and sediment control measures, the impacts of impervious surfaces, the importance of the Critical Area Program, the benefits of recycling, native plants, proper lawn care, best management practices, and rain gardens, the importance of proper disposal of hazardous household materials and pet waste, along with additional nonpoint source pollution and stormwater related materials. Staff utilized this time to kick off Harford County Streams Summer Adventure program.

In November 2018, the Eden Mill Nature Center (EMNC) held their annual Fall Fest. The Fall Fest is fun for the whole family. Visitors were able to visit the nature center, the educational garden area, and the historic grist mill museum. All participants were given a passport scavenger hunt card and were able to engage with the Phoenix Wildlife Center, the Natural History Society of Maryland, Harford Land Trust, and Master Gardeners' while learning about native animals and plants. Some other activities included were pumpkin chunkin', gourd hunting, corn grinding, interacting with farm animals, playing in a leaf pile, and various games. This event reached 712 people this year.

School Activities

During this reporting period, MS4 staff met several times with the Environmental Club at Forest Hill Elementary School (FHES) to work with the students in beautifying and cleaning up the rain gardens, meadows and raised planters on the school campus. This time was also used as an opportunity to educate the students on rain garden function, the importance of native plants, and the role they play with pollinator species.

During the 2018-2019 school year, MS4 staff partnered with the fifth-grade science class at Homestead Elementary to help the students develop an understanding of the impacts of stormwater on stream health and drainage issues on the school campus. One component of this learning process was presenting to the students the importance of managing the

stormwater and the positive role native trees, shrubs and perennials plants play in improving water quality and stream health, and stabilizing soils. The fifth-grade science class played an important role in the design and implementation of a bioretention facility on their school property that addressed the stormwater issues. In April and June 2019 MS4 staff instructed students on proper planting techniques and worked with the students to plant the native perennials in the new facility. Visit the project webpage for more information <http://www.harfordcountymd.gov/2688/Homestead-Rain-Garden>.

The Homestead Rain Garden was the first school project completed that was not initially identified by the MS4 Office. Mr. Bohlman, a 5th grade teacher, along with his students reached out to the MS4 Office requesting assistance to address a drainage issue on their campus. To thank him for championing this project, the MS4 Office purchased a weather station for the school. Mr. Bolhman had the weather station installed on the school roof and has added the station to Weather Underground.

In March 2019, MS4 staff participated as a judge and mentor for the St. Stephen School annual science fair. Activities included classroom presentations on types of experiments to perform, principles of the scientific method, ways to effectively collect and display data and communicate results.

In April 2019, MS4 staff met with St. Stephens Green School committee to provide guidance on implementing projects after being accepted as a green school.

Miscellaneous Outreach

Harford Streams Facebook

In July 2015, MS4 staff began utilizing Harford Streams – Green Choices. Healthy Streams. Facebook Page at bit.ly/HarfordStreamsFB to inform, engage and encourage support for protecting local waterways. During this reporting period, Watershed Protection and Restoration staff reported the following:

Facebook Insights

Total Page Likes – 1,261
Total Reach – 83,897
Total Impressions – 126,796

Anita C. Leight Estuary Center

The Anita C. Leight Estuary Center (ACLEC) is a Harford County Department of Parks and Recreation facility and is a component of the Chesapeake Bay National Estuarine Research Reserve (CBNERR). Otter Point Creek Alliance (OPCA) is the non-profit organization of the ACLEC dedicated to supporting the ACLEC's and CBNERR's mission to increase the awareness, understanding, and appreciation of estuarine ecosystems through research, monitoring, and education. During this reporting period, MS4 staff continued to serve on the board of directors for the Anita C. Leight Center's Otter Point Creek Alliance and participate in various educational events as stated below.

During this reporting period, the ACLEC hosted various outreach events that included Earth Day events, APG Pollution Prevention Fair, Arbor Day Festival, World Wetlands Day, Harford County Wade-In, elementary school outreach programs on Chesapeake Bay Wildlife, environmental festivals, field trips, and Envirothon. The information below summarizes the number of people reached during each of the educational opportunities.

Number of People Reached (3,024)

General Public – 1,728

Elementary, Middle and High School Students – 1,181

Organized Groups – 115

ACLEC volunteers contributed numerous hours towards stewardship projects that included the removal of invasive plants, the annual Marsh Clean Up, participating in the NOAA Marine Debris Canoe Program, shoreline clean up, growing and planting bay grasses, planting native plants in the Critical Areas, and E-cycling.

Maryland Water Monitoring Council

During this reporting period, staff continued to participate on the Stream Restoration Monitoring Sub-Committee sponsored by the Maryland Water Monitoring Council (MWMC). The MWMC serves as a statewide collaborative body encouraging effective collection, interpretation, and dissemination of environmental data and strives to improve communication within the Maryland water monitoring and management community regarding issues, policies, and resource management. The mission of the Stream Restoration Monitoring Sub-Committee is to provide a forum for the exchange of data and information about the effectiveness of stream restoration practices in Maryland, to coordinate among those involved with stream

restoration monitoring throughout the state and to communicate stream restoration monitoring results. The group is made up of representatives from county and state agencies, environmental consulting firms, practitioners, and academia with diverse experience, knowledge, and expertise in the applying monitoring to stream policy and management.

Eden Mill Nature Center

The Eden Mill Nature Center (EMNC) is a Harford County Department of Parks and Recreation facility located in the Piedmont Plateau along the mainstem of Deer Creek. EMNC provides a variety of resources to encourage environmental education and outdoor recreation for people of all ages and is dedicated to developing a greater awareness and appreciation to the natural and historical resources of the area.

EMNC staff provides public education and outreach through various nature center activities, camps, programs, special events and meetings.

During this reporting period, the Eden Mill Nature Center reported the following:

Number of People Reached (7,063)

Registered Participants – 5,280

Drop in Visitors – 1,783

EMNC had 965 volunteers that contributed 5,419 hours to support the nature center activities, special events and meetings.

Master Watershed Stewards (MWS)

Master Watershed Stewards work within their communities to identify pollutants, educate their neighbors about stream health, and take actions to reduce human impacts on water quality.

During this reporting period, the eight Harford County MWS completed various projects, participated in numerous outreach functions and continuous education classes and workshops.

Master Watershed Stewards

Activities Performed – 122

MWS Volunteer Hours – 466

Individuals Educated – 575



Office of Drug Control Policy

The Harford County Office of Drug Control Policy (HCODCP) in conjunction with the Harford County Sheriff's Department, Maryland State Police, Havre de Grace Police Department and the U.S. Drug Enforcement Administration hosted two Prescription Drug Take Back events and collected unwanted medications from six permanent drop-off boxes. These events and drop-off locations allow the safe collection of unused or expired medications so that they may be disposed of safely and without harm to the environment. Periodically, the medications are delivered to an incinerator for proper disposal.

During this reporting period, the HCODCP reported the following:

Total Unwanted Medications Collected - 3,166 lbs.

Aberdeen Police Department – 217 lbs.

Bel Air Police Department – 60 lbs.

Havre de Grace Police Department – 859 lbs.

Maryland State Police – 358 lbs.

Harford County Board of Education Building – 170 lbs.

Harford County Administration Building – 1175 lbs.

Wegmans – 327 lbs.

- c. Provide information regarding the following water quality issues to the regulated community when requested:
 - i. NPDES permitting requirements;
 - ii. Pollution prevention plan development;
 - iii. Proper housekeeping; and
 - iv. Spill prevention and response.

The regulated community consists of businesses and industries that have been issued permits by MDE. If requested by the regulated community, MS4 staff will provide MDE's document, *Stormwater Pollution Prevention Guidance* and refer the business or industry directly to MDE for further guidance. If Harford County determines that a business or industry does not have an NPDES permit, but engages in activities that should be permitted, that information is forwarded to MDE for further action.

E. Restoration Plans and Total Maximum Daily Loads

In compliance with §402(p)(3)(B)(iii) of the CWA, MS4 permits must require stormwater controls to reduce the discharge of pollutants to the MEP. By regulation at 40 CFR §122.44, BMPs and programs implemented pursuant to this permit must be consistent with applicable WLAs developed under EPA approved TMDLs (see list of EPA approved TMDLs attached and incorporated as Attachment B).

Harford County shall annually provide watershed assessments, restoration plans, and opportunities for public participation, and TMDL compliance status to MDE. A systematic assessment shall be conducted, and a detailed restoration plan developed for all watersheds within Harford County. As required below, watershed assessments and restoration plans shall include a thorough water quality analysis, identification of water quality improvement opportunities, and a schedule for BMP and programmatic implementation to meet stormwater WLAs included in EPA approved TMDLs.

Watershed assessments are completed to systematically identify opportunities for watershed restoration. The completion of watershed assessments for the entire county is labor and cost intensive. The County has expressed this concern throughout the permit reissuance process particularly the need to complete assessments in rural watersheds with minimal impervious area. The inventory within the urban watersheds in the county is significant and the likelihood of watershed restoration within these rural watersheds is fairly low. However, the County offers to satisfy this permit requirement by completing watershed assessments for the entire county, hereafter called large watershed assessments.

The County will continue to complete small watershed assessments to identify opportunities for watershed restoration that have the potential to be completed within a reasonable timeframe.



1. Watershed Assessments

- a. By the end of the permit term, Harford County shall complete detailed watershed assessments for the entire County. Watershed Assessments conducted during the previous permit cycles may be issued to comply with this requirement provide the assessments include all the items listed in Part IV.E.a.b. below. Assessments shall be performed at an appropriate watershed scale (e.g. Maryland hierarchical eight or twelve –digit sub-basins) and be based on MDE’s TMDL analysis or an equivalent and comparable County water quality Analysis.
- b. Watershed assessments by the County shall:
 - i. Determine current water quality conditions;
 - ii. Include the results of a visual watershed inspection;
 - iii. Identify and rank water quality problems;
 - iv. Prioritize all structural and nonstructural water quality improvement projects; and
 - v. Specify pollutant load reduction benchmarks and deadlines that demonstrate progress toward meeting all applicable stormwater WLAs.

There are four major basins located within Harford County including, Bush River, Lower Susquehanna River, Gunpowder River, and Upper Western Shore (Appendix E1).

The Bush River watershed has been the focus of the County’s watershed restoration program. It contains most of the County’s priority funding area, or development envelope, and therefore the highest concentration of urban impervious areas. The County completed an assessment of the Bush River watershed in 2003, which was the impetus for completing the County’s first small watershed assessment in Wheel Creek.



Large Watershed Assessments

Completed Large Watershed Assessments (163,000 acres)

Bush River (2003) – 75,000 acres

Deer Creek (2007) – 88,000 acres

During this reporting period, the County contracted with Bayland Consultants & Designers to complete large watershed assessments of the Little Gunpowder River, Broad Creek and Lower Susquehanna River North, Swan Creek and Lower Susquehanna River South. Brief summaries are provided in the following paragraphs and the full reports (draft) are included in Appendix E1. With the completion of these large watershed assessments, Harford County has completed assessments for all watersheds.

Large Watershed Assessment Completed this Reporting Period (78,000 acres)

Little Gunpowder River (2019) – 21,000 acres

Swan Creek (2019) – 16,000 acres

Lower Susquehanna River South (2019) – 8,000 acres

Broad Creek (2019) – 25,000 acres

Lower Susquehanna River North (2019) – 8,000 acres

Little Gunpowder River (Gunpowder River Basin)

This is a mixed agricultural, forested and urban watershed located along the western boundary of the county and encompasses approximately 20,809 acres. A watershed-based approach that included both a desktop analysis and field assessments was used to evaluate water quality conditions and improvement potential within the watershed. During the field survey phase 9 streams and 31 existing BMPs were assessed during the field reconnaissance. Potential projects include 3 stream restoration projects, 6 BMP retrofit projects, and 1 new BMP project. A draft assessment report documenting the protocols and findings is located in Appendix E1.

Swan Creek (Upper Western Shore) and Lower Susquehanna River South

These are mixed residential, agricultural, and forested watersheds located in the south eastern portion of the county. The Harford County portion of the Swan Creek watershed encompasses approximately 15,544 acres. It excludes that portion of the Swan Creek watershed that is within the boundaries of Aberdeen Proving Ground and under federal jurisdiction. The Lower Susquehanna River South watershed is the southern portion of the Lower Susquehanna River

watershed and encompasses approximately 6,831 acres. A watershed-based approach that included both a desktop analysis and field assessments was used to evaluate water quality conditions and improvement potential within the watershed. During the field survey phase 13 streams and 20 existing BMPs were assessed during the field reconnaissance. Potential projects include 5 stream restoration projects, 3 BMP retrofit projects, and 4 new BMP projects. A draft assessment report documenting the protocols and findings is located in Appendix E1.

Broad Creek (Lower Susquehanna River) and Lower Susquehanna River North

These are mixed residential, agricultural, and forested watersheds located in the north eastern portion of the county. The Harford County portion of the Broad Creek watershed encompasses approximately 25,395 acres. It excludes that portion of the Broad Creek watershed that is in Pennsylvania. The Lower Susquehanna River North watershed encompasses approximately 8,381 acres and includes the Harford County portion of the Conowingo Dam-Susquehanna River watershed and the northern Harford County portion of the Lower Susquehanna River watershed. A watershed-based approach that included both a desktop analysis and field assessments was used to evaluate water quality conditions and improvement potential within the watershed. During the field survey phase 17 streams and 15 existing BMPs were assessed during the field reconnaissance. Potential projects include 2 stream restoration projects, 5 BMP retrofit projects, and 3 new BMP projects. A draft assessment report documenting the protocols and findings is located in Appendix E1.

Watershed Assessment Master Plan

A watershed restoration master plan was completed during the FY2017 reporting period. The master plan included a GIS desktop analysis used to assign a priority ranking to each of the County's subwatersheds and develop a schedule for conducting small watershed assessments. The analysis was based on percent impervious cover, current subwatershed conditions, and proximity to adjacent impacted subwatersheds. The County continues to use this plan to prioritize small watershed assessments.

Small Watershed Assessments

The following small watershed assessments have been completed and are available online at <http://www.HarfordCountyMD.gov/HarfordStreams> :



Completed Small Watershed Assessments (16,920 acres)

- Wheel Creek (2008) - 440 acres
- Plumtree Run (2011) - 1,650 acres
- Sam’s Branch (2012) - 370 acres
- Foster Branch (2012) - 1,420 acres
- Declaration Run (2014) – 430 acres
- Riverside Area (2014) – 300 acres
- Upper Bynum Run (2018) – 5,350 acres
- Stout Bottle Branch /Cabbage Run (Deer Creek 2018) – 4,672 acres
- Upper Farnandis Branch (2018) – 490 acres
- Emmord Branch/Reardon Inlet (2018) – 1,010 acres
- Taylor Creek (2018) – 697 acres

Small Watershed Assessment completed this Reporting Period (9,262 acres)

- Middle/Lower Bynum Run (2019) – 9,262 acres

Middle/Lower Bynum Run

The County contracted with WSP to complete an assessment of the Middle and Lower Bynum Run watershed. This is an urban watershed that covers portions of the Town of Bel Air and Harford County and encompasses approximately 9,746 acres (less the Farnandis Branch; small watershed assessment previous completed). A watershed-based approach that included both a desk top analysis and field assessments was used to evaluate water quality conditions and improvement potential within the watershed. A total of 15.5 miles (81,925 linear feet) of stream, 79 outfalls, 65 existing BMPs and 11 proposed BMPs were assessed during the field reconnaissance. An assessment report documenting the protocols and findings is located in Appendix E1.

No additional small watershed assessments are planned for fiscal year 2020. The County currently has a large inventory of potential projects. See Watershed Restorations Projects below.



2. Restoration Plans

- a. Within one year of permit issuance, Harford County shall submit an impervious surface area assessment consistent with the methods described in the MDE document “Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated, Guidance for National Pollutant Discharge Elimination System Stormwater Permits” (MDE, June 2011 or subsequent versions). Upon approval by MDE, this impervious surface area assessment shall serve as the baseline for the restoration efforts required in this permit.

Impervious Area Assessment

In February 2017, MDE provided comments to Harford County for the updated impervious assessment submitted on August 1, 2016. MDE approved an impervious baseline of 11,094 acres and requested additional information for 282 impervious acres submitted for consideration to be removed from the baseline.

Baseline Impervious Acres Pending Approval (282)

Pre-2002 stormwater facilities - 187 acres

Non-rooftop disconnection - 79 acres

Watershed restoration projects through 2009 - 106 acres

Pre-2002 Stormwater Facilities

Along with the development of the County’s stormwater management asset management geodatabase, the County will verify during the next reporting period all pre-2002 stormwater management facilities providing water quality management.

Non-rooftop Disconnection

MDE requested the County verify 10% of the non-rooftop connections by conducting field visits. During this reporting period, the County reviewed the locations through a desktop exercise to determine the viability of conducting field visits. Since the County’s evaluation was limited to parcels 5 acres or larger, field verification proved difficult since most houses on these large lots



are not easily visible from public roadways. The County will consider updating the evaluation to include smaller parcels in order to create a larger inventory for field verification.

Watershed Restoration Projects through 2009

Twelve watershed restoration projects were completed through 2009 for a total of 176.68 impervious acres treated. Credits for stream restoration projects have been updated to align with MDE's guidance discussed below.

During this reporting period, four stream restorations were inspected. Two stormwater management facilities will be inspected during fiscal year 2020.

Two stormwater retrofits are currently failing inspections, one maintained by a homeowner's association and one maintained by the County. Repairs for the County-maintained facility are anticipated summer 2020. The County stormwater management maintenance inspector will continue to coordinate with the HOA to complete the repairs for the other failing facility. The required repairs do not impact the water quality proportions of the retrofit.

Harford County requests MDE's approval for a total of 141.12 impervious acres (176.68 less 35.56 for the County-maintained facility with needed repairs) to be removed from the previously approved baseline. Therefore, County's updated baseline would be 10,953 acres.

Grass Swales

During this reporting period, the County continued to work on the second phase of the grass swale assessment. Preliminary results have identified 275 swales treating approximately 0.13 impervious acres each, for a total of 39 impervious acres. Once the work has been completed, the County will request a reduction in the baseline.



By the end of this permit term, Harford County shall commence and complete the implementation of restoration efforts for twenty percent of the County’s impervious surface area consistent with the methodology described in the MDE document cited in PART IV.E.2.a. that has not already been restored to the MEP. Equivalent acres restored of impervious surfaces, through new retrofits or the retrofit of pre-2002 structural BMPs shall be based upon the treatment of the WQv criteria and associated list of practices defined in the 2000 Maryland Stormwater Design Manual. For alternate BMPs, the basis for calculation of equivalent impervious acres restored is based upon the pollutant loads from forested cover.

Watershed Restoration Projects

During this reporting period, two watershed restoration projects were completed for a total cost for design and construction of \$2,214,963 (Appendix E2a). Combined, these projects treat 94.1 impervious acres. One project was under construction at the end of this reporting period and 15 projects were under design. After the end of the reporting period, construction began for three projects. Watershed restoration for an additional 107.3 impervious acres will be completed by the end of the permit term (Appendix E2.a.).

Watershed Restoration Projects (Completed) - 2

Bynum Run at St Andrews Stream Restoration
Stormwater Retrofit at Homestead Elementary

Watershed Restoration Projects (Under Construction) - 1

Annie’s Playground Stream Restoration

Watershed Restoration Project (Construction start post reporting period) - 3

Willoughby Beach Road Extended Stormwater Retrofits and Stream Restoration
Tributary to Plumtree Run at Wakefield Manor Stream Restoration
Plumtree Run Barrington Place Stream Restoration



Watershed Restoration Projects (Under Design) - 15

Courthouse Bioretention
Mariner Point Tree Planting
Unnamed Tributary to Emmord Branch Stream Restoration
Foster Branch at Stillmeadow Stream Restoration
Heavenly Pond Wetland & Stream Creation
Fallston Library SWM Retrofit
Fallston Volunteer Firehouse SWM Retrofit
Church Creek Elementary School SWM Retrofit & Stream Restoration
Northwest Branch Declaration Run Stream Restoration
Sunnyview Drive Stream Restoration
Watervale Creek Stream Restoration
Woodland Run Stream Restoration
C Milton Wright SWM Retrofit & Stream Restoration
Fallston Middle and High School SWM Retrofit & Stream Restoration
Fallston Firehouse Retrofit
Hickory Vet Retrofit
Spenceola Retrofit
Gaviagns Retrofit

In April 2019, MDE issued guidance that increased impervious acre credits for stream restoration. The County adjusted the impervious acres credits for each of the completed stream restorations in accordance with this guidance (Appendix E2a).

Through this reporting period, watershed restoration has been completed for a total of 630.4 impervious acres. The total cost for the restoration is \$13.2 M with over half funded through grants. The average cost per impervious credit is \$62,032 (Appendix C6).

Watershed Restoration Project Inspections

During this reporting period, the County contracted with EA Engineering to develop a mobile application for inspection of stream restoration sites. This application was used to complete inspections for seven stream restorations. A description of how the application was developed and the results of the inspections is included in Appendix E2.a. During the next reporting period the application will be updated to align with the recently released expert panel for evaluating stream restoration projects.



Watershed Restoration Project Monitoring

Woodbridge Stream Restoration Post – Construction Monitoring

The County has contracted with KCI Technologies, Inc. to conduct post-construction monitoring for five years for the Woodbridge Stream Restoration project that was completed in April 2015. The main purpose of this study is to document and analyze the current and future stability of the restoration project and to support the County in its efforts to comply with the Woodbridge Stream Restoration Joint permit # 2011-60634-M24. Post-construction monitoring is be conducted annually for five years and includes a geomorphic assessment, physical habitat assessment, riparian buffer planting evaluation, benthic macroinvertebrate assessments, structure inspections, and photographic documentation. The report documenting Year 4 of the monitoring efforts is included in Appendix E2.a.

Dembytown Stream Restoration Post – Construction Monitoring

The County has contracted with KCI Technologies, Inc. to conduct post-construction monitoring for five years for the Dembytown Stream Restoration project completed along an unnamed tributary to Foster Branch. This restoration project was completed in April 2017. Information and data collected in this reach will be used to evaluate the success of the restoration project as required by the Army Corps of Engineers (ACOE) permit # 2015-60430-M37. These tasks include invasive plant and vegetation assessments, a geomorphology assessment, a physical habitat assessment, a wetland assessment, photo documentation, and a visual hydrologic assessment. The monitoring report documenting the methods, results and conclusions for Year 3 are included in Appendix E2.a.

Ring Factory ES Pond Retrofit and Stream Restoration Post-Construction Monitoring

The County has contracted with WBCM to complete the post-construction monitoring for three years for the Ring Factory Elementary School Outfall and Stream Restoration project as required by permit #2016-60581-M37. This project was completed in June 2018 and included approximately 1,078 linear feet of stream restoration and re-establishment of 5,274 square feet of non-tidal wetlands. The scope addresses tasks required by the ACOE Nationwide Permit Ref. 2016-60581-M37 Special Conditions and includes a visual assessment and field walk, riffle crest profile and resources classification, vegetation species richness and invasive species assessment, stream habitat assessment, photo documentation, wetland delineation and hydric soil monitoring. A copy of the Year 1 report is included in Appendix E2.a.

Bear Cabin Branch Stream Restoration Post-Construction Monitoring

The County has contracted with Ecotone, Inc. to complete the post-construction monitoring for the Bear Cabin Branch Stream Restoration project as authorized by permit #2017-60285-M37. The three-year monitoring plan for the 4,078 linear feet of stream restoration includes a visual assessment of the reach, an evaluation of the structural stability by documenting changes in riffle cross sections and longitudinal profile, identification of necessary corrective measures, vegetation assessment, stream habitat assessment, and photo documentation. This project was completed in May 2018, and a copy of the Year 2 Report is included in Appendix E2. a.

The Bear Cabin Branch project is categorized as a legacy sediment removal and floodplain reconnection (LSR-FR) stream restoration design. Little research has been conducted on the effectiveness of this design approach. To address this issue, the County has partnered with Ecotone and students and professors from Towson University to research the effects of the removal of the legacy sediments and reconnecting the floodplain on riparian plant communities and the export of nitrogen. Bear Cabin Branch is one of six LSR-FR projects in the Maryland Piedmont where plant community and water quality data is being collected and results being compared. Preliminary data results were presented at the annual Maryland Water Monitoring Council conference in 2019. Further research is anticipated to determine the effectiveness of this design approach.

Bynum Run at St. Andrews Stream Restoration Post-Construction Monitoring

The County has contracted with Ecotone, Inc. to conduct the post-construction monitoring of the Bynum Run at St. Andrew's Stream Restoration project as authorized by permit #2014-60352-M37. The five-year monitoring plan for the 3,345 linear feet of stream restoration includes a visual assessment of the reach, an evaluation of the structural stability by documenting changes in riffle cross sections and longitudinal profile, identification of necessary corrective measures, vegetation assessment, stream habitat assessment, and photo documentation. This project was completed in May 2019, and a copy of the Year 1 report is included in Appendix E2.a.

Emmord Branch Stream Restoration Permit Monitoring

The County has contracted with WBCM, Inc. to conduct pre- and post-construction monitoring for the Emmord Branch Stream Restoration project. This is a three-year post-construction effort, and the information and data collected in this reach will be used to evaluate the success of the restoration project as required by the Army Corps of Engineers (ACOE) permit # 2018-

61811-M37. These tasks include invasive plant and vegetation assessments, a geomorphology assessment, a physical habitat assessment, and a visual hydrologic assessment. Construction is scheduled to begin in June 2020. A scope of services for these monitoring efforts is included in Appendix E2.a.

Willoughby Beach Stream Restoration Permit Monitoring

The County has contracted with KCI, Inc. to conduct pre- and post-construction monitoring along Sam's Branch for the Willoughby Beach Stream Restoration project. This is a three-year post-construction monitoring effort, and the information and data collected in this reach will be used to evaluate the success of the restoration project as required by the Army Corps of Engineers (ACOE) permit # 2016-60665-M37. These tasks include invasive plant and vegetation assessments, a geomorphology assessment, a physical habitat assessment, biological assessment (fish only), a wetland assessment, and a visual hydrologic assessment. Construction is scheduled to begin in June 2020. A scope of services for these monitoring efforts is included in Appendix E2.a.

Connections to the Wastewater Treatment Plant

In fiscal year 2017, the MS4 Office began setting aside funds to assist with the connection of failing septic systems to the wastewater treatment plant. A grant of \$4,500 is used to pay a portion of the required hookup fees, reducing the overall financial commitment for the property owners. Since this program began, the MS4 Office has been able to assist in the connection of 21 properties to the wastewater treatment plant.

For fiscal year 2019, 6 septic systems were abandoned and connected to the wastewater treatment plant for a total of 2.34 impervious acres treated (Appendix C6).

Septic System Upgrades

The Health Department manages the program for upgrading septic systems through the use of Bay Restoration Funds. The MS4 Office obtains this information on an annual basis for inclusion within this annual report. For fiscal year 2019, 18 septic systems were upgraded for a total of 4.68 impervious acres treated (Appendix C6).



Septic System Pump Outs

For this reporting period, the County contracted with RKK to review each manifest completed by septic haulers that dropped off at the County's wastewater treatment plant, Sod Run. The manifests included septic pump outs, holding tanks, and commercial waste. A total of 10,568 manifests were reviewed. 6,583 manifests were for septic pump outs. An additional 485 manifests or approximately 8% of the volume was excluded. Exclusions included landfill leachate, manifests with missing addresses, addresses outside of Harford County, and porta potties. A summary of the work completed is included in Appendix E2a.

The County completed a further review of the 6,098 manifests where septic tanks were pumped out. Two additional manifests were removed because of incomplete address information.

Based on the expert panel (2014), Chesapeake Bay Model 5.3.2 load reductions for septic pump out are based on a 1,000 gallon tank with 2.5 people per household. The assumptions for the load calculations also include accumulation of solids over a five-year timeframe, allowing for load reductions per address once every five years. It is unknown currently if there are load reductions for commercial properties, consideration for pump outs more frequently than every five years, or consideration for pump outs from holding tanks.

The County reviewed the distribution of septic pump outs by volume for fiscal year 2019. Only 39% of the pump outs were less than 1,200 gallons, potentially indicating residential tanks larger than the average assumed by the expert panel and / or commercial tanks (Appendix E2a). Additional research of the county's manifests will be completed during the next reporting period.

Based on the expert panel recommendations, the County identified 1,500 manifests with multiple pump outs at 376 addresses. Reducing the multiple pump outs, the total number of addresses where septic tanks were pumped out during fiscal year 2019 is 4,972. The resulting volume was calculated as the total of the average volume per household. Based on the adjusted volume, an average tank size of 1,368 gallons was calculated. The overall reduction by removing the multiple pump outs is 25% by volume (Appendix E2a).

The total volume of septic pump outs for fiscal year 2019 was comparable to the volume over the past ten years. Based on RKK's review and exclusions, the volumes for each year were reduced by 8% (Appendix E2a). The volumes were further reduced by 25% based on the

County's review for multiple pump outs (Appendix E2a). Finally, the number of tanks pumped out were calculated by dividing the adjusted total volume by average tank size calculated for fiscal year 2019 (Appendix E2a).

For fiscal year 2019, 4,972 septic tanks were pumped out for a total of 149.2 impervious acres treated (Appendix C6).

Restoration Credits

Portions of two of the watershed restoration projects have significant repairs and those credits have been removed from the total credits. The total credits completed through this reporting period is 859.1 impervious acres (Appendix E2.a).

A total of 970.4 impervious acres are anticipated to be completed through the end of the permit term including watershed restoration, septic systems abandoned and connected to the wastewater treatment plant, and installation of best available technology on septic systems. This will represent approximately 9% of the untreated impervious area.

At the end of the permit term, an additional 127 impervious acres were under construction, 20 impervious acres had signed construction contracts, and 621 impervious acres were under design, for a total of 768 impervious acres, or 60% of the needed credits to meet the County's watershed restoration requirement.

Identified Watershed Restoration Projects

During the previous reporting period, the County developed a list of identified projects from completed small watershed assessments and an inventory of County-owned properties. This list of identified projects has anticipated credits of 1,552 impervious acres (Appendix E2.a). Additional projects identified in small watershed assessments for Emmord and Lower Bynum Run will be added to the inventory during the next reporting period.



- b. Within one year of permit issuance, Harford County shall submit to MDE for approval a restoration plan for each stormwater WLA approved by EPA prior to the effective date of the permit. The County shall submit restoration plans for subsequent TMDL WLAs within one year of EPA approval. Upon approval by MDE, these restoration plans will be enforceable under this permit. As part of the restoration plans, Harford County shall:
 - i. Include the final date for meeting applicable WLAs and a detailed schedule for implementing all structural and nonstructural water quality improvement projects, enhanced stormwater management programs, and alternative stormwater control initiatives necessary for meeting applicable WLAs;
 - ii. Provide detailed cost estimates for individual projects, programs, controls, and plan implementation;
 - iii. Evaluate and track the implementation of restoration plans through monitoring or modeling to document the progress toward meeting established benchmarks, deadlines, and stormwater WLAs; and
 - iv. Develop an ongoing, iterative process that continuously implements structural and nonstructural restoration projects, program enhancements, new and additional programs, and alternative BMPs where EPA approved TMDL stormwater WLAs are not being met according to the benchmarks and deadlines established as part of the County's watershed assessments.



Watershed Restoration Plans

Swan Creek Restoration Plan

As required the County submitted the Swan Creek Sediment TMDL Restoration Plan on September 29, 2017. On May 31, 2018 and May 3, 2019, Harford County received comments from MDE in response to the County's submittal of these plans. On July 26, 2019, the County met with MDE to discuss the most recent set of comments. On September 19, 2019, MDE approval the County's plan (Appendix E2b).

Bush River Restoration Plan

As required the County submitted the Bush River PCB TMDL Restoration Plan on August 2, 2017. On May 31, 2018 and May 3, 2019, Harford County received comments from MDE in response to the County's submittal of these plans (Appendix E2b). The County has addressed MDE's most recent set of comments and submitted the updated plan with this report (Appendix E2b).

Chesapeake Bay and Bynum Run Restoration Plans

On April 12, 2017, Harford County received comments from MDE in response to the County's submittal of the Bynum Run Sediment TMDL Restoration Plan. The County has addressed MDE's comments and submitted the updated plan with this report (Appendix E2b).

Based on MDE's review of the Bynum Run Restoration, the County will update the Chesapeake Bay Restoration Plan; specifically the methodology to disaggregate the landcover and loads for the Phase 2 MS4 jurisdictions including Town of Bel Air, City of Aberdeen, City of Havre de Grace, and Aberdeen Proving Grounds.

Watershed Restoration Monitoring

USGS Stream Gages

Harford County Department of Public Works and the United States Geological Survey (USGS) partnered for the continued operation of the following gages through June 2019.

Bynum Run at Bel Air (01581500) – restarted 1999
Plumtree Run near Bel Air (01581752) – installed 2001
James Run near Belcamp (01581649) – installed 2004

Swan Creek at Swan Creek (01580700) – installed 2007
Wheel Creek near Abingdon (0158175320) – installed 2009
Foster Branch near Joppatowne (01585075) – installed 2015

The operation of these gages supports the ongoing efforts to create a state-wide stream gaging network, and the data will supplement information recorded at additional Harford County gages that are not funded by the County. The data collected at each of these gages is presented in ‘real-time’ at <http://waterdata.usgs.gov/md/nwis/rt>.

MS4 staff partnered with the USGS in 2013 to monitor the water quality in the Plumtree Run watershed and again in 2015 to replicate the same monitoring plan in the Foster Branch watershed. The County developed long - term restoration plans for both of these watersheds and is conducting monitoring activities through a single, coordinated strategy rather than by monitoring each individual stream restoration projects in each watershed. All water quality monitoring is conducted at the Plumtree Run gage (USGS monitoring station 01581752) and the Foster Branch gage (USGS monitoring station 01585075), and site operation is designed to be compatible with the Chesapeake Bay Nontidal Monitoring Network (NTN) to maintain the ability to compare conditions observed at this station to those measured across the region. The monitoring plan consists of samples collected on a monthly fixed-frequency interval augmented with samples collected during eight to ten storm events that are analyzed for nutrients, suspended sediment, and dissolved chloride and *E. coli* bacteria. Continuous water quality monitoring data for water temperature, specific conductance and turbidity is also collected and displayed in near real time on the USGS web page.

Data collected for this study will be used to detail current water quality conditions in Plumtree Run and Foster Branch and document improvements to water quality as watershed restoration activities are implemented in the watershed. All data is reviewed and posted in the USGS National Water Information System (NWIS) and published in the USGS annual data report of the MD-DE-DC Water Science Center available at <http://wdr.water.usgs.gov/>. The County is anticipating developing a cumulative review of this data during the next reporting period.

Plumtree Run and Foster Branch Monitoring Plans

The MS4 staff contracted with KCI Technologies to develop monitoring plans for the Plumtree Run and Foster Branch watersheds. The primary goal of this effort is to characterize baseline biological, physical habitat, and chemical stream conditions prior to the implementation of

additional stream restoration projects. A secondary goal is to have a monitoring plan which also serves to collect data that can be used to document ecological uplift as restoration projects are completed within these watersheds.

Both monitoring plans follow a Before-After, Control-Impact (BACI) study design. By implementing this monitoring plan before more projects are implemented, a baseline condition can be described; the “Before” portion of the BACI. By continuing with this effort far enough in the future to collect data after project implementation, the “After” portion of the BACI concept is captured as well. Plumtree Run and Foster Branch are the watersheds where these treatments will be applied, the “Impact” portion of the BACI concept. A local urban/suburban reference/control site is nearby; the “Control” portion of the BACI design. The County and KCI feel this is the best strategy for measuring ecological response or ecological lift to the implementation of the Plumtree Run and Foster Branch Watershed Small Watershed Action Plans.

Five in-stream monitoring sites are located in each watershed and were assessed for benthic macroinvertebrates, spring and summer physical habitat, fish, herpetofauna, invasive plants and in situ water chemistry. Sampling methods used are consistent with the Maryland Biological Stream Survey (MBSS) procedures (DNR, 2015). The MBSS protocols are standard for biomonitoring efforts across Maryland. Using these MBSS protocols will allow a direct comparison to DNR-collected data, allowing use of a 4,700+ stream site dataset for comparison with results from Plumtree Run and Foster Branch.

In the Foster Branch watershed, mean BIBI scores over the four years of monitoring ranged from 2.31 to 2.60, in the ‘Poor’ category, and mean FIBI scores ranged from 2.87 (‘Poor’) to 3.22 (‘Fair’). The changes in mean BIBI and FIBI score over time were not statistically significant.

In the Plumtree Run watershed, mean BIBI scores over the three years of monitoring ranged from 2.20 (‘Poor’) to 1.40 (‘Very Poor’), and mean FIBI scores were in the ‘Fair’ category and ranged from 3.20 to 3.56. The changes in mean BIBI and FIBI score over time were not statistically significant.

Foster Branch and Plumtree Run Monitoring reports for Year 4 are included in Appendix E2. b.



3. Public Participation

Harford County shall provide continual outreach to the public regarding the development of its watershed assessments and restoration plans. Additionally, the County shall allow for public participation in the TMDL process, solicit input, and incorporate any relevant ideas and program improvements that can aid in achieving TMDLs and water quality standards. Harford County shall provide:

- a. Notice in a local newspaper and the County's website outlining how the public may obtain information on the development of watershed assessments and stormwater watershed restoration plans and opportunities for comment;
- b. Procedures for providing copies of watershed assessments and stormwater watershed restoration plans to interested parties upon request;
- c. A minimum 30-day comment period before finalizing watershed assessments and stormwater watershed restoration plans; and
- d. A summary in each annual report of how the County addressed or will address any material comment received from the public.

Upper Bynum Run Small Watershed Assessment

As a part of the Upper Bynum Run Small Watershed Assessment, all property owners near or adjacent to a storm water management facility or the stream received a letter from the County. The letter informed each property owner of the purpose and importance of the assessment, requested permission to access the property to evaluate the existing conditions, requested property owner contact information for additional correspondence and a link to the County website <http://www.harfordcountymd.gov/2398/Upper-Bynum-Run-In-Progress> should the property owners have any questions, comments or concerns about the assessment. Various property

owners and property managers for homeowner’s associations utilized this opportunity to contacted County staff to answer questions about the assessment.

Upon the completion of the field work and the data analysis, an interactive, online GIS Story Map was created outlining the importance of healthy streams and summarizing the purpose and findings of the assessment. During the next reporting period, property owners previously contacted will be provided with a link to the Story Map as a means for the public to provide comments. A summary of comments and County response will be included in the next annual report.

Middle/Lower Bynum Run Small Watershed Assessment

As a part of the Middle/Lower Bynum Run Small Watershed Assessment, all property owners near or adjacent to a storm water management facility or the stream received a letter from the County. The letter informed each property owner of the purpose of the assessment, requested permission to access the property to evaluate the existing conditions, requested property owner contact information for additional correspondence, and provided the County website should the property owners have any questions, comments or concerns about the assessment. Various property owners and property managers for homeowner’s associations utilized this opportunity to contacted County staff to answer questions about the assessment.

An interactive, online GIS Story Map will be created summarizing the results of the assessment. During the next reporting period, property owners previously contacted will be provided with a link to the Story Map as a means for the public to provide comments. A summary of comments and County response will be included in the next annual report.



4. TMDL Compliance

Harford County shall evaluate and document its progress toward meeting all applicable stormwater WLAs included in EPA approved TMDLs. An annual TMDL assessment report with tables shall be submitted to MDE. This assessment shall include complete descriptions of the analytical methodology used to evaluate the effectiveness of the County's restoration plans and how these plans are working toward achieving compliance with EPA approved TMDLs. Harford County shall further provide:

- a. Estimated net change in pollutant load reductions from all completed structural and nonstructural water quality improvement projects, enhanced stormwater management programs, and alternative stormwater control initiatives;
- b. A comparison of the net change in pollutant load reductions detailed above with the established benchmarks, deadlines, and applicable stormwater WLAs;
- c. Itemized costs for completed projects, programs, and initiatives to meet established pollutant reduction benchmarks and deadlines;
- d. Cost estimates for completing all projects, programs, and alternatives necessary for meeting applicable stormwater WLAs; and
- e. A description of a plan for implementing additional watershed restoration actions that can be enforced when benchmarks, deadlines, and applicable stormwater WLAs are not being met or when projected funding is inadequate.

For the projects constructed during this reporting period, load reductions were calculated using the Accounting Document (2014). Once the County finalized the development of the spreadsheet to align with the Phase 6 Bay Model, all project load reductions will be calculated using this method. A summary of the load reductions is included in Appendix E4.



F. Assessment of Controls

Harford County and ten other municipalities in Maryland have been conducting discharge characterization monitoring since the early 1990s. From this expansive monitoring, a statewide database has been developed that includes hundreds of storms across numerous land uses. Analyses of this dataset and other research performed nationally effectively characterize stormwater runoff in Maryland for NPDES municipal stormwater purposes. To build on the existing information and to better track progress toward meeting TMDLs, better data are needed on ESD performance and BMP efficiencies and effectiveness.

Assessment of controls is critical for determining the effectiveness of the NPDES stormwater management program and progress toward improving water quality. The County shall use chemical, biological, and physical monitoring to assess watershed restoration efforts, document BMP effectiveness, or calibrate water quality models for showing progress toward meeting any applicable WLAs developed under EPA approved TMDLs identified above. Additionally, the County shall conduct physical stream monitoring to assess the implementation of the latest version of the 2000 Maryland Stormwater Design Manual. Specific monitoring requirements are described below.

1. Watershed Restoration Assessment

The County shall continue monitoring in the Wheel Creek watershed or select and submit for MDE's approval a new watershed restoration project for monitoring. Monitoring activities shall occur where the cumulative effects of watershed restoration activities can be assessed. One outfall and an associated in-stream station, or other locations based on a study design approved by MDE, shall be monitored. The minimum criteria for chemical, biological, and physical monitoring are as follows:



Wheel Creek Watershed Background

In 2009, MS4 staff and MDE selected the Wheel Creek watershed to monitor ambient conditions. The Wheel Creek watershed (unofficially named) is centrally located in Harford County, approximately three miles south of the Town of Bel Air. It is a second order tributary to Winters Run (MDE8DIGIT 02130702) and Atkisson Reservoir (MDE8DIGIT 02130703) in the Bush River watershed (MDE6DIGIT 021307). Wheel Creek is situated along the eastern edge of the Piedmont physiographic province, drains 435 acres, and contains approximately 27% impervious cover. A mixture of commercial and high-density residential land use dominates the headwaters, along with a mixture of medium and low density residential land use. The Harford Glen Environmental Education Center, which is part of the Harford County Public School system, is in the lower reaches of the watershed and is predominately forest.

Wheel Creek Watershed

435 acres

27% impervious cover

This watershed was selected based on the channel instability, sedimentation, pond retrofit, and stream restoration opportunities and implementation recommendations outlined initially in the *Bush River Water Restoration Action Strategy* and more detailed in the *Wheel Creek Small Watershed Assessment*.

Wheel Creek Small Watershed Assessment

The priority restoration projects recommended in the 2008 Wheel Creek Small Watershed Assessment have been constructed. The following is a summary of each project along with the completion date.

Constructed

Gardens of Bel Air SWM Retrofit (2013)

Calvert's Walk Stream Restoration (2013)

Festival at Bel Air SWM Retrofit (2015)

Country Walk 1A SWM Retrofit (2015)

Phase 1 - Lower Wheel Creek Stream Restoration and WQ Facilities (2016)

County Walk 1B SWM Retrofit (2017)

Phase 2 - Lower Wheel Creek Stream Restoration (2017)

Project success will be evaluated through a pre- and post-construction monitoring effort that includes chemical, biological and physical monitoring components that began in January 2009.

a. Chemical Monitoring:

- i. Eight (8) storm events shall be monitored per year at each monitoring location with at least two occurring per quarter. Quarters shall be based on the calendar year. If extended dry weather periods occur, baseflow samples shall be taken at least once per month at the monitoring stations if flow is observed;
- ii. Discrete samples of stormwater flow shall be collected at the monitoring stations using automated or manual sampling methods. Measurements of pH and water temperature shall be taken;
- iii. At least three (3) samples determined to be representative of each storm event shall be submitted to a laboratory for analysis according to method listed under 40 CFR Part 136 and event mean concentrations (EMC) shall be calculated for:
Biochemical Oxygen Demand (BOD5) Total Lead
Total Kjeldahl Nitrogen (TKN) Total Copper
Nitrate plus Nitrite Total Zinc
Total Suspended Solids Total Phosphorus
Total Petroleum Hydrocarbons (TPH) Hardness
E. coli or enterococcus
- iv. Continuous flow measurements shall be recorded at the in-stream monitoring station or other practical locations based on the approved study design. Data collected shall be used to estimate annual and seasonal pollutant loads and reductions, and for the calibration of watershed assessment models. Pollutant load estimates shall be reported according to any EPA approved TMDLs with a stormwater WLA.



Wheel Creek Chemical Monitoring Sites

Three permanent water quality monitoring stations were established in the Wheel Creek watershed between the summer of 2010 and the spring of 2011.

Station WC002 (In-stream)

Located on the mainstem of Wheel Creek just downstream of Wheel Road

Station WC003 (Outfall)

Located on the Middle Branch of Wheel Creek
 Outfall from the instream SWM facility on Cinnabar Lane

Station WC004 (In-stream)

Located upstream of WC003 on the Middle Branch just off Wheel Court

Chemical Sample Analysis

Each sample collected in Wheel Creek was analyzed for the parameters listed in the table below using Standard Methods or EPA methods. Suburban Testing Laboratory and Harford County’s Sod Run WWTP laboratory analyzed the stormflow and baseflow samples for all parameters except for *Escherichia coli* which were analyzed by Enviro-Chem Laboratory.

Parameter	Method	Reporting Limit
5-day Biological Oxygen Demand (BOD5)	SM 5210 B	1-2 mg/L
Total Suspended Solids (TSS)	SM 2540 D	2-60 mg/L
Total Kjeldahl Nitrogen (TKN)	EPA 351.2	0.5-1 mg/L
Total Phosphorus (TP)	EPA 365.4	0.1 mg/L
Total Petroleum Hydrocarbons (TPH)	EPA 1664BSGT@PHC	5 mg/L
Total Copper (Cu)	EPA 200.7 Rev 4.4	0.002-0.04 mg/L
Total Zinc (Zn)	EPA 200.7 Rev 4.4	0.01-0.02 mg/L
Total Lead (Pb)	EPA 200.7 Rev 4.4	0.001-0.005 mg/L
Total Hardness	CALC (200.8)	0.7-50 mg/L
Total Nitrate (NO3) + Nitrite (NO2)	EPA 300.0	0.1 mg/L
<i>E. coli</i>	SM 9223B	1 MPN/100mL



Wheel Creek Chemical Monitoring Results

Wheel Creek Year 9 Monitoring Results

The water quality monitoring results include baseflow and stormflow concentration data, event mean concentration (EMC) values and pollutant loading results collected from July 2018 through June 2019. During this reporting period, the County continued to contract with Versar, Inc. to collect samples during stormflow events. A total of 8 storm events were collected at Stations WC002, WC003 and WC004. When a storm event was sampled, three water quality samples were collected and composited at each station over the course of the storm hydrograph. Storm event sampling dates are listed below. Continuous flow was collected at each station during each storm event utilizing SIGMA area velocity probes or ISCO bubbler flow meters. The instantaneous discharge, level, velocity, water temperature and pH were recorded at the time the samples were collected.

Stormflow Sampling Dates	
July 17, 2018	January 4, 2019
September 17, 2018	February 20, 2019
October 26, 2018	June 10, 2019
November 15, 2018	June 12, 2019

During this reporting period, Versar staff collected discrete baseflow samples at each station during 10 baseflow events.

Baseflow Sampling Dates	
August 28, 2018	February 27, 2019
October 18, 2018	March 26, 2019
November 29, 2018	April 23, 2019
December 18, 2018	May 22, 2019
January 22, 2019	June 27, 2019

The MS4 Office continued to contract with Versar to develop a detailed analysis of the sampling methods, materials, data results and discussion for year eight of this monitoring effort. The final monitoring report is included in Appendix F1. A summary of the results is outlined below.



Federal and State reference values for certain nutrients were exceeded on several occasions, confirming detrimental stream chemistry impacts from development and changes in land use. Total nitrogen, calculated from the sum of nitrate plus nitrite and TKN, was present at concentrations exceeding the EPA reference values (0.69 mg/L) for both baseflow (all detected samples) and stormflow (97.1% of detected samples). For total phosphorus, one result in baseflow samples and 86.2% of the detectible results in stormflow samples were found to be above the corresponding EPA reference concentration (0.03656 mg/L). Chloride in stormflow exceeded the EPA acute criterion (860 mg/L) in 10.1% of samples, while 30.0% of baseflow samples exceeded the chronic criterion for chloride (230 mg/L).

All baseflow samples had detectable amounts of zinc but none exceeded the MDE chronic surface water criterion (120 µg/L). All stormflow samples had detectable concentrations of zinc and two samples had an amount exceeding the MDE acute criterion (120 µg/L). All lead concentrations fell below the MDE acute criterion (65 µg/L) for stormflow and the chronic criterion (2.5 µg/L) for baseflow this monitoring period. Copper concentrations did not exceed the MDE chronic criterion (9 µg/L) in baseflow samples, while 8.7% of stormflow samples exceeded the acute criterion (13 µg/L).

E. coli bacteria concentrations were detected in all baseflow samples at all stations, ranging in concentration from 6.3 to greater than the maximum reporting limit of 2,420 MPN/100ml. *E. coli* concentrations were equal to or greater than the maximum reportable result in 33.3% of stormflow grab samples, up from 27.8% in the 2017-2018 monitoring period. TPH was not detected above the reporting limit in any of the baseflow or stormflow grab samples collected at the monitoring stations.

Average baseflow concentrations of combined nitrate plus nitrite, chloride, lead, and copper were highest at Station WC004 compared to the other two stations downstream. Samples collected at Station WC003 had the highest average concentrations of total phosphorus, TSS, and zinc during baseflow conditions. Station WC002 samples had the highest average concentrations of TKN, BOD, and ammonia at baseflow. Average stormflow EMCs were highest at Station WC004 for zinc. Average EMCs for BOD, ammonia, nitrate plus nitrite, total phosphorus, TSS, chloride, copper, lead, and *E. coli* were highest at Station WC002. At Station WC003, only orthophosphate and TKN were highest of the three stations.



Average stormflow loads were highest at Station WC002 and lowest at Station WC004 for all parameters. Since discharge volume for a given storm increases with distance downstream, maximum load results at Station WC002 are expected.

Comparisons of pre-restoration and post-restoration pollutant load and concentration data were performed to determine the overall benefit to watershed conditions as a result of the implementation the restoration projects. Restoration activity initiated in late summer 2012 and concluded in spring 2017, allowing a post-restoration body of data to be accumulated. Subwatershed-level and total watershed benefits were evaluated by leveraging the placement of monitoring stations in relation to the restoration projects and completion timelines. A summary of the restoration effectiveness is included in the final report. The results are defined through time series plots of annual average EMCs and MCs, comparison of ratios of average concentrations and loads at Stations WC003 and WC002, determined first under pre-restoration conditions and then under post-restoration conditions, time-series statistical test performed on baseflow concentration and individual storm EMC data, and comparing ratios of concentration data.

Wheel Creek - Continuous Flow Monitoring

In 2012, DNR installed stream level loggers at stations WC002, WC003, and WC004 and up until June 30, 2016, operated and maintained them as well. Due to budget constraints and changes in DNR's monitoring focus, DNR discontinued these efforts, and Versar assumed the responsibility of the operation and maintenance of those loggers. DNR methodologies have been applied and modified as needed. Flow rates were estimated for each station from five-minute level data and using a power-function rating curve. The rating curves were derived using a combination of physically measured flow rates at the station and hydraulic computations. This flow rate data, along with flow meter data collected during individual storm events and USGS data was used to calculate event mean concentrations (EMC) and pollutant loading calculations.

US Geological Survey

Harford County continued to partner with the U.S. Geological Survey for Water Year 2019 to operate and maintain a precipitation gage and a continuous-record streamflow-gaging station. The flow gage is located on Wheel Creek approximately 250 feet upstream of the confluence with Winters Run at Atkisson Reservoir, and the precipitation gage located in Atkisson Reservoir, 0.7 miles upstream of Atkisson Dam.

The gaging station collects stage data by use of a non-submersible pressure transducer system and is interfaced with a Data Collection Platform (DCP) to transmit the data in near real-time to the USGS Maryland-Delaware-DC Water Science Center public webpage. The following items/products were produced by USGS from the operation of streamflow-gaging station:

- (1) A continuous 5-minute recording interval record of gage heights made available to the public in near real-time,
- (2) A stage-discharge relation developed using conventional discharge measurements and corresponding gage heights,
- (3) A record of datum corrections and rating shifts,
- (4) A record of computed unit-value discharge data with mean daily flows and yearly flow statistics,
- (5) Documentation of data analysis, data-quality checks, final data review, and
- (6) Publication of computed daily discharge values in the USGS Annual Water-Data Report. Precipitation gage data is collecting using a tipping bucket rain gage. Data collected at the Wheel Creek gages are available in 'real-time' at <http://waterdata.usgs.gov/md/nwis/rt>.

b. Biological Monitoring:

- i. Benthic macroinvertebrate samples shall be gathered each spring between the outfall and in-stream monitoring locations or other practical locations based on an approved study design; and
- ii. The County shall use the EPA Rapid Bioassessment Protocols (RBP), Maryland Biological Stream Survey (MBSS), or other similar method approved by MDE.

Wheel Creek Biological Monitoring Sites

In 2009, Harford County MS4 Office and Maryland Biological Stream Survey (MBSS) staff selected eight biological monitoring stations in support of the Wheel Creek restoration project and the Chesapeake and Atlantic Coastal Bays Trust Fund. Seven stations are located in Wheel

Creek and one is located in an adjacent reference watershed. The monitoring stations were selected based on the location of stream restoration and stormwater retrofit projects proposed throughout the watershed. In 2015, due to staffing and budget constraints and an analysis of the existing data, the number of monitoring stations was decreased to four. With the current monitoring design, the goal is to assess the benefits of individual projects on biological communities and assess the efficacy of individual restoration techniques. This could potentially provide valuable data to guide the selection of restoration techniques in the future.

Each site was sampled during the spring and summer sampling periods. During the spring, temperature loggers were deployed at each location then sites were sampled for water chemistry, physical habitat, and presence of vernal pools, herpetofauna, and benthic macroinvertebrates. These same sites were also sampled in the summer for fish, crayfish, freshwater mussels, reptiles, amphibians, invasive riparian vegetation, and instream habitat. Sampling was conducted following the *Maryland Biological Stream Survey Sampling Manual: Field Protocols* (Stranko, et. al, 2010).

Wheel Creek Biological Monitoring Results

Biological results indicate that the streams within the Wheel Creek Watershed are typical of those in urbanized areas of Maryland's Piedmont. At several sites, benthic macroinvertebrate and fish communities, the best indicators of overall stream health, are degraded by multiple stressors resulting from land disturbance, channel alternation and the hydrologic and thermal stressors associated with upstream impervious surfaces. The presence of some sensitive organisms such as mayflies, stoneflies, fallfish, and northern red salamanders suggests that water quality and habitat at some sites is less degraded than at others. During some sampling years, the benthic and fish Indices of Biotic Integrity at some sites indicate better conditions than at others.

A summary of the biological data collected from 2009 – 2018 is included in Appendix F1.



c. Physical Monitoring:

- i. A geomorphologic stream assessment shall be conducted between the outfall and in-stream monitoring locations or in a reasonable area based on the approved study design. This assessment shall include an annual comparison of permanently monumented stream channel cross-sections and the stream profile;

Wheel Creek Geomorphologic Monitoring Sites

In 2010, four assessment reaches were established to assess the geomorphic stability of the stream channels in the Wheel Creek watershed as they respond to restoration activities. Assessment techniques include a survey of permanently-monumented channel cross-sections, a longitudinal profile survey, particle size analysis, substrate facies mapping (Pre-Restoration, Year 1 only), and an assessment of bank pins and scour chains (Pre-Restoration, Years 1 through 4). The monitoring locations were based on the following criteria:

Station WC01

Within a proposed stream stabilization reach

Station WC02

Downstream of a stream stabilization reach and BMP retrofit location

Station WC03

Downstream of a BMP retrofit location only

Station WC04

Control site with no proposed restoration activities

The geomorphic monitoring was not conducted when there was active construction occurring on Lower Wheel Creek at Station WC01. Once the construction was completed in March 2017, the geomorphic monitoring resumed. Versar re-established Stations WC01 and WC02 because the benchmark monuments were damaged at both stations during construction. A longitudinal profile of each reach was re-surveyed using a laser level, calibrated stadia rod, and 300-foot

measuring tape following the procedure outlined in Harrelson et al. (1994). The profiles were established along the centerline of each bankfull channel and included a survey of breakpoints in and between bed features and delineation of riffle, run, pool, and glide features. A survey of the bankfull elevation where discernible, the top of bank, and the water surface was also performed.

Cross-sectional and longitudinal profile surveys were conducted to establish baseline conditions of channel geometry and slope, to which subsequent data can be compared in determining whether lateral or vertical migration of the channel is occurring.

Modified Wolman pebble counts were completed to assess substrate particle size distribution and track changes in channel roughness. A total of 3 pebble counts were conducted within each monitoring reach, feature-specific pebble counts were conducted at each cross-section location within the cross-sectional bed feature, and a weighted pebble count was conducted throughout the entire reach based on the proportion of bed features (e.g., riffle, run, pool, and glide) present within the survey reach.

2019 marked the third year of post-restoration monitoring. Subsequent surveys hopefully will enable comparisons to quantitatively evaluate changes in geomorphological conditions as a result of restoration efforts throughout the watershed. By comparing post-restoration conditions to the pre-restoration data, any benefits to the stream ecosystem resulting from restoration projects can potentially be quantified. With the current monitoring design, there may have the ability to assess the benefits of individual projects and assess the efficacy of individual restoration techniques. This could provide valuable data to help guide the selection of restoration techniques in the future.

Wheel Creek Geomorphologic Monitoring results are included in Appendix F1.

- ii. A stream habitat assessment shall be conducted using techniques defined by the EPA's RBP, MBSS, or other similar method approved by MDE; and



Wheel Creek Habitat Monitoring Sites

The physical habitat assessment was conducted at each biological monitoring site in Wheel Creek and the Reference Watershed during the 2018 summer index sampling period utilizing MBSS protocols and Stream Habitat Assessment Data Sheets. Metric selection and data analysis followed the guidance document *A Physical Habitat Index for Freshwater Wadeable Streams in Maryland, Final Report, (Paul, et al. 2002)*. Eight metrics were used to calculate the Physical Habitat Index (PHI) for the Piedmont ecoregion. These metrics include percent embeddedness, remoteness, percent shading, epifaunal substrate, instream habitat, instream woody debris and root wads, bank stability and riffle run quality.

Wheel Creek Habitat Monitoring Results

Most physical habitat parameters at the sampling sites in Wheel Creek and the Reference Watershed were in the Poor, Marginal or Suboptimal categories. Instream Habitat, a measure of fish habitat quality, was rarely rated Good among all years sampled. Instream Habitat was generally rated higher at the Reference site. Epifaunal Substrate, a measure of benthic macroinvertebrate habitat suitability, was most often rated Poor, Marginal or Sub-optimal, suggesting that habitat for these organisms was generally lacking.

Appendix F1 contains a data summary presenting the 2009 -2018 physical habitat monitoring results.

- iii. A hydrologic and/or hydraulic model shall be used (e.g., TR-20, HEC-2, HEC-RAS, HSPF, SWMM, etc.) in the fourth year of the permit to analyze the effects of rainfall; discharge rates; stage; and, if necessary, continuous flow on channel geometry.

- d. Annual Data Submittal: The County shall describe in detail its monitoring activities for the previous year and include the following:
 - i. EMCs submitted on MDE’s long-term monitoring database as specified in PART V below;
 - ii. Chemical, biological, and physical monitoring results and a combined analysis for the approved monitoring locations; and
 - iii. Any requests and accompanying justifications for proposed modifications to the monitoring program.

The County continued to contract with Versar to complete an analysis of the water quality, precipitation and stream discharge data collected in Wheel Creek during this reporting period. The report for Year 9 of this project is included in Appendix F1. The report outlines the study design, baseflow, stormflow, synoptic and sediment transport monitoring methods, rainfall and flow rate logging methods, calculations used to determine EMC, pollutant loading rates, long term trend analysis, followed by a discussion of the data results and a comparison of pre and post restoration conditions.

MBSS conducted a biological and physical habitat assessment in the Wheel Creek watershed during the spring and summer seasons. Benthic macroinvertebrates and water quality were collected in the spring, and fish, herpetofauna and an evaluation of the physical habitat covered in the summer. Those index periods were selected to sample benthic communities at the time of year when community structure provide useful information about environmental stresses and to sample fish communities during low flow conditions and when spawning migrations are not in progress. Appendix F1 contains a summary report describing the 2009 -2018 biological and physical habitat monitoring results.



2. Stormwater Management Assessment

The County shall continue monitoring the Church Creek watershed or select and submit for MDE's approval a new watershed restoration project for determining the effectiveness of stormwater management practices for stream channel protection. Physical stream monitoring protocols shall include:

- a. An annual stream profile and survey of permanently monumented cross sections in Church Creek to evaluate channel stability;
- b. A comparison of the annual stream profile and survey of the permanently monumented cross-sections with baseline conditions for assessing areas of aggradation and degradation; and
- c. A hydrologic and/or hydraulic model shall be used (e.g., TR-20, HEC-2, HEC-RAS, HSPF, SWMM, etc.) in the fourth year of the permit to analyze the effects of rainfall; discharge rates; stage; and, if necessary, continuous flow on channel geometry.

Church Creek Monitoring Site

In 2003, MS4 staff and MDE selected the Church Creek watershed to provide monitoring for MDE's use to determine the effectiveness of their stormwater management program. Harford County does not utilize this monitoring for its MS4 program.

The 181-acre watershed includes commercial and residential development. Approximately 40% of the watershed was developed prior to the implementation of the Design Manual. The Wexford residential development, which comprises approximately 20% of the watershed, was developed using the 2000 Stormwater Design Manual standards. The Wexford development is served by two extended detention facilities with micropools, one rain garden and two grassed swales. The stream reach begins just south of MD Route 7 and extends 2400 linear feet and is surveyed annually. A longitudinal profile was established along the thalweg of the channel and included a survey of breakpoints in and between bed features and delineation of riffles, runs, pools, and glides. A survey of the bankfull elevation, where discernible, top of bank, and water

surface was also performed. Cross-sectional surveys were completed in October 2018 at four monumented sites and captured features of the floodplain, and pertinent channel features including the top of bank, bankfull elevation, edge of water, limits of point bars and instream depositional features, thalweg and floodprone elevation.

A Hydrologic and hydraulic model (e.g., TR-20 and HEC-RAS) was prepared for the fourth year of the permit to evaluate discharge, stage, erosion potential and channel geometry and stability in the Wexford Study area. An H&H model was previously developed by KCI in 2006. The 2006 model was reviewed and used as a basis for the current model with updates to land use, stream geometry and other model inputs as needed. The H&H model results were submitted with the FY2018 Annual Report.

Church Creek Monitoring Results

The fourteenth year of monitoring results indicates that the Wexford site continues to degrade over time. The upstream half of the reach, station 0+00 to 12+00, is relatively stable with a moderate increase in bar formation and the bed material is comprised of larger cobble substrate. Cross-section 1, located at station 3+00, was previously the most stable, but this year large amounts of bed deposition and incision have occurred while the banks have remained stable. As the survey continues downstream, a change to smaller gravel and sand substrate is noticeable along with an increase in bar formation and transverse riffles. Pools in this part of the reach continue to both deepen and fill in, in addition to movement of riffle crests. Cross-section 3 was also actively changing between 2017 and 2018 monitoring years with the thalweg migrating from the right side of the channel to the left. Cross section 4 in the past has been the most unstable but remained stable this year in comparison to the 2017 survey. Overall, cross section 4 is the most actively eroding over time, having increased in cross sectional area significantly in the 14 years of monitoring.

It is important to note that the changes in channel cross-section dimension that occurred between the 2017 and 2018 surveys may be due to two factors. First, 2018 was a very wet year with rainfall amounts well above normal. Average annual rainfall in the Baltimore area is near 42 inches. Rainfall data through the end of September, just prior to the October 2018 field survey at Wexford was 53.5 inches. A higher frequency of storm events and total discharge can have an impact on channel geometry. In addition to the total rainfall, a major flood event occurred on August 31, 2018 that likely resulted in much of the channel erosion and bed down-cutting and shifting observed in the cross-section results in October 2018. The 2018 Wexford Annual Physical Assessment Report is included in Appendix F2.

G. Program Funding

1. Annually, a fiscal analysis of the capital, operation, and maintenance expenditures necessary to comply with all conditions of this permit shall be submitted as required in PART V below.

During this reporting period, the MS4 Office issued purchase orders totaling \$2.4 M. The following is a summary of expenditures for this reporting period:

FY2018 Expenditures - \$5.2 M

Capital - \$2,396,374

Maintenance - \$12,297

The maintenance and capital expenditures represent purchase orders issued during this reporting period (Appendix G). An additional \$1.3 M was spent in operating expenses.

2. Adequate program funding to comply with all conditions of this permit shall be maintained. Lack of funding does not constitute a justification for noncompliance with the terms of this permit.

In May 2019, the County Council approved the fiscal year 2020 budget. The full budget document is available at the following link

<http://www.harfordcountymd.gov/ArchiveCenter/ViewFile/Item/1571>

FY2020 Projected Revenue - \$748 M

Property Taxes - \$317 M

Income Taxes - \$234 M

Other Revenue \$197 M

The County Council approved the following capital budget for the Watershed Protection and Restoration Program. Less proposed grants, 90% of the budget is dedicated to the implementation of this permit:

FY2020 Watershed Protection and Restoration Approved Capital Budget - \$10.95 M

Paygo - \$0.45 M
Future Bonds - \$6.15 M
Proposed Grants - \$4.0 M
Other - \$0.35

Fifteen full time positions were approved for FY2020 for the implementation of this program under the 301603 account (Appendix G) and a portion of the 303220 account:

Staff Funded under the Watershed Protection and Restoration Program - \$1.6 M

MS4 Office – 4
Erosion and Sediment Control / Stormwater Plans Review – 4
Erosion and Sediment Control / Stormwater Construction Inspections - 5
Stormwater Maintenance Inspections – 1

Additional funding was approved FY2020 to continue contracting for supplemental staff for the following:

Supplemental Staff under the Watershed Protection and Restoration Program - \$0.25 M

MS4 Office – 0.4
Erosion and Sediment Control / Stormwater Construction Inspections – 1
Stormwater Maintenance Inspections – 1

As discussed above under Permit Administration, staff from various other departments and division within the County assists the MS4 Office with the implementation of this permit (Appendix A).



PART V. PROGRAM REVIEW AND ANNUAL PROGRESS REPORTING

A. Annual Reporting

1. Annual progress reports, required under 40 CFR 122.42(c), will facilitate the long-term assessment of Harford County's NPDES stormwater program. The County shall submit annual reports on or before the anniversary date of this permit and post these reports on the County's website. All information, data, and analyses shall be based on the fiscal year and include:
 - a. The status of implementing the components of the stormwater management program that are established as permit conditions including:
 - i. Source Identification;
 - ii. Stormwater Management;
 - iii. Erosion and Sediment Control;
 - iv. Illicit Discharge Detection and Elimination;
 - v. Litter and Floatables;
 - vi. Property Management and Maintenance;
 - vii. Public Education;
 - viii. Watershed Assessment;
 - ix. Restoration Plans;
 - x. TMDL Compliance;
 - xi. Assessment of Controls; and
 - xii. Program Funding.
 - b. A narrative summary describing the results and analyses of data, including monitoring data that is accumulated throughout the reporting year;

- c. Expenditures for the reporting period and the proposed budget for the upcoming year;
 - d. A summary describing the number and nature of enforcement actions, inspections, and public education programs;
 - e. The identification of water quality improvements and documentation of attainment and/or progress toward attainment of benchmarks and applicable WLAs developed under EPA approved TMDLs; and
 - f. The identification of any proposed changes to the County’s program when WLAs are not being met.
2. To enable MDE to evaluate the effectiveness of permit requirements, the following information shall be submitted in a format consistent with Attachment A:
- a. Storm drain system mapping (PART IV.C.1);
 - b. Urban BMP locations (PART IV.C.3);
 - c. Impervious surfaces (PART IV.C.4);
 - d. Water quality improvement project locations (PART IV.C.6);
 - e. Monitoring site locations (PART IV.C.5);
 - f. Chemical monitoring results (PART IV.F.1);
 - g. Pollutant load reductions (PART IV.E.4 and IV.F.1);
 - h. Biological and habitat monitoring (PART IV. F.1);
 - i. Illicit discharge detection and elimination activities (PART IV.D.3);
 - j. Erosion and sediment control and stormwater program information (PART IV.D.1 and IV.D.2);
 - k. Grading permit information - quarterly (PART IV. D.2); and



I. Fiscal analyses - cost for NPDES related implementation (PART IV. G).

3. Because this permit uses an iterative approach to implementation, the County must evaluate the effectiveness of its programs in each annual report. BMP and program modifications shall be made within 12 months if the County's annual report does not demonstrate compliance with this permit and show progress toward meeting WLAs developed under EPA approved TMDLs.

B. Program Review

In order to assess the effectiveness of the County's NPDES program for eliminating non-stormwater discharges through the illicit connection program and reducing the discharge of pollutants to protect water quality, MDE will review program implementation, annual reports, and periodic data submittal. Procedures for the review of local erosion and sediment control and stormwater management programs exist in Maryland's sediment control and stormwater management laws. Additional evaluations may be conducted at MDE's discretion to determine compliance with permit conditions.

C. Reapplication for NPDES Stormwater Discharge Permit

This permit is effective for no more than five years, unless administratively continued by MDE. Continuation or reissuance of this permit beyond this permit term will require the County to reapply for NPDES stormwater discharge permit coverage in its fourth year annual report. Failure to reapply for coverage constitutes a violation of this permit.

As part of this application process, Harford County shall submit to MDE an executive summary of its NPDES stormwater management program that specifically describes how the County is meeting the overall goal to ensure that each County watershed has been thoroughly evaluated and its progress in implementing water quality improvements. This application shall be used to gauge the effectiveness of the County's NPDES stormwater program and will provide guidance for developing future permit conditions. At a minimum, the application summary shall include:



1. Harford County's NPDES stormwater program goals;
2. Program summaries for the permit term regarding:
 - a. Illicit discharge detection and elimination results;
 - b. Restoration plan status including County totals for impervious acres, impervious acres controlled by stormwater management, the current status of water quality improvement projects and acres managed, and documentation of progress toward meeting stormwater WLAs developed under EPA approved TMDLs;
 - c. Pollutant load reductions as a result of this permit and an evaluation of whether TMDLs are being achieved;
 - d. Impervious acres compared to the baseline and twenty percent restoration requirement in PART IV.E.2.a.; and
 - e. Other relevant data and information for describing County programs;
3. Program operation and capital improvement costs for the permit term; and
4. Descriptions of any proposed permit condition changes based on analyses of the successes and failures of the County's efforts to comply with the conditions of this permit.



PART VI. SPECIAL PROGRAMMATIC CONDITIONS

A. Chesapeake Bay Restoration by 2025

A Chesapeake Bay TMDL has been developed by the EPA for the six Bay States (Delaware, Maryland, New York, Pennsylvania, Virginia, and West Virginia) and the District of Columbia. The TMDL describes the level of effort that will be necessary for meeting water quality criteria and restoring Chesapeake Bay. This permit is requiring compliance with the Chesapeake Bay TMDL through the use of a strategy that calls for the restoration of twenty percent of previously developed impervious land with little or no controls within this five year permit term as described in Maryland's Watershed Implementation Plan. The TMDL is an aggregate of nonpoint sources or the load allocation (LA), and point sources or WLA, and a margin of safety. The State is required to issue NPDES permits to point source discharges that are consistent with the assumptions of any applicable TMDL, including those approved subsequent to permit issuance.

Urban stormwater is defined in the CWA as a point source discharge and will subsequently be a part of Maryland's WLA. The NPDES stormwater permits can play a significant role in regulating pollutants from Maryland's urban sector and in the development of Chesapeake Bay Watershed Implementation Plans. Therefore, Maryland's NPDES stormwater permits issued to Harford County and other municipalities will require coordination with MDE's Watershed Implementation Plan and be used as the regulatory backbone for controlling urban pollutants toward meeting the Chesapeake Bay TMDL by 2025.

B. Comprehensive Planning

Harford County shall cooperate with other agencies during the completion of the Water Resources Element (WRE) as required by the Maryland Economic Growth, Resource Protection and Planning Act of 1992 (Article 66B, Annotated Code of Maryland). Such cooperation shall entail all reasonable actions authorized by law and shall not be restricted by the responsibilities attributed to other entities by separate State statute, including but not limited to reviewing and approving plans and appropriating funds.



PART VII. ENFORCEMENT AND PENALTIES

A. Discharge Prohibitions and Receiving Water Limitations

Harford County shall prohibit non-stormwater discharges through its MS4. NPDES permitted non-stormwater discharges are exempt from this prohibition. Discharges from the following will not be considered a source of pollutants when properly managed: water line flushing; landscape irrigation; diverted stream flows; rising ground waters; uncontaminated ground water infiltration to separate storm sewers; uncontaminated pumped ground water; discharges from potable water sources; foundation drains; air conditioning condensation; irrigation waters; springs; footing drains; lawn watering; individual residential car washing; flows from riparian habitats and wetlands; de-chlorinated swimming pool discharges (not including filter backwash); street wash water; and firefighting activities.

Consistent with §402(p)(3)(B)(iii) of the CWA, the County shall take all reasonable steps to minimize or prevent the contamination or other alteration of the physical, chemical, or biological properties of any waters of the State, including a change in temperature, taste, color, turbidity, or odor of the waters or the discharge or deposit of any organic matter, harmful organism, or liquid, gaseous, solid, radioactive, or other substance into any waters of the State, that will render the waters harmful to:

1. Public health, safety, or welfare;
2. Domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial use;
3. Livestock, wild animals, or birds; and
4. Fish or other aquatic life.

B. Duty to Mitigate

Harford County shall take all reasonable steps to minimize or prevent any discharge in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.



C. Duty to Comply

Harford County shall be responsible for complying with all conditions of this permit. Other entities may be used to meet various permit obligations provided that both the County and the other entity agree contractually. Regardless of any arrangement entered into however, the County remains responsible for permit compliance. In no case may this responsibility or permit compliance liability be transferred to another entity.

Failure to comply with a permit provision constitutes a violation of the CWA and is grounds for enforcement action; permit termination, revocation, or modification; or denial of a permit renewal application. The County shall comply at all times with the provisions of the Environment Article, Title 4, Subtitles 1, 2, and 4; Title 7, Subtitle 2; and Title 9, Subtitle 3 of the Annotated Code of Maryland.

The County shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the County to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by the County only when the operation is necessary to achieve compliance with the conditions of the permit.

D. Sanctions

1. Penalties Under the CWA - Civil and Criminal

Section 309(d) of the CWA, 33 USC §1319(d) provides that any person who violates any permit condition is subject to a civil penalty not to exceed \$25,000 per day for each violation. Pursuant to the Civil Monetary Penalty Inflation Adjustment Rule, 40 CFR Part 19, any person who violates any NPDES permit condition or limitation after December 6, 2013, is liable for an administrative penalty not to exceed \$37,500 per day for each such violation. Section 309(g)(2) of the CWA, 33 USC §1319(g)(2) provides that any person who violates any permit condition is subject to an administrative penalty not to exceed \$10,000 per day for each violation, not to exceed \$125,000.

Pursuant to the Civil Monetary Penalty Inflation Adjustment Rule, 40 CFR Part 19, any person who violates any NPDES permit condition or limitation after December 6, 2013, is liable for an administrative penalty not to exceed \$16,000 per day for each such violation, up to a total penalty of \$187,500. Pursuant to Section 309(c) of the CWA, 33 USC §1319(c), any person who negligently violates any permit condition is subject to criminal penalties of \$2,500 to \$25,000 per day of violation, or imprisonment of not more than one year, or both. If a person has been convicted of negligent violations of the CWA previously, the criminal penalties may be increased to \$50,000 per day of violation, or imprisonment of not more than two years, or both. Any person who knowingly violates any permit condition is subject to criminal penalties of \$5,000 to \$50,000 per day of violation, or imprisonment for not more than three years, or both. If a person has been convicted of knowing violations of the CWA previously, the criminal penalties may be increased to \$100,000 per day of violation, or imprisonment of not more than six years, or both.

2. Penalties Under the State's Environment Article - Civil and Criminal

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the County from civil or criminal responsibilities and/or penalties for a violation of Title 4, Title 7, and Title 9 of the Environment Article, Annotated Code of Maryland, or any federal, local, or other State law or regulation. Section 9-342 of the Environment Article provides that a person who violates any condition of this permit is liable to a civil penalty of up to \$10,000 per violation, to be collected in a civil action brought by MDE, and with each day a violation continues being a separate violation. Section 9-342 further authorizes the MDE to impose upon any person who violates a permit condition, administrative civil penalties of up to \$10,000 per violation, up to \$100,000.

Section 9-343 of the Environment Article provides that any person who violates a permit condition is subject to a criminal penalty not exceeding \$25,000 or imprisonment not exceeding one year, or both for a first offense. For a second offense, Section 9-343 provides for a fine not exceeding \$50,000 and up to two years imprisonment.

The Environment Article, §9-343, Annotated Code of Maryland, provides that any person who tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished

by a fine of not more than \$50,000 per violation, or by imprisonment for not more than two years per violation, or both.

The Environment Article, §9-343, Annotated Code of Maryland, provides that any person who knowingly makes any false statement, representation, or certification in any records or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than \$50,000 per violation, or by imprisonment for not more than two years per violation, or both.

E. Permit Revocation and Modification

1. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the County for a permit modification or a notification of planned changes or anticipated noncompliance does not stay any permit condition. A permit may be modified by MDE upon written request by the County and after notice and opportunity for a public hearing in accordance with and for the reasons set forth in COMAR 26.08.04.10.

After notice and opportunity for a hearing and in accordance with COMAR 26.08.04.10, MDE may modify, suspend, or revoke and reissue this permit in whole or in part during its term for causes including, but not limited to the following:

- a. Violation of any terms or conditions of this permit;
- b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts;
- c. A change in any condition that requires either a temporary reduction or elimination of the authorized discharge;
- d. A determination that the permitted discharge poses a threat to human health or welfare or to the environment and can only be regulated to acceptable levels by permit modification or termination;

- e. To incorporate additional controls that are necessary to ensure that the permit effluent limit requirements are consistent with any applicable TMDL WLA allocated to the discharge of pollutants from the MS4; or
- f. As specified in 40 CFR §§122.62, 122.63, 122.64, and 124.5.

2. Duty to Provide Information

The County shall furnish to MDE, within a reasonable time, any information that MDE may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit; or to determine compliance with this permit. The County shall also furnish to MDE, upon request, copies of records required to be kept by this permit.

F. Inspection and Entry

Harford County shall allow an authorized representative of the State or EPA, upon the presentation of credentials and other documents as may be required by law, to:

- 1. Enter the permittee’s premises where a regulatory activity is located or conducted or where records must be kept under the conditions of this permit;
- 2. Have access to and obtain copies at reasonable times of any records that must be kept under the conditions of this permit.
- 3. Inspect at reasonable times, without prior notice, any construction site, facility, equipment (including monitoring and control equipment), practices or operations regulated or required under this permit: and
- 4. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location.

G. Monitoring and Record Keeping

Unless otherwise specified by this permit, all monitoring and records of monitoring shall be in accordance of 40 CFR Part 122.41(j).



H. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges nor does it authorize any injury to private property or an invasion of personal rights, nor any infringement of federal, State, or local law or regulations.

I. Severability

The provisions of this permit are severable. If any provision of this permit shall be held invalid for any reason, the remaining provisions shall remain in full force and effect. If the application of any provisions of this permit to any circumstance is held invalid, the application to other circumstances shall not be affected.

J. Signature of Authorized Administrator and Jurisdiction

Each application, report or other information required under this permit to be submitted to MDE shall be assigned as required by COMAR 26.08.04.01-1. Signatories shall be principal executive officer, ranking elected official, or other duly authorized employee.

