NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

Municipal Separate Storm Sewer System Discharge Permit

Permit Number MD0068306

2014 ANNUAL REPORT

Anne Arundel County
Department of Public Works
2662 Riva Road
Annapolis, Maryland 21401

February 12, 2015

2014 Annual Report for
Anne Arundel County
Storm Water National Pollutant
Discharge Elimination System

Permit Number MD0068306

Submitted to:

Water Management Administration
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, MD 21230

February 2015

Submitted by:
Anne Arundel County
Department of Public Works
2662 Riva Road
Annapolis, MD 21401

Prepared by:

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(*Provided on the accompanying CD)*

I. PURPOSE AND SCOPE

This Annual Report was assembled to detail the activities in Anne Arundel County for the County and State Fiscal Year beginning July 1, 2013 and ending June 30, 2014. These activities demonstrate compliance with the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit terms provided by 40 CFR 122.42(c). It describes the components of the stormwater management program and the associated implementation status. The County proposes no revision to the program at this time.

This report also summarizes the monitoring programs implemented by Anne Arundel County, including data collection and analysis. Digital data and specific reports for the major programs conducted during the reporting term can be found within the Appendices. Digital data found in Appendix A is submitted in the format consistent with Attachment A to the Permit and Appendix B of the August 2014 document entitled *Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated: Guidance for National Pollutant Discharge Elimination System Stormwater Permits (MDE 2014).*

On February 12, 2014 the County was issued a new, Fourth Generation, NPDES MS4 Permit. Activities described in this report, and occurring prior to February 2014, were performed in compliance with the Permit that expired on November 8, 2009. Activities occurring from February 2014 through June 2014 were performed in compliance with the new Permit. Where appropriate, this differentiation is identified in the Report narrative.

II. IMPLEMENTATION STATUS – STORMWATER MANAGEMENT PROGRAM

Components of Anne Arundel County's stormwater management program were established to address the requirements outlined in the County's NPDES MS4 permit. The major components also address stormwater Waste Load Allocations (WLAs) associated with Total Maximum Daily Loads (TMDLs), and overall water quality improvement within the County's waterways. Program components include:

- Storm Drain Infrastructure and Impervious Area Inventory;
- Erosion and Sediment Control Program;
- Stormwater Management Program;
- Illicit Connection Detection and Elimination;
- Litter and Floatables;
- Management and Maintenance of County-owned Facilities (e.g., roads, parking lots);
- Public Education and Outreach;
- Watershed Assessment;
- Watershed Restoration Plans;
- TMDL Compliance;
- Watershed Restoration Assessment;
- Stormwater Management Assessment; and
- Program Funding.

The County feels the above programs address the major water quality concerns within County watersheds. Monitoring efforts have shown that the implementation of these programs results in the improvement of water quality, which motivates the County to continue its dedication to these programs. Efforts in these program areas during the reporting period are addressed under the appropriate permit conditions in **Part IV** of this report.

III. WATER QUALITY

The NPDES MS4 Permit issued to Anne Arundel County in February 2014 requires implementation of a stormwater management program to effectively prohibit pollutants in stormwater discharges, to attain WLAs as set forth in approved TMDLs, and to comply with all provisions of the permit. Compliance with permit conditions shall constitute compliance with the Clean Water Act (§402(p)(3)(B)(iii)) and adequate progress toward compliance with Maryland's water quality standards and any U.S. Environmental Protection Agency (EPA) approved stormwater WLAs.

Anne Arundel County endeavors to manage, implement, and enforce a stormwater management program in accordance with the Clean Water Act and corresponding NPDES regulations. The activities undertaken in support of permit compliance, and documented herein, show progress toward reducing pollutants in stormwater discharges, prohibiting unauthorized discharges to the County's storm drain system, and attaining stormwater WLAs for established TMDLs.

IV. STANDARD PERMIT CONDITIONS

A. Permit Administration

Anne Arundel County shall designate an individual to act as a liaison with the Maryland Department of the 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 submit in its annual reports 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.

Status:

Coordination of Anne Arundel County's NPDES MS4 Permit was performed by the Department of Public Works (DPW) Watershed Protection and Restoration Program for the 2014 reporting year (1 July 2013 – 30 June 2014). The program coordinators for this reporting year are:

Ms. Ginger Ellis
Environmental Planning Administrator
Watershed Protection and Restoration Program
Anne Arundel County Department of Public Works
2662 Riva Road, MS 7409
Annapolis, MD 21401
410-222-4240
pwelli16@aacounty.org

Ms. Janis Markusic
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Figure 1 shows the organizational chart for the 2014 reporting year. Changes in personnel during the reporting year include personnel in the DPW Director and Deputy Director positions. Additionally, a new position, Watershed Protection and Restoration Program (WPRP) Administrator, was added to the DPW Bureau of Engineering organizational structure.

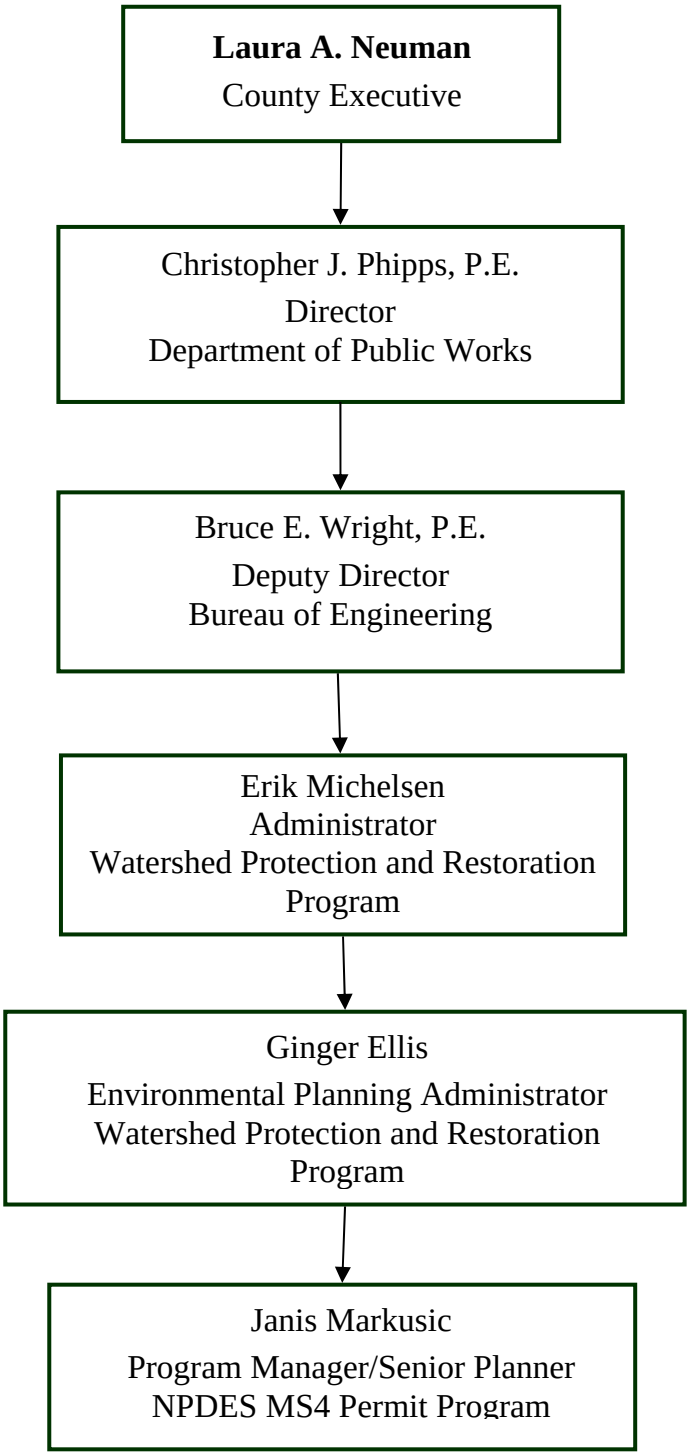

Figure 1. Organization Chart for NPDES Permit Administration (7/2013 through 6/2014)

Additional County staff members responsible for projects related to compliance with the NPDES MS4 Permit are listed below.

Department of Public Works:

- Doug Burkhardt, Engineer Manager
  Bureau of Engineering, Technical Engineering
  Provides managerial support and oversight for geographic information systems (GIS) data collection and geodatabase development activities associated with urban best management practices (BMPs) and storm drain system records.

- Ramzi Bannura, Program Manager
  Bureau of Highways, Infrastructure Management Division
  Programs and maintains GIS databases for the closed storm drain system, associated infrastructure databases, and the County's roads inventory.

- Darryl Hockstra, Engineer Manager
  Bureau of Highways, Infrastructure Management Division
  Administers the Infrastructure Management Division and oversees the capital program associated with stormwater management pond inspection and repair; and emergency storm drain and stormwater system inspection and repair.

- Andy Watcher, Engineer III
  Bureau of Highways, Infrastructure Management Division
  Inspects publicly owned storm drain infrastructure and manages storm drain system and structure repairs.

- Rich Olsen, Program Specialist II
  Bureau of Highways, Infrastructure Management Division
  Inspects and maintains a subset of urban stormwater BMPs that are the responsibility of DPW.

- Alex Baquie, Assistant Chief Road Operations
  Bureau of Highways, Road Operation Division
  Administers the County's Road Operation Division; maintains the Bureau's permit coverage under the MDE General Permit No. 12-SW (General Discharge Permit for Stormwater Associated with Industrial Activity); develops and implements Stormwater Pollution Prevention Plans (SWPPPs) associated with Road Operations district yard facilities; documents the use of pesticides, herbicides, fertilizers, and de-icing materials associated with road maintenance activities; implements the County's street sweeping and inlet cleaning programs; conducts roadside litter clean-up activities; and provides support for volunteer watershed and stream clean-up activities.

- Rick Fisher, Senior Engineer
  Bureau of Engineering, Watershed, Ecosystem & Restoration Services
  Administers the Watershed Assessment Program; manages watershed assessment contracts; manages the technical engineering and water quality models in support of NPDES MS4 Permit activities and the County's Phase II Watershed Implementation Plan (WIP); coordinates data, tracking and reporting of impervious surface reduction and pollutant load credit; manages the County's impervious surface and land cover GIS layers; and documents the locations and descriptions of watershed restoration projects.

- Jeff Cox, Engineer III
  Bureau of Engineering, Watershed, Ecosystem & Restoration Services
  Maintains, updates, and provides quality control of GIS data layers (e.g., impervious surfaces, land cover) that support the engineering and water quality models utilized for supporting NPDES activities.

- Ken Pensyl, Engineer III
  Bureau of Engineering, Watershed, Ecosystem & Restoration Services
  Manages design and construction of watershed restoration projects.

- Dennis McMonigle, Engineer III
  Bureau of Engineering, Watershed, Ecosystem & Restoration Services
  Manages design and construction of watershed restoration projects.

- Ken Weeks, Engineer III
  Bureau of Engineering, Watershed, Ecosystem & Restoration Services
  Manages design and construction of watershed restoration projects.

- Masoud Ghatineh, Senior Engineer
  Bureau of Engineering, General Engineering
  Manages design and construction of watershed restoration projects as required through the County's tidal waters dredging program.

- Chris Victoria, Planner II
  Bureau of Engineering, Watershed, Ecosystem & Restoration Services
  Provides consultant oversight for stormwater monitoring, biological monitoring, and geomorphic assessment of County stream reaches including those identified in **Part F** of this permit. Assists Program Manager with implementation of the Illicit Discharge Detection and Elimination (IDDE) Program.

- Christian Tait
  Bureau of Utility Operations
  Responsible for maintaining the Utilities Operations facilities' permit coverage under the MDE General Permit No. 12-SW (General Discharge Permit for Stormwater Associated with Industrial Activity) and the development/implementation of SWPPPs associated with Water Reclamation Facilities.

- Rhody Holthaus
  Bureau of Waste Management Services
  Responsible for maintaining the Waste Management Services facilities' permit coverage under the MDE General Permit No. 12-SW (General Discharge Permit for Stormwater Associated with Industrial Activity), and for the development and implementation of SWPPPs associated with the County's three landfill facilities.

Office of Planning & Zoning:

- Chris Soldano, Assistant Planning & Zoning Officer
  Development Division
  Oversees components of the County's Stormwater Management Program to ensure consistency with State requirements, including the updating of County stormwater legislation and of the County's Stormwater Practices and Procedures Manual.

- David Braun, Chief Engineer
  Development Division
  Oversees the review of stormwater management on new development and redevelopment projects.

Department of Inspections & Permits:

- John Peacock, Chief of Environmental Enforcement
  Environmental Programs
  Administers the County's Stormwater Management Program and the County's Erosion and Sediment Control Program to ensure compliance with State regulations. Tracks, inspects, and enforces all permits for private and public stormwater management BMPs related to new development and redevelopment projects. Oversees triennial inspection of stormwater BMPs. Tracks development projects disturbing more than one acre and reports this information to MDE as required by the Program and the NPDES MS4 Permit. Oversees staff who respond to County Environmental Compliance Hotline and provides follow-up enforcement for IDDE Program.

- Vernon Murray, Inspector
  Coordinates and conducts the Sediment and Erosion Control "responsible personnel certification" classes on behalf of the County.

Anne Arundel Soil Conservation District:

- Jim Stein, District Manager
  Oversee development plan review for erosion and sediment control compliance.

B. Legal Authority

Anne Arundel County shall maintain adequate legal authority in accordance with NPDES regulations 40 CFR Part 122.26 throughout the term of this permit. In the event that any provision 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.

Status:

Anne Arundel County continues to maintain the authority to comply with the terms of this permit. As documented in prior Annual Reports, this includes implementation of the 2000 Maryland Stormwater Design Manual (MDE 2000) as well as the 2007 Stormwater Management Act. The County Code has been revised to incorporate these stormwater management requirements, and subsequently renumbered, over the past 10 years. As of November 2010, Article 16 of the County Code contains the stormwater management program and erosion and sediment control regulations. Article 17 contains the subdivision and development requirements. Article 18 contains the zoning regulations. A copy of the final approved implementing legislation and other associated documentation was provided in a prior years' Annual Report.

The County Stormwater Management Practices and Procedures Manual was updated and became effective on November 22, 2010. A letter was received from MDE in September 2011 stating that Article 16 and the County Stormwater Management Practices and Procedures Manual have been approved. There were no further revisions to the Manual during the reporting period.

No changes were made to the County Erosion and Sediment Control Code or Stormwater Management Code during the 2014 reporting period. The Department of Inspections and Permits (I&P) and the County Office of Law are currently working on the MDE required revisions to the Floodplain Code and Erosion and Sediment Control Code. Because both Codes are contained in Article 16 of the County Code, one bill will be submitted to the County Council addressing both sets of changes to Article 16.

In 2013 Anne Arundel County established a Watershed Protection and Restoration Program as mandated by §4-202.1 of the Environment Article of the State Code for the purpose of supporting compliance with the requirements of the County's NPDES MS4 permit, the Chesapeake Bay TMDL, local watershed TMDLs, and stormwater WIPs through stormwater management practices and stream and wetland restoration activities. The Program also maintains and administers the Watershed Protection and Restoration Special Revenue Fund established under Article 13. Title 7. §4-11-119 of the Anne Arundel County Code (available in **Appendix I**).

The entire County Code, including Articles 13 and 16, can be found online through the County website at http://www.aacounty.org/CountyCode/index.cfm, under the link for the County Code.

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 tables as required in PART V of this permit.

1. <u>Storm drain system</u>: all infrastructure, major outfalls, inlets, and associated drainage areas delineated;

Status:

In 2008, Anne Arundel County completed a Countywide inventory of storm drain inlets, manholes, outfalls, culverts, and pipes for all County watersheds. In 2014, the County continued to capture updates for incorporation into the County storm drain maps and the County GIS. Furthermore, the County continues to populate the drainage area information for the County outfalls, following the watershed study schedule as presented in **Part IV.E** of this permit. To maintain accuracy of the closed storm drain system mapping, the County has been conducting a re-inspection of the Countywide system on a regular basis. The storm drain inlet and outfall database was prepared in the format required by MDE and is included in **Appendix A.**

The County is able to identify which storm drain structures are outfalls by querying the GIS for structures with no hydraulic connection to any other structure downstream. The County then focuses on these discharge points for delineation of contributing drainage area. As of June 30, 2014, there are a total of 5,526 closed storm drain outfalls in the County. As reported previously, the County has the ability to delineate drainage areas and assess hydrologic conditions at any storm drain outfall within the County. Currently, delineation of drainage areas to all storm outfalls within eight of the twelve County watersheds (Severn, South, Upper Patuxent, Magothy, Patapsco Non-Tidal, Patapsco Tidal, Bodkin Creek, and Little Patuxent) has been completed. This drainage area coverage constitutes 4,263 structures out of the total 5,526 closed storm drain outfalls.

As of June 30, 2014, there are 1,410 major outfalls in the County. According to 40 CFR 122.26, a major municipal separate storm drain outfall is defined as an outfall pipe with an internal diameter of 36 inches or greater or an outfall pipe with an internal diameter of 12 inches or greater that receives storm water from industrially zoned lands. In addition, as of June 2014, there are 34,780 storm drain inlets.

In 2010, the County completed the delineation of drainage areas to all outfalls within the Little Patuxent Watersheds. Mapping showing these outfalls and their drainage areas was submitted with a previous annual report**.** A GIS layer containing outfalls and the drainage areas for the Severn, South, Magothy, Upper Patuxent River, Patapsco Non-Tidal, Patapsco Tidal, and Bodkin Creek Watersheds was provided in the 2007, 2008, and 2009 reports. The GIS layer will be reviewed and updated on an annual basis, and as a result of re-inspections, to reflect future development and retrofits. During the last permit year, the County identified 14 new major outfalls. The drainage areas for these new outfalls have been delineated and added to the inventory of major outfall drainage areas submitted in **Appendix A**. The County's plan for the next reporting year (FY2015) is to provide outfall drainage areas for both the West and Rhode River watersheds in addition to new outfalls added to the County's inventory.

The County will continue to develop drainage areas for outfalls as the watershed assessments are completed.

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

Status:

The NPDES MS4 Permit requires that sources of pollutants in stormwater runoff be identified and linked to specific water quality impacts on a watershed basis. Compliance with this permit requirement includes the annual submittal, in GIS format with associated tables, of the "…industrial and commercial land uses and sites that the County has determined have the potential to contribute significant pollutants." A methodology for determining these land uses is described below. The data and GIS coverage are found in **Appendix A**.

Attachment 2 to the Basis for Final Determination to Issue Anne Arundel County's NPDES MS4 Permit (11-DP-3316; MD0068306) is a memorandum from the U.S.EPA to MDE dated November 29, 2012. This memorandum lists specific objections to draft language proposed for the 4th generation NPDES MS4 Permits. Specific to the development of the above methodology, is a paragraph on Page 4 of this memorandum that addresses Industrial/Commercial Monitoring as a component of the MS4 permit. In this paragraph, EPA objects to the permit on the basis that it does not require the permittee to maintain an inventory of industrial and commercial sites having the potential to contribute pollutants to the storm drain system. EPA proposes the language (above) included in the permit as part of the Source Identification Section (**Part IV.C.2**), further indicating that these identified sites correlate to the required visual surveys of commercial and industrial areas that are conducted under the Illicit Discharge Detection and Elimination (IDDE) program as described in the NPDES MS4 Permit (**Part IV.D.3**)

Page 6 of the Anne Arundel County NPDES MS4 Permit Fact Sheet, developed by MDE as a companion document to the Permit, describes requirements for an effective IDDE program. Included in this program description, is the requirement that the County routinely survey commercial and industrial areas, and monitor major storm drain outfalls to identify illicit discharges. Major storm drain outfalls are defined by the Clean Water Act (40 CFR 122.26) as:

> A municipal separate storm sewer outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (discharge from a single conveyance other than circular pipe which is associated with a drainage area of more than 50 acres); or for municipal separate storm sewers that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or the equivalent), an outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (discharge from other than a circular pipe associated with a drainage area of two acres or more).

To meet the **Part IV.C.2** requirement of identifying commercial and industrial land uses and sites that have the potential to contribute pollutants to the storm drain system, and to correlate this requirement with that found in **Part IV.D.3.b**, the County has developed a GIS coverage and geodatabase predicated on intersecting the following GIS layers and data:

- Industrial and commercial polygons from Anne Arundel County 2011 Land Cover
- County closed storm drain system inlets, pipes, and outfalls

Specifically, inlets in designated Industrial and Commercial land cover polygons were identified and the closed storm drain pipes intersecting these inlets were selected. Closed storm drain pipes connecting to the already selected pipes were also selected to provide the closed storm drain system network connected to the chosen inlets. Once this network was identified, the outfalls intersecting the closed storm drain pipes were selected. All outfalls not meeting the definition of a "major outfall" were removed from the selected set of outfalls. This resulted in 896 outfalls that would drain Commercial and Industrial lands in the County.

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

Status:

Anne Arundel County I&P maintains the Urban BMP Database, which contains information related to all stormwater management BMPs subject to inspection by the County.

The Urban BMP Database provided in **Appendix A** reflects the on-going effort to improve the quality of Anne Arundel County's BMP data. In the next permit year, the County is expected to make further progress on improving the Database quality, including making progress towards database clean-up. The total number of BMP records has increased by 273 to 10,453 in 2014. The 10,453 BMPs are BMPs that we can confirm as having either an approval date or completion date. The County updated the structure type of all existing BMPs to comply with the latest MDE guidance on urban BMP data reporting (MDE 2014).

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;

Status:

During the 2014 reporting year, the County continued efforts to maintain an accurate impervious surface dataset.

- In the spring of 2014 the County initiated a contract with Axis Geospatial to update its impervious surface and land cover datasets utilizing imagery captured for the state of Maryland's High Resolution Aerial Ortho-photography captured during the spring of 2014. It is anticipated that Axis will begin the update process in early 2015 and complete the task by summer 2015. The next annual report, FY2015 will use impervious surface calculations based on the 2014 impervious surface dataset.

Impervious Cover

The impervious surface layer is crucial to the County's Watershed Management Tool (WMT). The WMT consists of many watershed analysis models for characterizing the existing conditions of the watershed. The WMT also provides predictive modeling for future conditions, restoration approaches, and preservation scenarios. These models are fully integrated with GIS and currently use the 2011 impervious layer for many different watershed and planning analyses, including hydrologic analysis, Rosgen Level 1 stream classification, pollutant loading estimates, and stream sediment loading estimates.

In 2014 the County initiated a task to update its 2011 impervious surface dataset utilizing imagery captured in the spring of 2014 as part of the statewide aerial orthophotography capture. Currently imagery is being processed and delivery of the imagery is anticipated in early 2015. Once the imagery has been delivered, the County is under contract with Axis Geospatial to update the 2011 impervious surface dataset using the 2014 imagery.

Non-Jurisdictional Land within the County

For NPDES reporting, the County is responsible for accounting for all impervious and BMP information pertaining to County-owned land and private lands directly

under the jurisdiction of the Anne Arundel County government. The City of Annapolis, the Baltimore-Washington International Thurgood Marshall Airport (BWI), Fort George G. Meade (FGGM), the Patuxent Research Refuge, State Highway and Federal Highway roads, State and Federal facilities are examples of land areas that are outside the stormwater authority of Anne Arundel County. Using the County's parcel layer along with the Consolidated Property File (CPF), a GIS layer of parcels not considered the responsibility of Anne Arundel County was developed. Data analyses indicate that approximately seven percent of the land within the County boundary is owned by the State Government, eight percent is owned by the Federal Government, 12 percent is owned by the County local government, and 72 percent is privately owned, including land within the jurisdiction of the City of Annapolis. Digging deeper into this information reveals that approximately 21 percent of the impervious acres within the entire County's impervious area are outside the jurisdictional authority of the County with respect to stormwater management. A breakdown of impervious surfaces within Anne Arundel County is listed in Table 1.

Table 1. Land Cover and Impervious Distribution by Land Ownership/Jurisdiction

Anne Arundel County Land Cover Categories	City of Annapolis	State	Federal	County	Private	City of Annapolis	State	Federal	County	Private	City of Annapolis	State	Federal	County	Private
	Land Acres					Impervious Acres					Percent Impervious				
Airport	0	1,032	0	68	105	0	844	0	48	74	0%	82%	22%	71%	70%
Commercial	978	691	1,609	1,877	7,403	636	331	810	1,233	4,946	65%	48%	50%	66%	67%
Industrial	21	512	365	424	3,919	13	285	166	192	2,420	61%	56%	46%	45%	62%
Transportation	189	3,775	928	3,057	1,688	145	2,794	528	1,982	484	77%	74%	57%	65%	29%
Pasture/Hay	0	147	565	231	5,070	0	1	4	5	18	0%	1%	1%	2%	0%
Row Crops	0	135	565	395	10,977	0	2	0	8	39	0%	1%	0%	2%	0%
Residential 1/2-acre	110	60	46	1,225	9,422	28	14	11	644	1,708	26%	24%	24%	53%	18%
Residential 1/4-acre	1,786	99	129	2,783	14,694	640	14	33	1,614	3,384	36%	14%	25%	58%	23%
Residential 1/8-acre	568	132	678	3,309	15,395	242	33	211	1,830	4,664	43%	25%	31%	55%	30%
Residential 1-acre	46	108	21	909	10,513	9	13	1	376	1,483	19%	12%	7%	41%	14%
Residential 2-acre	35	224	58	1,207	22,187	9	24	5	402	2,510	26%	11%	8%	33%	11%
Open Space	254	2,949	2,925	3,741	11,235	15	154	94	172	216	6%	5%	3%	5%	2%
Water	13	241	224	375	1,510	1	0	1	1	8	4%	0%	0%	0%	1%
Open Wetland	1	280	107	397	794	0	0	0	0	1	0%	0%	0%	0%	0%
Forested Wetland	0	64	93	53	75	0	0	0	0	0	0%	0%	0%	0%	0%
Woods	523	9,028	12,922	12,762	70,303	7	80	36	197	278	1%	1%	0%	2%	0%
Utility	0	39	216	75	1,600	0	2	1	6	30	0%	4%	0%	7%	2%
SubTotal	4,523	19,516	21,452	32,888	186,889	1,745	4,591	1,901	8,709	22,263	39%	24%	9%	26%	12%
Total	**265,268**					**39,209**					**15%**				

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

Status:

<u>a. Parole Plaza, Church Creek, and Picture Spring Branch</u>

The County maintains three monitoring sites, Parole Plaza, Church Creek, and Picture Spring Branch, where the required chemical, physical, and biological monitoring of watershed restoration efforts and stormwater management application is conducted. A summary of the 2014 permit year monitoring efforts at these sites is found in **Part IV.F**, and the complete monitoring reports for the reporting year are included in **Appendix B** (*Chemical, Biological, and Physical Characterization of the Church Creek and Parole Plaza NPDES Monitoring Stations: 2013-2014*) and **Appendix C** (*Biological and Geomorphological Conditions in the Picture Spring Branch Subwatershed: 2013-2014*).

The feature class contained in **Appendix A** gives the location of the Parole Plaza, Church Creek, and Picture Spring Branch monitoring sites.

<u>b. Countywide Biological Monitoring Program</u>

Since 2004, the County has implemented a Countywide biological monitoring program focusing on benthic macroinvertebrates and modeled after the Maryland Biological Stream Survey (MBSS). The program uses a probability-based stratified random sampling design so that overall watershed condition can be evaluated and comparisons between different watershed units can be made. A total of 24 Primary Sampling Units (PSUs) are sampled in a five-year rotation called a Round. Round 1 began in 2004 and ended in 2008. Round 2 began in 2009 and concluded in 2013.

The results of Rounds 1 and 2 have been reported in prior years' Annual Reports. During the 2014 reporting period, there was no activity for this program. The County has, instead, chosen to review and update the program design to ensure data collected will address the current regulatory environment. It is anticipated that this program redesign will be completed during the 2015 reporting period and the program will be re-implemented during the 2016 spring index period.

<u>c. Town Center Water Quality Monitoring Program</u>

Through routine baseflow and storm event monitoring, the County characterizes receiving stream water quality from Parole Town Center and Odenton Town Center drainage areas. One continuous monitoring station is maintained by the County on the Cowhide Branch tributary of Weems Creek. As part of the Parole Town Center Area, Weems Creek has been monitored since the late 1980s.

Continuous flow data and rainfall are collected at this station, and monthly stormwater and baseflow monitoring is performed at this site. In addition, the County has been performing monthly baseflow monitoring at three other stations; one station is located on Broad Creek (Parole Town Center area) and the other two are located on Picture Spring Branch (Odenton Town Center area), a tributary of the Severn River. Monitoring at these three baseflow stations was discontinued in January 2014. At all stations, a total of 18 parameters are sampled, including:

Calcium	TKN	Alkalinity
Copper	NH3	Total Phenols*
Lead	TP	Oil and Grease*
Zinc	TSS	*E. coli**
Magnesiu	PO4	VOC (EPA 624)*
m	COD	*Cowhide Branch station only*
Iron	Turbidity	
BOD5	TOC	
NO_3/NO_2	Hardness	

The highlights of the program during the reporting period:

1. A total of 8 storms were sampled at Weems Creek.
2. A total of 10 baseflow samples were collected at Weems Creek. A total of 6 baseflows were collected at the three baseflow stations before sampling was discontinued in January 2014, for a total of 16 samples.

The Chemical Monitoring Site Locations Database is included in **Appendix A**.

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

Status:

Watershed restoration/retrofit activities in the design or construction phase or completed during the 2013 to 2014 fiscal years are presented in **Appendix A.** The projects listed have been constructed and provide a measured water quality benefit. It should be noted that the list of restoration projects completed by the County for the current reporting year is relatively small in comparison to past reporting years. The County has worked over the past year to establish the programmatic structure and staffing required to develop and implement restoration projects, and has moved forward with focused feasibility studies of previously identified restoration subwatersheds for purposes of identifying specific implementable restoration projects prior to project design. A decision has been made by the County to not count the list of potential restoration projects originally developed for the Watershed Implementation Plan as "Proposed" restoration projects until a feasibility study can be done to determine if an actual project can be implemented. Once the feasibility studies are completed and

schematic designs submitted, identified viable projects will be deemed "Proposed" or "In-Design" and move forward in the implementation process. It is anticipated that 275 projects will be in the design stage for the next permit reporting cycle.

Past reporting cycles of the County's NPDES permit have required the County to report various restoration activities. A requirement for reporting these practices was the ability to provide a water quality benefit as outlined in MDE's Stormwater Design Manual. In August 2014, MDE issued guidance for accounting for wasteload allocations and impervious surface treatment. As a result, the County is required to determine water quality volume treatment to account for load and treatment credits associated with restoration projects. Due to this requirement, previously reported restoration projects which did not have a reported water quality volume associated with the project cannot be credited for impervious surface treatment and pollutant load reductions until the water quality volume treatment can be determined. Therefore, until the water quality volume is determined, the County will not claim credit for these projects. It is expected that the County will make progress towards calculating water quality volumes for these projects during the upcoming reporting year and continue into the future years. The County will take impervious surface treatment and load reduction credit for these practices once the measured water quality volume has been determined. This effort is integrally tied to the ongoing Urban BMP Database improvements and the required database enhancements associated with the August 2014 guidance, which the County began implementing shortly after receipt of that guidance.

D. Management Programs

The following management programs shall be implemented in areas served by Anne Arundel 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

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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 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.***

Status:

The 2000 Maryland Stormwater Design Manual was fully implemented by the County. However, this condition was superseded by the Maryland Stormwater Management Act of 2007. During this reporting period the Office of Planning and Zoning (OPZ) continued the requirement for all proposed new stormwater management plans to comply with the new Environmental Site Design (ESD) standards in accordance with the County Code, State Code and the current edition Maryland Stormwater Management Design Manual.

Also during this reporting period, efforts to update Chapter VI (Stormwater Management) of the Department of Public Works Design Manual continued. The purpose of this effort is to:

- incorporate the new Maryland stormwater management requirements into the Department's guidance document for capital projects;
- add guidance for stormwater management associated with retrofit projects; and
- ensure that the procedures, standards and criteria within the manual are consistent with those prescribed by the State and County stormwater ordinance and with the County's Stormwater Practices and Procedures Manual.

This is a collaborative work effort between DPW, OPZ, I&P, and the Soil Conservation District (SCD). A Fact Sheet describing the purpose and goals of this project was included in the **2013 Annual Report.** Work will continue into the next annual reporting cycle to finalize this chapter of the Design Manual. The County will provide a copy of the final update for MDE review and approval prior to incorporating it into the County's Department of Public Works Design Manual.

As of September 2011 the County has an MDE-approved Stormwater Management Code, which incorporates the current edition of the Maryland Stormwater Management Design Manual. Copies of the County legislation (Bill 74-11) and the MDE approval letter were provided in the 2011 Annual Report.

During the reporting period, no modifications were required to address programmatic problems.

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.

Status:

During the reporting period, County records indicate 92 Concept Plans, 106 Site Development Plans, and 221 Final Development Plans were received. No storm water exemptions were issued. No waivers requests were received and, subsequently, none were approved.

During the FY14 reporting period, the number of redevelopment projects submitted for review were not tracked separately from the new development projects. Efforts are now underway to provide a means for readily making this distinction within the development review project information capture and tracking systems. Data gleaned from this system for FY14 indicates 30 redevelopment projects were submitted for grading permit review.

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 Anne Arundel County.

Status:

Stormwater construction inspections are conducted by the assigned area Erosion Control Inspectors in conjunction with the required erosion and sediment control plan inspections. For the reporting period the following inspections were performed:

- 860 Stormwater Construction Inspections
- 71 Stormwater Correction Notices

d. Conducting preventative maintenance inspections, according to COMAR 26.17.02, 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.

Status:

In late 2014 (FY15), MDE conducted the field portion of their triennial evaluation of the County's Stormwater Management Program. MDE's previous triennial administrative and field review of the County's stormwater management program was completed in 2005. The County's Department of Inspections & Permits (I&P) continues to maintain all programmatic information required by MDE since that 2005 review. Program modifications resulting from the 2014 triennial evaluation will be documented in the FY15 NPDES MS4 Annual Report.

The State and County Stormwater Management Codes require preventive maintenance inspections once during the first year of operation and every three years thereafter. For the reporting period the following maintenance inspections were performed:

- 902 First Year of Operation Maintenance Inspections
- 1,252 Three Year Maintenance Inspections
- 606 Three Year Maintenance Correction Notices

The required first year inspections are performed by the Area Erosion Control Inspectors as part of the process for completing issuing grading permits. Grading permit Certificates of Completion are not issued until all construction is complete and a passing first year maintenance inspection result is obtained.

Triennial inspection dates that occurred during this reporting cycle are only included for 485 of the BMPs in the Urban BMP database in **Appendix A,**

submitted with this report. The County is not taking credit for the remaining BMPs and they are not included in **Appendix A** due to a lack of complete data related to these BMPs. As part of the County's on-going data cleanup, the records for these BMPs will be further researched and they will be included in future reporting.

For the months of July 2013 through November 2013 there was one dedicated Stormwater Management Maintenance Inspector position, which was responsible for performing the 3-year maintenance inspections and Illicit Discharge inspections. The incumbent inspector retired November 30, 2013. By February 2014 the vacancy was filled and five additional Stormwater Maintenance Inspectors and an Inspections Supervisor had been hired. There is one additional inspection position to be filled and then the full time dedicated staff will consist of seven Inspectors and an Inspections Supervisor. These positions are responsible for performing the required triennial maintenance inspections and associated enforcement as well as Illicit Discharge inspections and enforcement. They will also be responsible for the construction inspection of stormwater management and stream channel restoration projects funded under the County Watershed Protection and Restoration Program.

I&P coordinates with the County Office of Law on the enforcement of violations where the field-generated Maintenance Correction Notices have been ignored. A formal Violation Notice Letter was developed by the Office of Law to be sent by certified mail to the appropriate property owners when a Maintenance Correction Notice goes unheeded. If the Violation Notice Letter does not result in compliance action, the Office of Law will take the appropriate legal actions to enforce violations and obtain compliance.

At last count the Department of Public Works, Infrastructure Management Division is responsible for the maintenance of over 800 public stormwater management BMP's. The Department of Inspections and Permits does not perform regular maintenance inspections or maintain maintenance inspection records on these BMP's. At last count there are approximately 300 publicly owned stormwater management BMP's that are maintained by the Department of Central· Services, the Anne Arundel Board of Education and the Department of Recreation and Parks. While I&P does perform maintenance inspections on these public BMP's, the County agency "owning" the BMP is responsible for any follow-up maintenance requirements.

During this reporting period, and while the County hired additional staff for the Stormwater Maintenance Inspection Program, the triennial maintenance inspection schedule was based on the following priority system. This prioritization scheme will be modified in FY15.

1. On a weekly basis, schedule triennial maintenance inspections by using the SWM Urban BMP Database. Review the proposed weekly inspection schedule with the assigned supervisor and adjust accordingly. A priority is to be placed on the following BMPs:

    - Large BMPs serving commercial and industrial projects;
    - Large BMPs serving single-family subdivisions with private stormwater management; and
    - Large BMPs serving multi-family subdivisions.

2. Triennial maintenance inspections for private BMPs serving single-family residential lots or public devices not maintained by DPW shall be given a secondary scheduling priority. These should only be inspected if an inspection request is received by the responsible agency or a complaint is received.

2. <u>Erosion and Sediment Control</u>

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;

Status:

MDE conducts the Sediment and Erosion Control Delegation evaluations every two years, with the last evaluation conducted in the Fall/Winter of 2012. The Department has submitted an application to retain MDE's delegation of enforcement authority for the years 2015-2016. MDE has begun the administrative review and will schedule the field portion of the evaluation in the very near future.

Additionally, and as reported earlier in **Part IV.B.** Legal Authority, the County is in the process of incorporating MDE's most recent Erosion and Sediment Control Code changes into the County Code (Article 16). MDE's final review comments on the proposed updated language have been addressed by the County. Because the County is also working on required revisions to the Floodplain Code, and because both Codes are contained in Article 16 of the County Code, the County will introduce one legislative bill before County Council to address these changes to Article 16.

a. ***At least three times per year, conducting responsible personnel certification classes to educate construction site operators regarding erosion and sediment control compliance;***

Status:

During the reporting period the County conducted five Green Card training sessions as noted below. Environmental Control Supervisor Vernon Murray has been certified by MDE to provide the training, administer exams, issue Green Cards, and provide MDE with spreadsheets of all successful participants in the Green Card training.

- September 6, 2013 (101 students)
- November 7, 2013 (39 students)
- March 31, 2014 (38 students)
- June 13, 2014 (37 students)
- June 20, 2014 (38 students)

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

Status:

Green Card certification information is provided in **Appendix A**.

c. 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.

Status:

Information regarding grading permits from the County's Construction General Permit Activity Database is provided in **Appendix A.** Based on previous guidance from MDE, quarterly reports were not required providing the Construction General Permit Activity Database continues to be submitted with the annual report.

3. <u>Illicit Discharge Detection and Elimination (IDDE)</u>

Anne Arundel 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 150 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;

Status:

Anne Arundel County developed and continues to maintain an extensive program designed to detect and eliminate illicit discharges into the municipal storm drain system and upland pollutant sources resulting from dumping, poor housekeeping, and other non-permitted activities.

The program includes the inspection of a minimum of 150 storm drain outfalls annually. This inspection records the presence of dry weather flow, the structural integrity of the outfall, and other maintenance issues. During this reporting period, illicit discharge screening targeted Hanover, Linthicum Heights, and Glen Burnie; 152 outfalls were evaluated. No complaint-driven outfall inspections were performed during this reporting period.

Anne Arundel County's GIS coverage of storm drains and closed storm drain utility grids were used to create maps for field activities. These maps were used in the field to identify the extent of the storm drain systems, locations of outfalls, and contributing businesses or facilities. Only commercial and industrial storm drain systems were identified on the maps for screening efforts, per the guidance provided by MDE (MDE 1997). Outfalls with primarily residential drainage were not inspected.

The water chemistry, physical condition of each outfall structure, and the conditions surrounding the outfall were recorded on field datasheets. When a dry-weather discharge was found, the field crew tested the discharge using a Chemetrics color comparator test kit (detergents, phenols, copper, chlorine, and ammonia), an Extech single analyte tester (fluoride), and a YSI sonde (water temperature and pH). Physical parameters noted at each outfall include structural condition, vegetative condition, erosion, floatables, algae growth, discharge odor, and discharge clarity.

If an outfall's discharge was found to have a concentration above the action criteria for any of the analytes, it was revisited within 24 hours, but at least four hours after the first test. The second visit helps determine if the initial result was an anomaly or confirms the result of the chemical test conducted on the first visit. Any outfall with dry weather flow that was found to have a concentration above the action criteria during both inspections was recorded as a possible illicit connection. Possible illicit connections also included situations where an

observable pollutant had been discharged through a storm drain system, but at the time of inspection the system was not flowing or the discharge did not contain the pollutant.

To identify the source of any illicit discharge, the field crews followed the storm drain systems upstream, testing flows through manholes and inlets as necessary and practical, until the source was identified or the discharge could not reasonably be tracked further. Evidence of illicit discharges, including the probable cause(s) was photo-documented. Site-specific reports were prepared for each identified illicit discharge and/or structural issue found in the field and were submitted to the Anne Arundel County MS4 Program Manager. The potential illicit discharge reports were then forwarded to I&P for further investigation and enforcement.

Seven structural issues associated with storm drain outfalls (e.g., in-pipe sedimentation, headwall concerns, deteriorating corrugated metal piping) were also reported to the County MS4 Program Manager. These site specific reports were then forwarded to the County's Infrastructure Management Division (IMD) for appropriate action. In some instances, the identified structural issues can be associated with non-County-owned infrastructure. In these instances the reports were generally forwarded to I&P for follow-up site visits, inspections, and appropriate enforcement.

Of the screened outfalls containing dry-weather flow, six yielded a result above the action criteria limit for one or more of the tested contaminants. Three of the six outfalls had concentrations that were above at least one action level when retested, and one outfall exhibited above action criteria concentrations for two retests. The County inspectors performed follow-up site visits and inspections for the reported problem outfalls. Further details, including site-specific reports, are included in the *Illicit Discharge Detection and Elimination – 2014 Annual Report* (**Appendix D**).

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;

Status:

Field personnel perform a visual inspection of all accessible commercial and industrial sites within the target areas. The inspections are designed to identify poor housekeeping, dumping and other non-permitted discharges (e.g., vehicle wash water) that may be intercepted by the County's storm drain system.

This reporting period's inspections identified 24 upland pollutant sources with the potential to discharge pollutants into County storm drains or Waters of the United States. Follow-up compliance investigations and compliance actions were taken

for these sites or are underway. A full report of the procedures and data collected from the illicit detection and elimination field investigation can be found in the *Illicit Discharge Detection and Elimination – 2014 Annual Report* (**Appendix D**). Digital data are included in **Appendix A**. The report includes a discussion of the enforcement actions taken in 2014.

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

Status:

There are two departments within the County that address reports of illegal dumping and spills. I&P is the County agency primarily responsible for enforcing spills and illegal dumping into both public and privately-owned storm drain systems. The County Department of Health addresses complaints specifically relating to food service facilities (e.g., overflowing dumpsters, waste grease containers), as well as noting violations during their regular facility inspections.

I&P received over 30 illicit discharge, dumping, and/or storm drainage complaints during this reporting period, including referrals from DPW as part of their IDDE Program. Illicit Discharge complaints and referrals are logged into the I&P Compliance Case Database, which is used to track cases from the receipt of a complaint or referral to closure. The Compliance Database is available for public viewing on the I&P page of the Anne Arundel County website. The page has a Quick Link to the Compliance Database. Case numbers can be used to track the progress of any individual Illicit Discharge complaint or referral received by I&P.

Compliance case data pertinent to the complaints received during the reporting year are documented in Appendix F of the *Illicit Discharge Detection and Elimination – 2014 Annual Report* (**Appendix D**). All complaints and referrals were investigated and enforced as appropriate.

I&P utilizes a phased approach to eliminating and enforcing illicit storm drain discharges. Phase I Enforcement consists of a Violation Notice sent by first class and certified mail to the property owner. The Phase I Violation Notice includes an explanation of the violation and requests a written commitment to immediately cease and desist the illicit discharge. Upon written receipt of the commitment to comply, the Department monitors the site for up to 60 days and if compliance is maintained the violation is considered abated. Should the Department fail to receive the written commitment to comply or if further violations are observed, the Department proceeds to Phase II enforcement.

At the Phase II level of enforcement I&P posts a Stop Work Order on the property and issues $1000 civil citations to the property owners. The civil citations must be paid and the violation abated or the civil citations are litigated in court. For the

reporting period, it was not necessary to issue any civil citations for the failure to abate illicit discharges at the Phase 2 level of enforcement. If a violation were to remain unabated by the court date, the Department requests the full payment of the fines and an abatement order from the District Court judge. The failure to comply with any Court issued abatement order results in Contempt of Court charges being filed by the County Office of Law.

Significant violations are screened with the County Office of Law for possible criminal enforcement as authorized in the County Code or for referral to MDE for enforcement under the State Code. During the reporting period it was not necessary to issue any civil citations for the failure to eliminate any illicit storm drain discharges.

As described in the 2013 Annual Report, as part of its general activities associated with food service facilities, the Department of Health is including protocols for leaking or overflowing dumpsters. Enforcement is conducted under State of Maryland Regulations Dealing with Food Service Facilities (COMAR 1 0.15.03.19), which requires refuse containers capable of holding all garbage from a facility between periods of removal and containers which do not leak. Violation of this regulation would be marked on the food facility inspection report and would require correction typically within 30 days of the investigation. Failure to comply by the second re-inspection would result in $175 re-inspection fees until compliance is achieved.
For the reporting period, 17 identified dumpster and/or waste grease bin issues, and general debris issues were referred to the Health Department for further inspection and enforcement. Please refer to the *Illicit Discharge Detection and Elimination – 2014 Annual Report* (**Appendix D**) for details.

d. Report significant illicit discharges to MDE

Status:

For the reporting period all illicit discharge complaints and referrals received were successfully enforced by I&P without the need for any referrals to MDE.

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

Status:

All activities completed as part of the County's 2014 IDDE program are included in the *Illicit Discharge Detection and Elimination – 2014 Annual Report* and accompanying database submitted in December 2014 (**Appendix D**). Additionally, IDDE data are reported according the Attachment A requirements,

and are included in **Appendix A.** The County makes no request to modify its IDDE program.

4. <u>Litter and Floatables</u>

This section of the permit requires Anne Arundel 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. Anne Arundel 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.

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

Status:

As watershed assessments continue per the schedule found in Part IV.E.1, information on litter control programs in those watershed areas, potential litter sources, and opportunities for eliminating litter and floatables will be examined. During the reporting period, no watershed assessments were initiated. In FY15, a watershed assessment project will be initiated for the Herring Bay watershed. This assessment will include documentation of potential sources and opportunities for control and elimination of litter and floatables.

b. Within one year of permit issuance, as part of the public education program described in PART IV.D.6., Anne Arundel 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.***

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.

Status:

Litter Cleanup, Waste Management, & Recycling

The County's Waste Management Services (WMS) developed and operates a robust public education and outreach program targeted to waste reduction and recycling, as well as household hazardous waste disposal.

WMS recognizes the importance of keeping adults educated about its programs, particularly in regards to its changes and advancements, and to encourage residents to recycle more often. Program specialists attend fairs, festivals, HOA meetings, community outreach events, and more. WMS also provide technical assistance with recycling at larger-scale events such as the County Fair, Annapolis Greek Festival; staff were present at over 20 fairs and festivals this year, and WMS provided recycling assistance to 15 events.

The County provides support to citizens working to better their own communities. Each year WMS, upon written request from a local community association, dispatches 40 roll-off dumpsters to aid in community and watershed cleanup activities. This service is available March thru November. Additional information is available on the County's website at:
http://www.aacounty.org/dpw/WasteManagement/commClean.cfm.

The County Bureau of Highways (BOH) is responsible for all maintenance activities associated with County roads. Litter is collected from County roadways on a routine basis. Additionally, BOH conducts weekend roadside litter and trash removal throughout the year, using supervised inmate labor, in partnership with the Department of Detention Facilities. The program was first started in 2007 with a focus on high litter count road segments, dump sites and illegal roadside signs that were proliferating across the County. The goal of the weekend program is to realize an improvement in the condition of roadsides in Anne Arundel County without a reduction to other Highways services. Weekend litter removal activities follow a programmed frequency throughout the year.

A total of 6,910 thirty-gallon bags of litter were removed from roadsides from July 1, 2013 to June 30, 2014, with 3,709 bags collected during our routine work week and 3,201 bags collected by our weekend litter removal program. This represents a 26% decrease from the last reporting period in which 9,393 bags of litter were removed.

Education should not stop once you've received your diploma! It's important to keep adults educated about our programs, particularly in regards to its changes and advancements, and to encourage residents to recycle more often. Our

program specialists also attend fairs, festivals, HOA meetings, community outreach events, and more. We also provide technical assistance with recycling at larger scale events such as the County Fair, Annapolis Greek Festival, and more. We attended over 20 fairs and festivals in FY 13 as well as provided recycling assistance to 15 events.

The County's efforts to promote recycling begin with their own employees through the County Office Recycling Program (CORP). CORP was developed to assist in providing our offices and facilities with the necessary tools behind an effective recycling program (*e.g.*, containers, signage, and pick-up service); all offices/facilities have a Recycling Coordinator that directly communicates with our office. There are about 250 sites (County offices, parks, pools, etc.) that collected 1,221 tons of single-stream recycling.

Anne Arundel County promotes its recycling program to the public through a number of methods: increased customer base to include providing services to small business and multifamily units; improve communication with customers by maximizing the use of various media including direct mail, broadcast media, newspaper advertisements, attendance at civic and community meetings, workshops, displays, special promotions; and a specially designed program for school aged children; and educate customers on new programs, schedule changes and holiday collections. The County's Small Business program has signed up 205 customers; 1303 tons of single-stream recycling was collected. This extensive outreach effort has proven to be very successful. Since its inception in 2008, the Countywide recycling rate has increased from 31% to 44%.

Stream Cleanups

BOH has supported several stream cleanup initiates during the reporting period. This includes Project CleanStream 2014, sponsored by the Severn River Association and involving the headwaters of Clements Creek and Luce Creek in Annapolis, Maryland during April 2014. Significant support was also provided to The Friends of the Patapsco Valley & Heritage Greenway who sponsored several watershed clean-ups in Patapsco State Park off of Race Road in Hanover, Maryland. Additionally, the Bureau of Highways removed in excess of 10 loads of trash, tires, chemicals, metal, and glass dumped illicitly along roadsides and reported by these and other volunteer organizations.

In total, stream cleanup efforts removed 32,298 pounds (16.2 tons) of material from local waterways. Specific events and locations are listed here.

Magothy River

April 5, 2014 - Project Clean Stream, 1265 Green Holly Dr., removed 66 lbs. of trash.

April 5, 2014 - Watershed Clean-up Sandy Point SP, removed trash from beaches, no weight or amount provided for materials removed.

Middle Patuxent

April 12, 2014 - Patuxent River Clean-up by Canoe, removed trash along the shoreline in and around Jug Bay, no weight or amount provided for materials removed.

Patapsco Non-Tidal

Fall 2013 - Holly Creek in Linthicum Heights, removed 25 tires and cleared 4 fallen tree obstructions.

Fall 2013 - Patapsco River Clean-up, removed trash and debris from illegal dump sites, no weight or amount provided for materials removed.

April 5, 2014 - Project Clean Stream, 5526 Belle Grove Rd, removed 7,760 lbs. of trash.

Patapsco Tidal

April 5, 2014 - Project Clean Stream, 490 Chalet Dr., removed 500 lbs. of trash.

Severn River

September 7, 2013 - Jonas Green Park, removed trash and invasive plants from rain gardens and swales near park building, no weight or amount provided for materials removed.

April 5, 2014 - Severn Run Stream Clean-up, removed trash along the Severn Run, no weight or amount provided for materials removed.

April 5, 2014 - Project Clean Stream. 8318 Telegraph Road, removed 11,620 lbs. of solid waste and tires.

April 5, 2014 - Project Clean Stream, 351 Dubois Road, removed 66 lbs. of trash

April 5, 2014 - Project Clean Stream, 1901 Lawrence Ave. North, removed 6,560 lbs. of debris, trash, and metal.

April 5, 2014 - Project Clean Stream, 17 Washington Dr., removed 5,760 lbs. of litter and debris.

April 5, 2014 - Project Clean Stream, 1443 River Road, removed 66 lbs. of trash.

South River

April 5, 2014 - Project Clean Stream South River Federation, various sites throughout watershed, no weight or amount provided for materials removed.

April 5, 2014 - Aberdeen Creek Trash Clean-up, no weight or amount provided for materials removed.

April 12, 2014 - Woodhaven Community Clean-up, removed trash and debris from Bell Branch, no weight or amount provided for materials removed.

West River

May 3, 2014 - Hot Sox Field Trash Clean-up, cleaned up historic dump site, no weight or amount provided for materials removed.

5. <u>Property Management and Maintenance</u>

a. Anne Arundel 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.

Status:

Anne Arundel County's Water Reclamation Facilities (WRFs) NPDES discharge permits are current or continue in force pending MDE issuance of a revised permit. The County-owned WRFs with NPDES discharge permits are:

Annapolis WRF, permit number 07-DP-0838, effective August 1, 2009 to July 31, 2014. A renewal package was submitted as per the permit requirement.

Broadneck WRF, permit number 06-DP-0677, effective June 1, 2010 to May 31, 2015. A renewal package was submitted as per the permit requirement.

Broadwater WRF, permit number 06-DP-0813, effective March 1, 2010 to February 28, 2015. A renewal package was submitted as per the permit requirement.

Cox Creek WRF, permit number 07-DP-0698, effective January 1, 2010 to December 31, 2014. A renewal package was submitted as per the permit requirement.

Maryland City WRF, permit number 02-DP-2393, effective August 1, 2008 to July 31, 2013. A renewal package was submitted as per the permit requirement.

Mayo Large Communal WRF, permit number 02-DP-2291, effective October 1, 2013 to September 30, 2018.

Patuxent WRF, permit number 02-DP-0132, effective August 1, 2008 to July 31, 2013. A renewal package was submitted as per the permit requirement.

The State's General Discharge Permit for Storm Water Associated with Industrial Activities, Permit 12-SW, became effective January 2014. County-owned facilities requiring general discharge permit coverage have submitted NOIs to MDE.

During this reporting period, Anne Arundel County's Bureau of Utilities developed and submitted the required compliance information for the WRFs and the Utility Operations Center facilities listed below.

Annapolis WRF, permit number 12-SW-0756: Notice of Intent submitted on May 20, 2014, coverage effective June 16, 2014 to December 31, 2018.

Broadneck WRF, permit number 12-SW-0758: Notice of Intent submitted on June 27, 2014, coverage effective July 30, 2014 to December 31, 2018.

Broadwater WRF, permit number 12-SW-0757: Notice of Intent submitted on June 18, 2014, coverage effective June 26, 2014 to December 31, 2018.

Cox Creek WRF, permit number 12-SW-0760: Notice of Intent submitted on June 30, 2014, coverage effective August 11, 2014 to December 31, 2018.

Maryland City WRF, permit number 12-SW-0761: Notice of Intent submitted on June 11, 2014, coverage effective July 14, 2014 to December 31, 2018

Patuxent WRF, permit number 12-SW-2459: Notice of Intent submitted on June 27, 2014, coverage effective August 6, 2014 to December 31, 2018

Anne Arundel County Utility Operations Center, permit number 12-SW-2345: Notice of Intent submitted on July 16, 2014, coverage effective September 8, 2014 to December 31, 2018.

SWPPPs, developed for each of the above facilities, were updated as required by the new permit and submitted with the Notice of Intent. In support of the NOI and in compliance with the SWPPP, WRF staff performs monthly inspections, quarterly dry weather inspections, quarterly wet weather inspections, annual

comprehensive site inspections, annual record review, and annual training. These records are maintained at each facility.

The State's General Discharge Permit 12-SW also applies to the three County-owned facilities managed by Waste Management Services (WMS) noted below. During this reporting period, facilities developed and submitted the required compliance documentation to MDE:

- Northern Recycling Center (formerly known as Glen Burnie Convenience Center) and closed Landfill,, permit number 12-SW-0298: Notice of Intent submitted on June 17, 2014, coverage effective August 15, 2014 to December 31, 2018.
- Millersville Sanitary Landfill and Resource Recovery Center, permit number 12-SW-1304: Notice of Intent to renew submitted on June 17, 2014, coverage effective August 15, 2014 to December 31, 2018; and
- Southern Recycling Center (formerly known as Sudley Convenience Center) and closed Landfill, permit number 12-SW-0297: Notice of Intent submitted June 17, 2014, coverage effective August 18, 2014 to December 31, 2018.

Documentation submitted to MDE included review of and updates to the SWPPPs for each facility. Annual Comprehensive SWPPP Compliance Evaluation Inspection Reports were completed for these facilities in November and December 2013. At these facilities the stormwater management facilities (SWMFs) are inspected routinely and all necessary repairs are undertaken immediately. WMS employs two technicians tasked with the maintenance of the SWMFs. No pesticides are used at these facilities; encroaching vegetation is removed entirely by mechanical means.

County-owned facilities operated by DPW, Bureau of Highways, that require NPDES storm water general discharge permit coverage are listed in Table 2. Each of these facilities maintains compliance documentation required by the new General Permit 12-SW, for submittal to MDE.

Table 2. Bureau of Highways Facilities

Facility	Permit Number	NOI and SWPPP Submission	Permit Coverage Period
Northern District Roads			
200 Dover Rd	12-SW-1176	June 30, 2014	Sept. 12, 2014 – Dec. 31, 2018
318 Mountain Rd	12-SW-1181	June 30, 2014	Aug. 21, 2014 – Dec. 31, 2018
Central District Roads			
1427 Duckens St	12-SW-1177	June 30, 2014	Aug. 21, 2014 – Dec. 31, 2018
1847 Crownsville Rd	12-SW-1179	June 30, 2014	Aug. 21, 2014 – Dec. 31, 2018
415 Broadneck Rd	12-SW-1182	June 30, 2014	Aug. 21, 2014 – Dec. 31, 2018
Southern District Roads			
350 West Central Ave	12-SW-2298	June 30, 2014	Aug. 21, 2014 – Dec. 31, 2018
6657 Old Solomons Island Rd	12-SW-1180	June 30, 2014	Aug. 21, 2014 – Dec. 31, 2018

Bureau of Highways Stormwater Pollution Prevention Plan Development and Implementation

During the period July 1, 2013, through June 30, 2014, the following items related to implementation of 02-SW were completed:

- Implemented each SWPPP, including:
  - Performed routine facility inspections of each facility, at least quarterly.
  - Completed annual outfall visual assessments of each facility, following a major storm.
  - Completed comprehensive annual inspections of each facility in June 2014.
  - Completed updates to each SWPPP in June 2014.
  - Completed an internal document review during comprehensive annual inspections of each facility.
  - Continuation of maintenance improvements to further prevent stormwater impacts, including:
    - Use of coir log wattles and/or straw bales at select locations.
    - Use of asphalt curbing to contain bulk road maintenance materials at select locations.
- Completed underground storage tank testing using Maryland Department of the Environment Certified UST Inspectors for:
  - Annual testing of spill buckets (catchment basins) at all facilities during 2014.
  - Five year tank tightness testing completed at all facilities during August 2013.

- Five year containment sump testing completed at select facilities during August 2013.

- Completed capital improvements to Salt Barn storage infrastructure at the following District Yards:

- Northern District, Dover Road, salt barn repairs, October 2013
- Central District, St. Margaret's Yard, salt barn repairs, November 2013
- Southern District, Davidsonville Yard, salt barn repairs, September 2013

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;

Status:

Anne Arundel County's street sweeping program is intended to provide a continuous level of street cleanliness while keeping debris (including litter and floatables) and pollutants out of storm drains, our creeks, rivers and ultimately the Chesapeake Bay.

Anne Arundel County has historically operated a modest program that includes two (2) county-owned street sweepers. In June 2014, the County contracted for street sweeping services for which funding was appropriated via the Watershed Protection and Restoration Fund (WPRF). These services will initially augment the existing County street sweeping program. As the WPRF is phased in and increased funding is available, the program can be expanded to encompass additional curbed County roadways.

FY14 Sweeping Schedule

The County's neighborhood streets are relatively clean because of the work of conscientious residents who assist the County by keeping the areas in front of their homes free of litter and debris. Residential streets were not included in the program for routine street sweeping during this reporting period. Main thoroughfares, business districts and industrial areas were scheduled for street sweeping up to four times per year. Arterial, major collector and roads in business districts were targeted for routine sweeping. This allows the County to capture the most debris for each available hour of street sweeping effort.

The County swept 275 curb miles of streets from July 1, 2013 to June 30, 2014, which equates to 22.9 curb miles/month - a 23% decrease from the last

reporting period. Major equipment repairs and associated downtime on the County's two street sweepers constrained the sweeping effort during the reporting period.

To appropriately allocate the impervious area management credit and pollutant load reduction credit for these street sweeping activities, accomplishment data for the two time periods corresponding to the two applicable NPDES permit terms is provided:

- July 1, 2013 through January 31, 2014: The County swept 169 miles of streets during this period.
- February 1, 2014 through June 30, 2014: The County swept 106 miles of streets during this period.

ii. Inlet inspection and cleaning;

Status:

The County cleaned and removed debris from catch basins, inlets and outlets of pipes to maintain proper drainage for 15,804 structures during the July 1, 2013 to June 30, 2014 reporting period. This is an 11% decrease from the last reporting period in which 17,677 structures were cleaned.

In addition, the County inspects catch basins, manholes, and associated pipes/ditches to identify structures for cleaning with a sewer vacuum. A total of 1,165 structures were cleaned with a Vactor™ truck, a decrease of 36% from the last reporting period in which 1,824 were cleaned with a sewer vacuum.

To appropriately allocate the impervious area management credit and pollutant load reduction credit for these cleaning activities, accomplishment data for the two time periods corresponding to the two applicable NPDES permit terms is provided:

- July 1, 2013 through January 31, 2014: The County cleaned 10,753 structures during this period.
- February 1, 2014 through June 30, 2014: The County cleaned 6,213 structures during this period.

Ditch & Curbline Cleaning

During the reporting period, the County cleaned and removed debris from roadside inlet and outlet ditches and concrete swales; removed leaves from ditch lines and curbs using a leaf vacuum; and cleaned and reshaped roadside ditches by machine for a total of 126,350 feet during the reporting period.

This is a 26% decrease from the last reporting period in which the County cleaned 170,787 feet.

iii. Reducing the use of pesticides, herbicides, fertilizers, and other pollutants associated with vegetation management through increased use of integrated pest management;

Status:

Pesticides & Herbicides

Anne Arundel County makes a financial contribution annually to support Maryland Department of Agriculture (MDA) programs for Gypsy Moth control (http://mda.maryland.gov/plants-pests/Pages/gypsy_moth_program.aspx) and Mosquito control (http://mda.maryland.gov/plants-pests/pages/mosquito_control.aspx). Some of this work occurs along county-maintained roadways. No data regarding the quantity of pesticides applied along roadways is recorded by the Bureau of Highways.

Herbicide use associated with road maintenance performed by the Bureau of Highways is limited to the activities included in the performance standard for H0040, which covers the application of Glyphosate (e.g., Roundup ™) on County rights-of-way to control vegetative growth around guardrails, concrete structure, and prior to crack sealing operations in the traveled portion of the roadway. A total of 138 gallons of Glyphosate were used during the reporting period. This is a 1,625% increase over the previous reporting period in which eight gallons were applied.

Other than noted above, the Bureau of Highways recorded no other pesticide or fertilizer application. Please note, however, that other pesticides, herbicides, and fertilizers may be used along the County roadside rights-of-way as part of CIP projects, developer projects, projects by citizens, or contractors working on behalf of other agencies of County Government. Special care of median landscaping along certain County and State roads in Anne Arundel County is completed under the direction of the Department of Central Services Facilities Management Division. The Bureau of Highways does not record pesticide, herbicide, and fertilizer use that occurs outside of the Bureau of Highways.

Landfills and recycling centers managed by WMS do not use herbicides to control the unwanted woody vegetation and encroaching vegetation. Weeds and other problematic vegetation at these facilities is removed entirely by mechanical means.

The Facilities Maintenance Division (FMD) – Horticulture Department, under the Office of Central Services, has a Pesticide Public Agency Permit and also a

Public Agency Applicator Certificate. The application categories are 3-A (exterior ornamental care), 3-B (interior ornamental care), and 6 (right-of-way weed control). The applicator certificate is held by Rodney Gotts, who is required to attend a one day re-certification training class once a year, per the guidelines of MDA. This class includes Integrated Pest Management (IPM) and pesticide safety. This education and other education is used by Rodney to train his crew throughout the year with IPM. Each time there is chemical use, a pesticide report must be filled out and file, which reviewed during MDA's biennial inspection.

Integrated Pest Management (IPM)

The maintenance plan for all FMD properties and right-of ways include IPM. Key elements include:

- use of herbicides only when pulling or cutting weeds have not proven effective;
- use of insecticides only when natural methods have not proven effective;
- elimination of fertilizer use, proper use of hand weeding and mulching, and sparing use of herbicides in on roadway medians;
- limiting fertilizer use on FMD properties, and only using when grass needs nutrients to encourage proper growth that helps with the prevention of soil erosion and limits runoff;
- selecting disease- and insect-resistant plants for new plantings; and
- selecting the least toxic product available, using appropriate storage facilities and techniques, and compliance with all applicable laws and regulations.

During the reporting period, the Department of Recreation and Parks (R&P) began implementation an (IPM) program for County parks and athletic facilities. The IPM plan is required pursuant to County legislation that became effective July 1, 2013 and that modified Article 14 of the County Code by adding §14-1-105 (Integrated Pest Management Plan). The updated Article 14 of the County Code can be found online at: www.aacounty.org/CountyCode/index.cfm. Pursuant to this legislative requirement, the public is provided prior notification of pesticide application at R&P public facilities.

Documentation for the program is available in **Appendix H**. Program objectives are to:

- minimize the amount and toxicity of pesticides used in the park facilities;

- eliminate unnecessary pesticide applications;
- provide IPM education to the public, park users and park staff;
- improve landscape and grounds cleanliness;
- utilize only Licensed, Certified and Registered Technician pesticide applicators;
- reduce or eliminate exposure of children, vulnerable adults, nursing mothers with infants and pets to pesticide applications; and
- provide universal public and staff notification.

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

Status:

Snow and Ice Control

The amounts of de-icing chemicals used by the County Bureau of Highways from July 1, 2013 to June 30, 2014 are found in Table 3. De-icing chemical data for the 2011-2012 and 2012-2013 reporting period are provided as a comparison. The quantity of deicing chemicals used each year is highly variable because it is based on actual winter weather conditions including precipitation type, and factors such as road surface temperature.

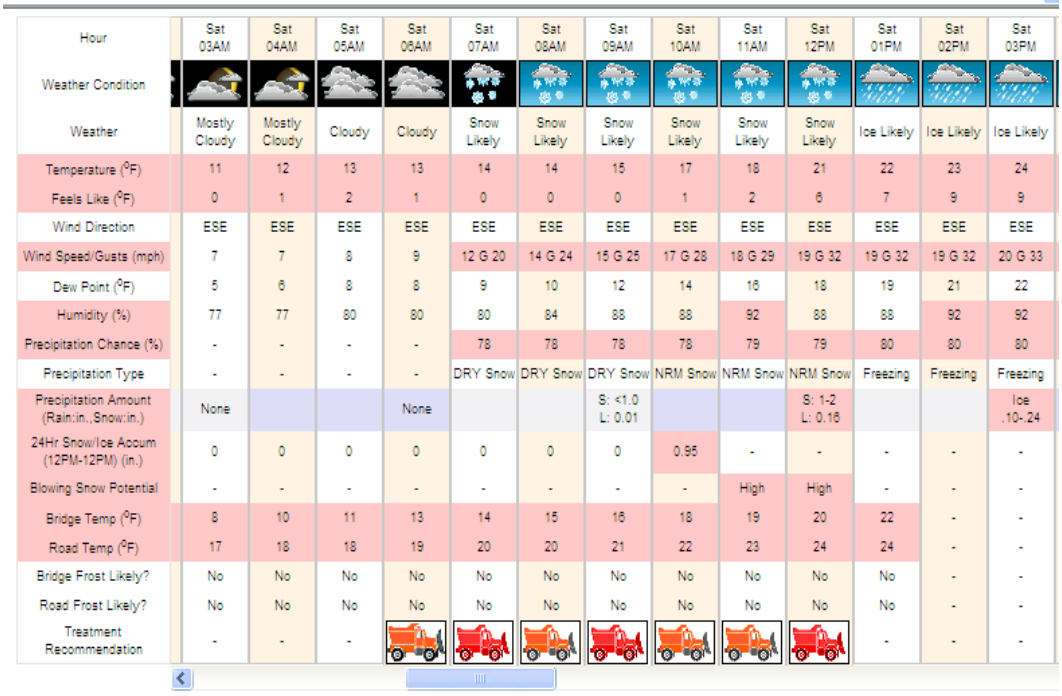
Table 3. Deicing Material Applied

Material	2011-2012	2012- 2013	2013 – 2014
Salt	1,689 tons	6,378 tons	50,996
Sand/ Salt mix	0 tons	0 tons	0
Liquid Calcium Chloride	0 gallons	355 gallons	13,355(a)
NWS1 Snow Totals (BWI)	1.8 inches	8.0 inches	39 inches (b)

(a) Average winter temperature at BWI Thurgood Marshall Airport is 35.1 degrees according to the National Weather Service (NWS). Winter 2013-2014 average temperature was 33.3. Calcium Chloride depresses the freezing-point and is used more extensively during colder periods to prevent ice formation and to deice road surfaces.
(b) Average annual snowfall total at BWI Thurgood Marshall Airport is 20.1 inches according to the National Weather Service (NWS). Winter 2013-2014 snowfall totals were 39 inches, 94% higher than average.

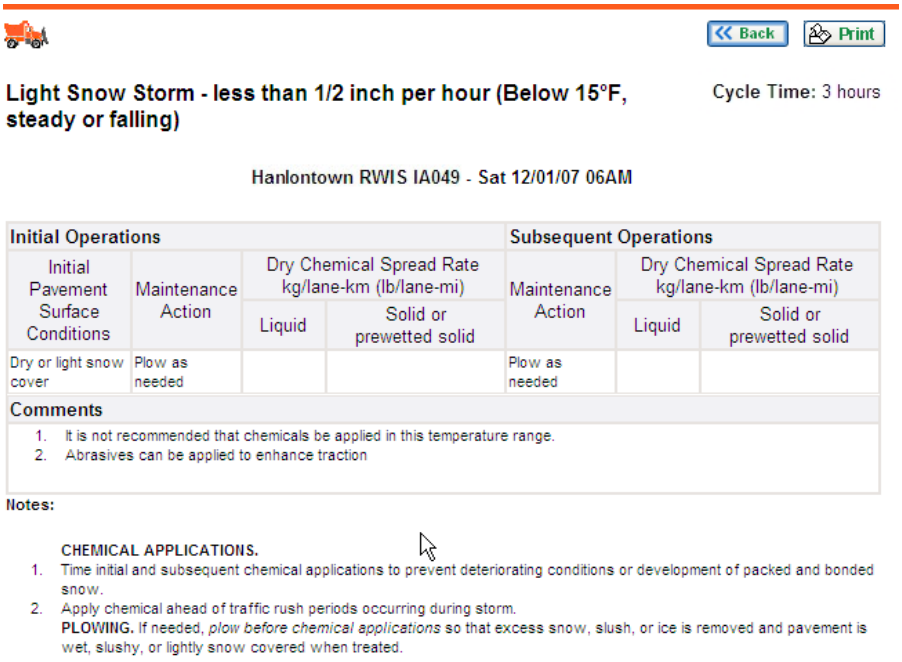
In 2013-2014, the Bureau continued its use of a maintenance decision support system (MDSS) which uses real-time data from our Road Weather Information System (RWIS). The RWIS system is a series of pavement and bridge deck sensors and other instruments installed along certain County-owned bridges and roadways. The integration of RWIS data into a MDSS allows the

management team to select the most appropriate winter treatment for actual weather conditions in each area of the County during a winter storm event. Studies have shown use of an MDSS can help reduce the use of deicing chemicals. Screen shots from the MDSS (Figure 2 and Figure 3) are from the County's subscription weather service, MxVision WeatherSentry Online at http://weather.dtn.com/dtnweather/. Annual training on proper snow plowing techniques is also offered. It includes information on the application of deicing products and proper application rates.



Hour	Sat 03AM	Sat 04AM	Sat 05AM	Sat 06AM	Sat 07AM	Sat 08AM	Sat 09AM	Sat 10AM	Sat 11AM	Sat 12PM	Sat 01PM	Sat 02PM	Sat 03PM
Weather Condition													
Weather	Mostly Cloudy	Mostly Cloudy	Cloudy	Cloudy	Snow Likely	Snow Likely	Snow Likely	Snow Likely	Snow Likely	Snow Likely	Ice Likely	Ice Likely	Ice Likely
Temperature (°F)	11	12	13	13	14	14	15	17	18	21	22	23	24
Feels Like (°F)	0	1	2	1	0	0	0	1	2	6	7	9	9
Wind Direction	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE
Wind Speed/Gusts (mph)	7	7	8	9	12 G 20	14 G 24	15 G 25	17 G 28	18 G 29	19 G 32	19 G 32	19 G 32	20 G 33
Dew Point (°F)	5	6	8	8	9	10	12	14	16	18	19	21	22
Humidity (%)	77	77	80	80	80	84	88	88	92	88	88	92	92
Precipitation Chance (%)	-	-	-	-	78	78	78	78	79	79	80	80	80
Precipitation Type	-	-	-	-	DRY Snow	DRY Snow	DRY Snow	NRM Snow	NRM Snow	NRM Snow	Freezing	Freezing	Freezing
Precipitation Amount (Rain:in.,Snow:in.)	None			None			S: <1.0 L: 0.01			S: 1-2 L: 0.16			Ice .10-.24
24Hr Snow/Ice Accum (12PM-12PM) (in.)	0	0	0	0	0	0	0	0.95	-	-	-	-	-
Blowing Snow Potential	-	-	-	-	-	-	-	-	High	High	-	-	-
Bridge Temp (°F)	8	10	11	13	14	15	16	18	19	20	22	-	-
Road Temp (°F)	17	18	18	19	20	20	21	22	23	24	24	-	-
Bridge Frost Likely?	No	No	No	No	No	No	No	No	No	No	No	-	-
Road Frost Likely?	No	No	No	No	No	No	No	No	No	No	No	-	-
Treatment Recommendation	-	-	-								-	-	-

Figure 2. MDSS Hourly Weather Forecast With Treatment Recommendations



Back Print

Light Snow Storm - less than 1/2 inch per hour (Below 15°F, steady or falling) Cycle Time: 3 hours

Hanlontown RWIS IA049 - Sat 12/01/07 06AM

Initial Operations				Subsequent Operations		
Initial Pavement Surface Conditions	Maintenance Action	Dry Chemical Spread Rate kg/lane-km (lb/lane-mi)		Maintenance Action	Dry Chemical Spread Rate kg/lane-km (lb/lane-mi)	
		Liquid	Solid or prewetted solid		Liquid	Solid or prewetted solid
Dry or light snow cover	Plow as needed			Plow as needed		

Comments

1. It is not recommended that chemicals be applied in this temperature range.
2. Abrasives can be applied to enhance traction

Notes:

CHEMICAL APPLICATIONS.

1. Time initial and subsequent chemical applications to prevent deteriorating conditions or development of packed and bonded snow.
2. Apply chemical ahead of traffic rush periods occurring during storm.

PLOWING. If needed, *plow before chemical applications* so that excess snow, slush, or ice is removed and pavement is wet, slushy, or lightly snow covered when treated.

Figure 3. MDSS Treatment Recommendation

Activities at WMS facilities also require the use of salt de-icing. The salt usage at each facility is as follows:

- Millersville Landfill and Resource Recovery Facility – 15 tons
- Northern Recycling Center – 7.5 tons
- Central Recycling Center – 6.25 tons
- Southern Recycling Center – 5 tons

v. Ensuring that all County staff receive adequate training in pollution prevention and good housekeeping practices.

Status:

The three County-owned facilities managed by WMS that fall under the State's General Discharge Permit 12-SW (Northern Recycling Center, Millersville Sanitary Landfill and Resource Recovery Center, and Southern Recycling Center) have approved SWPPPs. WMS held trainings at each of the facilities in December 2013 on the following topics: Hazardous Waste Operations (Response); Good Housekeeping and Spill Prevention; Preventative Maintenance for Sediment and Erosion Control; Runoff Control; and other SWPPP-related topics. Documentation regarding these facilities is included in **Appendix E**.

BOH also held staff training sessions that have been administered to Road District personnel during the reporting period to support SWPPP implementation, as summarized in Table 4.

Table 4. SWPPP Training Summary for Bureau of Highways Facilities

Training Number	Training Location	Training Date	Training Session Topic
14985932	1312SD	05/19/2014	TRAINING SESSION #2: WHAT IS A SWPPP?
14985924	1310NM	05/19/2014	TRAINING SESSION #1:WHEN IT RAINS IT DRAINS
14985931	1311CS	05/19/2014	TRAINING TOPIC: EROSION CONTROL
14985929	1311CO	05/19/2014	TRAINING SESSION #1: WHEN IT RAINS IT DRAINS
14985928	1311CC	05/19/2014	TRAINING SESSION #4: OUR STORMWATER POLLUTION PREVENTION PLAN PART II
14972448	1311CS	03/05/2014	TRAINING TOPIC: SPILLS & CLEAN UP
14972447	1311CO	03/05/2014	TRAINING SESSION #5: SECONDARY CONTAINMENT
14972446	1311CC	03/05/2014	TRAINING SESSION #3: OUR STORMWATER POLLUTION PREVENTION PLAN PART I
13960464	1312SD	12/16/2013	TRAINING SESSION #1: WHEN IT RAINS IT DRAINS
13960460	1310NM	12/16/2013	TRAINING SESSION #1: "WHEN IT RAINS IT DRAINS"
13960463	1311CS	12/16/2013	TRAINING SESSION #5: SECONDARY CONTAINMENT
13960462	1311CO	12/16/2013	TRAINING SESSION #6: POLLUTION PREVENTION TEAM
13960461	1311CC	12/16/2013	TRAINING SESSION #6: POLLUTION PREVENTION TEAM
13951319	1310NM	10/07/2013	TRAINING TOPIC: MULCHING BMP-15
13951318	1310ND	10/07/2013	TRAINING TOPIC: MULCHING FOR EROSION CONTROL.
13951324	1311CS	10/07/2013	TRAINING SESSION #1: "WHEN IT RAIN IT DRAINS"
13951322	1311CO	10/07/2013	TRAINING SESSION #2: WHAT IS A SWPPP?
13951321	1311CC	10/07/2013	TRAINING SESSION #5: SECONDARY CONTAINMENT
13948608	1310ND	09/19/2013	TRAINING SESSION #1: WHEN IT RAINS IT DRAINS
13947291	1310NM	09/10/2013	TRAINING TOPIC: BMP-10 SPILL PREVENTION /CONTROL
13941546	1312SD	08/06/2013	TRAINING TOPIC: INSPECTION – FACILITY/OUTFALL/STORAGE TANKS
13941540	1310ND	08/06/2013	TRAINING SESSION #1: WHEN IT RAINS IT DRAINS

6. Public Education

Anne Arundel 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.

Status:

I&P maintains a 24-hour Environmental Hotline for citizens to report environmentally-related complaints including spills and illegal dumping into the County storm drain system. The Hotline has been in existence since 1988 and has been advertised in numerous ways, including the County webpage (www.aacounty.org/IP/EnvironmentalPrograms/index.cfm). For the reporting period a total of 641 environmentally-related complaints were received and investigated by the Department. The complaints received typically involve potential Critical Area violations, sediment control issues, or illegal grading activities. All complaints including their compliance status, inspection results, enforcement and completion dates are viewable on the Inspections & Permits Compliance Case Database which is available for viewing on the above referenced web page.

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.

Status:

The County continues to provide residents with information necessary to make informed decisions regarding water quality issues and environmental stewardship. Several County departments have public outreach programs tailored to their specific discipline. Examples of some of the outreach activities are described below.

Via the County website, Anne Arundel County DPW provides water quality-related information associated with County-provided services (www.aacounty.org/DPW/index.cfm). Information, presentations, brochures and fliers available through this website address such issues as:

- Annual Drinking Water Quality Report,

- Rehabilitation and maintenance of County sewer infrastructure,
- Information on recent wastewater spills,
- Fix a Leak Week,
- Preventing Sewer Backups,
- It Takes Teamwork to Protect the Bay,
- West County Groundwater Quality,
- Homeowner's Guide to Septic Tanks, and
- Homeowner's Guide to Grinder Pumps.

The DPW Bureau of Utilities webpage includes a link to a Kids Page. This page uses brightly colored pictures and interactive games to teach the importance of water as a valuable resource and to instill water saving habits at a young age. The page also includes a description of the Water Cycle (www.aacounty.org/DPW/Kids/watercycle.cfm) and information on the County's Jr. Smart Water Saver Program (www.aacounty.org/DPW/Kids/util03.cfm). The Jr. Smart Water Saver Program teaches elementary-aged children about the importance of water and water conservation through games and coloring activities

The DPW Bureau of Highways developed a website and authored material to act as a Resident's Guide to Rain Gardens in Anne Arundel County. The materials, available at www.aacounty.org/DPW/Highways/RainGarden.cfm, explain relevant County requirements, and outline opportunities for homeowners to use rain gardens to provide flood control, groundwater recharge, and water-cooling benefits, while removing many types of pollutants and other contaminants from stormwater runoff.

Additionally, and in response to residents sweeping leaves into storm drain facilities, the Bureau of Highways authored and published a Leaf Brochure, available at www.aacounty.org/dpw/highways/LeafRemoval.cfm#.U2mgp1cVCIo. It explains relevant County services, and suggested opportunities for homeowners to manage leaves most responsibly.

Relating to sediment and erosion control practices, the I&P website contains general information available to the public regarding this topic including buffer management, grading and permits, the Chesapeake Bay Critical Area, invasive species, and sensitive areas. This information can be found at www.aacounty.org/IP/FAQs/Environment.cfm. Additionally, I&P staff outreach to the public on sediment and erosion control practices through the conduct of "Responsible Personnel Certification" classes. Commonly known as "Green Card Training", these classes serve to education not only the construction contractors operating in the County but are also made available to representatives of local watershed groups and citizens interested in learning more on this topic.

Outreach pertinent to household hazardous waste disposal has been reported in prior annual reports. The DPW, Waste Management Services Division (DPW WMS) manages an extensive outreach campaign geared toward residential recycling. Additionally, the County advertised and conducted six Household Hazardous Waste drop-off days, holding two events at each of the County Landfills and Convenience Centers during this reporting period. These events successfully kept 139 tons of hazardous waste out of landfills. Additional information is available on the County's website at: http://www.aacounty.org/dpw/wastemanagement/householdwaste.cfm.

Literature outlining alternatives to hazardous household chemicals, and safe disposal of such chemicals, is provided to the public through many different venues. DPW WMS also provides information such as what can be recycled; ways to get recycling and composting bins; dealing with yard waste and grasscycling; amounts recycled in different areas of the County; local events that promote recycling; and question and answer forums at outreach events, in County offices, through the County website (http://www.aacounty.org/DPW/WasteManagement/index.cfm), on the "Recycle. More. Often." website (www.recyclemoreoften.com) and on the Anne Arundel County Recycling Division Facebook page (www.facebook.com/annearundelrecycling). Since the recycling programs inception in 2008, the Countywide recycling rate has increased from 31% to 44%.

The County demonstrates their own commitment to lawn care and landscape management by instituting IPM programs. Programs such as those put in place by Facilities Maintenance Department and the Department of Recreation and Parks model best practices for citizens.

The County uses social media (e.g., WPRP Facebook and Twitter accounts) to remind residents about bay-friendly de-icing practices. These reminders occur more prominently when snow events are eminent. Additional information on Bay Friendly deicing practices will be incorporated into the WPRP web page (www.aarivers.org) in FY15 as that webpage develops. The County's webpage, www.aacounty.org/dpw/highways/snowremoval.cfm, also explains our roadway winter de-icing strategy and provides resources to help shape customer expectations. An example excerpt is included below:

> *"Winter operations activities related to snow and ice control include plowing snow from the roadway and shoulders, and responsibly applying deicing chemicals to arterial and collector roads and isolated icy spots to facilitate snow plowing.*

Anne Arundel County uses covered storage facilities for its road salt and stores a total of approximately 11,650 tons of salt at the following locations: Dover Road (Glen Burnie), Mountain Road (Pasadena), Crownsville Road (Annapolis), Broadneck Road (St. Margarets), Duckins Street (Odenton), West Central Avenue (Davidsonville), and at a storage yard in Friendship, MD. At the present time, a small portion of Anne Arundel County's fleet is equipped with liquid calcium chloride pre-wetting equipment. Pre-wetting dry salt during its application helps the salt to adhere to the roadway. In contrast, dry salt can "bounce" and blow off the roadway and be less effective.

Deicing materials are an effective tool for maintaining safe winter road conditions. However, Anne Arundel County is aware that excessive use can have negative impacts on the environment. We strive to only apply as much salt as necessary to achieve safe driving conditions. So, what are some of the environmental concerns associated with road salts? Heavy use of road salts has been assessed to cause damage to vegetation, organisms in soil, birds and to other wildlife. Chloride ions from road salts find their way eventually into waterways, whether by direct runoff into surface water or by moving through the soil and groundwater. In surface water, road salts can harm freshwater plants, fish and other organisms that are not adapted to living in saline waters.

In winter months, as soon as snow begins to accumulate, equipment is dispatched to service arterial and collector roadways. Our next priority will be insuring each community road is passable. Passable means that although the road may be snow-covered or snow-packed, at least one travel lane will be accessible with a front-wheel drive car. All-weather tires are a must. If our snowplow driver determines that your street meets our definition of passable, no further service will be provided."

Residential car care and residential car washing can readily contribute pollutants to the stormdrain system as can improper boat cleaning and maintenance actions. Information on proper maintenance and cleaning of these vehicles is provided on both the County WPRP web page (www.aarivers.org) and through the County's Watershed Stewards Academy (WSA). In addition to outreach by individual stewards, information on proper car and boat repair is found on the WSA webpage: www.aawsa.org/solutions/reduce-personal-pollution/maintain-your-car-and-boat.html. This webpage also include links to Maryland's Clean Marina Initiative and Eco-Friendly Car Washing, among others.

The Public Safety article of the Anne Arundel County Code includes regulations governing animal control. §12-4-909 is specific to the removal of animal excreta and requires that "*A person shall remove excreta deposited by*

an animal owned by that person on public walks, recreation areas, or private property other than the owner's." DPW WMS maintains a webpage that advises residents on the proper disposal methods for a variety of problematic household waste products, including pet waste (www.aacounty.org/DPW/WasteManagement/problemProducts.cfm). Additionally, education regarding pet waste management is included on the "Think Bay" section of the WPRP webpage (www.aarivers.org) as well as the WSA webpage www.aawsa.org/solutions/reduce-personal-pollution/scoop-your-pet-waste.html. These webpages include links to information regarding pet waste removal stations as well as local services that will clean up pet waste. The WSA page includes an interactive map of pet waste stations in the County such that residents and visitors can locate such stations for use when exercising their pets.

During this reporting year Anne Arundel County DPW, the County Board of Education's Arlington Echo Outdoor Education Center, The Keith Campbell Foundation, the Chesapeake Bay Trust and National Fish and Wildlife Foundation continued to provide leadership and funding to the Watershed Stewards Academy (WSA), which was established in 2008 as an organized framework to educate community leaders to become "Master Watershed Stewards". During this reporting period, WSA completed certification of the 23 Master Watershed Stewards, including the completion of capstone projects. Capstone projects include a comprehensive community assessment; outreach and education to the community on how to reduce pollution sources and employ rainscaping to reduce runoff; and either one in the ground rainscaping project per person or one behavior change program per group. During the reporting period, the WSA initiated a two track certification system in which deeper training was offered in either rainscaping projects or community based social marketing. Community based social marketing projects involve a social science framework to effect pollutant reducing behavior change. The rainscaping projects range from water harvesting to rain gardens and bioswales.

During this reporting period, WSA also recruited and trained an additional 28 Master Watershed Steward Candidates, who began work on their capstone projects. Once certified, Master Watershed Stewards complete about 40 hours per year in volunteer community watershed restoration, eight continuing education classes and three networking sessions annually. All certification and continuing education courses were instructed by stormwater professionals or Master Watershed Stewards and consisted of 58 volunteer instructors logging over 116 hours of volunteer time spent on instruction.

The effort to replicate WSA has continued with a new WSA holding its first certification course in Cecil County. Efforts continued to support the Howard

County WSA, including the certification training of their leader, Terry Matthews.

The WSA continued to support and engage Certified Master Watershed Stewards through the following activities:

- Conducted three networking meetings designed to allow Stewards to share their successes and learn new techniques for engaging communities.
- Offered eight continuing education classes for Certified Stewards.
- Held the third annual "Spring into Action" conference to a sellout crowd of 120 Stewards and Consortium members. This day-long conference offered additional training and networking opportunities to foster collaboration and action.
- Coordinated the use of training and outreach materials.
- Coordinated plant orders to give Stewards wholesale rates for additional rainscaping projects in their communities.
- Connected interested communities with their closest Master Watershed Steward for consultation and presentations.
- Coordinated the Backyard Buffer program, in collaboration with Maryland Department of Natural Resources (MD DNR), in which 2,400 tree seedlings were planted in areas adjacent to stormwater flow. An educational workshop for participants was held to instruct homeowners on how to plan, install and care for trees.
- Created a comprehensive Behavior Change Handbook to guide the development and piloting of pollution reducing behavior change campaigns.
- *Leaves are a Pain in the Drain* – WSA created and piloted a leaf pick up behavior change campaign focusing on communities in Ward 1 of the City of Annapolis, and in Severna Park, to voluntarily pick up their leaves from impervious areas adjacent to their property. Focus groups and survey work informed the development of door hangers, commitment tools, and magnetic prompts.

As a group, Certified Steward and Steward Candidates gave 3,693 volunteer hours toward engaging their communities in stormwater education and restoration. Stewards engaged 780 community volunteers who gave 3,424 volunteer hours to install and maintain stormwater BMPs. They reached over 5,000 people in one-on-one outreach and education on stormwater topics. Stewards and their communities installed 55 rain barrels and 9 cisterns that captured over 5,000 gallons of water during each major rain event; planted

over 14,000 native trees and plants; created 317,887 square feet of stormwater restoration; and removed almost 30,000 square feet of invasive plants. Stewards recruited over $978,185 in grant matching funds and led their communities to donate almost $70,000 in private funds. Additionally, in-kind services valued at over $76,000 were donated to Steward projects.

The Watershed Stewards Academy piloted the "Clean Water Communities" neighborhood certification program in the Hillsmere community. This pilot program installed 9 cisterns, 7 conservation landscapes, and 2 rain gardens across 10 properties to prevent over 200,000 gallons of polluted runoff from entering Duvall Creek, a tributary of the South River. This program implementation represents over a 20% runoff reduction across 10 parcels in this community.

As noted in prior Annual Reports and in earlier sections of this report, the WSA developed and refined training and resources for stewards to employ community-based social marketing to effect pollutant reducing behavior changes such as pet waste disposal, removal of leaves from impervious surfaces, and reduction in fertilizer use. Using face-to-face surveys, Stewards are taught to measure a baseline of behavior and measure a behavior change. They are also supported with template tools and sample behavior change campaigns for use in their own community.

The WSA facilitated the networking of Anne Arundel County restoration resources via involvement of watershed organizations, the WSA Consortium of Support Professionals, County restoration projects, and private communities to avoid duplication and further common goals. Together with several members of the Consortium of Support Professionals, the WSA has offered several stormwater tours to engage constituents in stormwater issues and provide professional level instruction on rainscaping techniques.

The WSA board of directors continues to provide fundraising and strategic direction for the organization. In April 2014, the WSA Board finalized its 5 year strategic plan, affirming the strong partnership between Anne Arundel County government and the non-profit WSA.

To evaluate program success, Stewards continue to use the data input form at www.aacounty.org/DPW/Watershed/Restoration/RestorationActivity.cfm to track restoration projects installed by Master Watershed Stewards or their communities via a GIS application. These efforts are displayed graphically on the County's WPRP GIS Mapping Application (http://www.aacounty.org/OIT/GIS/MyAnneArundel.cfm). The WPRP Modeling & Analysis team is able to connect a pollutant load reduction for most BMPs and graphically summarize the extent of education efforts in the County.

In an effort to increase stormwater pollution awareness throughout Anne Arundel County, the WPRP has developed a compressive web-based informational program. A major component of this initiative was the development of the WPRP's webpage (www.aarivers.org) to provide residents with an overview of the WPRP program and stormwater fee, environmental restoration plans, watershed assessments and information about stormwater pollution in general. The webpage also provides links to other County departments such as Utilities for water conservation tips and Inspections and Permits for stormwater management and Chesapeake Bay Critical Area information.

Since the development of the WPRP webpage, several enhancements have been integrated. Residents are provided with educational resources to reduce stormwater pollution from their property. Residents learn how their everyday actions can have an impact on our local waterways and provide recommendations on how they can minimize these impacts. The following topics are addressed:

- Rain barrel benefits and installation
- Rain garden benefits and installation
- Permeable pavement and paver benefits and installation
- Bay-friendly car maintenance tips
- Household Hazardous Waste disposal tips
- Fertilizer and pesticide application tips
- Recycling, litter reduction and source reduction tips
- Pet waste management tips
- Onsite septic tank maintenance tips
- Green boating tips

In the coming months, several additional enhancements are planned for the webpage. The goal is to provide residents with the most up to date information regarding the WPRP in the most convenient way.

In addition to the WPRP webpage, several social media outlets including Facebook (https://www.facebook.com/aawprp) and Twitter (https://twitter.com/AAWPRP), were also introduced to help educate residents about water quality issues and to provide an avenue for timely updates of restoration projects, educational materials, links to local watershed groups and newspaper articles. These social media sites are updated on a daily basis and provide residents with an outlet to discuss local stormwater issues and allow the WPRP to continually educate residents about the program.

The Arlington Echo Outdoor Education Center is operated by the Office of Environmental Literacy and Outdoor Education Program of Anne Arundel

County Public Schools. Arlington Echo Outdoor Education Center offers Anne Arundel County students year-round opportunities to experience the natural environment. The Outdoor Education programs at Arlington Echo use environmental and outdoor learning to enhance, extend and enrich classroom curriculum. Arlington Echo mainly hosts fourth grade elementary students on day and overnight trips, but also hosts middle, and high school groups.

While developing a positive environmental ethic and sense of stewardship, students learn the meaning of respecting each other as well as respecting the environment. By the end of their residential experience, students are given the tools necessary to become Chesapeake Stewards, and have gained the knowledge to protect and preserve the Chesapeake Bay and its watershed at home, school, and on their own.

Chesapeake Connections is the Outdoor Education outreach program of Arlington Echo which connects classroom instruction with a series of relevant hands-on experiences that lead to environmental stewardship. The staff at Arlington Echo Outdoor Education Center provides support and expertise to complete yearlong environmental service-learning projects as part of Chesapeake Connections with many Anne Arundel middle and elementary schools. The service-learning projects are infused into each school's curricula and involve using community areas or school grounds for environmental restoration activities. The program works to restore and/or create bogs, gardens, and runoff areas on school grounds or in the community. These projects meet growing environmental needs in our area and help protect the Chesapeake Bay.

The WPRP has partnered with the Chesapeake Connections program to provide hands-on experiences for Anne Arundel County students through the planting of native trees and other vegetation at several restoration projects. Below is a listing of those opportunities that occurred during the reporting period:

- Ruppert's Ravine – September 2013 - 310 6th grade students from Marley Middle School
- Gray's Luck – October 2013 - 200 6th grade students from Corkran Middle School
- Windsor Ridge – November 2013 - 300 6th grade students from George Fox Middle School
- Fair Oaks II – November 2013 - 60 students (6th-8th grade) from Meade Middle School
- Forest Drive Outfall – June 2014 - 90 6th grade students from Annapolis Middle School

The WPRP strives to keep residents apprised of current accomplishments of the program. One of the most effective ways to communicate those milestones is through the local media. Below are select articles about the WPRP that were published during the reporting period:

- *"Stormwater funding could improve ailing Magothy River"* – February 24, 2014- Capital Gazette, http://bit.ly/1ydXYM7
- *"Longtime Crofton resident: Beaver Creek restoration 'in everybody's interest'"* – April 15, 2014 – Capital Gazette, http://bit.ly/1ye3JcQ
- *"Anne Arundel to pull up miles of concrete channels"* – April 16, 2014 – Capital Gazette, http://bit.ly/1ydYUjQ
- *"Two stormwater projects completed in Annapolis"* – June 12, 2104 – Capital Gazette, http://bit.ly/1ydXaqD

The following is a list of informational presentations and events in which the WPRP participated during the reporting period:

- August 16, 2013 – Severna Park Chamber of Commerce
- September 17, 2013 -- Brooklyn Park Town Hall Meeting
- January 12, 2014 – Severn River Commission
- February 20, 2014 – State of the Magothy
- February 21, 2014 – Anne Arundel County Planning Advisory Board
- March 10, 2014 – Anne Arundel County Watershed Stewards Academy
- March 12, 2014 – Linthicum Heights Improvement Association
- March 15, 2014 – Davidsonville Green Expo
- March 24, 2014 – Turnbull Estates HOA
- April 11, 2014 – Anne Arundel County Council Work Session
- April 15, 2014 – New Opportunities in Construction – County Event
- May 20, 2014 – Harwood Civic Association
- May 27, 2014 – Chesapeake Environmental Protection Association
- June 4, 2014 – Greater Pasadena Council
- June 5, 2014 – Severn River Association
- June 5, 2014 – Baltimore Port Alliance

The Anne Arundel County Department of Health publishes fact sheet series entitled "Health Matters" (see examples in **Appendix F**). These fact sheets are distributed at events run by the Department of Health and can also be found on their website (www.aahealth.org). Some of the subjects covered include:

- Water Quality and Swimming or Fishing In Anne Arundel County Rivers and Creeks;
- On-site sewage disposal systems and private water wells;

- Bay Restoration Fund (BRF) Program, for nitrogen-reducing pretreatment units for septic systems to be installed within the Chesapeake Bay Critical Area;
- Collapsed Septic Tanks, Overflowing Septic Systems and Failing Septic Systems Interim Health and Safety Requirements; and
- Application Procedures for Property Improvements Where Well or On-Site Septic Systems are Utilized.

The Anne Arundel County Department of Health continues to publicize a hotline (410-222-7999) on the Department of Health's website (www.aahealth.org), Health Matters fact sheets, and other literature. This hotline alerts the public to current advisories and closures of recreational water as the result of sewage spills and bacterial exceedances from the 106 bathing beaches that the department monitors from Memorial Day through Labor Day. The Department also promotes an e-alert system so an individual can be notified by e-mail when the Department has an advisory or closure of recreational waters. Individuals can sign up for the e-alert system on the Department of Health's website.

The Department of Health, in conjunction with MDE and the Maryland Department of Health and Mental Hygiene, promotes the Maryland Healthy Beaches campaign. The campaign makes people aware of everyone's impact to the waterways in the State of Maryland. One of the campaigns major focus is the importance of picking up pet waste. In 2013, the Department of Health created a 'Beach Swimming Guide' on its website to keep the public abreast of recreational water quality in the County.

The Department of Health also publicizes information about on-site sewage disposal systems and private water wells. The Department also provides a DVD on the maintenance and care of an on-site sewage disposal system to each individual homeowner at the time of installation for each newly installed system. The DVD's are also available to view on the department's web-site.

The Department of Health sponsored a Septic System and Bay Restoration Fund Expo at several public schools throughout the County this past March and promotes locally the Bay Restoration Program. This program is a grant that plans to use grant funds to help qualified applicants connect to existing public sewer and continues to pay for nitrogen reducing pretreatment units that must be installed in conjunction with an onsite sewage disposal system that is in the Chesapeake Bay Critical Area. The grant funds the entire cost off the treatment unit and a five-year service and maintenance program for repairs of failing systems in the Critical Area. The Department of Health administers this grant, awarded by MDE and funds about 250 nitrogen reducing pretreatment units annually. These treatment units reduce the nitrogen load

from an on-site sewage disposal system by at least 50 percent. This is a direct reduction to the nitrogen load that is reaching the Chesapeake Bay.

There are many other environmental health information topics located on the Department's website, under Environmental Health, including:

- The Bay Restoration Fund,
- Environmental Assistance Programs,
- Environmental Health Fees,
- Recreational water quality, and
- Well and Septic Systems.

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.

Status:

The County provides training for staff working at County facilities with stormwater discharge permits as discussed in **Part IV.D.5.b.** BOH has developed a comprehensive training document consisting of a series of six modules intended to educate staff on pollutant sources, the importance of storm water pollution prevention, what components constitute a storm water pollution prevention plan, implementation of a storm water pollution prevention plan, secondary containment concepts, and an effective pollution prevention team. These modules are presented bi-monthly on an annual, rotating basis.

Managers at each of the County-owned facilities requiring coverage under NPDES general discharge permit have updated their SWPPPs following the issuance of the new General Permit by MDE in January 2014. Training is performed yearly, which is critical to ensure staff are fully knowledgeable of the potential pollutant sources at each facility, how to properly store and handle these sources, and the procedures for responding to a spill or emergency. Refresher trainings are provided when necessary.

In demonstration of compliance, the SWPPP Evaluation Reports for the four Waste Management Services facilities are included digitally in **Appendix E**, including training outlines for each. Pollution prevention plans and spill prevention, control, and countermeasure plans are kept at these facilities and updated regularly.

Lastly, following the January 2014 issuance of the new General Permit 12-SW, the County coordinated with several private businesses regarding implementation of Permit 12-SW requirements and provision of information for completion of SWPPPs.

E. Restoration Plans and Total Maximum Daily Loads

Anne Arundel County shall annually provide watershed assessments, restoration plans, 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 Anne Arundel 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.

1. Watershed Assessments

a. By the end of the permit term, Anne Arundel County shall complete detailed watershed assessments for the entire County. Watershed assessments conducted during previous permit cycles may be used to comply with this requirement provided the assessments include all of the items listed in PART IV.E.1.b below. Assessments shall be performed at an appropriate watershed scale (e.g., Maryland's 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.***

Status:

Anne Arundel County developed a TMDL Support group within the Watershed Protection and Restoration Program (WPRP) to comply with the conditions outlined in the NPDES MS4 permit. One component of the program is to perform watershed assessments, as stipulated by the permit requirements (**Part E.1.b**), for each of the County's 12 watersheds. The watershed studies involve a partnership

between the County, various consultants, and citizen stakeholders. The field data collection is performed primarily by consultants specifically for each watershed study effort. All modeling, analysis, and reporting are performed in-house by County staff. Once the data are collected and analyzed for a watershed, the TMDL support staff collaborates with the consultants and other citizen stakeholders in a series of professional management team meetings to thoroughly review the information and reach consensus pertaining to assumptions and data interpretations. Once consensus is reached, the County publishes the study, including recommended restoration/preservation actions and desired implementation strategies. Additionally, environmental concerns and recommendations are portrayed in GIS files published on the County website on the interactive WERS mapping application found at the following website address:
http://gis-world2.aacounty.org/silverlightviewer/?Viewer=WERS.

Recommendations developed during watershed studies are used to advise and prioritize land use decisions and Capital Improvement Program expenditures relating to environmental restoration and preservation. To expedite implementation, preliminary restoration designs are developed as part of the watershed assessment and planning effort for some of the highest priority recommendations.

During past permit cycle, the County completed watershed assessments on seven of 12 of its eight-digit sub-basins (Bodkin Creek, Magothy River, Patapsco Non-Tidal, Patapsco Tidal, Severn River, South River, and Upper Patuxent) Two watershed assessments are currently in progress (Little Patuxent, and West and Rhode Rivers) and two watershed assessments are planned for the future (Herring Bay and Middle Patuxent) and are expected to be completed by 2017

Completed watershed assessments can be found on the County's website
http://www.aacounty.org/DPW/Watershed/WatershedStudies.cfm

Table 5 shows the current schedule established to complete these studies.

Table 5. Watershed Assessment Schedule

Watershed	MDE 8-Digit Watershed Code	Timeline for Targeted Bioassessment Completion (Calendar Year)	Timeline for Habitat Assessment Completion (Calendar Year)	Timeline for Analysis Completion (Calendar Year)
Severn	02131002	Complete	Complete	Complete
South	02131003	Complete	Complete	Complete
Upper Patuxent	02131104	Complete	Complete	Complete
Magothy	02131001	Complete	Complete	Complete
Patapsco Non-Tidal	02130906	Complete	Complete	Complete
Patapsco Tidal	02130903	Complete	Complete	Complete
Bodkin	02130902	Complete	Complete	Complete
Little Patuxent	02131105	Complete	Complete	2015
Rhode	02131004	Complete	Complete	2015
West	02131004	Complete	Complete	2015
Herring Bay	02131005	Complete	2016	2016
Middle Patuxent	02131102	2016	2017	2017

During 2014, the County completed the field assessment task and analysis of overtopping culvert crossings for the West and Rhode Study. Work remains to be completed for the geomorphology and prioritization analyses. All study related materials will be published on the County website: http://www.aacounty.org/DPW/Watershed/WestRhodeStudy.cfm

During 2014, the County continued its work on the Watershed Master Plan study efforts for the Little Patuxent Watershed. Analyses were completed for the Stream Reach Priority for Restoration as well as for the overall watershed Subwatershed Priority for Restoration and Preservation. Work still remains on the development of concept restoration plans and final report. All study related materials will be published on the County website:
http://www.aacounty.org/DPW/Watershed/LittlePatuxentStudy.cfm

Watershed restoration efforts are monitored through the County's Watershed Protection and Program (WPRP): Stream Monitoring project. This project funds the ongoing assessment of restoration project efficacy. At a minimum, restoration projects are monitored for stability and native vegetation survivability for up to five years following project completion. During this monitoring period, any identified issues that may lead to project failure are either addressed through immediate remediation via the Stream Monitoring project, or are put forward for re-design and construction through a stand-alone capital project.

2. Restoration Plans

a. Within one year of permit issuance, Anne Arundel 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.

By the end of this permit term, Anne Arundel 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 WQ_v 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.

Status:

The following write-up details Anne Arundel County's (County) process for determining controlled and uncontrolled impervious surfaces, as outlined in the August 2014 MDE document titled "Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated Guidance for National Pollutant Discharge Elimination System Stormwater Permits." As previously described in **Part IV C.4** of this report, the portion of impervious surfaces under the County's jurisdiction is 30,972 acres. This includes both public and private lands within the County's jurisdiction and excludes all Federal, State, and City of Annapolis lands.

The first step in this process was to identify all managed impervious surfaces using records from the County's Urban BMP database that have been inspected within the past three years and have a documented water quality volume; past implemented stream restoration projects and living shoreline restoration projects; rooftop disconnects; open section roads; septic conversions to waste water treatment plants; upgraded septic systems to enhanced nitrogen removal systems; and street sweeping practices. Once all managed impervious surfaces have been accounted for, the total was subtracted from the initial 30,972 acres resulting in **1,700** acres of managed impervious surfaces and **29,273** acres of unmanaged impervious surfaces. This is the Anne Arundel County impervious area baseline resulting from the impervious surface assessment. Multiplying the **29,273** acres of unmanaged impervious by 20% resulted in **5,854** acres of impervious surfaces to be controlled/managed during the five year permit cycle.

The first year of the current permit cycle began February 12, 2014. Between February 2014 and the end of this reporting period (June 30, 2014), the County implemented restoration projects and alternative BMPs corresponding to **55.6** equivalent impervious acres of the targeted **5,854** impervious acres for restoration.

The following provides and details the methods utilized by the County to determine impervious surface baseline, and the credit to be applied to the baseline restoration target.

Existing BMP Credit

Using the criteria outlined in the guidelines, Section II Establishing Baselines: Impervious Surface Area Assessment, BMPs records were queried and selected from the County's Urban BMP database that were found to meet the requirements by having a documented water quality volume from either the grading permit application or sealed stormwater report and having an inspection record within the last three years. This resulted in a list of 238 BMPs that could count towards the baseline. The BMPs consisted of mostly infiltration trenches, dry wells, and wet pond practices. Associated GIS layers are included in **Appendix A** of this report and are attributed with the BMP unique identifier Storm ID linking back to the Urban BMP database. Credit was calculated by applying the designed treatment volume in relation to the one inch runoff volume, and was found to provide 263 equivalent impervious acres of treatment that was included in the baseline assessment.

Toward the end of this reporting year, additional Urban BMP maintenance inspectors were hired. As the County further enhances its maintenance inspection program, ramps up field inspection efforts using inspection checklist, and increases inspection and maintenance of additional BMPs, the impervious credit associated with these practices will be applied toward impervious surface restoration. It is expected that the County will make progress towards calculating water quality volumes for the BMPs during the upcoming reporting year and continue into the future years. The County will take impervious surface treatment and load reduction credit for these practices once the measured water quality volume has been determined. This effort is tied to the ongoing Urban BMP Database improvements and the required database enhancements associated with the August 2014 guidance, which the County began implementing shortly after receipt of that guidance (MDE 2014). The database structure will be modified as necessary to remain compliant with MDE's requirements.

Water Quality Improvement Project Credit

Prior to the issuance of the August 2014 guidelines, the County did not consistently track water quality volume treatment for all environmental restoration projects. Under the current guidelines, the County claimed equivalent

impervious surface treatment credits for stream restoration and living shoreline restoration projects implemented prior to February 2014 based on the linear foot of treatment per project. The County identified 58 previously implemented restoration projects providing an equivalent impervious surface treatment credit of 461 acres that was included in the baseline assessment. The County has been working to calculate water quality volume for the remaining previously implemented water quality improvement projects. As water quality volume treatment is determined for these projects, the equivalent impervious surface treatment credit will be applied toward the 20% impervious surface restoration target.

Water quality improvement projects constructed after February 2014 utilized the August 2014 guidelines for determining equivalent impervious surface treatment credit based on the water quality volume provided in relation to the one inch rainfall runoff water quality volume. During this time period, the County constructed nine pond retrofits and two stream restoration projects for a total equivalent impervious surface restoration credit of 28.7 acres towards the 20% reduction target goal. GIS layers depicting both of these water quality improvement project impervious surfaces are attached in **Appendix A** of this report.

Rooftop Disconnect Credit

Rooftop disconnects have been identified by intersecting the County's building rooftop GIS layer against areas zoned as Rural Agriculture (RA) which specifies one dwelling per 20 acres and Residential Low Density (RLD) one dwelling per five acres. Building rooftops within these zoning classifications were then further refined by selecting rooftops on residential parcels greater than three acres and are a distance greater than 100 ft. from streams. As a result of this analysis, 14,070 rooftops were identified for a disconnect credit of 499 impervious acres. These disconnected impervious acres were included in the baseline assessment. A GIS layer depicting these rooftop disconnects is attached in **Appendix A** of this report.

Open Section Roadway Credit

Open section roads denote roads that do not have curb and gutters. These areas have been identified by intersecting the County's functional road classification GIS layer against areas zoned as Rural Agriculture (RA) and Residential Low Density (RLD). These two zoning classifications make up a majority of rural areas within the County. Open section roads within these zoning classifications were further refined by removing from the selection, roadways drained by the County's closed storm drain layer and roadway segments with a distance less than 100 feet from streams. As a result of this analysis, 393 individual roadway segments were identified for a disconnect credit of 211 impervious acres. These disconnected impervious acres were included in the baseline assessment. A GIS

layer depicting these open section roadway impervious surfaces is attached in **Appendix A** of this report.

Septic System Connection to Wastewater Treatment Plant Credit

Septic system connections to the County's sewer treatment system, implemented prior to February 2014, received an equivalent impervious surface credit of 0.39 acre for each connection and this credit was applied to the baseline assessment. The County made 180 connections, or 70 acres in equivalent impervious credit, prior to February 2014. After February 2014, the County made an additional 40 connections or 15.6 acres that are applied as equivalent impervious surface reduction credits towards the 20% reduction target. A GIS layer depicting these septic system connection impervious surfaces are attached in **Appendix A** of this report.

Septic Systems Upgraded to Enhanced Nitrogen Removal System Credit

Septic system upgrades to enhanced nitrogen removal units made by the County prior to February 2014 received an equivalent impervious surface credit of 0.26 acre for each upgrade and this credit was applied to the baseline assessment. Prior to February 2014, the County made 710 upgrades or 184.6 acres in equivalent impervious credit that were applied to the baseline assessment.. After February 2014, the County made an additional 15 upgrades or 3.9 acres of equivalent impervious surface reduction credits towards the baseline restoration target. A GIS layer depicting these septic system upgrade impervious surfaces are attached in **Appendix A** of this report.

Street Sweeping Credit

In addition to the above mentioned credit inventories, the County also maintains an inventory of street sweeping miles. During 2014 the County contracted for street sweeping services. These services augment the existing County street sweeping program and will expand as the Stormwater Remediation Fee is phased in and additional revenue becomes available to encompass additional curbed County roadways. Currently, the County targets those curbed roads with high traffic volumes or outfalls that discharge to and/or touch a tidal or non-tidal water body within the Patapsco River Watershed, the priority area given the Baltimore Harbor Trash TMDL. Additionally, during 2014 the Bureau of Highways hired two Vactor operators and is currently in the process of purchasing two Vactor trucks for the storm drain inlet cleaning program.

Prior to February 2014, the County swept 169 curb miles of roadway or the equivalent of 167.7 acres of impervious surfaces based on the August 2014 guidance. This equates to 11.74 acres of equivalent impervious acres for the baseline assessment. After February 2014, the County swept an additional 106

curb miles or 105.2 acres of impervious surfaces or 7.36 acres of equivalent impervious surface credit towards the baseline impervious surface restoration target. As these data are not maintained in a GIS format, they will not be geographically represented in **Appendix A**. The values stated above have been added to the values represented in **Appendix A** and are reflected in the calculations referenced earlier in this section.

b. Within one year of permit issuance, Anne Arundel 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, Anne Arundel County shall:

- ***i. Include the final date for meeting applicable WLAs and a detailed schedule for implementing all structural and nonstructural water quality 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 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.***

Status:

Prior to the February 12, 2014 effective date of Anne Arundel County's current NPDES MS4 permit, EPA had approved a number of WLAs for the County (Table 6).

Table 6. Waste Load Allocations (WLAs) Approved by EPA for Anne Arundel County

Basin Name	8-Digit Basin Number	Impairment	Year	Comment
Chesapeake Bay Mainstem 3 Mesohaline	02139997, 02130511, 02130505, 02130903	Nutrients & Sediment	2010	Bay TMDL
Chesapeake Bay Mainstem 4 Mesohaline	02139998, 02130511, 02131005	Nutrients & Sediment	2010	Bay TMDL
Chesapeake Bay Mainstem 4 Mesohaline (Tracy & Rockhold Creeks)	02131005	Bacteria	2006	
Little Patuxent River	02131105	Sediments	2011	
Magothy River Mesohaline	02131001	Nutrients & Sediments	2010	Bay TMDL
Magothy River Mesohaline (Mainstem, Forked Creek, & Tar Cove)	02131001	Bacteria	2006	
Patapsco River Lower N. Branch	02130906	Bacteria	2009	
Patapsco River Lower N. Branch	02130906	Nutrients & Sediments	2009, 2011	Bay TMDL
Patapsco River Mesohaline	02130902, 02130903	Nutrients & Sediments	2010	Bay TMDL
Patapsco River Mesohaline (Baltimore Harbor)	02130903	Nutrients	2007	Bay TMDL
Patapsco River Mesohaline (Furnace & Marley Creeks)	02130903	Bacteria	2011	
Patuxent River Oligohaline	02131101	Nutrients & Sediments	2010	Bay TMDL
Patuxent River Tidal Fresh	02131102	Nutrients & Sediments	2010	Bay TMDL
Patuxent River Upper	02131104	Bacteria	2011	
Patuxent River Upper	02131104	Sediments	2011	
Rhode River Mesohaline	02131004	Nutrients & Sediments	2010	Bay TMDL
Rhode River Mesohaline (Bear Neck & Cadle Creeks)	02131004	Bacteria	2006	
Severn River Mesohaline	02131002	Nutrients & Sediments	2010	Bay TMDL
Severn River Mesohaline (Mainstem, Mill, Meredith, and Whitehall Creeks)	02131002	Bacteria	2008	
South River Mesohaline	02131003	Nutrients & Sediments	2010	Bay TMDL
South River Mesohaline (Mainstem, Duvall Creek, Ramsey Lake, & Selby Bay)	02131003	Bacteria	2005	
West River Mesohaline	02131004	Nutrients & Sediment	2010	Bay TMDL
West River Mesohaline (Mainstem & Parish Creek)	02131004	Bacteria	2006	

*Note: Local TMDL is superceded by the Bay TMDL if the latter is more stringent.

In late FY14 and early FY15, Anne Arundel County executed contracts to develop restoration plans for the nine TMDLs that have been approved for bacteria impairments and for three (3) TMDLs that have been approved for sediment impairments. These TMDL restoration plans are currently in draft format. As required by the permit these restoration plans will identify a suite of structural and non-structural projects and programs necessary for meeting the WLAs identified in the individual TMDLs and will include detailed cost

estimates and a schedule for implementation. These restoration plans are being developed pursuant to the following MDE guidance documents:

- *"Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated – Guidance for National Pollutant Discharge Elimination System Stormwater Permits". August 2014*
- *"General Guidance for Developing a Stormwater Wasteload Allocation (SW-WLA) Implementation Plan". May 2014*
- *"Guidance for Developing a Stormwater Wasteload Allocation Implementation Plan for Bacteria Total Maximum Daily Loads". May 2014*
- *"Guidance for Developing Stormwater Wasteload Allocation Implementation Plans for Nutrient and Sediment Total Maximum Daily Loads." November 2014*

Although they were not developed during this FY14 reporting period, draft restoration plans to meet the bacteria and sediment stormwater WLAs are submitted to MDE, as required by the permit, as **Appendix G** of this NPDES MS4 Permit Annual Report. The County anticipates concurrently advertising the availability of these reports for review and comment as per the requirements of **Part IV.E. 3** of this permit (below).

The twelve (12) remaining TMDLs, those with stormwater WLAs for nutrients and sediment, approved prior to the issuance date of the permit are being addressed via the Chesapeake Bay TMDL through the County's Phase II Watershed Implementation Plan (WIP) and associated Programmatic and Implementation 2-Year Milestones. The County submitted its first set of 2 – Year Milestones (2012-2013) on July 2, 2012 as part of its Phase II WIP submittal. MDE conducted an evaluation of the County's progress toward meeting those 2-Year Milestones in July, 2014. The County received "High" ratings in most Milestone categories. MDE found that the County had made significant commitments to the stormwater sector as well as the septic and wastewater sectors. MDE also found that although substantial progress was made, follow through on commitments related to securing legal authorities and public engagement needed to be reflected in future milestones. In February 2014 Anne Arundel County submitted its 2014-2015 2-Year Milestones. An interim progress report on those milestones will be submitted to MDE by January 30, 2015.

The County's Phase II WIP, 2-Year Milestones and progress reports can be found at:
www.mde.state.md.us/programs/Water/TMDL/TMDLImplementation/Pages/WIPPhaseIICountyDocuments.aspx

3. Public Participation

Anne Arundel 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. Anne Arundel County shall provide:

a. Notice in a local newspaper and the County's web site 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.

Status:

The County provides information on watershed assessment and restoration via the County website (www.aarivers.org) as well as through our interactive online mapping application. As watershed assessments are completed, the associated study reports are published on the WPRP webpage as noted in **Part E.1**. Additionally, restoration projects are highlighted on the WPRP webpage. Future watershed assessments to be initiated in FY15 will also include local news media notification regarding availability of information from these assessments.

As originally reported in the 2010 Annual Report, the County developed an interactive online mapping application to track restoration projects undertaken by non-County organizations such as the Watershed Stewards Academy, grassroots environmental preservation groups, and local Riverkeepers. The mapping application also allows these organizations, and anyone with internet access and interest, to open the mapping application and view the many data layers that have resulted from the County's watershed assessments. Since 2010, the County has provided additional functionality to this mapping application by making changes to the overall look and feel of the application. Most recently, the viewer was changed to a more robust Geocortex viewer. This required a change in the URL of

the mapping application, the new address is http://gis-world2.aacounty.org/silverlightviewer/?Viewer=WERS.

During FY2015 and as TMDL Implementation Plans are drafted and new watershed assessments initiated, the County will provide notice of these activities in local newspapers and on social media outlets. The County recognizes the importance of public input into these studies and plans and will provide a minimum of 30 days for public comment on draft TMDL implementation plans as well as watershed assessment reports. Draft documents will be made available for review and/or download through the County webpage, and a minimum number of hard copy reports will also be made available on request. Prior to final acceptance, a summary of the comments received and County response will be incorporated into each document.

4. TMDL Compliance

Anne Arundel 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. Anne Arundel 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.

Status:

As noted earlier, Anne Arundel County continues to work collaboratively with MDE and various stakeholders within the County to implement individual watershed restoration plans and the Chesapeake Bay TMDL Watershed Implementation Plan (WIP) to reduce the nutrient and sediment load within Anne Arundel County's portion of three major tributary basins (Lower Western Shore, Patuxent, and Patapsco). Individual TMDL restoration plans were recently drafted and submitted, with this report, for MDE review and comment (see **Part IV.E.2.b**). Implementation of activities associated with the Chesapeake Bay TMDL stormwater WLA for Anne Arundel County have been ongoing since FY2013. Detailed information pertaining to the County's progress toward achieving programmatic and implementation milestones associated with the County's Phase II WIP were reported to MDE on 31 January 2015 as previously documented in this section.

With respect to the net change in pollutant loads necessary to meet TMDL requirements, **Appendix A, Table G** of this report lists the pollutant load reduction summary for completed water quality improvement projects, alternative stormwater controls, and enhanced management programs implemented by the County through the end of this reporting period. This summary includes both those water quality improvement projects implemented between 2008 and February 2014, and those projects, alternative controls, and management programs implemented after issuance of the 4th generation Permit (February 2014 through June 2014). The net pollutant load reductions associated with the County's cumulative stormwater management and restoration efforts, and the County's Chesapeake Bay TMDL stormwater WLA are shown below in Table 7. Pollutant Load Reductions and Waste Load Allocations (WLA). The remaining reduction required to meet the SW WLAs are to be achieved by 2025.

Table 7. Pollutant Load Reductions and Waste Load Allocations (WLA)

	SW WLA Delivered	Required Reduction to Meet WLA	Load Reduction Achieved	Remaining Reduction Needed
Total Nitrogen (lbs/yr)	449,641	207,742	5,192	202,550
Total Phosphorus (lbs/yr)	30,147	26,385	3,016	23,369
Total Suspended Sediment (Tons/yr)*	2,323	4,786	504	4,282
*Numbers derived from MAST scenario run spreadsheet dated July 2012.				

Water quality improvement projects and programs implemented from 2008 through the end of the reporting period are documented **Appendix J.** This spreadsheet includes the total cost associated with each project and program included this accounting.

Project costs incurred during the reporting period, and associated with stormwater programs, restoration projects, and street sweeping, are provided in **Part IV. G** of this Report. More specifically, for the time period of February 2014 through June 30, 2014, the County implemented nine BMP (i.e. Pond) retrofits, two stream restoration projects, and swept one hundred six curb miles of roadway for a cost of $2,547,465. The total pollutant load reductions associated with these specific actions are included in the above summary table and are detailed below:

- 611.5 lbs/year of Total Nitrogen,
- 121.6 lbs/year of Total Phosphorus, and
- 32.2 tons of Total Suspended Solids.

.The County continues to work toward meeting the TMDL targeted goals, and it is anticipated that 275 Capital Program water quality improvement projects will be in the design stage for the next permit reporting period as previously mentioned in **Part IV C.6** of this report. Information on projected costs, through FY2020, to complete the restoration projects identified and budgeted for TMDL and MS4 Permit compliance can be found in the County's current (FY15) capital budget. These budgets are available on the County webpage (www.aacounty.org/Budget/index.cfm). The Capital Budget Program Class for Watershed Protection and Restoration Projects identifies and provides cost estimates for those projects specifically identified to meet stormwater WLAs and MS4 restoration requirements. A summary of projected funding from FY15 through FY20 is:

FY15: $78,927,300
FY16: $76,582,100
FY17: $75,815,100
FY18: $75,750,300
FY19: $76,673,000
FY20: $80,189,200

It is important to note that the Capital Program budget for FY16 and beyond is approved but funding has not been appropriated. Much like the operating budget, the Capital Program funds are appropriated on a fiscal year basis.

Part IV. E.4.e. of Anne Arundel County's NPDES MS4 permit requires the development 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.

During the 2012 development of *Maryland's Phase II Watershed Implementation Plan (WIP) For The Chesapeake Bay*, Anne Arundel County with the concurrence of the State of Maryland and EPA recognized the need for adaptive management in the WIP development and implementation process. As discussed in *Maryland's*

Phase II Watershed Implementation Plan For The Chesapeake Bay, March 20, 2012, as implementation moves forward achievement of stormwater waste load allocation goals needs to be evaluated and watershed restoration plans modified in response to the rate of progress, additional modeling results, and resource availability.

Anne Arundel County took a conservative approach when developing the urban stormwater component of its Phase II WIP. The County's strategy was structured to achieve the Edge of Stream (EOS) final target load derived from the County's Watershed Management Tool (WMT) baseline estimate which was higher than the MAST baseline estimates. In addition, the strategy included only restoration and preservation recommendation for the seven watersheds that were assessed at the time the County's Phase II WIP was developed in July 2012. Restoration opportunities for load reduction from the Little Patuxent, West and Rhode Rivers, Herring Bay and Middle Patuxent River watersheds were not identified nor taken into account.

Further, Anne Arundel County adopted legislation in June 2013 to create the WPRP, including a Stormwater Remediation Fee (Fee). The Stormwater Remediation Fee is structured to provide sufficient funding for projects to meet the pollutant load reduction required by the Chesapeake Bay TMDL, EPA-approved individual TMDLs with a stormwater WLA, and to meet the impervious surface management requirements as well as other stormwater obligations set forth in the County's NPDES MS4 Permit. Given the basis upon which the Fee was established, at this time, funding to achieve applicable stormwater WLAs is considered to be sufficient.

Adaptive management is a critical component of achieving the WLAs required by the County's NPDES MS4 Permit. The Chesapeake Bay TMDL and individual approved TMDLs have clearly established load reduction targets. 2-Year Implementation Milestones have been established by the County to provide interim planning targets and to serve as a vehicle for assessing progress toward the load reduction targets. Progress will be measured through three approaches: tracking implementation of management measures, estimating load reductions through modeling, and tracking overall program success through long term monitoring. Planning targets will then be re-evaluated against progress and revised to ensure that Anne Arundel County is on track to meet its goals. Progress assessments are scheduled for 2017 and 2021, with 2025 set as the final date for achievement of loads reductions.

Following the adoption of its Stormwater Remediation Fee in 2013 Anne Arundel County developed a 6-year Capital Improvement Program (CIP) in FY14 that created a Watershed Protection and Restoration Program (WPRP) Class of projects to implement those restoration projects identified in the County's Phase II WIP for achieving stormwater WLAs. Funding for this class of projects

averages 74 million dollars annually. Projects in the WPRP Class were identified and prioritized through a planning level assessment and consist of restoration of ephemeral and perennial streams with a MBSS Maryland Physical Habitat Index (MPHI) score of severely degraded or degraded; implementation of stormwater/water quality treatment at currently untreated stormwater pipe outfalls (greater than 24 inches), and retrofit of stormwater management ponds built prior to 2002, with drainage areas in excess of 10 acres, to optimize pollutant reduction and ecosystem functions for the facilities. As WPRP projects are funded, more detailed feasibility and constructability assessments are conducted. These assessments may result in identifying projects previously thought to be implementable but due to a variety of reasons are not; or identifying additional and new opportunities for load reduction. As these feasibility assessments are completed the County will incorporate these findings into its modeling, reassess anticipated load reductions and adapt its implementation program to delete or add projects.

At this time, multiple lines of evidence including results of several model runs, monitoring data, and the most recent science on BMP effectiveness and water quality response will be evaluated as part of TMDL compliance assessment. The milestones and progress assessments will contribute to continual reassessment of management plans, and adapting responses accordingly as technologies and efficiencies change, programs mature, credit trading is enacted, and regulations are put in place.

F. Assessment of Controls

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 the Parole Plaza outfall and Church Creek in- stream station in the South River 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:

a. <u>Chemical Monitoring</u>

i. Twelve 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 samples determined to be representative of each storm event shall be submitted to a laboratory for analysis according to methods listed in 40 CFR Part 136 and EMC shall be calculated for:

Biochemical Oxygen Demand (BOD_5)	***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 an 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 TMDL with a stormwater WLA.

Status:

Anne Arundel County continues to conduct a long-term monitoring program to satisfy the above permit conditions. This monitoring program includes chemical, biological, and physical monitoring in the Church Creek subwatershed located in the South River Watershed. Monitoring for this permit reporting period extended from July 2013 through June 2014. The full Church Creek monitoring report can be found in **Appendix B** and the data required to support this section are also provided in **Appendix A** in the prescribed format.

The chemical monitoring activities take place at two monitoring stations in the Church Creek subwatershed:

- Parole Plaza Station: Outfall representing a highly impervious (87 percent) commercial land use which was redeveloped in 2007 as the Annapolis Towne Centre; the construction incorporated stormwater management into the redevelopment (i.e. a restoration station); and
- Church Creek Station: An instream station approximately 2,000 feet downstream of the Parole Plaza monitoring station.

During the 2014 reporting period, seven storm events were sampled and five baseflow samples were collected and analyzed. Storm event samples were collected from both stations for the rising, peak, and falling limbs of the hydrograph. Samples were analyzed for the parameters, including Hardness which became a requirement in the fourth generation NPDES MS4 Permit which took effect in February 2014.

Continuous water level measurements were taken at the Church Creek instream station and within both the 60" corrugated metal pipe and the 54" reinforced concrete pipe at the Parole Monitoring Station. Event Mean Concentrations (EMCs) for each parameter were calculated for each storm and applied to total stormflow discharges to calculate stormflow pollutant loads for each site. An EMC is a statistical parameter used to represent the flow-weighted average concentration of a given parameter during a storm event (USEPA 2002). Total seasonal loads were calculated by multiplying the average seasonal EMC by the total volume for the season. Annual loads were calculated by summing all seasonal loads.

As in prior years, comparisons to water quality criteria continue to indicate elevated pollutant concentrations in the Church Creek watershed, primarily during wet weather conditions. In particular, copper, zinc, total phosphorous, BOD5, nitrate-nitrite, and E. coli frequently exceeded criteria at both sampling stations. Additionally, the Federal water quality criteria were exceeded for total phosphorous, nitrate-nitrite and E. coli during baseflow sampling at both the Church Creek and Parole Plaza Stations, with lead, copper, zinc and BOD5 also being exceeded at the Parole Plaza station.

Water quality criteria for the pollutants listed above were more frequently exceeded at the Parole Plaza monitoring station than at the Church Creek station for all contaminants except for BOD5. Total phosphorous, nitrate-nitrite and E. coli concentrations remained high at both stations throughout the 2014 monitoring period, exceeding water quality criteria for at least 90% of the time at both Church Creek and Parole Plaza. Note that prior to site stabilization, total suspended solids concentrations had been particularly high due to construction activity at Annapolis Towne Centre. Following stabilization of the site in Fall 2008, the event mean concentrations for total suspended solids have dropped significantly. During the last three reporting years, no wet weather samples exceeded the water quality criterion for total suspended solids at either station.

During the 2014 reporting year, loading rates increased for all sampled parameters at the Parole Plaza Station when compared to the 2013 reporting year except for E. coli. At the Church Creek Station, 2014 reporting year loading rates increased for all sampled parameters when compared to the 2013 reporting year except for BOD5, zinc and lead. The sharp increase in E. coli loads at the Church Creek station may be due to an increase in pet waste washing into the storm drain system as a result of the likely increase in occupancy of the Annapolis Towne Centre residential buildings. This same increase was observed at the Parole Plaza station during the 2013 reporting year, but a slight decrease in E. coli loads occurred at this station in 2014.

Hardness was much higher in the winter at both stations due to the large amount of road salt used to deice local roads during a winter that produced an abnormally large amount of snow and ice. TKN and nitrate-nitrite loads were also highest in the winter months at each station. Water chemistry monitoring during the 2014 winter months consisted solely of baseflow sampling, and the higher natural background nitrogen concentrations observed during baseflow (which are often diluted during storm events) is the likely cause of the elevated winter TKN and nitrate-nitrite loads. All other Church Creek pollutant loads, except E. coli, were highest in the spring. The increase in metal and total phosphorus loads were likely associated with the increase in TSS, which is likely a product of accelerated stream bank erosion occurring after several freeze-thaw cycles facilitated by the consistent swings in temperature observed during the 2014 winter. All metal, total phosphorus, and TSS loads were highest in the fall at the Parole Plaza station, which is primarily due to the total volume of water passing through this station in the fall being much higher than volumes observed in the other seasons. It should be noted, however, that the limited number of samples collected for each season ultimately makes it difficult to draw strong conclusions about seasonal pollutant loading rates. These interpretations should be viewed cautiously.

Further discussion of the monitoring activities at these stations and the resulting data can be found in the included monitoring report in **Appendix B**.

b. <u>Biological Monitoring</u>

i. Benthic macroinvertebrate samples shall be gathered each Spring between the outfall and in-stream stations or other practical locations based on an MDE 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.

Status:

A total of four 75-meter biological monitoring reaches are positioned along Church Creek between the Annapolis Towne Centre outfall and the Church Creek in-stream water quality monitoring station. Benthic macroinvertebrate samples were collected from these stations in March 2014, following the MBSS spring index period protocols. One station is located on the Parole Plaza Tributary just below Forest Drive, two stations are located along the Church Creek mainstem, on either side of Solomons Island Road (Maryland State Highway 2), and a fourth site, located just upstream of the confluence with the Parole Plaza Tributary, was added in 2007 to monitor the effects of runoff from the adjacent Annapolis Harbour Center and Festival at Riva shopping centers.

The biological condition at each station was evaluated using the BIBI developed for use in Maryland's Coastal Plain streams. Results of the 2014 sampling period indicate that biological conditions within the Church Creek study area continue to be impaired by urbanization within the surrounding watershed. Since 2006, all stations have consistently been rated as either 'Poor' or 'Very Poor.' The number of EPT taxa, the number of *Ephemeroptera* and the percent *Ephemeroptera* were low for all stations.

The physical habitat quality was evaluated using both the MBSS Physical Habitat Index (PHI) and EPA's Rapid Bioassessment Protocol (RBP). The stream physical habitat remains degraded throughout the entire study reach and appears to have changed very little from prior years. Overall, PHI and RBP scores indicate that habitat conditions limit the potential for healthy biological communities. The close proximity to roads and development, along with a lack of instream woody debris and stable epifaunal substrate, prohibits the stream from supporting a diverse and healthy macroinvertebrate community. Elevated levels of dissolved solids indicate the presence of water quality stressors. These appear to be a few of the factors limiting the biological conditions within Church Creek. The results of the biological monitoring program are included in **Appendix B**.

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;

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

***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.**

Status:

Due to the highly altered conditions of the drainage area and stream channel in the study area, reliable bankfull indicators were often difficult to locate in the field, thus leading to a fair amount of professional judgment used to interpret the data and categorize the stream segments. This means that categorization of some of the stream segments may change dramatically from year to year. Table 8 is a summary of each reach and its classification.

Table 8. Physical Characterization Summary

Reach	2013 Classification	2014 Classification	Notes
XS-1	F4	F5/4	Channel degradation, loss of floodplain connectivity, and widening indicate this channel is not stable.
XS-2	G5c	G4c	Actively degrading and widening with lack of sinuosity; shifting to a less-stable form.
XS-3	G4c	G4c	This section was recently stabilized with modification to the channel dimensions.
XS-4	C5	C5	Low entrenchment, low width/depth ratio, low slope, and well-connected floodplain.
XS-5	F4/3	F3	Slight entrenchment, moderate width/depth ratio, and low sinuosity.

While geomorphic data collected in the Church Creek study area were generally consistent with previous measurements, significant departure from expected values, as derived from Maryland Coastal Plain regional relationships of bankfull channel geometry, were observed for cross sectional area, bankfull width, and bankfull depth dimensions. All dimensions were generally larger in the Church Creek study area, and were more similar to relationships of bankfull channel geometry derived from urban watersheds. This reflects the higher level of imperviousness in the study area, as compared to those levels in the drainage areas used to develop the regional relationship data.

Additional information and data pertinent to the water quality, biological, physical and habitat assessments of Church Creek are included in the *Chemical, Biological, and Physical Characterization of the Church Creek and Parole Plaza NPDES Monitoring Stations: 2013-2014*, located in **Appendix B**.

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.

Status:

The required chemical monitoring results are found in **Appendix A**. This database has been revised to comply with the formatting requirements as per the fourth generation Permit issued in February 2014. Also included in **Appendix B** is the report entitled *Chemical, Biological, and Physical Characterization of the Church Creek and Parole Plaza NPDES Monitoring Stations: 2013-2014,* which provides greater detail on the work performed in this watershed.

During the 2015 reporting year, the County will continue the monitoring program at the Church Creek and Picture Spring Branch Stations. The County is currently investigating other potential candidate sites for the long term monitoring program and, should an appropriate candidate site be identified, will propose the relocation of the monitoring stations to MDE.

2. Stormwater Management Assessment

The County shall continue monitoring the Picture Spring Branch in the Severn River 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 Picture Spring Branch 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.

Status:

Physical condition and habitat monitoring for Picture Spring Branch, in the vicinity of the West County Library site, began in 2003 and is conducted annually. Five permanent cross-sections were established throughout the study area to evaluate channel stability over time (see **Appendix C** for a location map). Three cross-sections are located on the North Tributary, including one downstream of Maryland State Highway 170, and one on the South Tributary. It should be noted that the South Tributary does not receive significant stormwater runoff from the West County Library site. The majority of the runoff from this site drains to the North Tributary.

In 2014, these cross sections were re-measured and longitudinal profile surveys were conducted along both the North Tributary (totaling 1,935 linear feet) and South Tributary (totaling 366 linear feet). Channel dimensions along the North Tributary have not changed substantially from baseline conditions, although some minor aggradation was noted. Channel dimensions appear moderately constant for three out of the five cross sections in 2014, compared to baseline conditions. Only very minor changes were observed from baseline conditions in cross section XS-2, showing signs of minor aggradation in this overwidened reach. On the other hand, cross sections XS-1 and XS-4 have experienced a 37.5% and 31.6% increase over baseline conditions, respectively. Not surprisingly, these are the only two sections not located in an engineered or partially-armored channel. However, when comparing the most recent four years of data, only minor changes are shown where XS-1 has degraded by 9.3% while XS-4 has aggraded by 7.5%. Although cross section XS-4 has filled in slightly between 2013 and 2014, notable stream bed erosion is apparent. Between 2012 and 2013, the cross section area of XS-4 increased significantly by 62.8%. Cross sections XS-3 and XS-5 decreased in cross-section areas between the baseline assessment and the 2014 survey by 8.4% and 8.2%, respectively. These two stations also show a similar change between 2011 and 2014 surveys by a decrease of 5.5% and 6.3%, respectively. During the 2014 survey, slight deposition was seen along the right bank of cross section XS-3.

Overall, it appears that the BMPs installed as part of the development of the West County Library site have been effective in reducing the geophysical impacts of stormwater runoff. As noted previously, the South Tributary does not receive significant amounts of drainage from the West County Library site.

In March 2014, a biological assessment was conducted at three previously established 75-meter reaches within the study area. From 2006 to 2008, biological condition in these reaches appeared to remain fairly steady with ratings of ‘Fair’ to ‘Poor’; however, during 2009 scores declined at all three sites with two of the sites rating ‘Poor’ and one rating ‘Very Poor’. Between 2009 and 2014, BIBI scores have been somewhat variable, fluctuating between the ‘Poor’ and ‘Fair’

categories. In 2012 all sites received a rating of 'Fair', and in 2013 two of three sites received a rating of 'Fair' while one returned to the 'Poor' category. In 2014 the ratings for all sites returned to the 'Poor' category. The full biological and geomorphological conditions report is included in **Appendix C**.

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.

Status:

The 2014 Annual Report covers the reporting period of July 2013 to June 2014, and corresponds to the County's 2014 Fiscal Year (FY2014). The summary of funding for this reporting period is shown in this section (Table 9). The funding period reflects the initial year of the revenue change from general obligation bonds and County pay-go funding to the dedicated special revenue from the WPRP. The Watershed Protection and Restoration Fund (WPRF) was implemented July 1, 2013 in response to State legislated requirements found in HB987. This Fund now provides the primary fiscal support for all eligible components of the NPDES MS4 Permit program. Those permit-required elements not eligible for funding through WPRP will continue to be supported through the County's annual budget process (general revenue funds).

During the reporting period, funding for NPDES MS4 Permit compliance was addressed through the County CIP and fiscal year operating budgets. CIP funding for the current County fiscal year and the next five fiscal years is allocated to the "Stormwater Runoff Controls," "Water Quality Improvements" and "Watershed Protection and Restoration" CIP project classes. Specific line items funded through the CIP include stormwater permit compliance program; storm drain rehabilitation; closed storm drain repairs and replacement; stormwater infrastructure inspection and maintenance; stormwater facility retrofits; outfall repairs; and stream and ecological restoration projects.

The capital budgets for "Stormwater Runoff Controls" and "Water Quality Improvements" project classes are being phased into the Watershed Protection and Restoration CIP project class. When all ongoing capital projects from these two project classes are completed, the classes will be closed. New projects that would previously be funded in these two classes are now being incorporated into and funded through the "Watershed Protection and Restoration" CIP project class. The 6-year CIP budget (FY14 through FY19) for the "Watershed Protection and Restoration" project class is $460,000,000.

The Anne Arundel County operating budget for FY14 also provides permit compliance support through funding of personnel services (i.e., staff) associated with permit compliance. Such support is derived primarily from the County's OPZ, I&P, SCD, DPW, Office of Law, and the County Health Department. Each of these agencies has responsibility or provides support for certain permit requirements and that all must work collaboratively to achieve County compliance with permit terms. Funding for permit compliance has been included in the operating budgets for the WPRF.

With the implementation of the WPRF, a dedicated revenue source was created. Revenues for FY14 totaled $13,168,000. For the initial year of the funding program, 169,722 properties in Anne Arundel County were assessed a fee equal to 60% of the full fee. During FY2015, properties will be assessed 80% of the fee, with full implementation in FY2016. Estimated projections of revenue for FY2015 and FY2016 are $17,790,900 and $21,954,000 respectively. These revenues fund the operating budget directly, and the CIP budget indirectly through debt repayment on WPRF bonds.

The complete FY2014 approved County budget is available for review and download at www.aacounty.org/Budget/index.cfm.

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.

Status:

Table 9 denotes the distribution of funding from the County's FY2014 Capital and Operating Budgets. This table is provided below and also as an electronic file in the required spreadsheet format.

With the FY14 revenue associated with the WPRF, the County was able to begin increasing the number of staff dedicated to stormwater management program implementation and compliance with MS4 permit and TMDL requirements. Delays due to proposed legislation changes slowed these program enhancements somewhat. However, additional increases in staff will continue in FY15. These staffing levels will improve the commitment of the County in achieving MS4 permit compliance and maintaining adequate funding to meet permit obligations.

Table 9. Fiscal Analysis

Permit Condition	Fiscal Year 2014
Legal Authority	$79,300
Source ID	$573,685
SW Management	$382,344
Erosion and Sediment Control	$49,012
Illicit Discharge Detection and Elimination	$110,752
Trash and Litter Control	$222,073
Property Management	$8,331,864
Inlet Cleaning	$489,621
Street Sweeping	$36,808
Other Road Maintenance	$0
Public Education	$109,261
Watershed Assessment	$94,567
Watershed Restoration	$72,053,217
Chemical Monitoring Assessment	$133,779
Biological Monitoring Assessment	$216,201
Physical Stream Assessment	$89,121
Stormwater Design Manual Monitoring	$294,950
TMDL Assessment	$196,247
Annual Report Preparation	$46,983
Total Annual Cost for NPDES MS4 Program	**$83,509,785**

H. Discharge Characterization (Part D of Third Generation Permit)

Anne Arundel 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. Summaries of this dataset and other research performed nationally effectively characterize stormwater runoff in Maryland for NPDES municipal stormwater purposes. These data shall be used by Anne Arundel County for guidance to improve stormwater management programs and develop watershed restoration projects. Monitoring required under this permit is now designed to assess the effectiveness of stormwater management programs and watershed restoration projects developed by the County. Details about this monitoring can be found in Part III.H. (Fourth Generation Permit - Part IV.F.)

Status:

Discharge Characterization reporting is a requirement of the Anne Arundel County's prior NPDES MS4 Permit (Third Generation Permit). This requirement was not carried forward with the Fourth Generation NPDES MS4 Permit issued in February 2014. Thus, this specific section of the annual report will not be included in future years' reports.

As a component of the County's required watershed studies, Event Mean Concentration (EMC) data for the Anne Arundel County urban land covers were compiled for various studied pollutants (CWP 2005, CWP & VA DCR 2007, Pitt et al 2004). The EMC data are weighted mean values derived from statistical assessment of pollutant concentrations measured for multiple storm events. These data are currently utilized for assessing pollutant loadings using the EPA Simple Method.

During the 2005 to 2014 reporting years, the EMC discharge characterization values were applied to a wide array of land conditions to assist County staff, stakeholders, and decision makers in addressing water quality concerns. The EMC data were used in the EPA Simple Method to model pollutant loads, correlate the results with the drainage area contributory imperviousness, and develop pollutant loading goals associated with watershed and subwatershed assessments, as well as individual water quality restoration projects.

During the 2011 Phase II WIP development, the County reconciled its EMCs for various land covers with those used in the Chesapeake Bay Program's (CBP) Watershed Model (Version 5.3) such that the County's pollutant load modeling efforts would produce results analogous to those of the CBP Watershed Model. Subsequently, these EMCs were used to characterize pollutant loading and develop watershed restoration projects. Use of these reconciled EMCs will continue with future watershed assessments.

Recognizing that EMC values associated with the Bay Model may be updated in the coming years, the County continues to monitor and incorporate updates into its watershed modeling scenarios that support Part IV.E. of the Fourth Generation NPDES MS4 Permit. Additionally, as pre-2011 watershed assessments are updated and pollutant load models are re-run, the CBP Model values will be utilized in an effort to better align the County's pollutant loading estimates with the Bay Program and the Phase II WIP. Lastly, the County recognizes the importance of keeping records denoting the EMC values used in each of the pollutant loading characterizations undertaken as part of the watershed assessments.

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