

Introduction

The City of Waynesboro is located in the Shenandoah Valley at the foothills of the Blue Ridge Mountains with a population of just over 21,000 residents. The corporate limits total 15.1sq.mi. with 11.3sq.mi. being urbanized. The South River is the local watershed of the urbanized area, which is a tributary of the Shenandoah River, Potomac River and ultimately the Chesapeake Bay. In 2013, the City of Waynesboro was designated as a Phase II Municipal Separate Storm Sewer System (MS4) due to a significant portion of the City being considered an urbanized area following the 2010 census. Waynesboro's MS4 Program was adopted and implemented as part of the Stormwater Program in the Public Works Department.

The MS4 programs are regulated by the Commonwealth of Virginia under the Stormwater Act and federally by the Environmental Protection Agency under the Clean Water Act. The programs are structured by five-year permit cycles in accordance with the General VPDES Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems. The purpose of the program is to locally implement minimum control measures to reduce pollutant discharge from stormwater infrastructure into waterbodies. The permit includes the Chesapeake Bay Total Maximum Daily Load (TMDL), which requires reductions in phosphorous, nitrogen, and total suspended solids, pollutants of concern (POC) in a phased approach.

The 2013 Construction General Permit called for 5% POC reductions by 2018, an additional 35% by 2023 and the final 60% by 2028. Although the 2013 General Permit allowed the City to defer the 5% requirement for reductions by 2018 the City realized the magnitude of resources that would need to be applied to meet this full permit requirement. Consequently, the City initiated several projects and practices including the completion of a large constructed wetland and the purchase of a state-of-the-art street sweeper.

In 2015, the City of Waynesboro engaged Wiley|Wilson to assist with the development of a Chesapeake Bay TMDL Action Plan as part of this process. Wiley|Wilson assisted with an update to the City's Action Plan in 2018 using Table 3b in the General Permit that establishes the loading rates for the Potomac River Basin and also compiling data for Best Management Practices (BMP's) that were installed or operated prior to June 30, 2018. This document that is included as **Appendix A** covers the required components of an Action Plan including:

1. A description of the current program and existing legal authority.
2. New or modified legal authority necessary to meet the requirements of the Chesapeake Bay TMDL special condition.
3. Means and methods to address discharges from new sources.
4. Estimated existing source loads and calculated total pollutant of concern (POC) required reductions. The City's regulated area was determined using GIS data such as aerial imagery, contour lines, and surface water features.
5. Means and methods to meet the required reductions and schedule. The 2018 Final Draft detailed both BMP's the City has installed and other practices that have been implemented to meet pollution reduction requirements. **Table 1** below details how the City's means and methods have changed in anticipation of updated guidance on how to account for reductions from street sweeping and additional regular practices such as storm drain cleaning.
6. Means and methods to offset increased loads from new sources initiating construction between July 1, 2009 and June 30, 2014. The City did not have any development projects that used an average land cover condition greater than 16% for calculating post construction loading.

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7. Means and Methods to Offset Increased Loads from Grandfathered Projects Beginning Construction after July 1, 2014. The City did not have any development projects that fit this criteria and used an average land cover condition greater than 16% for calculating post construction loading.
8. An estimate of the expected cost to implement the necessary reductions. The City originally determined that it was in compliance with the 2023 goals.

Moving Forward

The City has updated sections of the document including modifications to legal authority, means and methods to reduce runoff pollution, and the associated cost estimates. The City has revised the means and methods to reach compliance by June 30, 2023 and therefore developed preliminary cost estimates for BMP's to make up the difference. These costs are included in **Table 2**.

New or modified legal authority:

- The Public Works Department will work with other City departments to responsibly update Property Maintenance regulations to allow for properly designed and maintained Land Use conversions to Mixed Open Space.
- Erosion and Sediment Control Ordinance – The City recently updated the Erosion Control Ordinance to include performance bonds for residential construction. The City enacted this provision for the purposes of increasing compliance with termination of residential construction sites.
- Stormwater Management Ordinance
- Stormwater Utility Ordinance
- Illicit Discharge Ordinance
- Zoning Ordinance
- Subdivision Ordinance

Means and methods to meet the required reductions and schedule: The City has identified additional projects and annual BMP's to meet permit obligations for decreasing stormwater runoff pollution. **Table 1** below details how the City's means and methods have changed in anticipation of updated guidance on how to account for reductions from street sweeping and additional regular practices such as storm drain cleaning. The City will continue to evaluate maintenance operations and implement measures when feasible. Any BMP's installed during these operations will be evaluated using current guidance for accounting pollution reductions and accounted for in MS-4 Annual Reports. In addition, the City reserves the right to implement other measures including but not limited to implementing offsets or purchasing credits from public or private sources.

- Street Sweeping - Although there has not been any formal guidance from DEQ regarding changes in reporting street sweeping reductions; the City is using the methods established in the Expert Panel Report on Street and Storm Drain Cleaning to develop sound annual estimates for pollutant removal using this practice beginning July 1, 2023.
- Storm Drain Cleaning – Annually, Waynesboro contracts storm inlet and pipe cleaning services to remove and dispose of debris prior to reaching the South River. The pollutant reduction of the collected mass is deduced by applying the storm cleaning credit guidance laid out by the Expert Panel Report on Street and Storm Drain Cleaning.

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- Stream Restoration – This is a very effective practice that the City has explored for achieving some of the planned reductions. The City has identified and continues to monitor sites where stream restoration may be feasible. But these sites are not strong enough candidates with current data and upland conditions such as agricultural use or pending development to designate at this time.
- Hopeman Station Level 1 Constructed Wetland – The City of Waynesboro has previously built two Constructed Wetland BMP’s in existing stormwater detention facilities. The City has identified another site for this practice in an existing basin with an approximately 70 acre drainage area consisting of moderate density residential development and open space. The estimated pollutant removal for this project is: 224 lbs. of TN, 33 lbs. of TP, and 25,689 lbs. of TSS. These estimated pollution reductions were derived by using the Potomac River Basin loading rates to determine the pollutant loads from Regulated Impervious and Pervious areas in the basin watershed. The efficiencies for a Level 1 Constructed Wetland in the VA BMP Clearinghouse were then applied to determine TN and TP removal. The TSS reductions were estimated by using an assumed .7” rainfall depth treated on the Stormwater Treatment Curve in the Retrofit Removal Adjustor Curve for Sediment from the Recommendations of the Expert Panel to Define Removal Rates for Urban Stormwater Retrofit Projects. This project is contingent on the City’s ability to take ownership of the existing basin and funding sources that may be diminished by the COVID-19 pandemic.
- Club Court Floodplain Parcels Land Use Conversion – The City of Waynesboro owns several residential building lots in the floodplain of the South River that previously had houses on them. These lots cannot be developed and are strong candidates for Land Use Conversion from managed turf to forest. Currently, the lots are mowed on a regular schedule by Parks and Recreation employees. The estimated pollutant reductions for this project are: 15 lbs. of TN, 4 lbs. of TP, and 1,482 lbs. of TSS. These estimated decreases in pollution were calculated by applying the Edge of Stream Loading Reductions for the Potomac River Basin for a Turf to Forest conversion.

Table 1.

BMPs implemented prior to July 1, 2018				
SITE	BMP TYPE	TN lbs/ac	TP lbs/ac	TSS lbs/ac
Street Sweeping Ongoing	Street Sweeping	487	159	229,710
Jefferson Park November 2016	Constructed Wetland	1,529	291	94,635
Pelham East October 2013	Constructed Wetland	190	53	Included in Jefferson Park
Ridgeview Park October 2013	Bio-retention	4	1	544
Fir Street March 2016	Land Use Change	1	1	418
Achieved to Date		1,739	391	116,841

Figure 1. Vicinity Map of Proposed Wetland Site

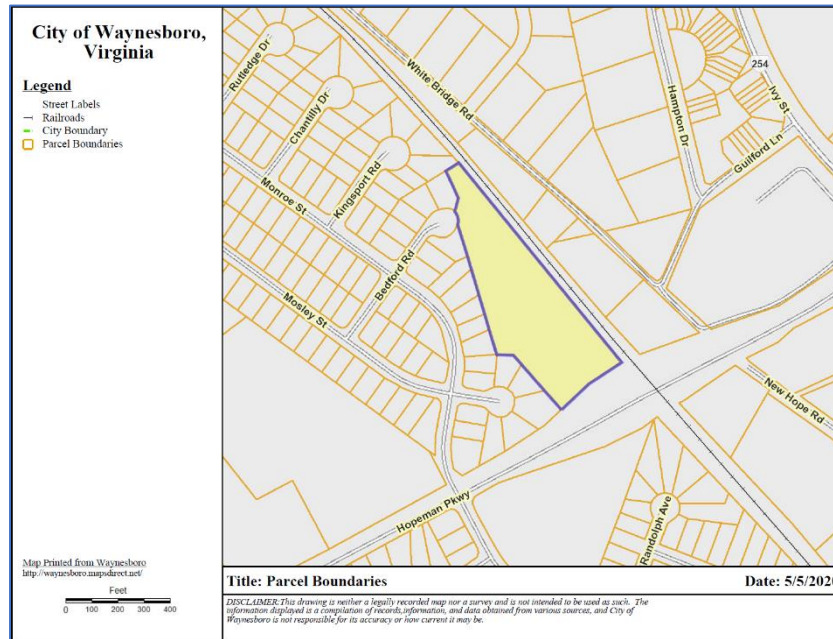
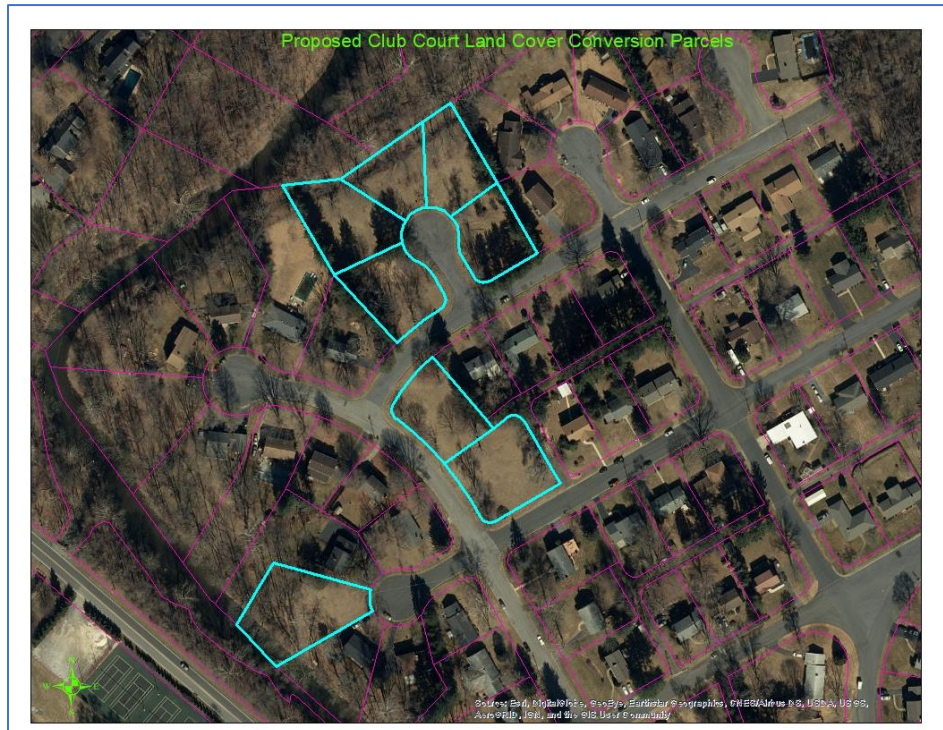


Figure 2. Vicinity Map of Proposed Land Conversion Parcels



Appendix A – City of Waynesboro 2018-2023 TMDL Action Plan

City of Waynesboro Virginia

Chesapeake Bay TMDL

2018 – 2023 Action Plan

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1.0 - Introduction

The City of Waynesboro is an independent City located in Augusta County, Virginia. The City was designated as regulated Small Municipal Separate Storm Sewer System (MS4) in August 2013. Waynesboro developed a stormwater management program that addresses the six minimum control measures established by the United States Environmental Protection Agency to comply with the General Permit. The Development of a Chesapeake Bay Total Maximum Daily Load (TMDL) Action Plan is an additional requirement of the Small MS4 general permit. As a new MS4 community, Waynesboro is required to complete the TMDL action plan by June 30, 2018. The TMDL Action Plan will be a critical planning tool used to provide permit compliance in a fiscally responsible manner. The following study was developed to characterize the City's watershed in preparation of plan development. The characterization reviews the existing program authorities, estimates existing source loads, identifies potential reduction means and methods, and reviews potential compliance costs.

2.0 - Current Program and Legal Authority

The City of Waynesboro implemented a MS4 stormwater management program in February of 2014. The program was developed to address the six minimum controls and the special conditions for the Chesapeake Bay TMDL. The MS4 program has been established with the appropriate legal authority to administer the requirements of the TMDL action plan. No additional authorities are required at this time.

3.0 - Means and Methods to Address Discharges from New Sources

The City of Waynesboro is required to provide means and methods to address discharges from new sources after July 1, 2009. Land disturbing activities in excess of one acre with an average impervious land cover greater than 16% are required to provide additional offsets. The City employed an average land cover condition of 16% for all land disturbing activities between July 1, 2009 and June 30, 2014. No additional reductions will be required to offset new sources during this time period.

Waynesboro developed and adopted a stormwater management ordinance that became effective July 1, 2014. The ordinance meets or exceeds the minimum requirements set forth by the Virginia Stormwater Management Act (62.1-44.15:24 et seq, Code of Virginia) and the Erosion and Sediment Control Act (62.1-44.15:67 et seq, Code of Virginia). All new land-disturbing activities that exceed one acre will be required to adhere to the stormwater management ordinance. No additional reduction will be required to offset new sources constructed after July 1, 2014.

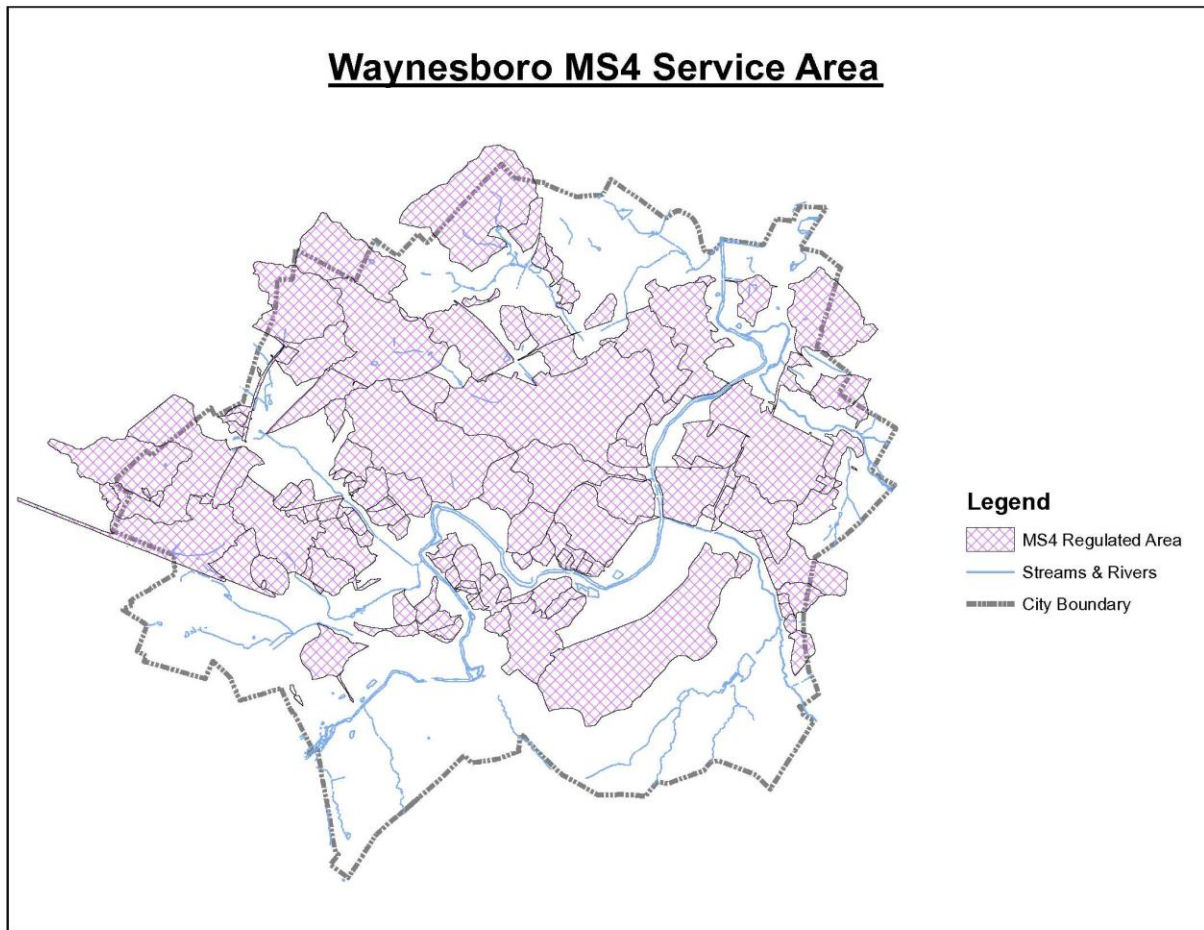
4.0 - Estimated Existing Source Loads and Calculated Total Pollutant of Concern Reductions

The Virginia Department of Environmental Quality requires that existing MS4 communities provide Pollutant of Concern (POC) reductions based on the 2009 service area during the current permit cycle (July 1, 2013-June 30, 2018). Future permit cycle reductions will be determined using expanded MS4 areas as determined by the 2010 census data. As a new MS4 community, Waynesboro is not required to provide any POC reductions during the current permit cycle. To determine anticipated second and third cycle reductions Waynesboro's load reductions have been developed utilizing the 2010 Census data. The following sections describe the methodologies used to determine the potential load reduction requirements.

4.1 – MS4 Service Area Delineation Methodology

Existing stormwater mapping, high-resolution aerial photographs (VGIN "Most Recent Imagery"), U.S. Census 2010 urbanized area boundaries, City of Waynesboro boundaries, and available topographic mapping were utilized to delineate the City's MS4 area. Each of these data sets was integrated into a GIS Environment and delineation determinations were developed utilizing best professional judgement. Field investigations were performed in areas where digital data was insufficient to make reasonable determinations. Areas of sheet flow into the City boundary and out from the City boundary were considered. The evaluation identified minimal interactions between VDOT and Augusta County. In accordance with DEQ TMDL guidance, some areas were eliminated from the MS4 regulated area. These include areas already covered by a general VPDES permit, areas which drain to surface waters without connection to MS4 infrastructure, and stream corridors. It is anticipated that further MS4 area refinement will be performed as additional information becomes available. The total MS4 service area was determined to be 5,518 acres.

Figure 1 – MS4 Service area map



4.2 – Pervious and Impervious Surface Calculations

The City of Waynesboro has developed extensive impervious area data sets as part of the implementation and operation of their stormwater utility fee. This data was generated by utilizing a combination of the best available aerial imagery and field verifications. The areas were digitized into GIS mapping. These mapping layers were then integrated into the MS4 service area delineation to determine the total regulated pervious and impervious area. Table 1 provides the acreage of each.

Table 1 – Regulated Pervious and Impervious Area

Subsource	Total Existing Acres Served by MS4
Regulated Urban Impervious	1,791
Regulated Urban pervious	3,727

4.3 – Estimating Existing Loads

The regulated urban pervious and impervious acreage was used to estimate the total existing source loads for each POC. The City is located within the Potomac River watershed, thus loading rates provided in Table 2b of the May 18, 2015 Chesapeake Bay TMDL guidance document were used. Table 2 provides a summary of the estimated existing source loads.

**Table 2 - Calculation Sheet for Estimating Existing Source Loads for the Potomac River Basin
(Based on Chesapeake Bay Program Watershed Model Phase 5.3.2)**

Subsource	Pollutant	Total Existing Acres Served by MS4	2009 EOS Loading Rate (lbs/acre)	Estimated total POC Load Based on 2009 Progress Run
Regulated Urban Impervious	Nitrogen	1,791	16.86	30,196
Regulated Urban pervious		3,727	10.07	37,531
Regulated Urban Impervious	Phosphorus	1,791	1.62	2,901
Regulated Urban pervious		3,727	0.41	1,528
Regulated Urban Impervious	Total Suspended Solids	1,791	1,171.32	2,097,834
Regulated Urban pervious		3,727	175.80	655,207

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4.4 – Required Reductions from Existing Loads

The City of Waynesboro is not required to achieve any reductions during the first permit cycle (July 1, 2013-June 30, 2018). However, due to the significant cost of compliance, estimated load reductions have been developed for planning purposes. These estimates are based on the current guidance document and model runs. These estimated loadings are likely to be modified as future bay model runs are established.

The load reductions required for the second and third permit cycles have not been defined in the current TMDL guidance document. Loading rates have been provided for the 5% reductions required by existing MS4 communities. These rates were then extrapolated to develop reduction rates for the second (40%) and third (60%) permit cycles. Tables 3 provides the worksheet for determining second cycle reduction requirements.

Table 3 - Calculation Sheet for Determining Total POC Reductions Required During the 2nd Permit Cycle for Waynesboro Virginia (Based on Chesapeake Bay Program Watershed Model Phase 5.3.2)

		A	B	C	D	E	F	G
Pollutant	Subsource	Loading Rate (ls/ac/yr)	Existing developed lands as of 6/30/09 served by the MS4 within the 2010 CUA (acres) ²	Loading (lbs/ac./yr)	MS4 required Chesapeake Bay total L2 Loading rate reduction	Percentage of L2 required loading rate reduction by 6/30/2023	40% cumulative reduction required by 6/30/2023 (lbs/yr)	Sum of 40% cumulative reduction (lb/yr)
Nitrogen	Regulated urban impervious	16.86	1,791	30,196	9%	40%	1,087	1,988
	Regulated urban pervious	10.07	3,727	37,531	6%	40%	901	
Phosphorus	Regulated urban impervious	1.62	1,791	2,901	16%	40%	186	230
	Regulated urban pervious	0.41	3,727	1,528	7.25%	40%	44	

Total Suspended Solids	Regulated urban impervious	1171.32	1,791	2,097,834	20%	40%	167,827	190,759
	Regulated urban pervious	175.8	3,727	655,207	8.75%	40%	22,932	

5.0 - Means and Methods to Meet Required Reductions

5.1 – Introduction

The City of Waynesboro is required to identify means and methods that may be employed to achieve the required second cycle pollutant reductions identified in section 4. The following sections describe how the City anticipates achieving the reductions required by the special condition. These strategies were developed using the TMDL Guidance Document published by the Department of Environmental Quality dated May 18, 2015.

5.2 – Existing Credits

The City of Waynesboro will use credits for existing projects and programs that have been previously implemented in accordance with DEQ’s TMDL guidance. The City will take credit for BMP’s that were installed between January 1, 2006 and June 30, 2009 that have not been previously reported to DEQ. The City will also receive credit for any structural BMP’s installed after July 1, 2009 providing treatment for previously untreated areas. The chart below identifies existing project crediting for each POC.

Table 4 - Existing Load Reductions

SITE	BMP TYPE	POLLUTANT REDUCTIONS (lbs/ac/yr)		
		TN	TP	TSS
Street Sweeping	Street Sweeping	487	159	229,710
Jefferson Park	Constructed Wetland	1529	291	94,635
Pelham East*	Constructed Wetland	190	53	
Ridgeview Park	Bio-retention	4	1	544

Fir Street	Land Use Change	1	1	418
Total		2,211	505	325,181

* - TSS reductions included in Jefferson Park

5.3 – New Projects Reductions

The City of Waynesboro continues to develop additional capital improvement projects that will have a positive impact on the water quality. The City reserves the right to move forward with additional projects as they are developed and funding is available. Constituent reductions will reported in the annual MS4 report. Credits will be applied to the City’s TMDL reductions requirements. Any credits above and beyond the required second cycle reductions will be applied to third cycle requirements. No specific new projects are being included in this action plan.

5.4 – Alternative Strategies

The City of Waynesboro reserves the right to modify this TMDL action plan to use strategies and/or methodologies that have not been included in this document. Those alternative strategies may be used to replace and/or enhance pollutant reduction strategies presented in the TMDL Action Plan. Alternative strategies may include, but are not limited to:

- Emerging BMP technologies
- Redevelopment credits
- Land use conversions
- Public private partnerships
- Trading

5.5 – Future Considerations

The existing programs and projects identified in section 5.2 exceed the required 2nd cycle permit reductions. In accordance with Part III of the 2013 TMDL guidance document, all TMDL credits in excess of current cycle requirements shall be credited towards future obligations. In addition, all additional projects identified in section 5.3 or otherwise shall be reported and credited to future obligations. Table 5 below identifies the anticipated 3rd cycle contributions.

Table 5 - Anticipated 3rd Cycle Credits

Credit Category	TN	TP	TSS
Existing Credits	2,211	505	325,181
New Project Credits	TBD	TBD	TBD
Required 2nd Cycle Reductions	1,988	230	190,759
Anticipated 3rd Cycle Carryover	223	275	134,422

6.0 - Means and Methods to Offset Increased Loads from New Sources Initiating Construction between July 1, 2009 and June 30, 2014

Land disturbing activities in excess of one acre utilizing an average impervious land cover greater than 16% are required to provide additional offsets. The City employed an average land cover condition of 16% for all land disturbing activities between July 1, 2009 and June 30, 2014. It is not anticipated that additional reductions will be required to offset new sources during this time period. The City will continue to evaluate potential grandfathered projects prior to completion of the Chesapeake Bay action plan.

7.0 - Means and Methods to Offset Increased Loads from Grandfathered Projects Beginning Construction after July 1, 2014

The City of Waynesboro does not have any projects that qualify as grandfathered projects in accordance with Virginia code 9VAC25-870-48. It is not anticipated that any offset reductions will be required at this time. The City will continue to evaluate potential grandfathered projects prior to completion of the Chesapeake Bay action plan.

8.0 –Cost of Compliance and Funding

The City of Waynesboro has obtained compliance with the Commonwealth of Virginia’s 2018-2023 requirements of the Chesapeake Bay TMDL. Continuing compliance with the Chesapeake Bay TMDL will be a costly endeavor for the City of Waynesboro. The City continues to evaluate the anticipated costs of full compliance as well as operation and maintenance of current best management practices. Waynesboro has developed a stormwater utility fee to aid in the funding of the TMDL program. The City will also continue to seek additional grant funding opportunities to advance the program.

9.0 – Public Comment on Draft Action Plan

This section to be included upon completion of public comment period