Town of Ashland
Chesapeake Bay TMDL Action Plan
Updated November 1, 2019

This document is the Town of Ashland's the Chesapeake Bay TMDL Action Plan, which demonstrates that the Town has:

1. Achieved and exceeded the POC reductions required at the end of the first permit cycle.
2. Calculated the full scope of offsets for existing development and new sources that are required to be made by the end of the second permit cycle; and,
3. Determined the methods that will be used to meet the reductions required by the end of the second permit cycle.

This Action Plan also includes:

1. A review of the current MS4 permit authority and implementation capabilities,
2. Existing, new, and modified legal authorities necessary to meet required reductions, if any;
3. An estimate of future grandfathered projects and their acreage, if any;
4. Expected costs for implementing the Action Plan; and,
5. A description of public comment process and period.

A draft Chesapeake Bay TMDL Action Plan was submitted to the Virginia Department of Environmental Quality (DEQ) for review and approval with the Town of Ashland's Registration Statement for reissuance of the VPDES General Permit for Small Municipal Separate Storm Sewer Systems (MS4s) by June 1, 2018. The November 1, 2019, update to the Chesapeake Bay TMDL Action Plan is being submitted to DEQ to become effective in accordance with the MS4 General Permit that was issued by DEQ in 2018.

Permit Requirements

1. Current program and existing legal authority

The following is a list of the Town's legal authorities that enable the Town to ensure compliance with this Action Plan:

a. Ashland, VA, Code of Ordinance Part II, Chapter 4.1, Article I: Stormwater Management, https://ashland.municipalcodeonline.com/book?type=code#name=ARTICLE_I_STORMWATER_MANAGEMENT ;
b. Ashland, VA, Code of Ordinance Part II, Chapter 4.1, Article III: Chesapeake Bay Preservation Area, https://ashland.municipalcodeonline.com/book?type=code#name=ARTICLE_III_CHESAPEAKE_BAY_RESERVATION_AREA ;
c. Ashland, VA, Code of Ordinance Part II, Chapter 4.1, Article V: Water Quality Protection, https://ashland.municipalcodeonline.com/book?type=code#name=ARTICLE_V_WATER_QUALITY_PROTECTION ;

d. Ashland, VA, Code of Ordinance Part II, Chapter 4.1, Article VI: Municipal Separate Storm Sewer Systems Management Program, https://ashland.municipalcodeonline.com/book?type=code#name=ARTICLE_VI_MUNICIPAL_SEPARATE_STORM_SEWER_SYSTEM_(MS-4)_MANAGEMENT_PROGRAM ;
e. Ashland, VA, Code of Ordinance Part II, Chapter 5: Erosion and Sediment Control, https://ashland.municipalcodeonline.com/book?type=code#name=5_EROSION_AND_SEDIMENT_CONTROL* ;
f. Town of Ashland's MS4 Program Plan, http://www.ashlandva.gov/DocumentCenter/View/42/MS4ProgramPlan ;
g. Town of Ashland Land Disturbance Permit, http://www.ashlandva.gov/DocumentCenter/View/37/Land-Disturbing-Permit-Application; and
h. Town Agreement in Lieu of Erosion & Sediment Control, Water Quality, and Stormwater Management, http://www.ashlandva.gov/DocumentCenter/View/36/Agreement-in-Lieu---Erosion--Sediment-Control--Water-Quality--Stormwater-Managment .

2. New or modified legal authority *(General Permit, Part II.A.11.a) Any new or modified legal authorities, such as ordinances, permits, policy, specific contract language, orders, and interjurisdictional agreements, implemented or needing to be implemented to meet the requirements of Part II A 3, A 4, and A 5.*

None required.

3. Load and Cumulative Reduction Calculations *(General Permit Section Part II.A.11.b)*) *The load and cumulative reduction calculations for each river basin calculated in accordance with Part II A 3, A 4, and A 5.*

Part II.A.3 Reduction requirements. No later than the expiration date of this permit, the permittee shall reduce the load of total nitrogen, total phosphorus, and total suspended solids from existing developed lands served by the MS4 as of June 30, 2009, within the 2010 Census urbanized areas by at least 40% of the Level 2 (L2) Scoping Run Reductions. The 40% reduction is the sum of (i) the first phase reduction of 5.0% of the L2 Scoping Run Reductions based on the lands located within the 2000 Census urbanized areas required by June 30, 2018; (ii) the second phase reduction of at least 35% of the L2 Scoping Run based on lands within the 2000 Census urbanized areas required by June 30, 2023; and (iii) the reduction of at least 40% of the L2 Scoping Run , which shall only apply to the additional lands that were added by the 2010 expanded Census urbanized areas required by June 30, 2023. The required reduction shall be calculated using Tables 3a, 3b, 3c, and 3d below as applicable.

Part II.A.4 No later than the expiration date of this permit, the permittee shall offset 40% of the increased loads from new sources initiating construction between July 1, 2009, and June 30, 2019, and designed in accordance with 9VAC25-870 Part II C (9VAC25-870-93 et seq.) if the following conditions apply:

a. The activity disturbed one acre or greater; and
b. The resulting total phosphorous load was greater than 0.45 lb/acre/year, which is equivalent to an average land cover condition of 16% impervious cover.
The permittee shall utilize Table 4 of Part II A 5 to develop the equivalent pollutant load for nitrogen and total suspended solids for new sources meeting the requirements of this condition.

Part II.A.5 No later than the expiration date of this permit, the permittee shall offset the increased loads from projects grandfathered in accordance with 9VAC25-870-48 that begin construction after July 1, 2014, if the following conditions apply:
a. The activity disturbs one acre or greater; and
b. The resulting total phosphorous load was greater than 0.45 lb/acre/year, which is equivalent to an average land cover condition of 16% impervious cover.
The permittee shall utilize Table 4 below to develop the equivalent pollutant load for nitrogen and total suspended solids for grandfathered sources meeting the requirements of this condition.

See Attachment 1 for Estimated Existing Source Loads: Table 2a (James River Basin) and Table 2b (York River Basin). Table 2 from General Permit First Cycle.

See Attachment 2 for Total POC Reductions Required During the First Permit Cycle: Tables 3a (James River Basin) Table 3d (York River Basin). Table 3 from General Permit First Cycle.

See Attachment 3 for Total POC Reductions Required During the Second Permit Cycle: Tables 3a (James River Basin) Table 3d (York River Basin). Table 3 from General Permit Second Cycle.

The MS4 General Permit requires post-construction stormwater runoff controls for:

a. New development and development on prior developed lands that are defined as large construction activities or small construction activities in 9VAC25-870-10;
b. New development and development on prior developed lands that disturb greater than or equal to 2,500 square feet, but less than one acre, located in a Chesapeake Bay Preservation Area designated by a local government located in Tidewater, Virginia, as defined in § 62.1-44.15:68 of the Code of Virginia; and
c. New development and development on prior developed lands where an applicable state regulation or local ordinance has designated a more stringent regulatory size threshold than that identified in subdivision "a" or "b" above.

The Town of Ashland's Ordinance requires that stormwater runoff controls be implemented for any land disturbing activity in excess of 2,500 s.f. There is an exception for single family residential development that is not part of a larger plan of development. Requirements for addressing stormwater runoff are described in the following sections of the Town Code:

a. Ashland, VA, Code of Ordinance Part II, Chapter 4.1, Article I: Stormwater Management, https://ashland.municipalcodeonline.com/book?type=code#name=ARTICLE_I_STORMWATER_MANAGEMENT ;

b. Ashland, VA, Code of Ordinance Part II, Chapter 4.1, Article III: Chesapeake Bay Preservation Area, https://ashland.municipalcodeonline.com/book?type=code#name=ARTICLE_III_CHESAPEAKE_BAY_RESERVATION_AREA ;
c. Ashland, VA, Code of Ordinance Part II, Chapter 4.1, Article V: Water Quality Protection, https://ashland.municipalcodeonline.com/book?type=code#name=ARTICLE_VI_MUNICIPAL_SEPARATE_STORM_SEWER_SYSTEM_(MS-4)_MANAGEMENT_PROGRAM ; and
d. Ashland, VA, Code of Ordinance Part II, Chapter 5: Erosion and Sediment Control, https://ashland.municipalcodeonline.com/book?type=code#name=5_EROSION_AND_SEDIMENT_CONTROL*;

Note that the Town of Ashland does not utilize an average land cover condition greater than 16% impervious cover for the design of post-development stormwater management facilities. Therefore, there are no New Source that disturbed one acre or greater as a result of the utilization of an average land cover condition greater than 16% impervious cover for the design of post-development stormwater management facilities.

For New Source that did not utilize an average impervious land cover condition greater than 16% for the design of post development stormwater management facilities additional offsets are not required beyond those for existing development. For New Source that disturbed less than 1 acre, additional offsets are also not required beyond those for existing development. However, if additional offsets were implemented, these offsets have been used to address the Town's total pollutant requirement.

The regulated area of Town in the James River Basin is 1,633.91 acres. This consists of 639.25 pervious acres, 439.73 impervious acres and excluded areas. Excluded areas for this calculation include 554.93 acres of forested land. Other Excluded areas include Interstate 95 and VDOT facilities, and Hanover County facilities totaling 9.25 acres impervious and 6.21 acres pervious. These facilities will we addressed under their respective MS4s.

The regulated area of Town in the York River Basin is 2,973.94 acres. This consists of 1,079.12 pervious acres, 732.04 impervious acres and excluded areas. Excluded areas for this calculation include 1,162.78 acres of forested land. Other Excluded areas may include Interstate 95 and VDOT facilities, and Hanover County facilities totaling 73.76 acres impervious and 74.48 acres pervious. These facilities will we addressed under their respective MS4s.

The impervious, pervious and forested land covers were calculated as follows. The Town began with the GIS dataset representing land cover (impervious, pervious, and forest) developed by the Richmond Regional Planning District Commission (RRPDC). Next, the Town asked its consultant, Timmons Group, to review and verify the data. Timmons Group performed a desktop analysis of the land cover data, comparing it with the Town boundary and with the most current aerial imagery. Discrepancies between the RRPDC land cover data and the Town boundary were corrected by editing the shape file to reflect the actual Town boundary and the most current aerial imagery. To ensure that the topology of the data was clean and accurate, a summation of

the area for impervious, pervious, and forest was compared to the area encompassed by the Town. The analysis resulted in the following break-down of land cover: 23% impervious cover, 26% pervious cover, and 51% forested cover.

To further refine the RRPDC information, the forested area was digitized by hand using aerial photography. Hanover County impervious planimetric data generated in 2008, including road edge and building outlines, was then processed against the updated land cover data to provide better connectivity of impervious surfaces. Finally, the data was visually analyzed for errors and discrepancies against aerial imagery to produce the final breakdown of present land cover in the Town of Ashland.

4. **Total reductions achieved as of July 1, 2018, for each pollutant of concern** *(General Permit Part II.A.11.c) The total reductions achieved as of July 1, 2018, for each pollutant of concern in each river basin.*

Attachment 4 shows the management practices and retrofit programs (including improvements from redevelopment) that were implemented between July 1, 2009 and the end of the first permit cycle to achieve the 5.0% reductions required for existing development. Also included in Attachment 4 are the management practices and retrofit programs that have or will be implemented between July 1, 2018, and November 1, 2019.

5. **List of BMPs implemented prior to July 1, 2018, to achieve reductions associated with the Chesapeake Bay TMDL** *(General Permit Part II.A.11.d) A list of BMPs implemented prior to July 1, 2018, to achieve reductions associated with the Chesapeake Bay TMDL including: (1) The date of implementation: and (2) the reductions achieved.*

See Attachment 4.

6. **BMPs to be implemented by the permittee prior to the expiration of this permit** *(General Permit Part II.A.11.e) The BMPs to be implemented by the permittee prior to the expiration of this permit to meet the cumulative reductions calculated in Part II.A.3, A.4, and A.5, including as applicable: (1) Type of BMP; (2) Project name; (3) Location; (4) Percent removal efficiency for each pollutant of concern; and (5) Calculation of the reduction expected to be achieved by the BMP calculated and reported in accordance with the methodologies established in Part II.A.8 for each pollutant of concern.*

See Attachment 5.

7. **Summary of comments received** *(General Permit Part II.A.11.f) A summary of any comments received as a result of public participation required in Part II.A.12, the permittee's response, identification of any public meetings to address public concerns, and any revisions made to Chesapeake Bay TMDL action plan for no less than 15 days. (General Permit Part II.A.12) Prior to submittal of the action plan required in Part II A 11, the permittee shall provide an opportunity for public comment on the additional BMPs proposed to meet the reductions not previously approved by the department in the first phase Chesapeake Bay TMDL action plan for no less than 15 days.*

The draft Chesapeake Bay TMDL Action Plan will be posted on the Town's website for public comment for 15 days. At the conclusion of the 15 days, comments received will be taken into consideration when developing the final version of the Action Plan. The Town will continue to post the Action Plan on the website, and will give consideration to any further comments received.

Attachment 1

Town of Ashland

Table 2 a: Calculation Sheet for Estimating Existing Source Loads for the James River Basin

***Based on Chesapeake Bay Program Watershed Model Phase 5.3.2**

Subsource	Pollutant	Total Existing Acres Served by MS4 (6/30/09)	2009 EOS Loading Rate (lbs/acre)	Estimated Total POC Load Based on 2009 Progress Run
Regulated Urban Impervious	Nitrogen	430.48	9.39	4,042.21
Regulated Urban Pervious		633.04	6.99	4,424.95
Regulated Urban Impervious	Phosphorus	430.48	1.76	757.64
Regulated Urban Pervious		633.04	0.5	316.52
Regulated Urban Impervious	Total Suspended Solids	430.48	676.94	291,409.13
Regulated Urban Pervious		633.04	101.08	63,987.68

Table 2 d: Calculation Sheet for Estimating Existing Source Loads for the York River Basin

***Based on Chesapeake Bay Program Watershed Model Phase 5.3.2**

Subsource	Pollutant	Total Existing Acres Served by MS4 (6/30/09)	2009 EOS Loading Rate (lbs/acre)	Estimated Total POC Load Based on 2009 Progress Run
Regulated Urban Impervious	Nitrogen	658.28	7.31	4,812.03
Regulated Urban Pervious		1004.64	7.65	7,685.50
Regulated Urban Impervious	Phosphorus	658.28	1.51	994.00
Regulated Urban Pervious		1004.64	0.51	512.37
Regulated Urban Impervious	Total Suspended Solids	658.28	456.68	300,623.31
Regulated Urban Pervious		1004.64	72.78	73,117.70

Attachment 2

Town of Ashland

Table 3 a: Calculation Sheet for Determining Total POC Reductions Required During the First Permit Cycle for the James River Basin

***Based on Chesapeake Bay Program Watershed Model Phase 5.3.2**

Subsource	Pollutant	Total Existing Acres Served by MS4 (6/30/09)	First Permit Cycle Required Reduction in Loading Rate (lbs/acre)	Total Reduction Required First Permit Cycle (lbs)	Totals (lbs)
Regulated Urban Impervious	Nitrogen	430.48	0.042255	18.19	31.46
Regulated Urban Pervious		633.04	0.02097	13.27	
Regulated Urban Impervious	Phosphorus	430.48	0.01408	6.06	7.21
Regulated Urban Pervious		633.04	0.0018125	1.15	
Regulated Urban Impervious	Total Suspended Solids	430.48	6.7694	2,914.09	3,194.05
Regulated Urban Pervious		633.04	0.44225	279.96	

Table 3 d: Calculation Sheet for Determining Total POC Reductions Required During this Permit Cycle for the York River Basin

***Based on Chesapeake Bay Program Watershed Model Phase 5.3.2**

Subsource	Pollutant	Total Existing Acres Served by MS4 (6/30/09)	First Permit Cycle Required Reduction in Loading Rate (lbs/acre)	Total Reduction Required First Permit Cycle (lbs)	Totals (lbs)
Regulated Urban Impervious	Nitrogen	658.28	0.032895	21.65	44.71
Regulated Urban Pervious		1004.64	0.02295	23.06	
Regulated Urban Impervious	Phosphorus	658.28	0.01208	7.95	9.81
Regulated Urban Pervious		1004.64	0.00184875	1.86	
Regulated Urban Impervious	Total Suspended Solids	658.28	4.6	3,028.09	3,347.98
Regulated Urban Pervious		1004.64	0.3184125	319.89	

Attachment 3

Town of Ashland

Table 3a

Calculation Sheet for Estimating Existing Source Loads and Reduction Requirements for the James River, Lynnhaven, and Little Creek Basins During the Second Permit Cycle

		A	B	C	D	E	F	G
Pollutant	Subsource	Loading Rate (lbs/ac/yr)[1]	Existing developed lands as of 6/30/09 served by the MS4 within the 2010 CUA (acres)[2]	Loading (lbs/yr)[3]	MS4 required Chesapeake Bay total L2 loading rate reduction	Percentage of L2 required reduction by 6/30/2023	40% cumulative reduction Required by 6/30/2023 (lbs/yr)[4]	Sum of 40% cumulative reduction (lb/yr)[5]
Nitrogen	Regulated Urban Impervious	9.39	430	4,042	9%	40%	146	252
	Regulated Urban Pervious	6.99	633	4,425	6%	40%	106	
Phosphorus	Regulated Urban Impervious	1.76	430	758	16%	40%	48	58
	Regulated Urban Pervious	0.5	633	317	7.25%	40%	9.18	
Total Suspended Solids	Regulated Urban Impervious	677	430	291,409	20%	40%	23,313	25,552
	Regulated Urban Pervious	101	633	63,988	8.75%	40%	2,240	

[1]Edge of stream loading rate based on the Chesapeake Bay Watershed Model Progress Run 5.3.2.

[2]To determine the existing developed acres required in Column B, permittees should first determine the extent of their regulated service area based on the 2010 Census Urbanized Area (CUA). Next, permittees will need to delineate the lands within the 2010 CUA served by the MS4 as pervious or impervious as of the baseline date of June 30, 2009.

[3]Column C = Column A x Column B.

[4]Column F = Column C x (Column D ÷ 100) x (Column E ÷ 100).

[5]Column G = The sum of the subsource cumulative reduction required by 6/30/23 (lbs/yr) as calculated in Column F.

Table 3d

Calculation Sheet for Estimating Existing Source Loads and Reduction Requirements for the York River and Poquoson Coastal Basin During the Second Permit Cycle

		A	B	C	D	E	F	G
Pollutant	Subsource	Loading Rate (lbs/ac/yr)[1]	Existing developed lands as of 6/30/09 served by the MS4 within the 2010 CUA (acres)[2]	Loading (lbs/yr)[3]	MS4 required Chesapeake Bay total L2 loading rate reduction	Percentage of L2 required reduction by 6/30/2023	40% cumulative reduction Required by 6/30/2023 (lbs/yr)[4]	Sum of 40% cumulative reduction (lb/yr)[5]
Nitrogen	Regulated Urban Impervious	7.31	658.28	4,812	9%	40%	173	358
	Regulated Urban Pervious	7.65	1,004.64	7,685	6%	40%	184	
Phosphorus	Regulated Urban Impervious	1.51	658.28	994	16%	40%	64	78
	Regulated Urban Pervious	0.51	1,004.64	512	7.25%	40%	14.86	
Total Suspended Solids	Regulated Urban Impervious	457	658.28	300,623	20%	40%	24,050	26,609
	Regulated Urban Pervious	73	1,004.64	73,118	8.75%	40%	2,559	

[1]Edge of stream loading rate based on the Chesapeake Bay Watershed Model Progress Run 5.3.2.

[2]To determine the existing developed acres required in Column B, permittees should first determine the extent of their regulated service area based on the 2010 Census Urbanized Area (CUA). Next, permittees will need to delineate the lands within the 2010 CUA served by the MS4 as pervious or impervious as of the baseline date of June 30, 2009.

[3]Column C = Column A x Column B.

[4]Column F = Column C x (Column D ÷ 100) x (Column E ÷ 100).

[5]Column G = The sum of the subsource cumulative reduction required by 6/30/23 (lbs/yr) as calculated in Column F.

Attachment 4
Town of Ashland
Attachment 4: BMPs Implemented by the Town of Ashland Up to Nov. 1, 2019

Credits for BMPs in Regulated Urban Areas for the James River Basin

BMPs	Date Installed or Planned	Location or Project	Subsource	Pollutant	Drainage Area to BMP	Loading Rate (lbs/acre)	Estimated POC Load to BMP	BMP Removal Efficiency for POC	Estimated Removal of POC	Total POC Removal by BMP	POC Remaining Post-Develop	Status	Removal Rate References[1]
Retro-Fits													
Permeable Paver & Rain Garden Treatment Train	2012	Town of Ashland Municipal Parking Lot	Impervious	Nitrogen	1.00	9.39	9.39	VRRM	9.39	9.39		Completed	Appendix V.F CBTM
			Pervious			6.99	0.00		0.00				
			Impervious	Phosphorus	1.00	1.76	1.76	VRRM	1.76	1.76			Appendix V.F CBTM
			Pervious			0.5	0.00		0.00				
			Impervious	TSS	1.00	677	677	VRRM	677	677			Appendix V.F CBTM
			Pervious			101	0.00		0.00				
Grass Strip	2012	Adjacent toTown of Ashland Municipal Parking Lot	Impervious	Nitrogen	0.30	9.39	2.82	25%	0.70	0.70		Completed	
			Pervious			6.99	0.00	25%	0.00				Table V.A.1 CBTM
			Impervious	Phosphorus	0.30	1.76	0.53	25%	0.13	0.13			
			Pervious			0.5	0.00	25%	0.00				Table V.A.1 CBTM
			Impervious	TSS	0.30	677	203	50%	102	102			Table V.C.1 CBTM
			Pervious			101	0.00	50%	0.00				
Permeable Paver	2014	Railroad Ave Street-scape Phase 1	Impervious	Nitrogen	0.48	9.39	4.51	59%	2.66	2.66	1.85	Completed	
			Pervious			6.99	0.00	59%	0.00				Table V.A.1 CBTM
			Impervious	Phosphorus	0.48	1.76	0.84	59%	0.50	0.50	0.35		
			Pervious			0.5	0.00	59%	0.00				Table V.A.1 CBTM
			Impervious	TSS	0.48	677	325	55%	179	179	146		Table V.C.1 CBTM
			Pervious			101	0.00	55%	0.00				
Bioretention area	2014	Railroad Ave Street-scape Phase 1	Impervious	Nitrogen	0.15	9.39	1.41	64%	0.90	0.90	0.51	Completed	
			Pervious			6.99	0.00	64%	0.00				Table V.A.1 CBTM
			Impervious	Phosphorus	0.15	1.76	0.26	55%	0.15	0.15	0.12		
			Pervious			0.5	0.00	55%	0.00				Table V.A.1 CBTM
			Impervious	TSS	0.15	677	102	55%	56	56	46		Table V.C.1 CBTM
			Pervious			101	0.00	55%	0.00				
Bioretention area	2009	Hanover Ave	Impervious	Nitrogen	0.12	9.39	1.13	64%	0.72	2.38	1.34	Completed	
			Pervious		0.37	6.99	2.59	64%	1.66				Table V.A.1 CBTM
			Impervious	Phosphorus	0.12	1.76	0.21	55%	0.12	0.22	0.18		
			Pervious		0.37	0.5	0.19	55%	0.10				Table V.A.1 CBTM
			Impervious	TSS	0.12	677	81	55%	45	65	53		Table V.C.1 CBTM
			Pervious		0.37	101	37.40	55%	21				
Dry Pond	2012	Kempsville/ Carter Lumber	Impervious	Nitrogen	1.01	9.39	9.48	10%	0.95	3.16	28	Completed	Table V.J.1 CBTM
			Pervious		3.17	6.99	22.16	10%	2.22				
			Impervious	Phosphorus	1.01	1.76	1.78	15%	0.27	0.50	2.86		Table V.J.1 CBTM
			Pervious		3.17	0.5	1.59	15%	0.24				
			Impervious	TSS	1.01	677	684	10%	68	100	904		Table V.J.1 CBTM
			Pervious		3.17	101	320	10%	32				

Attachment 4
Town of Ashland
Attachment 4: BMPs Implemented by the Town of Ashland Up to Nov. 1, 2019

Filterra	2015	Duncan Street	Impervious	Nitrogen	0.12	9.39	1.13		0.00	0.00	3.71	Completed	BMP Clearing House
			Pervious		0.37	6.99	2.59		0.00				
			Impervious	Phosphorus	0.12	1.76	0.21	50%	0.11	0.20	0.20		BMP Clearing House
			Pervious		0.37	0.5	0.19	50%	0.09				
			Impervious	TSS	0.12	677	81.23		0.00	0.00	119		BMP Clearing House
			Pervious		0.37	101	37.40		0.00				

Street Sweeeping[3]	**Date Installed or Planned**	**Location or Project**	**Average Miles Driven/ Year**	**POC**	**Removal Rate (lbs/Mile)**				**Estimated Removal of POC**	**Total POC Removal**		**Status**	
Street Sweeeping	On going	Throughout watershed	1,040	Nitrogen	0.155				161	161		On going	EPRSSDC
			1,040	Phosphorus	0.0579				60	60			EPRSSDC
			1,040	TSS	78				81,148	81,148			EPRSSDC
												Remaining	**Achieved**
				Total Required N Removal by 2018			31	**Total N Removed**		180		-149	Yes
				Total Required P Removal by 2018			7.21	**Total P Removed**		64		-56	Yes
				Total Required TSS Removal by 2018			3,194	**Total TSS Removed**		82,327		-79,133	Yes
												Remaining	**Achieved**
				Total Required N Removal by 2023			252	**Total N Removed**		180		71	No
				Total Required P Removal by 2023			58	**Total P Removed**		64		-6	Yes
				Total Required TSS Removal by 2023			25,552	**Total TSS Removed**		82,262		-56,709	Yes

Credit for POC Removed During First Permit Cycle to be Applied During Second Permit Cycle

POC	**Remaining POC After First Cycle**	**Annual Avg. Street Sweeping Removal**	**Remaider After Accounting for Annual Street Sweeping**	**Credit to be Applied to Second Permit Cycle**
Nitrogen	-149	161	12	0
Phosphorus	-56	60	4	0
TSS	-79,133	81,148	2,015	0

Credits for BMPs in Regulated Urban Areas for the York River Basin

BMPs	**Date Installed or Planned**	**Location or Project**	**Subsource**	**POC**	**Drainage Area to BMP (ac)**	**2009 EOS Loading Rate (lbs/acre)**	**Estimated POC Load to BMP**	**BMP Removal Efficiency for POC**	**Estimated Removal of POC**	**Total POC Removal**	**POC Remaining Post-Develop**	**Status**	**Removal Rate Reference**
Retro-Fits													
Permeable Paver & Rain Garden Treatment Train	2013	College Park	Impervious	Nitrogen	4.86	7.31	35.53	VRRM	36	60	0.00	Completed	Appendix V.F CBTM
			Pervious		3.14	7.65	24.02	VRRM	24				
			Impervious	Phosphorus	4.86	1.51	7.34	VRRM	7.34	8.94	0.00		Appendix V.F CBTM
			Pervious		3.14	0.51	1.60	VRRM	1.60				
			Impervious	TSS	4.86	456.68	2,219.46	VRRM	2219	2,448	0.00		Appendix V.F CBTM
			Pervious		3.14	72.78	228.53	VRRM	229				

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Permeable Paver	2015	APD Parking Lot	Impervious	Nitrogen	0.08	7.31	0.58	59%	0.35	1.70	1.18	Completed	
			Pervious		0.30	7.65	2.30	59%	1.35				Table V.A.1 CBTM
			Impervious	Phosphorus	0.08	1.51	0.12	59%	0.07	0.16	0.11		
			Pervious		0.30	0.51	0.15	59%	0.09				Table V.A.1 CBTM
			Impervious	TSS	0.08	456.68	36.53	55%	20	32	26		Table V.C.1 CBTM
			Pervious		0.30	72.78	21.83	55%	12				
Permeable Paver	2015	Railroad Ave Street-scape Phase 2	Impervious	Nitrogen	0.27	7.31	1.97	59%	1.16	1.16	0.81	Completed	
			Pervious			7.65	0.00	59%	0.00				Table V.A.1 CBTM
			Impervious	Phosphorus	0.27	1.51	0.41	59%	0.24	0.24	0.17		
			Pervious			0.51	0.00	59%	0.00				Table V.A.1 CBTM
			Impervious	TSS	0.27	456.68	123.30	55%	68	68	55		Table V.C.1 CBTM
			Pervious			72.78	0.00	55%	0.00				
Redevelopment													
Dry Pond	2010	RMC Soccer Field Restrooms	Impervious	Nitrogen	0.73	7.31	5.34	10%	0.53	1.67	15	Completed	Table V.J.1 CBTM
			Pervious		1.48	7.65	11.32	10%	1.13				
			Impervious	Phosphorus	0.73	1.51	1.10	15%	0.17	0.28	1.58		Table V.J.1 CBTM
			Pervious		1.48	0.51	0.75	15%	0.11				
			Impervious	TSS	0.73	456.68	333.38	10%	33	44	397		Table V.J.1 CBTM
			Pervious		1.48	72.78	107.71	10%	11				
Rainwater Harvesting	2011	RMC Freshman Dorms	Impervious	Nitrogen	0.43	7.31	3.14	43%	1.35	1.35	1.79	Completed	
			Pervious		0.00	7.65	0.00	43%	0.00				
			Impervious	Phosphorus	0.43	1.51	0.65	70%	0.45	0.45	0.19		
			Pervious		0.00	0.51	0.00	70%	0.00				
			Impervious	TSS	0.43	456.68	196.37	85%	167	167	29		
			Pervious		0.00	72.78	0.00	85%	0.00				
Filterra	2011	RMC Freshman Dorms	Impervious	Nitrogen	0.35	7.31	2.56	0%	0.00	0.00	3.02	Completed	BMP Clearing House
			Pervious		0.06	7.65	0.46	0%	0.00				
			Impervious	Phosphorus	0.35	1.51	0.53	50%	0.26	0.28	0.28		BMP Clearing House
			Pervious		0.06	0.51	0.03	50%	0.02				
			Impervious	TSS	0.35	456.68	159.84	0%	0.00	0.00	164		BMP Clearing House
			Pervious		0.06	72.78	4.37	0%	0.00				
Wet Pond	2012	Chick-Fil-A	Impervious	Nitrogen	9.13	7.31	66.74	30%	20	20	47	Completed	
			Pervious		3.73	7.65	28.53	30%	8.56				Table V.A.1 CBTM
			Impervious	Phosphorus	9.13	1.51	13.79	50%	6.89	6.89	6.89		
			Pervious		3.73	0.51	1.90	50%	0.95				Table V.A.1 CBTM
			Impervious	TSS	9.13	456.68	4,169.49	60%	2502	2,502	1,668		Table V.C.1 CBTM
			Pervious		3.73	72.78	271.47	60%	163				
Bioretention	2012	RMC Brock Commons	Impervious	Nitrogen	0.03	7.31	0.22	64%	0.14	1.80	1.02	Completed	
			Pervious		0.34	7.65	2.60	64%	1.66				Table V.A.1 CBTM
			Impervious	Phosphorus	0.03	1.51	0.05	55%	0.02	0.12	0.10		
			Pervious		0.34	0.51	0.17	55%	0.10				Table V.A.1 CBTM
			Impervious	TSS	0.03	456.68	13.70	55%	7.54	21	17		Table V.C.1 CBTM
			Pervious		0.34	72.78	24.75	55%	14				

Attachment 4
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Attachment 4: BMPs Implemented by the Town of Ashland Up to Nov. 1, 2019

Street Sweeeping[3]	**Date Installed or Planned**	**Location or Project**	**Average Miles Driven/ Year**	**POC**	**Removal Rate (lbs/LF)**				**Estimated Removal of POC**	**Total POC Removal**		**Status**	
Street Sweeeping	On going	Throughout watershed	1,561	Nitrogen	0.155				242	242		On going	EPRSSDC
			1,561	Phosphorus	0.0579				90	90			EPRSSDC
			1,561	TSS	78				121,722	121,722			EPRSSDC
Stream Restorations[2]	**Date Installed or Planned**	**Location or Project**	**Length (LF)**	**POC**	**Removal Rate (lbs/LF)**				**Estimated Removal of POC**	**Total POC Removal**		**Status**	
Mechumps Creek 1	2010	Cottage Green Dr to Hill Carter Pkwy	1204	Nitrogen	0.075				90	90		Completed	Table V.J.1 CBTM
			1204	Phosphorus	0.068				82	82			Table V.J.1 CBTM
			1204	TSS	44.88				54,036	54,036			Table V.J.1 CBTM
Mechumps Creek by APD	2015	Adjacent to APD	210	Nitrogen	0.075				16	16		Completed	Table V.J.1 CBTM
			210	Phosphorus	0.068				14	14			Table V.J.1 CBTM
			210	TSS	44.88				9,425	9,425			Table V.J.1 CBTM
												Remaining	Achieved?
				Total Required N Removal by 2018			45	**Total N Removed**		435		-390	Yes
				Total Required P Removal by 2018			10	**Total P Removed**		204		-194	Yes
				Total Required TSS Removal by 2018			3,348	**Total TSS Removed**		190,464		-187,116	Yes

Retro-Fits	**Date Installed or Planned**	**Location or Project**	**Subsource**	**POC**	**Drainage Area to BMP (ac)**	**2009 EOS Loading Rate (lbs/acre)**	**Estimated POC Load to BMP**	**BMP Removal Efficiency for POC**	**Estimated Removal of POC**	**Total POC Removal**	**POC Remaining Post-Develop**	**Status**	
New Extended Detention Basins	2019	Town's Maintenance Facility on Vaughan Road	Impervious	Nitrogen	2.40	7.31	17.54	VRRM	2.40	2.40	15	Completed	Appendix V.F CBTM
			Pervious			7.65	0.00		0.00				
			Impervious	Phosphorus	2.40	1.51	3.62	VRRM	0.49	0.49	3.13		Appendix V.F CBTM
			Pervious			0.51	0.00		0.00				
			Impervious	TSS	2.40	456.68	1,096.03	VRRM	1006	1,006	90		Appendix V.F CBTM
			Pervious			72.78	0.00		0				
Stream Restorations[2]	**Date Installed or Planned**	**Location or Project**	**Length (LF)**	**POC**	**Removal Rate (lbs/LF)**				**Estimated Removal of POC**	**Total POC Removal**		**Status**	
Mechumps Creek, Phase II	2018	Hill Carter Pkwy to I-95	1274	Nitrogen	0.075				96	96		Completed	Table V.J.1 CBTM
			1274	Phosphorus	0.068				87	87			Table V.J.1 CBTM
			1274	TSS	44.88				57,177	57,177			Table V.J.1 CBTM
												Remaining	Achieved?
				Total Required N Removal by 2023			358	**Total N Removed**		533		-175	Yes
				Total Required P Removal by 2023			78	**Total P Removed**		291		-213	Yes
				Total Required TSS Removal by 2023			26,609	**Total TSS Removed**		248,647		-222,038	Yes

Attachment 4
Town of Ashland
Attachment 4: BMPs Implemented by the Town of Ashland Up to Nov. 1, 2019

Credit for POC Removed During First Permit Cycle to be Applied During Second Permit Cycle				
POC	Remaining POC Credit After First Cycle	Annual Avg. Street Sweeping Removal	Remaider After Accounting for Annual Street Sweeping	Credit to be Applied to Second Permit Cycle
Nitrogen	-390	242	-149	149
Phosphorus	-194	90	-104	104
TSS	-187,116	121,722	-65,394	65,394

Notes:

1. Abreviations for Reference:
   CBTM: Chesapeake Bay TMDL Special Condition Guidance Manual, May 18, 2015
   EPRSSDC: Expert Panel Report on Street and Storm Drain Cleaning, May 19, 2016

2. Calculations for pollutant removal by Stream Restorations were performed as follows in accordance with Appendix V.J - Urban Stream Restoration of the Chesapeake Bay TMDL Special Condition Guidance Manual

Table V.J.1 – Urban Stream Restoration Interim Approved Removal Rates

BMPs	How Credited	lbs TN/LF	lbs TP/LF	lbs TSS/LF
Stream Restoration	Mass Reduction/Length (lbs/L.F.)	0.075	0.068	44.88/ 15.13*
Mechumps Creek 1	1204	90	82	54,036
Mechumps Creek by APD	210	16	14	9,425
Mechumps Creek 2	1274	96	87	57,177

*The value that should be used to calculate reductions for sediment is dependent on the project's location. Projects located outside the coastal plain should use 44.88 lbs TSS/linear ft. Projects located within the coastal zone should use 15.13 lbs TSS/linear ft.

Attachment 4
Town of Ashland
Attachment 4: BMPs Implemented by the Town of Ashland Up to Nov. 1, 2019

3. Street cleaning credit for lane miles swept based on Street Cleaning Practice-4 (SCP-4) of 1 pass every 4 weeks by advanced sweeping technology.

60% of the impervious area in Town is in the York River Watershed, and 40% is in the James River Watershed.

Watershed	**% Imp. Area in Town**	**Miles. Driven/Year**	
James River	40%	1,040	
York River	60%	1,561	

Year	Miles Driven per year	Actual lbs. Collected per year
FY 14-15	301	73,317
FY 15-16	1159	504,426
FY 16-17	4243	572,438
FY 17-18	4845	1,097,267
FY 18-19	2456.5	472,120
Average	2600.9	543,914

Estimating Pollutant Reduction by a Local Street Cleaning Program						
SCP*	Removal Rate (%) [1]			Mass Removed (lbs) [2]/mile		
	TSS	TN	TP	TSS	TN	TP
SCP-4	6	1	3	78	0.155	0.0579
[1] From Table 17, and assume one curb mile equals an acre. Table 17 is from *Recommendations of*						
[2] Assume annual load from impervious cover of 1,300 lbs/ac/year (sediment), 15.5 lbs/ac/yr (nitrogen) and 1.93 lbs/ac/yr (phosphorus) --Table 4 (EPRSSDC)						
SCP* = Street Cleaning Practice						

Attachment 5
Town of Ashland
Attachment 5: BMPs to be Implemented by the Town Before the Expiration of the Permit

Credits for BMPs in Regulated Urban Areas for the James River Basin

Street Sweeeping[3]	**Date Installed or Planned**	**Location or Project**	**Average Miles Driven/ Year**	**POC**	**Removal Rate (lbs/LF)**				**Estimated Removal of POC**	**Total POC Removal**		**Status**	
Street Sweeeping	On going	Throughout watershed	1,040	Nitrogen	0.155				161	161		On going	EPRSSDC
			1,040	Phosphorus	0.0579				60	60			EPRSSDC
			1,040	TSS	78				81,148	81,148			EPRSSDC
Stream Restorations[2]	**Date Installed or Planned**	**Location or Project**	**Length (LF)**	**POC**	**Removal Rate (lbs/LF)**				**Estimated Removal of POC**	**Total POC Removal**		**Status**	
Licking Hole Creek	2019 to 2023	East of Rte. 1 and South of Dow Gil Rd.	145	Nitrogen	0.075				11	11		Future	Table V.J.1 CBTM
			145	Phosphorus	0.068				9.86	9.86			Table V.J.1 CBTM
			145	TSS	44.88				6,508	6,508			Table V.J.1 CBTM
Stony Run	2019 to 2023	South of Hanover Ave. East of Lee Ave	1100	Nitrogen	0.075				83	83		Future	Table V.J.1 CBTM
			1100	Phosphorus	0.068				75	75			Table V.J.1 CBTM
			1100	TSS	44.88				49,368	49,368			Table V.J.1 CBTM
												Remaining	Achieved?
				Total Required N Removal by 2023			252	**Total N Removed**		255		-3	Yes
				Total Required P Removal by 2023			58	**Total P Removed**		145		-87	Yes
				Total Required TSS Removal by 2023			25,552	**Total TSS Removed**		137,024		-111,471	Yes

Credits for BMPs in Regulated Urban Areas for the York River Basin

BMPs	**Date Installed or Planned**	**Location or Project**	**Subsource**	**POC**	**Drainage Area to BMP (ac)**	**2009 EOS Loading Rate (lbs/acre)**	**Estimated POC Load to BMP**	**BMP Removal Efficiency for POC**	**Estimated Removal of POC**	**Total POC Removal**	**POC Remaining Post-Develop**	**Status**	**Removal Rate Reference**
Retro-Fits													
New Extended Detention Basins	2019	Town's Maintenance Facility on Vaughan Road	Impervious	Nitrogen	2.40	7.31	17.54	VRRM	2.40	2.40	15	Completed	Appendix V.F CBTM
			Pervious			7.65	0.00		0.00				
			Impervious	Phosphorus	2.40	1.51	3.62	VRRM	0.49	0.49	3.13		Appendix V.F CBTM
			Pervious			0.51	0.00		0.00				
			Impervious	TSS	2.40	456.68	1,096.03	VRRM	1006	1,006	90		Appendix V.F CBTM
			Pervious			72.78	0.00		0				
Street Sweeeping[3]	**Date Installed or Planned**	**Location or Project**	**Average Miles Driven/ Year**	**POC**	**Removal Rate (lbs/LF)**				**Estimated Removal of POC**	**Total POC Removal**		**Status**	
Street Sweeeping	On going	Throughout watershed	1,561	Nitrogen	0.155				242	242		On going	EPRSSDC
			1,561	Phosphorus	0.0579				90	90			EPRSSDC
			1,561	TSS	78				121,722	121,722			EPRSSDC

Stream Restorations[2]	Date Installed or Planned	Location or Project	Length (LF)	POC	Removal Rate (lbs/LF)				Estimated Removal of POC	Total POC Removal		Status	
Mechumps Creek, Phase II	2018	Hill Carter Pkwy to I-95	1274	Nitrogen	0.075				96	96		Completed	Table V.J.1 CBTM
			1274	Phosphorus	0.068				87	87			Table V.J.1 CBTM
			1274	TSS	44.88				57,177	57,177			Table V.J.1 CBTM

POC	Credit from 1st to 2nd Cycle (see Attach. 4)
Nitrogen	149
Phosphorus	104
TSS	65,394

												Remaining	Achieved?
				Total Required N Removal by 2023			358	**Total N Removed**		488		-131	Yes
				Total Required P Removal by 2023			78	**Total P Removed**		281		-203	Yes
				Total Required TSS Removal by 2023			26,609	**Total TSS Removed**		245,299		-218,690	Yes

Notes:

1. Abreviations for Reference:
   CBTM: Chesapeake Bay TMDL Special Condition Guidance Manual, May 18, 2015
   EPRSSDC: Expert Panel Report on Street and Storm Drain Cleaning, May 19, 2016
2. Calculations for pollutant removal by Stream Restorations were performed as follows in accordance with Appendix V.J - Urban Stream Restoration of the Chesapeake Bay TMDL Special Condition Guidance Manual

Table V.J.1 – Urban Stream Restoration Interim Approved Removal Rates

BMPs	How Credited	lbs TN/LF	lbs TP/LF	lbs TSS/LF
Stream Restoration	Mass Reduction/Length (lbs/L.F.)	0.075	0.068	44.88/ 15.13*

Project	Length (LF)	lbs TN Removed	lbs TP Removed	lbs TSS Removed
Mechumps Creek 1	1204	90.30	81.87	54,035.52
Mechumps Creek by APD	210	15.75	14.28	9,424.80
Mechumps Creek 2	1195	89.63	81.26	53,631.60

*The value that should be used to calculate reductions for sediment is dependent on the project's location. Projects located outside the coastal plain should use 44.88 lbs TSS/linear ft. Projects located within the coastal zone should use 15.13 lbs TSS/linear ft.

3. Street cleaning credit for lane miles swept based on Street Cleaning Practice-4 (SCP-4) of 1 pass every 4 weeks by advanced sweeping technology.
The Town calculated average miles of street driven since FY 09-10 (see below). At a minimum, this amount will be driven throughout the rest of the permit cycle.
60% of the impervious area in Town is in the York River Watershed, and 40% is in the James River Watershed.

Watershed	**% Imp. Area in Town**	**Average miles. Driven/Year**	
James River	40%	1,040	
York River	60%	1,561	

Year	Miles Driven per year	Actual lbs. Collected per year	
FY 14-15	301	73,317	Bad year because Town losts its street sweeper operator
FY 15-16	1159	504,426	
FY 16-17	4243	572,438	
FY 17-18	4845	1,097,267	
FY 18-19	2456.5	472,120	
Average	2600.9	543,914	

Estimating Pollutant Reduction by a Local Street Cleaning Program						
SCP*	Removal Rate (%) [1]			Mass Removed (lbs) [2]/mile		
	TSS	TN	TP	TSS	TN	TP
SCP-4	6	1	3	78	0.155	0.0579
[1] From Table 17, and assume one curb mile equals an acre. Table 17 is from *Recommendations of*						
[2] Assume annual load from impervious cover of 1,300 lbs/ac/year (sediment), 15.5 lbs/ac/yr						
SCP* = Street Cleaning Practice						