

**Virginia Stormwater
Management Program (VSMP)
Permit No. VA0088579**

**Arlington County Chesapeake Bay TMDL Action Plan
UPDATE**



2021 – 2026 Permit Cycle
Updated Draft April 2022

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1 **Overview**

2 This update of Arlington County’s Chesapeake Bay Total Maximum Daily Load (TMDL) Action Plan is
3 developed to meet the requirements of Part 1.E.1 of Arlington County’s Municipal Separate Storm Sewer
4 System (MS4) Permit, VA0088579, issued July 1, 2021. The permit requires this Action Plan to
5 document a minimum cumulative 40% reduction of the Bay TMDL pollutants of concern (POC) to be
6 achieved during the 2022-2026 (‘2nd’) permit cycle. The POCs are total nitrogen (TN), total phosphorus
7 (TP), and total suspended solids (TSS).

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9 DEQ approved the [TMDL Action Plan for the 2013-2018 \(‘1st’\) permit cycle](#) (minimum 5.0% POC
10 reduction) on September 3, 2015. DEQ administratively continued the 1st permit cycle through June 30,
11 2021.

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13 The numbered sections in this Action Plan correspond with the sections of Arlington’s MS4 permit, 1.E.1.j
14 items 1) through 7).

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16 In addition to responding specifically to the Bay TMDL POC reduction requirements, the projects and
17 programs in this Action Plan reflect the goals and objectives of Arlington’s adopted [Stormwater Master
18 Plan](#) – which emphasizes local water quality, stream corridors, and mitigating development impacts –
19 alongside a growing emphasis on [creating resiliency to flooding and climate change](#). Projects are also
20 strategically identified to align with infrastructure protection and integrity needs and address related
21 public safety issues resulting from failed slopes, eroded trails, exposed and broken sanitary sewer lines
22 and collapsed outfalls.

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24 **Glossary of Key Terms**

25 **Best Management Practice (BMP).** A project or program recognized by the Virginia Department of
26 Environmental Quality (DEQ) to provide TMDL POC reduction credits.

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28 **Land Disturbing Activity (LDA) Program.** Arlington County’s regulatory program for construction
29 activity and post-construction stormwater management.

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31 **Municipal Separate Storm Sewer System (MS4) Permit.** The Clean Water Act discharge permit for
32 Arlington County’s storm drain system, administered by Virginia DEQ.

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34 **Pollutant of Concern (POC).** For the Chesapeake Bay TMDL, total nitrogen (TN), total phosphorus
35 (TP), and total suspended solids (TSS). Each MS4 permit assigns a specific amount of POC load
36 reductions to be achieved.

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38 **Chesapeake Bay Total Maximum Daily Load (TMDL).** A pollution ‘budget’ for the Chesapeake Bay
39 that sets the maximum amount of the TN, TP, and TSS POCs the Bay can receive and still meet water
40 quality standards. Each MS4 permit in Virginia prorates a portion of this budget to the regulated
41 localities. There are also other sources of pollution in this budget besides the contributions from MS4
42 permittees, including wastewater treatment plants, agriculture, air pollutants, and septic systems.

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44 **MS4 Permit Cycle.** Typically, five (5) years in Virginia. Virginia established a three (3) permit cycle
45 timeline for MS4 permittees to meet their Bay TMDL pollution budgets. Arlington entered its 2nd permit
46 cycle in FY 2022, after DEQ extended the 1st permit cycle for three (3) years due to DEQ’s workload and
47 other factors. The end of Arlington’s 3rd permit cycle, where full compliance with the pollution budget is
48 required, is expected to be FY 2031.

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New or modified legal authority (1)

Existing legal authorities are sufficient meet the Bay TMDL requirements of Part 1.E.1 of the permit.

Load and cumulative reduction calculations (2)

The table below contains the load reduction requirements calculated for Arlington County’s MS4 Service Area, in the format of Table 2 from the permit document. The 1st permit cycle Action Plan document describes the methodologies for the [MS4 Service Area delineation](#) and estimated regulated pervious and impervious acreage.

Table 2 Calculation Sheet for Estimating Existing Source Loads and Reduction Requirements for the Potomac River Basin								
		A	B	C	D	E	F	G
Pollutant	Subsource	Loading rate (lbs/ac/yr) ¹	Existing developed lands as of 8/30/09 served by the MS4 within the regulated area (acres) ²	Load (lbs/yr) ³	Percentage of MS4 required Chesapeake Bay total L2 loading reduction	Percentage of L2 required reduction by TBD	40% cumulative reduction required by TBD (lbs/yr) ⁴	Sum of 40% cumulative reduction (lb/yr) ⁵
Nitrogen	Regulated urban impervious	16.86	5,203.59	87,732.53	9%	40%	3,158.37	4,627.39
	Regulated urban pervious	10.07	6,078.36	61,209.09	6%	40%	1,469.02	
Phosphorus	Regulated Urban Impervious	1.62	5,203.59	8,429.82	16%	40%	539.51	611.78
	Regulated urban pervious	0.41	6,078.36	2,492.13	7%	40%	72.27	
Total suspended solids	Regulated urban impervious	1171.32	5,203.59	6,095,069.04	20%	40%	487,605.52	525,005.67
	Regulated urban pervious	175.8	6,078.36	1,068,575.69	9%	40%	37,400.15	

1Edge of stream loading rate based on the Chesapeake Bay Watershed Model 5.3.2
2To determine the existing developed acres required in Column B, permittees should first determine the extent of their regulated MS4 service area. Next,
3Column C = Column A x Column B
4Column F = Column C x Column D x Column E.
5Column G = The sum of the subsource cumulative reduction required by TBD (lbs/yr) as calculated in Column F.

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60 Regarding 1.E.1.c (new sources) and 1.E.1.d (grandfathered projects), Arlington County’s 1st permit
61 cycle Action Plan (Section 2) documented the County’s direct development accounting methodology that
62 makes it unnecessary to calculate separate POC load offsets for either new sources or grandfathered
63 projects.

64

65 Arlington County regulates development through its Land Disturbing Activities (LDA) program. For all
66 regulated land development activity that disturbs at least 2,500 square feet of land (the regulatory
67 threshold set for Chesapeake Bay Preservation Act localities) within Arlington County’s MS4 Service Area,
68 the County accounts for the associated POC load changes from land use changes alongside the POC
69 reductions from BMPs. This methodology captures the net POC loads for all regulated development
70 activity whether new development or redevelopment or grandfathered. Most regulated land
71 development activity in Arlington County is redevelopment and as a result generates a net POC reduction
72 credit. Overall, the POC credits from redevelopment significantly exceed the increased POC loads
73 associated with new sources and grandfathered projects.

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77 Example of accounting from the FY2021 MS4 Annual Report.
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104.986899.76	Pollutant	Existing Development Conditions for Projects from 7/1/2020 to 6/30/2021 Acres	2009 EOSLoading Rate (lbs/ac)	Load	Post Development Conditions for Projects from 7/1/2020 to 6/30/2021 Acres	2009 EOSLoading Rate (lbs/ac)	Load	Load Increase	Total Load Increase	Reduction from SWMF drain to MS4 in FY21	Reduction from SWMF that do not Drain to MS4 in FY20	Difference
Regulated Urban Impervious	Nitrogen	38.98	16.86	657.15	48.58	16.86	819.06	161.91	65.24	191.8355	3.76	-130.36
Regulated Urban Pervious		-38.98	10.07	-392.53	-48.58	10.07	-489.20	-96.67				
Regulated Urban Impervious	Phosphorus	38.98	1.62	63.14	48.58	1.62	78.70	15.56	11.62	22.05	1.16	-11.58
Regulated Urban Pervious		-38.98	0.41	-15.98	-48.58	0.41	-19.92	-3.94				
Regulated Urban Impervious	Total Suspended Solids	38.98	1171.32	45654.42	48.58	1171.32	56902.73	11248.30	9560.62	14569.99	493.29	-5502.66
Regulated Urban Pervious		-38.98	175.80	-6852.68	-48.58	175.80	-8540.36	-1687.68				

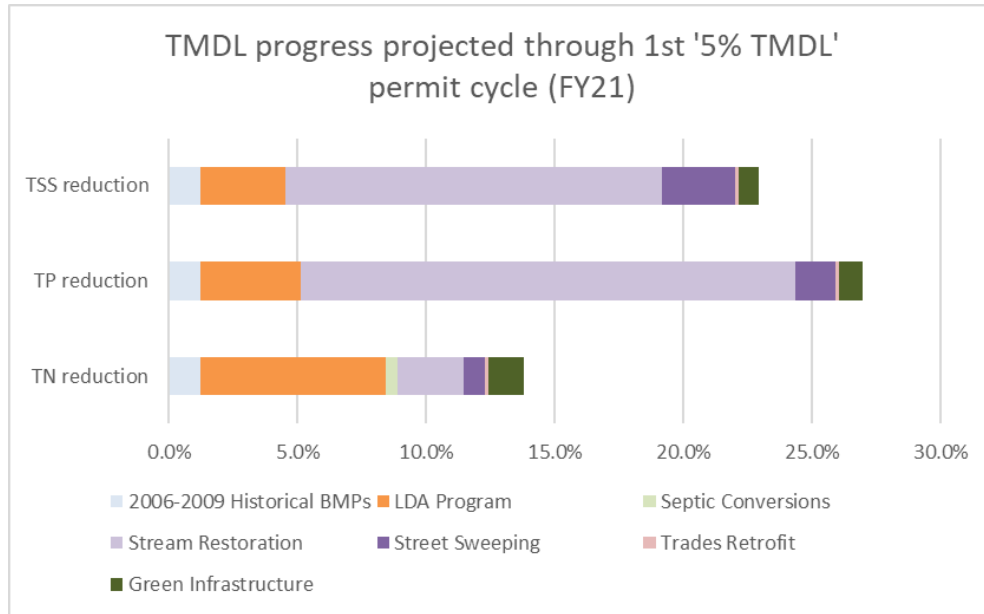
Development Load Changes and Load Reductions from SWMF for FY21

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82 **Load reductions achieved to date (3)**

83 Through the end of the 1st permit cycle, Arlington exceeded the 5% POC reduction requirement through
 84 the project and program categories shown in the chart and table below. Collectively, in the terminology
 85 of the permit, these projects and programs are referred to as 'best management practices,' or 'BMPs.'

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Project/program	TN reduction	TP reduction	TSS reduction
2006-2009 Historical BMPs	1.2%	1.2%	1.2%
LDA Program	7.2%	3.9%	3.3%
Septic Conversions	0.5%	0.0%	0.0%
Stream Restoration	2.5%	19.2%	14.6%
Street Sweeping	0.8%	1.5%	2.8%
Trades Retrofit	0.1%	0.1%	0.2%
Green Infrastructure	1.4%	0.9%	0.8%
	13.8%	27.0%	22.9%

Cumulative POC reductions through 1st permit cycle by project/program category

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91 Stream restoration has provided the most POC credits to date because of the significant reduction in
 92 erosion and increase in stream stability and overall resiliency that result from these projects. The LDA
 93 program also generates substantial POC credits because most regulated development activity is
 94 redevelopment, and the stormwater regulatory program requires a 10%-20% net pollutant reduction for
 95 redevelopment projects.

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97 **List of BMPs implemented to date to achieve reductions (4)**

98 Appendix A provides a summary of the projects and programs that provide the POC reductions
 99 summarized in the previous section.

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BMPs to be implemented prior to the expiration of this permit to meet the cumulative reductions (5)

The table below provides the projected BMPs and estimated POC reductions to be reported for credit during the 2nd permit cycle, conservatively for projects recently completed (but yet reported for credit), under construction, or in active design. The table also includes projected POC reductions from the LDA program¹.

Projects and Programs	TN Reduction	TP Reduction	TSS Reduction
WGCC stream restoration	980	290	21400
Ballston Pond restoration	1270	150	126660
Donaldson Run Tributary B stream restoration	320	70	66390
Gulf Branch stream restoration	200	50	33070
Sparrow Pond restoration	320	30	30780
Walter Reed - 5th St S green infrastructure	9.3	0.8	560
N Oakland Street – Park green infrastructure	9.4	0.6	380
N Larrimore St and 9th ST N green infrastructure	5.8	0.5	310
LDA Program	500	20	25000
	3610	610	304550

Estimated POC reductions for 2nd permit cycle (lbs)

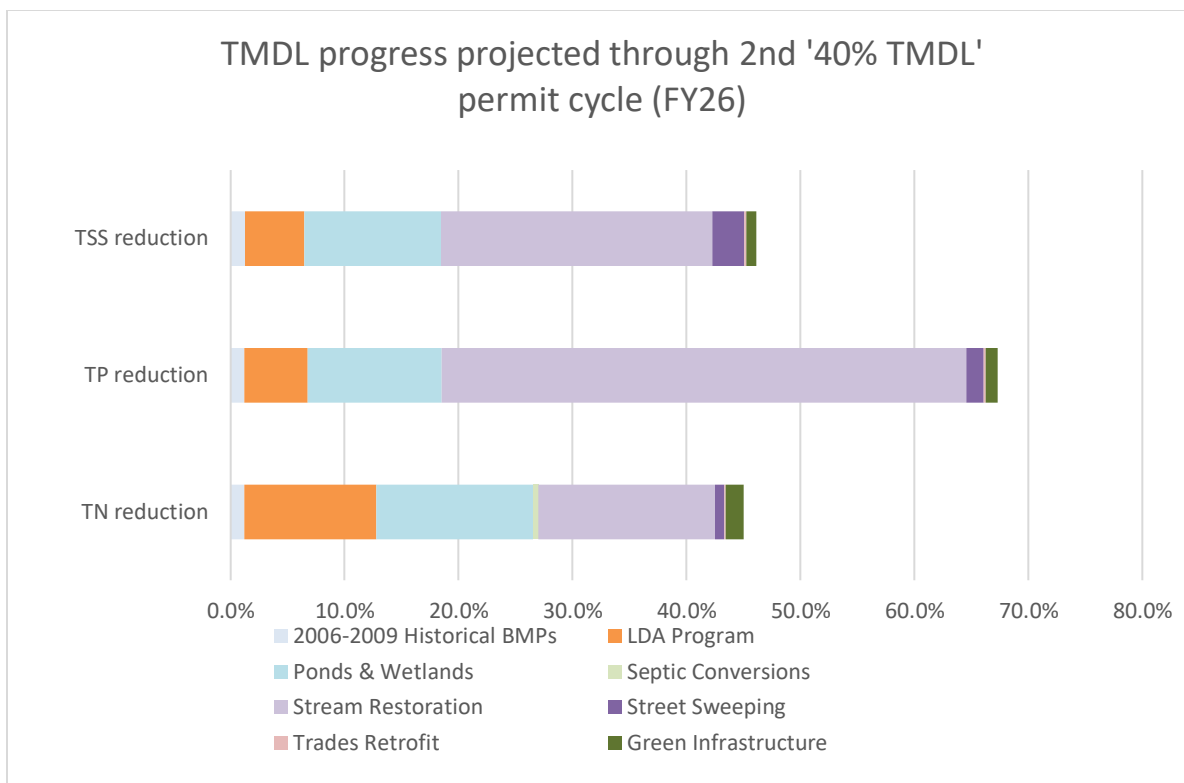
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The capital costs for these projects are estimated at \$17.7 million. Actual credits (including final calculated removal efficiencies) and costs will be updated as reported with each annual report. Note that cost accounting to date has included only capital costs and not operating costs (e.g., for the LDA program, plan review, inspections, maintenance, etc.). These operating costs are part of the total cost of Chesapeake Bay TMDL compliance and may be reported in the future.

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The chart and table on the following page estimate cumulative POC reductions through the end of the 2nd permit cycle to reach the 40% POC reduction requirement. Actual projects/programs and amounts and proportions of POC reduction may vary at the County’s discretion. The total POC reduction achieved will meet the 40% minimum POC reduction requirement but may be less than or more than estimated below. Updates and project/program details and documentation will be provided in each annual report as well as with the draft 3rd MS4 permit cycle Chesapeake Bay TMDL Action Plan. Any POC reductions from these projects and programs that exceed the cumulative 40% POC reduction requirement will be applied to the cumulative 100% POC reduction requirement for the 3rd MS4 permit cycle.

¹ Note that street sweeping is not included in this table because it is an annual rather than cumulative credit that is re-calculated each year. Similarly, septic tank conversion is also not included because it is a one-time credit. Both are included in the estimated projections below.



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Project/Program	TN reduction	TP reduction	TSS reduction
2006-2009 Historical BMPs	1.2%	1.2%	1.2%
LDA Program	11.6%	5.6%	5.2%
Ponds & Wetlands	13.7%	11.8%	12.0%
Septic Conversions	0.5%	0.0%	0.0%
Stream Restoration	15.5%	46.0%	23.8%
Street Sweeping	0.8%	1.5%	2.8%
Trades Center Retrofits	0.1%	0.1%	0.2%
Green Infrastructure	1.6%	1.0%	0.9%
	45.0%	67.3%	46.1%

Cumulative POC reductions estimated through 2nd permit cycle by project/program category

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An estimate of the expected cost to implement the necessary reductions (6)

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See previous section for this information.

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Public Comments on Draft Action Plan (7)

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Arlington County will solicit public comment on this updated 2nd permit cycle Bay TMDL Action Plan in several ways. The County will make this draft Action Plan available for comment online in late April and will publicize the plan via announcements on the web and distribution via email announcement to various stakeholders, including commissions, local environmental organizations, and the general public. A summary of comments received and the County's response (including any changes to the action plan document) will be included as Appendix B.

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Appendix A. List of BMPs through end of 1st permit cycle (through FY21)

Project Type	Plan Name	SWMF Installation Date	TN Reduction	TP Reduction	TSS Reduction
Stream Restoration	Tributary A 1 & 2	9/1/2006	118.37	112.39	73972.78
Stream Restoration	Tributary A 3 & 4	9/1/2006	79.17	81.67	53103.46
Stream Restoration	Tributary B Headwater	9/1/2007	29.64	32.11	20969.92
Watershed Retrofit	Patrick Henry Drive & 9th Road N - North	6/1/2011	1.64	0.15	113.28
Watershed Retrofit	Patrick Henry Drive & 9th Road N - South	6/1/2011	5.37	0.53	396.87
Trades Retrofit	4200 28th Street S -Manufactured - Ultra Urban Inserts (6)	7/1/2011	0.35	0.05	49.31
Trades Retrofit	4250 29th Street S - Manufactured - Ultra Urban Inserts (6)	7/1/2011	0.21	0.03	29.28
Trades Retrofit	2881 S Taylor Street - Manufactured - Ultra Urban Inserts (1)	7/1/2011	0.28	0.04	38.53
Trades Retrofit	4200 28th Street S - Manufactured - Ultra Urban Inserts (1)	7/1/2011	0.06	0.01	7.71
Trades Retrofit	4200 28th Street S - Manufactured - Ultra Urban Inserts (1)	7/1/2011	0.03	0.01	4.63
Trades Retrofit	4200 28th Street S - Manufactured - Ultra Urban Inserts (1)	7/1/2011	0.01	0.00	1.54
Trades Retrofit	4200 28th Street S - Manufactured - Ultra Urban Inserts (1)	7/1/2011	0.19	0.03	26.20
Trades Retrofit	2701 S Taylor Street - Manufactured - Ultra Urban Inserts (12)	7/1/2011	0.18	0.03	24.66
Trades Retrofit	2701 S Taylor Street -Manufactured - Ultra Urban Inserts (6)	7/1/2011	1.87	0.28	260.43
Trades Retrofit	2701 S Taylor Street - Manufactured - Ultra Urban Inserts (6)	7/1/2011	0.14	0.02	20.03
Trades Retrofit	2701 S Taylor Street - Manufactured - Ultra Urban Inserts (1)	7/1/2011	0.34	0.05	47.77
Trades Retrofit	2701 S Taylor Street - Manufactured - Ultra Urban Inserts (12)	7/1/2011	0.90	0.14	124.82
Trades Retrofit	2701 S Taylor Street - Manufactured - Ultra Urban Inserts (6)	7/1/2011	0.42	0.06	58.56
Trades Retrofit	2701 S Taylor Street - Manufactured - Ultra Urban Inserts (6)	7/1/2011	0.09	0.01	12.33
Trades Retrofit	2701 S Taylor Street - Manufactured - Ultra Urban Inserts (12)	7/1/2011	0.71	0.11	98.62
Trades Retrofit	2701 S Taylor Street - Manufactured - Ultra Urban Inserts (1)	7/1/2011	0.11	0.02	15.41
Trades Retrofit	2701 S Taylor St - Manufactured - Ultra Urban Inserts (6) - Model Co1414H	7/1/2011	0.11	0.02	15.41
Trades Retrofit	4300 29 th Street S - Earth Product Recycling – StormFilter®	8/1/2011	8.81	1.33	1224.42
Watershed Retrofit	Albemarle Bioretention	12/1/2011	5.90	0.47	319.65
Watershed Retrofit	Weenie Beenie Bioswale	12/1/2011	0.72	0.08	62.96
Watershed Retrofit	Pentagon City Median - North	4/1/2014	10.07	1.04	787.78
Watershed Retrofit	Gulf Branch Nature Center - Stormwater Planters	4/1/2014	0.17	0.02	14.84
Watershed Retrofit	Gulf Branch Nature Center - Stormwater Planters	4/1/2014	0.17	0.02	14.84
Watershed Retrofit	Pentagon City - Stormwater Planters A-E	4/1/2014	3.40	0.38	292.57
Watershed Retrofit	Pentagon City - Stormwater Planters F-K	4/1/2014	4.64	0.51	396.97

Project Type	Plan Name	SWMF Installation Date	TN Reduction	TP Reduction	TSS Reduction
Watershed Retrofit	8th Street S Curbside	12/1/2014	5.36	0.50	366.06
Watershed Retrofit	11th Street Park - Bioretention 1	10/15/2016	4.93	0.28	152.60
Watershed Retrofit	Northside Leaf/Mulch Storage Facility	11/1/2016	9.38	0.93	690.82
Watershed Retrofit	11th Street Park - Bioretention 2	11/7/2016	1.55	0.08	41.34
Watershed Retrofit	Patrick Henry Drive & 20th Street N	5/1/2017	14.71	1.25	873.44
Living Shore	Four Mile Run	10/13/2017	29.64	32.11	20969.92
Watershed Retrofit	Kensington Street - B	12/22/2017	11.55	0.88	590.22
Watershed Retrofit	Kensington Street - A (32nd St)	12/22/2017	10.15	0.81	549.51
Watershed Retrofit	John Marshall Drive - B	12/22/2017	5.53	0.40	262.39
Watershed Retrofit	John Marshall Drive - A	12/22/2017	15.63	1.40	999.10
Watershed Retrofit	Kirkwood Road @13th Street N	8/16/2018	3.31	0.31	226.64
Watershed Retrofit	Williamsburg Blvd Medians 2 - D	11/1/2018	3.88	0.39	287.32
Watershed Retrofit	Williamsburg Blvd Medians 2 - A-C	11/1/2018	4.31	0.43	317.07
Watershed Retrofit	Williamsburg Blvd Medians 1 - North	11/1/2018	5.61	0.58	441.16
Watershed Retrofit	Williamsburg Blvd Medians 1 - South	11/1/2018	9.49	0.84	597.68
Stream Restoration	Windy Run	3/18/2019	38.09	35.56	22982.13
Watershed Retrofit	N Kentucky Street @ 22nd St N	10/18/2019	2.79	0.24	169.72
Watershed Retrofit	2nd Street S - Bioretention 2	11/25/2019	2.46	0.20	135.53
Watershed Retrofit	2nd Street S - Bioretention 1	11/25/2019	3.08	0.26	182.91
Watershed Retrofit	N 11th Street @ George Mason Drive (B)	7/1/2020	3.93	0.33	226.66
Watershed Retrofit	N 11th Street @ Evergreen Street (A)	7/1/2020	7.57	0.66	463.00
Watershed Retrofit	N Oakland Street @ Pershing Drive	5/25/2021	2.10	0.18	125.01
2006-2009 Historical BMPs	2006 - 2009 Historical BMP's		140.30	18.40	16101.30
Development	Redevelopment July 15 -Jun 16		100.57	6.32	5787.93
Development	Redevelopment July 18 -June 19		124.58	10.04	8287.26
Development	Redevelopment July 09 - June 14		122.08	7.05	6337.05
Development	Redevelopment July 19 -June 20		82.12	7.28	4506.78
Development	Redevelopment July 14 -June 15		46.29	3.27	2497.94
Development	Redevelopment July 16 -June 17		110.02	4.29	3968.19
Development	Redevelopment July 17 -June 18		111.02	9.18	5517.35
Development	Redevelopment July 20 -June 21		130.36	11.58	5502.66
Development	Additional July 09 – June 14		9.72	1.18	999.46
Septic Conversions	Septic tank conversions		52.92	0.00	0.00
Street Sweeping	County Roadways		97.30	23.50	37090.10

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145 **Appendix B. Summary of public comment/response**

146 Information will be included after public comments have been received and reviewed.