



City of Charlottesville, Virginia

Sediment Total Maximum Daily Load (TMDL) Action Plan for Moores Creek, Lodge Creek, Meadow Creek, and Schenks Branch



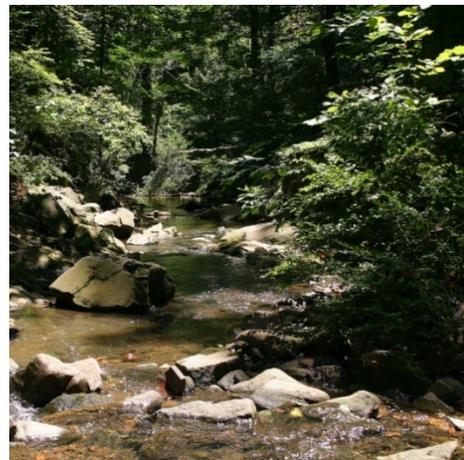
Moores Creek



Lodge Creek



Meadow Creek



Schenks Branch

MS4 General Permit Registration Number VAR040051

April 2021

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Appendix A – Public Education and Outreach Plan

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Background

The City of Charlottesville, Virginia's corporate limits and population of just over 48,000 people are located within the 750 square mile Rivanna River watershed. The Rivanna River watershed is part of the larger James River watershed, the largest watershed in Virginia; the James River is a major tributary of the Chesapeake Bay. Originating from springs in the foothills of the Blue Ridge Mountains, the Rivanna River flows along the eastern portion of Charlottesville and forms a boundary with neighboring Albemarle County. The Rivanna River and its urban tributaries provide important ecological, recreational, and cultural value to the city.

The city's 10.2 square miles contain approximately thirty-five miles of open waterways, with approximately thirteen additional miles of waterways that flow inside of the stormwater infrastructure system. Charlottesville consists of three main drainage areas. Along the eastern portions of the city, approximately 1.3 square miles of land drain through minor tributaries of or directly into the Rivanna River. The Meadow Creek and Moores Creek watersheds are the two largest drainage areas within the city and both drain into the Rivanna River. The Meadow Creek watershed spans the northern portion of the city and has a highly urbanized drainage area of approximately nine square miles, about 70 percent of which is located within the city limits. Schenks Branch is a tributary of Meadow Creek, and its approximately 2 square mile watershed encompasses much of downtown Charlottesville. Moores Creek, which has its headwaters in Albemarle County, forms the southern boundary of the city; approximately 3.8 square miles of the city drain into the creek. The thirty-five square mile Moores Creek watershed encompasses diverse land uses including highly urbanized areas, suburban and rural, agricultural, as well as open space within Charlottesville and Albemarle County. Lodge Creek is a tributary of Moores Creek, has an approximately .5 square mile watershed, and its headwaters are on the grounds of the University of Virginia.

The City has a municipal separate storm sewer system (MS4), meaning there are two separate conveyance systems for stormwater and sewage, with wastewater from residents and businesses flowing to the wastewater treatment plant, and stormwater draining untreated directly into local surface waters. As a result of stormwater runoff's impacts to water quality, stormwater discharges from MS4s are regulated by the United States Environmental Protection Agency (EPA) under the Clean Water Act and by the Commonwealth of Virginia under the Virginia Stormwater Management Act. The regulations governing MS4s were developed and implemented in two phases. The first phase began in the early 1990s, requiring operators of MS4s serving populations of greater than 100,000 people to apply for and obtain a permit to discharge stormwater collected by their systems into waterways. The second phase of MS4 regulations became effective March 23, 2003, and requires that operators of small MS4s (less than 100,000 people) in "urbanized areas" obtain permit coverage for stormwater discharges. Small MS4s include stormwater systems operated by cities such as Charlottesville, as well as counties, towns, community colleges, and public universities.

In Virginia, discharges from small MS4s are regulated by the Department of Environmental Quality (DEQ), under the *General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems* (MS4 General Permit). Under that permit, small MS4s must develop, implement, and enforce a stormwater management program that addresses six “minimum control measures (MCMs)” to control the discharge of pollutants from the MS4 to “the maximum extent practicable” through the development and implementation of best management practices (BMP).

As required by the EPA and Commonwealth of Virginia, the City of Charlottesville operates and enforces a stormwater management program. The City was originally issued a stormwater discharge permit from DEQ on March 4, 2003 (Permit No. VAR040051). Subsequently, regulatory authority and program oversight was transferred to the Virginia Department of Conservation and Recreation (DCR) in January 2005, and the permit expired on December 9, 2007. This permit was administratively extended while new permit requirements were being finalized. The City’s second MS4 General Permit was issued by DCR on July 9, 2008 and remained in effect until July 1, 2013. Regulatory authority and program oversight was transferred back to DEQ in 2013, and the City’s third MS4 General Permit was issued on July 1, 2013 and the permit expired on October 31, 2018. This permit was administratively extended while new permit requirements were being finalized. The City’s fourth MS4 General Permit was issued by DEQ on November 1, 2018 and will remain in effect until it expires on October 31, 2023.

The City has prepared this Local TMDL Action Plan to address Part II.B of the City’s MS4 General Permit, *Local TMDL Special Condition*. The City coordinated with the County of Albemarle (the County) and the University of Virginia (UVA) in the development of this Action Plan. The requirements of this Action Plan, as presented in Part II.B of the MS4 General Permit, are below:

B. Local TMDL special condition.

1. The permittee shall develop a local TMDL action plan designed to reduce loadings for pollutants of concern if the permittee discharges the pollutants of concern to an impaired water for which a TMDL has been approved by the U.S. Environmental Protection Agency (EPA) as described in Part II B 1 a and 1 b:
 - a. For TMDLs approved by the EPA prior to July 1, 2013, and in which an individual or aggregate wasteload has been allocated to the permittee, the permittee shall update the previously approved local TMDL action plans to meet the conditions of Part II B 3, B 4, B 5, B 6, and B 7 as applicable, no later than 18 months after the permit effective date and continue implementation of the action plan;
 - b. For TMDLs approved by EPA on or after July 1, 2013, and prior to June 30, 2018, and in which an individual or aggregate wasteload has been allocated to the permittee, the permittee shall develop and initiate implementation of action plans to meet the conditions of Part II B 3, B 4, B 5, B 6, and B 7 as applicable for each pollutant for which wasteloads have been allocated to the permittee's MS4 no later than 30 months after the permit effective date.
2. The permittee shall complete implementation of the TMDL action plans as soon as practicable. TMDL action plans may be implemented in multiple phases over more than one permit cycle using the adaptive iterative approach provided adequate progress is achieved in the implementation of BMPs

designed to reduce pollutant discharges in a manner that is consistent with the assumptions and requirements of the applicable TMDL.

3. Each local TMDL action plan developed by the permittee shall include the following:
 - a. The TMDL project name;
 - b. The EPA approval date of the TMDL;
 - c. The wasteload allocated to the permittee (individually or in aggregate), and the corresponding percent reduction, if applicable;
 - d. Identification of the significant sources of the pollutants of concern discharging to the permittee's MS4 and that are not covered under a separate VPDES permit. For the purposes of this requirement, a significant source of pollutants means a discharge where the expected pollutant loading is greater than the average pollutant loading for the land use identified in the TMDL;
 - e. The BMPs designed to reduce the pollutants of concern in accordance with Parts II B 4, B 5, and B 6;
 - f. Any calculations required in accordance with Part II B 4, B 5, or B 6;
 - g. For action plans developed in accordance with Part II B 4 and B 5, an outreach strategy to enhance the public's education (including employees) on methods to eliminate and reduce discharges of the pollutants; and
 - h. A schedule of anticipated actions planned for implementation during this permit term.

The City intends to implement this Action Plan through multiple MS4 General Permit cycles using an adaptive iterative approach, making progress to reduce pollutant discharge in a manner consistent with the assumptions and requirements of the applicable TMDL WLAs. While this Action Plan presents current and future practices intended to mitigate the sediment impairments described in this report, the City reserves the right to make modifications to the Action Plan as new opportunities become available or proposed projects and strategies are deemed infeasible or ineffective.

TMDL Action Plan

1. The TMDL project name; (General Permit Part II.B.3.a)

Sediment TMDLs for Moores Creek, Lodge Creek, Meadow Creek, and Schenks Branch Albemarle County and City of Charlottesville, Virginia (dated January 20, 2016)

The Sediment TMDL Report noted above identified four separate stream segments that were included in Virginia's 2012 303(d) Report on Impaired Waters due to violations of the general aquatic life (benthic) standard. These impaired segments include 6.37 miles of Moores Creek (VAV-H28R_MSC01A00), 1.37 miles of Lodge Creek (VAV-H28R_XRC01A04), 4.0 miles of Meadow Creek (VAV-H28R_MWC01A00), and 1.13 miles of Schenks Branch (VAV-H28R_SNK01A02).

Moores Creek and its tributary, Lodge Creek, were originally listed as impaired on Virginia's 2008 and 2006 305(b)/303(d) Water Quality Assessment Integrated Reports, respectively, due to water quality violations of the general aquatic life (benthic) standard. Meadow Creek and its tributary, Schenks Branch, were originally listed as impaired in the same reports in 2006 and 2008, respectively, also due to water quality violations of the general aquatic life (benthic) standard.

The following are excerpts from the Sediment TMDL Report (Page ii):

TMDLs must be developed for a specific pollutant. Since a benthic impairment is based on a biological inventory, rather than on a physical or chemical water quality parameter, the pollutant is not explicitly identified in the assessment, as it is with physical and chemical parameters. The process outlined in USEPA's Stressor Identification Guidance Document (USEPA, 2000) was used to identify the critical stressors for each of the impaired watersheds in this study. As a result of the stressor analysis, the most probable stressor contributing to the impairment of the benthic community in Moores Creek was identified as sediment due to poor habitat metrics related to active erosion, poor vegetative cover and bank stability. In contrast, the most probable stressors for Lodge Creek were identified as hydrologic modification and sediment because of the large amount of impervious surfaces in the watershed, poor riparian vegetation scores in the habitat metric, and erosion from unstable stream banks. For Meadow Creek, the most probable stressors were also identified as hydrologic modification and sediment due to the high percentage of urbanization in the watershed and the poor bank stability scores in the habitat metric. The same most probable stressors - hydrologic modification and sediment – were identified for Schenks Branch attributable to the high percentage of impervious surface area and headwater reaches being enclosed in culverts. This TMDL was written for the common stressor in all four streams, sediment, and will address all four benthic impairments.

Below is Figure 2-1 from the Sediment TMDL Report, Moores Creek, Lodge Creek, Meadow Creek, and Schenks Branch Watersheds.

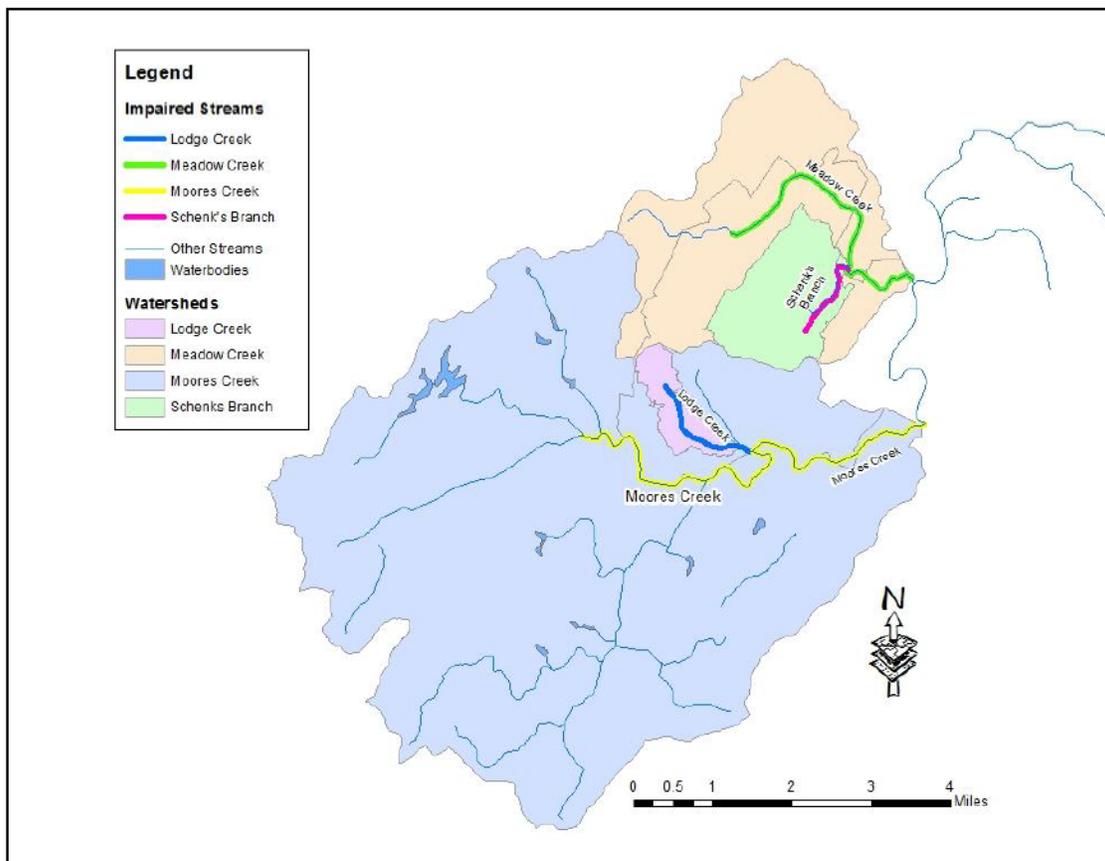


Figure 2-1. Moores Creek, Lodge Creek, Meadow Creek, and Schenks Branch Watersheds

2. The EPA approval date of the TMDL; (General Permit Part II.B.3.b)

The Sediment TMDL was approved by EPA on July 26, 2016.

3. The wasteload allocated to the permittee (individually or in aggregate), and the corresponding percent reduction, if applicable; (General Permit Part II.B.3.c)

Aggregated wasteload allocations (WLA) and corresponding percent reductions were assigned to the MS4 permit holders in the impaired watersheds. The MS4 permit holders include the City, as well as the County, UVA, the Virginia Department of Transportation, and Piedmont Virginia Community College. The figure below from the Sediment TMDL Report, Figure 5-2 shows the regulated MS4 areas in the impaired watersheds.

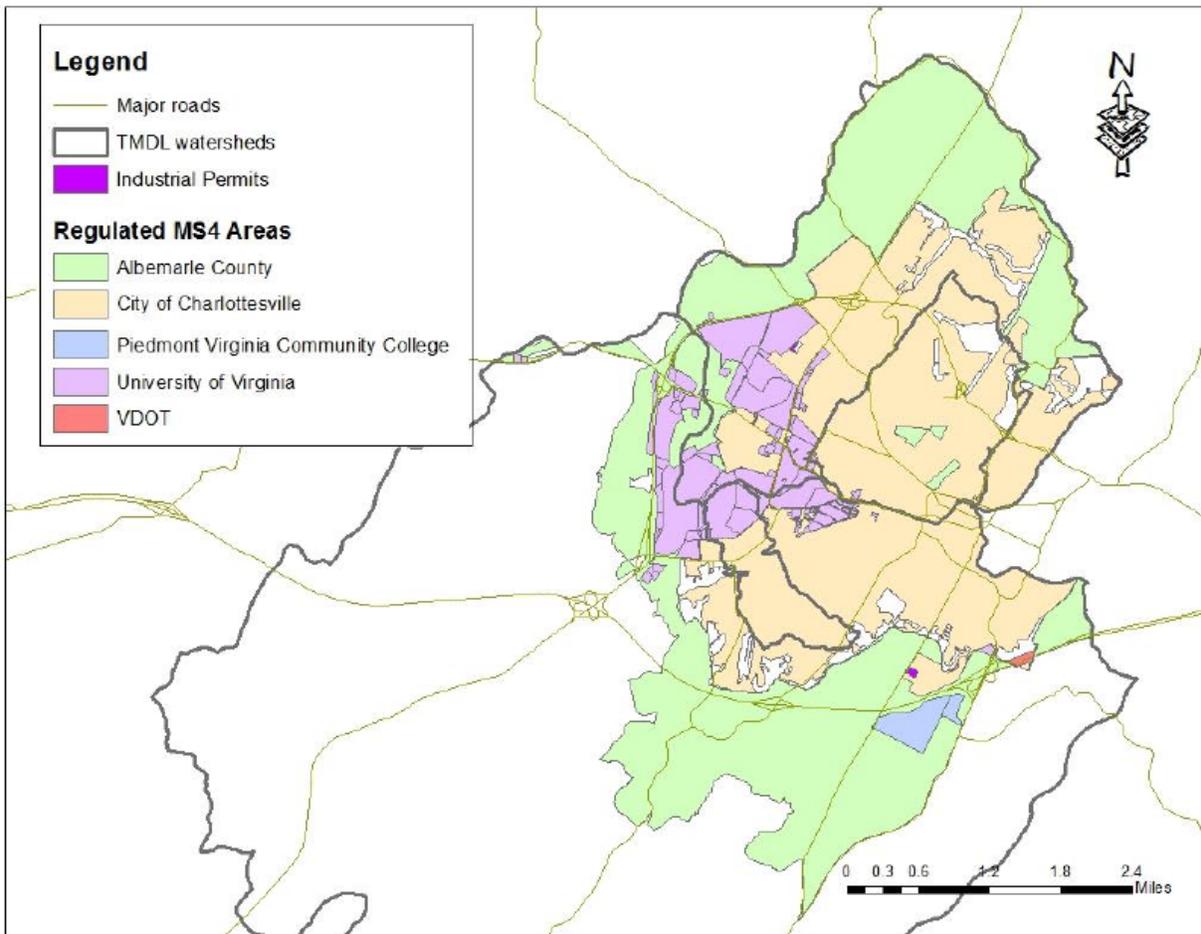


Figure 5-2. Regulated MS4 Areas within the Impaired Watersheds

The allocated MS4 wasteload allocations (WLA) and corresponding percent reductions for Lodge Creek, Moores Creek, Meadow Creek, and Schenks Branch are presented on the ensuing pages, in Tables 6-4 through 6-7 from the Sediment TMDL Report.

Table 6-4. Lodge Creek: Sediment TMDL Load Allocation Scenario

Land Use/ Source Group	Area (acres)	Existing Sediment Load (tons/yr)	Allocation Scenario		
			% Reduction	Load Reduction Needed (tons/yr)	Allocated Load (tons/yr)
Non-Regulated Areas					
Forest	2.64	0.056			0.056
Harvested Forest	0.03	0.0043	42.9%	0.0018	0.0024
Impervious developed	0.88	0.273	52.2%	0.142	0.131
Pervious developed	4.62	0.663	52.2%	0.346	0.317
Transitional***	0.06	0.238	25.0%	0.059	0.178
Channel Erosion		0.011	52.2%	0.006	0.005
Non-MS4 Permitted WLA**					0.000
SSOs		0.0014	100.0%	0.001	0.000
Non-Regulated Sub-Totals		1.25	44.7%	0.56	0.69
Regulated-MS4 Areas					
Forest	50.04	1.06			1.06
Impervious developed	156.81	48.60	52.2%	25.35	23.25
Pervious developed	252.66	36.24	52.2%	18.91	17.34
Transitional***	1.12	4.80	25.0%	1.20	3.60
Channel Erosion		0.64	52.2%	0.34	0.31
Regulated-MS4 Sub-Totals		91.3	50.1%	45.8	45.6
Future Growth				-0.5	0.5
Total Loads		92.6	49.5%	45.8	46.8

** Non-MS4 Permitted WLA includes individual VPDES, ISWGP, and other general permitted loads.

*** The Allocation Scenario Load for Transitional Land Use equals the construction WLA.

LA components =	0.5
WLA components =	46.2
TMDL - MOS =	46.8

Table 6-5. Moores Creek: Sediment TMDL Load Allocation Scenario

Land Use/ Source Group	Area (acres)	Existing Sediment Load (tons/yr)	Allocation Scenario			Load Reduction from §319 Implementation
			% Reduction	Load Reduction Needed (tons/yr)	Allocated Load (tons/yr)	
Non-Regulated Areas						
Row Crops	86.1	74.1	14.2%	10.5	63.6	65.9
Pasture	200.0	128.4	14.2%	18.2	110.2	
Hay	710.9	193.2	14.2%	27.4	165.8	
Forest	11,933.6	373.9			373.9	
Harvested Forest	120.5	30.5	42.9%	13.1	17.41	
Impervious developed	440.2	140.5	14.2%	19.9	120.6	
Pervious developed	2,704.7	286.8	14.2%	40.6	246.2	
Transitional***	31.8	93.0	25.0%	23.3	69.77	
Channel Erosion		163.0	14.2%	23.1	139.9	
Non-MS4 Permitted WLA**				-4.1	4.1	
SSOs		0.0057	100.0%	0.0057	0.0	
Non-Regulated Sub-Totals		1,483.4	11.6%	171.9	1,311.6	
Regulated-MS4 Areas						
Pasture	16.01	10.3	14.2%	1.5	8.8	
Hay	93.86	25.5	14.2%	3.6	21.9	
Forest	1,189.06	36.9			36.9	
Impervious developed	1,180.17	376.7	14.2%	57.4	319.3	
Pervious developed	2,759.24	292.6	14.2%	41.5	251.1	
Transitional***	13.91	40.7	25.0%	10.2	30.53	
Channel Erosion		52.8	14.2%	7.5	45.3	
Regulated-MS4 Sub-Totals		835.5	14.6%	121.7	713.8	
Future Growth				-21.9	21.9	
Total Loads		2,318.9	11.7%	271.7	2,047.2	

** Non-MS4 Permitted WLA includes individual VPDES, ISWGP, and other general permitted loads.

*** The Allocation Scenario Load for Transitional Land Use equals the construction WLA.

LA components =	1,237.6
WLA components =	809.6
TMDL - MOS =	2,047.2

Table 6-6. Meadow Creek: Sediment TMDL Load Allocation Scenario

Land Use/ Source Group	Area (acres)	Existing Sediment Load (tons/yr)	Allocation Scenario		
			% Reduction	Load Reduction Needed (tons/yr)	Allocated Load (tons/yr)
Non-Regulated Areas					
Forest	74.0	2.2			2.2
Harvested Forest	0.7	0.17	42.9%	0.07	0.10
Impervious developed	27.5	9.8	52.7%	5.2	4.7
Pervious developed	84.6	11.5	52.7%	6.0	5.4
Transitional***	1.2	4.0	25.0%	1.0	2.99
Channel Erosion		2.2	52.7%	1.1	1.0
Non-MS4 Permitted WLA**				-1.6	1.6
SSOs		0.0002	100.0%	0.0002	0.0
Non-Regulated Sub-Totals		29.8	39.8%	11.9	18.0
Regulated-MS4 Areas					
Hay	35.81	14.4	52.7%	7.6	6.8
Forest	598.09	17.7			17.7
Impervious developed	1,337.67	478.4	52.7%	253.5	225.0
Pervious developed	2,249.84	304.7	52.7%	160.5	144.2
Transitional***	9.96	34.3	25.0%	8.6	25.7
Channel Erosion		49.0	52.7%	25.8	23.2
Regulated-MS4 Sub-Totals		898.5	50.7%	455.9	442.6
Future Growth				-5.1	5.1
Total Loads		928.4	49.8%	462.6	465.7

** Non-MS4 Permitted WLA includes individual VPDES, ISWGP, and other general permitted loads.

*** The Allocation Scenario Load for Transitional Land Use equals the construction WLA.

LA components =	13.4
WLA components =	452.3
TMDL - MOS =	465.7

Table 6-7. Schenks Branch: Sediment TMDL Load Allocation Scenario

Land Use/ Source Group	Area (acres)	Existing Sediment Load (tons/yr)	Allocation Scenario		
			% Reduction	Load Reduction Needed (tons/yr)	Allocated Load (tons/yr)
Non-Regulated Areas					
Forest	5.1	0.1			0.1
Harvested Forest	0.1	0.01	42.9%	0.00	0.01
Impervious developed	22.9	7.8	57.1%	4.5	3.4
Pervious developed	75.7	10.9	57.1%	6.2	4.7
Transitional***	1.0	4.3	25.0%	1.1	3.2
Channel Erosion		0.2	57.1%	0.1	0.1
Non-MS4 Permitted WLA**				-3.0	3.0
SSOs		0.0001	100.0%	0.0001	0.0
Non-Regulated Sub-Totals		23.4	38.1%	8.9	14.5
Regulated-MS4 Areas					
Forest	44.48	1.3			1.3
Impervious developed	475.54	162.4	57.1%	95.7	66.8
Pervious developed	770.51	110.7	57.1%	63.2	47.5
Transitional***	3.07	13.3	25.0%	3.3	10.0
Channel Erosion		2.6	57.1%	1.5	1.1
Regulated-MS4 Sub-Totals		290.4	56.4%	163.6	126.7
Future Growth				-1.6	1.6
Total Loads		313.8	54.5%	171.0	142.8

** Non-MS4 Permitted WLA includes individual VPDES, ISWGP, and other general permitted loads.

*** The Allocation Scenario Load for Transitional Land Use equals the construction WLA.

	LA components =	8.3
	WLA components =	134.5
	TMDL - MOS =	142.8

The City, County, and UVA have agreed to take responsibility for the sediment loads generated within their MS4 regulated area boundary regardless of sheet flow draining to or from another jurisdiction. Sediment reduction credit for BMPs installed on any lands with inter-jurisdictional sheet flow will be received by the permittee that installs and maintains the BMP. However, each entity reserves the right to enter into agreements in which TMDL credit is shared with adjacent permittees for any projects which treat drainage from their own and/or multiple permittees' lands.

4. Identification of the significant sources of the pollutants of concern discharging to the permittee's MS4 and that are not covered under a separate VPDES permit. For the purposes of this requirement, a significant source of pollutants means a discharge where the expected pollutant loading is greater than the average pollutant loading for the land use identified in the TMDL; (General Permit Part II.B.3.d)

The Sediment TMDL Report states, "Sediment is generated in the Moores Creek and Meadow Creek watersheds through the processes of surface runoff, in-channel disturbances, and streambank and

channel erosion, as well as from natural background contributions and permitted sources. Sediment generation is accelerated through human-induced land-disturbing activities related to a variety of agricultural, forestry, mining, transportation, and residential land uses” (Page 93).

The City notes that average pollutant loading rates as a function of land use are not explicitly provided in the TMDL, although they can be inferred from the Sediment TMDL Report’s Table F-5, which is below.

Table F-5. City of Charlottesville Regulated MS4 Land Use Areas and Sediment Loads

City of Charlottesville Summary

	Lodge Creek	Moores Creek	Meadow Creek	Schenks Branch	Lodge Creek	Moores Creek	Meadow Creek	Schenks Branch
	Area in acres				Sediment Load in tons/yr			
Forest (for)	43.37	157.70	123.22	41.82	0.92	4.66	3.86	1.22
Transitional (barren)	1.02	4.91	3.15	2.92	4.34	16.91	9.21	12.67
Pervious LDI (pur_LDI)	185.15	839.84	787.91	609.85	26.44	117.20	84.96	89.11
Pervious MDI (pur_MDI)	9.56	74.88	133.45	104.98	1.41	8.73	10.67	13.74
Pervious HDI (pur_HDI)	1.33	27.80	25.80	23.13	0.21	2.93	1.81	3.15
Impervious LDI (imp_LDI)	94.31	310.72	341.42	250.45	24.90	85.10	93.49	65.75
Impervious MDI (imp_MDI)	12.23	109.95	124.71	146.35	5.34	50.17	56.79	63.53
Impervious HDI (imp_HDI)	4.67	108.54	75.85	64.95	2.04	48.89	34.71	28.19
water	0.00	5.78	3.78	0.44				
sub-watershed total	351.65	1,640.13	1,619.28	1,244.89	65.58	334.60	295.48	277.37
Regulated MS4 Total				4,855.95				973.04

The Sediment TMDL Report also states, “Streambank erosion was modeled within the GWLF model using a modification of the routine included in the AVGWLF version of the GWLF model (Evans et al., 2001). This routine calculates average annual streambank erosion as a function of percent developed land, average area-weighted curve number (CN) and K-factors, watershed animal density, average slope, streamflow volume, mean channel depth, and total perennial stream length in the watershed”. (Page 91)

Chapter 3 of the Sediment TMDL Report discusses the most probable stressors of the benthic macroinvertebrate communities in the impaired streams, as well as potential sources of these stressors. Sediment is listed as the most probable stressor for all four impaired streams, as well as hydrologic modifications for all the streams except Moores Creek. The potential sources of sediment identified in the Report include residential runoff, forest harvesting operations, construction sites, in-stream disturbances, channel erosion from unstable banks, and washoff from impervious areas. Areas of the impaired streams with insufficient riparian buffers are noted as being more prone to erosion. The Report also notes that hydrologic modifications driven by large amounts of impervious surfaces are likely to increase channel erosion and sediment loads downstream. Based on this information, the City assumes that the following are significant sources of sediment discharging to the City’s MS4: residential runoff, washoff from impervious areas, and construction sites. Additionally, the City assumes that in-stream disturbances and channel erosion from unstable stream banks (due in part to insufficient riparian buffers) in stream segments that drain to the City’s MS4 are significant sources of sediment to the City’s MS4.

5. The BMPs designed to reduce the pollutants of concern in accordance with Parts II B 4, B 5, and B 6; (General Permit Part II.B.3.e)

Part II.B.5 of the MS4 General Permit states:

5. Local sediment, phosphorus, and nitrogen TMDLs.

a. The permittee shall reduce the loads associated with sediment, phosphorus, or nitrogen through implementation of one or more of the following:

- (1) One or more of the BMPs from the Virginia Stormwater BMP Clearinghouse listed in 9VAC25-870-65 or other approved BMPs found on the Virginia Stormwater BMP Clearinghouse website;
- (2) One or more BMPs approved by the Chesapeake Bay Program; or
- (3) Land disturbance thresholds lower than Virginia's regulatory requirements for erosion and sediment control and post development stormwater management.

b. The permittee may meet the local TMDL requirements for sediment, phosphorus, or nitrogen through BMPs implemented to meet the requirements of the Chesapeake Bay TMDL in Part II A as long as the BMPs are implemented in the watershed for which local water quality is impaired.

c. The permittee shall calculate the anticipated load reduction achieved from each BMP and include the calculations in the action plan required in Part II B 3 f.

d. No later than 36 months after the effective date of this permit, the permittee shall submit to the department the anticipated end dates by which the permittee will meet each WLA for sediment, phosphorus, or nitrogen. The proposed end date may be developed in accordance with Part II B 2.

The Sediment TMDL Report included a summary of BMPs implemented in MS4 areas between 2009 and 2014 to illustrate progress being made to reduce sediment in the impaired watersheds (Appendix E, page 147). However, it is the City's understanding that the Sediment TMDL Report did not incorporate sediment reductions from these BMPs, and that sediment reductions from these BMPs may be eligible towards meeting the WLAs (Sediment TMDL Report, pages 124 and 147). Similarly, sediment reductions from BMPs implemented after 2014 may also be eligible towards meeting the WLAs. The City intends to determine which of these BMPs are eligible, and to account for their sediment reductions using the latest version of DEQ's Guidance Memo No. 20-2003 - Chesapeake Bay TMDL Special Condition Guidance (dated February 6, 2021). This Action Plan will be updated with the pertinent calculations when that effort is complete.

The following BMPs have been employed by the City to reduce sediment discharges to Moore Creek, Lodge Creek, Meadow Creek, and Schenks Branch:

Programmatic BMPs

The City's MS4 Program Plan includes a variety of programmatic BMPs that aim to reduce pollutants of concern, including sediment. The following section provides an explanation of how the identified BMPs are applicable to reducing the sediment impairments.

MCM 1 – Public Education and Outreach on Stormwater Impacts

The City's public education and outreach program is an effective way of making citizens and businesses aware of ways to reduce the stormwater impact of their everyday activities, as well as raising public awareness about what they see others doing on a day-to-day basis. Efforts to educate the community and promote low impact development practices such as rain gardens and rainwater harvesting, and to identify and report illicit discharges through a diverse array of media has the effect of reducing the discharge of sediment into impaired waters.

MCM 2 – Public Involvement / Participation

Involving the public in activities such as stream clean-ups, tree plantings, workshops, and community events not only educates the public on things they can do to reduce their stormwater impacts, but also promotes a connection to local waters and watershed issues while fostering a sense of shared responsibility for stewardship of these community resources. This ultimately leads to a reduction in the amount of pollutants entering local impaired waters through behavior change. Additionally, projects such as tree planting in riparian areas increases their pollution reduction capacity through greater filtration and absorption of stormwater. Continuing to foster community partnerships, such as the ones the City has cultivated with the University of Virginia, the County of Albemarle, the Rivanna Conservation Alliance, and the Thomas Jefferson Soil and Water Conservation District advances the state of stormwater management in the City, ultimately resulting in reduced pollutant discharge.

MCM 3 – Illicit Discharge Detection and Elimination

The City's illicit discharge detection and elimination (IDDE) program provides the mechanism to identify and directly eliminate pollutants entering impaired waters through dry weather screening of stormwater outfalls and response to water pollution reports. IDDE education of residents and businesses also raises awareness of the stormwater drainage system's direct connection to local waterways and illicit discharges, while providing avenues for reporting of illegal activities so that the City can take the appropriate actions. GIS mapping of the stormwater drainage system, including portions of the system that convey streams, allows for faster and targeted responses to incidents, reducing the impacts to waterways. Training of City staff also puts more "eyes on the street" to identify potential and actual situations that lead to stormwater pollution, while reducing impacts from City operations.

MCM 4 – Construction Site Stormwater Runoff Control

The City's Erosion and Sediment Control Program aims to minimize sediment leaving active construction sites in the city. The City has voluntarily reduced the land disturbance threshold which triggers the requirement for an E&S control plan and permit to 6,000 square feet, making this program even more effective at preventing sediment from leaving construction sites. Properly trained and certified staff ensures that program administration, plan review, and site inspection most effectively and efficiently reduce sedimentation from the development process.

MCM 5 – Post Construction Stormwater Management in New Development and Redevelopment

The City's post-construction stormwater management program aims to ensure appropriate measures are employed such that post-development water quantity does not increase and water quality does not decrease when compared to the pre-development conditions of land in the City. The City has voluntarily

reduced the land disturbance threshold which triggers post-construction stormwater management requirements to 6,000 square feet, making this program even more effective at reducing stormwater volumes and protecting water quality. The City encourages green stormwater infrastructure in new development and redevelopment that reduces stormwater volume and improves stormwater quality, thereby reducing high flows that cause in-stream erosion and sedimentation. The City also implements green stormwater infrastructure on public lands in new development, redevelopment, and retrofit situations that reduce stormwater volume, thereby reducing high flows that cause in-stream erosion and sedimentation. The structural stormwater management facility (SMF) inspection program ensures that existing public and private SMFs are being maintained properly, thereby maximizing their effectiveness in addressing sediment pollution. Protecting and improving the City's urban forest, particularly in riparian areas, allows these areas to serve as natural pollution filtration devices, keeping sediment in surface runoff from ever entering impaired waters.

MCM 6 – Pollution Prevention / Good Housekeeping for Municipal Operations

The City's street sweeping and stormwater infrastructure flushing and cleaning programs are effective at capturing sediment pollution that would otherwise be conveyed into impaired waters. Pollution prevention training also raises public employee awareness of how they can reduce the stormwater impact of their everyday work activities. The green public lands management strategies employed by the City reduce sediment pollution by acquiring and preserving green space. Development and implementation of stormwater pollution prevention plans and nutrient management plans for certain City facilities and lands will decrease the amount of pollutants leaving these sites.

6. Any calculations required in accordance with Part II B 4, B 5, or B 6; (General Permit Part II.B.f)

No calculations are required at this time. As the City determines the eligibility of existing BMPs and accounts for their sediment reductions, the pertinent calculations will be included in this Action Plan. As new BMPs are implemented, their sediment reductions and the pertinent calculations will also be included in this Action Plan.

7. For action plans developed in accordance with Part II B 4 and B 5, an outreach strategy to enhance the public's education (including employees) on methods to eliminate and reduce discharges of the pollutants; (General Permit Part II.B.3.g)

Public Education and Outreach Program

The City's public education and outreach programs have been enhanced to promote methods to eliminate and reduce discharges of sediment. See Appendix A, the City's Public Education and Outreach Plan, developed in conjunction with the Rivanna Stormwater Education Partnership (RSEP), for details on these enhancements. In addition to the education program described in Appendix A, City staff worked to enhance education and outreach through designing and conducting a stormwater management facility maintenance workshop, which educated BMP owners and maintenance staff on their responsibilities for maintenance and how best to fulfill them. The workshop was conducted in June 2016 and addressed sediment pollution. Also in collaboration with RSEP, the City completed a GIS-based

Story Map website in 2020, which provides interactive information on the Rivanna River and its watershed, local stream health, community water quality monitoring programs, projects and programs the MS4 permit holders are undertaking, and things residents can do at home and work to improve stream health and water quality. The Story Map is here: tinyurl.com/RivannaStoryMap.

Training Program

The City conducts training for applicable employees in accordance with the MS4 General Permit. The goal of the training program is to reduce the impact of municipal operations on stormwater runoff. This program builds on stormwater general awareness and pollution prevention (P2) training that is routinely provided to City operations and maintenance employees from the Departments of Public Works, Utilities, and Parks and Recreation. Training materials include stormwater pollution prevention plans, standard operating procedures, illicit discharge detection and elimination procedures, training videos and other presentations.

The following table provides an overview of the training plan and its basic elements:

Training Category (and Frequency)	Department of Utilities	Department of Public Works	Department of Parks and Recreation	Fire Department
Recognition & Reporting of Illicit Discharges for Field Personnel (once per 24 months)	X	X (Public Service and Facilities Maintenance)	X	X
Good Housekeeping & P2 Practices for Road, Street, and Parking Lot Maintenance (once per 24 months)		X (Public Service)	X	
Good Housekeeping & P2 Practices for Maintenance and Public Works Facilities (once per 24 months)	X	X (Public Service and Facilities Maintenance)	X (Parks and Golf)	X
Good Housekeeping and P2 Practices for Recreational Facilities (once per 24 months)			X (Aquatics and rec centers staff, maintenance staff)	
Pesticide and Herbicide Applicators certification per VA Pesticide Control Act (as required)			X (Horticulture Crew)	
VA E&S Control Law and Regulations - DEQ certifications (as required)		X Plan Reviewers, Inspectors, Program Administrator		
Stormwater Management Law and Regulations - DEQ/VSMP certifications (as required)		X Plan Reviewers, Inspectors, VSMP Administrator		
Basic Spill Response (once every 24 months)	X	X	X	X
Hazardous Materials Operations and Technicians (annually)				X
Procedures for Operations and Maintenance Activities (once every 24 months)	X	X	X	

**8. A schedule of anticipated actions planned for implementation during this permit term.
(General Permit Part II.B.3.h)**

As permitted in Part II.B.2 of the MS4 General Permit, the City is proposing to implement this Action Plan in multiple phases over more than one permit cycle using an adaptive iterative approach to ensure that adequate progress continues to be made toward reducing the discharge of sediment to Moores Creek, Lodge Creek, Meadow Creek, and Schenks Branch.

The following schedule is proposed for implementation of the Programmatic BMPs included in this Action Plan for the current permit cycle ending on October 31, 2023:

BMP	Description	Schedule
BMP 1.1	Rivanna Stormwater Education Partnership (RSEP)	Ongoing/Annual
BMP 1.2	City Environmental Webpages	Ongoing/Annual
BMP 1.3	Youth Stormwater Education	Ongoing/Annual
BMP 1.4	Illicit Discharge and Pollution Prevention Education Program	Ongoing/Annual
BMP 1.5	Public Education and Outreach Plan	Ongoing/Annual
BMP 2.1	Volunteer Stream Clean-Ups	Ongoing/Annual
BMP 2.2	Adopt-A-Stream Program	Ongoing/Annual
BMP 2.3	Tree Planting Program	Ongoing/Annual
BMP 2.4	Watershed and Water Quality Activities	Ongoing/Annual
BMP 2.5	Public Involvement	Ongoing/Annual
BMP 3.1	IDDE Program	Ongoing/Annual
BMP 3.2	Maintenance of GIS Data, MS4 Map, and Information Table	Ongoing/Annual
BMP 3.4	Online Reporting of Environmental Concerns and Illicit Discharges	Ongoing/Annual
BMP 4.1	Erosion and Sediment Control Program	Ongoing/Annual
BMP 4.2	General Permit for Discharges from Construction Activities	Ongoing/Annual
BMP 5.1	Stormwater Management Materials	Ongoing/Annual
BMP 5.2	Development Plan Review	Ongoing/Annual
BMP 5.3	Structural Stormwater Management Facility and Best Management Practice Inventory and Reporting	Ongoing/Annual
BMP 5.4 Program	Structural Stormwater Management Facility Inspection and Maintenance Program	Ongoing/Annual
BMP 5.5	Urban Forest Management	Ongoing/Annual
BMP 5.6	Investigate Green Stormwater Infrastructure Retrofit Opportunities	Ongoing/Annual
BMP 6.1	Street Sweeping Program	Ongoing/Annual
BMP 6.2	Stormwater Infrastructure Flushing and Cleaning	Ongoing/Annual
BMP 6.3	Training for Appropriate Personnel	Ongoing/Annual
BMP 6.4	Written Procedures for Operations and Maintenance Activities	Ongoing/Annual
BMP 6.5	Stormwater Pollution Prevention Plans for Municipal Facilities	Ongoing/Annual
BMP 6.6	Turf and Landscape Nutrient Management Plans	Ongoing/Annual
BMP 6.7	Green Public Lands Management Strategies	Ongoing/Annual

Additionally, the City anticipates completing two stream restoration projects during the current permit cycle ending on October 31, 2023. The projects include restoration of ~1,030 linear feet of a tributary to Schenks Branch in the City's McIntire Park and ~1,580 linear feet of Meadow Creek in the City's Meadow

Creek Gardens Park. The City anticipates a twenty-four month window from the time of Notice to Proceed on the design contract until the completion of construction. Notice to Proceed on the design contract is imminent as of the writing of this Action Plan.

The City intends to demonstrate its progress on implementation of this Action Plan by tracking and reporting on BMP implementation in its MS4 Annual Report that is submitted to DEQ on or before October 1 of each permit year. In accordance with the adaptive iterative approach adopted by the City and referenced in this Action Plan, the City may modify and/or replace BMPs, as necessary, to achieve the most effective plan for reducing the discharge of sediment from the City's MS4 and meeting the assigned TMDL WLAs.

City of Charlottesville – MS4 Program Plan

Appendix A

Public Education and Outreach and Public Involvement and Participation Program

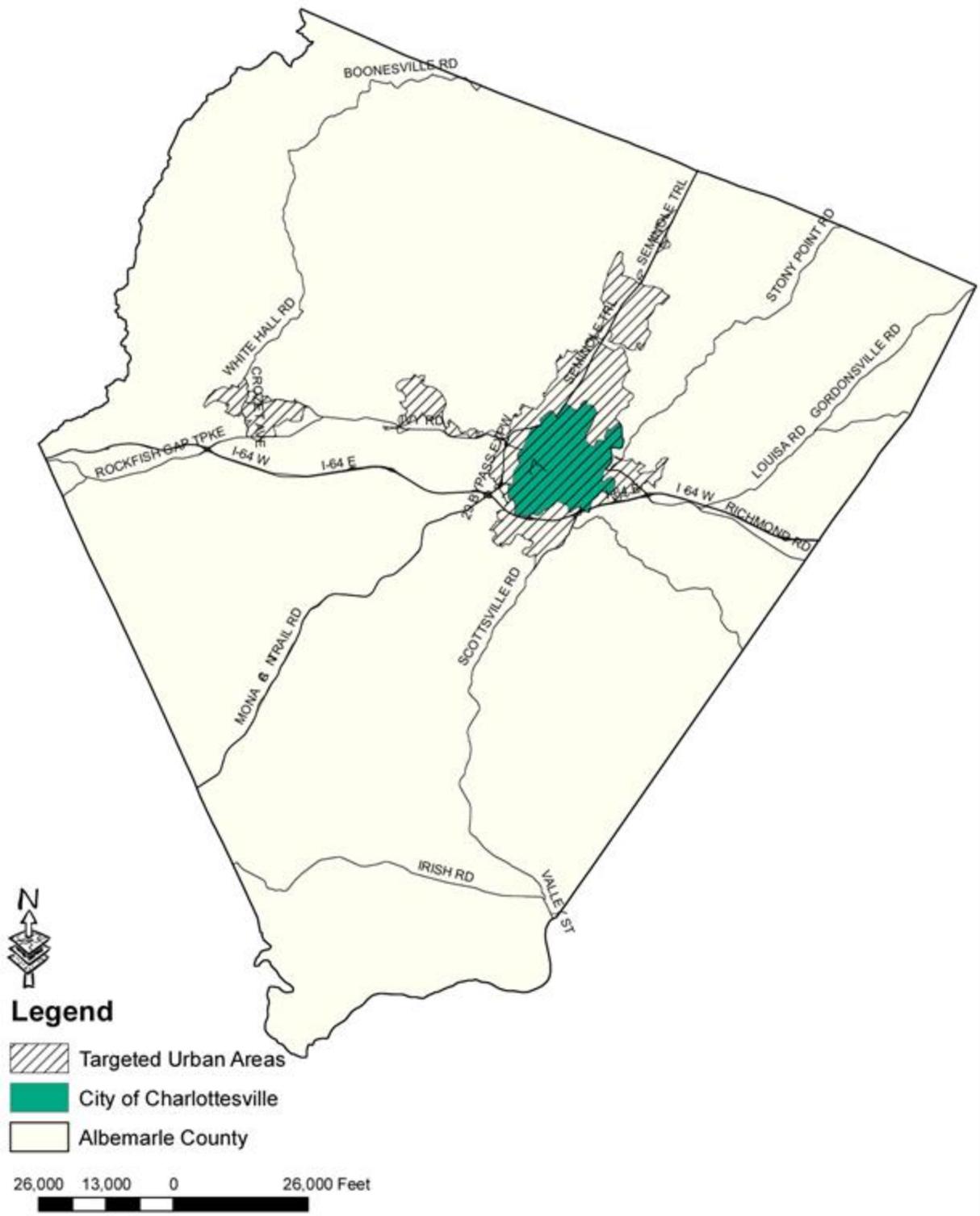
1. Background - Coordinating efforts amongst local MS4 operators

Educating, reaching out to, and involving the public in stormwater issues is accomplished primarily through participation in the Rivanna Stormwater Education Partnership (RSEP). The RSEP is a collaborative effort among local public entities in the City of Charlottesville and the surrounding County of Albemarle that hold small MS4 permits under the National Pollutant Discharge Elimination System program. The RSEP is dedicated to helping its members achieve the MS4 permit requirements related to education, outreach, and public participation in stormwater management.

The MS4 permit holders that comprise RSEP are Albemarle County, the City of Charlottesville, and the University of Virginia. Other members of RSEP are Albemarle County Public Schools, the Albemarle County Service Authority, and the Rivanna Water and Sewer Authority. The Thomas Jefferson Soil and Water Conservation District (TJSWCD) provides support to RSEP and serves as its coordinating body.

Founded in March 2003, the RSEP meets a minimum of six times a year to plan and implement stormwater education initiatives and share information about each partner's stormwater programs. Education initiatives are undertaken by the RSEP to help make citizens aware of stormwater issues, while also equipping them with practical knowledge and actions to help improve local water quality. RSEP utilizes a multi-faceted approach to educate and provide outreach across targeted urban areas (Figure 1). Past campaign materials, including print ads, movie theatre ads, posters on public transit buses, magnets, radio spots, and utility bill inserts are written in simple, easy to understand language and often utilize simple pictures or drawings to help the message come across to all generations and all education levels. RSEP also provides some campaigns in Spanish. Education and outreach materials are available at www.rivanna-stormwater.org. Each partner pays an annual membership fee to help fund RSEP projects. In addition, the RSEP has successfully applied for and partnered on grants to supplement education efforts.

The RSEP has produced effective and far-reaching education programs that have benefited from the variety of expertise and resources each partner offers. Planning and implementing education initiatives through the RSEP has resulted in Rivanna River watershed-focused projects and has avoided the over-exposure and redundancy that might result if each partner were carrying out projects on their own.



Targeted Urban Areas: U.S. Census Urban Area and Urban Cluster (2010) available at <https://www.census.gov/geo/maps-data/>

Figure 1. Urban Areas Targeted by RSEP Education and Outreach

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2. Identification of high-priority water quality issues and their importance

RSEP held several meetings to discuss and determine the high priority water quality issues for the region, which will be the focus of their education and outreach campaigns for the current MS4 permit cycle. During the 2013-2018 permit cycle, RSEP chose local and regional water quality impairments, bacteria, sediment, and nutrients (nitrogen and phosphorus), as their high priority issues. Campaigns conducted during this time frame were considered successful. However, RSEP found the chosen issues limited in some ways the extent of outreach efforts that the group could undertake. For the 2018-2023 permit cycle, RSEP members have chosen to address broader categories of water quality issues, namely runoff volume reduction, potential runoff pollutants, and TMDL pollutants as the high priority issues. By grouping regional water quality impairments as one high priority issue, RSEP can still address this highly important topic, while allowing the group to also address other issues that also have the potential to impact water quality in the region.

The reasoning behind choosing each of these high-priority issues is further described in the following sections. Examples of planned education and outreach campaigns and general content ideas are provided in Table 1. Using the adaptive iterative approach, the plan may be modified at any time during the permit cycle to address changes in local stormwater issues or concerns.

a. Runoff Volume Reductions

One of the biggest challenges facing urban waterways is the sheer volume of runoff being transported from impervious surfaces to streams. In developed areas, rainwater falls on impervious surfaces, such as buildings, parking lots, and driveways which prevent water from infiltrating into the ground and recharging local aquifers. This rainwater flows rapidly across impervious surfaces and into storm sewers, which direct the water to local streams. As a result of this rapid transport to local streams, stream flow volumes and velocities are significantly higher than would be observed under natural conditions. These high, rapid flows can cause stream bank erosion and changes in stream ecosystem habitats. Best management practices (BMPs) can be installed to mitigate the impacts of development by slowing down the transport of water from impervious surfaces to local streams.

While localities and developers are required to install BMPs for certain construction projects, maintenance of these BMPs is not always taken into account during their installation. In addition, there are many BMPs homeowners can implement or install to reduce the runoff volume and velocity from their properties and contribute to healthier streams. RSEP intends to provide education and outreach to both homeowners as well as new and existing BMP owners during the permit period. The goal of this education program will be to educate recipients on the negative impacts of increased stormwater volume and velocity and also provide ideas for ways they can reduce, mitigate, or treat runoff from their property.

b. Potential Runoff Pollutants

As stormwater flows across roadways, parking lots, and driveways, it picks up pollutants such as sediment, oil, nutrients, bacteria, and trash that are lying on the surface. Sources of these pollutants can be as varied as the pollutants themselves, ranging from pet waste left by a local resident to a diesel fuel spill on a local industrial site to cigarette butts tossed on the ground by passing smokers.

There are two primary ways to handle potential runoff pollutants. The first is to prevent the potential pollutant from becoming a water quality issue. Educational messaging for this approach will range from reminding restaurants how to properly handle their used cooking oil to reminding residents to obtain a soil test before applying fertilizer on their lawns. The second way to handle potential runoff pollutants is to try to capture them after they are out in the environment. While this approach is not ideal, it is a necessary component of a comprehensive outreach program. In addition to reducing runoff as previously discussed, certain BMPs can also help trap or absorb these pollutants in the environment and prevent them from reaching local waterways. In addition, the illicit discharge and elimination (IDDE) programs run by the various MS4 permit holders will help to identify and eliminate possible illicit discharges resulting from human activity in the watershed. IDDE education and outreach efforts provided by RSEP have warned against storm drain dumping and encouraged use of the RSEP Water Pollution Hot Line to report suspected illegal discharges.

c. TMDL Impairments – Bacteria, Sediment, Nitrogen, Phosphorus

The Chesapeake Bay TMDL requires pollution reductions of phosphorus, nitrogen, and sediment loads across the Bay watershed and sets pollution limits needed to achieve desired water quality standards. These TMDL impairments have significant impacts in the local area. In addition to sediment reductions required in the Chesapeake Bay TMDL, sediment source reductions are also required by the Rivanna River Benthic TMDL. Local TMDLs for streams such as Meadow and Lodge Creek also touch on sediment as a pollutant source, with bacteria as an added pollutant of concern in many local streams.

TMDL impairments are logical topics for MS4 education and outreach programs, as most of the streams with TMDLs in the local areas are urban streams and MS4s are concentrated in the urban areas. Of the stream miles assessed within the targeted urban areas, almost 30% have an impaired benthic macro-invertebrate community, as a result of too much sediment in our waterways¹. The *Final Report of the Benthic TMDL Development for the Rivanna River Watershed* submitted to VA DEQ (2008) identifies an existing sediment load from land-based and in-stream erosion from the MS4 point source. Over a quarter (26%) of streams assessed within the targeted urban areas are considered impaired by excessive amounts of bacteria². Bacteria impairments in these streams can be caused by a variety of sources including urban stormwater, pet waste, leaking sewer pipes, wildlife excrement, and agricultural uses. In

¹ *Final 2012 305(b)/303(d) Water Quality Assessment Integrated Report*, VA DEQ, 2014

² *Final 2012 305(b)/303(d) Water Quality Assessment Integrated Report*, VA DEQ, 2014

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addition, the MS4 general permit requires permittees to utilize turf and landscape management plans to minimize nutrient usage, while also prohibiting the usage of deicers containing urea, nitrogen, or phosphorus. Similar messaging is also relevant to home and business owners.

The goal of outreach and education campaigns focusing on TMDL impairments will include a variety of approaches, strategies, and target audiences. Licensed dog owners in the City and County can be targeted to pick up pet waste to reduce bacteria. Strategies utilized to address reductions in runoff volume can be used to target sediment. While homeowners, gardeners, and landscape maintenance professionals can be targeted to address fertilizer usage.

3. Providing public involvement opportunities during the reporting cycle

This Education and Outreach Plan will be posted on the [RSEP website](#), [the City of Charlottesville's website](#), [Albemarle County's website](#), and [UVA's website](#) and will remain available for the duration of the 2018-2023 MS4 Permit Cycle. At any time during the permit cycle, the public can visit any of these websites to report potential illicit discharges, improper disposal or spills to the MS4, complaints regarding land disturbing activities, or other potential stormwater pollution concerns. In addition, the public can also utilize these websites to provide input on any of the RSEP partners' MS4 programs, including the Education and Outreach Plan.

4. Adjusting target audience and messages to address any observed weaknesses or shortcomings

As necessary, RSEP will adjust target audiences and messages to address any observed weaknesses or shortcomings in the public education and outreach program. Additional educational materials have already been developed and may be modified or improved to address changing needs. In addition, the messaging described in Table 1 or activities described in Table 2 may be altered to appeal to different target audiences or to address a different high priority issue than the one listed. Other methods beyond those currently described in Tables 1 and 2 are likely to be employed as well. For example, RSEP members are currently discussing the possibility of creating a humorous stormwater education video to appeal to residents, brainstorming ways to partner with the local arts community on an educational display, considering starting a "love your watershed" initiative, as well as brainstorming additional "new" strategies to engage audiences in different ways. Some of these "new" ideas will require support and resources beyond what RSEP alone can provide and thus are not listed as planned education strategies or public involvement opportunities. However, RSEP will continue to pursue these ideas where feasible to find innovative ways to reach new audiences.

Table 1. Education and Outreach Strategies

Strategy Examples	Public Audience	Time Frame Anticipated Frequency	Anticipated Relevant Message(s)	High Priority Issues Addressed		
				Runoff Volume Reductions	Potential Runoff Pollutants	TMDL Pollutants
Written Materials <i>Utility Bill Inserts</i>	Homeowners and residents	Spring <i>Two or Three times during permit cycle</i>	Pick up After Your Pets: Animal waste that is washed off of lawns and sidewalks sends harmful bacteria into the storm drain system and into streams and rivers, creating problems for swimmers and fish.		✓	✓
			Use moderation when applying lawn products such as fertilizers, pesticides or herbicides. Better yet, get your soil tested, fertilize only in the fall, and look into non-chemical products to protect your lawn. Call the Cooperative Extension Service in Albemarle County at 872-4580 to find out how to get your soil tested.		✓	✓
Media Materials <i>Charlottesville Public Access Station PSAs</i>	Homeowners and residents	Winter <i>Once during permit cycle</i>	We all prefer healthy streams and lakes...but most of our local waters are somewhat polluted. When it rains, pollution is carried directly into streams by runoff from parking lots, streets, and lawns. Here's what YOU can do to reduce pollution: (one) pick up after your pet, (two) don't over-fertilize your lawn, and (three) capture the water from your rooftop in a rain barrel...or in a rain garden. Do your part to keep our streams clean and healthy. Visit Rivanna-stormwater.org .	✓	✓	✓
Media Materials <i>Cville Weekly Ads</i>	Homeowners and residents	Fall or Spring <i>Annually</i>	While being good to your pet, don't be bad to the river. Every time it rains, runoff from your lawn carries bacteria and other organisms from your pet's waste into local streams. Dispose of your pet's waste properly by bagging it and		✓	✓

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			<p>throwing it away.</p> <p>Don't over-fertilize your lawn. Excess nutrients from fertilizer are a major source of water pollution when they are carried by rain runoff into storm drains and local waterways. Apply fertilizer based on a soil test. Don't rake leaves down storm drains or into streams. When leaves are washed into streams they decompose there and degrade water quality. Compost them or bag for proper disposal. When you mow your lawn, don't dispose of grass clippings down a storm drain. Like decomposing leaves, grass clippings degrade water quality. Leave them on your lawn.</p>		✓	✓
<p>Written Materials <i>Charlottesville Area Transit Bus Ad</i></p>	<p>Homeowners and residents</p>	<p>Fall <i>Once during permit cycle</i></p>	<p>Don't over fertilize your lawn. Excess nutrients from fertilizer are a major source of water pollution when they are carried by rain runoff into storm drains and local waterways. Apply fertilizer based on a soil test. Don't rake leaves down storm drains or into streams. When leaves are washed into streams they decompose there and degrade water quality. Compost them or bag for proper disposal. When you mow your lawn, don't dispose of grass clippings down a storm drain. Like decomposing leaves, grass clippings degrade water quality. Leave them on your lawn.</p>		✓	✓
<p>Media Materials <i>Radio Ads</i></p>	<p>Homeowners and residents</p>	<p>Summer <i>Once during permit cycle</i></p>	<p>Did you know 1 quart of motor oil can contaminate 250,000 gallons of water? Every year in the U.S., millions of gallons of used motor oil, chemicals, and other wastes are disposed of illegally – down a storm drain or in the trash. Unlike sewage, stormwater is not</p>		✓	

			<p>treated. Storm drains empty directly into local streams and eventually reach the Chesapeake Bay. Please do your part to keep our waterways healthy. Recycle used motor oil at the Rivanna Solid Waste Authority's Ivy location or return it to where you bought it.</p>			
			<p>Planning to wash your car this weekend? Ever wonder where all that water goes after it runs off your driveway? This water does not get treated and carries oil, soaps, and cleaners into storm drains; it flows directly into local streams and eventually reaches the Chesapeake Bay. To help prevent this, consider using biodegradable cleaning products, and wash your car on the lawn, instead of the driveway. Even better, take your car to a carwash facility that recycles its wash water.</p>		✓	✓
			<p>Pet waste commonly contains bacteria and parasites harmful to humans and other pets. Waste left on trails, sidewalks and grassy areas can wash into creeks and lakes, harming aquatic life and making the water unsafe for swimming and wading. Our own Moores Creek has been found to contain harmful levels of E. coli. By picking up after dogs and cats, you can improve local water quality and keep your community safer!</p> <p>Remember: Always scoop pet waste and dispose of it properly by throwing it in the trash, flushing it down the toilet or composting it with a pet waste composter.</p>		✓	✓
Alternative Materials	Homeowners and residents	Spring <i>Once during permit</i>	Hand out magnets regarding cigarette butt litter, picking up pet waste, and proper car		✓	✓

<i>Magnets</i>		<i>cycle</i>	washing at Earth Week or other tabling events			
Alternative Materials Stickers	Homeowners and residents	Spring <i>Once during permit cycle</i>	Hand out stickers with stormwater focused messaging at Earth Week or other tabling events		✓	✓
Media Materials Social Media Promotion	Homeowners and residents	Twice Yearly <i>Annually</i>	Provide stormwater focused social media content to existing local Facebook pages or other social media outlets. Share stormwater video online.	✓	✓	✓

Table 2. Public Involvement Opportunities

Description of public involvement activity	Anticipated time period and frequency	Metric to determine if the activity is beneficial to water quality
Tabling at Earth Day Eco Fair and other Events	2-3 Events <i>Annually</i>	Number of individuals spoken with
Hands-On Workshop	Once per permit cycle	Number of workshop attendees