



COUNTY of ROANOKE VIRGINIA

Municipal Separate Storm Sewer System Annual Report

July 1, 2021 – June 30, 2022

Submitted:
October 1, 2022



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Roanoke Valley Television Station
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Certification Statement and Requirements

As required by the MS4 Permit VAR040022, all reports required by state permits, including annual reports, and other information requested by the board or department shall be signed by a person described in Part III K 1 of the permit, or by a duly authorized representative of that person, as described in Part III K 2 of the permit.

1. *For a corporation: by a responsible corporate officer. For the purpose of this chapter, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy-making or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions that govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for state permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;*
2. *For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or*
3. *For a municipality, state, federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this chapter, a principal executive officer of a public agency includes: the chief executive officer of the agency, or a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.*

Duly Authorized Representatives

A person is a duly authorized representative only if:

1. *The authorization is made in writing by a person described in Part III K 1;*
2. *The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the operator. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and*
3. *The signed and dated written authorization is submitted to the department.*

CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.


Responsible Official Signature

09.27.2022
Date

VAR040022
MS4 Permit Number

County of Roanoke
MS4 Name

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Executive Summary

According to the United States Environmental Protection Agency (US EPA), polluted stormwater runoff is a leading cause of impairment to nearly 40 percent of surveyed U.S. water bodies that do not meet water quality standards. Whether travelling by overland flow or through stormwater conveyance systems, polluted stormwater runoff is discharged into local receiving waterways. Such untreated water pollution can result in the destruction of fish, wildlife, and aquatic life habitats; it can also cause a loss of aesthetic value and can threaten public health due to its potential to contaminate food, drinking water supplies, and recreational waterways.

The **County of Roanoke** is committed to continuing in the development, implementation, and enforcement of a Municipal Separate Storm Sewer System (MS4) Program, pursuant to the requirements of the **MS4 Permit VAR040022**, as issued by the Virginia Department of Environmental Quality. This program is designed to reduce the discharge of pollutants from the County's regulated MS4 area to the maximum extent practicable (MEP) and to satisfy the appropriate water quality requirements of the State Water Control Law and its attendant regulations.

The County's MS4 program addresses six Minimum Control Measures (MCMs), as follows:

- MCM-1: Public Education and Outreach
- MCM-2: Public Involvement and Participation
- MCM-3: Illicit Discharge Detection and Elimination
- MCM-4: Construction Site Stormwater Runoff Control
- MCM-5: Post-Construction Stormwater Management for New Development and Development on Prior-Developed Lands
- MCM-6: Pollution Prevention and Good Housekeeping for Municipal Operations

The County has contracted with the Clean Valley Council (CVC) to provide services to meet the permit requirements of **MCM-1: Public Education and Outreach on Stormwater Impacts**, and **MCM-2: Public Involvement and Participation**. The associated Best Management Practices, as developed by the County, for which CVC is responsible (or partially responsible) are listed below:

- BMP 1-3: Stream Monitoring and Education
- BMP 1-4: Stormwater Education Program for Schoolchildren
- BMP 1-5: Stormwater Public Awareness Program
- BMP 2-1: Storm Drain Stenciling Program
- BMP 2-2: Stormwater Public Events

In an effort to deliver a consistent message across the entire Roanoke Valley region, the County participates on the Roanoke Valley-Alleghany Regional Commission's regional Stormwater Advisory Committee. This group is comprised of neighboring MS4s, and interested parties such as the CVC, Upper Roanoke River Roundtable, the Virginia DEQ, and others.

The Minimum Control Measures and associated BMPs used by the County to satisfy the MS4 Permit requirements are described in detail in the County's MS4 Program Plan, dated May 2019. This Annual Report provides the required documentation regarding those MCMs and BMPs for the **reporting period of July 1, 2021 - June 30, 2022**. Both documents are posted on the County's website at: <https://www.roanokecountyva.gov/1755/Stormwater-MS4-Permit>.

Section I. Minimum Control Measures

Pursuant to 9VAC25-89-40, Part I (Discharge Authorization and Special Conditions), the following Minimum Control Measures (MCMs) describe the actions that Roanoke County will use to develop, implement, and enforce its MS4 Program, all of which are designed to reduce the discharge of pollutants from this small MS4 to the maximum extent practical (MEP). The measures will also be employed to protect water quality and to satisfy the appropriate water quality requirements of the State Water Control Law and its attendant regulations.

- **MCM-1:** Public Education and Outreach
- **MCM-2:** Public Involvement and Participation
- **MCM-3:** Illicit Discharge Detection and Elimination
- **MCM-4:** Construction Site Stormwater Runoff Control
- **MCM-5:** Post-Construction Stormwater Management for New Development and Development on Prior-Developed Lands
- **MCM-6:** Pollution Prevention and Good Housekeeping for Municipal Operations
- **TMDL:** TMDL Special Conditions

NOTE:

As per Part I.B. of the General Permit, implementation of the above-listed MCMS and the Chesapeake Bay and Local TMDL requirements in Part II (as applicable) consistent with the provisions of an iterative MS4 program required pursuant to the General Permit constitutes compliance with the standard of reducing pollutants to the "maximum extent practicable," provides adequate progress in meeting water quality standards, and satisfies the appropriate water quality requirements of the State Water Control Law and its attendant regulations. Due to this iterative nature of the MS4 Program, over the course of the permit term Roanoke County may find it necessary to change or replace one or more of the "anticipated" Best Management Practices (BMPs) used to satisfy the MCMs; such changes/replacements will be made when the County finds the BMP(s) to be ineffective.

This report will provide an evaluation of the MS4 Program Plan implementation, including a review of each MCM to determine the MS4 program's effectiveness and whether or not changes to the MS4 Program Plan are necessary.



MCM-1: Public Education and Outreach

This minimum control measure is intended to implement a public education and outreach program that is designed to:

1. Increase the public's knowledge of how to reduce stormwater pollution, placing priority on reducing impacts to impaired waters and other local water pollution concerns;
2. Increase the public's knowledge of hazards associated with illegal discharges and improper disposal of waste, including pertinent legal implications; and
3. Implement a diverse program with strategies that are targeted toward individuals or groups most likely to have significant stormwater impacts.

The County has developed the following Best Management Practices (BMPs) to meet these program goals:

BMP 1-1: Stormwater Educational Resources

The County has created and will maintain a comprehensive listing of existing stormwater-related agencies and organizations along with pertinent educational programs and resources, which shall be made available to the public by way of the County's stormwater website.

BMP 1-2: Roanoke County Stormwater Newsletter

Roanoke County will create and distribute a Stormwater Newsletter, which shall be annually distributed to all Roanoke County residences.

BMP 1-3: Stream Monitoring and Education

Roanoke County will provide stream monitoring and informational stream seminars for Roanoke County students and residents.

BMP 1-4: Stormwater Education Program for Schoolchildren

Roanoke County will develop and implement a stormwater education program for its schoolchildren. Different programs will target appropriate grade levels.

BMP 1-5: Stormwater Public Awareness Program

Roanoke County has developed and will implement a Stormwater Public Awareness Program that includes the distribution of stormwater merchandise, public service announcements, and other high visibility educational media. The program includes:

1. A list of the high-priority stormwater issues that Roanoke County will communicate to the public as part of its public education and outreach program;

2. The rationale for selection of each high-priority stormwater issue and an explanation of how each education or outreach strategy is intended to have a positive impact on stormwater discharges;
3. Identification of the public audience to receive each high-priority stormwater message;
4. The strategies from Table 1 of Part I.E.1.d. to be used to communicate each high priority stormwater message; and
5. The anticipated time periods the messages will be communicated or made available to the public.

BMP 1-6: Roanoke County Stormwater Webpage

Roanoke County will maintain its Stormwater webpage as a means to inform the public on the various ways to reduce stormwater pollution, placing priority on reducing impacts to impaired waters and addressing other local water pollution concerns.

BMP 1-7: Targeted Education Program

Roanoke County implements a stormwater quality education program for specific (target) audiences. This BMP coordinates with **BMP 1-5**.

This report provides a detailed description of the goals of each BMP, the status of the County's compliance with each BMP, and an evaluation of the BMP and any proposed modifications needed to better achieve the overall MS4 Program goals. In addition, the strategies to ensure consistency with local TMDLs are also provided, and they are broken down by impairment type: *Escherichia coli* (*E. coli*) bacteria (EC), sediment (SED), or Polychlorinated biphenyls (PCBs).

BMP 1-1: Stormwater Educational Resources

Goal:

The goal of this BMP is to create and maintain a comprehensive listing of stormwater-related agencies and organizations, educational programs and resources, such as current publications, websites, videos, maps, and training opportunities that directly address stormwater issues such as stormwater management, stormwater quality, floodplain management, stormwater pollution prevention, conservation practices, and riparian habitat protection. The public will be made aware of these resources by way of the County's stormwater website, which is located here: <https://www.roanokecountyva.gov/332/Stormwater-Resources>

Responsible Party:

Roanoke County's Department of Development Services.

Schedule:

Roanoke County maintains and annually updates its stormwater resources database, which provides contact information and website links to aid the public in accessing the various stormwater educational resources. The updated tables are on the website noted above, and they are also on the attached compact disk under the folder titled **BMP 1-1**.

Measurable Goals:

Success for this BMP will be measured by tracking website usage and the number of requests received by the County for this or similar data.

Permit Year	Viewing Statistics
(1) 2018 - 2019	102 Visits; 133 Page Views
(2) 2019 - 2020	171 Visits; 126 Page Views
(3) 2020 - 2021	150 Visits; 188 Page Views
(4) 2021 - 2022	127 Visits; 144 Page Views

TMDL Consistency:

The County's stormwater website highlights a page discussing "Non-point Source Pollution (NPS)." This page illustrates how agriculture and straight pipes can contribute to the overall stormwater pollution problem (EC) and provides a list of NPS pollutants, including fertilizer and pesticides from lawns or farms; organic wastes from manure and sewage; pathogens such as bacteria and viruses; salt from irrigation and acid-mine drainage; sediment from erosion of unprotected lands; and toxins such as airborne chemicals, oils, and metals. (EC, PCBs, SED)

In addition, the website contains a "PCBs Fact Sheet" and highlights Illicit Discharge Detection and Elimination (IDDE) through the use of various public service messages from the County's IDDE Public Outreach video kit. The associated messages directly tie to the TMDLs (EC, SED, PCBs). The Fact Sheet can be accessed here:

<https://www.roanokecountyva.gov/DocumentCenter/View/9349/PCB-Facts-May-2017?bidId=>

Evaluation and Modification:

In accordance with the MS4 Program Plan, the number of website visits to this database within the permit year illustrates whether the website is an effective format to distribute the information concerning stormwater educational resources. With site visits and page views as shown, the County believes this BMP is successful. No modifications are planned for this BMP.

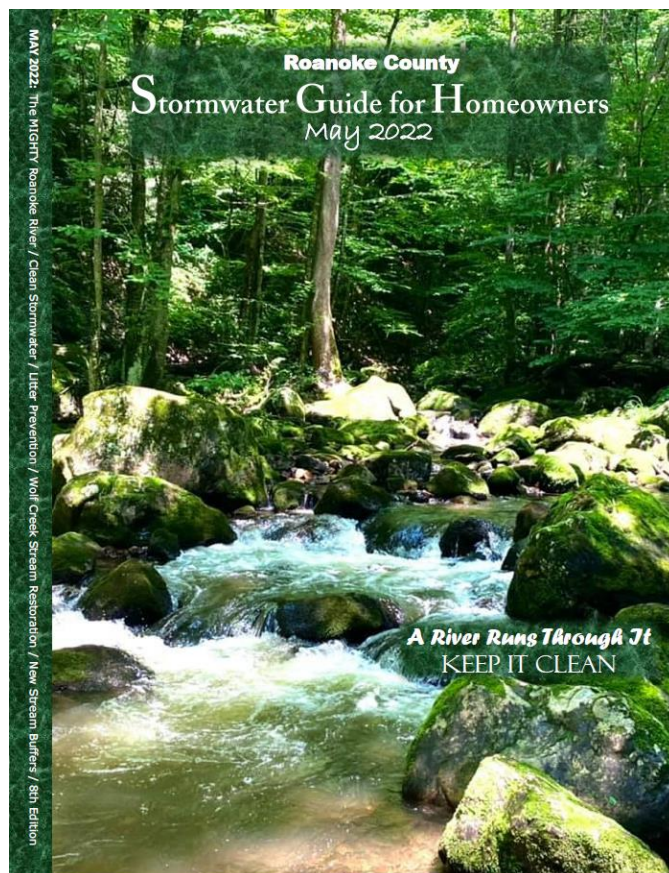
The screenshot displays the 'Stormwater Resources' page on the Roanoke County VA website. The browser's address bar shows the URL 'roanokecountyva.gov/332/Stormwater-Resources'. The website's header includes the Roanoke County VA logo, social media icons for Facebook, Twitter, YouTube, and LinkedIn, a search bar, and language selection options. A navigation menu at the top lists 'ENGAGE!', 'DEPARTMENTS', 'RESIDENTS', 'GOVERNMENT', 'VISITORS', and 'BUSINESS'. The left sidebar contains a list of links: 'County Stormwater Projects', 'Non-Point Source (NPS) Pollution', 'Roanoke County Watersheds', 'Stormwater Contractor Appreciation', 'Stormwater Documents & Ordinances', 'Stormwater MS4 Permit', 'Stormwater Management Public Education', 'Stormwater Network Structures', 'Stormwater Resources', 'Stream Impairments & Total Maximum Daily Loads', 'Volunteer Opportunities', and 'Development Services'. The main content area features a breadcrumb trail: 'Home > Departments > Development Services > Stormwater Management > Stormwater Resources'. The title 'Stormwater Resources' is prominently displayed. Below it, the 'Additional Information' section provides context on water quality educational programs and lists four resource categories: 'Audio / Visual Resources', 'Environmental Education Program Resources', 'Governmental Agency Efforts Resources', and 'Printed Material Stormwater Resources'. The 'Contact Us' section offers contact information for reporting stormwater or NPS pollution problems, including an email link and a phone number (540-772-2096). The Windows taskbar at the bottom shows the search bar, task view button, and several open applications, with the system clock indicating 3:12 PM on 8/9/2021.

BMP 1-2: Roanoke County Stormwater Newsletter

Goal:

The goal of this BMP is to create and distribute an annual Stormwater Newsletter, which shall be mailed to every single family residence in Roanoke County. The purpose of this newsletter shall be to (1) increase the public's knowledge on ways to reduce stormwater pollution, placing priority on reducing impacts to impaired waters and other local water pollution concerns; and (2) increase the public's knowledge of hazards associated with illegal discharges and improper disposal of waste, including pertinent legal implications. The target public audience for this publication will be County homeowners.

The newsletter, while primarily aimed at County homeowners, will also address regional issues that affect the entire Roanoke River watershed. Topics may include: litter prevention, stormwater pollution prevention, stormwater quality education, residential best management practices, updates on local impaired water bodies, and TMDLs. It will also include subjects that are specific to Roanoke County's Stormwater Management Program. The stormwater newsletter's focus will be coordinated with the high-priority water quality issues identified in **BMP 1-5**.



<https://www.roanokecountyva.gov/DocumentCenter/View/23609/Stormwater-Newsletter-May-2022-?bidId=>

Responsible Party:

Department of Development Services.

Schedule:

Roanoke County provides its annual newsletter to all single family residences in the County and distributes copies to the public libraries and schools. The newsletter is posted on the stormwater website at

[Stormwater Public Education Documents | Roanoke County, VA - Official Website \(roanokecountyva.gov\)](https://www.roanokecountyva.gov/DocumentCenter/View/23609/Stormwater-Newsletter-May-2022-?bidId=)

Measurable Goals:

Success for this BMP is measured by documenting the number of County residences to which the newsletter was mailed.

Permit Year	Distribution Statistics
(1) 2018 - 2019	35,195 residences
(2) 2019 - 2020	35,026 residences
(3) 2020 - 2021	34,309 residences
(4) 2021 -2022	34,646 residences*

Note: The mailing list is provided on the attached compact disk under the folder titled **BMP 1-2.*

TMDL Consistency:

This informative newsletter helps to address sediment, bacteria, and PCBs.

Evaluation and Modification:

This newsletter exclusively focuses on stormwater issues for homeowners. It has been very well received by County residents, making it an effective BMP for delivering stormwater-related information and education to County residents. No modifications are planned for this BMP.

BMP 1-3: Stream Monitoring and Education

Goal:

In cooperation with the Clean Valley Council (CVC), Roanoke County provides stream monitoring and informational stream seminars for Roanoke County students and residents. The goal of this BMP is to educate students and residents about field procedures for biological stream monitoring, in addition to motivating citizens to monitor waterways in their neighborhood and to enhance grassroots cooperation to promote the importance of stream monitoring within the County. These seminars and monitoring sessions provide some field exposure to aquatic habitats, update citizens on local, state, and federal water quality regulations, and keep citizens updated on local stream health.

Responsible Party:

Roanoke County's Department of Development Services, through the Clean Valley Council.



Schedule:

On behalf of Roanoke County, the Clean Valley Council educates Roanoke County students and citizens by holding stream education seminars and monitoring sessions. Special emphasis is placed on monitoring stream segments with a TMDL designation. The County has created a database to track the names of monitored streams and the number and type of participating groups. The database will be submitted to DEQ in the annual report.

Measurable Goals:


Success for this BMP will be measured by tracking the number of citizens/students involved in stream monitoring activities conducted by the CVC on behalf of Roanoke County. In addition, Roanoke County will track the number of stream schools given by the CVC, the number of participating students, and their respective grade level(s).

Permit Year	# of Stream Schools (CVC)	# of Participants
(1) 2018 - 2019	17 - Stream School Seminars	290 students 13 adults
(2) 2019 - 2020	17	325 students 16 adults
(3) 2020 -2021	19	1354 students* 56 adults*
(4) 2021 -2022	18	430 students 19 adults

All in-person stream school seminar locations were on the Roanoke River or its tributaries.

*NOTE: New virtual program was created in response to the FY20-21 school restrictions due to COVID-19; this venue enabled reaching larger #s of children & adults. Visit <https://cleanvalley.org/cvc-productions/>

- For more details, see the attached compact disk under the folder titled **BMP 1-3** and the summary provided below.

 <p>Clean Valley Council</p>	<h2 style="text-align: center;">Outdoor Stream School</h2> <p style="text-align: center;"><i>What is our local watershed and how does pollution affect our ecosystems?</i></p>
<p>Grade Level Biology, APES</p> <p>High Priority Issues Pollution Prevention, Excess Bacteria, Sediments, Nutrients</p> <p>Standards of Learning LS.6, LS.7, LS.8, LS.9, LS.10, LS.11, ES.8, BIO.2, BIO.8</p> <p>Duration 45-60 minutes</p> <p>Setting Outdoor Space near stream</p> <p>Vocabulary Benthic Macroinvertebrate, Riparian Corridor, Vegetative Cover, Soil Erosion, Sedimentation, Point Source Pollution, Nonpoint Source Pollution, Bacterial Load, Nutrient Load, Eutrophication, Algal Bloom, Turbidity, pH, Dissolved Oxygen, Bioassessment, Best Management Practice</p> <p>Character Education Personal effects on effects on watershed. Economic effects of external cost from pollution.</p>	<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p>Summary Students will perform a series of chemical and biological assessments on a local stream. This will enhance their understanding of the factors involved in determining water quality, and the connection between point source and non-point source pollution in their waterways. Common pollutants such as sediment, animal waste, nutrients, fossil fuels, and litter, including cigarette butts are discussed.</p> <p>Objectives Students will:</p> <ul style="list-style-type: none"> • Identify their local watersheds and map the movement of water from the land to storm drains where it empties into local waterways and ultimately the ocean • Identify macroinvertebrates and discuss how they can determine water quality. • Discover best management practices for preventing water pollution </div> <div style="width: 48%;"> <p>Materials</p> <ul style="list-style-type: none"> • Watershed maps • Stream School Kit • Water shoes for students <p>Pre-Teaching Options</p> <ul style="list-style-type: none"> • Watersheds • Ecosystems </div> </div>

TMDL Consistency:

This activity allows students and residents to understand the many factors that can affect the life in a stream. The effects of PCBs-laden sediment, pet waste, stream bank erosion, and agricultural runoff are discussed during the monitoring sessions as being likely contributors to degraded water quality in local receiving streams. (EC, PCBs, SED)

Evaluation and Modification:

Stream schools are hands-on events and no literature is distributed. The County has decided to retire this BMP, and it will develop a new BMP that addresses the importance of stream monitoring for the next permit year. The County's MS4 Program Plan will be updated to reflect the new BMP.



Outdoor stream school in action.



Students examine their findings during an outdoor stream school.

BMP 1-4: Stormwater Education Program for Schoolchildren

Goal:

Roanoke County, through the Clean Valley Council (CVC), has established a stormwater education program for Roanoke County's schoolchildren. The CVC educators develop and implement various programs to address stormwater pollution prevention and related water quality issues. Different program materials have been developed to target appropriate grade levels, and they are correlated with the applicable Standards of Learning (SOLs). In addition, the messages for the various grade levels have been coordinated with the County's high-priority water quality issues, as identified in **BMP 1-5**.

Responsible Party:

Roanoke County's Department of Development Services, through the Clean Valley Council.

Schedule:

The County will document how many children have been educated on stormwater quality by tracking the number of programs provided and the number of children reached. At the end of each annual period, the County will analyze the statistics of how many programs were provided and how many children were reached to determine the most effective method.

Measurable Goals:

Success for this BMP will be measured by tracking the number of programs that were provided and the number of schoolchildren that were reached.

- This Annual Report contains the program names, a brief description of each program and their goals, dates and locations of each program that was presented, the number of participants in each program, and the high-priority water quality issues they address. See the attached compact disk under the folder titled **BMP 1-4**.

Permit Year	Programs Given	# Student Participants	# Adult Participants
(1) 2018 - 2019	117	2,741	158
(2) 2019 - 2020	49	1,057	47
(3) 2020 - 2021	46	1,204	106
(4) 2021 - 2022	26	537	30

TMDL Consistency:

Several of the educational programs that are presented to Roanoke County Schools target sources of bacteria, such as "Oceans of Trash" and "Watersheds to Oceans" (EC). Others target potential sources of sediment, such as "Soil: Who Needs It?" (SED)

Evaluation and Modification:

The number of school programs and participating students indicates that the stormwater educational programs are an effective method to address stormwater and related water quality issues in the school system. However, the County has decided to retire this BMP, and it will develop a new BMP that addresses the importance of Stormwater Education Program for

Schoolchildren for the next permit year. The County's MS4 Program Plan will be updated to reflect the new BMP.

The County anticipates that the new BMP will target appropriate grade levels with SOL-applicable material. The specific educational programs will be routinely evaluated and new programs may be incorporated, as needed to address new issues that impact the community.

BMP 1-5: Stormwater Public Awareness Program

Goal:

Roanoke County's Stormwater Public Awareness Program targets three high-priority water quality issues that contribute to the degradation of stormwater runoff and the receiving waters into which it drains: excess bacteria, excess sediments, and excess nutrients.

Rationale for Selection - Sediment and bacteria were selected because the County has been assigned a Total Maximum Daily Load (TMDL) by DEQ for these impairments, meaning the County has been put on a "pollution diet" to limit these two pollutants from entering its waterways. Nutrients (phosphorus and nitrogen, in particular) were chosen because they have such negative impacts on receiving waters when in large quantities. Excess nutrients wash off of lawns, other managed turf areas, and farm fields and are carried in stormwater runoff to the area's receiving waters (streams, creeks, and the Roanoke River). Once in the waterways, they cause algal overgrowth, which in turn decreases the oxygen that marine life need to survive. This often results in fish kills, fish illnesses, and the tainting of human food. Groundwater supplies may also be affected by nutrient pollution.

The County's Public Awareness Program focuses on (1) ways to increase the public's knowledge about how to prevent these pollutants from getting into stormwater runoff, and (2) the hazards and legal implications of illegal discharges and improper disposal of wastes.

The County has developed relevant messages for this BMP and uses a variety of means and methods, including partnering with the Clean Valley Council and RVTv3, to communicate with the public via the distribution of printed materials (brochures, fact sheets, and newsletters), radio and TV advertisements, use of websites and social media, storm drain stenciling, speaking engagements, and through giveaways of stormwater-related merchandise.

In addition, as outlined in **BMP 1-7**, the County also targets certain public audiences with specific educational materials and messages, which are designed to help them reduce stormwater pollution in their day-to-day activities.

Responsible Party:

Department of Development Services, with assistance from the CVC and RVTv.

Schedule:

The County's Public Awareness Program incorporates the development and distribution of printed materials, billboard and mass transit advertisements, signage at select locations, radio and television advertisements, newspaper articles, and use of websites and social media. The County annually tracks the number and types of materials that are distributed and posted on websites/social media and the size of the audience that is exposed to such materials, as appropriate.

Measurable Goals:

The County will document the type of public awareness method that was utilized, including the size of the audience reached, and any impact indicators that show what effect the method had on behavior.

- In this annual period, the Clean Valley Council (CVC) was involved in the following activities on behalf of Roanoke County:

Permit Year	Programs Given	# Student Participants	# Adult Participants
(3) 2020 - 2021	56	1,129	453,111
(4) 2021 - 2022	1	152,735	152,736

See the folder titled **BMP 1-5** for the type of public awareness method that was utilized and the location or type of these events, some of which were conducted in virtual fashion.

- The County's Planning Department distributes a monthly e-newsletter entitled Community Developments. Pertinent stormwater messages are included from time to time, and the e-newsletter reaches **1,474** individuals. The archived newsletters are available on the County's website, click here:

<https://www.roanokecountyva.gov/Archive.aspx?AMID=39&Type=&ADID=>

- The County's Department of Development Services created a new pet waste poster, entitled "Pretty as a Princess," which focuses on "scooping the poop" as a strategy to reduce bacteria that may enter receiving waters. The poster is on the County's website, in the stormwater (residential) newsletter, and it was shared on the RVTV website. This poster was also mailed to a variety of targeted (pet-related) businesses, as identified in **BMP 1-7: Targeted Education Program**.

- The County's Department of Development Services created two posters to raise awareness about keeping pollution from entering stormwater, with the ultimate goal of protecting receiving waters from collecting pollutants, such as trash, fertilizers, lawn waste, leaves, and sediment. These posters can be found at the end of the section and on the County's website at <https://www.roanokecountyva.gov/1648/Stormwater-Public-Education-Documents>

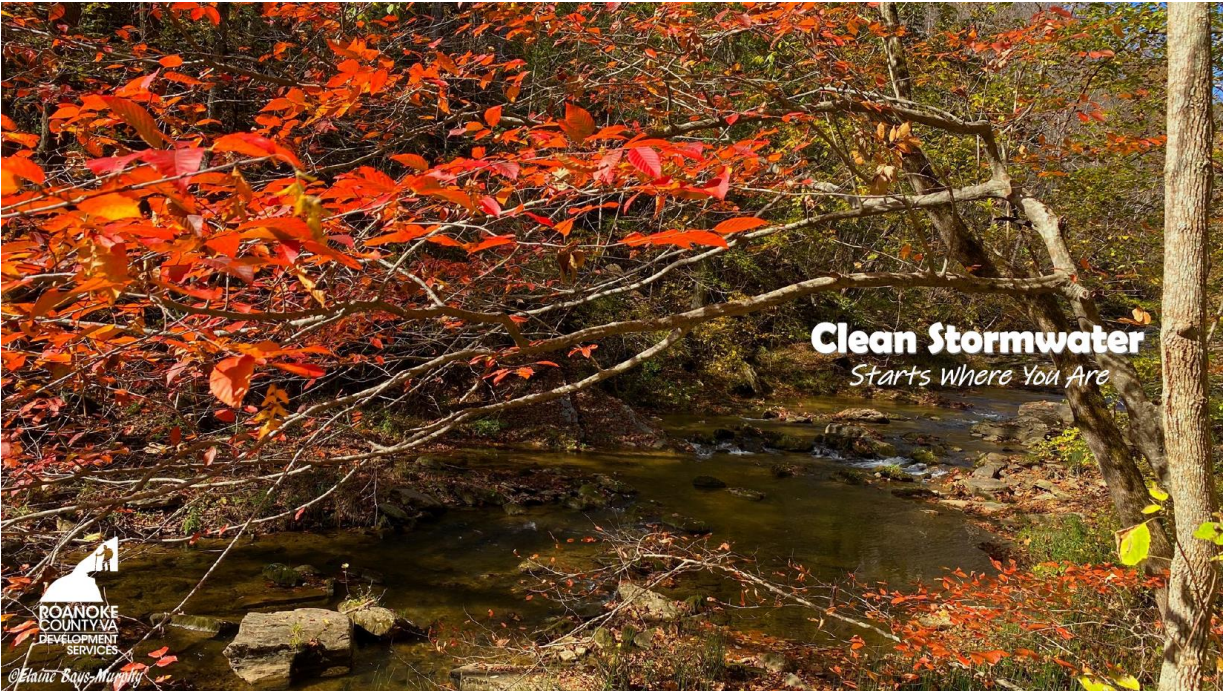


The first poster "**CLEAN STORMWATER: Starts Where You Are**" was used in the annual residential newsletter entitled "A Stormwater Guide for Homeowners," which was mailed to all single-family residences in the County of Roanoke. This newsletter may be viewed here:

<https://www.roanokecountyva.gov/1648/Stormwater-Public-Education-Documents>

<https://www.roanokecountyva.gov/DocumentCenter/View/23352/Pretty-as-a-Princess---Poop-Fairy-Poster-May-2022?bidId=>

A direct link to the poster is provided on the next page.



Clean Stormwater *Starts Where You Are*

<https://www.roanokecountyva.gov/DocumentCenter/View/23229/Clean-Stormwater-Starts-Where-You-Are?bidId=>

The second poster, “**Construction Site Waste Management: Starts with You**” was used in the annual contractor newsletter, entitled “*It’s Just Dirt*,” which was mailed to every land-disturbing contractor, land developer, and civil engineering firm in the region, along with the regional home builders association. The newsletter may be viewed here:

<https://www.roanokecountyva.gov/1648/Stormwater-Public-Education-Documents>



Construction Site Waste Management

Starts with you

<https://www.roanokecountyva.gov/DocumentCenter/View/23942/Construction-Site-Waste-Management-Starts-With-You?bidId=>

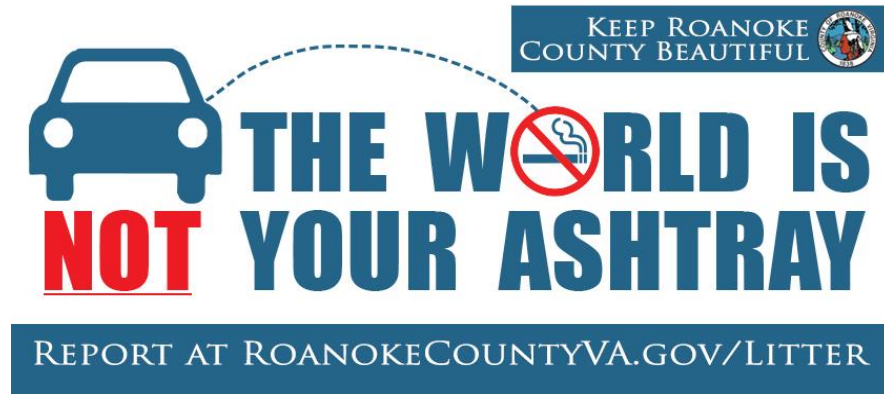
- The County uses various Public Service Announcements (PSAs) to share information with the public as part of its stormwater public awareness/education program. The PSAs encourage folks to “do the right things,” such as not littering, bagging or mulching leaves and grass clippings, bagging pet waste, washing cars on the grass, and refraining from pouring anything into the storm drain. The overarching goal for these PSAs is to address the three high priority water quality issues affecting stormwater runoff: bacteria, nutrients, and sediments. To view these PSAs, click on the following link:
<https://www.roanokecountyva.gov/1598/Stormwater-Public-Education-Videos>
- The County purchased a set of video programs that were designed for educating the general public on Illicit Discharge Detection and Elimination (IDDE) to the storm drainage system; such discharges include the selected three high-priority water quality issues: excess bacteria, sediment, and nutrients. The kit includes five videos of varying run times, which are designed to be used in specific medium/media or to reach a specific audience. Along with the aforementioned PSAs, the videos are posted on the County’s website at <https://www.roanokecountyva.gov/1598/Stormwater-Public-Education-Videos>

The County tracks the size of the audiences that access the PSAs and videos. The data for this reporting year is provided below:

PSAs	Views
Granny Says	12
Leaf Solution	7
Rain Barrel	7
Scoop the Poop	17
SWM Lawn Care	7
Cooking Oil/Grease (CVC)	2
Car Wash (CVC)	6

Public Videos	Views
Illicit Discharge - A Grate Concern (30 sec)	2
Illicit Discharge - A Grate Concern (60 sec)	1
Illicit Discharge - A Grate Concern (2 min)	1
Illicit Discharge - A Grate Concern (5 min)	1
Illicit Discharge - A Grate Concern (10 min)	1
(Spanish) Illicit Discharge - A Grate t Concern (30 sec)	0
(Spanish) Illicit Discharge - A Grate Concern (60 sec)	0
(Spanish) Illicit Discharge - A Grate Concern (2 min)	0
(Spanish) Illicit Discharge - A Grate Concern (5 min)	0
(Spanish) Illicit Discharge - A Grate Concern (10 min)	1
(Spanish) Illicit Discharge - A Grate Concern (30 sec)	0
Stormwater Pollution Prevention for Construction Sites	17
Stormwater Pollution Prevention for MS4s	83
Illicit Discharge Detection and Elimination (for employee training) https://youtu.be/Y8M3-VPXrmk	90

- The County continues to run its anti-littering ad campaign: *The World is Not Your Ashtray*. Permanent signs with the message have been placed at several prominent intersections, and the County's website provides an opportunity for citizens to report litter thrown out of vehicles. If the vehicle listed in the online complaint form can be confirmed, Roanoke County Police Department sends a notice to the vehicle's owner that the offense was witnessed and requests their compliance with Roanoke County's litter ordinance in the future. Only verified complaints are processed. For access to the form, click here: <https://www.roanokecountyva.gov/FormCenter/Police-6/Report-Littering-44>



- Roanoke Valley Television (RVTV) runs at least one Clean Valley Council PSA in every edition of Inside Roanoke, which airs 4 times per week. All of the County's stormwater-related PSAs run in regular rotation on the air, meaning each get an estimated 4 plays per day on Cox Cable Channel 3. (NOTE: Cox does not provide RVTV with accurate subscriber counts, as it stopped that practice several years ago. However, the rough estimate is that the Station reaches approximately 43,000 households.)

TMDL Consistency:

The various activities used for this BMP are intended to bring stormwater quality issues to the public's attention. Related activities for this BMP focus on bacteria and sediment, because the County has TMDLs for these pollutants. (EC & SED)

Evaluation and Modification:

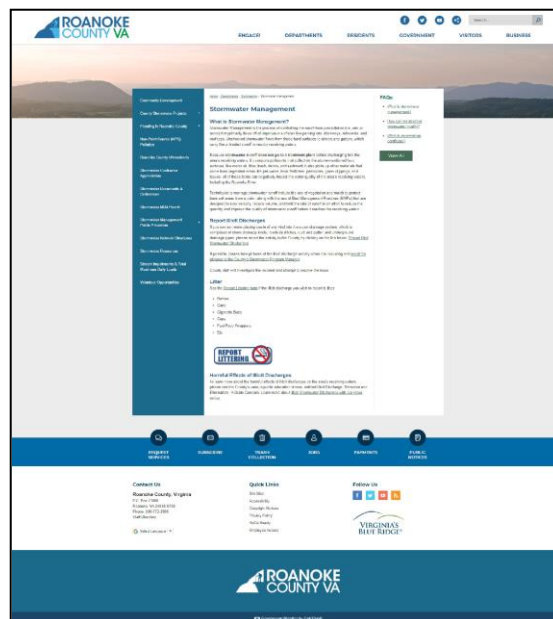
The number and types of activities, and the number and types of materials that are distributed and posted on websites/social media and the size of the audience that is exposed to such materials indicates that the Stormwater Public Awareness Program is effective.

The County will continue to use this BMP to increase the public's knowledge about how to prevent pollutants from getting into stormwater runoff and to inform the public about the hazards and legal implications of illegal discharges and improper disposal of wastes. No modifications are planned for this BMP.

BMP 1-6: Roanoke County Stormwater Webpage

Goal:

Roanoke County will maintain and monitor its Stormwater webpage, which enables the public to obtain information concerning the County's Stormwater Management Program, ordinances, design guidelines, general information, contact information, stormwater pollution prevention information, educational materials, and links to other organizations and sites. The website also helps to inform the citizens about on-going community-based projects, including storm drain stenciling, Save Our Streams and other similar stream monitoring programs, regional clean-ups, and other local water quality educational programs and events. The messages for the website will be coordinated with the high-priority water quality issues identified in **BMP 1-5**. The stormwater website address is <https://www.roanokecountyva.gov/stormwater>



In addition, the stormwater website will contain the appropriate videos from the County's IDDE Public Outreach kit (discussed in **BMP 1-5**) in an effort to inform the public about the hazards and legal ramifications of illicit discharges. The webpage includes recent versions of the County's stormwater-related public education materials, such as newsletters, fact sheets, posters, brochures, etc.

Responsible Party:

The Department of Development Services, with assistance from the County's Web Content Manager.

Schedule:

Roanoke County will maintain its stormwater website and document the webpage usage, including the annual number of visits to each page.

Measurable Goals:

Webpage statistics including the most- and least- popular material will be analyzed for effectiveness of the website.

For this reporting year, there were a total of **4,243 visits**, with **5,149 page views** to the stormwater website between July 1, 2021 and June 30, 2022. The number of visitors to each webpage is shown below.

Roanoke County Stormwater Webpage Statistics

Visits / Page Views

Period: July 1, 2021 - June 30, 2022

www.roanokecountyva.gov/stormwater

Page Name	Visits	Page Views	%
https://www.roanokecountyva.gov/306/Stormwater-Management	1351	1779	40
https://www.roanokecountyva.gov/1781/County-Stormwater-Projects	161	206	0
https://www.roanokecountyva.gov/1221/Glade-Creek-Restoration-Vinyard-Park-Pha	0	0	0
https://www.roanokecountyva.gov/1782/Murray-Run-Restoration-at-Ogden-Road	0	0	0
https://www.roanokecountyva.gov/1783/The-Orchards-Channel-Improvements	0	0	0
https://www.roanokecountyva.gov/2899/Wolf-Creek---Phase-II	0	0	0
https://www.roanokecountyva.gov/353/Non-Point-Source-NPS-Pollution	165	174	11
https://www.roanokecountyva.gov/330/Roanoke-County-Watersheds	129	155	10
https://www.roanokecountyva.gov/1780/Stormwater-Contractor-Appreciation	166	171	0
https://www.roanokecountyva.gov/331/Stormwater-Documents-Ordinances	880	949	14
https://www.roanokecountyva.gov/1755/Stormwater-MS4-Permit	364	429	9
https://www.roanokecountyva.gov/1560/Stormwater-Management-Public-Education	196	261	0
https://www.roanokecountyva.gov/1561/Background-on-Stormwater-Public-Educatio	104	104	0
https://www.roanokecountyva.gov/1648/Stormwater-Public-Education-Documents	541	703	10
https://www.roanokecountyva.gov/1598/Stormwater-Public-Education-Videos	0	0	0
https://www.roanokecountyva.gov/332/Stormwater-Resources	127	144	0
https://www.roanokecountyva.gov/546/Stream-Impairments-Total-Maximum-Daily-L	0	0	0
https://www.roanokecountyva.gov/356/Volunteer-Opportunities	59	74	5
Total	4243	5149	100%

Permit Year	Webpage Views	Most Popular (MP) and Least Popular Page (LP)
(1) 2018 - 2019	3,855	MP: Flooding in Roanoke County LP: Flood Insurance*
(2) 2019 - 2020	3,998	MP: Stormwater Management LP: Contractor Appreciation*
(3) 2020 - 2021	3,455	MP: Stormwater Management LP: Stormwater Resources*
(4) 2021 - 2022	5,149	MP: Stormwater Management LP: Volunteer Opportunities*

*Represents the least viewed of those pages that were actually viewed. Quite a few pages were not viewed at all, or were viewed via YouTube rather than through the County's website.

Viewing statistics for the Stormwater Management (SWM) homepage show that visits to this web page have more than doubled since 2018; there were 685 more visits in 2022 than in 2018.

- 2017 - 2018: 666 visits
- 2018 - 2019: 780 visits
- 2019 - 2020: 1032 visits
- 2020 - 2021: 1056 visits
- 2021 - 2022 1351 visits

A summary of the views of the stormwater-related videos and Public Service Announcements (PSAs) is shown below. NOTE: It is assumed that some people view the PSAs directly on YouTube rather than through the video page on the County's stormwater site. Views on YouTube are not tracked.

Views for Videos and PSAs (July 1, 2021 - June 30, 2022)

Video Title	Views	Average View Duration
Illicit Discharge Detection and Elimination (Employee training video)	90	0:08:13
Stormwater Pollution Prevention for MS4s (" " ")	83	0:17:52
Stormwater Pollution Prevention for Construction Sites (" " ")	17	0:06:17
Granny Says PSA 30	12	0:00:27
Leaf Solution PSA 30	7	0:00:23
Rain Barrel PSA	7	0:00:23
Scoop the Poop	17	0:00:23
SWM Lawn Care PSA 30	7	0:00:19
¹ Cooking Oil and Grease PSA 30	2	0:00:15
¹ Car Wash PSA 30	6	0:00:21
Illicit Discharge, Detection and Elimination, A Grate Concern 30 sec.	2	0:00:13
Illicit Discharge, Detection and Elimination, A Grate Concern 60 sec.	1	0:00:09
Illicit Discharge, Detection and Elimination, A Grate Concern 2 min.	1	0:00:04
Illicit Discharge, Detection and Elimination, A Grate Concern 5 min.	1	0:00:02
Illicit Discharge, Detection and Elimination, A Grate Concern 10 min.	1	0:00:02
Ilícito de Desechos, Deteccion y Eliminacion (Una gran preocupacion) 10 min.	1	0:00:03

¹The Clean Valley Council (CVC) produced this PSA on behalf of Roanoke County, City of Roanoke, and Town of Vinton

TMDL Consistency:

The County's stormwater webpage contains a broad range of public education materials, which address many topics, including ways to minimize sediment, bacteria, and PCBs in stormwater runoff. (EC, SED, PCBs).

Evaluation and Modification:

Roanoke County finds this BMP to be an effective way to provide the public with information about its Stormwater Management Program and to offer a means by which the public can provide input about the program, report illicit discharges and spills, and submit complaints about land-disturbing activities. No modifications are planned for this BMP.

BMP 1-7: Targeted Education Program

Goal:

The goal of this BMP is to implement an education program for specific public (target) audiences to raise their awareness about stormwater quality. This program will focus on three high-priority stormwater issues (i.e., stormwater pollutants) that contribute to the degradation of local waters: excess bacteria, excess sediment, and excess nutrients.

The intention of the program is to inform the target audiences about (1) ways to prevent these pollutants from getting into stormwater runoff and (2) the hazards and legal implications of illegal discharges and the improper disposal of wastes.

The County selected the target audiences based on the likelihood that each of them could generate excess bacteria, sediment, and/or nutrients from their day-to-day activities. The educational materials and messages mailed to each of the target audiences are specific to their type of operation (such as car wash operations or kennel cleaning) to ensure the program is effective.

In accordance with Table 1 of Part 1 E 1 of the MS4 permit, the County selected various strategies to deliver the targeted materials and messages to the selected public audiences. These are outlined on the next several pages in **Table 1-7A**.

Responsible Party:

Department of Development Services.

Schedule:

Roanoke County has developed a list of public (target) audiences to receive specific messages on an annual basis about ways to reduce stormwater pollution in their day-to-day activities.

Measurable Goals:

The County documents which materials were provided to the various public audiences, including the size of each audience reached, and any impact indicators that show what effect the method had on behavior.

- The tables provided on the following pages summarize the activities conducted for this permit year:
 - Table 1-7A. Stormwater Education Program for Specific Audiences
 - Table 1-7B. Print Materials to Address Specific TMDLs
 - Table 1-7C. Program Materials and Target Audiences for BMP 1-7
 - Table 1-7D. Summary of Targeted Mailings and % Reach



Table 1-7A. Stormwater Education Program for Specific Audiences (eff. May 2019)


High-Priority Water Quality Issue	Target Audiences	Means to Determine Audience Size	Audience Size	Overall Messages	Means to Deliver Messages	Rationale
#1 SEDIMENT	Car Washing/Detail Facilities	Business Licenses/Yellow Pages	115	<ul style="list-style-type: none"> • All wash water to sanitary sewer. • Potential damage caused to streams by wash water. 	<ul style="list-style-type: none"> • Mailer, annually • PSAs on local cable station 	Commercial car wash facilities can contribute significant sediment if wash water is discharged into the County's MS4.
	Car Dealers	Business Licenses/Yellow Pages	27	<ul style="list-style-type: none"> • All wash water to sanitary sewer. • Potential damage caused to streams by wash water. 	<ul style="list-style-type: none"> • Mailer, annually • PSAs on local cable station 	Vehicle washing/detailing can contribute significant sediment if wash water is discharged into the County's MS4, which drains, untreated, to local streams. Residential
	Auto Body Shops (includes tire shops, auto parts stores, etc.	Business Licenses/Yellow Pages	112	<ul style="list-style-type: none"> • All wash water to sanitary sewer. • Potential damage caused to streams by wash water. 	<ul style="list-style-type: none"> • Mailer, annually • PSAs on local cable station 	
	Homeowners	Tax Records	34,646	<ul style="list-style-type: none"> • Potential damage caused to streams by wash water. • Direct wash water to grass area for filtration and infiltration. • Never allow wash water to flow into street or storm drains. 	<ul style="list-style-type: none"> • County Publication sent annually to homeowners • PSAs on local cable station • Handouts at local environmental events, 4 per year minimum 	
	Contractors Involved in Land-Disturbing Activities	Development Services Permit Records and Yellow Pages	496	<ul style="list-style-type: none"> • Damage caused to streams by sediments. • Healthy fish populations require clear stream bottoms. • Silt fence is not enough. • Limit disturbed areas. • Stabilize as quickly as possible. 	<ul style="list-style-type: none"> • Brochure given to land-disturbance permittee when permit is issued • Brochure given with enforcement actions • Newsletter mailed on an annual basis 	Erosion and sediment control is required by regulations; however, more effective implementation may occur with additional education.

High-Priority Water Quality Issue	Target Audiences	Means to Determine Audience Size	Audience Size	Overall Messages	Means to Deliver Messages	Rationale
#2 BACTERIA	Restaurants	Business Licenses/ Yellow Pages	483	<ul style="list-style-type: none"> Excessive bacteria hinder stream usage and contributes to algae overgrowth, which hurts aquatic life. All wastewater to sanitary sewers. Keep exterior trash receptacles and dumpsters covered and do not wash out into storm drain. Clean kitchen hoods and floor mats; properly dispose of the wastewater. 	<ul style="list-style-type: none"> Mailer, annually PSAs on local cable station 	Uncovered dumpsters containing garbage and greasy floor mats that are rinsed out onto the pavement can contribute bacteria to the MS4, which discharges directly to local streams.
	Pet / Kennel Owners (dogs/cats)	Pet Licenses	Dog: 6809 Cat: 203	<ul style="list-style-type: none"> Excessive bacteria hinder stream usage. Dog waste ends up in streams. Pick up after your pet and properly dispose of waste. 	<ul style="list-style-type: none"> County Publication sent annually to homeowners & kennels PSAs on local cable station 	Dog waste is a major source of bacteria in local streams.
		Kennel licenses	180			
	Veterinarian Offices	Business Licenses/ Yellow Pages	13	<ul style="list-style-type: none"> Excessive bacteria hinder stream usage. Dog waste ends up in streams. Pick up after pets and properly dispose of waste. 	<ul style="list-style-type: none"> Brochures sent to veterinarian offices, annually PSAs on local cable station 	Dog waste is a major source of bacteria in local streams.
	Pet Stores/Pet Boarding/ Grooming	Business Licenses/ Yellow Pages	40	<ul style="list-style-type: none"> Excessive bacteria hinder stream usage. Dog waste ends up in streams. Pick up after pets and properly dispose of waste. 	<ul style="list-style-type: none"> Brochures sent to pet stores, annually PSAs on local cable station 	Dog waste is a major source of bacteria in local streams.
	County Police and Firemen; Animal Control Officer	County Records	1	<ul style="list-style-type: none"> Excessive bacteria hinder stream usage. Dog waste ends up in streams. Pick up after pets and properly dispose of waste. 	<ul style="list-style-type: none"> In-house training 	Dog waste is a major source of bacteria in local streams; these County employees own or handle dogs as part of their work.
	Homeowners	Tax Records	34,646	<ul style="list-style-type: none"> Do not feed wildlife Do not feed pets outdoors 	<ul style="list-style-type: none"> Mailer, annually 	By encouraging wildlife to come close to homes, their feces has a higher chance of finding its way to the MS4.
	Septic System Owners	Tax Records; WVWA	~14,000 septic systems	<ul style="list-style-type: none"> Keep septic system maintained; provide periodic pump out. Repair failing septic systems. 	<ul style="list-style-type: none"> Mailer, annually 	Malfunctioning or poorly maintained onsite sewage disposal systems may result in discharges of bacteria from human waste.

High-Priority Water Quality Issue	Target Audiences	Means to Determine Audience Size	Audience Size	Overall Messages	Means to Deliver Messages	Rationale
#3 NUTRIENTS	Homeowners	Tax Records/GIS	34,646	<ul style="list-style-type: none"> Excess nutrients damage streams. Do not over-fertilize. Use soil tests. Keep fertilizer off of pavements. Do not over-water lawns. 	<ul style="list-style-type: none"> County Publication sent annually to Homeowners PSAs on local cable station 	Excessive nutrients are carried off of lawns and other managed turf areas to the County's MS4 and then to local streams; this leads to algal overgrowth in the streams, which adversely impacts fish and other marine life.
	Nurseries/Greenhouses	Business Licenses/Yellow Pages	9	<ul style="list-style-type: none"> Excess nutrients damage streams. Do not over-fertilize. Use soil tests. Keep fertilizer off of pavements. 	<ul style="list-style-type: none"> Mailer, annually PSAs on local cable station 	
	Lawn Care Services	Business Licenses/Yellow Pages	251	<ul style="list-style-type: none"> Excess nutrients damage streams. Do not over-fertilize. Use soil tests. Keep fertilizer off of pavements. Encourage use of organic products. 	<ul style="list-style-type: none"> Mailer, annually PSAs on local cable station 	

Table 1-7B. Print Materials to Address Specific TMDLs*

Type	Publication Name	TMDLS Addressed
Poster	"Construction Site Waste Management Starts With You"	Construction Trash, Debris, PCBs, and more
	"I Carry Your Stuff. You Scoop My Poop. Deal?"	Bacteria
	"Cute? You Betcha.' But Did You Know? I have to poop outside, my peeps have to scoop it up."	Bacteria
	"No, I am NOT the Poop Fairy"	Bacteria
	"Who Left the Dogs' Poop?"	Bacteria
	"Pups Poop, People Scoop. Do it."	Bacteria
	"Clean Stormwater Starts Where You Are"	Bacteria, Sediment, PCBs, and more
	"Clean Stormwater: Starts Right Here Under the Trees"	Bacteria, Sediment, PCBs, and more
	"Clean Stormwater: Starts Right Here on Your Project"	Bacteria, Sediment, PCBs, and more
	"Stormwater - Do Your Part: Keep it Clear"	Bacteria, Sediment, PCBs, and more
	"Sediment Pollution = No Fish. The Choice is Clear"	Bacteria, Sediment, PCBs, and more
	"Granny Says. . ."	Bacteria, Sediment, PCBs, and more
	"Clean Stormwater Makes for Happy Kids"	Bacteria, Sediment, PCBs, and more
	"Clean Stormwater: Wildlife Depend On It"	Bacteria, Sediment, PCBs, and more
	"Clean Stormwater: Happy Kids, Healthy Fish"	Bacteria, Sediment, PCBs, and more
Postcard	"Only Rain Down the Storm Drain" (by CVC)	Bacteria, Kitchen grease, Oil
	"Only Rain May Go Down the Storm Drain" (by CVC)	Sediment (plus Detergent, Oil, Heavy Metals, etc.)
Newsletters	"A Stormwater Guide for Homeowners May 2022"	Bacteria, Sediment, PCBs, and more
	"A Stormwater Guide for Homeowners" (previous issues)	Bacteria, Sediment, PCBs, and more
	"It's Just Dirt, A Newsletter for Contractors" June 2022	Sediment, PCBs (plus Minimum ESC Stds. & more)
	"It's Just Dirt, A Newsletter for Contractors" (previous issues)	Sediment, PCBs (plus Minimum ESC Stds. & more)
Brochure	"It's Just Dirt"	Sediment
	"Stormwater Best Management Practices for Proper Pet Waste Disposal"	Bacteria
	"Stormwater Best Management Practices for Restaurants"	Bacteria
	"Reduce, Reuse, Recycle and Properly Dispose of Hazardous Household Wastes"	Bacteria, Sediment, PCBs, and more
Fact Sheet	"Illicit Discharge Facts"	Bacteria, Sediment, PCBs, and more
	"Facts for Plumbers"	Bacteria, Sediment, PCBs, and more
	"Facts for Landscapers"	Sediment
	"Fall Foliage Facts"	Bacteria, Sediment, and more
	"Fact Sheet for Mosquito Control"	None (published as a Public Service message)
	"Tips for Homeowners - Stormwater Best Practices"	Bacteria, Sediment
	Fact Sheet for PCBs	PCBs
	Pool Fact Sheet**	None**
	Car Washing Tips	Sediment (plus Heavy Metals, Grease, Oil, etc.)

 New in 2021-2022

*Print materials are available online at <https://www.roanokecountyva.gov/1648/Stormwater-Public-Education-Documents>

**The Pool Fact Sheet is mailed to every pool-related business and pool owner in the County (1,834 total). And while it does not address a specific TMDL, this document is believed to be of value in helping to keep chemicals, such as chlorine and algicide, out of the area's receiving waters.

Table 1-7C. Program Materials and Target Audiences for BMP 1-7

Target Audience	Product Type	Delivery Method	# of Recipients	Nature of Message
Restaurants	Letter and Brochure	Mailed	231	Stormwater Management BMPS for Restaurants; MS4 permit requirements.
	Postcard	Mailed	231	Only rain down the storm drain; no solid or liquid waste; do not rinse out dumpsters.
Car Washes, Auto Repair Shops, New & Used Car Dealers, Auto Detailers, etc.	Car Washing Tips (Fact Sheet) and Letter	Mailed	254	Wash water carries sediment, oil, and heavy metals to receiving waters.
Vets, Groomers, Stables, Pet Daycare, Kennels, and Boarding, etc.	Letter, Brochure, and Poster	Mailed	234	Pet waste pollutes receiving streams; owners are encouraged to pick up after their pets.
Landscaping Professionals	Letter and Fact Sheet	Mailed	260	Grass/shrub clippings, leaves, sediment, fertilizers, etc. cause pollution to receiving waters; use BMPs to minimize lawn debris, reuse stormwater, install erosion controls, and employ alternative lawn care practices.
Violators (or potential violators) of Illicit Discharge Ordinance	Letter, Fact Sheet(s), and Ordinance	Mailed at time of violation	34	It is illegal to discharge anything into the MS4 system except for the allowable non-stormwater discharges listed in the permit.
Plumbers	Fact Sheet	Provided in Lobby	unknown	It is illegal to discharge anything into the MS4 system except for the allowable non-stormwater discharges listed in the permit.
Contractors involved in Land-disturbing activities	Brochure	Distributed with ESC Permits	150	"It's Just Dirt" brochure and newsletter describe the harm to receiving waters from excess sediment from construction sites, explains permit requirements, & provides techniques to "keep the dirt on the project."
	Newsletter	Mailed	496	
Residents	Brochure	Provided in Lobby	unknown	Reduce, reuse, recycle and properly dispose of hazardous household wastes.
Residences	Newsletter	Mailed	34,646	MS4 Permit requirements; high-priority water quality issues; minimizing PCBs, reducing stormwater pollution at home, do not feed wildlife, pick up pet waste, prevent illicit discharges, maintain septic system, create stream buffers.

A list of County businesses that received the above-listed materials can be found on the attached compact disk under the folder titled BMP 1-7.

The County continued to use its previously-developed brochures, fact sheets, and posters to target certain audiences. The items were distributed, in most cases, directly to the targeted audiences and the percentages of the targeted audiences that were reached have been listed in Table 1-7D.

Table 1-7D. Summary of Targeted Mailings and % Reach

Annual Period	Type of Educational Material	Target Group	# Sent /Total # in Target Group	% of Target Audience Reached
2018-2019 (YEAR 1)	Restaurant Postcard, Letter, and Brochure	Restaurants	85 / 85	100%
	Car Wash Postcard, Letter, and Brochure	Businesses with Car Washing	166 / 166	100%
	It's Just Dirt Newsletter	Land-disturbing Contractors	332 / 332	100%
	It's Just Dirt Brochure	Land-disturbing Contractors	298* / 332	~92.5%
	Stormwater Newsletter	Residences	40,305 / 40,305	100%
	Landscaping Fact Sheet	Professional Landscapers, Nurseries, Greenhouses	153 / 153	100%
	Pet Waste Poster, Letter, and Brochure	Veterinarians, Groomers, Stables, Pet Daycare, Pet Boarding, Animal Control, etc.	37 / 37	100%
	"Tips for Homeowners - Stormwater Best Practices"	Residential lots using individual stormwater control measures without maintenance agreements	23 / 23	100%
2019-2020 (YEAR 2)	Restaurant Postcard, Letter, and Brochure	Restaurants	106 / 106	100%
	Car Wash Postcard, Letter, and Brochure	Businesses with Car Washing	180 / 180	100%
	"It's Just Dirt" Newsletter	Land-disturbing Contractors	335 / 335	100%
	"It's Just Dirt" Brochure	Land-disturbing Contractors	208* / 335	62%
	Stormwater Newsletter	Residences	35,026 / 35,026	100%
	Landscaping Fact Sheet	Professional Landscapers, Nurseries, Greenhouses	158 / 158	100%
	Pet Waste Poster, Letter, and Brochure	Veterinarians, Groomers, Stables, Pet Daycare, Pet Boarding, Animal Control, etc.	44 / 44	100%
	"Tips for Homeowners - Stormwater Best Practices"	Residential lots using individual stormwater control measures without maintenance agreements	30 / 30	100%

* Not all contractors obtain a land-disturbing permit in any given year; some contractors obtain multiple permits

Table 1-7D. Summary of Targeted Mailings and % Reach (con't.)

Annual Period	Type of Educational Material	Target Group	# Sent /Total # in Target Group	% of Target Audience Reached
2020-2021 (YEAR 3)	Restaurant Postcard, Letter, and Brochure	Restaurants	84 / 84	100%
	Car Washing Tips (Fact Sheet) and Letter	Businesses with Car Washing	161 / 161	100%
	"It's Just Dirt" Newsletter	Land-disturbing Contractors	351 / 351	100%
	"It's Just Dirt" Brochure	Land-disturbing Contractors	179* / 351	*51%
	Stormwater Newsletter	Residences	34,309 / 34,309	100%
	Landscaping Fact Sheet	Professional Landscapers, Nurseries, Greenhouses	182 / 182	100%
	Pet Waste Poster, Letter, and Brochure	Veterinarians, Groomers, Stables, Pet Daycare, Kennels, Boarding, Animal Control, etc.	224 / 224	100%
	"Tips for Homeowners - Stormwater Best Practices"	Residential lots using individual stormwater control measures without maintenance agreements	27 / 27	100%
2021-2022 (YEAR 4)	Restaurant Postcard, Letter, and Brochure	Restaurants	231 / 231	100%
	Car Washing Tips (Fact Sheet) and Letter	Businesses with Car Washing	254 / 254	
	"It's Just Dirt" Newsletter	Land-disturbing Contractors	496 / 496	100%
	"It's Just Dirt" Brochure	Land-disturbing Contractors	150* / 496	*30.2%
	Stormwater Newsletter	Residences	34,646 / 34,646	100%
	Landscaping Fact Sheet	Professional Landscapers, Nurseries, Greenhouses	260 / 260	100%
	Pet Waste Poster, Letter, and Brochure	Veterinarians, Groomers, Stables, Pet Daycare, Kennels, Boarding, Animal Control, etc.	234 / 234	100%
	"Tips for Homeowners - Stormwater Best Practices"	Residential lots using individual stormwater control measures without maintenance agreements	9 / 9	100%

* Not all contractors obtain a land-disturbing permit in any given year; and, some contractors obtain multiple permits.

A new Stormwater poster, entitled "Clean Stormwater Starts Where You Are" was included as the centerfold of the annual stormwater newsletter for homeowners, which was mailed to every residence in the County. This newsletter included articles about the following: use of native plants for shoreline protection (to prevent erosion), stormwater tips to keep the Roanoke River and her tributaries pollution free, the benefit of "scooping the poop," and recommendations as to why NOT to feed wildlife.

A second new poster, entitled “Construction Site Waste Management Starts With You” was used as the centerfold of the annual “*It’s Just Dirt*” newsletter, which was mailed (and emailed) to all land-disturbing contractors, land developers, and consulting firms in the region, including the Roanoke Regional Home Builders Association. This newsletter included articles about:

- Project highlights for the Glenmary Substation and Tanglewood Shops A & B, recipients of the annual Stormwater Clean Award.
- Channel protection for erosion prevention.
- Use of sediment retention rolls for slope stabilization.
- The value of stream buffers and a summary of the County’s new stream buffer ordinance.
- How to keep the dirt on the project.
- Avoiding enforcement by “doing things right the first time.”

Both newsletters are available at

<https://www.roanokecountyva.gov/1648/Stormwater-Public-Education-Documents>

TMDL Consistency:

The Contractor newsletter is primarily focused on keeping dirt from construction sites out of the river and other local waterways. The Car Washing Tips (fact sheet) targets local businesses that may have uncontrolled discharges from vehicle washing operations, which could increase sediment discharges into local receiving waters. Therefore, these documents address the TMDL for sediment (SED). Similarly, the restaurant postcard addresses rinsing of kitchen equipment and accessories, which may contribute bacteria to receiving waters. The Pet Waste posters focus on bagging pet waste and placing it in the trash. Thus, these documents help address the County’s TMDL for bacteria (EC). The Stormwater newsletter for residents, the *It’s Just Dirt* newsletter for contractors, and the “PCBs Fact Sheet” help address the County’s TMDL for PCBs. Other outreach materials previously developed by the County also address the TMDLs, as shown in Table 1-7B.

Evaluation and Modification:

The County finds this BMP to be effective in raising the awareness of specific public (target) audiences regarding how their day-to-day activities may affect stormwater quality. No modifications are planned for this BMP.



MCM-2: Public Involvement and Participation

This minimum control measure (MCM) is intended to provide a means for the public to be involved with and participate in the County's Stormwater Program in an effort to improve water quality and support local restoration and clean-up projects.

The County has developed the following Best Management Practices (BMPs) to meet these program goals:

BMP 2-1: Storm Drain Stenciling Program

The County will implement a storm drain inlet stenciling program, which is designed to engage citizens and educate the public about the consequences of dumping waste into the storm drainage system.

BMP 2-2: Stormwater Public Events

The County will participate in and/or conduct at least 4 public events per year (in two different categories, as listed in Table 2 in the MS4 Permit) to bring attention to current stormwater pollution issues.

BMP 2-3: MS4 Program and Stormwater Pollution Prevention Website

Roanoke County will maintain a webpage that is dedicated to the MS4 Program and Stormwater Pollution Prevention. This webpage will contain the effective MS4 permit and coverage letter, the most current MS4 Program Plan, the Annual Report for each permit year covered by the current permit, and a mechanism for the public to report (i) potential illicit discharges, improper disposal, or spills to the MS4, (ii) complaints regarding land disturbing activities, or (iii) other potential stormwater pollution concerns. It will also include the methods for how the public can provide input on the Roanoke County's MS4 program.

BMP 2-4: Household Hazardous Waste Event

Roanoke County will participate in Household Hazardous Waste Collection events to help citizens dispose of household materials that could be hazardous to dispose of in landfills.

This report provides a detailed description of the goals of each BMP, the status of the County's compliance with each BMP, and an evaluation of the BMP and any proposed modifications needed to better achieve the overall MS4 Program goals. In addition, the strategies to ensure consistency with local TMDLs are also provided, and they are broken down by impairment type: *Escherichia coli* (*E. coli*) bacteria (EC), sediment (SED), or Polychlorinated biphenyls (PCBs).

BMP 2-1: Storm Drain Stenciling Program

Goal:

The goal of this BMP is to coordinate a storm drain inlet stenciling program through the Clean Valley Council (CVC). This effort will be coordinated with interested parties from local schools, neighborhoods, businesses, and other groups to stencil messages on storm drain inlets in an effort to educate people about the consequences of dumping waste into the storm drainage system.

Responsible Party: Roanoke County's Department of Development Services, through the Clean Valley Council.

Schedule:

The County coordinates its storm drain stenciling program through the CVC. A minimum of 50 storm drain inlets will be stenciled per year with messages designed to raise public awareness about stormwater pollution. The County will document the number and location of the inlets that are stenciled in each permit year.

Measurable Goals:

The County will document the number of storm drains stenciled, the number of participants, and the groups that participated. Using these numbers as indicators, the County will evaluate the effectiveness of this BMP and make adjustments to annually increase attendance.



For event dates, locations, number of participants and names of groups participating, see the next page in this report or refer to the attached compact disk under the folder titled **BMP 2-1**.

Permit Year	# of Storm Drain Inlets Stenciled	# of Participants
(1) 2018 - 2019	60	19
(2) 2019 - 2020	53	3*
(3) 2020 - 2021	52	4*
(4) 2021 - 2022	60	6

* NOTE: Storm Drain Stenciling efforts could not be completed using volunteers in the permit year due to COVID-19; CVC staff conducted the work.

TMDL Consistency:

The storm drain stenciling program is an outreach method to inform and remind citizens that what enters storm drainage structures goes directly to local creeks and streams via underground piping. Roanoke County believes that when citizens understand that stormwater receives no treatment before being discharged to area waterways, unlike sanitary waste which goes to a wastewater treatment plant before discharge, they will be more likely to refrain from allowing their pet waste, yard clippings, and other non-stormwater debris/waste to enter the storm drain system through roadside drainage inlets. (EC)

Evaluation and Modification:

The County finds this BMP to be an effective method to educate the public about the consequences of dumping waste into the storm drainage system. The County has decided to make this program more robust and will retire this BMP. A new similar BMP will be developed for the next permit year and beyond, and the MS4 Program Plan will be accordingly updated.



BMP 2-2: Stormwater Public Events

Goal:

The goal of this BMP is to engage citizens in various public events to raise awareness about ways to improve water quality and to support local restoration and clean-up projects. To that end, Roanoke County participates in and/or conducts at least 4 public events per year (in two different categories, as listed in Table 2 in the MS4 Permit) to bring attention to current stormwater pollution issues.

Responsible Party:

The County's Department of Development Services, in conjunction with Clean Valley Council, Roanoke Valley Resource Authority (RVRA), and the County's Department of Parks Recreation and Tourism (PRT).

Schedule:

The County annually partakes in and/or conducts at least four of the following events (in at least two of the various MS4 permit categories) to engage the public and raise awareness about stormwater pollution issues.



Public Event	Responsible Party	Category (per MS4 Permit)	Metric
Clean Valley Day (stream and watershed clean-up)	CVC	Restoration	Weight of trash collected; number of participants
Go Fest (booth, stream school)	CVC	Educational; Monitoring	Number of participants/students
Household hazardous waste collection (see BMP 2-4)	RVRA	Disposal or Collection	Weight of waste collected; number of participants
Storm drain stenciling program (see BMP 2-1)	CVC	Pollution Prevention	Number and location of storm drains stenciled; number of participants
Implementation of pet waste stations in parks and along greenways (see BMP B-1 in Roanoke County's Bacteria TMDL Action Plan)	PRT	Pollution Prevention	Number and location of pet waste stations installed/maintained
Stormwater education program for Roanoke County's schoolchildren - meets applicable SOLs (See BMP 1-4)	CVC	Educational	Number of programs provided; number of children taught
Stream monitoring and informational stream seminars (See BMP 1-3)	CVC	Monitoring	Number of stream schools given; number of participating students

Measurable Goals:

The County will document the details of the events, the number of County or CVC participants, and the number of people in attendance (where applicable). Success for this BMP will be measured by the completion of at least four of the listed events and fulfillment of their corresponding metrics.

- On behalf of Roanoke County and neighboring localities, the Clean Valley Council was active in **10** regional events during the permit year and together they involved **31,046** people. During these events, CVC staff distributed a variety of materials with stormwater-related messages and addressed questions and comments about

stormwater and water quality. Information highlighted at the booths included the benefits of stream buffers, the differences between storm and sanitary sewers, and the importance of pet waste pick up and disposal. Attendance and types of materials distributed are documented in the folder titled **BMP 2-2** on the attached CD.

- Deschutes Tinker Creek Cleanup
 - Mill Mountain Zoo Sunday
 - Mill Mountain Zoo Red Panda Day - Children's Literacy
 - Fall Waterways Cleanup
 - GoFest
 - Clean Valley Day
 - Virtual Earth Summit
 - Anytime Cleanup
 - Pop-Up Cleanup
 - Mill Mountain Zoo Boo
- For FY 2022, Roanoke County's Department of Parks, Recreation, and Tourism had **167** volunteers working a total of **249.25** hours in **16** park clean-up events along various waterways in several parks.
 - Roanoke County's Department of Planning and Department of Parks, Recreation, and Tourism submitted a grant application to the Virginia Trees for Clean Water program, through the Roanoke Valley-Alleghany Regional Commission, for an annual tree planting ceremony. Four "Red Sunset" maple trees were planted at Mountain View Elementary School. Roanoke County hosted the annual tree planting ceremony on April 6, 2022 at Mountain View Elementary School. Roanoke County officially celebrated Arbor Day 2022 on April 29 and released a video of the event at [Roanoke County Arbor Day 2022 - YouTube](#).



Roanoke County hosted the annual tree planting ceremony on April 6, 2022 at Mountain View Elementary School.

Permit Year	Public Event(s)	# of Participants
(1) 2018 - 2019	8 Regional (CVC) + 16 River Cleanups; 1 Tree Planting event	43,051 - CVC events; 363 River Cleanups; Unknown attendance at Tree Planting event
(2) 2019 - 2020	9 Regional (CVC) 4 Park Cleanups Virtual Earth Day & Arbor Day "events"	46,308 - CVC events 52 Volunteers Virtual - due to COVID 19
(3) 2020 - 2021	14 Regional (CVC) 11 Park Cleanups 1 Arbor Day/Tree Planting event	3,140 - CVC events 133 Volunteers Unknown attendance at Tree Planting event
(4) 2021 - 2022	10 Regional (CVC) 16 Park Cleanups 1 Arbor Day/Tree Planting event	31,046 - CVC events 167 Volunteers ~30 Participants - Tree Planting event

TMDL Consistency:

Since they are key regional water quality issues, pet waste and soil erosion are common issues discussed at the aforementioned events in which CVC participated, (EC & SED). In addition, the tree planting event focused on the value of stream buffers for protecting water quality, through their pollution-filtering capabilities (EC & SED) and for maintaining wildlife habitat.

Evaluation and Modification:

Based upon the attendance at these public events, Roanoke County finds this BMP to be an effective method of allowing the citizens to inquire about issues and have hands-on involvement in projects that help to improve water quality. Also, such events provide the County with an opportunity to receive public input and also to disseminate pertinent stormwater-related information. The County anticipates taking a more robust approach to stormwater-related public events in the next permit year and beyond, and will modify this BMP to reflect those changes. The changes will be accordingly reflected in the County's MS4 Program Plan.

BMP 2-3: MS4 Program and Stormwater Pollution Prevention Website

Goal:

Roanoke County will maintain a webpage that is dedicated to the MS4 Program and to Stormwater Pollution Prevention. This website will contain the effective MS4 permit and coverage letter, the most current MS4 Program Plan, the Annual Report for each permit year covered by the current permit, and a mechanism for the public to report (i) potential illicit discharges, improper disposal, or spills to the MS4, (ii) complaints regarding land disturbing activities, or (iii) other potential stormwater pollution concerns. It will also include the methods for how the public can provide input on Roanoke County's MS4 program.

Responsible Party:

The Department of Development Services, with support from Roanoke County's webmaster.

Schedule:

Roanoke County maintains a webpage that is dedicated to its MS4 Program and Stormwater Pollution Prevention topics. The page can be accessed by clicking on this link:

<https://www.roanokecountyva.gov/1755/Stormwater-MS4-Permit>

The annual report for each year of the current permit's term will be posted to this webpage no later than 30 days after it has been submitted to DEQ.

Measurable Goals:

Success for this BMP will be measured by the successful posting of the MS4 permit, the corresponding permit coverage letter, the MS4 Program Plan, and the MS4 Annual Report (the latter of which will be posted within 30 days following its submittal to DEQ), along with a mechanism for the public to report its stormwater-related concerns and the methods by which the public can provide input on Roanoke County's MS4 program.

In this Permit Year, the County received 7 stormwater-related complaints through its "Report a Concern" web form. (See folder titled **BMP 2-3** on the attached CD.) These complaints were addressed by staff or forwarded to the proper agency for resolution (i.e., VDOT, WVWA, VDH, etc.) Historically, the resolution to such complaints was not tracked, but the County hopes to use Cityworks for this purpose in future permit years. Note that the County also received 36 illicit discharge complaints, which are summarized in the folder titled **BMP 3-3** on the attached CD.

TMDL Consistency:

Access to the MS4 Program documents and stormwater management information gives Roanoke County citizens a means to familiarize themselves with the issues concerning the County's streams and rivers, the associated impairments, and any approved TMDLs. In addition, the program documents detail the County's efforts to address these issues.

This BMP helps to inform citizens on ways to get involved with current water quality issues and to make them aware of available outreach programs, both with the goal of helping citizens minimize any impacts that they may have on local water quality. (EC, SED, & PCBs)

Evaluation and Modification:

Roanoke County believes that posting the MS4 program-related documents on its Stormwater Website is an effective way to allow interested citizens to become more familiar with the County's stormwater program and to provide them with a means to make comments and become involved. No modifications are planned for this BMP.

BMP 2-4: Household Hazardous Waste Event

Goal:

The goal of this BMP is to provide citizens with an opportunity to dispose of their potentially-hazardous household materials in an environmentally-friendly manner; this will avoid having such products end up in local landfills.

Responsible Party:

The Department of Development Services, through the Roanoke Valley Resource Authority (RVRA).

Schedule:

Roanoke County will participate in at least one Household Hazardous Waste (HHW) Collection event each year. For each event, the County will document the number of attendees and the total weight of the collected waste.



Measurable Goals:

Success for this BMP will be measured by the continued participation in Household Hazardous Waste Collection Events.

- Regional statistics and weight totals for the HHW Events for this permit year can be found on the attached compact disk under the folder titled **BMP 2-4**.

Permit Year	HHW Events	Attendance	
		County	Total
(1) 2018 - 2019	12	481	891
(2) 2019 - 2020	9*	328	618
(3) 2020 - 2021	12	494	932
(4) 2021 - 2022	12	484	909

*Due to closures associated with Covid-19, several events were canceled

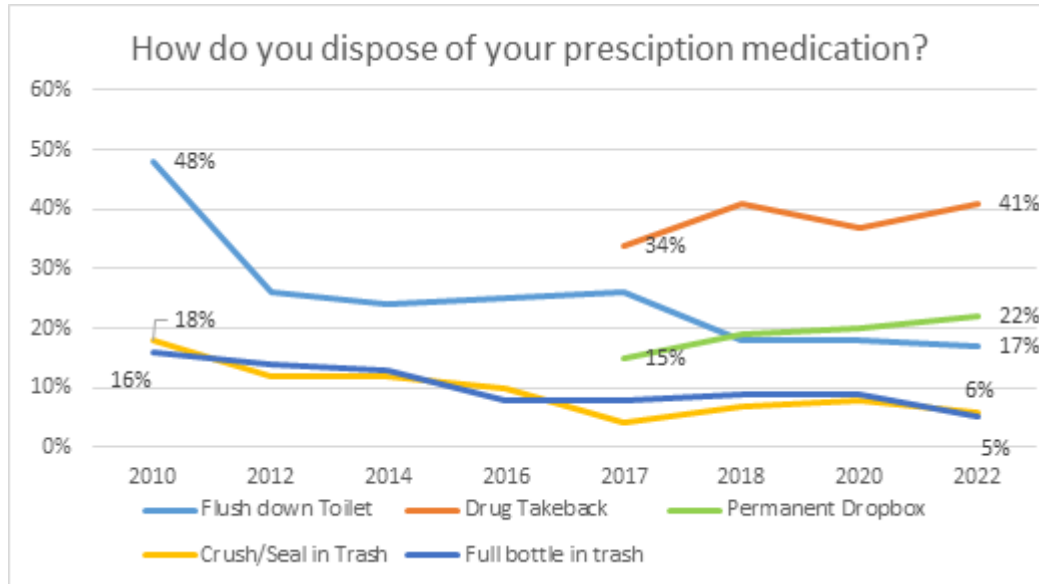
- In addition to the HHW Events, the Western Virginia Water Authority (WVWA) held two Rx Take-Back events in the Roanoke Valley region during this permit year, one in October 2021, and one in April, 2022. (See next page for collection totals.)
 - Additional medication was collected at the permanent take-back boxes located at the Towers CVS, Walgreens on Hershberger Road, and Carilion pharmacies, but the WVWA has no way of knowing the collection totals for any of the permanent take-back boxes.
 - WVWA created a regional website, [TakeThemBack.org](https://www.takethemback.org) with an interactive map that shows all permanent drug take-back boxes located in the Roanoke Valley.

Rx collection breakdown for Permit Year 4 (2021 -2022)

Totals by Site	October 2021 Sites	Pounds Collected
	CVS at Towers	204.2
	CVS 9 th Street	49.3
	Solutions Center	32.5
	Roanoke County Fire Station #1	427.6
	Kroger at Valley Gateway	99.2
	Walmart (Clearbrook)	21.5
	Walgreens (Electric Rd. & Brambleton Ave.)	267.6
	Kroger at Tanglewood	168.8
	Lewis Gale Cave Spring ER	167.7
	Super Shoes	453
	VSP Division 6 Office	17.7
	Penelope (in Daleville)	124.9
	Solomon's Mission	49.2
	Total	2083.2

Totals by Site	April 30, 2022 Sites	Pounds Collected
	Botetourt - Solomon's Mission	34.5
	Botetourt - Penelope in Daleville	101.1
	Roanoke City CVS at 9th Street	30.6
	Roanoke City Solutions Center on Melrose	21.0
	Roanoke City CVS at Towers	106.7
	Roanoke County Fire Station #1	504.9
	Roanoke County Kroger at Tanglewood	72.3
	Roanoke County Kroger at Valley Gateway	159.1
	Roanoke County Walgreens Brambleton	156.8
	Salem Super Shoes	390.2
	Salem State Police HQ	144.8
	Salem VA Medical Center	N/A
	Franklin County (2 sites)	32.5
	Vinton Kroger	214.4
	Total	1968

- WVWA received their 2022 SurveyUSA phone poll results, and out of 500 adults 18 and over in the counties/cities of Botetourt, Craig, Roanoke City, Roanoke County, and Salem City, when it comes to the question, “How would you most likely dispose of unwanted prescription drugs in your home?” These are the results:



TMDL Consistency:

Currently, there is no known direct benefit that this BMP will have on any of the TMDL waste load allocations. However, it should have a beneficial effect on stream water quality by keeping these products out of local receiving waters.

Evaluation and Modification:

Participation in the Household Hazardous Waste events is popular with citizens. Roanoke County understands that these events help to keep hazardous wastes from being disposed of in an inappropriate fashion and out of local waterways, therefore, the County does not have any plans to modify this BMP.



MCM-3: Illicit Discharge Detection and Elimination (IDDE)

The goal of this minimum control measure is to develop, implement, and enforce a program to detect and eliminate illicit discharges to the storm sewer system. The BMPs that have been established to complete this measure are listed below:

BMP 3-1: Municipal Separate Storm Sewer System (MS4) Map

The County maintains a map of its municipal separate storm sewer system (MS4) in its GIS network. This database will be maintained so that a map of all the public storm sewers in the County will be available to the public.

BMP 3-2: Illicit Discharge Ordinance

Roanoke County's Illicit Discharge Ordinance has been adopted and will be maintained to provide authority to address illicit discharges. It includes language that prohibits non-stormwater discharges into the storm drainage [MS4] system.

BMP 3-3: Illicit Discharge Detection and Elimination Program

Roanoke County maintains written procedures and implements a program to detect, identify, and address non-stormwater discharges and illegal dumping into its MS4.

BMP 3-4: Dry Weather Screening

Roanoke County implements a program to annually inspect at least 50 storm drain outfalls within its MS4 area in search of unauthorized discharges.

This report provides a detailed description of the goals of each BMP, the status of the County's compliance with each BMP, and an evaluation of the BMP and any proposed modifications needed to better achieve the overall MS4 Program goals. In addition, the strategies to ensure consistency with local TMDLs are also provided, and they are broken down by impairment type: *Escherichia coli* (*E. coli*) bacteria (EC), sediment (SED), or Polychlorinated biphenyls (PCBs).

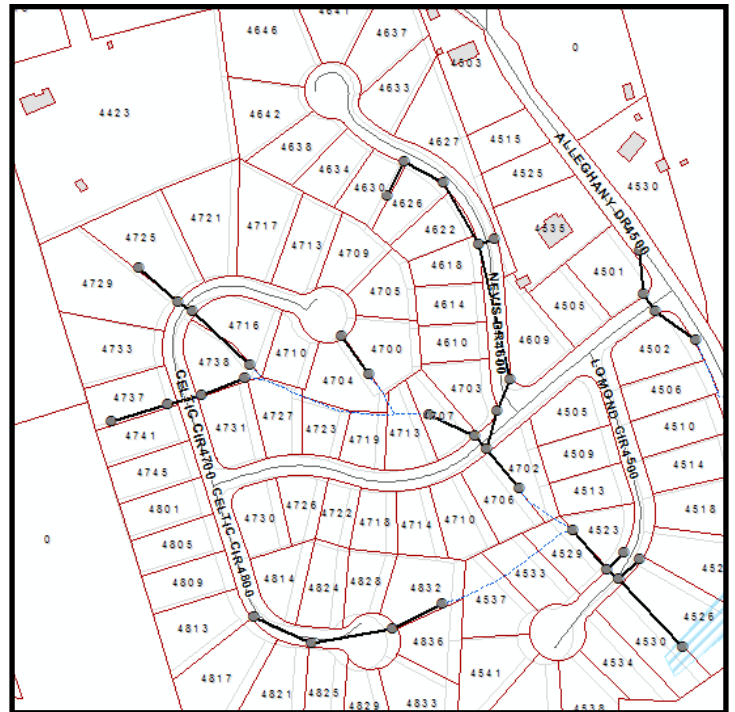
BMP 3-1: Municipal Separate Storm Sewer System (MS4) Map

Goal:

The goal of this program is to develop and maintain an accurate MS4 map (with a corresponding information table), which shows the storm sewer system that is owned or operated by the County within the Census Urbanized Area identified by the 2010 decennial census.

The MS4 map shall include the location of MS4 outfalls that discharge to surface waters, a unique identifier for each mapped item, the name and location of receiving waters to which the MS4 outfall (or point of discharge) discharges, the MS4 regulated service area, and all stormwater management facilities owned or operated by Roanoke County.

The information table associated with the MS4 map shall include the following information for each outfall or point of discharge for those cases in which Roanoke County elects to map the known point of discharge:



- a) A unique identifier as specified on the storm sewer system map;
- b) The latitude and longitude of the outfall or point of discharge;
- c) The estimated regulated acreage draining to the outfall or point of discharge;
- d) The name of the receiving water;
- e) The 6th Order Hydrologic Unit Code of the receiving water;
- f) An indication as to whether the receiving water is listed as impaired in the Virginia 2016 305(b)/303(d) Water Quality Assessment Integrated Report;
- g) The predominant land use for each outfall discharging to an impaired water; and
- h) The name of any EPA-approved TMDLs for which Roanoke County is assigned a waste load allocation.

Responsible Party:

The Department of Development Services, with assistance from the Department of Communications/Information Technology.

Schedule:

Roanoke County maintains an accurate MS4 map and will annually update it no later than October 1 of each year. The County's updates to the storm sewer system map and outfall information table will include any new outfalls constructed or TMDLs approved, or both, during the immediately preceding reporting period.

Roanoke County will provide written notification to any downstream adjacent MS4 of any known physical interconnection established or discovered after the effective date of the current permit.

Measurable Goals:

Success for this BMP will be measured by demonstrating that the County has updated its MS4 map and outfall information table to include any new outfalls constructed or TMDLs approved or both during the immediately-preceding reporting period.

- For this reporting year, the County confirms that the MS4 map and information table were updated to reflect any changes to the MS4 occurring on or before June 30, 2022. In addition, the County previously sent letters to the regulated MS4s to which its MS4 system is physically-interconnected.
 - The MS4 map can be accessed on the attached compact disk under the folder titled **BMP 3-1**. In addition, the letters and the map are in **BMP 3-1** of the County's MS4 Program Plan, which is posted on the website at:
<https://www.roanokecountyva.gov/DocumentCenter/Index/1538>

TMDL Consistency:

An updated and accurate storm drainage map identifying all of the municipal separate storm sewers and their components aids Roanoke County in the discovery of illicit connections and the locations where sediment and other pollutants may be entering the regulated MS4. (SED, EC, and PCBs)

Evaluation and Modification:

Roanoke County believes that the process of mapping the storm [sewer] drainage system is an appropriate method to aid in the enforcement, detection, and elimination of illicit discharges to the system. No modifications are planned for this BMP.

BMP 3-2: Illicit Discharge Ordinance

Goal:

The goal of this BMP is to adopt regulations that prohibit illicit discharges into the County's Municipal Separate Storm Sewer System and that also provide the County with an enforcement mechanism.

Responsible Party:

The Department of Development Services, in cooperation with the County Attorney.

Schedule and Evaluation:

Roanoke County's Illicit Discharge Ordinance was adopted on April 22, 2014, and it is compliant with Virginia's stormwater regulations. Enforcement measures and penalties are included in the Illicit Discharge Ordinance. The County will update the ordinance, as necessary, to maintain the effectiveness of the program.



Measurable Goals:

Success of this BMP will be measured by the continued compliance of the County's Illicit Discharge Ordinance with the MS4 General Permit.

- The County's Illicit Discharge Ordinance is available on the stormwater website at: <https://roanokecountyva.gov/DocumentCenter/View/5469/Illicit-Discharge-Ordinance-Eff-July-1?bidId=>

TMDL Consistency:

An Illicit Discharge Ordinance aids in the enforcement of illicit discharges to the MS4 system. This legal mechanism aids the County in eliminating illicit connections and discouraging a wide variety of illicit discharges to the MS4 system. (EC, SED, & PCBs)

Evaluation and Modification:

Roanoke County finds that the Illicit Discharge Ordinance is an effective tool for use in dissuading its citizens from illegally discharging into the MS4. No modifications are planned for this BMP.

BMP 3-3: Illicit Discharge Detection and Elimination Program

Goal:

The goal of this BMP is to detect, identify, and eliminate non-stormwater discharges and illegal dumping into the County's MS4. As part of this effort, the County will maintain written procedures that include:

- 1) A description of the legal authorities, policies, standard operating procedures or other legal mechanisms available to Roanoke County to eliminate identified sources of ongoing illicit discharges including procedures for using legal enforcement authorities.
- 2) A timeframe upon which to investigate, identify, and locate the source of any observed unauthorized non-stormwater discharge. Priority of investigations shall be given to discharges of sanitary sewage and those believed to be a risk to human health and public safety. Per the MS4 permit, discharges authorized under a separate VPDES or state permit require no further action.
- 3) Methodologies to determine the source of all illicit discharges. If Roanoke County is unable to identify the source of an illicit discharge within six months of beginning the investigation, then staff will document that the source remains unidentified. If the observed discharge is intermittent, staff will document that attempts to observe the discharge flowing were unsuccessful.
- 4) Methodologies for conducting a follow-up investigation for illicit discharges that are continuous or that Roanoke County expects to occur more frequently than a one-time discharge to verify that the discharge has been eliminated except as provided for in Part I E 3 c (4);
- 5) A mechanism to track all illicit discharge investigations to document the following:
 - o The dates that the illicit discharge was initially observed, reported, or both;
 - o The results of the investigation, including the source, if identified;
 - o Any follow-up to the investigation;
 - o Resolution of the investigation; and
 - o The date that the investigation was closed.

Responsible Party:

The Department of Development Services.

Schedule:

Roanoke County maintains written procedures for and implements an investigation program to respond to potential illicit discharges into its MS4. To enhance the effectiveness of the existing program, the County revised these procedures in this Permit Year 4 by adding a water testing protocol for sites where flow is observed. The new procedures are included on the attached compact disk under the folder titled **BMP 3-3**.

Measurable Goals:

Success for this BMP will be measured by compliance with the written procedures and documentation of the complaints received/investigated and closed. The documentation includes the following information:

A list of illicit discharges to the MS4 including spills reaching the MS4 with information as follows:

- The source of illicit discharge.
- The dates that the discharge was observed, reported, or both.
- Whether the discharge was discovered by Roanoke County during dry weather screening, reported by the public, or other method (describe).
- How the investigation was resolved.
- A description of any follow-up activities.
- The date the investigation was closed.

A summary of the investigations, including the required information above, is provided on the attached compact disk under the folder titled **BMP 3-3**.

Permit Year	# of Illicit Discharge Complaints Received / Investigated	# of Closed Investigations
(1) 2018 - 2019	10	10
(2) 2019 - 2020	20	19
(3) 2020 - 2021	44	44
(4) 2021 - 2022	34	34

TMDL Consistency:

Identifying and eliminating illicit discharges to the MS4 system helps to minimize the entry of pollutants into local receiving waters. (EC, SED, & PCBs)

Evaluation and Modification:

This BMP has been strengthened with the new water testing protocol, which allows staff to conduct field sampling/testing of stormwater to determine if more rigorous laboratory analysis is needed. The County believes that this BMP provides a valuable strategy to detect, identify, and eliminate non-stormwater discharges and illegal dumping into the County's Municipal Separate Storm Sewer System (MS4). No further modifications are planned at this time.

BMP 3-4: Dry Weather Screening

Goal:

The goal of this BMP is to inspect storm drain outfalls to detect illicit discharges during dry weather (i.e., when the storm drainage system would normally be dry) so that actions may be taken to eliminate them.

The County maintains dry weather field screening protocols to detect, identify, and eliminate illicit discharges to the MS4. The protocol includes:

- a) A prioritized schedule of field screening activities and rationale for prioritization determined by Roanoke County based on such criteria as age of the infrastructure, land use, historical illegal discharges, dumping or cross connections.
- b) A schedule to annually screen (i.e., inspect) 50 outfalls.
- c) A mechanism to track the following information:
 - The unique outfall identifier;
 - Time since the last precipitation event;
 - The estimated quantity of the last precipitation event;
 - Site descriptions (e.g., conveyance type and dominant watershed land uses);
 - Whether or not a discharge was observed; and
 - If a discharge was observed, the estimated discharge rate (e.g., width and depth of discharge flow rate) and visual characteristics of the discharge (e.g., odor, color, clarity, floatables, deposits or stains, vegetation condition, structural condition, and biology).

Responsible Party:

The Department of Development Services.

Schedule:

Roanoke County implements an annual outfall inspection program to detect and locate the source of dry weather illicit discharges that enter its MS4. To increase the effectiveness of the existing program, the County enhanced its procedures in this Permit Year 4 by adding a water testing protocol for sites where flow is observed. The new procedures are included on the attached compact disk under the folder titled **BMP 3-3**.

Measurable Goals:

Success for this BMP is measured by field screening a minimum of 50 outfalls per year and documenting the results of these inspections.

- For this permit year, Roanoke County selected 60 outfalls for inspection, using the following criteria, in descending order:
 - In the MS4 area
 - Drains to an impaired waterway
 - Within 1/10th of a mile from the nearest receiving water

The results of these inspections follow, and a detailed summary of the inspections can be found on the attached compact disk under the folder titled **BMP 3-4**:

Permit Year	# Outfalls Inspected	# of Illicit Discharges Found
(1) 2018 - 2019	61	0
(2) 2019 - 2020	51	0
(3) 2020 - 2021	57	1
(4) 2021 - 2022	59	0

TMDL Consistency:

Dry Weather Screening of outfalls aids in the location, identification, and elimination of illicit discharges to the MS4. This method provides staff with the methodology needed to screen, target, test, and monitor the storm drain system in an effort to discover existing illegal discharges and illegal connections to the MS4. (EC, SED, & PCBs)

Evaluation and Modification:

Roanoke County believes that Dry Weather Screening is a critical component in the detection and elimination of illicit discharges and illicit connections to its storm sewer system. Roanoke County will continue inspecting outfalls. As noted above, a new testing protocol was implemented this permit year as an enhancement to the existing program.



MCM-4: Construction Site Stormwater Runoff Control

The goal of this minimum control measure is to reduce pollutants that may enter the MS4 via stormwater runoff from construction activities. To accomplish this, the County implements the Virginia Erosion and Sediment Control (VESC) Program and the Virginia Stormwater Management Program (VSMP). The BMPs that will be used to satisfy this MCM are listed below:

BMP 4-1: Legal Authorities

Roanoke County utilizes certain legal authorities to comply with Virginia's Erosion and Sediment Control Program and its Stormwater Management Program in an effort to reduce pollutants that may enter its MS4 via stormwater runoff from construction activities.

BMP 4-2: Plan Review

The County maintains and implements written procedures to ensure the proper implementation of controls for erosion and sediment and stormwater management to reduce pollutants that may enter its MS4 via stormwater runoff from construction activities.

BMP 4-3: Site Inspections

The County maintains and implements written inspection procedures to ensure that controls for erosion and sediment and stormwater management are properly implemented and that all associated documents are utilized during inspection, including the inspection schedule.

BMP 4-4: Compliance and Enforcement

The County maintains and implements written procedures for compliance and enforcement regarding construction site stormwater runoff requirements.

BMP 4-5: Responsible Land Disturber Certification

Roanoke County employees who oversee the performance of regulated land disturbance activities conducted by the County are DEQ-certified as Responsible Land Disturbance in accordance with the VESC Program.

This report provides a detailed description of the goals of each BMP, the status of the County's compliance with each BMP, and an evaluation of the BMP and any proposed modifications needed to better achieve the overall MS4 Program goals. In addition, the strategies to ensure consistency with local TMDLs are also provided, and they are broken down by impairment type: *Escherichia coli* (*E. coli*) bacteria (EC), sediment (SED), or Polychlorinated biphenyls (PCBs).

BMP 4-1: Legal Authorities

Goal:

The goal of this BMP is to maintain and use certain legal authorities to comply with Virginia's Erosion and Sediment Control Program and the Virginia Stormwater Management Program (VSMP). The County uses the following legal authorities:

- **Erosion and Sediment Control (ESC) Ordinance #022316-7:** adopted on February 23, 2016 and revised on July 27, 2021 to incorporate 25' stream buffers along perennial streams; its purpose is to reduce pollutants in stormwater runoff from construction activities in an effort to keep such pollutants from entering the County's MS4.

This ordinance requires ESC controls for all regulated land disturbances of 2,500 square feet or more and an engineered ESC Plan for any land disturbance greater than 10,000 square feet. The ESC Plan must provide for the implementation of appropriate erosion and sediment controls, to include their proper placement, design, and maintenance requirements. The ordinance includes site inspection and compliance/enforcement procedures for erosion and sediment control.

- **Erosion and Sediment Control (ESC) Permit:** authorizes commencement of land disturbing activities for which an approved ESC Plan or Agreement-in-lieu-of an ESC Plan have been approved by the County.
- **Agreement-in-lieu-of an Erosion and Sediment Control Plan:** requires compliance with the minimum control measures, as listed in the Virginia Erosion and Sediment Control Regulations (9VAC25-840), for projects that disturb less than 10,000 square feet.
- **Stormwater Management Ordinance #042214-12:** adopted on April 22, 2014; its purpose is to protect property, state waters, stream channels, and other natural resources from the potential harm of unmanaged stormwater, and to establish requirements whereby stormwater is managed to protect water quality and downstream property owners.
- **Virginia Stormwater Management Program (VSMP) Permit:** issued by the County for projects that will cause one acre or more of land disturbance, and for which there is a County-approved stormwater management plan.
- **Agreement-in-lieu-of a Stormwater Management Plan:** requires compliance with certain stormwater management control strategies and is only applicable for the construction of single-family homes.
- **VSMP Approval Letter from the Virginia DEQ:** provides Roanoke County with coverage under the General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems General Permit Number VAR040022.
- **Letter from DEQ Approving Alternative Inspection Program (ESC):** authorizes Roanoke County to conduct an alternative inspection program for ESC.

- **Stormwater Management Design Manual:** provides design guidelines for regulated land-disturbing projects to ensure their compliance with the VSMP requirements.

Responsible Party:

The Department of Development Services implements the County's Erosion and Sediment Control and Stormwater Management programs, which includes conducting plan reviews, site inspections, compliance/enforcement activities, and project permitting.

The County Attorney's office provides support to the Department of Development Services during compliance/enforcement actions, as necessary.

Schedule:

Roanoke County implements an ESC ordinance to comply with Virginia's Erosion and Sediment Control Law and Regulations and a SWM Ordinance to comply with the Virginia Stormwater Management Program (VSMP). The County will update the ordinances and supporting documents, as needed, to remain consistent with both programs.

Measurable Goals:

Success for this BMP will be measured by the annual evaluation of the ESC and SWM ordinances, coordinating updates to the supporting documents, and the continued compliance of the ordinances with Virginia's ESC and VSMP programs.

- The aforementioned documents are in the MS4 Program Plan and can be accessed on the County's website at <https://www.roanokecountyva.gov/DocumentCenter/Index/1538>

TMDL Consistency:

The ESC and VSMP ordinances target the reduction of sediment and other pollutants in stormwater runoff from construction sites. Both ordinances require the installation of onsite control measures to ensure compliance under local law. (SED)

Evaluation and Modification:

Roanoke County believes that the ESC and VSMP ordinances are critical components to aid in reducing sediment and other pollutants carried by stormwater runoff from construction activities into its MS4. No modifications are planned for this BMP.

BMP 4-2: Plan Review

Goal:

The goal of this BMP is to maintain and implement written procedures to address the proper implementation of erosion and sediment controls and stormwater management controls to address construction site stormwater runoff.

Responsible Party:

The Department of Development Services.

Schedule:

Roanoke County maintains and implements ESC and VSMP procedures to comply with Virginia's Erosion and Sediment Control Program and the Virginia Stormwater Management Program. The County will update these procedures and supporting documents, as necessary, to remain consistent with both programs.

Measurable Goals:

Success for this BMP will be measured by the annual evaluation of the written procedures and supporting documents and the number of plans approved.

- Roanoke County finds its land development procedures and other supporting documents to be effective at this time. No changes are currently proposed.

Permit Year	# of ESC Plan Reviews	# of VSMP Plan Reviews	# of Agreement-in-lieu-of ESC Plans	# of Agreement-in-lieu-of SWM Plans
(1) 2018 - 2019	10 SFR 0 TOV; 10 RoCo 27 Commercial 1 TOV; 26 RoCo	1 SFR 0 TOV; 1 RoCo 26 Commercial 0 TOV; 26 RoCo	162 SFR 6 TOV; 156 RoCo, 35 Commercial 1 TOV; 34 RoCo	23 SFR 1 TOV; 22 RoCo
(2) 2019 - 2020	13 SFR 1 TOV; 12 RoCo 10 Commercial 0 TOV; 10 RoCo	2 SFR 0 TOV; 2 RoCo 9 Commercial 0 TOV; 9 RoCo	144 SFR 4 TOV; 140 RoCo, 5 Commercial 2 TOV; 3 RoCo	24 SFR 0 TOV; 24 RoCo
(3) 2020 - 2021	20 SFR 0 TOV; 20 RoCo 23 Commercial 2 TOV; 21 RoCo	0 SFR 0 TOV; 0 RoCo 24 Commercial 2 TOV; 22 RoCo	138 SFR 3 TOV; 135 RoCo 37 Commercial 1 TOV; 36 RoCo	33 SFR 0 TOV; 33 RoCo
(4) 2021 - 2022	30 SFR 0 TOV; 30 RoCo 9 Commercial 0 TOV; 9 RoCo	9 SFR 0 TOV; 9 RoCo 18 Commercial 1 TOV; 18 RoCo	102 SFR 3 TOV; 99 RoCo 13 Commercial 0 TOV; 13 RoCo	20 SFR 0 TOV; 20 RoCo

TOV = Town of Vinton RoCo = Roanoke County

TMDL Consistency:

Conducting plan reviews for ESC and VSMP compliance helps to ensure that active construction projects minimize sediment and other pollutants in their stormwater runoff. Both ordinances require the installation of onsite control measures to control pollutants. (SED)

Evaluation and Modification:

Roanoke County believes that ESC and VSMP plan reviews are critical components to aid in reducing sediment and other pollutants carried by stormwater runoff from construction activities into its MS4. No modifications are planned for this BMP.

BMP 4-3: Site Inspections

Goal:

The goal of this BMP is to maintain and implement written inspection procedures to address the proper installation and maintenance of erosion and sediment controls and stormwater management techniques used on active, regulated land-disturbing projects and to ensure that all associated documents are utilized during inspection, including the inspection schedule.

Responsible Party:

The Department of Development Services.

Schedule:

Roanoke County maintains and implements ESC and VSMP site inspection procedures to comply with Virginia's Erosion and Sediment Control Program and Virginia's Stormwater Management Program. The County will update these procedures and supporting documents, as necessary, to remain consistent with both programs, as they relate to construction site stormwater runoff. In addition, ESC inspections will be conducted in accordance with the County's Alternate Inspection Schedule, as approved by DEQ.

Measurable Goals:

Success for this BMP will be measured by the annual evaluation of the written ESC/VSMP site inspection procedures and the number of inspections conducted.

- Roanoke County finds its written ESC/VSMP site inspection procedures and other supporting documents to be effective at this time. No changes are currently proposed.

Permit Year	Total # of ESC Inspections	Total # of VSMP Inspections
(1) 2018 - 2019	1,662 SFR 24 TOV; 1,638 RoCo, 989 Commercial 19 TOV; 970 RoCo	4 SFR 0 TOV; 4 RoCo, 90 Commercial 0 TOV; 90 RoCo
(2) 2019 - 2020	2,381 SFR 48 TOV; 2,333 RoCo, 1,343 Commercial 20 TOV; 1,323 RoCo	35 SFR 0 TOV; 35 RoCo, 156 Commercial 1 TOV; 155 RoCo
(3) 2020 - 2021	1653 SFR 17 TOV; 1636 RoCo 1012 Commercial 13 TOV; 999 RoCo	82 SFR 0 TOV; 82 RoCo, 262 Commercial 2 TOV; 260 RoCo
(4) 2021 - 2022	1905 SFR 56 TOV; 1849 RoCo 1068 Commercial 25 TOV; 1043 RoCo	41 SFR 0 TOV; 41 RoCo, 90 Commercial 1 TOV; 89 RoCo

TOV = Town of Vinton RoCo = Roanoke County

TMDL Consistency:

Conducting ESC and VSMP site inspections of construction activities helps to ensure that the required controls, as shown on the approved plan, are implemented and properly maintained in the field; such controls help reduce sediment in stormwater runoff from construction sites. (SED)

Evaluation and Modification:

Roanoke County believes that conducting ESC and VSMP site inspections against written procedures and approved plans helps to reduce sediment and pollutants in stormwater runoff during land-disturbing activities. No modifications are planned for this BMP.

4-4: Compliance and Enforcement

Goal:

The goal of this BMP is to maintain and implement written procedures for achieving compliance on active construction sites through corrective action or enforcement action to the extent allowable under federal, state, or local law, regulation, ordinance, or other legal mechanisms.

Responsible Party:

- The Department of Development Services has the overall responsibility to implement the County's ESC program and VSMP, which includes conducting plan reviews, site inspections, compliance/enforcement activities, and project permitting.
- The County Attorney's office provides support to the Department of Development Services during compliance/enforcement actions, as necessary.

Schedule:

Roanoke County implements compliance and enforcement procedures to strive for compliance with its ESC program and VSMP on active construction sites. The County will revise its written enforcement procedures, as needed.

Measurable Goals:

Success for this BMP will be measured by the annual evaluation of the erosion and sediment control and VSMP compliance/enforcement procedures and documentation of the total number and type of enforcement actions implemented.

- Roanoke County finds its written ESC/VSMP compliance and enforcement procedures and other supporting documents to be effective at this time. No changes are currently proposed.
- A summary of the enforcement actions taken for this reporting period, including the number and type of enforcement actions, is shown below; supporting data is included on the attached compact disk under the folder titled **BMP 4-4**.

LEGAL NOTICE

Date: _____

WHEREAS, violation of Section _____ of the Roanoke County Code has been found on these premises

IT IS HEREBY ORDERED in accordance with the referenced Code that all persons cease, desist from and

STOP WORK

at once pertaining to grading, land disturbance activity, construction, alterations or repairs on these premises known as _____

All persons acting contrary to this order or removing or mutilating this notice are subject to arrest unless such action is authorized by the Roanoke County Department of Community Development

Contact Name _____

Contact Phone Number _____ Erosion and Sediment Control Program Administrator

Year	# of ENFORCEMENT ACTIONS			
	Notice to Comply (NTC)	Stop Work Order (SWO)	Notice of Permit Requirement (NOP)	Civil Penalty (Summons)
(1) 2018 - 2019	35	6	5	1
(2) 2019 - 2020	59 52 RoCo, 7 TOV	8 7 RoCo, 1 TOV	9 7 RoCo, 2 TOV	9 8 RoCo, 1 TOV
(3) 2020 - 2021	47 46 RoCo, 1 TOV	20 18 RoCo, 2 TOV	18 16 RoCo, 2 TOV	16 15 RoCo, 1 TOV
(4) 2021 - 2022	56 56 RoCo, 0 TOV	31 31 RoCo, 0 TOV	17 16 RoCo, 1 TOV	9 9 RoCo, 0 TOV

TOV = Town of Vinton RoCo = Roanoke County

TMDL Consistency:

Conducting ESC and VSMP compliance and enforcement activities helps to ensure that active construction projects minimize sediment and other pollutants in their stormwater runoff. (SED)

Evaluation and Modification:

Roanoke County believes that ESC and VSMP compliance and enforcement activities are critical components to aid in reducing sediment and other pollutants carried by stormwater runoff from construction activities into its MS4. No modifications are planned for this BMP.

BMP 4-5: Responsible Land Disturber Certification

Goal:

The goal of this BMP is to ensure that employees who oversee the performance of regulated land disturbance activities conducted by the County will have the qualifications to properly implement erosion and sediment control measures. Such employees will be DEQ-certified as Responsible Land Disturbers in accordance with the Virginia Erosion and Sediment Control Law and Regulations.

Responsible Party:

The Department of Development Services.

Schedule:

Roanoke County requires employees that oversee the performance of regulated land disturbance activities conducted by the County to be certified by DEQ as Responsible Land Disturbers.

Measurable Goals:

Success for this BMP will be measured by maintenance of the Responsible Land Disturber certification by the applicable employees.

EMPLOYEE	CERTIFICATION	CERTIFICATION #	EXPIRATION DATE
Jeff Altice	RLD	39411	4-28-25

TMDL Consistency:

Requiring employees that have responsibility to oversee the performance of regulated land disturbance activities to have the qualifications to properly implement erosion and sediment control measures helps to minimize the amount of sediment that leaves the construction site and thereby minimizes the potential of sedimentation in receiving waters. (SED)

Evaluation and Modification:

Roanoke County will continue to require the applicable personnel to hold the proper RLD certification. No modifications are planned for this BMP.



MCM-5: Post-Construction Stormwater Management for New Development and Development on Prior-Developed Lands

The goal of this minimum control measure is to implement a post-construction stormwater runoff management program that is consistent with the Virginia Stormwater Management Act (§ 62.1-44.15:24 et seq. of the Code of Virginia) and the Virginia Stormwater Management Program (VSMP) Regulations (9VAC25-870). The BMPs that will be used to satisfy this minimum control measure are listed below:

BMP 5-1: Stormwater Management Legal Authorities

Roanoke County utilizes certain legal authorities to comply with Virginia's Stormwater Management Act and Stormwater Management Program (VSMP) Regulations.

BMP 5-2: Post-Construction Inspections for Existing Stormwater Management Facilities

Roanoke County maintains and implements written inspection and maintenance procedures for post-construction stormwater management facilities (SWMFs) that discharge to the MS4 to address the long-term operation and maintenance requirements of these facilities.

BMP 5-3: Stormwater Management Facility Tracking

Roanoke County maintains and implements a GIS-based system to track stormwater management facilities to address the long-term operation and maintenance requirements of these facilities.

BMP 5-4: Strategies to Encourage Long-Term Maintenance of Stormwater Control Measures on Single Family Residential Lots

Roanoke County implements strategies to promote the long-term maintenance of stormwater control measures that are designed to treat stormwater runoff solely from the individual single-family residential lot. These strategies are used in lieu of recorded maintenance agreements and post-construction inspections by the County.

BMP 5-5: Storm Sewer System Maintenance

Roanoke County implements a program to maintain and repair its storm sewer system within its MS4 program area. Such maintenance helps to keep the system working as designed, which minimizes the risk of surcharging and overflows; it also helps to minimize street flooding associated with clogged inlet structures and conveyances.

This report provides a detailed description of the goals of each BMP, the status of the County's compliance with each BMP, and an evaluation of the BMP and any proposed modifications needed to better achieve the overall MS4 Program goals. In addition, the strategies to ensure consistency with local TMDLs are also provided, and they are broken down by impairment type: *Escherichia coli* (*E. coli*) bacteria (EC), sediment (SED), or Polychlorinated biphenyls (PCBs).

BMP 5-1: Stormwater Management Legal Authorities

Goal:

The goal of this BMP is to maintain and use certain legal authorities to comply with Virginia's Stormwater Management Act and Stormwater Management Program (VSMP) Regulations, as it relates to post-construction stormwater management facilities. The County uses the following legal authorities:

- **Stormwater Management Ordinance #042214-12, adopted on April 22, 2014;** its purpose is to protect property, state waters, stream channels, and other natural resources from the potential harm of unmanaged stormwater, and to establish requirements whereby stormwater is managed to protect water quality and downstream property owners.

Responsible Party:

- The Department of Development Services has the overall responsibility to implement the County's SWM Ordinance.
- The County Attorney's office provides support to the Department of Development Services during compliance/enforcement actions, as necessary.

Schedule:

Roanoke County implements a SWM ordinance to comply with Virginia's Stormwater Management Act and Stormwater Management Program (VSMP) Regulations. The County will update this ordinance and the supporting documents, as necessary, to remain consistent with Virginia's VSMP program.

Measurable Goals:

Success for this BMP will be measured by an annual evaluation of the Stormwater Management Ordinance.

- Roanoke County finds its Stormwater Management Ordinance to be effective at this time. No changes are currently proposed. The ordinance is posted on the County's website at: <https://www.roanokecountyva.gov/DocumentCenter/View/5470/Stormwater-Management-OrdinanceChap-23-July-1?bidId>

TMDL Consistency:

The County's Stormwater Management Ordinance requires the property owner to provide for the maintenance and repair of their stormwater structures and stormwater management facilities. This helps to ensure that such structures and facilities operate properly, which in turn helps to minimize sediment and bacteria in stormwater runoff from such facilities. (SED & EC)

Evaluation and Modification:

The County's Stormwater Management Ordinance is an effective means to achieve compliance. The ordinance provides the necessary enforcement options to ensure that property owners provide for the maintenance and repair of their stormwater structures and stormwater management facilities. No modifications are planned for this BMP.

BMP 5-2: Post-Construction Inspections for Existing Stormwater Management Facilities

Goal:

The goal of this BMP is to develop and implement written inspection and maintenance procedures to provide for the long-term operation and maintenance requirements of post-construction stormwater management facilities.

Inspections will be conducted as follows:

- County-owned SWM facilities will be annually inspected.
 - When it is determined that maintenance is required during inspections of County-owned facilities, Roanoke County (or the Roanoke County Public Schools, as appropriate) will conduct the maintenance in accordance with its written procedures.
 - The County will inspect all privately-owned SWM facilities that discharge into the MS4 once every 5 years. In addition, the County will:
 - Require the owner to develop and record a maintenance agreement, including an inspection schedule to the extent allowable under state or local law or other legal mechanism;
 - Utilize its legal authority for enforcement of the maintenance responsibilities if maintenance is neglected by the owner; and
 - Will implement a progressive compliance and enforcement strategy, which is included in the Program Plan.

Responsible Party:

The Department of Development Services, with assistance from the County Attorney's office during compliance/enforcement actions, as needed.

- Note that Roanoke County Public Schools (RCPS) rely on the County's Department of Development Services to conduct inspections of RCPS-owned SWMFs; however, RCPS conducts maintenance for the school-owned SWMFs.

Schedule:

Roanoke County maintains and implements procedures for post-construction stormwater management facility inspection/maintenance and compliance/enforcement to comply with the Virginia Stormwater Management Act and the Stormwater Management Program Regulations. The County will update these procedures and supporting documents, as necessary, to remain consistent with Virginia's VSMP program.

Measurable Goals:

Success for this BMP will be measured by the annual evaluation of the written post-construction inspection procedures and completion of the required post-construction inspections.

- Roanoke County finds its post-construction stormwater management facility inspection/maintenance and compliance/enforcement procedures to be effective at this time. No changes are currently proposed.

- The inspection summary for this permitting year follows:

Permit Year	Private SWMFs			Public BMPs (Owned by County or RCPS)	
	Total #	# Inspected	# of Enforcement Actions	Total #	# Inspected
(1) 2018 - 2019	684	316	0	79 31 RoCo; 44 RCPS; 4 TOV	79 31 RoCo; 44 RCPS; 4 TOV
(2) 2019 - 2020	678 641 RoCo, 37 TOV	319 285 RoCo, 34 TOV	0	79 31 RoCo; 44 RCPS; 4 TOV	79 31 RoCo; 44 RCPS; 4 TOV
(3) 2020 - 2021	680 642 RoCo, 38 TOV	376 347 RoCo, 29 TOV	0	79 32 RoCo; 43 RCPS; 4 TOV	79 32 RoCo; 43 RCPS; 4 TOV
(4) 2021 - 2022	683 641 RoCo, 42 TOV	240 232 RoCo, 8 TOV	30	80 33 RoCo; 43 RCPS; 4 TOV	80 33 RoCo; 43 RCPS; 4 TOV

TOV = Town of Vinton RoCo = Roanoke County RCPS = Roanoke County Public Schools

- During this permit year, Roanoke County inspected all of its public SWMFs and conducted routine maintenance, where needed. During last year's inspection, two detention basins in Explore Park were found to be in need of major maintenance/repair. Maintenance on one of these basins has been completed. Maintenance on the second basin has been deferred due to budget constraints. Currently, this basin has no operating outfall, however it is performing satisfactorily as a retention facility, and there are no adverse effects to downstream properties. See folder titled **BMP 5-2** on the attached compact disk for inspection results for each public facility.

TMDL Consistency:

This BMP ensures that all permanent stormwater management facilities (SWMFs) are adequately maintained and properly functioning, which is critical for flood protection and erosion prevention. (SED)

Evaluation and Modification:

Roanoke County believes that inspecting permanent stormwater management facilities is a critical component in reducing pollutants in and reducing volume and velocity of stormwater runoff from developed sites. No modifications are planned for this BMP.

BMP 5-3: Stormwater Management Facility Tracking

Goal:

The goal of this BMP is to maintain an electronic database or spreadsheet of all known County-owned and privately-owned stormwater management facilities that discharge into the MS4. This spreadsheet is available online in the “Quick Links” section of the following webpage:

<https://www.roanokecountyva.gov/1755/Stormwater-MS4-Permit>

The County’s database includes the following information, as applicable:

- The SWMF type
- The SWMF location (latitude and longitude)
- The 6th Order Hydrologic Unit Code in which the SWMF is located
- The acres treated by the SWMF, including total acres, impervious acres, and pervious acres
- The date the SWMF was brought online (MM/YYYY). If the date brought online is not known, the County will use June 30, 2005
- Indication as to whether the SWMF is owned by the County or privately-owned
 - If the stormwater management facility is privately-owned, whether or not a maintenance agreement exists
- Indication as to whether the SWMF is part of Roanoke County’s local TMDL action plans
- The date of Roanoke County’s most recent inspection of the SWMF

Responsible Party:

The Department of Development Services, with the assistance of the Department of Communications and Information Technology.

Schedule:

- The electronic database or spreadsheet of all known County-owned and privately-owned SWMFs that discharge into the MS4 will be updated no later than 30 days after (1) a new SWMF is brought online, (2) a new BMP is implemented to meet a TMDL load reduction, or (3) after discovery of an existing SWMF.
- Roanoke County will use DEQ’s Construction Stormwater Database, or other application as specified by DEQ, to report each of its SWMFs installed after July 1, 2014, to address the control of post-construction runoff from land-disturbing activities for which Roanoke County is required to obtain a General VPDES Permit for Discharges of Stormwater from Construction Activities.
- No later than October 1 of each year, Roanoke County will electronically report all other SWMFs and BMPs implemented between July 1 and June 30 of each year using the DEQ BMP Warehouse and associated reporting template.

Measurable Goals:

Success for this BMP will be measured by updating of the electronic database or spreadsheet and by submittal of the SWMF information to DEQ through the Virginia Construction Stormwater General Permit database and the DEQ BMP Warehouse, as described above.

- Roanoke County is currently engaged in one project with a SWMF that required coverage under the General VPDES Permit for Discharges of Stormwater from Construction Activities:

PROJECT	VSMP Permit Issued:
William Byrd HS Additions & Renovations	May 19, 2022

- Roanoke County enters new SWMF information in the DEQ Construction General Permit tracking system when the Notice of Termination for the associated project is entered to initiate project closeout.

New Stormwater Facilities Brought Online

HUC	#	Acres Treated
030101010402	5	19.84
030101010404	6	54.13
030101010403	2	2.57
030101010301	14	5.8
Total	27	82.34

TMDL Consistency:

Tracking permanent SWMFs helps to ensure that all permanent stormwater management facilities are inspected, adequately maintained, and properly functioning, which is critical for flood protection and erosion prevention. (SED)

Evaluation and Modification:

Roanoke County believes that tracking permanent SWMFs helps to ensure that these facilities are routinely inspected, adequately maintained, and properly functioning, which is critical for flood protection and erosion prevention. No modifications are planned for this BMP.

BMP 5-4: Strategies to Encourage Long-Term Maintenance of Stormwater Control Measures on Single Family Residential Lots

Goal:

The goal of this BMP is to implement strategies to promote the long-term maintenance of stormwater control measures that are intended to treat stormwater runoff solely from the individual single family residential (SFR) lot. These strategies will be used to replace recorded maintenance agreements and post-construction inspections by the County.

Responsible Party:

The Department of Development Services.

Schedule:

Roanoke County implements various strategies to promote the long-term maintenance of stormwater control measures to treat runoff from SFR structures. The County will update these strategies, as necessary, to remain consistent with Virginia's VSMP program.

Measurable Goals:

Success for this BMP will be measured by tracking the number of new residential lots covered by the strategies, proper implementation of the strategies, and evaluating the effectiveness of the strategies in promoting the long-term maintenance of stormwater control measures.

- See folder titled **BMP 5-4** on the attached compact disk for a list of the **9 new SFRs** covered by the strategies, which include:
 - Directing stormwater runoff from rooftops as non-erosive sheet flow to well-vegetated areas on the property to the maximum extent practicable
 - Directing stormwater runoff from impervious surfaces (e.g., driveways, parking areas, sidewalks) as non-erosive sheet flow to well-vegetated areas on the property to the maximum extent practicable, and
 - Directing stormwater runoff from lawns as non-erosive sheet flow to undisturbed naturally-vegetated areas on the property to the maximum extent practicable.
- The County's Fact Sheet entitled "Tips for Homeowners: Stormwater Best Practices" provides strategies and maintenance tips for residential stormwater practices. It is on the County's website at <https://www.roanokecountyva.gov/DocumentCenter/View/7072/SW-Tips-for-Homeowners-?bidId=>

TMDL Consistency:

By implementing strategies to promote the long-term maintenance of stormwater control measures that are designed to treat stormwater runoff solely from the individual residential lot, this BMP helps to assure that such sites are not contributing large volumes of sediment to receiving waters. (SED)

Evaluation and Modification:

Roanoke County believes this is an effective BMP to address the maintenance of relatively simple stormwater management practices used on individual single-family residences (SFRs). No modifications are planned for this BMP at this time.

BMP 5-5 Storm Sewer System Maintenance

Goal:

The goal of this BMP is to actively maintain and repair the County's storm sewer (i.e., drainage) system in its MS4 program area. Such maintenance helps to keep the system working as designed, which minimizes the risk of surcharging and overflows; it also helps to minimize street flooding associated with clogged inlet structures and conveyances. In addition, the County's maintenance crews have the potential to discover illicit connections and observe where pollutants may be entering the regulated storm sewer system.

Responsible Party:

The Department of Development Services, Division of Stormwater Operations.

Schedule:

Roanoke County implements and is committed to continuing its storm sewer (drainage) system maintenance program. The number of large stormwater maintenance/repair projects will be documented. In addition, the number of emergency projects and small-scale maintenance/repair projects completed each year will be tracked.

Measurable Goals:

Success for this BMP will be measured by the continuation of this program, and the increase in total value of improvement that has been completed to maintain the storm sewer system.

- The Stormwater Operations Division of the Department of Development Services employs two stormwater construction / maintenance crews with a total of 7 employees. These crews perform a large variety of duties including installation of pipes and structures, repair of damaged structures, emergency response to flooding problems, and other County storm drain system maintenance. In this permit year, the following were completed:

Permit Year	Total Projects*					Annual Period Improvement Value
	Large	Small	Emergency	Inter-departmental	Board-Approved	
(1) 2018 - 2019	15	10	4	-		\$1,577,692
(2) 2019 - 2020	7	17	20	2		\$1,228,500
(3) 2020 - 2021	6	24	1	9		\$942,600
(4) 2021 - 2022	9	4	6	11	1	\$616,300

**Does not include 13 routine/repetitive maintenance projects*

- Implementation of these projects resulted in the following:
 - Pipe installed = **316 feet**
 - Properties improved = **61**
 - Channel improvements = **1254** feet (open/rip rap channel)
 - Total restoration area = **93,106** square feet
 - Total amount of sediment removed = **199** cubic yards
 - Completed Projects = **44**

A total of **6,132 labor** hours were committed towards maintenance and improvements to the municipal storm sewer system. The value of these improvements that were performed in-house is estimated to be **\$616,300**.

TMDL Consistency:

This program is responsible for maintaining the regulated storm sewer system. This includes the improvement of eroding stream banks and channels. This program directly remediates existing areas where sediment is eroding and stabilizes the system, removing the input of sediment to the streams and channels. (SED) This program also increases the potential for discovering illicit connections to the storm drain system. (EC)

Evaluation and Modification:

Roanoke County will continue to maintain the County's storm sewer system as a means to keep the system properly functioning. Such work also provides an opportunity for the County to discover potential illicit connections its MS4. No modifications are planned for this BMP.



County drainage crew improving an existing storm drainage system.



MCM-6: Pollution Prevention and Good Housekeeping for Municipal Operations

The goal of this minimum control measure is to implement a Pollution Prevention and Good Housekeeping Program to reduce stormwater runoff pollution and prevent illicit discharges during day-to-day operations at Roanoke County's various high-priority municipal facilities. The BMPs that will be used to satisfy this minimum control measure are listed below:

BMP 6-1: Spill Prevention, Control, and Countermeasure Plans

Roanoke County has developed and will maintain Spill Prevention, Control, and Countermeasures (SPCC) plans for some of its municipal facilities. These plans will be updated and new plans will be prepared, as needed.

BMP 6-2: Standard Operating Procedures

Roanoke County will maintain and implement written standard operating procedures (SOPs) for daily operations and maintenance activities that have a potential of discharging pollutants directly or with stormwater runoff into the MS4. The SOPs will be used in training activities.

BMP 6-3: Employee Training

Roanoke County implements biennial training for applicable employees in (1) recognition and reporting of illicit discharges; (2) good housekeeping and pollution prevention practices for: *(a) road, street, and parking lot maintenance, (b) maintenance and public works facilities, and (c) recreational facilities*; (3) spill response by emergency response employees; (4) herbicide application training; and (5) contractor oversight for environmental compliance.

BMP 6-4: Stormwater Pollution Prevention Plans for Municipal Facilities

Roanoke County will identify all high-priority facilities with a high potential to discharge pollutants in stormwater. Stormwater Pollution Prevention Plans (SWPPPs) will be prepared, implemented, and maintained. SWPPPs will be used in training activities.

BMP 6-5: Nutrient Management Plans

Roanoke County will identify all County-owned lands where nutrients are applied to a contiguous area of 1 acre or more. Nutrient Management Plans will be prepared by a certified nutrient management planner and will be implemented and maintained.

BMP 6-6: Pesticide Applicator Certification

All employees and County-hired contractors who apply pesticides/herbicides shall have the proper Virginia Pesticide Applicator Certificate.

This report provides a detailed description of the goals of each BMP, the status of the County's compliance with each BMP, and an evaluation of the BMP and any proposed modifications needed to better achieve the overall MS4 Program goals. In addition, the strategies to ensure consistency with local TMDLs are also provided, and they are broken down by impairment type: *Escherichia coli* (*E. coli*) bacteria (EC), sediment (SED), or Polychlorinated biphenyls (PCBs).

BMP 6-1: Spill Prevention, Control, and Countermeasure Plans

Goal:

The goal of this BMP is to develop, maintain, and implement Spill Prevention, Control, and Countermeasure (SPCC) Plans for appropriate municipal facilities, as required by Federal Oil Spills Prevention and Preparedness Regulations (40 CFR Part 112), to help municipal facilities prevent a discharge of oil into navigable waters or adjoining shorelines.

Responsible Party:

The Department of Development Services is responsible to develop and update SPCC plans. Applicable departments are responsible for compliance with SPCC plans.

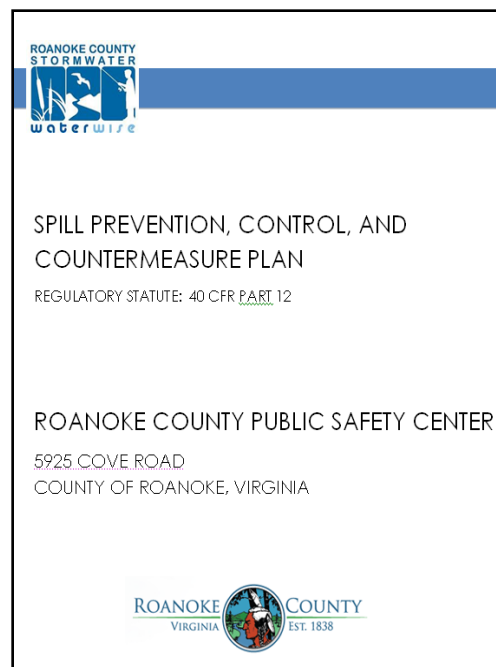
Schedule:

Roanoke County updates its SPCC plans, as necessary, and creates new plans for County facilities, as needed. Training is provided for those employees who are involved with any County SPCC plan.

Measurable Goals:

Success for this BMP is measured by (1) the updating of existing SPCC plans in accordance with Federal Oil Spills Prevention and Preparedness Regulations (40 CFR Part 1120), which require plans to be reviewed and updated every 5 years, or when a change has occurred; and (2) the creation of new SPCC plans for applicable County facilities. For this permit year:

- The County facilities that currently have a SPCC plan are listed below. All of these SPCC plans were revised in August/September 2021 to meet Federal regulations, which require SPCC plans to be updated every 5 years. These plans were previously revised in 2016. The completed SPCC plans may be viewed in the folder entitled **BMP 6-1** on the attached compact disc or on the website in the County's MS4 Program Plan, which may be accessed here: <https://www.roanokecountyva.gov/1755/Stormwater-MS4-Permit>
 - Cave Spring Fire Station
 - Clearbrook Fire Station
 - Fort Lewis Fire Station
 - Hollins Fire Station
 - Fleet Service Center
 - Public Safety Center
- There were no changes in operations in Permit Year 4 that necessitated revisions to the SPCC plans, nor were there any additional facilities identified that need a SPCC Plan.



TMDL Consistency:

This BMP minimizes the potential for oil spills to enter the MS4. Having updated SPCC Plans aids in the education of County employees who work in areas where there is some risk of oil spills. This BMP does not directly address any of the County's TMDL requirements.

Evaluation and Modification:

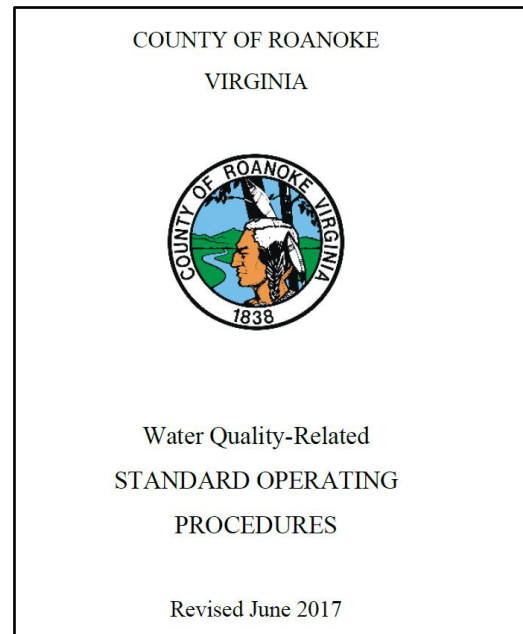
SPCC plans are required for facilities per 40 CFR Part 112. The County finds this to be an effective BMP to assure the proper storage of oil. No modifications are planned for this BMP.

BMP 6-2: Standard Operating Procedures

Goal:

The goal of this BMP is to develop and implement written standard operating procedures (SOPs) to help prevent pollutant discharge from activities at municipal facilities such as (1) road, street, and parking lot maintenance, (2) equipment maintenance, and (3) the application, storage, transport, and disposal of pesticides, herbicides, and fertilizers. These SOPs will be used in the employee training program (**see BMP 6-3**) and are designed to:

- 1) Prevent illicit discharges
- 2) Ensure the proper disposal of waste materials, including landscape wastes
- 3) Prevent the discharge of wastewater or County vehicle wash water or both into the MS4 without authorization under a separate VPDES permit
- 4) Require implementation of best management practices when discharging water pumped from utility construction and maintenance activities
- 5) Minimize the pollutants in stormwater runoff from bulk storage areas (e.g., salt storage, topsoil stockpiles) through the use of best management practices
- 6) Prevent pollutant discharge into the MS4 from leaking municipal automobiles and equipment
- 7) Ensure that the application of materials, including fertilizers and pesticides, is conducted in accordance with the manufacturer's recommendations



Responsible Party:

The Department of Development Services develops, evaluates, and amends the written water quality-related SOPs and provides support to applicable departments, the latter of which are responsible to comply with the SOPs that are pertinent to their activities.

Schedule:

SOPs will be annually evaluated and revised, as needed.

Measurable Goals:

Success for this BMP will be measured by the updating of the written SOPs, as necessary, and by employee training on the appropriate SOPs.

- There were no additions or modifications to the County's Water Quality-Related Standard Operating Procedures during the permit year. This document is posted on the County's website at:
<https://www.roanokecountyva.gov/DocumentCenter/View/16211/Water-Quality-Related-SOPs-June-2017>

TMDL Consistency:

This BMP ensures that all Standard Operating Procedures for water quality are in place and used for training. This is an effective BMP to help ensure pollutants from the County's daily operations do not enter the MS4. (SED)

Evaluation and Modification:

Roanoke County believes it is effective to maintain water quality-related SOPs and to train employees to use them, as a means to protect receiving waters from pollutants that may be carelessly handled by employees in their daily operations. No modifications are planned for this BMP.

BMP 6-3: Employee Training

Goal:

The goal of this BMP is to provide County employees with necessary training to support the requirements of the MS4 Permit. The written training plan provides for the following:

- 1) Field personnel receive training in the Recognition and Reporting of Illicit Discharges no less than once per 24 months;
- 2) Employees performing road, street, and parking lot maintenance receive training in Pollution Prevention and Good Housekeeping associated with those activities no less than once per 24 months;
- 3) Employees working in and around maintenance, public works, or recreational facilities receive training in Pollution Prevention and Good Housekeeping practices associated with those facilities no less than once per 24 months;
- 4) Employees and contractors hired by Roanoke County who apply pesticides and herbicides are trained or certified in accordance with the Virginia Pesticide Control Act (§ 3.2-3900 et seq. of the Code of Virginia). Certification by the Virginia Department of Agriculture and Consumer Services (VDACS) Pesticide and Herbicide Applicator program shall constitute compliance with this requirement;
- 5) Employees and contractors serving as plan reviewers, inspectors, program administrators, and construction site operators obtain the appropriate certifications as required under the Virginia Erosion and Sediment Control Law and its attendant regulations;
- 6) Employees and contractors implementing the stormwater program obtain the appropriate certifications as required under the Virginia Stormwater Management Act and its attendant regulations; and
- 7) Employees whose duties include emergency response have been trained in spill response. Training of emergency responders such as firefighters and law-enforcement officers on the handling of spill releases as part of a larger emergency response training shall satisfy this training requirement, and it shall be documented in the training plan.

Responsible Party:

The Department of Development Services provides the appropriate departments with access to the training materials; each department is responsible to make certain that their employees take and comply with the pertinent training.

Schedule:

Employee training is conducted on a biennial basis. The County will review the training program on a biennial basis and update it, as needed. This training was last provided in Permit Year 3 (2020-2021), and it will be provided again in Permit Year 5.

Measurable Goals:

This BMP will be measured by training of the pertinent County employees in accordance with the schedule. In addition, Roanoke County will maintain documentation of each training event for a minimum of three years after the training event.

Employees in eleven departments receive training in one or more of the topics listed below, depending on job class, on a biennial basis.

Recognition and Reporting Illicit Discharges

Applicable field personnel receive training in the recognition and reporting of illicit discharges. This training video takes approximately 30 minutes.

Good Housekeeping and Pollution Prevention Practices

Employees that perform road, street, and parking lot maintenance, or are employed in and around maintenance and public works facilities and at recreational facilities receive training in good housekeeping and pollution prevention practices. This training video takes approximately 1 hour.

NOTE: All employees who are required to take *Good Housekeeping and Pollution Prevention Practices* are required to read and follow the County's Water Quality-Related Standard Operating Procedures (SOPs). These procedures were designed to eliminate or minimize pollutant discharges in stormwater.

Contractor Oversight for Environmental Compliance

Supervisors who oversee Contractors that perform work for the County or employees involved in developing contracts for Contractors take this training. The training explains that all Contractors must have their own written good housekeeping and pollution prevention program, or they must comply with the County's written policies and water quality-related SOPs. County employees who oversee Contractors working for the County must ensure compliance by Contractors. This training video takes approximately 30 minutes.

Hazardous Materials (HAZ-MAT) Training

The County of Roanoke currently maintains basic hazardous materials training for its employees in Fire and Rescue. All career (paid) staff are certified to HAZ-MAT Operations. For this permit year, there are 203 uniformed, career employees. The number of volunteers is always in flux, but the County estimates that there are also 101 volunteers that currently have HAZ-MAT Operations training. HAZ-MAT certification does not expire from the Virginia Department of Fire Programs; however, all career personnel receive annual, internal training on this topic as part of their career development training.

Stormwater Pollution Prevention Plan (SWPPP) Training

Employees who work at a County municipal facility that has a SWPPP are required to take SWPPP training to assure that they know (1) where the SWPPP document is kept, (2) what it is for, and (3) which pollution prevention practices are to be used in and around the particular facility. This training presentation (PowerPoint) takes approximately 30 minutes to view.

In addition, a summary report of all DEQ-certified staff who review, approve, and inspect the implementation of stormwater management plans is also on the enclosed compact disk in the folder titled **BMP 6-3**.

TMDL Consistency:

This BMP ensures that all employees receive pollution prevention training and targeted employees receive additional training for municipal good housekeeping, pollution prevention, and Illicit Discharge Detection and Elimination (IDDE). It also ensures that all Fire and Rescue employees maintain basic hazardous waste training to prevent any mishandling of hazardous materials in ways that could be detrimental to the environment. (SED/EC)

Evaluation and Modification:

Roanoke County believes it is effective to train employees in the above-mentioned topics. No modifications are planned for this BMP.

BMP 6-4: Stormwater Pollution Prevention Plans for Municipal Facilities

Goal:

The goal of this BMP is to identify high-priority facilities in Roanoke County that have a high potential of discharging pollutants and to prepare, maintain, and implement a site-specific stormwater pollution prevention plan (SWPPP) for each identified facility.

High-priority facilities that have a high potential for discharging pollutants are those facilities that are not covered under a separate VPDES permit and for which any of the following materials or activities occur and are expected to have exposure to stormwater resulting from rain, snow, snowmelt, or runoff:

- 1) Areas where residuals from using, storing or cleaning machinery or equipment remain and are exposed to stormwater
- 2) Materials or residuals on the ground or in stormwater inlets from spills or leaks
- 3) Material handling equipment
- 4) Materials or products that would be expected to be mobilized in stormwater runoff during loading or unloading or transporting activities (e.g., rock, salt, fill dirt)
- 5) Materials or products stored outdoors (except final products intended for outside use where exposure to stormwater does not result in the discharge of pollutants)
- 6) Materials or products that would be expected to be mobilized in stormwater runoff contained in open, deteriorated or leaking storage drums, barrels, tanks, and similar containers
- 7) Waste material except waste in covered, non-leaking containers (e.g., dumpsters)
- 8) Application or disposal of process wastewater (unless otherwise permitted)
- 9) Particulate matter or visible deposits of residuals from roof stacks, vents or both not otherwise regulated (i.e., under an air quality control permit) and evident in the stormwater runoff

Roanoke County has developed SWPPPs for all of its high-priority facilities. Along with the previously-developed Implementation Schedule, the SWPPPs are located in **BMP 6-4** of the County's MS4 Program Plan. This document is posted on the County's website at: <https://www.roanokecountyva.gov/DocumentCenter/Index/1538>

The schedule identifies the high-priority facilities that have a high potential to discharge pollutants. This document also indicates when the various SWPPPs were prepared. Each SWPPP is kept at the high-priority facility for which it was written and contains the following information:

- 1) A site description that includes a site map identifying all outfalls, direction of stormwater flows, existing source controls, and receiving water bodies.

- 2) A description and checklist of the potential pollutants and pollutant sources.
- 3) A description of all potential non-stormwater discharges.
- 4) Written procedures designed to reduce and prevent pollutant discharge.
- 5) A description of the applicable training as required in Part I E 6 m of the MS4 Permit.
(See BMP 6-3 in this Report.)
- 6) Procedures to conduct an annual comprehensive site compliance evaluation.
- 7) An inspection frequency of no less than once per year and maintenance requirements for site-specific source controls. The date of each inspection and associated findings and follow-up shall be logged in each SWPPP.
- 8) A log of each unauthorized discharge, release, or spill incident reported in accordance with Part III G of the MS4 Permit, to include the following:
 - a. Date of incident.
 - b. Material discharged, released, or spilled.
 - c. Estimated quantity discharged, released or spilled.

Responsible Party:

The Department of Development Services evaluates the high-priority facilities and prepares and updates the necessary SWPPPs. The applicable departments implement their SWPPPs, conduct the requisite training and facility inspections, and handle incident reporting in the event of an unauthorized discharge, release, or spill.

Schedule:

Roanoke County has identified all of its municipal high-priority facilities, and it has determined which of these high-priority facilities have a high potential to discharge pollutants in stormwater. All necessary SWPPPs have been completed, and they will be maintained for as long as each facility has a high potential to discharge pollutants.

In accordance with the MS4 Permit, no later than June 30 of each year, Roanoke County will review any of its high-priority facilities for which a SWPPP has not been developed to determine if the facility has a high potential to discharge pollutants. If the facility is determined to be a high-priority facility with a high potential to discharge pollutants, the County will develop a SWPPP no later than December 31 of that same year.

If activities change at a facility such that it no longer meets the criteria of a high-priority facility with a high potential to discharge pollutants, Roanoke County may remove the facility from the list of high-priority facilities with a high potential to discharge pollutants.

Measurable Goals:

Success for this BMP will be measured by the implementation/maintenance of the required SWPPPs and the SWPPPs being kept at the high-priority facility for which they were written and used as part of the staff training conducted at said facility.

In addition, Roanoke County will review the contents of any site-specific SWPPP no later than 30 days after any unauthorized discharge, release, or spill reported in accordance with Part III G of the MS4 Permit to determine if additional measures are necessary to prevent future unauthorized discharges, releases, or spills. If necessary, the County will update the SWPPP no later than 90 days after the unauthorized discharge.

- In this permit year:
 - No new SWPPPs were developed.
 - Several SWPPPs will be updated in Permit Year 5:
 - Fleet Service Center
 - Regional Fire & EMS Training Center
 - RCPS Burton Center for the Arts
 - RCPS Municipal Yards
 - RCPS Bus Lots
 - One SWPPP was previously retired, as the facility it covers no longer exists:
 - Cave Spring Bus Lot SWPPP
 - There was one report of an on unauthorized release: Approximately 15 gallons of hydraulic oil was released from the supply line at the Fleet Service Center fuel island due to an accidental overfill by a vehicle operator. Oil-dry and other absorbent materials were immediately deployed to contain the fluid.
- All of the County's SWPPPs are available in the MS4 Program Plan, which can be accessed on the website <https://www.roanokecountyva.gov/DocumentCenter/Index/1538>
- SWPPP inspection reports are included on the attached CD in the folder titled BMP 6-4. The following inspections were completed, as marked by an 'X'.

Facility Name	Quarterly Inspections				Annual Assessment (due July 1, 2022)
	Qtr. 1 (due Oct 1, 2021)	Qtr. 2 (due Jan 1, 2022)	Qtr. 3 (due April 1, 2022)	Qtr. 4 (due July 1, 2022)	
Fleet Service Center	X	X		X	X
Public Service Center (@ Kessler Mill)	X	X	X	X	X
#1 North County Fire & Rescue	X	X	X	X	X
#3 Cave Spring Fire & Rescue	X	X	X	X	X
#5 Hollins Fire & Rescue	X	X	X	X	X
#6 Mount Pleasant Fire & Rescue	X	X	X	X	X
#9 Fort Lewis Fire & Rescue	X	X	X	X	X
Regional Fire & EMS Training Center	X	X	X	X	X
RCPS Bus Lots		X (Northside & Vinton Only)	X	X	X
RCPS Burton Center for Arts & Technology	X		X	X	X
RCPS Municipal Yards	X		X	X	X

X= report completed and submitted.

TMDL Consistency:

This BMP ensures that all high-priority facilities that have a high potential to discharge pollutants in stormwater have a SWPPP in place with employees trained to understand, implement, and maintain it. The SWPPP identifies Best Management Practices to be employed at each facility to prevent the discharge of pollutants into the MS4. (SED/EC)

Evaluation and Modification:

Roanoke County will continue to implement and update the completed SWPPPs and will prepare new SWPPPs, as necessary. No modifications are planned for this BMP.

BMP 6-5: Nutrient Management Plans

Goal:

The goal of this BMP is to ensure that excessive nutrients are not being applied to County-owned lands. To achieve this, Roanoke County will maintain and implement turf and landscape nutrient management plans (NMPs) that have been developed by a certified turf and landscape nutrient management planner (in accordance with § 10.1-104.2 of the Code of Virginia) on all lands owned or operated by the County where nutrients are applied to a contiguous area greater than one acre. If nutrients are being applied to achieve final stabilization of a land disturbance project, application amounts will follow the manufacturer's recommendations.

Responsible Party:

The Department of Development Services will track progress. The Department of Parks, Recreation, and Tourism (PRT) is responsible for the preparation, implementation, and maintenance of Nutrient Management Plans on County-owned lands. Roanoke County Public Schools (RCPS) is responsible for the preparation, implementation, and maintenance of Nutrient Management Plans on RCPS-owned lands.

Schedule:

All County-owned lands where nutrients are applied to a contiguous area of 1 acre or more have been identified and Nutrient Management Plans are in place. The County will continue to implement these plans and update them, as needed.

Measurable Goals:

Success for this BMP will be measured by the implementation of the Nutrient Management Plans for the applicable lands.

- Part 1 of the plan for County-owned lands was updated in June 2022; it is provided on the attached CD in the folder titled BMP 6-5. No changes in acreages.

TMDL Consistency:

This BMP ensures that excessive nutrients are not being applied for all County-owned lands where nutrients are applied to a contiguous area of 1 acre or more. While there is no known benefit towards satisfying the TMDL requirements for *E. coli* or sediment, there is a water quality benefit associated with proper application of nutrients. The minimization of land-applied nutrients helps the County address one of its high priority water quality issues, that of preventing excess nutrients from entering receiving waters via stormwater runoff.

Evaluation and Modification:

Roanoke County will continue to implement all of its NMPs, which are in the MS4 Program Plan and can be accessed online at <https://www.roanokecountyva.gov/DocumentCenter/Index/1538>.

BMP 6-6: Pesticide Applicator Certification

Goal:

The goal of this BMP is to ensure that all employees and contractors hired by the County who apply pesticides and herbicides are trained or certified in accordance with the Virginia Pesticide Control Act (§ 3.2-3900 et seq. of the Code of Virginia). Certification by the Virginia Department of Agriculture and Consumer Services (VCACS) Pesticide and Herbicide Applicator program shall constitute compliance with this requirement.

Responsible Party:

The Department of Development Services shall track compliance. The Departments of Parks, Recreation and Tourism and General Services are responsible to ensure that their employees or contractors who apply pesticides on County-owned lands have current pesticide/herbicide applicator certifications.

Schedule:

Roanoke County annually reviews the pesticide/herbicide applicator certifications held by its employees and hired contractors.

Measurable Goals:

Success for this BMP will be measured by maintenance of current certification by the applicable employees and any hired contractors. See the summary table, below, for those County employees that hold the requisite certifications:

EMPLOYEE	CERTIFICATION TYPE	CERTIFICATION #	EXPIRATION DATE
Eric C. Vest	Commercial Pesticide Applicator	72792-G	6/30/2023
Jerad Ray	Commercial Pesticide Applicator	127518-G	6/30/2023
Eric C. Vest	Certified Fertilizer Applicator	CFA-13407-57329	6/4/2025

TMDL Consistency:

While there is no known benefit towards satisfying the TMDL requirements for *E. coli* or sediment, there is a water quality benefit associated with proper application of pesticides so as to avoid excess products entering the receiving waters by way of stormwater runoff.

Evaluation and Modification:

Roanoke County will continue to require the applicable personnel to hold the proper pesticide and fertilizer applicator certifications. No modifications are planned for this BMP.

Section II. Total Maximum Daily Load Action Plans

A. Introduction

Roanoke County has developed three Total Maximum Load (TMDL) Action Plans to reduce loadings for three pollutants of concern (sediment, bacteria, and PCBs), because the County discharges (or may discharge) these pollutants to impaired waters for which a TMDL has been approved by the U.S. Environmental Protection Agency (EPA) and in which an individual or aggregate waste load has been allocated to Roanoke County. The plans are summarized below:

TMDL Action Plan for Bacteria (*E. coli*)

The *Total Maximum Daily Load (TMDL) Action Plan for Bacteria Reduction (E. coli) in the Roanoke River, Ore Branch, Tinker Creek, Glade Creek, Carvin Creek, and Lick Run* was completed in July 2015 and submitted to DEQ with the corresponding MS4 Annual Report. The latest version of this plan, dated April 2020, is on the County's website at:

<https://roanokecountyva.gov/DocumentCenter/View/18092/E-coli-TMDL-Action-Plan-April-2020?bidId=>

TMDL Action Plan for Sediment

The *Total Maximum Daily Load (TMDL) Action Plan for Benthic Reduction (Sediment) in the Roanoke River* was completed in July 2015 and submitted to DEQ with the corresponding MS4 Annual Report. The latest version of this plan, dated September 2022, is on the County's website at:

<https://www.roanokecountyva.gov/DocumentCenter/View/24488/Sediment-TMDL-Action-Plan-Sept-2022?bidId=>

TMDL Action Plan for PCBs

The *Total Maximum Daily Load Action Plan for PCBs in the Roanoke River, Mason Creek, Peters Creek, Tinker Creek, Wolf Creek, and an Unnamed Tributary to the Roanoke River* was completed in June 2016 and submitted to DEQ with the corresponding MS4 Annual Report. The latest version of this plan, dated April 2020, is on the County's website at:

<https://roanokecountyva.gov/DocumentCenter/View/18093/PCBs-TMDL-Action-Plan-April-2020?bidId=>

Pursuant to the MS4 permit requirements, a summary of the BMPs conducted by the County to implement each of its local TMDL Action Plans follows next in this report, along with a detailed description of the goals of each BMP, the status of the County's compliance with each BMP, and an evaluation of the BMP and any proposed modifications needed to better achieve the TMDL goals. Each BMP describes how it is consistent with the local TMDL and identifies which impairment type it addresses: *Escherichia coli* (*E. coli*) bacteria (EC), sediment (SED), or Polychlorinated biphenyls (PCBs).



B. BMPs to Address Bacteria (*E. coli*)

The latest version of the TMDL Action Plan for Bacteria Reduction (*E. coli*), dated April 2020, is posted on the County's website at:

<https://roanokecountyva.gov/DocumentCenter/View/18092/E-coli-TMDL-Action-Plan-April-2020?bidId=>

This plan was developed to reduce bacteria in the Roanoke River, Ore Branch, Tinker Creek, Glade Creek, Carvin Creek, and Lick Run. The BMPs that will be used to address bacteria are listed below, and fall into three categories: (1) domestic pets, (2) wildlife, and (3) illicit connections or illicit discharges to the MS4.

BMP #	BMP Name	Implementation Date
DOMESTIC PETS		
B-1	Dog Waste Stations and Signage <ul style="list-style-type: none"> Develop a written plan of where to install Install at least 3 dog waste stations per year until plan is achieved 	July 2020 Ongoing
B-2*	Protect Stream Buffers: Ordinance <ul style="list-style-type: none"> Finalize ordinance language Present to Board of Supervisors for consideration Implement ordinance (if approved) 	Fall 2020 Winter 2020 Winter 2021
B-3*	Protect Stream Buffers: No-Mow Policy for County-owned Lands	Spring 2021
WILDLIFE		
B-4	Public Education: Reducing Food Sources Accessible to Wildlife	July 2020
ILLICIT CONNECTIONS OR ILLICIT DISCHARGES TO THE MS4		
B-5	Public Education: Septic System Repair & Maintenance	Ongoing
B-6	Business Outreach: Eliminating Illicit Discharges	Ongoing
B-7*	Enhanced Public Outreach for Bacteria (<i>E. coli</i>)	Ongoing
B-8*	Enhanced Employee Training for Bacteria (<i>E. coli</i>)	Ongoing

* Also effective in reducing sediment discharge to the Roanoke River.

BMP B-1: Dog Waste Stations and Signage

Goal:

The goal of this BMP is to increase the number of maintained dog waste stations and associated signage in public parks and greenways to reduce discharge of *E. coli* from dog waste into receiving waters.

Responsible Party:

The Department of Development Services will be responsible for plan development and the Department of Parks, Recreation, and Tourism (PRT) will install and maintain the dog waste stations and accompanying signage.

Schedule:

By July 1, 2020, Roanoke County will develop a written plan that describes where dog waste stations should be installed on County property.

Measurable Goals:

A minimum of 3 dog waste stations will be annually installed until the conditions of the written plan are met. And, each dog waste station will have coordinating signage reminding owners to pick up after their dogs. In this permit year:

- The current plan is being reevaluated in terms of locations, needs, and maintenance capabilities. PRT is assessing the impact of its revised and adopted Park Ordinance, which does not permit pets on ballfields. An example is Vinyard Park East; because this is a specialty sports field complex, no dogs will be allowed, so there will be no need for a dog waste station at this location. Park rules signs will reflect this ordinance where applicable. PRT is also assessing the current and proposed locations of Mutt Mitt stations that could possibly be relocated closer to pavilions or other existing trash cans that are routinely serviced.
 - For the locations of existing “Mutt Mitt” dog waste stations, see the online map at <https://www.roanokecountyva.gov/2594/GIS-Mapping-Support>. In addition, the written plan, map, and inventory are located in the folder titled **TMDLs**, sub-folder **B-1** on the attached compact disk.

TMDL Consistency:

Actions that decrease discharges of *E. coli* are consistent with the TMDL for bacteria. (EC)

Evaluation and Modification: Roanoke County will continue to install and maintain dog waste stations, as outlined above. No modifications are planned for this BMP.



BMP B-2: Protect Stream Buffers: Ordinance

Goal:

The goal of this BMP is to evaluate the possibility of enacting stream buffer requirements, because stream buffers can be effective in dissuading stream access and in filtering stormwater runoff that sheet flows through the buffer, which helps to remove sediment, bacteria, and other pollutants.

Responsible Party:

The Department of Development Services is responsible to develop and implement the Stream Buffer Ordinance.

Schedule:

This activity began in permit year 2016 - 2017. The new stream buffer requirements were incorporated into the County's Erosion & Sediment Control (ESC) Ordinance. The new requirements state that a 25 ft. wide stream buffer along perennial streams must be established in which no land grading may occur. The stream buffer requirements were accepted by the Board and the revised ordinance became effective on July 27, 2021.

The revised ESC Ordinance with the proposed Stream Buffer requirements can be viewed in the folder entitled TMDLs, sub-folder B-2 on the attached compact disk and online at <https://www.roanokecountyva.gov/2610/Ordinances-and-Design-Manuals>.

Or, a direct link to the document follows:

<https://www.roanokecountyva.gov/DocumentCenter/View/17847/ESC-Ordinance-eff-7-27-21?bidId=>

Measurable Goals:

Success for this BMP has been achieved, as the ordinance has been adopted. The County, through its Department of Development Services, will implement this ordinance, beginning with its effective date of July 27, 2021.

TMDL Consistency:

Actions that reduce discharges of *E. coli* are consistent with the TMDL for bacteria. (EC)

Evaluation and Modification:

Evaluation and modification are not appropriate at this time.

BMP B-3: Protect Stream Buffers: No-Mow Policy for County-owned Lands

Goal:

The goal of this BMP is to evaluate the possibility of a “no-mow policy for County-owned lands” along streams, as a means to minimize stream bank erosion and dissuade access to streams by dogs.

Responsible Party:

The Department of Development Services is responsible to develop the no-mow policy for County-owned lands with assistance from the County’s Department of Parks, Recreation, and Tourism.



Schedule:

A no-mow policy for County-owned lands is being implemented by the County’s Parks, Recreation, and Tourism. This policy attempts to balance the competing goals of providing adequate access to streams for the public, providing adequate views of the streams, excluding dogs, protecting stream banks, and providing vegetative filters.

- Implementation of this policy began in spring 2021. It can be viewed in the folder titled **TMDLs**, sub-folder **B-3** on the attached compact disk.

Measurable Goals:

Success for this BMP has been achieved, as a “no-mow policy for County-owned lands” has been adopted. The County, through its Department of Parks, Recreation, and Tourism, will implement this no-mow policy.

TMDL Consistency:

Actions that reduce discharges of *E. coli* are consistent with the TMDL for bacteria. (EC)

Evaluation and Modification:

Evaluation and modification are not appropriate at this time.

BMP B-4: Public Education: Reducing Food Sources Accessible to Wildlife

Goal:

The goal of this BMP is to incorporate messages into the existing public education program to encourage citizens to reduce food sources accessible to wildlife. This messaging is to help assure that wild animals do not become dependent on people for food, to minimize the potential for spreading disease between people and animals, to minimize property damage, and to minimize the discharge of bacteria-carrying animal waste that may find its way into the nearest storm drainage system.

Responsible Party:

The Department of Development Services.

Schedule:

By July 2020, Roanoke County expanded its public education program to encourage citizens to reduce food sources accessible to wildlife.

Typical messages in this program have and will include:

- Keep trash cans covered and protected from animals
- Do not feed pets outdoors
- Secure bird feeders from squirrels, bears, and other animals
- Do NOT feed wild animals, including Canadian geese



Measurable Goals:

Success for this BMP will be measured by the incorporation of messages into the existing public education program to encourage citizens to reduce food sources accessible to wildlife.

See page 12 of the Stormwater Guide for Homeowners, dated May 2022 for a pertinent article: <https://www.roanokecountyva.gov/DocumentCenter/View/23609/Stormwater-Newsletter-May-2022-?bidId=>

TMDL Consistency:

Actions that reduce discharges of *E. coli* are consistent with the TMDL for bacteria. (EC)

Evaluation and Modification:

Evaluation and modification are not appropriate at this time.

BMP B-5: Public Education: Septic System Repair & Maintenance

Goal:

The goal of this BMP is to incorporate messages into the existing public education program to encourage citizens to properly maintain their septic systems, because malfunctioning or poorly maintained onsite sewage disposal systems may result in discharges of bacteria from human waste.

Responsible Party:

The Department of Development Services.

Schedule:

By July 2020, Roanoke County expanded its public education program to encourage citizens to periodically pump out their septic systems and to keep them properly operating.



Measurable Goals:

Success for this BMP will be measured by the incorporation of messages into the existing public education program to encourage citizens to properly maintain and periodically pump out their septic systems. See page 4 of last year's newsletter for an article about septic systems.

<https://www.roanokecountyva.gov/DocumentCenter/View/21422/Stormwater-Newsletter-JUNE-2021-website-version?bidId>

In this permit year, Roanoke County partnered with the Roanoke Valley Alleghany-Regional Commission (RVARC) and received grant funding through the Virginia Environmental Endowment's Community Conservation Program (CCP). The awarded funds will be used to implement a "*Septic System Education and Pump-out Program*" for residents in Roanoke County over a three (3) year period. The grant documents are on the attached CD in the folder titled **BMP B-5**. The program is expected to begin by winter 2022 and will include:

- * At least five (5) in-person Education Workshops focused on septic system maintenance, one in each of the five magisterial districts in Roanoke County
- * One virtual Education Workshop focused on septic system maintenance
- * 150 cost-free septic tank pump-outs for residents who attend one of the workshops <https://www.roanokecountyva.gov/2963/Septic-Pump-Out-Program>

TMDL Consistency:

Actions that reduce discharges of *E. coli* are consistent with the TMDL for bacteria. (EC)

Evaluation and Modification:

Roanoke County currently incorporates messages in its public education program about the need to periodically pump out septic systems and to keep systems properly operating. Roanoke County will continue these messages.

BMP B-6: Business Outreach: Eliminating Illicit Discharges

Goal:

The goal of this BMP is to visit targeted businesses that have an elevated potential to discharge bacteria in the conduct of their day-to-day activities and to take corrective actions where illicit discharges are observed.

Responsible Party:

The Department of Development Services.

Schedule:

Roanoke County annually conducts site inspections of targeted businesses that have an elevated potential to discharge bacteria, such as veterinary clinics, kennels, pet stores, restaurants, vehicle maintenance shops, and car washing facilities.

Measurable Goals:

Roanoke County will annually conduct site inspections of 15 selected facilities; County staff will meet with business owners or managers to discuss ways to minimize illicit discharges in the day-to-day operations at each facility. If an actual or potential illicit discharge is identified, the County's inspection staff will work with the business owner to eliminate or reduce the risk.

NOTE: In this reporting period, no site inspections were conducted due to lingering business closures associated with COVID-19. However, all of the businesses in the target group for bacteria were sent educational literature, as shown in Table 1-7A: Stormwater Education Program for Specific Audience.

TMDL Consistency:

Actions that reduce discharges of *E. coli* are consistent with the TMDL for bacteria. (EC)

Evaluation and Modification:

Roanoke County finds this to be an effective means to identify potential or actual illicit discharges. No changes are planned for this BMP at this time.



BMP B-7: Enhanced Public Outreach for Bacteria (*E. coli*)

Goal:

The goal of this BMP is to enhance the BMPs used under MCM 1 and MCM 2, where applicable, to ensure that they address bacteria as a high priority water quality issue. This will help to raise awareness of the water quality issues involving *E. coli* (bacteria) in target audiences and the general public.

Responsible Party:

Department of Development Services, with assistance from the CVC, RVTv, and the County's web content manager.

Schedule:

Roanoke County has developed a list of public (target) audiences to receive specific messages on an annual basis about ways to reduce *E. coli* (bacteria) pollution in their day-to-day activities.

Measurable Goals:

Success for this BMP will be measured by the incorporation of information concerning *E. coli* (bacteria) into the MS4 Program public education and outreach efforts in accordance with **Figure 7** in the TMDL Action Plan for *E. coli*. Also, see **BMP 1-7** in this report for a detailed assessment of compliance with goals and complete versions of Tables 1-7a through 1-7d. Note that Table 1-7a shows how the County addresses *E. coli* for certain target audiences and the general public.

TMDL Consistency:

The enhanced Public Education and Outreach goals were specifically tailored to address water quality issues related to *E. coli*. (EC)

Evaluation and Modification:

Use of messages tailored to address *E. coli* (bacteria) that are focused on the proper target audiences is an effective means to raise awareness, improve individual's actions, and increase support for water quality programs. Roanoke County believes that its current activities in this area are robust, and no modifications are planned for this BMP.

Stormwater Best Management Practices for Proper Pet Waste Disposal



A Guide for Roanoke County Pet Owners

BMP B-8: Enhanced Employee Training for Bacteria (*E. coli*)

Goal:

The goal of this BMP is to enhance **BMP 6-3** to ensure that it addresses *E. coli* (bacteria) as a high priority water quality issue. This will help to raise awareness of those County employees that are required to take such training.

Responsible Party:

The Department of Development Services provides the appropriate departments with access to the training materials; each department is responsible to make certain that their employees take and comply with the pertinent training.

Schedule:

Employee training will be conducted on a biennial basis. The County will review the training program on a biennial basis and update it, as needed.

Measurable Goals:

Compliance with **BMP 6-3** training goals in the following topics with evidence that *E. coli* (bacteria) has been incorporated into the training material as a high priority water quality issue.

- Recognition and Reporting of Illicit Discharges
- Good Housekeeping and Pollution Prevention Practices
- Contractor Oversight for Environmental Compliance
- Hazardous Materials (HAZ-MAT) Training

This training is performed every two years, pursuant to the MS4 permit requirements, and it was conducted in this Permit Year 3. This training will next be offered in Permit Year 5.

TMDL Consistency:

The Enhanced Employee Training was specifically tailored to address ways to reduce *E. coli* (bacteria) in stormwater runoff.

Evaluation and Modification:

This training is important to give County employees the understanding that *E. coli* (bacteria) is a high priority water quality issue and that measures shall be implemented, where practical, to reduce its discharge into stormwater. No modifications are planned for this BMP.



C. BMPs to Address Sediment

The latest version of the TMDL Action Plan for Sediment, dated September 2022, is posted on the County's website at:

<https://www.roanokecountyva.gov/DocumentCenter/View/24488/Sediment-TMDL-Action-Plan-Sept-2022?bidId=>

This plan was developed to reduce sediment in the Roanoke River. The BMPs that will be used to address bacteria are listed below:

BMP #	BMP Name/Task	Estimated Implementation Dates
S-1	Lower Threshold for Compliance: Erosion & Sediment Control Program	Ongoing
S-2	Roanoke County MS4 BMP Capital Improvement Program	Ongoing
S-3	Enhanced Public Outreach for Sediment	Ongoing
S-4	Enhanced Employee Training for Sediment	Ongoing
S-5	Contractor Appreciation Program	Ongoing

BMP S-1: Lower Threshold for Compliance: Erosion & Sediment Control Program

Goal:

The goal of this BMP is to reduce the offsite discharge of silt and sediment from construction sites, particularly from smaller sites that disturb less than 10,000 square feet, which is the state's threshold for compliance under the Virginia Erosion & Sediment Control (ESC) Program. As discussed in the County's TMDL Action Plan for Sediment Reduction, it was previously estimated that this lower threshold kept approximately 1,680 tons/year of sediment out of the area waterways.

However, as noted in the September 2022 version of the Action Plan, the County revised this estimate using the Chesapeake Bay Program guidance to estimate the sediment removal attributed to the enhanced and rigorous ESC Program (*Recommendations of the Expert Panel to Define Removal Rates for Erosion and Sediment Control Practices (2014)*).



Erosion and sediment control devices are not 100% effective; however, per the Chesapeake Bay Program, a properly-designed and installed set of controls should retain at least 85% of sediment on the construction site. Roanoke County permits and inspects approximately 129 land disturbing activities per year that each disturb less than 10,000 square feet. Cumulatively, these activities disturb approximately 18 acres per year.

Therefore, Roanoke County's lower threshold for compliance keeps about **184 tons/year** of sediment out of local waterways ($12 \text{ tons/acre/year} \times 85\% \times 18 \text{ acre} = 184 \text{ tons/year}$).

Responsible Party:

The Department of Development Services.

Schedule:

Roanoke County has been implementing a lower threshold of compliance (2,500 square feet) under its Erosion and Sediment Control Program for many years due to its steep terrain, highly erodible soils, and sediment-impaired waterways.

Measurable Goals:

Success for this BMP will be measured by the continued implementation of the County's Erosion and Sediment Control Program using a lower threshold of compliance (i.e., 2,500 sq. ft.)

TMDL Consistency:

Actions or activities that reduce discharges of sediment to receiving waters are consistent with the TMDL for sediment. (SED)

Evaluation and Modification:

Roanoke County will continue to implement its Erosion and Sediment Control Program using a lower threshold of compliance (i.e., 2,500 square feet). No changes are planned for this BMP.

BMP S-2: Roanoke County MS4 BMP Capital Improvement Program

Goal:

The goal of this BMP is to employ capital resources in the most cost-effective means to reduce sediment loads in the Roanoke River.

Responsible Party:

The Department of Development Services.

Schedule:

This program is ongoing. In 2015, the County's consultant recommended that the most cost-effective BMP to reduce sediment discharged from the County's MS4 would be *natural stream restoration where excessive stream bank erosion was occurring*. The consultant's recommendation was supported by the reported experiences of other localities.

Measurable Goals:

Since Roanoke County believes that natural stream restoration is the most cost-effective means to lower sediment loads in the Roanoke River, the County has been addressing the reduction of sediment loads through the construction of stream restoration projects. Roanoke County's program to construct structural BMPs, such as stream restoration, is supported by its 10-Year Capital Improvement Program (CIP). Currently, the County's CIP indicates planned funding for one capital BMP project about every three years. This program also assumes that 50% of the cost will be provided through the Virginia Stormwater Local Assistance Fund (SLAF).

Thus, success for this BMP will be measured by the continued funding and implementation of one capital BMP project about every three years.

- Last permit year, Roanoke County completed Phase 1 improvements to Wolf Creek.
- The County recently received SLAF funding to perform Phase 2 of the Wolf Creek natural stream restoration project. Design work is underway, and construction is expected to begin in the fall of 2022 with a duration of approximately 6 months. Phase 2 will begin at Spring Grove Drive and will extend about 1,600 linear feet upstream. For more information, click on this link: [Wolf Creek Phase 2](#). It is estimated that this project will keep **475 tons of sediment/year** out of the area waterways.

TMDL Consistency:

Structural BMPs that reduce discharges of sediment to receiving waters are consistent with the TMDL for sediment. (SED)

Evaluation and Modification:

Roanoke County will continue to implement its MS4 BMP Capital Improvement Program. No modifications are planned for this BMP.



Existing eroding vertical banks in Wolf Creek will be addressed in Phase 2 of this natural stream restoration project.

BMP S-3: Enhanced Public Outreach for Sediment

Goal:

The goal of this BMP is to enhance the BMPs used under MCM 1 and MCM 2, where applicable, to ensure that they address sediment as a high priority water quality issue. This will help to raise awareness of the water quality issues involving sediment in target audiences and the general public.

Responsible Party:

Department of Development Services, with assistance from the CVC, RVTv, and the County's web content manager.

Schedule:

Roanoke County has developed a list of public (target) audiences to receive specific messages on an annual basis about ways to reduce sediment pollution in their day-to-day activities.

Measurable Goals:

Success for this BMP will be measured by the incorporation of information concerning sediment into the County's public education and outreach efforts. For example, an annual newsletter entitled *It's Just Dirt* is directed at land disturbing contractors across the region and is mailed to approximately 500 firms each year. Its primary purpose is to educate contractors about ways to reduce sediment pollution from their active land-disturbing projects.

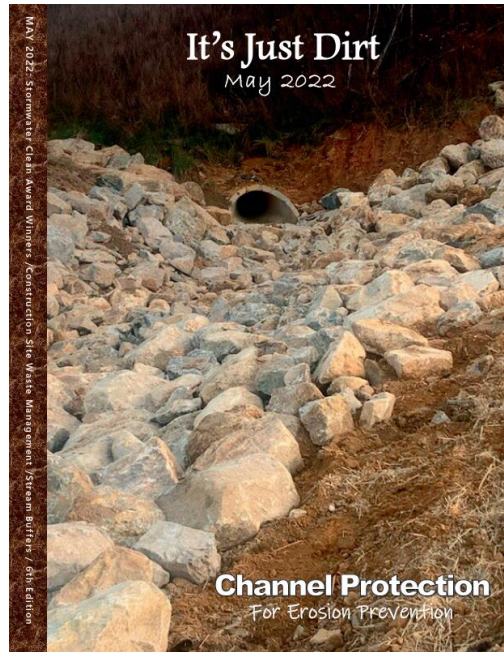
See **BMP 1-7** in this report for a detailed assessment of compliance with goals. Note that **Table 1-7a** shows how the County addresses sediment for certain target audiences and the general public.

TMDL Consistency

The enhanced Public Education and Outreach goals were specifically tailored to address water quality issues related to sediment. (SED)

Evaluation and Modification:

Use of messages tailored to address sediment that are focused on the proper target audiences is an effective means to raise awareness, improve individual's actions, and increase support for water quality programs. Roanoke County believes that its current activities in this area are robust, and no modifications are planned for this BMP.



<https://www.roanokecountyva.gov/DocumentCenter/View/23688/Contractor-Newsletter-May-2022-?bidId=>

BMP S-4: Enhanced Employee Training for Sediment

Goal:

The goal of this BMP is to enhance **BMP 6-3** to ensure that it addresses sediment as a high priority water quality issue. This will help to raise awareness of those County employees that are required to take such training.

Responsible Party:

The Department of Development Services provides the appropriate departments with access to the training materials; each department is responsible to make certain that their employees take and comply with the pertinent training.

Schedule:

Employee training will be conducted on a biennial basis. The County will review the training program on a biennial basis and update it, as needed.

Measurable Goals:

Compliance with **BMP 6-3** training goals in the following topics with evidence that sediment has been incorporated into the training material as a high priority water quality issue.

- Recognition and Reporting of Illicit Discharges
- Good Housekeeping and Pollution Prevention Practices
- Contractor Oversight for Environmental Compliance
- Hazardous Materials (HAZ-MAT) Training

This training is performed every two years, pursuant to the MS4 permit requirements, and it was last conducted in Permit Year 3.

TMDL Consistency:

The Enhanced Employee Training was specifically tailored to address ways to reduce sediment in stormwater runoff. (SED)

Evaluation and Modification:

This training is important to give County employees the understanding that sediment is a high priority water quality issue and that measures shall be implemented, where practical, to reduce its discharge into stormwater. No modifications are planned for this BMP.

BMP S-5: Contractor Appreciation Program

Goal:

To reduce discharge of sediment from construction sites.

Responsible Party:

Department of Development Services, with assistance from the Public Information Officer.

Schedule:

Roanoke County has implemented the Contractor Appreciation Program to recognize those contractors that are proactive in implementing erosion and sediment controls and employing stormwater management measures to “keep their dirt on their project.”

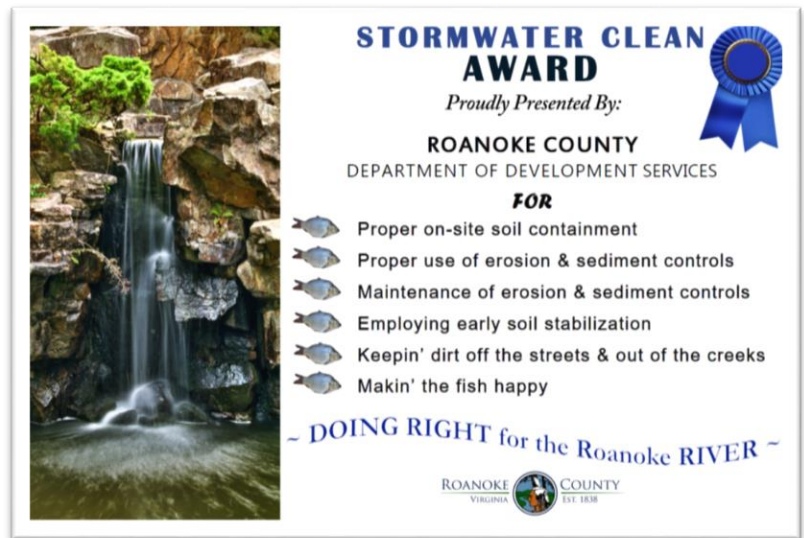
Measurable Goals:

Success for this BMP will be measured by the continued implementation of the Contractor Appreciation Program. In this permit year, two firms won the prestigious award for their outstanding work regarding erosion and sediment control:

- EDC - “Tanglewood Shops A & B” project
- Appalachian Power - Glenmary Substation project

For specific details about these projects and the program, visit the following webpage:

<https://www.roanokecountyva.gov/1780/Stormwater-Contractor-Appreciation>.



Roanoke County's Stormwater Inspector Chriss VanEeckhout & Stormwater Program Manager Cindy Linkenhoker presented the Stormwater Clean Award to EDC Project Manager Michael Rauch and Project Superintendent Gregory Harders for the "Tanglewood Shops A & B" project.



Appalachian Power's Glenmary Substation project won the Roanoke County Stormwater Clean Award for its proactive efforts regarding erosion and sediment control.

TMDL Consistency:

Actions that result in lowering the discharge of sediment from construction sites are consistent with the TMDL. (SED)

Evaluation and Modification:

The County believes that this program is very effective in raising awareness among contractors to 'do the right thing' by keeping their dirt on their projects and out of the local receiving waters. It gives staff an opportunity to work with the Contractors in a positive way and provides the recipient contractors with positive and free publicity for their projects. No modifications are planned for this BMP.



D. BMPs to Address PCBs

The latest version of the TMDL Action Plan for PCBs, dated September 2020, is posted on the County's website at:

<https://roanokecountyva.gov/DocumentCenter/View/18093/PCBs-TMDL-Action-Plan-April-2020?bidId=>

This plan was developed to reduce PCBs in the Roanoke River, Mason Creek, Peters Creek, Tinker Creek, Wolf Creek, and an Unnamed Tributary to the Roanoke River. The BMPs that will be used to address PCBs are listed below.

BMP #	BMP Name/Task	Estimated Implementation Dates
P-1	Enhanced Public Education and Outreach for PCBs	Ongoing
P-2	Enhanced Employee Training for PCBs	Ongoing
P-3	Use of Existing Ordinances and Programs	Ongoing

BMP P-1: Enhanced Public Education and Outreach for PCBs

Goal:

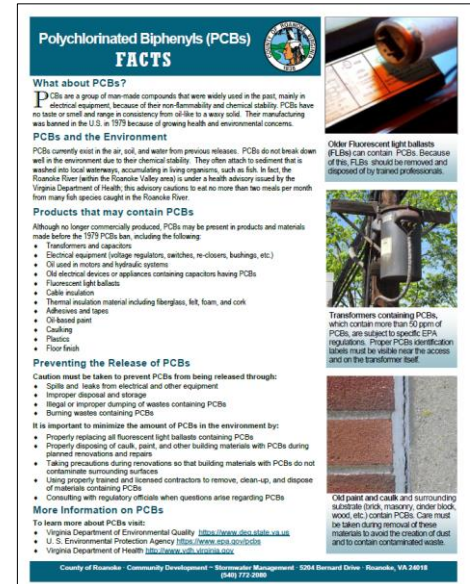
The goal of this BMP is to enhance several of the County's existing BMPs to ensure that they include messages about PCBs and ways to reduce them from entering the MS4.

Specifically, the following existing BMPs will be used to address PCBs:

BMP 1-2: Roanoke County Stormwater Newsletter

Roanoke County promotes general public awareness of PCBs and their potential sources. For example, a message regarding PCBs was included in the County's Stormwater Newsletter "A Stormwater Guide for Homeowners," dated June 2020. The newsletter is posted on the stormwater website at

<https://www.roanokecountyva.gov/1648/Stormwater-Public-Education-Documents>



In this permit year, a specific article about PCBs was not included in the Stormwater Newsletter, but there were articles and tips about reducing sediment loss. As described in the County's Program Plan for Reduction of PCBs, which may be viewed here <https://www.roanokecountyva.gov/1755/Stormwater-MS4-Permit>, the rationale for reducing sediment loss from property (residential lots, construction sites, etc.) is a strategy to reduce PCBs, because the latter attached to sediment and may be washed to local receiving waters in stormwater runoff. The May 2022 Stormwater Newsletter may be viewed here: <https://www.roanokecountyva.gov/1648/Stormwater-Public-Education-Documents>. A direct link to the document is provided below: <https://www.roanokecountyva.gov/DocumentCenter/View/23609/Stormwater-Newsletter-May-2022-?bidId=>

BMP 1-5: Stormwater Public Awareness Program

Roanoke County promotes public awareness specifically to the development community regarding PCBs and their potential sources by providing developers with a copy of the PCBs Awareness Fact Sheet when they apply for demolition permits. The Fact Sheet is also posted on the County's website at

<https://www.roanokecountyva.gov/DocumentCenter/View/9349/PCB-Facts-May-2017?bidId=>

In this permit year, the County issued demolition permits, as follows:

Permit Year	# of Demolition Permits Issued
(1) 2018 - 2019	15 - Residential 10 - Commercial
(2) 2019 - 2020	10 - Residential 5 - Commercial
(3) 2020 - 2021	20 - Residential 2 - Commercial
(4) 2021 -2022	14 - Residential demos 3 - Commercial structures

BMP 1-6: Roanoke County Stormwater Webpage

Roanoke County promotes general public awareness of PCBs and their potential sources by placing the PCBs Awareness Fact Sheet on its stormwater webpage. The PCBs Fact Sheet can be found here:

<https://www.roanokecountyva.gov/DocumentCenter/View/9349/PCB-Facts-May-2017?bidId>

BMP 2-3: MS4 Program and Stormwater Pollution Prevention Website

Roanoke County has posted its PCBs Awareness Fact Sheet and PCBs PowerPoint Presentation on the stormwater webpage here:

<https://www.roanokecountyva.gov/1648/Stormwater-Public-Education-Documents>

Responsible Party:

Department of Development Services, with assistance from the CVC, RVTv, the County's web content manager, and specific departments (for employee training).

Schedule:

Roanoke County has identified public (target) audiences to receive specific messages on an annual basis about ways to reduce PCBs in their day-to-day activities.

Measurable Goals:

Success for this BMP will be measured by the incorporation of information concerning PCBs into the MS4 Program public education and outreach efforts. See **BMP 1-7** in this report for a detailed assessment of compliance with goals. In addition, **Table 1-7B** shows the various County publications that address PCBs for certain target audiences and the general public.

TMDL Consistency:

The enhanced Public Education and Outreach goals were specifically tailored to address water quality issues related to PCBs.

Evaluation and Modification:

Use of messages tailored to address PCBs that are focused on the proper target audiences is an effective means to raise awareness, improve individual's actions, and increase support for water quality programs. Roanoke County believes that its current activities in this area are robust, and no modifications are planned for this BMP.

BMP P-2: Enhanced Employee Training for PCBs

Goal:

The goal of this BMP is to enhance two existing training-related BMPs to ensure that they address PCBs as a high priority water quality issue. This will help to raise awareness of those County employees that are required to take such training. The following BMPs will be enhanced:

BMP 6-2: Standard Operating Procedures

Roanoke County incorporates the PCBs Awareness Fact Sheet and PCBs PowerPoint Presentation into its written Water Quality-Related Standard Operating Procedures (SOPs). These procedures address daily operations and maintenance activities that have a potential of discharging pollutants directly or with stormwater runoff into the MS4. The SOPs will be used in employee training activities.

BMP 6-3: Employee Training

Roanoke County implements biennial training for applicable employees regarding PCBs. Specifically, employees are required to review the PCBs Awareness Fact Sheet and PCBs PowerPoint Presentation, which are incorporated in the written Water Quality-Related Standard Operating Procedures (SOPs). This training was conducted last permit year.

Responsible Party:

The Department of Development Services provides the appropriate departments with access to the training materials; each department is responsible to make certain that their employees take and comply with the pertinent training.

Schedule:

Employee training will be conducted on a biennial basis. The County will review the training program on a biennial basis and update it, as needed.

Measurable Goals:

Compliance with **BMP 6-3** training goals with evidence that the topic of PCBs has been incorporated into the training material as a high priority water quality issue and into the Water Quality-Related Standard Operating Procedures (SOPs) described in **BMP 6-2**.

Employee training is performed every two years, pursuant to the MS4 permit requirements, and it was last conducted in Permit Year 3 (2020-2021).

TMDL Consistency:

The Enhanced Employee Training was specifically tailored to address ways to reduce PCBs in stormwater runoff.

Evaluation and Modification:

This training is important to give County employees the understanding that PCBs are a high priority water quality issue and that measures shall be implemented, where practical, to reduce their discharge into stormwater. No modifications are planned for this BMP.

BMP P-3: Use of Existing Ordinances and Programs

Goal:

Given the TMDL assumption that PCBs are widely dispersed across the impaired watersheds in minute quantities, the goal of this BMP is to continue to implement the following ordinances and programs to achieve overall long-term reductions of the discharge of PCBs:

Illicit Discharge Ordinance

Roanoke County will continue to identify and eliminate illicit discharges in accordance with Chapter 24 of the County Code.

Erosion and Sediment Control Ordinance

Roanoke County will continue to implement its local Erosion and Sediment Control ordinance, which requires administrative oversight, plan review, inspections, and enforcement associated with active land-disturbing projects. Through implementation of this ordinance, the discharge of sediments, which may potentially have PCBs adhered to them as a result of atmospheric deposition, will be minimized.

Stormwater Management Ordinance

Roanoke County will continue to implement its Stormwater Management Ordinance, which requires the inspection of post-construction stormwater management facilities (SWMFs); As required, the County will conduct annual site inspections of County-owned stormwater facilities, and it will conduct site inspections of privately-owned stormwater facilities once every 5-years. During these inspections, County staff will assure that the stormwater facility is properly functioning, that adequate vegetation exists for facility stability, and that water is not ponding in the facility for periods longer than designed. It is anticipated that the SWMFs will interrupt the pathway of incoming PCBs and keep them from entering the downstream impaired waters. By properly disposing of the sediments during maintenance, as described in the Standard Operating Procedure (SOP) manual, potential PCBs-laden sediments will be eliminated as a potential source.

Emergency Spill Response and Containment

The Roanoke County Fire and Rescue Department provides emergency response services to County residents. As part of this service, approximately 186 uniformed career employees and 101 volunteers are trained in hazardous materials operations. In response to spills and accidental releases, Fire and Rescue staff may assist the responsible party in mitigating containment of an accidental release.

Regulation of Open Burning

Roanoke County regulates open burning under Chapter 9 of the County Code. This code section places restrictions on the burning of construction and demolition waste and debris, which may contain PCBs. Thus, by implementing Chapter 9, the release of PCBs into the environment from local airborne deposition is minimized.

Regulation of Illegal Dumping and Littering

Roanoke County regulates illegal dumping and littering under Chapter 13 of the County Code. This chapter provides the County with the necessary legal authority to minimize the amount of debris and wastes that are dumped, which may minimize the discharge of incidental PCBs that may be present in such materials.

Contract Language

Roanoke County uses general contract language in its vendor contracts to ensure that demolition and construction wastes are lawfully disposed of in permitted landfills. The proper disposal of demolition and construction waste minimizes the amount of PCBs that are available for entry into receiving waters by interrupting their travel path.

DEQ Coordination

Roanoke County will continue to coordinate with the DEQ, particularly via the local Blue Ridge Regional Office in Salem, VA. Through combined state and local efforts, it is anticipated that the quantity of PCBs being discharged from current sources into the waters in and around Roanoke County will diminish. In addition, DEQ will continue to strategize on how best to remove the legacy pollutants that currently exist in these impaired waterways.

Responsible Party:

Department of Development Services, with assistance from other departments such as Fire & Rescue and Planning/Zoning.

Schedule:

Roanoke County has the above-named ordinances, programs, and strategies already in place that are believed to help achieve overall long-term reductions of the discharge of PCBs.

Measurable Goals:

Success for this BMP will be measured by the continued implementation of the above-named ordinances, programs, and strategies.

TMDL Consistency:

Actions that reduce the discharge of PCBs are consistent with the TMDL for PCBs.

Evaluation and Modification:

These ordinances, programs, and strategies help to reduce the discharge of PCBs into the environment. Therefore, no modifications are planned for this BMP.

Section III. Supporting Documents

(See attached CD)