

TOWN OF VINTON, VIRGINIA
Virginia Stormwater Management Program (VSMP)
General Permit for Discharges of Stormwater from Small
Municipal Separate Storm Sewer System (MS4)
Annual Report
Permit Year Five

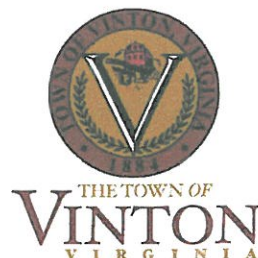
October 1, 2018

REPORTING PERIOD OF
JULY 1, 2017 – JUNE 30, 2018

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Submitted To:
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Pursuant to General Permit Number VAR040026



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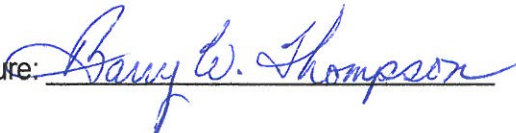
Contributing Agencies and Organizations:

Clean Valley Council (CVC)
County of Roanoke
City of Roanoke
Roanoke Valley Resource Authority (RVRA)
Roanoke Valley Television Station (RVTV)
Virginia Saves Our Streams Foundation
Western Virginia Water Authority (WVWA)

Signed Certification in Accordance with 9VAC25-870-370 B:

"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."

Print Name: Barry W. Thompson Title: Town Manager

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VAR040026 Town of Vinton, Virginia

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Executive Summary

The Town of Vinton finds that the uncontrolled and polluted stormwater runoff to the Town's storm sewer system has an adverse impact on the water quality of the receiving waters. When left uncontrolled, this water pollution can result in the destruction of fish, wildlife, and aquatic life habitat; a loss in aesthetic value; and it threatens public health by contaminating food, drinking water supplies, and recreational waterways.

The Town is committed to continuing the development, implementation, and enforcement of its Municipal Separate Storm Sewer System (MS4) Program that is designed to reduce the discharge of pollutants from the regulated MS4 and to addressing impaired waters that the MS4 discharges into to the maximum extent practicable (MEP). The main goal of this program is to protect water quality, and to improve waters into which the regulated small MS4 discharges. This program is also designed to meet the appropriate water quality requirements of the Clean Water Act (CWA), Virginia Stormwater Management Act, and associated regulations.

The Town's commitment to establish and sustain a comprehensive program that protects the Town's stormwater quality has been made through strong regional cooperation for the implementation of the minimum control measures practices. Strong regional cooperation is instrumental in minimizing pollutants in the Roanoke River, creeks and streams, and providing Roanoke Valley citizens with clean water now and into the future.

Since 2003, the Town has developed and continues to develop a comprehensive plan to meet the conditions of the MS4 permit to the maximum extent practicable as outlined in six minimum control measures (MCMs) practices: Public education and outreach on stormwater impacts; Public participation and involvement; Illicit discharge detection and elimination; Construction site stormwater runoff control; Post-construction stormwater management in new development and redevelopment; and Pollution prevention and good housekeeping for municipal operations.

Beginning 2015 year reporting, numerous best management practices (BMPs) within each of the MCM have been modified and updated by the Town to address the new program requirements as of June 30, 2015 concerning: MCM 4 Construction Site Stormwater Runoff Control Stormwater Management Progressive Compliance and Enforcement and MCM 6 Pollution Prevention/Good Housekeeping for Municipal Operations in regards to Stormwater Pollution Prevention Plan (SWPPP) for Town facilities and a Nutrient Management Plan (NMP) for Vinton War Memorial property. This report entails MCMs and associated BMPs for reporting period of July 1, 2017 through June 30, 2018, the fifth annual report for the Town's reissued MS4 permit, having an effective date of July 1, 2013 and an expiration date of June 30, 2018.

The Town was originally issued a VSMP permit effective July 8, 2003 (Permit No. VAR040026) and successfully met the requirements over the initial five year permit period. The VSMP permit was re-issued on July 14, 2008 and expired on July 8, 2013. The third VSMP permit was re-issued on July 1, 2013 and will expire on June 30, 2018. While the basic framework has not changed, several permit modifications require changes to the Town's stormwater management program. This plan demonstrates how the Town will meet the new requirements through 2018.

The Town is committed to continuing the development, implementation, and enforcement of its Municipal Separate Storm Sewer System (MS4) Program that is designed to reduce the discharge of pollutants from the regulated MS4 and to addressing impaired waters that the MS4 discharges into, to the maximum extent practicable (MEP). The main goal of this program is to protect water quality, and to improve waters into which the regulated small MS4 discharges. This program is also designed to meet the appropriate water quality requirements of the Clean Water Act (CWA), Virginia Stormwater Management Act, and associated regulations.

Since 2003, the Town has and continues to develop a comprehensive plan to meet the conditions of the MS4 permit to the maximum extent practicable as outlined in six minimum control measures (MCMs) practices:

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

In addressing these six minimum control measures, the Town emphasizes the importance of lowering sediment and bacteria discharges to the storm sewer systems in accordance with the approved TMDLs within the Town.

The Town has engaged in an extensive review and assessment of the existing stormwater management operations; ordinances, protocols, and programming against the VSMP permit compliance requirements. Based on that review and assessment, the Town has developed appropriate and cost effective best management practices (BMPs) with the goal of controlling pollution to the maximum extent practicable.

Community Profile

The Town has a population of 8,098 based on 2010 Census; contains 3.2 square miles in area; and 90 miles of roadways. Based on the 2003 land use survey, the Town's developed land use can be categorized as follows: Residential 51%; Commercial 8%; Industrial 6%; Public/Semi-Public 14%; and Transportation 21%. The undeveloped/vacant land is about 16% and consists of heavily wooded areas with steep slopes that are not optimal for development. Majority of the residential areas were developed before the Town adopted the stormwater quality management requirements in 2008 under the VSMP Phase II requirements.

Stormwater Management Program

The Town's commitment to establish and sustain a comprehensive program that protects the Town's stormwater quality has been made through strong regional cooperation for the implementation of the minimum control measures practices. The Town has and continues to partner with the County of Roanoke in the stormwater management program. The County of Roanoke continues to provide services to the Town through already in place agreements such as the Virginia Erosion and Sediment Control (ESC) and Virginia Stormwater Management Program (VSMP) administration including plan review, approval, permit issuance, site and best management practice inspection for construction activities; schools, parks, recreation and tourism services and administration; building review, inspections, and approval services and administration.

The Town intends to continue its participation in regional efforts to educate the general public and developers. These efforts are in cooperation with Roanoke County and City of Roanoke, and other regional organizations such as the Clean Valley Council (CVC), Roanoke Valley Resource Authority (RVRA), Roanoke Valley Television (RVTV) Channel 3, Roanoke Valley Alleghany Regional Commission (RVARC), Upper Roanoke River Roundtable (URRR), Roanoke Valley Greenway Commission, Roanoke Valley Urban Forestry Council (RVUFC), Western Virginia Water Authority (WVWA), and Blue Ridge Land Conservancy. Strong regional cooperation is instrumental in minimizing pollutants in the Roanoke River, creeks and streams, and providing Roanoke Valley citizens with clean water now and into the future.

The Town seeks to implement a comprehensive stormwater management program that addresses stormwater quality and quantity, and protects aquatic habitats through positive action. The Department of Public Works is responsible for overall coordination of Virginia Stormwater Management Program (VSMP) and MS4 compliance.

The Town's Physically Interconnected MS4s to which It Discharges

The Town of Vinton is located in Roanoke County, and it is bordered on its western and northern limits by the City of Roanoke. To the east, lie Roanoke County and the Blue Ridge Parkway. The southern border lies along the Roanoke River. The northwest and west portions of the Town are bordered by Glade Creek and Tinker Creek. The eastern portion is bordered by Wolf Creek. The Town has a population of 8,098; contains 3.2 square miles in area; 90 miles of roadways and the stormwater outfalls discharging to the waters of the state: Glade Creek, Tinker Creek, Wolf Creek and Roanoke River; see Figure 1.

The Town owns and maintains its roadway systems, solid waste collection operation, and provides water and waste water system services to both Town and East Roanoke County residents. The Town pumps its sewage to the Roanoke Regional Wastewater Treatment Plant located in the City of Roanoke. The Town owns and operates its water system, which uses a series of ten wells drawing ground water from the Falling Creek Aquifer.

All other regulated small MS4's that the Town is physically interconnected MS4 including Virginia Department of Transportation (VDOT) were informed of the Town's MS4 Program Plan Update in a correspondence dated, December 23, 2008.

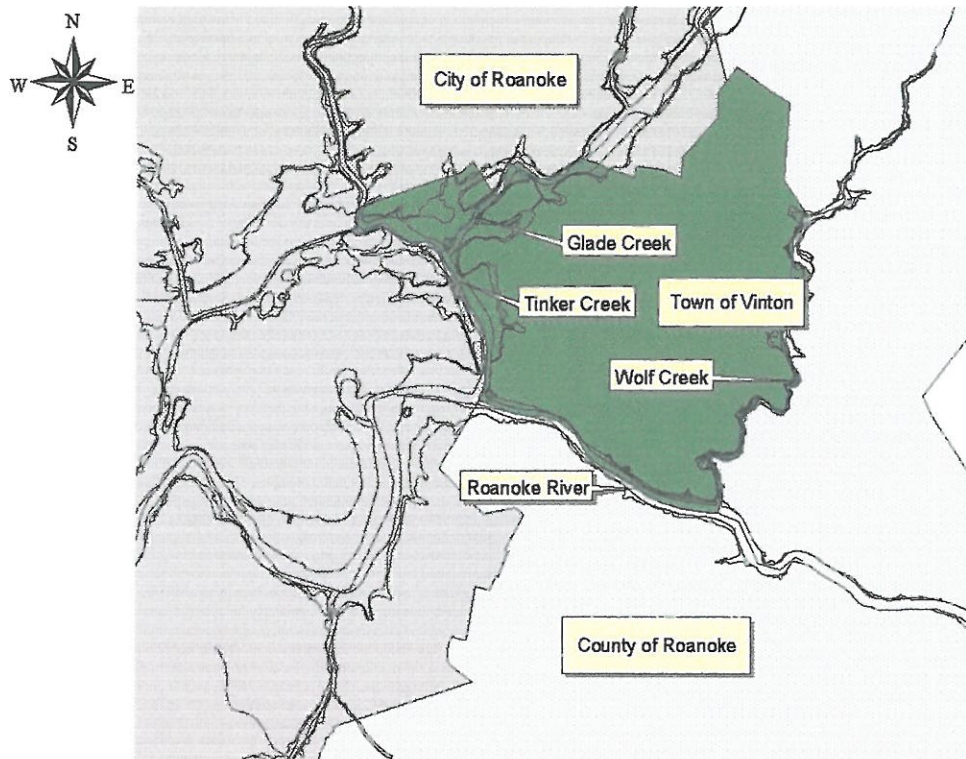


Figure 1. Receiving Waters for the Town of Vinton

The Town transports its solid waste to Tinker Creek Transfer Station, which is owned and operated by the Roanoke Valley Resource Authority (RVRA) and funded by the Cities of Roanoke and Salem, County of Roanoke, and Town of Vinton.

Watershed Summary

This section details a list of all known waters currently receiving discharges or that have potential to receive discharges from the regulated small MS4. The following Table 1 lists the waterways and the Hydrologic Unit Codes (HUC) as identified in the most recent version of the Virginia's 6th Order National Watershed Boundary Dataset and the estimated drainage areas in the Town of Vinton, served by the regulated small MS4 discharging to these surface waters.

Watershed	Hydrologic Unit	Impaired Receiving Waters	Drainage Area (Estimated in Acres)
Glade Creek	RU13	Glade Creek	711
Roanoke River	RU14	Roanoke River	148
Tinker Creek	RU13	Tinker Creek	489
Wolf Creek	RU14	Roanoke River	663

Table 1. Town of Vinton Watersheds HUC's, Impaired Receiving Waters, and Drainage Areas inside Town of Vinton

MCM 1:PUBLIC EDUCATION AND OUTREACH ON STORMWATER IMPACTS

The Town of Vinton, Roanoke County, and City of Roanoke entered into a contract agreement with Clean Valley Council (CVC), Inc., since August 2006 to help fulfill most of the Best Management Practices (BMPs) within the MCM 1 and MCM 2. The MCM 1 is intended to implement a public education program to distribute and make available educational materials to the community and conduct equivalent outreach activities about the impacts of stormwater discharges on water bodies and the steps that the public can take to reduce pollutants in stormwater runoff.

As indicated in the last reporting period, the **three selected high-priority water quality issues were bacteria, sediments, and nutrients**. The rationale for these selected water quality issues is because the Town has been assigned a total maximum daily load (TMDL) for these impairments, which means the Town has been put on a "Pollution Diet" to limit these pollutants from entering its waterways. Nutrients (phosphorus and nitrogen, in particular) were selected as the third water quality issue on which to focus, because they have such negative impacts on receiving waters when in large quantities. Excess nutrients wash off from lawns, other managed turf areas, and gardens and are transported via stormwater runoff to the area's local creeks, streams, and the Roanoke River. In these water bodies, they cause algae overgrowth, which in turn decreases the oxygen that marine life needs to survive. This often results in fish kills, fish illnesses, and the fainting of human food. Groundwater supplies may also be affected by nutrient pollution, thus making it an important topic on which to focus education efforts.

The education and outreach on these three water quality issues was designed to target a minimum of 20% of the Town's population each year. The Town of Vinton and County of Roanoke, through mutual aid agreement, continue to use various means to conduct public education, including spots on the local cable channel (RVTV-3), posting of educational material on the Town's website and Facebook pages, outreach activities with other organizations, the publication of newsletters and brochures, and the Town's annual calendar distributed to every household in early December. The Town will also continue to collaborate with the Clean Valley Council on education initiatives within the schools, and it will collaborate with neighboring localities such as the County of Roanoke and City of Roanoke, to conduct some education initiatives on a more regional scale.

A mix of best management practices (BMPs) has been chosen to target school children through outreach programs in the Roanoke County School System which include the Town of Vinton. Homeowners, restaurateurs, industries and the general public have been also be targeted through wastewater education, public forums, and Save Our Streams (SOS) field days. A list of programs or BMPs to meet these educational, and outreach measures is:

BMP 1-1. Stormwater Educational Resources, Publications, Links, and Programs Review

Update and distribute a comprehensive review of existing stormwater educational programs available to Town of Vinton and the Roanoke Valley area.

BMP 1-2. Development and Distribution of Stormwater Educational Materials

Develop and distribute a Roanoke County Stormwater Informational Mailer to Town of Vinton Residents and Businesses.

BMP 1-3. Stream School Seminars – Stream Monitoring and Education

On behalf of Town of Vinton, Clean Valley Council will provide stream monitoring and informational stream seminars for Town of Vinton residents.

BMP 1-4. Stormwater Educational Programs and Activities

Develop and implement a stormwater educational program for Town of Vinton/Roanoke County school age children. Different programs will target appropriate grade levels.

BMP 1-5. Stormwater Public Awareness Programs

Develop and implement a Stormwater Public Awareness Program that includes the distribution of stormwater merchandise, public service announcements, and other high visibility educational media.

This program has been revised by identifying at least three (3) high-priority water quality issues: **sediment, bacteria, and nutrients**; and their respective Target Audiences; and development of appropriate messages and media to target these issues and audiences.

BMP 1-6. Town of Vinton Stormwater Webpage where Citizens Can Obtain Information Concerning the Town’s Stormwater Management Program, Ordinances, Design Guidelines, Contact Information, Educational Programs, and Links to Other Organizations and Web Sites

Maintain and expand the Town’s Stormwater webpage that informs the public about water quality, community-based outreach and local projects.

BMP 1-7. Targeted Education Program

Develop and maintain a stormwater quality education program for specific targeted audiences within the Town.

Included in this document is a detailed description of the objective and measurable goal of each BMP; the strategies to ensure consistency with the identified local TMDLs; the responsible parties, the applicable supporting documents that include contract agreements, policies, ordinances, inspection forms, written procedures; the status of the Town’s compliance with each BMP, and an evaluation of the BMP and any proposed modifications needed to better achieve the goals of the stormwater program. The TMDL compliance is broken down by the identified impairment type: E. coli, fecal coliform (EC/FC) and sediment (SED). Beginning July 1, 2015, the stormwater public education and outreach program has been enhanced to incorporate the local TMDLs.

BMP 1-1. Stormwater Educational Resources, Publications, Links, and Programs Review

Goal: To continue to update and distribute a list of current publications, educational programs, websites, videos, maps, links, and training opportunities that directly address stormwater issues such as stormwater management, stormwater quality, impaired water bodies, floodplain management, pollution prevention, conservation practices, and riparian habitat protection. The target audiences and messages shall be coordinated with BMP 1-5.

Measurable Goal: The Town of Vinton has created and maintained this education programs review in the form of a stormwater programs database. The database documents educational programs, brochures, pamphlets, videos, maps, and training opportunities related to stormwater quality, stormwater management, pollution prevention, conservation practices and riparian habitat. The database is accessible through Town's website and includes instructions on accessing the variety of educational materials located on the site. The Town along with Roanoke County is planning to form target groups based on website usage to distribute specific program lists to libraries, schools and/or public organizations.

Table 2 lists the stormwater education resources that can be accessed through the Town's website and/or through other links; CVC, County of Roanoke, and City of Roanoke. Table 3 is the stormwater page report that tracked how many times these sites were accessed from July 1, 2017 through June 30, 2018. Additionally, CVC maintains and updates a collection of handouts and web resources. These materials are available to all citizens across the region, and handout materials are distributed at various events, as described in later sections of this report.

TMDL Consistency: The sources available on the Town's, Roanoke County's, and CVC's websites provide extensive educational material concerning the damage pet waste and sediment can do to the waterways (EC/FC, SED). The website provides links to the Roanoke County, CVC, state, and federal erosion and sediment control regulations for developers that are interested in ways to stabilize a construction site.

Evaluation and Modification: The Town was able to get the number of times that the database was viewed. Please see Table 3. The number of visits illustrates that while the website is an effective format to distribute the information concerning educational programs, the usage has been minimal. Modifications to this BMP may include new locations where this database is accessible to increase the amount and variety of information distributed.

Title of Resources	Date Added/Updated	Comment
Video: Illicit Discharge, Detection, and Elimination, A Great Concern in English or Spanish (30 and 60 seconds; 2, 5, and 10 minutes version): EC/FC, SED	2016	To learn about illicit discharges and how they can cause damage to our local waterways.
March 2016 Roanoke County Community Development Bulletin – Yard Management 101: BMPS to Protect Local Waters – Nutrients	2016	Protecting Stormwater from Fertilizer Pollution
Flyer: Storm Drain, Facts for Landscapers – EC/FC, SED	2015	Information on Garden and Backyard Practices
Flyer: Illicit Discharge Facts – Only Rain Down the Storm Drain	2015	Information Regarding Discharges
Flyer: Storm Drain, Facts for Plumbers	2015	Information on Illegal Discharges for Plumbers
Flyer: Tips for Homeowners, Stormwater Best Practices: EC/FC, SED	2015	BMPs for Residential Lot
Map: Roanoke Valley Pet Waste Stations – EC/FC	2015	Map of All Pet Waste Stations in the Roanoke Valley
Handout: Illicit Discharge Facts – Only Rain Down the Storm Drain	2015	Information on Illegal Discharges and How to Report It?
Brochure: After the Storm , A Citizen’s Guide to Understanding Stormwater Runoff and Its Effects on Water Quality in the Roanoke Valley – EC/FC, SED	2015	4 Pages Brochure on Stormwater Runoff and Its Effects on Water Quality
Flyer: Fall Foliage Facts – EC/FC	2015	Bagged Leaf Collection Information
Poster: “No, I am NOT the Poop Fairy” – EC/FC	2015	Poster for Pet Owners and Business
Brochure: It’s Just Dirt (Roanoke County Community Development Department/Town of Vinton Planning and Zoning Department): EC/FC, SED	2015	Construction Site Erosion Control and Permitting.
http://www.cleanvalley.org/stormwaterbusinesses	2014	Web Resources Targeted at Businesses: Carwash, Restaurant, Auto Shops
Flyer: Pool Maintenance Facts	2014	Flyer on Impacts of chemically-treated
Postcard: Only Rain Down the Drain – Car Wash (CVC)	2014	5 Keys for Protecting Stormwater when Washing a Car
Postcard: Only Rain Down the Drain – Restaurant (CVC)	2014	5 Keys for Protecting Stormwater at Restaurants
Brochure: Native Plants for Conservation, Restoration and Landscaping (DCR publication)	2014	Gardening Information for reducing stormwater impacts
Flyer: Stormwater and the Construction Industry – SED	2014	Maintain your BMPs during Construction

Table 2. Stormwater Educational Resources, Publications, and Programs

Webpage Name	Unique Page Views	Page Views
Vinton, VA - Official Website - Publication & Resources	36	48
Vinton, VA - Official Website - Public Outreach and Education	41	54
Vinton, VA - Official Website - Quick Facts	17	22
Vinton, VA - Official Website - Rain Barrels	N/A (number is 0 to 7)	N/A (number is 0 to 7)
Vinton, VA - Official Website - Stormwater Public Education Videos	14	19
Vinton, VA - Official Website - Stormwater Quality Information	70	101
Vinton, VA - Official Website - VSMP Permit	98	111
TOTALS FOR YEAR -- July 1, 2017 through June 30, 2018	276	355

Table 3. Stormwater Web Pages Report, July 1, 2017 through June 30, 2018

BMP 1-2. Development and Distribution of Stormwater Educational Materials

Stormwater educational materials were given out to students and adults through school outreach programs and Earth Summit for high school students and teachers; and community special events such as Roanoke Valley Home Show, Roanoke Valley Fall Waterways Clean-up After Event Picnic, Vinton Fall Festival, Earth Day Celebration, Energy Expo, and select locations including the Vinton Municipal Building and Roanoke County Vinton Branch Library.

The Town provides its citizens an annual calendar in early December of each year. The 2018 calendar, which was distributed in December 2017 to every household in the Town's limits, provides information on stormwater, special refuse pick-ups, household hazardous waste collection, fall leaf collection, adopt a truck program, clean-up week, and recycling collections. The calendar also lists environmental events in the Town and Roanoke Valley.

Goal: The Town along with Roanoke County will continue to develop stormwater educational mailer for general public and for specific commercial businesses. The material will contain the stormwater program, general stormwater quality education, updates of local impaired water bodies, and TMDL's. It will be based on the unique issues and concerns for the Roanoke River Watershed. Specific businesses will be targeted in an effort to increase business owners' awareness of the impacts of illicit discharges into the Town's storm sewer systems. The messages for the mailer will be coordinated with the high-priority water quality issues identified in BMP 1-5. The Town will post a version of the materials on its website for additional outreach, in addition in making these educational materials available at special events and the Information Center located in the lobby of the Town Municipal building.

Measurable Goal: For year five report, Town's calendar which contains stormwater information was distributed to more than **3,500** households. Other stormwater educational materials for year five reporting period were:

1. Vinton Treasurer/Finance Department continue to hand-out the Pick It Up...Its' Your "Doodie"! Don't Let Your Pet's Waste Pollute" brochure and the "No, I am NOT the Poop Fairy" poster to pet owners that come in to obtain and/or renew their dog/cat tag– EC/FC.
2. The "It's just Dirt..."What more do I need to know?" brochure that was developed in June 2015, continued to be made available at the Vinton Planning and Zoning Department and Roanoke

- County Community Development counters; given out to Responsible Land Disturber; property owner and/or developer at all pre-construction meeting – SED.
3. The "No, I am NOT the Poop Fairy" poster was developed in June 2015, along with the "Pick It Up...Its' Your Doodie" brochure were mailed to one veterinary hospital, one dog trainer/dog day care, and two pet groomer businesses located in the Town Limits–EC/FC.
 4. The "Reduce, Reuse, Recycle and Properly Dispose of Hazardous Wastes in and around Your Home – A Guide for Town of Vinton Residents" brochure that was developed in June 2015, continue to be made available at the Planning and Zoning Department counter, the Town Information Center and distributed during environmental events.
 5. On June 14, 2016, "A Stormwater Guide for Homeowners", April 2016 mailer was mailed to 3,678 Vinton's residential households. The mailer covers the following topics: What is an MS4 Permit?; What Programs in Roanoke County Relate to Stormwater? – Total Maximum Daily Loads (TMDLs), Floodplain Management Program, Virginia Erosion and Sediment Control Program, Virginia Stormwater Management Program (VSMP; Why Regulate Stormwater?; Minimizing Mosquitoes Around the Home; Clean Stormwater Starts At Home graphic; Kids Corner: The A-MACE-ING Journey of Stormwater; Before you Blow, You Should Know; Report Illicit Discharges; The World is Not Your Ashtray. This mailer is also made available at the Town Information Center Counter – EC/FC, SED, Nutrient.
 6. On June 14, 2016, the revised June 2015 car postcard "***Do not discharge any car wash water to storm drains, ditches, or streams, as it is polluted with sediment, oil, and heavy metals***". This postcard was mailed to 45 car wash operators/automotive businesses – EC/FC, SED.
 7. On June 14, 2016, the revised June 2015, restaurant brochure "Stormwater Best Management Practices for Restaurants – A Guide for Town of Vinton Restaurant and Eateries was mailed to 22 restaurants/eateries in the Town Limits – EC/FC, SED.

TMDL Consistency: The calendar; stormwater related articles, educational flyers, brochure, pamphlet, and mailer provided information on pet waste/bacteria (EC/FC), sediment (SED), nutrients, hazardous waste, and other applicable stormwater outreach programs. The "No, I am NOT the Poop Fairy" poster along with the "Pick It Up...Its' Your Doodie" brochure emphasized the importance of picking up after your pet and the pet waste pollutes the waterways. The car wash postcard targets local businesses that may have uncontrolled discharges from vehicle washing operations, which could increase sediment and bacteria discharges into local receiving waters. Therefore, this postcard would address the TMDL for sediment (SED) and bacteria (EC/FC). Similarly, the restaurant brochure addresses rinsing of kitchen equipment and accessories and washing down the parking areas, which may contribute bacteria to receiving waters. Thus, the restaurant brochure helps address the Town's TMDL for bacteria (EC/FC).

Evaluation and Modification: The Town in cooperation with Roanoke County has and continues to develop the brochures, postcards, flyers, and pamphlets with stormwater messages. The Town finds this BMP to be effective and intends to continue to publicize the stormwater message through a variety of media sources to continue to meet the goals of the Town's permit. No modifications are planned for this BMP due to the large number of citizens reached through these distributions of calendar, brochures and postcard. The Town will continue to educate its residents and businesses on its stormwater program through these educational mailers. Additionally, these educational mailers are posted on the website for additional outreach.

Year	Type Educational Material	Target Group	Number Reached
2013 – 2014 (Year One)	- Car Wash Postcard - Restaurant Postcard - A Guide for County of Roanoke/Town of Vinton Businesses Brochure	- Car Wash/Automotive Businesses - Restaurants - Every Business Owner in the Town of Vinton and County of Roanoke	45 22 1,208
2014 – 2015 (Year Two)	- Town's Annual Calendar - Pet Waste Brochure & Poop Fairy Poster - Green & Clean – SWM Lawn Care Tips - It's Just Dirt - Restaurant BMPs - Reduce, Reuse, Recycle and Proper Disposal of HHW - A Stormwater Guide for Homeowners - Revised Car Wash Postcard	- Residential Households - Pet Related Businesses/Pet Owners - Residents and Lawn Care Businesses - Contractors/Homeowners/RLD - Restaurants, Grocery Stores - General Public - Residential Households - Car Wash/Automotive Businesses	3,040 >30 >100 >100 22 >300 3,730 45
2015 – 2016 (Year Three)	- Town 2016 Annual Calendar: EC/FC, Sediment, Nutrient - Pet Waste Brochure & Poop Fairy Poster: EC/FC - It's Just Dirt: EC/FC, Sediment, Nutrient - Restaurant BMPs: EC/FC, SED - Reduce, Reuse, Recycle and Proper Disposal of HHW - A Stormwater Guide for Homeowners, April 2016: EC/FC, Sediment, Nutrient - Car Wash Postcard: EC/FC, Sediment	- Residential Households - Pet Related Businesses/Pet Owners - Contractors/Homeowners/RLD /Lawn Care Businesses - Restaurants/Eateries/Gas Station - General Public - Residential Households - Car Wash/Automotive Businesses	>3,494 >50 >100 >30 >100 >3,494 >45
2016 – 2017 (Year Four)	- Town 2017 Annual Calendar: EC/FC, Sediment, Nutrient - Pet Waste Brochure & Poop Fairy Poster: EC/FC - It's Just Dirt: EC/FC, Sediment, Nutrient - Restaurant BMPs: EC/FC, SED - Reduce, Reuse, Recycle and Proper Disposal of HHW - A Stormwater Guide for Homeowners, April 2016: EC/FC, Sediment, Nutrient - Car Wash Postcard: EC/FC, Sediment	- Residential Households - Pet Related Businesses/Pet Owners - Contractors/Homeowners/RLD /Lawn Care Businesses - Restaurants/Eateries/Gas Station - General Public - Residential Households - Car Wash/Automotive Businesses	>3,500 >70 >100 >35 >100 >3,500 >45

2017 – 2018 (Year Five)	- Town 2018 Annual Calendar: EC/FC, Sediment, Nutrient	- Residential Households	>3,500
	- Pet Waste Brochure & Poop Fairy Poster: EC/FC	- Pet Related Businesses/Pet Owners	>70
	- It's Just Dirt: EC/FC, SED, Nutrient	- Contractors/Homeowners/RLD /Lawn Care Businesses	>100
	- Restaurant BMPs: EC/FC, SED	- Restaurants/Eateries/Gas Station	>35
	- Reduce, Reuse, Recycle and Proper Disposal of HHW	- General Public	>100
	- Newsletter: A Stormwater Guide for Homeowners, June 2018: EC/FC, Sediment, Nutrient	- Residential Households	>3,500
- Car Wash Postcard: EC/FC, SED	- Car Wash/Automotive Businesses	>45	

BMP 1-3. Stream School Seminars – Stream Monitoring and Education

The Town of Vinton in cooperation with Clean Valley Council and the local chapter of the Virginia Save Our Streams will coordinate and conduct "Stream School Seminar" with school students, teachers and interested citizens during school year and at local environmental events such as the annual Fall Waterways Clean-up.

Goal: The goal of this BMP is to educate students, teachers, and citizens on the field procedures that have been established to determine water quality, in addition to motivating citizens to monitor waterways in their neighborhood and enhance grassroots cooperation to promote the importance of stream monitoring within the Town and East Roanoke County. These seminars and monitoring sessions will 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.

Measurable Goal: For Year Five reporting period, July 1, 2017 to June 30, 2018, Clean Valley Council provided 102 stream school seminars/programs at various locations with 1583 in attendance in the Valley.

TMDL Consistency: Stream school activity allows citizens to have an understanding of the many factors that can affect the life in a stream. The effects of pet waste, stream bank erosion, nutrients, and agricultural runoff are discussed during the monitoring sessions as being likely contributors to degraded water quality in receiving streams (EC/FC and SED).

Evaluation and Modification: The number of seminars, monitoring events, and participating citizens show that this Stream School Seminars BMP is an effective method to educate young people and citizens and enhance the grass-roots monitoring effort throughout the Town and East Roanoke County. The Town's goal is to continue to provide stream seminars and monitoring sessions as a means to educate citizens and encourage their cooperation in regional water quality health.

Year	Number of Stream School Seminars	Attendance
2013 – 2014 (Year One)	7 (85 Valley-wide)	492 (1,941 Valley-wide)
2014 – 2015 (Year Two)	2 (7 Valley-wide, 47 Total)	52 (806 Valley-wide)
2015 – 2016 (Year Three)	9 (76 Valley-wide)	300 Youth/4 Adults (1,445 Youth/56 Adults – Valley-wide)
2016 – 2017 (Year Four)	13 (15 Valley-wide, 28 total)	308 youth/ 8 adult (466 youth/237 adult Valley-wide)
2017-2018 (Year Five)	7 (102 total)	165 yth/8 adt (1583 yth/102 adt totl)

BMP 1-4. Stormwater Educational Programs and Activities

Clean Valley Council (CVC) educators under the direction of the Town, County of Roanoke, and City of Roanoke, have been and will continue developing and providing programs addressing stormwater quality issues at public and private schools, and environmental events. Town residents are served by Roanoke County Public School in addition to a number of private and parochial schools. Additionally, the Western Virginia Water Authority has also developed outreach programs for elementary, middle, and high schools in the Roanoke Valley. Stormwater educational giveaways such as pencils, stormwater chip clips, stormwater pamphlets, lanyards, rain gauges and funnel with stormwater messages were also given to the students that participated in these programs. In conjunction with these school programs, the CVC also holds an annual Earth Summit in November, in which select seniors and juniors from area high schools attend environmental workshops and lectures. The Town believes that this program is successful in teaching school children about stormwater issues and the benefits of healthy water bodies.

Goal: The Town will continue to work with CVC, County of Roanoke, and City of Roanoke, in developing and providing programs addressing stormwater and related water quality issues. Different programs will target appropriate grade levels and will be SOL correlated.

Measurable Goal: For year five, CVC has continued to provide stormwater education programs to public/private school age children and the general public at environmental events. 545 education programs were held in Valley-wide, with 12,346 students between Kindergarten and Grade 12, and 852 adults/teachers were reached. The **163** educational programs given within the Roanoke County Vinton District schools reached **3,732** students between Kindergarten and Grade 12, and **221** adults/teachers.

TMDL Consistency: The educational programs that have been and continued to be presented target sources of bacteria/E. Coli, sediment, and/or nutrients, such as "Indoor and Outdoor Stream Schools", "Soil Who Need It", "The Water Game", "Drains to Rivers", "Who Polluted the River", "Groundwater", (EC/FC, Nutrients), "Watershed to Oceans", "Oceans of Trash", "All About Natural Resources", "Green Game", "Land Use", "Lorax", "Environmental Science", "Think Earth", and Stormdrain Stenciling.– (EC/FC, SED, and Nutrients).

Evaluation and Modification: The number of school programs and students reached shows that the stormwater educational programs are an effective method to address stormwater and related water quality issues in the school system. The Town will continue to provide the funding to CVC for these educational programs that are grade levels appropriate and SOL applicable. The educational programs will continue to be evaluated and new program may be incorporated to address new issues that impact the community.

Year	Number of Stormwater Educational Programs	Students/Teachers Reached
2013 – 2014 (Year One)	135(379 – Valley-wide)	3,410 (9,650 – Valley-wide)
2014 – 2015 (Year Two)	28 (314 – Valley-wide)	701 (7,229- Valley-wide)
2015 – 2016 (Year Three)	33 (338 Valley-wide)	717 (7,604 Valley-wide)
2016 – 2017 (Year Four)	41 (64 Valley-wide)	1167 (1485 Valley-wide)
2017-2018 (Year Five)	37 Vinton (545 Valley-wide)	897 youth/42 adult Vinton (12,346 youth/852 adult Valley-wide)

BMP 1-5. Stormwater Public Awareness Programs

The Town of Vinton, City of Roanoke, and Roanoke County have partnered with Roanoke Valley Television (RVTV) Channel 3 and Clean Valley Council (CVC) in the development of a Stormwater Public Awareness Program including the distribution of stormwater merchandise, public service announcements, and other high visibility educational media to utilize social mass marketing methods to bring stormwater quality issues to the attention of the Town's and Roanoke Valley's citizens.

The Town has combined the promotional merchandise BMP with the public service announcement BMP to create a Public Awareness Program that will incorporate the distribution of stormwater merchandise, the creation of public service announcements, and working with local TV news networks to cover stormwater issues in the news media, as well as other high-visibility educational media to bring stormwater quality issues to the attention of Town citizens.

Goal: The Town, in conjunction with Roanoke County, City of Roanoke, and CVC, will develop a stormwater public awareness program that includes stormwater public service announcements (PSAs); distribution of stormwater merchandise, flyers, fact sheets, and other educational media to promote the importance of stormwater quality to the citizens.

Measurable Goal: The Town and CVC distributed bookmarks, lanyards, litter bags, pencils, funnels, chip clips, brochures, T-shirts, coloring books, stickers, tattoos, crayons, and magnets with stormwater message to promote the importance of protecting the water quality of our local waterways.

The Vinton Messenger, local main street newspaper published a five-series of stormwater management articles pertaining to the Municipal Separate Storm Sewer System (MS4) Permit program requirements; Virginia Stormwater Management Program (VSMP); Total Maximum Daily Loads (TMDLs) Action Plans; and three identified water quality issues; bacteria, sediments, and nutrients that have to be addressed by the Roanoke Valley Governments, specifically the Town of Vinton and Roanoke County. The articles were published on the following dates. Additionally, these articles were also posted on the Town's social media.

1. Stormwater Management and You, Part 1 – July 23, 2015.
2. Stormwater Management and You, Part 2 – July 30, 2015.
3. Stormwater Management, You and Your Pet, Part 3 – August 6, 2015.
4. Stormwater Management and Your Lawn, Part 4 – September 10, 2015.
5. Stormwater Management and You, Illicit Discharge, Part 5 – September 17, 2015.

Other public awareness/marketing outreach programs through the years were:

1. Rain Barrel, Lawn Care, and Car Wash PSAs that were produced in June 2015 by Roanoke Valley Television (RVTV)has and continued to be promoted by RVTV Channel 3 Station, Town's website, RVTV and Town social media/Facebooks – EC/FC, SED, Nutrients.
2. July 2015 – Scoop the Poop PSA was produced RVTV. The PSA has and continued to be promoted by RVTV Channel 3 Station, Town's website, RVTV and Town social media/Facebooks – EC/FC.
3. July 2015 – Oil and Grease PSA was produced RVTV. The PSA has and continued to be promoted by RVTV Channel 3 Station, Town's website, RVTV and Town social media/Facebook.

4. July 5, 2015 –Outreach and Information Booth at Explore Park: 35 attendees and 40 stormwater educational merchandise – EC/FC, SED, Nutrients
5. September 4, 2015 – Outreach and Information Booth, and Documentary Screening at Taubman Museum: 50 attendees – EC/FC, SED, Nutrients.
6. September 16, 2015 – Radical Reels Outdoor Activity and Living Expo/Outreach and Information Booth at Jefferson Center: 900 attendees.
7. October 10, 2015 – Vinton Fall Festival/Outreach and Information Booth: >700 attendees and 173 stormwater educational merchandise – EC/FC, SED, Nutrients.
8. October 16, October 17, and October 18, 2015 – GoFest Event/Outreach and Information Booth at Rivers Edge: 845 attendees and 665 stormwater educational merchandise – EC/FC, SED, Nutrients.
9. February 6, 2016 – Tons of Fun at Tanglewood Mall: Indoor Stream School, Stormwater Outreach and Information Booth: 900 attendees and 872 stormwater educational merchandise – EC/FC, SED, Nutrients.
10. March 22, 2016 – Senior Expo/Outreach and Information Booth at the Vinton War Memorial: > 600 attendees and 311 stormwater educational merchandise – EC/FC, SED, Nutrients.
11. April 22, 2016 – Paddle Fest/Paddling Film Festival at Hollins University: 150 attendees and 40 stormwater educational merchandise – EC/FC, SED, Nutrients.
12. April 23, 2016 – Earth Day Event at Rivers Edge/General Outreach and Information Booth: 1,200 attendees and 120 stormwater educational merchandise – EC/FC, SED.
13. April 30, 2016 – Vinton Dogwood Festival Event/Outreach and Information Booth: >500 attendees and 176 stormwater educational merchandise – EC/FC, SED, Nutrients.

Other public awareness/marketing outreach programs this year were:

1. September 11, 2016 – Radical Reels Outdoor Activity and Living Expo/Outreach and Information Booth at Jefferson Center: 450 attendees and 95 stormwater educational merchandise
2. October 10, 2015 – Vinton Fall Festival/Outreach and Information Booth: 500 attendees and 70 stormwater educational merchandise – EC/FC, SED, Nutrients.
3. October 14 - 16, 2016 – GoFest Event/Outreach and Information Booth at Rivers Edge: 5000 attendees and 900 stormwater educational merchandise – EC/FC, SED, Nutrients.
4. February 7, 2017 – Tons of Fun at Tanglewood Mall: Indoor Stream School, Stormwater Outreach and Information Booth: 1200 attendees and 150 stormwater educational merchandise – EC/FC, SED, Nutrients.

To supplement this effort, the Town’s website continue to post the 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 in stormwater. The five videos of varying run times, are designed to be used in specific medium/media and/or to reach a specific audience have been posted since June 2015. These videos can also be viewed in Spanish.

Additionally, Roanoke County, in conjunction with RVTv3, developed a Public Service Announcement (PSA) entitled “Granny Says” to share information with the public as part of its stormwater public awareness/education program. This PSA primarily focuses on illicit discharges, encouraging folks to “do the right things,” such as not littering, picking up after pets, bagging leaves and grass clippings, and pouring nothing down the storm drain. As with the County’s earlier PSAs, the overarching goal was to address the

three high priority water quality issues: bacteria, nutrients, and sediments. The Town's website provides a link to this PSA.

TMDL Consistency: The thousand pieces of stormwater promotional merchandise that were given out at special events and public buildings have reminder slogan on them to be conscious of day to day activities such as picking up after their pets (EC/FC) and filling bare spots or leaving riparian buffer on the stream banks to prevent erosion (SED).The Stormwater Public Service Announcements (PSAs) that were developed and posted, and the posted stormwater video programs incorporate the applicable TMDLs (EC/FC and SED) and the three high-priority water quality issues, the excess of sediment, bacteria, and nutrients.

Evaluation and Modification: The Town in cooperation with Roanoke County, RVTV, and CVC distributed a variety of media bringing stormwater quality issues to the attention of the public through merchandise and informational sessions. The Town finds this BMP to be effective and intends to continue to publicize the stormwater message through a variety of media sources to continue to meet the goals of the Town's permit.

Beginning the reporting period of July 1, 2014 to June 30, 2015, to better align with the MS4 permit requirements, this BMP has continued to focus on three high-priority water quality issues (excess bacteria, sediment, and nutrients) that contribute to the discharge and degradation of stormwater. Relevant messages and outreach materials that target these issues and the audiences likely to have the most impact on minimizing them have been and continued to be developed. The BMP focuses on (1) ways to increase the target audience's knowledge about ways 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 developed materials include public service announcements, printed brochures and newsletters, signage at select locations, radio advertisements, television advertisements, and use of websites and social media. The Town will track the number and types of materials that are distributed and posted on websites/social media and the size of audiences exposed to such materials, as appropriate.

Year	Media/Merchandise Distributed	Type/Sources of Media/Merchandise
2013 – 2014 (Year One)	4,719 (Valley-wide)	Students & general public merchandise; interviews/segments on radio and TV stations; and newspaper articles.
2014 – 2015 (Year Two)	- 1,473 (Valley-wide)	- Chip clips, pamphlets, bookmarks, magnets, funnel, rain gauge; rain barrel pamphlets. - Car Washing, Restaurant/Homeowners, Lawn Care, and Rain Barrel PSAs; Educational Videos. - PSAs & Stormwater Education Videos
2015 – 2016 (Year Three)	958 (7,052: Valley-wide)	- Pencils, lanyards, rain gauges, funnels, chip clips, bookmarks, magnets. - Car Washing, Restaurant/Oil/Grease, Lawn Care, Rain Barrel, Scoop the Poop, PSAs; and educational videos. - PSAs & Stormwater Education Videos

2016 – 2017 (Year Four)	7,150 (Valley-wide)	<ul style="list-style-type: none"> - Pencils, lanyards, rain gauges, funnels, chip clips, magnets. - Car Washing, Restaurant/Oil/Grease, Lawn Care, Rain Barrel, Scoop the Poop - PSAs & Stormwater Education Videos
2017-2018 (Year Five)	3,772 Valley-wide	<ul style="list-style-type: none"> - Bookmarks, lanyards, pencils, funnels, chip clips, brochures, T-shirts, coloring books, stickers, crayons, and magnets - PSAs & Stormwater Education Videos

BMP 1-6. Town of Vinton Webpage of Town’s Stormwater Management Program

Goal: The Town will continue to maintain and monitor the Town’s Stormwater webpage (<http://www.vintonva.gov/index.aspx?NID=209>), where citizens and visitors can obtain information concerning the Town’s Stormwater Management Program; Illicit Discharge Reporting Form, Public Outreach and Education; Publications & Resources; Quick facts; Rain Barrels; Stormwater Agency Links; Stormwater Public Education Videos; and VSMP General Permit. Additionally, the Town’s website calendar and Facebook also inform citizens of regional clean-up events, drug take-back event, household hazardous waste and E-Cycling collection events, and other local water quality educational programs, in addition of having the capability of receiving citizens’ requests and/or complaints on stormwater issues.

Measurable Goal: The Town was able to maintain and monitor the Town’s stormwater webpage beginning November 2010, in addition of having the capability of receiving citizens’ requests and/or complaints on stormwater issues. The stormwater website is continued to be updated to meet current needs of the stormwater program – EC/FC, SED, Nutrients.

TMDL Consistency: The Town’s stormwater webpage, website and Facebook posting inform and educate the general public, citizens, and visitors the overall pollution problem (EC/FC, SED) and how a citizen can prevent nonpoint source pollution through the pamphlets, brochures, flyers, PSAs. Additionally, the illicit discharge reporting form that can accessed from the Town’s stormwater webpage and/or the request tracker that can be accessed from the Town’s website are capable of receiving citizens’ requests and/or complaints on stormwater issues.

Evaluation and Modification: The Town continues to maintain, evaluate and design the stormwater webpage to make it easier to find frequently requested items and make this BMP a more effective method of information distribution and outreach.

Year	Webpage Views
2013 – 2014 (Year One)	154
2014 – 2015 (Year Two)	201
2015 – 2016 (Year Three)	138
2016 – 2017 (Year Four)	389
2017 - 2018 (Year Five)	101

BMP 1-7. Targeted Education Program

*** This BMP is a joint project with the County of Roanoke. The annual mailing and/or distribution of the educational materials for this targeted education program by the County of Roanoke included the Town of Vinton households, businesses, and contractors involved in land-disturbing activities.**

Goal: The goal of this BMP is to develop a stormwater quality education program for specific target audiences, as shown in Table 13 below. This BMP will provide information to these audiences in an effort to increase awareness of the impact of illicit discharges into the Town's storm sewer system from activities around the home or in connection with various business operations, and it is focused on the aforementioned three high-priority water quality issues: sediment, bacteria, and nutrients. The program is directed toward residents and certain groups of commercial, industrial, and institutional organizations that are most likely to have significant impacts to local stormwater quality. County of Roanoke included the Town's household and business owners when they do their annual mailing of these education mailers.

Measurable Goal: The County of Roanoke distributed previously revised postcards to two targeted audiences in the County and Town: auto car wash/detailing operations and restaurants in the County and Town of Vinton. These business types were chosen because car washing operations can have an adverse impact on local water quality through direct discharges of polluted wash waters; restaurants often rinse greasy range hoods and kitchen mats into the storm drainage system. In addition, a new brochure was also developed, Fact Sheet, and a poster to target certain audiences. As mentioned in BMP 1-5, the County, in conjunction with RVTV, developed a new Public Service Announcement (PSA) [along with a complementary poster] entitled "Granny Says" to share information with the public as part of its stormwater public awareness/ education program. This PSA primarily focuses on illicit discharges, encouraging folks to "do the right things," such as not littering, picking up after pets, bagging leaves and grass clippings, and pouring nothing down the storm drain. As with the earlier PSAs, the overarching goal was to address the three high priority water quality issues: bacteria, nutrients, and sediments. Please see the following Table 4, 4-A, 4-B, 4-C, and 4-D.

TMDL Consistency: The car wash postcard targets local businesses that may have uncontrolled discharges from vehicle washing operations, which could increase sediment discharges into local receiving waters. Therefore, these postcards address the TMDL for sediment (SED). Similarly, the restaurant postcard addresses rinsing of kitchen equipment and accessories, which may contribute bacteria to receiving waters. Thus, the restaurant postcard helps address the Town's TMDL for bacteria (EC/FC). The materials developed exclusively by the County/Town also address the TMDLs, as shown in the table.

Evaluation and Modification: Town Staff received phone calls following the mail-out of the various materials by the County. Additionally, according to Roanoke County Staff, they received numerous calls from local veterinary offices requesting additional copies of the "Poop Fairy" posters and brochures; also, several residents called to thank the County for the annual newsletter. The County and Town believe this program is an effective BMP to raise awareness about the impact of illicit discharges into the County's storm sewer system.

High-Priority Water Quality Issue	Target Audiences	Means to Determine Audience Size	Estimated Audience Size	Overall Messages	Means to Deliver Messages	Rationale
#1 Sediment	Car Washing/Detail Facilities	Business Licenses/Google	7	<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 Town's MS4.
	Car Dealers	Business Licenses/Google	2	<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 Town's MS4, which drains, untreated, to local streams. Residential car washing is specifically allowed; but, it still may contribute significant sediment if wash water is not properly handled.
	Auto Body Shops	Business Licenses/Google	3	<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	3,500	<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"> Publication sent annually to ROCCO/TOV homeowners PSAs on local cable station Handouts at local environmental events, 4 per year minimum 	
	Contractors Involved in Land-Disturbing Activities	Business Licenses	19	<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 	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	Estimated Audience Size	Overall Messages	Means to Deliver Messages	Rationale
Bacteria #2	Restaurants	Business Licenses/ Yellow Pages	31	<ul style="list-style-type: none"> Excessive bacteria hinder stream usage and contribute 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 wastewater. 	<ul style="list-style-type: none"> Mailer, annually PSAs on local cable station 	Uncovered dumpsters containing garbage and dumpsters and greasy floor mats that are rinsed out onto the pavement can contribute bacteria to our MS4, which discharges directly to our streams.
	Pet Owners (dogs/cats)	Pet Licenses	393	<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"> Publication sent annually to ROCCO & TOV Homeowners PSAs on local cable station 	Dog waste is a major source of bacteria in our streams.
	Veterinarian Offices	Business Licenses/ Yellow Pages	2	<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"> Brochures placed in Veterinarian offices, annually PSAs on local cable station 	Dog waste is a major source of bacteria in our streams.
	Pet Stores/Pet Boarding/ Grooming	Business Licenses/ Yellow Pages	3	<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"> Brochures placed in pet stores, annually PSAs on local cable station 	Dog waste is a major source of bacteria in our streams.
	Town Police and Firemen; Animal Control Officer	Town Records	30	<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"> In-house training 	Dog waste is a major source of bacteria in our streams; these County employees own or handle dogs as part of their work.

Table 4-A. Targeted Education Program: Sediment, Bacteria, and Nutrients

High-Priority Water Quality Issue	Target Audiences	Means to Determine Audience Size	Estimated Audience Size	Overall Messages	Means to Deliver Messages	Rationale
#3 NUTRIENTS	Homeowners	Tax Records	3,500	<ul style="list-style-type: none"> How 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 ROCOT/OV HO PSAs on local cable station 	Excessive nutrients are carried off lawns and other managed turf areas to the County's MS4 and then to local streams; this leads to algae overgrowth in the streams, which adversely impacts fish and other marine life.
	Nurseries/ Greenhouses	Business Licenses/ Yellow Pages	1	<ul style="list-style-type: none"> How 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	9	<ul style="list-style-type: none"> How 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 4-B. New and Previously-Developed Print Materials to Address Specific TMDLs (# - new for 2017-2018)

Type	Name	TMDLs Addressed
Poster	"There's No Such Thing as the Poop Fairy"	Bacteria
	"Who Left the Dogs' Poop?"	Bacteria
	# "Pups Poop, People Scoop. Do it!"	Bacteria
Newsletter	"Granny Says. . ."	Bacteria, Sediment, PCBs, and more
	# "Clean Stormwater Makes for Happy Kids"	Bacteria, Sediment, PCBs, and more
	# "A Stormwater Guide for Homeowners" May 2018	Bacteria, Sediment, PCBs, and more
	# "It's Just Dirt, A newsletter for contractors" May 2018	Sediment, PCBs, Minimum ESC Standards
Brochure	"It's Just Dirt"	Sediment
	Stormwater Best Management Practices for Proper Pet Waste Disposal	Bacteria
	"Stormwater Best Management Practices for Restaurants"	Bacteria
Fact Sheet	"Reduce, Reuse, Recycle and Properly Dispose of Hazardous Household Wastes"	Bacteria, Sediment, PCBs, and more
	"Illicit Discharge Facts"	Bacteria, Sediment, PCBs, and more
	"Facts for Plumbers"	Bacteria, Sediment, PCBs, and more
	"Facts for Landscapers"	Bacteria, Sediment, PCBs, and more
	"Fall Foliage Facts"	Sediment
Fact Sheet	"Fact Sheet for Mosquito Control"	Bacteria, Sediment, and more
	"Tips for Homeowners - Stormwater Best Practices"	None - published as a Public Health issue Bacteria, Sediment

TABLE 4-C. Program Materials and Targeted Audiences for BMP 1-7

Target Audience	Product Type	Delivery Method	# of Recipients	Nature of Message
Restaurants	Letter and Brochure	Mailed	31	Stormwater Management BMPs for Restaurants; MS4 permit requirements.
	Postcard	Mailed	31	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.	Postcard	Mailed	17	Wash water carries sediment, oil, and heavy metals to receiving waters.
Vets, Groomers, Pet Daycare and Boarding, etc.	Letter, Brochure, and Poster (TOV only)	Mailed	5	Pet waste pollutes receiving streams; owners are encouraged to pick up after their pets.
Landscaping Professionals	Letter and Fact Sheet (TOV only)	Mailed	10	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 of Illicit Discharge Ordinance	Fact Sheet(s) applicable to the discharge	Mailed at time of violation	5 (TOV & ROCO)	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 on the Counter	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 Projects	Brochure	Distributed with Permits	159 (ROCO & TOV)	"It's Just Dirt" – brochure describes the harm to receiving waters from excess sediment from construction sites, explains permit requirements, provides techniques to "keep dirt on the project."
	Newsletter	Mailed	111 (ROCO & TOV)	
Residents	Brochure	Provided in Lobby; sent to schools; mailed with Illicit Discharge notices	>30 (ROCO & TOV)	"Reduce, Reuse, Recycle and properly dispose of hazardous household wastes" brochure.
Residences	Newsletter	Mailed	39,509 (ROCO & TOV)	VSMP Program; proper methods for yard management, car washing, and disposal of hazardous household wastes; reasons to pick up pet waste; avoiding illicit discharges to the MS4.

Table 4-D. Summary of Targeted Mailings and % Reach in Roanoke County & Town of Vinton

Annual Period	Type of Educational Material	Target Group	# Sent /Total # in Target Group	% of Target Audience Reached
2013 - 2014 (YEAR 1)	Car Wash Postcard	Businesses with Car Washes	107 / 107	100%
	Restaurant Postcard	Restaurants	115 / 115	100%
	MS4 Permit Brochure for Businesses	All Town Businesses	1,209 / 1,209	100%
2014 - 2015 (YEAR 2)	Car Wash Postcard	Businesses with Car Washes	196 / 196	100%
	It's Just Dirt Brochure	Land-disturbing Contractors	12 / 51	23.5%
	Stormwater Newsletter	Residences	32,599 / 32,599	100%
	Restaurant Postcard + Brochure	Restaurants	125 / 125	100%
	Landscaping Fact Sheet	Professional Landscapers, Nurseries, Greenhouses	88 / 88	100%
	Pet Waste Poster + Brochure	Veterinarians, Groomers, Stables, Pet Daycare, Pet Boarding, etc.	34 / 34	100%
2015 - 2016 (YEAR 3)	Car Wash Postcard	Businesses with Car Washes	103 / 103	100%
	Restaurant Postcard, Letter, and Brochure	Restaurants	127 / 127	100%
	It's Just Dirt Brochure	Land-disturbing Contractors	162 / 97*	>100%
	Stormwater Newsletter	Residences	32,493	100%
	Landscaping Fact Sheet	Professional Landscapers, Nurseries, Greenhouses	117	100%
	Pet Waste Poster, Letter, and Brochure	Veterinarians, Groomers, Stables, Pet Daycare, Pet Boarding, etc.	34	100%
	"Tips for Homeowners - Stormwater Best Practices"	Residential lots using individual stormwater control measures without maintenance agreements	66 / 66 (32 new this year)	100%
2016 - 2017 (YEAR 4)	Car Wash Postcard and Letter	Businesses with Car Washes	78/78	100%
	Restaurant Postcard, Letter, and Brochure	Restaurants	76/76	100%
	It's Just Dirt Newsletter	Land-disturbing Contractors	187/187	>100%
	It's Just Dirt Brochure	Land-disturbing Contractors	162 / 32**	>100%
	Pool Maintenance Facts & Illicit Discharge factsheet	Residences having a pool and pool related businesses	1,551	100%
	Storm Drain Fact Sheet for Landscapers	Professional Landscapers, Nurseries, Greenhouses	106/106	100%
	Pet Waste Poster, Letter, and Brochure "Who Left the Poop"	Veterinarians, Groomers, Stables, Pet Daycare, Pet Boarding, etc.	50/50	100%
	"Tips for Homeowners - Stormwater Best Practices"	Residential lots using individual stormwater control measures without maintenance agreements	66 / 66 (No new ones this Permit year)	100%

2016 - 2017 (YEAR 4)	Car Wash Postcard and Letter	Businesses with Car Washes	92 / 92	100%
	Restaurant Postcard, Letter, and Brochure	Restaurants	80 / 80	100%
	It's Just Dirt Newsletter	Land-disturbing Contractors	111 / 111	100%
	It's Just Dirt Brochure	Land-disturbing Contractors	159 / 111	>100%
	Pool Maintenance Facts & Illicit Discharge factsheet	Residences having a pool and pool related businesses	1,551	100%
	Storm Drain Fact Sheet for Landscapers	Professional Landscapers, Nurseries, Greenhouses	106/106	100%
	Pet Waste Poster, Letter, and Brochure "Who Left the Poop"	Veterinarians, Groomers, Stables, Pet Daycare, Pet Boarding, etc.	50/50	100%
	"Tips for Homeowners - Stormwater Best Practices"	Residential lots using individual stormwater control measures without maintenance agreements	21 /21	100%

* Total # of RLDs entered into County's LDO tracking system since July 1, 2015; each RLD may obtain multiple permits

** Total # of RLDs entered into County's LDO tracking system since July 1, 2016; each RLD may obtain multiple permits

MCM 2:PUBLIC PARTICIPATION AND INVOLVEMENT

The Town of Vinton in conjunction with Roanoke County, City of Roanoke, Clean Valley Council (CVC), Inc., Roanoke Valley Resource Authority (RVRA), and Upper Roanoke and River Roundtable (URRR) Committee will continue to have the community involved with clean-up projects along local streams and riparian corridors through the annual Spring Clean Valley Day and Fall Waterways Clean-up.

This control measure is intended to implement programs that help inform and educate Town citizens about the components of the stormwater management program. Support from citizens is crucial for the success of the stormwater management plan. To get the citizens' support, the Town has and will continue to coordinate several programs to engage citizens' interest in stormwater high-priority water quality issues of excess in sediment, bacteria, and nutrients, as listed:

BMP 2-1. A Storm Drain Marking Program

Coordinate a storm drain marking program with area schools, organizations, and businesses to engage group involvement and educate people about the consequences of dumping waste into the storm drain system.

BMP 2-2. Cleanup and Environmental Events to Bring Attention to Current Stormwater Issues

Conduct public events to bring attention to current stormwater issues and allow feedback from citizens on the condition of the Town's Stormwater Management Program, from a citizen's point of view. The 2013 General Permit increased this requirement from 1 event per year to 4 events per year.

BMP 2-3. Staff and Citizens Representatives in Regional Environmental Organizations

Staff and/or Town citizens serve on the regional organizations such as Roanoke Valley Alleghany Regional Commission (RVARC), Clean Valley Council (CVC), Inc., Roanoke Valley Greenway Commission, Roanoke Valley Urban Forestry Council (RVUFC), Roanoke Valley Resource Authority (RVRA), and Western Virginia Water Authority (WVWA).

BMP 2-4. Post Town's VSMP MS4s General Permit Registration Statement and Annual Report on the Town's website for Citizen Access

Posting of the Town's VSMP Municipal Separate Storm Sewer Systems (MS4s) General Permit and Annual Report on the Town's website which citizens may view and comment upon.

Included in this document is a detailed description of the objective and Measurable Goal of each BMP, the strategies to ensure consistency with identified TMDL's and the three identified high-priority water quality issues, the status of the Town's compliance with each BMP, and an evaluation of the BMP and any proposed modifications needed to better achieve the goals of the stormwater program. The TMDL compliance is broken down by the identified impairment type: E. coli, fecal coliform (EC/FC) and sediment (SED).

BMP 2-1. A Storm Drain Marking Program

Goal: The Town, in conjunction with CVC, will coordinate a storm drain marking program with local schools, neighborhoods, businesses, and other organizations, to stencil messages on storm drains that educate people about the consequences of dumping waste into the storm drain system.

Measurable Goal: Four volunteers stenciled 38 storm drains located along South Pollard Street, Washington Ave, Cleveland Avenue, Maple Street, Blair Street, Lee Avenue, Jackson Avenue, Walnut Avenue, Gus Nicks Boulevard, and 1st Street on June 6, 2017.

TMDL Consistency: The storm drain marking program is an outreach method to inform and remind citizens that what goes into the storm drain goes directly to local creeks and streams. The stenciling activity and message will make the citizens understand that the storm drains are not treated by the sanitary sewer, therefore they will be less likely to allow pet waste, other non-stormwater waste, illicit discharges to enter the storm drain through the road-side inlets (EC/FC, SED).

Evaluation and Modification: The Town finds this BMP to be an effective method of getting citizens informed on the stormwater issues and illicit discharges. The Town proposes to continue with this BMP and will continue to coordinate this program with Clean Valley Council. The Town will continue to document the marking of the storm drains as an effort to enhance the education and outreach of its stormwater management program.

Year	Storm Drains Stenciled	Number of Participants
2013 – 2014 (Year One)	58	3
2014 – 2015 (Year Two)	37	4
2015 – 2016 (Year Three)	30	5
2016 – 2017 (Year Four)	38	4
2017 - 2018 (Year Five)	15	4

BMP 2-2. Clean-up and Environmental Events

Town Staff continues to be involved in the coordination of regional clean-up and environmental events such as the annual Clean Valley Day in spring and Fall Waterways Cleanup Events; Prescription Drug Take-back Program; Earth Day; Earth Summit; Go Fest; Riverfest; and public forums on environmental issues related to water quality and impaired water bodies.

The Town coordinated with CVC, Roanoke County, and City of Roanoke to conduct public forums in conjunction of the Fall Waterways Cleanup Event, describing what the three localities (Town, City, and County) were doing concerning stormwater management issues. The forums allowed for input and concerns to be received on stormwater issues. After evaluating the success, these three Valley governments believe that combining the forum with a stormwater and/or other environmental events would improve the effectiveness of the BMP by increasing public attendance.

A prescription drug drop-off box was placed in the Vinton Police Department in April 2018 as a location to dispose of prescription drugs. This box is available during business hours year round so that citizens can drop off unused prescription drugs at times other than the publicized Drug Take-back events.

The Town will continue to publicize its curbside recycling program in its efforts to increase awareness about the importance of recycling. The Town will continue its participation in the annual spring Clean Valley Day,

Annual Fall Waterways Clean-up, and Drug Take-back events, and Earth Day. Town staff and Town-appointed citizens are also board members of the CVC, RVTV, RVRA, Roanoke Valley Greenway Commission, WVWA, and Roanoke Valley Alleghany Regional Commission (RVARC), which enables special environmental events and projects to be done regionally to reduce costs and reach a wider audience.

Goal: The Town to continue to participate in the clean-up and environmental events to address stormwater issues including impairment to the water bodies. The Town will continue to have Town residents and/or personnel to serve as board members on regional organizations.

Measurable Goal: On Saturday, October 6, 2017, Town of Vinton along with other jurisdictions in Roanoke Valley, CVC, and area businesses participated in the Fall Waterways Cleanup Event. Gloves and trash bags were provided to the 586 volunteers to use in collecting litter. T-shirts, Safety Kits, and information packets were given to the participants of the clean-up event. Packets included information on Roanoke River Keepers and Citizens Guide to Understanding Stormwater brochures. – EC/FC, SED, Nutrients.

On October 13 - 15, 2017, CVC set-up an outreach and information booth at Go Fest, a valley-wide event created for families to appreciate and enjoy a wide variety of outdoor activities, lively presentations, and environmental education events. Our booth shared environmental education for all ages with the green game and stream schools each day. There were 36,000 attendees to the event, and our giveaways included pencils, lanyards, funnels, chip clips, stickers, and Citizens Guide to Understanding Stormwater brochures. – EC/FC, SED, Nutrients.

Earth Summit, sponsored by Clean Valley Council (CVC), which took place on November 9, 2017, is a day-long event designed to give high school students from around the Roanoke Valley the chance to explore and understand current environmental topics. 70 participants, 10th-12th-grade public & private school students in Botetourt County, City of Roanoke, City of Salem, County of Roanoke and the Town of Vinton, received lanyards and T-shirts. - SED.

On Saturday, April 7, 2018, the annual spring Clean Valley Day was held in the Roanoke Valley. Gloves and trash bags were provided to the volunteers to use in collecting litter. Giveaways to the 935 participants included T-shirts, Safety Kits, and information on Roanoke River Keepers (brochure), Citizens Guide to Understanding Stormwater (brochure), and Recycling (brochure). – EC/FC, SED, Nutrients.

On Saturday, April 21, 2018, more than a dozen members of the Vinton Town Council, leadership team, and family members picked up trash and tires along Hardy Road, Clearview Drive, Washington Avenue, Bypass Road, Mountain View Road, and former site of the recycling drop-off center at Lake Drive Plaza.

The Town's 2018 Arbor Day Celebration was held on Wednesday, April 18, 2018, at the Charles R. Hill Senior Center, at the Vinton War Memorial complex. The Vinton Senior Citizen Program, and Thrasher Memorial UMC Preschool attended the ceremonial tree planting.

CVC presented the 4th annual Roanoke Riverfest on June 30, 2018, along the Roanoke River in Smith Park, with participation from Roanoke City and Vinton. The event featured the Recycled Regatta, a race for boats made only of recycled materials, and the Great Duck Race. Included was the message for river advocacy and watershed education activities for kids and adults. T-shirts, stickers, and brochures were distributed to the estimated 500 in attendance. – EC/FC, SED, Nutrients.

TMDL Consistency: At least four times a year, the Town is involved in one or more public events to promote the Town and celebrate Roanoke Valley's citizens' commitment to regional water quality. In addition to litter, debris, and hazardous waste; excess of pet waste (EC/FC), erosion (SED) of stream banks, and nutrients are common themes at each of these events since these are regional three high-priority water quality issues (EC/FC, SED, and Nutrients).

Evaluation and Modification: The Town finds this BMP to be an effective method in involving citizens in addressing to address stormwater issues based on the citizens' involvement and attendance in these events.

Year	Environmental/Clean-up Events	Participants/Attendees
2013 – 2014 (Year One)	15 Regional/Local Events	>25,000
2014 – 2015 (Year Two)	12 Regional/Local Events	>20,000
2015 – 2016 (Year Three)	12 Regional/Local Events	> 25,000
2016 – 2017 (Year Four)	4 Regional/Local Events	>15,000
2017 - 2018 (Year Five)	5 Regional/Local Events	>38,000

BMP 2-3. Post MS4s General Permit and Report on Website for Citizens' Access

The Town continues to post the Town's Municipal Separate Storm Sewer Systems (MS4) Program documents on the Town's website which citizens may view and comment upon. This form of public viewing will allow Town citizens to become knowledgeable about the goals of the program and have information with which to comment on existing issues and influence changes in future programs. Each annual report as required will be posted on the website to keep citizens current on annual evaluations of the program's effectiveness and any proposed changes to the stormwater program.

Goal: The Town will continue to post the MS4 permit application and each subsequent annual report submitted to Department of Environmental and Quality (DEQ). Each annual report will be posted on the Town's website to keep citizens current on annual evaluations of program effectiveness.

Measurable Goal: The Town will continue to post on the stormwater website the Town of Vinton 2013-2018 VSMP General Registration Permit Statement, Town of Vinton MS4 Program Plan, March 28, 2013, and the MS4 annual reports. Additionally, the hard copies of these documents are also made available in the office of the Department of Planning and Zoning, and Public Works Department for review. No comments were received from the citizens regarding the Program Plan or the annual reports posted.

TMDL Consistency: Access to the MS4 Program Plan and Annual Reports gives Town of Vinton citizens a good education about all of the local streams and rivers, their impairments, and any approved TMDLs. In addition, the program plan and annual report detail the Town's and regional efforts to address these issues locally and regionally. This BMP helps to inform citizens on ways to get involved with current water quality issues, the three identified high-priority water quality issues, and on available outreach programs, with the goal of helping them to minimize any impacts that they may have on local water quality. (EC/FC, SED)

Evaluation and Modification: No modifications are planned for this BMP. The Town of Vinton believes that the Town's website and the stormwater webpage allow the Town citizens to be informed and stay current on the Town's VSMP and MS4 general permit program-related documents. The Town has and will continue to post the MS4 permit application and each subsequent annual report submitted to Department of Environmental Quality (DEQ). The permit information will be posted no more than 30 days after the Town receives permit approval and coverage from DEQ. Each annual report will be posted to the website no more than 30 days after annual renewal date. Any appropriate correspondence between the Town and DEQ will also be posted on the website for the public to view.

MCM 3:ILLICIT DISCHARGE DETECTION AND ELIMINATION

The Town has established a program to detect and eliminate illicit discharges in the Town's storm sewer system by developing and adopting ordinances and regulations, outfalls inspections, and an enforcement program to minimize illicit discharges and to prevent illegal discharges into the storm drain system.

The goal of the illicit connection and discharge elimination plan is to inspect known stormwater outfalls to Tinker, Glade, and Wolf Creeks and the Roanoke River as identified through review of existing storm sewer maps; eliminate illicit discharges as they are identified through visual monitoring of known stormwater outfalls; and field observations to identify and verify additional stormwater outfalls that may not have been identified through review of existing storm sewer maps. The programs that have been put in place to complete this measure are:

BMP 3-1. A Town-wide Storm Sewer System Map

A town-wide storm sewer system map in the GIS Database has been completed for all known locations of municipal storm sewer systems. The Town storm sewer database will be maintained through Roanoke County GIS Division, so that a map of all the public storm sewers in the Town will be available to the public.

BMP 3-2. The Town's Illicit Discharge Ordinance

The adoption of an ordinance to prohibit illicit discharges and enforcement authority by the Vinton Town Council. Additionally, policy, procedures, reporting, and enforcement measures have been developed to minimize non stormwater discharges into the storm drainage system.

BMP 3-3. MS4 Outfall Inspections

The Town will design and implement a program to inspect a minimum of 50 storm drain outfalls, within its MS4 area, annually.

BMP 3-4. Illicit Discharge Detection and Elimination Program

The Town will prepare and implement written procedures to detect, identify, and address non-stormwater discharges to the MS4 system.

Included in this document is a detailed description of the objectives and Measurable Goal of each BMP, the strategies to ensure consistency with identified TMDLs, implementation schedules, responsible parties, and supporting documents that include policies, ordinances, schedules, inspection forms, written procedures, and other documents necessary for the implementation of the BMPs. The TMDL compliance is broken down by the identified impairment type: E. coli, fecal coliform (EC/FC) and sediment (SED).

BMP 3-1: Town of Vinton Storm Sewer System Map

Roanoke County Department of Communication/Information Technology GIS Division has been responsible for Town's mapping services and needs. Since 2003, under the direction of Town Planning and Zoning Department, the County has developed and continued to update the Town's storm drain map.

Goal: To continue working with Roanoke County GIS Division in developing and updating the storm drain map which identifies all of the municipal separate storm sewers within the Town which discharge to natural drainage ways.

Measurable Goal: The Town will continue this program by expanding and updating the storm sewer map of the Town with Roanoke County assistance. In addition to locating any new storm sewer outfalls, the stormwater map has been updated to show the current outfalls and their associated Hydrologic Unit Code (HUC) of the waters that are being discharged to, and the names and locations of all the impaired surface waters that receive discharges from these systems.

TMDL Consistency: An updated and accurate storm drain map which identifies all of the municipal separate storm sewer systems will help the Town with the discovery of illicit discharge connections (EC/FC) and the locations where sediment may be entering the regulated MS4 (SED).

Evaluation and Modification: An updated and accurate storm sewer system map which identifies all of the Town's separate storm sewer system has greatly assisted the Town in the discovery of illicit connections and the locations where sediment may be entering the regulated MS4. No modifications are planned for this BMP. Town believes that the process of mapping the storm drain by the County of Roanoke is an appropriate method to aid in the enforcement, detection, and elimination of illicit discharges to the storm sewer system.

BMP 3-2: Illicit Discharge Ordinance

Illicit discharge detection, identification, and enforcement will be addressed by Town personnel as authorized under Article 3. Illicit Discharge Division 4. Inspections and Monitoring and Division 5. Enforcement and Penalties of the Stormwater Management Ordinance adopted on May 20, 2014.

Goal: To detect and eliminate illicit discharges into the MS4 by developing and adopting regulations and an enforcement program to prevent illegal discharges into the storm drain system.

Measurable Goal: Suitable measures for effective enforcement are included in the Illicit Discharge Ordinance. The ordinance has allowed for notice of violation being sent to property owners from complaints/requests that were received by Town personnel.

TMDL Consistency: The illicit discharge ordinance has greatly assists in the enforcement of the illicit discharges to the MS4 system. This legal method has helped the Town in discontinuing existing connections and discouraging future illicit discharges to the system (EC/FC and SED).

Evaluation and Modification: No modifications are planned for this BMP. The Town believes that the adoption of this ordinance is an effective tool in the enforcement, detection, and elimination of illicit discharges to the Town's storm sewer system.

Evaluation and Modification: Due to changes in the Virginia Stormwater Law and Regulations, the Town adopted a new Stormwater Management Ordinance in 2014, to include, a new, stand-alone Illicit Discharge Ordinance.

Year	Action	Modifications
2013 - 2014 (Year 1)	New Illicit Discharge Ordinance Developed and Adopted	n/a
2014 - 2015 (Year 2)	None	None
2015 – 2016 (Year 3)	None	None
2016 – 2017 (Year 4)	None	None
2017 - 2018 (Year 5)	None	None

BMP 3-3. MS4 Outfall Inspections

The Town has a total of 71 with 35 outfalls discharging to TMDL streams of Roanoke River, Tinker Creek and Glade Creek. Currently, dry weather screenings are performed by Town staff, with cooperation from Roanoke County’s personnel, if requested, based on their scheduling cycle. Additionally, these outfalls are also inspected by the Town Public Works personnel during the regular maintenance of these outfalls.

Goal: To detect dry weather illicit discharges so that actions may be taken to eliminate illegal connection and/or discharges.

Measurable Goal: For Year Five Reporting, **51** known outfalls were inspected, with no illicit discharges identified. The selection process in each year for the chosen outfalls followed these criteria, in descending order:

- In the MS4 area
- Drains to an impaired waterway
- Within 1/10th of a mile from the nearest receiving water

TMDL Consistency: Outfall inspections can detect an illicit discharge will greatly assist in the enforcement of the illicit discharges to the MS4 system. This inspection can help the Town in discontinuing existing illegal connections and discouraging future illicit discharges to the system. Once identified, appropriate enforcement action may be taken to track the discharge back to its source and ensure the illicit discharge or illegal connection is eliminated using BMPs 3-2 and 3-4 – (EC/FC, SED, and Nutrients).

Evaluation and Modification: The Town proposes to continue with its MS4 outfall inspection program to detect dry weather illicit discharges that enter its municipal separate storm sewer systems. No modifications are planned for this BMP, as it is required by the MS4 Permit. However, inspecting outfalls for the purpose of identifying illicit discharges and illegal connections has not yet proven to be successful.

Year	# Outfalls Inspected	# of Illicit Discharges Found
2013 - 2014 (Year 1)	15	None
2014 – 2015 (Year 2)	15	None
2015 – 2016 (Year 3)	18	None
2016 – 2017 (Year 4)	35	None
2017 - 2018 (Year 5)	51	None

BMP 3-4. Illicit Discharge Program to Minimize Illicit Discharges

Goal: To detect, identify, and address non-stormwater discharges into the Town's regulated storm sewer system. The Illicit Discharge Detection and Elimination Program will have written procedures for the following components:

1. A prioritized schedule of field screening activities,
2. Minimum number of field screening activities to be performed annually,
3. Methodologies to collect general information,
4. A time frame upon which to conduct an investigation to identify and locate the source of any observed continuous or intermittent non-stormwater discharge.
5. Methodologies to determine the source of all illicit discharges.
6. Mechanisms to eliminate identified sources of illicit discharges.
7. Methods for conducting a follow-up investigation to verify that the discharge has been eliminated.
8. A mechanism to track all investigations to document the date(s) that the illicit discharge was observed and reported, results of investigation, any follow-up to the investigation, resolution of the investigation, and the date that the investigation was closed.

Measurable Goal: The Town has developed procedures to detect, address, and report illicit discharges that enter the Town's separate storm sewer system. The illicit discharge ordinance (BMP 3-2) includes procedures to address illicit discharges through enforcement process.

TMDL Consistency: An illicit discharge program will assist in locating illicit discharges to the MS4 system. This will give staff the methodology needed to screen, target and monitor the storm drain system in an effort to discover existing illegal connections to the Town’s storm drain system (EC/FC, SED).

Evaluation and Modification: No modifications are planned for this BMP. The Town believes that the illicit discharge program is a critical component in the detection and elimination of illicit discharges to the Town’s storm sewer system.

Complaints about illicit discharges can be called in to Vinton Public Works and Planning and Zoning Departments during normal business hours. Additionally, complaints/concerns can also be reported online by clicking on “Report a Concern” on the Town’s homepage or by completing the “Illicit Discharge Reporting Form” that can be accessed from the Town’s stormwater page. The Town Planning and Zoning Department keeps a record of complaints, inspections and correspondence concerning needed corrective actions to be taken concerning alleged illicit connections and discharges.

Year	# of Illicit Discharge Complaints Received	# Resolved and Closed
2013 - 2014 (Year 1)	N/A	N/A
2014 - 2015 (Year 2)	6	6
2015 - 2016 (Year 3)	6	6
2016 - 2017 (Year 4)	2	2
2017 - 2018 (Year 5)	0	0

MCM 4: CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

*** The implementation of this MCM and its associated BMPs will be the responsibility of Roanoke County Department of Community Development in conjunction with Vinton Public Works Department.**

Since February 14, 1984, the County of Roanoke has been responsible for the Erosion and Sediment Control program for the entire County area, including the Town of Vinton.

On April 5, 2016, a resolution was adopted by the Vinton Town Council for the establishment of a Memorandum of Understanding (MOU) agreement between the County of Roanoke Board of Supervisors and the Vinton Town Council for the County to continue to administer the Virginia Erosion and Sediment Control Program (VESCP) and to administer the Virginia Stormwater Management Program (VSMP) for the Town of Vinton.

The Town and County recognize that construction sites can deposit significant amounts of silt and sediment in stormwater runoff due to large areas of land disturbances. The goal of this MCM is to implement and enforce a program that will reduce pollutants in stormwater runoff to the regulated municipal separate storm sewer system from construction sites and activities. The programs that have been established by the County and supported by the Town to meet this MCM measure are listed below:

BMP 4-1. Erosion and Sediment Control Ordinance

Establish and maintain an Erosion and Sediment Control Ordinance to require erosion and sediment controls during construction activities, as well as sanctions, to ensure compliance, under local law, for all land disturbances of 2,500 square feet or more

BMP 4-2. Erosion and Sediment Control Certification

Identify County employees that require DEQ Erosion and Sediment Control training and track employees' certifications to ensure they remain current.

BMP 4-3. Erosion and Sediment Control Plan Review

Develop and maintain written procedures for site plan review which addresses construction site stormwater runoff.

BMP 4-4. Erosion and Sediment Control Inspection

Develop and maintain written procedures for site inspections to confirm that construction complies with approved plans and that construction site stormwater runoff is properly addressed.

BMP 4-5. Erosion and Sediment Control Compliance and Enforcement

Develop and maintain written procedures for compliance and enforcement when necessary to compel compliance with construction site stormwater runoff requirements.

Town Staff continues to work cooperatively with Roanoke County in the implementation of this measure including: the review and adoption of the County's ESC ordinance; notification of any land disturbance without any permit; site and subdivision plans review process; and in the issuance of any land disturbance permit in the Town Limits. Any new development, re-development, and/or addition meeting certain criteria

will require site plans be submitted for review and approval as stated in the County's and Town's codes. The site plans must be submitted to the Planning and Zoning Department and be distributed to appropriate Town and County departments/personnel for comments and review.

The Planning and Zoning Director, who is also serves as the Town's Development Review Coordinator, is responsible for the review coordination, including providing written comments pertaining site plans received from applicable departments.

The property owner/developer is also notified by the Development Review Coordinator in writing that the DEQ requires that any land disturbance of one (1) acre or greater obtain a Virginia Stormwater Management Program (VSMP) permit. On April 5, 2016, a resolution was adopted by the Vinton Town Council for the establishment of a Memorandum of Understanding (MOU) agreement between the County of Roanoke Board of Supervisors and the Vinton Town Council for the County to continue to administer the Virginia Erosion and Sediment Control Program (VESCP) and to administer the Virginia Stormwater Management Program (VSMP) for the Town of Vinton. The County became the Town of Vinton VSMP administrator as of June 1, 2016, with the approval of the State Water Control Board.

Included in this document is a detailed description of the objective and Measurable Goal of each BMP, the strategies to ensure consistency with identified TMDL's, the status of the Town's compliance with each BMP, and an evaluation of the BMP and any proposed modifications needed to better achieve the goals of the stormwater program. The TMDL compliance is broken down by the identified impairment type: E. coli, fecal coliform (EC/FC) and sediment (SED).

BMP 4-1.Erosion and Sediment Control (ESC) Plan Ordinance

Goal: The goal of this BMP is to maintain an Erosion and Sediment Control (E&S) Ordinance designed to reduce pollutants in stormwater runoff from construction activities, in an overarching effort to keep such pollutants from entering the County's and Town's MS4. The Ordinance requires use of erosion and sediment controls, site inspection requirements, and sanctions to ensure compliance under state and local law. This ordinance requires E&S controls for all land disturbances of 2,500 square feet or more and an engineered E&S Plan for any land disturbance greater than 10,000 square feet. The E&S Plan must require construction site operators to implement appropriate erosion and sediment controls specific to the site.

Measurable Goal: Roanoke County's initial Erosion and Sediment Control Ordinance was in compliance with the regulations previously set forth and enforced by the Virginia Department of Conservation and Recreation (DCR). DCR reviewed the County E&S Program during July 2012. As a result of the DCR review, Roanoke County developed, and DCR approved, an alternative inspection program. However, with the recent changes to the Virginia's erosion and sediment control regulations, the County adopted revisions to its ordinance in February 2016 to meet the newer state requirements. A copy of the ordinance is on the compact disk under the folder titled **BMP 4-1**.

During this fifth year of the reissued permit, the County including the Town of Vinton had **31 commercial** regulated land-disturbing activities, with a total of **44.1663 acres** disturbed. The County also had **139residential** regulated land-disturbing activities, with a total of **34.3862 acres** disturbed. The monthly counts of land disturbing activities, both residential and commercial, can be found on the County of Roanoke submitted compact disk under the folder titled **BMP 4-1**.

Year	Action	Changes and Modifications
2013 - 2014 (YEAR 1)	Amended the ESC Ordinance/Land Development Procedures	Updated to Coordinate with State Regulations
2014 - 2015 (YEAR 2)	To Amend the ESC Ordinance/Land Development Procedures	ESC Ordinance to be Amended per State Guidance
2015 - 2016 (YEAR 3)	Adopted the County of Roanoke ESC and SWM Ordinance by reference on April 5, 2016.	Revised ESC and VSMP to meet state requirement were completed.
2016 - 2017 (YEAR 4)	None	None
2017-2018 (YEAR 5)	Proposed revisions to E & S Ordinance to incorporate potential stream buffer requirements; currently under Board of Supervisors consideration	None

TMDL Consistency: This ordinance targets reducing sediment in stormwater runoff from construction sites. These regulations require erosion and sediment controls on the site, as well as sanctions, to ensure compliance under local law (SED).

Evaluation and Modifications: The E&S Ordinance was revised to align with the revised state regulations, as noted above. Roanoke County and the Town believe that the Erosion and Sediment Control Ordinance is a critical component to aid in reducing pollutants carried by stormwater runoff from construction activities into its MS4. To that end, it is also critical that the ordinance remain in compliance with the Virginia Erosion and Sediment Control Regulations.

Year	Total Acres Disturbed – ROCO & TOV	Total # of Regulated Land- Disturbing Activities – ROCO & TOV
2013 - 2014 (YEAR 1)	102.4	168
2014 - 2015 (YEAR 2)	66.31	189
2015 - 2016 (YEAR 3)	68.067	159
2016 - 2017 (YEAR 4)	154.62	198
2017-2018 (YEAR 5)	RoCo: 44.1663 commercial 34.3862 residential 78.5525 TOTAL TOV: 0.11 SFR	RoCo: 31 commercial 139 residential 170 TOTAL TOV: 1 SFR

BMP 4-2. Erosion and Sediment Control (ESC) Certification

Goal: The goal of this Roanoke County BMP is to identify current Erosion and Sediment Control (E&S)-certified employees and develop a program for certification maintenance, additional certifications, and cross-training.

Measurable Goal: Roanoke County Community Development Department has staff whose job responsibilities necessitate erosion and sediment control training and certification, such as the County Engineer, Plan Review Engineers, Stormwater Program Manager, and Site Inspectors, to name a few. Currently, the County utilizes training and certification through the Virginia Department of Environmental Quality's E&S training and certification program. Any new employees hired into positions whose job responsibilities have already been determined as needing training in E&S will also be certified using this program.

TMDL Consistency: For this BMP, the County identifies employees that need E&S training and tracks their certifications to ensure that such certifications remain current. This BMP helps to minimize onsite erosion by educating key employees involved with this topic on correct E&S procedures and policy (SED).

Evaluation and Modification: No modifications are planned for this BMP. The Town is concurrent with the County that the certification of certain positions that could significantly impact erosion through land disturbance is a critical component in reducing pollutants in stormwater runoff.

ESC & STORMWATER MANAGEMENT CERTIFICATIONS				
NAME		CERTIFICATION	CERTIFICATE #	EXPIRATION DATE
Atkinson	Bob	Professional Engineer	0402 041822	01/31/19
Henderson	David	Professional Engineer	0402 022296	05/31/19
Yates	Morgan	Plan Reviewer	458	05/31/20
Younger	Carter	Plan Reviewer	Provisional	Provisional
Chaney	Alexandria	Plan Reviewer	ESPR0160	8/21/2020
Linkenhoker	Cindy	ESC Combined Administrator	363	11/30/21
Thompson	Philip	ESC Combined Administrator	698	12/09/19
Atkinson	Bob	SWM Combined Administrator	SWCA0283	12/08/21
Fuller	RG	SWM Combined Administrator	SWCA0325	03/15/19
Chaney	Alexandria	SWM Plan Reviewer	SWPR0293	09/23/20
Henderson	David	Dual SWM Combined Administrator	DCA0259	10/17/20
Sowder	Denise	Dual Program Administrator	DPA0107	02/05/19
Carroll	Curtis	ESC Inspector	1966	11/30/19
Cutchin	Miles	ESC Inspector	ESIN0959	06/15/21
Forry	Shane	ESC Inspector	ESIN1012	08/31/21
Fowler	Bill	ESC Inspector	3740	11/30/19
Fuller	RG	ESC Inspector	3848	11/30/19
Hale	Patricia	ESC Inspector	ESIN0942	05/29/21
Holland	Dale	ESC Inspector	1945	05/31/19
Waldron	Larry	ESC Inspector	3930	05/31/20
Yates	Morgan	ESC Inspector	1929	05/31/19
Cutchin	Miles	SWM Inspector	SWIN1386	06/26/21
Hale	Patricia	SWM Inspector	SWIN1370	05/31/21
Altice	Jeff	Responsible Land Disturber	39411	04/04/19
Atkinson	Bob	Professional Engineer	0402 041822	01/31/19

Table 6. Roanoke County Personnel ESC and SWM Certifications

In addition to the above-named staff, the County's 3rd party contractor, Nadean Carson, also holds the following certification:

Carson	Nadean	Dual Inspector	DIN0657	05/18/20
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BMP 4-3.Erosion and Sediment Control Plan Review

Goal: The goal of this BMP is to ensure that the procedures for site plan review incorporate considerations for water quality impacts by addressing the most current local stormwater management regulations which are outlined in the Town of Vinton/Roanoke County ESC Ordinance.

Measurable Goal: The Town along with Roanoke County has revised its Land Development Procedures to ensure compliance with the new adopted Stormwater Management Ordinance and Roanoke County Design Manual and the new Virginia Stormwater Management Regulations. Success for this BMP is measured by the annual evaluation of the written plan review procedures, as described below.

TMDL Consistency: The land development procedures list the steps needed for a site plan to meet the state and local ESC and permanent stormwater management facility requirements. This program minimizes erosion and flooding potential due to the benefit of an educated engineering design team and construction crew on the public and private land development sites. This BMP minimizes erosion and flooding potential through its education of the County’s engineering design team and construction crew for all public and private land development sites that require a site plan. Erosion and sediment control plans target reducing sediment in stormwater runoff from construction sites. Reviewing the plans for consistency to plan review procedures helps to ensure the proper erosion and sediment controls will be employed and properly maintained on the site (SED, EC/FC).

Evaluation and Modification: The Land Development Procedures document gives detailed instructions as to the required information needed to be incorporated in the development plan for review and approval. The Town and the County will continue to update the Land Development Procedures to ensure that the site plan review requirements and process are consistent with the most recent stormwater management regulations. As state stormwater management regulations change, the local ordinance must also be changed, and keeping the Land Development Procedures up to date makes the procedures a useful tool to utilize when developing a site.

Year	Total # of E&S Plan Reviews: ROCO & TOV
2013 - 2014 (YEAR 1)	Not reported
2014 - 2015 (YEAR 2)	196
2015 - 2016 (YEAR 3)	130 SFR 49 Commercial (incl. subdivisions)
2016 - 2017 (YEAR 4)	131 SFR (3 in TOV; 128 in RoCo) 41 Commercial (incl. subdivisions) (2 in TOV; 39 in RoCo)
2017-2018 (YEAR 5)	190 SFR (1 in TOV; 189 in RoCo) 55 Commercial (incl. subdivisions) (0 in TOV; 55 in RoCo)

BMP 4-4. Erosion and Sediment Control Inspection

Goal: To develop and maintain written procedures for inspections to confirm that construction complies with approved plans and that construction site stormwater runoff is properly addressed.

Measurable Goal: Success for this BMP is measured by the annual evaluation of the written site inspection procedures.

TMDL Consistency: Erosion and sediment control inspections of construction activities help to ensure that the required erosion controls, as shown on the approved plan, are implemented and properly maintained in the field; such controls reduce sediment in stormwater runoff from construction sites. The routine inspection of the site and the VSMP and ESC measures as identified will ensure that the VSMP and ESC requirements and measures are in place, therefore any construction activity will minimize erosion and flooding potential (SED, EC/FC).

Evaluation and Modification: No modifications are planned for this BMP. Roanoke County and the Town believe that inspecting construction sites against written procedures and approved plans helps to reduce pollutants in stormwater runoff during land-disturbing activities.

Year	# of Inspections Conducted (Commercial and SFR Projects): ROCO & TOV
2013 - 2014 (YEAR 1)	18,694
2014 - 2015 (YEAR 2)	14,131
2015 - 2016 (YEAR 3)	11,889* [SFR=9,679; Comm = 2,210]
2016 - 2016 (YEAR 4)	9,443* [SFR=6,723; COM = 2,720] RoCo: 1,085 SFR, 2,678 COM ToV: 24 SFR; 42 COM
2017-2018 (YEAR 5)	2,538** [SFR=1,633; COM = 905] RoCo: 1,631 SFR; 877 COM ToV: 2 SFR; 28 COM

SFR = Single Family Residential

COMM = Commercial

* Residential inspections occur with every building inspection

** Total # of inspections has decreased due to more focused and documented inspections using ESC/SWM inspectors exclusively (versus Bldg/Trade inspectors), and use of new CityWorks software

BMP 4-5. Erosion and Sediment Control Compliance and Enforcement

Develop and maintain written procedures for compliance and enforcement when necessary to compel compliance with construction site stormwater runoff requirements.

Goal: The goal of this County/Town BMP is to develop and maintain written procedures for compliance and enforcement, in order to ensure program consistency.

Measurable Goals: Success for this BMP will be measured by the annual evaluation of the written plan review procedures by Roanoke County. A summary of the enforcement actions taken, if any including the

total number and type of enforcement actions is provided by Roanoke County Department of Community Development.

Year	# of Enforcement Actions: ROCO & TOV NTC = Notice to Comply SWO = Stop Work Order
2013-2014 (YEAR 1)	12 - NTC 2- Civil Penalties [Summons]
2014 - 2015 (YEAR 2)	19 - NTC 1 - SWO
2015 - 2016 (YEAR 3)	20 - NTC 4 - SWO 1 - Civil Penalty [Summons]
2016 - 2017 (YEAR 4)	7- NTC 9 - SWO 1 - Civil Penalty [Summons]
2017-2018 (YEAR 5)	49 - NTC 20 - SWO 9 - Civil Penalty [Summons]

TMDL Consistency: Written procedures that allow for the enforcement of the erosion and sediment control program help to ensure that the required erosion controls, as shown on the approved plan, are implemented and properly maintained in the field; such controls reduce sediment in stormwater runoff from construction sites (SED).

Evaluation and Modification: No modifications are planned for this BMP. Roanoke County and the Town believe that implementing enforcement actions based on written procedures is critical to help reduce pollutants in stormwater runoff during land-disturbing activities.

MCM 5:POST-CONSTRUCTION STORMWATER MANAGEMENT IN NEW DEVELOPMENT AND REDEVELOPMENT

The Town of Vinton and Roanoke County recognize that addressing water quality in post construction runoff is an important way to prevent deposition of sediment and other pollutants into our streams and river. On April 5, 2016, a resolution was adopted by Vinton Town Council to adopt the County of Roanoke's revisions to the Stormwater Management Design Manual, by reference, as amended. On April 19, 2016, Vinton Town Council adopted an ordinance by amending the Town's Stormwater ordinance, to adopt the County of Roanoke Stormwater Ordinance by reference, as amended.

On the same date of April 5, 2016, a resolution was adopted by the Vinton Town Council for the establishment of a Memorandum of Understanding (MOU) agreement between the County of Roanoke Board of Supervisors and the Vinton Town Council for the County to continue to administer the Virginia Erosion and Sediment Control Program (VESCP) and to administer the Virginia Stormwater Management Program (VSMP) for the Town of Vinton. The County became the Town's VSMP administrator as of June 1, 2016, with the approval of the State Water Control Board, as indicated in the DEQ correspondence dated, May 27, 2016.

The programs that continue to be established to complete this measure are listed below:

BMP 5-1. Stormwater Management Ordinance and Manual

The Town of Vinton has adopted a Stormwater Management Ordinance and Design Manual, which complies with the July 1, 2014 state requirements.

BMP 5-2. Stormwater Management Plan Review

Develop and maintain written procedures for site plan review which addresses post-construction stormwater.

BMP 5-3. Stormwater Management Facility Construction Inspection

Develop and maintain written procedures for site construction inspections to confirm that construction complies with approved plans.

BMP 5-4. Stormwater Management Facility Post-Construction Inspection

Develop and maintain written procedures for post-construction inspections of privately owned and Town-owned stormwater management facilities.

BMP 5-5. Stormwater Management Facility Tracking

Develop and maintain a GIS based system to track Stormwater Management Facilities to ensure that proper post-construction inspection and maintenance is occurring.

BMP 5-6. Strategies to Encourage Long-Term Maintenance of Stormwater Control Measures for Individual Residential Lots

Develop and implement strategies to promote the long-term maintenance of stormwater control measures that are designed to treat stormwater runoff solely from the individual residential lot. These strategies would be used to replace recorded maintenance agreements and required Town/County post-construction inspections.

BMP 5-1. Stormwater Management Ordinance and Manual

Goal: The goal of this BMP is to adopt and enforce an ordinance and design manual that both require stormwater runoff to be addressed. These documents ensure that controls are in place that would prevent or minimize water quality and quantity impacts due to new development and redevelopment projects.

Measurable Goal: The Town started enforcing the stormwater ordinance and manual after adopting by reference Roanoke County Stormwater Management Ordinance and Manual on January 1, 2008. The stormwater management design manual details structural and non-structural best management practices (BMPs) that are appropriate for Roanoke Valley region. The ordinance requires the designation of a responsible party who is legally bound to inspect and maintain the best management practices for the life of the BMP.

Beginning July 2015, Roanoke County/Town of Vinton stormwater ordinances and design manual have been updated and presented to the Roanoke Homebuilders Association for their review and input. The revised documents were adopted by Roanoke County Board of Supervisors on February 23, 2016, and on April 5, and April 19, 2016, the Vinton Town Council adopted the County's ordinance and design manual by reference. As of June 1, 2016, the County became the Town's VSMP administrator with the approval of the State Water Control Board as indicated in the DEQ correspondence dated, May 27, 2016.

TMDL Consistency: The stormwater management ordinance and stormwater design manual goal is to reduce the quantity of stormwater runoff and improving the quality of stormwater runoff from new development, redevelopment, and existing developed areas. This manual and ordinance protects against erosion from stream banks, construction sites, developed areas, and redeveloped area (SED, EC/FC).

Evaluation and Modification: The materials associated with this BMP were revised to align with the new Virginia Stormwater Management Law and Regulations and subsequent revisions to same. The latest revisions to the County's ordinance added the use of civil penalties to the enforcement options and incorporated minor changes previously requested by the Virginia DEQ. Revisions to the design manual were made to clarify and correct minor issues that became apparent after initially implementing the VSMP.

Year	Action	Changes and Modifications
2013 - 2014 (YEAR 1)	New Stormwater Ordinance and Manual Adopted	New Documents, effective July 1, 2014
2014 - 2015 (YEAR 2)	New Guidance from the State due to VSMP Changes	Draft ESC, SWM Ordinances, Manual Design under Review
2015 - 2016 (YEAR 3)	Revised SWM Ordinance and Design Manual	ROCO Revised SWM Ordinance, SWM Design Manual, adopted by TOV on 4/5/16 and 4/19/16
2016 - 2017 (YEAR 4)	None	None
2017 - 2018 (YEAR 5)	None	None

BMP 5-2. Stormwater Management Plan Review

As of August 2014, the two Memoranda of Understanding (MOUs) between the County and the Town for the County to provide SWM plan review services and SWM facilities during and after construction services were renewed. On April 5, 2016, a resolution was adopted by the Vinton Town Council for the establishment of a Memorandum of Understanding (MOU) agreement between the County of Roanoke Board of Supervisors and the Vinton Town Council for the County to administer the Virginia Stormwater Management Program (VSMP) for the Town of Vinton.

Goal: To develop and maintain written procedures for site plan review which addresses post-construction stormwater runoff to ensure consistency of reviews.

Measurable Goal: Success for this BMP is measured by the annual evaluation of the written plan review procedures.

TMDL Consistency: Stormwater management plans target reducing sediment in stormwater runoff from construction sites and controlling volume and velocity of peak runoff rates during and after development. Reviewing the plans for consistency to plan review procedures helps to ensure the proper stormwater controls and practices will be employed and properly maintained on the site (SED, EC/FC).

Evaluation and Modification: No modifications are planned for this BMP. Roanoke County believes that maintaining and employing written procedures for stormwater management plan review is a critical component in reducing pollutants in and reducing volume and velocity of stormwater runoff during and after land-disturbing activities.

Year	# of SWM Plans Reviewed: ROCO & TOV	# of Agreement in Lieu of SWM Plans issued: ROCO & TOV
2013 - 2014 (YEAR 1)	37	-
2014 - 2015 (YEAR 2)	185	33
2015 - 2016 (YEAR 3)	162 28 - Commercial; 134 - SFR	32
2016 - 2017 (YEAR 4)	44 - Commercial; 161 - SFR	41
2017 - 2018 (YEAR 5)	17 - Commercial; 21 - SFR	21

SFR = Single Family Residential

NOTE:

VSMP Permits Issued for SFR = 21

VSMP Permits Issued for Commercial = 17

BMP 5-3. Stormwater Management Facility Construction Inspection

As of August 2014, the two Memoranda of Understanding (MOUs) between the County and the Town for the County to provide SWM plan review services and SWM facilities during and after construction services were renewed. On April 5, 2016, a resolution was adopted by the Vinton Town Council for the establishment of a Memorandum of Understanding (MOU) agreement between the County of Roanoke Board of Supervisors and the Vinton Town Council for the County to administer the Virginia Stormwater Management Program (VSMP) for the Town of Vinton.

Goal: To develop and maintain written procedures for construction inspections to confirm that construction complies with approved plans.

Measurable Goal: Success for this BMP will be measured by the annual evaluation of the written site construction inspection procedures.

TMDL Consistency: Stormwater Management Facility inspections help to ensure that the required facilities, as shown on the approved plan, are implemented and properly maintained in the field; such facilities help to reduce sediment in stormwater runoff from construction sites and control volume and velocity of peak runoff rates during and after development(EC/FC, SED).

Evaluation and Modification: No modifications are being planned for this BMP. Roanoke and the Town County believe that maintaining and employing written procedures for stormwater management construction inspections is a critical component in reducing pollutants in and reducing volume and velocity of stormwater runoff during and after land-disturbing activities.

Year	# of SWM Facilities Inspected Under Construction: ROCO & TOV
2013 - 2014 (YEAR 1)	111
2014 - 2015 (YEAR 2)	73
2015 - 2016 (YEAR 3)	53
2016 - 2017 (YEAR 4)	51
2017 - 2018 (YEAR 5)	30

BMP 5-4. Stormwater Management Facility Post-Construction Inspection Program

Goal: The goal of this BMP is to develop and maintain written procedures for post-construction inspections to confirm that adequate maintenance is occurring.

Measurable Goal: 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.

TMDL Consistency: This program 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: Based on the permit requirement to annually inspect all Town-owned stormwater management facilities and to inspect other stormwater management facilities at least once every 5 years, this BMP was modified to reflect the required inspection frequency.

Year	Post-Construction Stormwater Facilities Inspected: ROCO & TOV	Total Number of Stormwater Facilities*: ROCO & TOV	BMP Maintenance Guides Given Out; ROCO & TOV
2013 - 2014 (YEAR 1)	23 - Public 184 - Private	71 - Public 661 - Private	120
2014 - 2015 (YEAR 2)	49 Public 97 Private	71 - Public 700 - Private	0
2015 - 2016 (YEAR 3)	67- Public 95 - Private	67- Public 681- Private	30
2016 - 2017 (YEAR 4)	66- Public 254 - Private	66- Public 678- Private	8
2017 - 2018 (YEAR 5)	70 - Public 62 - Private	72 - Public 694 - Private	3

Total # of SWM Facilities has changed slightly due to more accurate accounting using the County's GIS

BMP 5-5. Stormwater Management Facility Tracking

Goal: To develop and maintain a GIS based system to track stormwater management facilities to ensure that proper inspection and maintenance is occurring.

Measurable Goal: Success for this BMP will be measured by the annual evaluation of any additions or modifications to the GIS stormwater database. In this Permit Year 4, there were 11 new Stormwater Management Facilities brought online in the MS4 area of the County and the Town, serving 16.81 acres.

TMDL Consistency: Proper maintenance of permanent stormwater management facilities is vital for the long term success of the facilities and the prevention of sediment and other pollutants from leaving the site and being transported into the local streams and river. 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, EC/FC).

Evaluation and Modification: The County is currently implementing a new software program (Cityworks®) to assist with facility and inspection tracking, and its Department of Community Development has added an additional staff position to assist with data organization. The County and the Town believe that these actions will improve this BMP. Roanoke County also 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.

Table 8. New Stormwater Facilities in ROCO & TOV Brought Online

HUC	#	Acres Treated
30101010402	9	10.22
30101010403	1	0.34
30101010404	1	3.94
Total	11	14.50

BMP 5-6. Strategies to Encourage Long-Term Maintenance of Stormwater Control Measures for Individual Lots

Develop and implement strategies to promote the long-term maintenance of stormwater control measures that are designed to treat stormwater runoff solely from the individual residential lot. These strategies would be used to replace recorded maintenance agreements and required Town/County post-construction inspections.

Goal: The goal of this BMP is to implement strategies to promote the long-term maintenance of stormwater control measures that are designed to treat stormwater runoff solely from the individual residential lot. These strategies will be used to replace recorded maintenance agreements and the required County/Town post-construction inspections.

Measurable Goals: Success for this BMP will be measured by tracking the number of new single-family residential lots each year that are covered by the strategies, annually reaching 100% of the total number of single-family residential lots covered under the strategies with homeowner outreach and education materials using direct mail, maintaining maintenance information for the stormwater practices on the Town’s website, and evaluating the effectiveness of the strategies in promoting the long-term maintenance of stormwater control measures.

TMDL Consistency: Stormwater management techniques target reducing sediment in stormwater runoff from developed sites and are designed to reduce volume and velocity of peak runoff rates during and after development. 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: The County and Town believe this is an effective BMP to address the maintenance of relatively simple stormwater management practices used on individual single-family residences (SFRs). However, as the County has more experience with it, revisions may be made in the future.

Permit Year 2 was the first year to not require maintenance agreements for individual residential lots. There are 15 residential lots in the Town that used individual stormwater control measures (underground facility) without maintenance agreements. 100% of the total individual SFRs were reached with homeowner education and outreach materials using direct mail by Roanoke County. For Permit Year 3, the newsletter entitled *A Stormwater Guide for Homeowners* was used to satisfy this mailing requirement, along with a new informational Fact Sheet entitled: “Tips for Homeowners – Stormwater Best Practices.” For Permit

Year 4, "A Stormwater Guide for Homeowners" was sent to all residences in the County and Town. In Permit Year 5, the May 2018 edition of the newsletter, with the articles "Stream Buffers: Why We Need Them", and "Maintaining Your Residential Septic System", was sent to Town and County residences.

The Town's website provide a link to Roanoke County's website on the maintenance information for stormwater practices under "Stormwater Public Education Documents" at:
<http://www.roanokecountyva.gov/index.aspx?NID=1648>

MCM 6: Pollution Prevention and Good Housekeeping for Municipal Operations

The main goal of the pollution prevention and good housekeeping program is to reduce stormwater runoff pollution from the Town's day-to-day operations. The Town continues to evaluate its facilities and also provide education and training programs that will educate Town employees about pollution prevention and hazardous waste. The programs that continue to be established to meet this measure are listed below.

BMP 6-1. Spill Prevention Control and Countermeasures Plans

Vinton will evaluate Spill Prevention Control and Countermeasure Plans (SPCCs) for some of its municipal facilities. These plans will be updated and new plans will be prepared, as needed.

BMP 6-2. Household Hazardous Waste Event

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

BMP 6-3. Storm Sewer Systems Maintenance Program

The Town will continue to provide storm sewer system infrastructure maintenance, and continue preventative measures with its street sweeping and leaf collection programs.

BMP 6-4. Training Program for Town Employees

The Town has and will continue to develop and implement biennial training for applicable employees in (1) recognition and reporting of illicit discharges; (2) good housekeeping, pollution prevention and spill control practices for, (a) road, street and parking lot maintenance, (b) maintenance and public works facilities, and (c) greenway/civic facilities; (3) spill response by emergency response employees; (4) herbicide application training when applicable; and (5) contractor oversight for environmental compliance.

BMP 6-5. Standard Operating Procedures

The Town has developed and implemented the 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. SOPs will be used in training activities.

BMP 6-6. Stormwater Pollution Prevention Plans (SWPPPs) for Municipal Facilities

The Town will identify all high-priority facilities that have 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 6-7. Nutrient Management Plan

The Town will identify any Town-owned land where nutrients are applied to a contiguous area of 1 acre or more. Any NMP will be implemented and maintained.

BMP 6-8: Pesticide Applicator Certification

All employees that apply pesticides shall have the proper Virginia Pesticide Applicator Certificate.

BMP 6-9: Responsible Land Disturber

Employees that oversee the performance of regulated land disturbance activities by County employees shall be recognized as a Responsible Land Disturber by DEQ.

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

Goal: The goal of this BMP is to develop and update Spill Prevention, Control, and Countermeasure (SPCC) Plans for appropriate Vinton municipal facilities. Facilities that store oil with an aggregate above-ground storage capacity of 1,320 gallons or more, or have a fully buried storage capacity of 42,000 gallons or more are required to have SPCC plans. The Town does not currently have any facilities that qualify. These plans must be updated when significant changes occur, and they must be evaluated every 5 years.

Measurable Goals: Success for this BMP will be measured by the updating or creation of SPCC plans for applicable Town facilities in accordance with 40 CFR Part 112.

Currently no Town facility meets the parameters for an SPCC Plan.

TMDL Consistency: This BMP minimizes the potential for oil spills to enter the municipal storm drain system. Having updated SPCC Plans will aid in the education of Vinton employees that are in areas with 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. Vinton finds this to be an effective BMP to assure the proper storage of oil.

BMP 6-2. Household Hazardous Waste Collection Event

Goal: The goal of this BMP is to encourage and identify strategies and events to help citizens dispose of household materials and waste that could be hazardous to dispose of in bulk landfills.

Measurable Goal: A permanent household hazardous waste facility is continued to be made available at the Roanoke Valley Resource Authority (RVRA). The facility is open on the third Saturday of each month, giving citizens in the Roanoke Valley opportunities to dispose of their hazardous materials year-round rather than during three regional collection events offered in the past. For FY 2017-2018, RVRA collected 1,235 gallons of oil, 0 batteries, and 4,828 gallons of latex paint from 831 residential households from Roanoke County, City of Roanoke, and Town of Vinton.

TMDL Consistency: Currently there is no known benefit that this BMP will have on any TMDL wasteload allocations. However, this BMP will have a beneficial effect on stream water quality.

Evaluation and Modification: The Town considers this BMP to be successful and proposes to continue with the funding to keep the monthly collection at the RVRA facility and to provide staff during the drug take back events. This monthly collection and drug take back events make it easier for citizens to dispose of their household hazardous materials and waste, and their unused prescription drugs. The Town will continue to advertise this monthly hazardous waste collection and drug take back events on its website to increase participation to keep hazardous wastes from being disposed inappropriately into the Roanoke Valley streams and river.

BMP 6-3. Storm Sewer Systems Maintenance Program

Goal: The goal of this BMP is for the Town Public Works Department to continue to actively maintain the Town's storm sewer system. Keeping the storm sewer system properly maintained is very important for the

Town because it keeps the regulated storm sewer working as designed, minimizing the potential for flows to surcharge or surpass the capacity of the regulated storm sewer system. The maintenance crews also have the potential of discovering illicit connections and additional areas where hazardous waste may be entering the regulated storm sewer system.

Measurable Goals:

The success of this BMP will be measured by the continuation of this program and the increase in total value of improvements that have been completed to maintain the storm sewer system. Public Works had two construction crews with a total of 6 employees. These crews perform a large variety of duties including installation of storm and sewer piping and infrastructure, repair of damaged structures, emergency response to flooding problems, storm drain structure cleaning and mapping along with other Town storm drain system maintenance.



This year 34 maintenance and improvement projects were completed, resulting in the following:

- Total storm drain structures mapped: 0
- Total storm drain structures inspected: >50
- Total storm drain structures improved: 6
- Total storm drain structures replaced: 2
- Small projects completed: 8
- Number of emergency projects: 3
- Total feet of pipe installed: 80
- Total feet of open/rip rap channel improved: 20

The following table summarizes the Public Works Department's total expenditures for labor, materials, and equipment to maintain the stormwater system to correct deficiencies. A total of 3,810.5 labor hours were spent on the storm sewer systems maintenance and repair. The value of these improvements was estimated to be \$222,502.17.

Reporting Period	Work Hours	Total Labor	Materials	Total Equipment	Total Expenditures
2013 - 2014 (Year One)	1,870	\$52,968.51	\$12,214.45	\$21,988.53	\$87,717.49
2014 - 2015 (Year Two)	2,553	\$74,369.27	\$21,785.81	\$30,177.93	\$143,506.56
2015-2016 (Year Three)	2,000	\$54,283.80	\$27,035.33	\$27,035.33	\$106,185.75
2016-2017 (Year Four)	3,810.5	\$105,716.27	\$70,214.84	\$46,571.06	\$222,502.17
2017-2018 (Year Five)	4,196.5	\$119,461.61	\$44,849.78	\$103,335.15	\$267,646.54

TMDL Consistency: This program is responsible for maintaining the regulated storm sewer system. This program involves cleaning up storm inlets, fixing eroded areas around storm drains and inlets to minimize sediment being eroded and washed into channels and streams (SED). This program also increases the potential for discovering illicit connections to the storm drain system (EC/FC).

Evaluation and Modification: No changes are planned for this BMP, the Town will continue to maintain this program of maintaining and repairing its storm sewer system to keep the system functioning properly. By being in the field, increases the opportunity to discover potential illicit discharge connections to the storm drain system.

Additional Measures: Public Street Sweeping and Leaf Collection Programs

The street sweeping program to target weekly sweeping of all primary streets will return the greatest benefit of collecting and thus preventing roadway contaminants, sediment and debris, from entering the stormwater collection system. Other streets are swept bi-weekly or at three week intervals. Sweeping frequency is impacted by inclement weather and equipment downtime. This continues to optimize both the use and effectiveness of the Town's single street sweeper and achieves desired results.

The leaf collection program, which is normally done in the months of November and December, also minimizes leaf and yard waste from entering the stormwater collection system. The total expenses on wages, and equipment cost of street sweeping program was \$92,221.13 and the total expense of the leaf collection program was \$30,806.24. The amount of debris collected by the street sweeping program has also been tracked, which was 55.00 cubic yards.

The street sweeping program offers the greatest benefit to capture roadway contaminants, debris, and sediment (SED) before entering the Town's storm sewer collection system. The leaf collection program minimizes leaf and yard debris that contaminated with pet waste from entering storm sewer system (EC/FC).

Reporting Period	Street Sweeping Program	Fall Leave Collection Program
2013 – 2014 (Year One)	\$152,693.91	\$23,666.17
2014 - 2015 (Year Two)	\$162,915.46	\$17,173.55
2015 -2016 (Year Three)	\$147,443.25	\$19,727.18
2016-2017 (Year Four)	\$127,084.64	\$22,977.34
2017-2018 (Year Five)	\$92,221.13	\$30,806.24

The Town will continue to maintain the street sweeping program and the leaf collection program. This program of collections of roadway contaminants, sediment, debris, leaf, yard waste, prevents them from entering the Town's storm sewer collection system, and is of aesthetic benefit.

BMP 6-4. Training Programs for Town Employees

Goal: The goal of this BMP is to develop and maintain the following training included in our stormwater management plan: recognition and reporting of illicit discharges, good housekeeping/ pollution prevention/spill control and Standard Operating Procedure training for all appropriate employees.

For Year Five reporting:

Recognition and Reporting Illicit Discharges

Applicable field personnel received training in the recognition and reporting of illicit discharges. This training video was approximately 30 minutes in length and was followed up with a discussion on possible findings/questions.

Good Housekeeping, Pollution Prevention and Spill Control 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 received training in good housekeeping and pollution prevention practices. This training video takes approximately 1 hour. Good Housekeeping and PPP training was conducted on

NOTE: All employees who were required to take this training were required to read and follow the Town's 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 Town or employees involved in developing contracts for Contractors took 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 Town's written policies and SOPs. Town employees who oversee Contractors working for the Town must ensure compliance by Contractors. This training video takes approximately 30 minutes.

Measurable Goals: The Public Works Department and Human Resources Department will be responsible to ensure the Town employees receive environmental awareness and management training and keeping record of the training programs provided, number, and name of employees attending the training programs.

TMDL Consistency: This program makes sure that all Fire and Rescue personnel maintains basic hazardous waste training to prevent mishandling of hazardous materials in ways that could be detrimental to the environment. The program is also responsible for education Town employees on environmental awareness and management training. This program will train every employee to be the eyes and ears of pollution prevention. This will increase the likelihood that any potentially hazardous situation will be brought to the attention of a supervisor and adequately addressed (EC/FC, SED).

Evaluation and Modification: The Town considers this BMP to be successful and proposes to continue with this program. The Town will continue the pollution prevention and environmental awareness training for all Town employees. The total number of new employees to receive training will be documented in addition to the total number of employees trained to date. Existing Town employees and new hires in the various departments, including Public Works, Fire and EMS, Police, and War Memorial, receive training in each of the applicable categories. For the Year Five reporting period, 74 employees received training.

BMP 6-5. Standard Operating Procedures (SOPs)

Goal: To develop and implement 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. SOPs will be used in training activities.

SOPs are designed to prevent pollutant discharge from (1) daily operations such as road, street, and parking lot maintenance, (2) equipment maintenance, and (3) the application, storage, transport, and disposal of pesticides, herbicides, and fertilizers.

The SOPs shall be designed to (1) prevent illicit discharges, (2) ensure the proper disposal of waste materials, including landscape wastes, (3) prevent discharge of municipal vehicle wash water into the MS4, (4) prevent discharge of wastewater into the MS4, (5) require use of BMPs when discharging water pumped from utility construction and maintenance activities, (6) minimize pollutants in stormwater runoff from bulk storage areas; (7) prevent pollutant discharge into the MS4 from leaking municipal automobiles and equipment; and (8) ensure that the application of materials, including fertilizers and pesticides is conducted in accordance with the manufacturer's recommendations.

Measurable Goal: As of April 2014, the Standard Operating Procedures have been developed. Town's employees have been informed of the SOP that has been developed in April 2014. The Town SOP can be accessed by all employees on the T:drive in a shared folder. Additionally, a paper copy the SOP will be kept at needed facilities and maintained by the Town's appropriate personnel.

TMDL Consistency: This program will train every employee to be diligent on their daily operation to minimize pollutions being discharged from their daily operations (EC/FC, SED).

Evaluation and Modification: The SOPs will be implemented by next reporting annual report. The SOPs evaluated and revised as needed.

BMP 6-6. Stormwater Pollution Prevention Plans (SWPPPs) for Municipal Facilities

Goal: To identify municipal facilities which have a high potential to discharge pollutants and provide SWPPPs for them. Town of Vinton will identify all high-priority facilities that have 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 as a part of the SOP training, where appropriate.

Measurable Goal: All town high-priority facilities have been identified and a time-line to prepare each SWPPP has been established.

TMDL Consistency: SWWP will prevent the discharge of pollutants from town facilities into the waterways.

Evaluation and Modification: All necessary SWPPPs shall be completed by the end of permit year five. The SWPPPs shall be maintained thereafter.

BMP 6-7. Nutrient Management Plan (NMP)

Goal: To ensure that excessive nutrients are not being applied to Town-owned lands.

Measurable Goal: All Town-owned lands where nutrients are applied to a contiguous area of 1 acre or more have been identified. Based on the analysis, the Vinton War Memorial Facility was the only facility where a NMP is required, which was prepared by a Certified Nutrient Management Planner, Robert Habel, CNMP, in June 2015, and approved by VA Department of Conservation and Recreation (DCR) on June 22, 2015. The NMP has been submitted as a separate document in October 1, 2015.

TMDL Consistency: NMP aims to limit the amount of nutrient rich runoff reaching the waterways by following a site-specific, agronomical and environmentally sound NMP prepared by a Certified Nutrient Management Planner (EC/FC, SED, and Nutrient).

Evaluation and Modification: The private landscaping company that maintains the Vinton War Memorial Facility has been given a copy of the NMP. Additionally, they are to keep track with the “Application Worksheets” and “Records/References” which are provided with the NMP.

BMP 6-8: Pesticide Applicator Certification

Goal: The goal of this BMP is to ensure that all employees that apply pesticides have the proper Virginia Pesticide Applicator Certificate.

Measurable Goals: Success for this BMP will be measured by maintenance of current certification by the applicable employees. A list of employees that currently hold Pesticide Applicator Certification is included below.

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: No modifications are planned for this BMP at this time. Vinton will continue to require the applicable personnel to hold the proper pesticide and fertilizer applicator certifications. Currently, the following employee in the Public Works Department holds Pesticide Applicator certifications:

EMPLOYEE	CERTIFICATION TYPE	CERTIFICATION #	EXPIRATION DATE
Kenny Sledd	Pesticide Applicator	127627-G	6/30/2019

BMP 6-9: Responsible Land Disturber (RLD)

Goal: The goal of this BMP is to ensure that employees that have responsibility to oversee the performance of regulated land disturbance activities by Town employees shall have the qualifications to properly implement erosion and sediment control measures. Responsible employees shall be certified as a Responsible Land Disturber by DEQ.

Measurable Goals: Success for this BMP will be measured by maintenance of current certification by the applicable employees. The Town does not engage in activity that requires an RLD certification.

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: No modifications are planned for this BMP at this time. Vinton employees do not perform work that meets RLD parameters.

SECTION II

TOWN OF VINTON

Total Maximum Daily Loads (TMDLs)

TMDL EXECUTIVE SUMMARY

The Town of Vinton Total Maximum Daily Load (TMDL) Action Plan for Sediment and E. coli Reduction in the Roanoke River have been prepared as required by the Town of Vinton's General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4s) General Permit No. VAR040026.

The Roanoke River and Tinker Creek were listed as "impaired" because they did not meet the Virginia water quality standard for wildlife habitat as measured using the modified Rapid Bioassessment Protocols (EPA, 1999). Streams are required to support the propagation and growth of a balanced, indigenous population of aquatic life, including game fish, which might reasonably be expected to inhabit them. Sediment was identified as the probable stressor pollutant that is adversely impacting macroinvertebrates (benthic organisms). The Town was assigned a WLA of 119.3 tons of sediment/year.

The Roanoke River, Tinker Creek, and Glade Creek were originally listed as "impaired" because they did not meet the Virginia water quality standard for fecal coliform bacteria. Since the initial listing, the state water quality standard has been changed from fecal coliform bacteria to E.coli bacteria. The Town's WLA for Roanoke River was set at 33,200,000,000 (3.32E+10) colony forming units per year. The WLAs for Tinker Creek and Glade Creek are nested within the Roanoke River WLA. The Town's WLA for Tinker Creek was set at 342,000,000,000 (3.42E+11) colony forming units per year. The WLA for Glade Creek is nested within the Tinker Creek WLA. Town's WLA for Glade Creek was set at 87,800,000,000 (8.78E+10) colony forming units per year.

The Town's strategy is to progressively implement Best Management Practices (BMPs) to decrease the amount of sediment and E. coli that enter Town waters in order to meet Virginia state water quality standards for aquatic life. The Town has and will continue implement BMPs over multiple state permit cycles and demonstrate that adequate progress is being made to reduce sediment and E. coli discharges. As additional information is obtained from Virginia Department of Environmental Quality (DEQ) monitoring or other sources, an adaptive iterative approach will be used to modify BMPs implementation as appropriate.

A. TMDL ACTIVITIES

The Town undertakes a number of activities to enhance its stormwater program to address its TMDL wasteload allocations. These activities are described in the MS4 Program Plan and specific TMDL Action Plans.

Following is the tabulation of the Best Management Practices (BMPs) that the Town currently has in place under the MS4 General Permit MCMs BMPs and plans to implement to decrease discharges of sediment and bacteria to the maximum extent practicable, along with their anticipated estimated implementation schedule. Please note the change in the implementation schedule for some of the tasks due to limited staff and resources.

- Note that all of the BMPs used to address sediment are also effective in addressing the Town's E.coli wasteload allocations and are also included in the Town of Vinton TMDL Action Plan for

Bacteria/E.coli Reduction in the Roanoke River, Tinker Creek, and Glade Creek (Bacteria Action Plan).

BMP Designation	BMP Name/Task	Implementation Dates (Start – Finish)
BMP 3-3	MS4 Outfall Inspection	Underway
BMP 3-4	Illicit Discharge Detection and Elimination Program	Underway
BMP 4-3	Erosion and Sediment Control (ESC) Plan Review	Underway – ROCO
BMP 4-4	Erosion and Sediment Control (ESC) Inspection	Underway – ROCO
BMP 4-5	Erosion and Sediment Control (ESC) Compliance and Enforcement	Underway – ROCO
BMP 5-1	Stormwater Management (SWM) Ordinance and Manual	Underway – ROCO
BMP 5-2	Stormwater Management (SWM) Plan Review	Underway – ROCO
BMP 5-3	Stormwater Management Facility (SWMF) Construction Inspection	Underway – ROCO
BMP 5-4	Stormwater Management Facility (SWMF) Post-Construction Inspection	Underway – ROCO
BMP 5-6	Strategies to Encourage Long-Term Maintenance of Single-Family Residential Structure Stormwater Control Measures	Underway – ROCO
T-1*	Initial Streams Assessment and BMP Planning	Begin Fall of 2017 Anticipated completion Fall of 2019
BMP 1-1 to BMP 1-7: T-2*	Enhanced Public Education and Outreach – Sediment, Bacteria, Nutrients	Underway – ROCO & TOV
BMP 6-2	Public Street Sweeping	Underway
BMP 6-3: T-3*	Enhanced Stormwater Training Program for Town Employees	Underway
BMP 6-5	Standard Operating Procedures (SOPs)	Underway
BMP 6-6: T-4*	Stormwater Pollution Prevention Plans (SWPPPs) for Municipal Facilities <u>Town Facilities Assessments and Corrections</u> <u>Screen Facilities/Schedule Assessments</u> Perform Assessment – Public Works Building: Facility # 1 – Outdoor Storage of Construction Materials: Facility # 2 Perform Assessment –Road Salt & Vehicle/Equipment Storage: Facility # 3	Underway <u>Completion Date:</u> Completed in June 2015 By June 2018

	Perform 2 Assessments – Organic Materials Collection Site: Facility # 4 and Vehicles & Equipment Storage: Facility # 5	Completed in June 2017
BMP 6-7	Nutrient Management Plan (NMP)	Completed: Vinton War Memorial.
BMP 6-8	Responsible Land Disturber	Underway – ROCO & TOV
T-5	Enhanced Illicit Discharge Detection and Elimination Program	Begin July 2017
T-6*	Erosion and Sediment Control Enhanced Enforcement Evaluate Policies Implement Changes (If Needed)	ROCO Underway/Ongoing
T-7	Dog Waste Stations Determine Needs Installation at Wolf Creek Greenway Installation at Gladetown Trail Installation at Roland E. Cook Lofts Installation at Vinton Farmers Market	Underway/Ongoing Completed Completed Completed Completed
T-8	Dog Waste Ordinance Research Ordinances and Obtain Public Input Discuss with Town Council Prepare Ordinance for Town Council Consideration	Underway/Ongoing By 2018-2019 By June 2019
T-10*	Stream Buffers Research Ordinances Identify Possibly Impacted Properties Obtain Public Input Discuss with Town Council Prepare Ordinance for Town Council Consideration	Underway/Ongoing Underway/Ongoing By December 2018 By December 2018 By June 2019
*	Capital Improvements Identify Feasible Capital Projects Construction	Identify Initial Capital Project by July 2019 To Be Determined

B. TMDL ACTION PLANS

Section 1.B.1 of the MS4 General Permit requires that the Town's MS4 Program Plan prepare and implement a specific TMDL Action Plan for pollutants allocated to the MS4 in approved TMDLs. The Town

has approved wasteload allocations for E. coli and Sediment. Specific TMDL Action Plans for E. coli and Sediment were completed July 1, 2015, and implementation began last permit year.

C. BMPs DEVELOPED to ADDRESS Sediment (SED) and E. coli (EC) TMDLs

The BMPs developed to address Sediment (SED) and E. coli (EC) TMDLs are listed below:

T-1: Initial Stream Assessments and BMP Planning (SED and EC) – Started 2017

Perform initial stream assessments in order to better understand their conditions and to assist in determining the most cost-effective means of lowering pollutant loads.

T-2: Enhanced Public Education and Outreach (SED and EC)

Enhance **BMPs 1-5, 1-7 and 2-3** to ensure that they address bacteria and sediment as high priority water quality issues.

T-3: Enhanced Employee Training (SED and EC)

Enhance **BMP 6-4** to ensure that it addresses bacteria and sediment as high priority water quality issues.

T-4: Town Facilities Assessments and Corrections (SED and EC)

As a part of **BMP 6-6**, all Town facilities have been assessed for conditions that could result in elevated discharges of bacteria or sediment. Where sources of elevated discharges are discovered, they will be eliminated. A Stormwater Pollution Prevention Plan (SWPPP) will be prepared where appropriate.

T-5: Enhanced Illicit Discharge Detection and Elimination Program (SED and EC)

Visit selected businesses that have a possible elevated potential to discharge bacteria or sediment to observe conditions. Take corrective actions where illicit discharges are observed.

T-6: Erosion and Sediment Control Enhanced Enforcement (SED and EC) – Implemented and Administered by Roanoke County as the County is the Town’s ESC Administrator

Evaluate the need to strengthen the erosion and sediment control program enforcement activities.

T-7: Dog Waste Stations (EC)

Increase the number of dog waste stations along Town’s greenways and on Town’s civic facilities.

T-8: Dog Waste Ordinance (EC)

Consider a new dog waste ordinance to strengthen the requirements to pick up dog waste.

T-9: Onsite Sewage Disposal System Maintenance Ordinance (EC) – To Start 2019

Evaluate the advisability of enacting a sewage disposal system maintenance ordinance.

T-10: Stream Buffers (SED and EC) – To Start July 2018

Evaluate the possibility of enacting stream buffer requirements.

Capital Improvements (SED and EC) – Identify Initial Capital Project by July 2019

Construct cost-effective capital improvements to address impairments utilizing 50% Virginia Stormwater Local Assistance Fund grants.

T-1: Initial Stream Assessments and BMP Planning (SED and EC) – To Begin Fall 2017

Goal: The goal of this BMP is to perform field and office investigations of streams within the MS4 area to document existing conditions and identify opportunities for implementation of cost-effective BMPs.

Measurable Goals: N/A

TMDL Consistency: The stream assessment will identify locations where Town efforts should be concentrated, to lower bacteria and sediment discharges (SED& EC).

Evaluation and Modification: The initial stream assessment will be valuable in understanding existing stream conditions and in prioritizing the Town's efforts.

T-2: Enhanced Public Education and Outreach (SED and EC)

Goal: Raise awareness of the water quality issues involving Sediment and E. coli in target audiences and the general public.

Measurable Goals: Incorporate information concerning sediment and E. coli into the MS4 Program public education and outreach efforts in accordance with Table 4-Aof the MS4 Annual Report in **BMP 1-7** for detailed assessment of compliance with goals.

TMDL Consistency: The enhanced Public Education and Outreach goals were specifically tailored to address Sediment and E-coli water quality issues.

Evaluation and Modification: Use of messages tailored to address Sediment and E. coli 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. The Town believes that its current activities in this area are robust and do not require modifications at this time.

T-3: Enhanced Employee Training (SED and EC)

Goal: Raise awareness of the water quality issues involving Sediment and E. coli in Town's employees that receive employee training as a part of **BMP 6-4**.

Measurable Goals: Compliance with **BMP 6-4** training goals for:

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

This training began in permit year 2014 - 2015 and will be performed every two years, in accordance with the MS4 Permit requirements. See **BMP 6-4** in the MS4 Annual Report for documentation of compliance.

TMDL Consistency: The Enhanced Employee Training was specifically tailored to address Sediment and E-coli water quality issues (SED and EC).

Evaluation and Modification: This training is important to give Town's employees the understanding of why certain procedures must be followed. The Town does not believe any modifications are needed at this time.

T-4: Town Facilities Assessments and Corrections (SED and EC)

Goal: Reduce discharges of Sediment and E.coli from Town facilities. Screen Town facilities for conditions that could result in elevated discharges of E-coli and Sediment.

Measurable Goals: The Town has identified all of its high-priority facilities that have a high potential to discharge pollutants in stormwater. Stormwater Pollution Prevention Plans (SWPPPs) will be prepared, implemented, and maintained for each of them. Annual inspections of all facilities that have a SWPPP will be conducted to ensure that any sources of E-coli and Sediment are identified and eliminated. Documentation of these inspections will be kept in each of the SWPPPs.

TMDL Consistency: Screening County facilities, performing site inspections, preparing and implementing SWPPPs, and eliminating potential sources of elevated E-coli and Sediment discharge are consistent with the E-coli and Sediment TMDLs (SED& EC).

Evaluation and Modification: No modifications are planned for this BMP at this time. The Town will continue to develop and implement the remaining SWPPPs, as previously identified and reported under BMP 6-6.

T-5: Enhanced Illicit Discharge Detection and Elimination Program (SED & EC)

Goal: Identify and eliminate Illicit Discharges by proactively visiting and observing conditions at businesses that may have the potential to discharge elevated levels of E. coli into receiving waters.

Measurable Goals: Beginning in permit year 2017 - 2018, a minimum of 5 businesses will be visited to perform site surveys to observe conditions. Initial businesses to be visited include: veterinary clinic, pet related businesses, and restaurants.

TMDL Consistency: Actively looking for illicit discharges of Sediment and E.coli is consistent with the TMDLs (SED& EC).

Evaluation and Modification: This activity will begin in permit year 2017 - 2018. Evaluation and modification are not appropriate at this time.

T-6: Erosion and Sediment Control Enhanced Enforcement (SED and EC) – Administered by Roanoke County

Goal: Reduce offsite discharge of silt and sediment from construction sites.

Measurable Goals: In permit year 2016 - 2017, evaluate current enforcement procedures and policies to determine if there is a need to revise them in order to obtain shortened corrective action times. If the evaluation determines that changes are advisable, any revisions to procedures and policies expect to be implemented in permit year 2017- 2018.

TMDL Consistency: Actions that result in lowering discharges of silt and sediment from construction sites are consistent with the TMDLs (SED& EC).

Evaluation and Modification: This activity will begin in permit year 2016 - 2017. Evaluation and modification are not appropriate at this time.

T-7: Dog Waste Stations (EC)

Goal: Increase the number of maintained dog waste stations in the greenways and civic facilities to reduce discharge of E. coli from dog waste.

Measurable Goals: In permit year 2017 - 2018, one dog waste station has been added for a total of four dog waste stations that have been documented, and future locations continue to be identified.

TMDL Consistency: Actions that decrease discharges of E. coli are consistent with the TMDL (EC).

Evaluation and Modification: No modifications are planned for this BMP at this time. The Town will continue to maintain the dog waste stations, as outlined in the tabulation above.



T-8: Dog Waste Ordinance (EC)

Goal: Reduce discharge of E. coli from dog waste.

Measurable Goals: In permit year 2017 - 2018, Town staff began research existing dog waste ordinances in other Virginia localities and will consider the need to revise the Town existing ordinance, if needed. In the event that it appeared to be advisable, a proposed dog waste ordinance would be presented to the Vinton Town Council for consideration in permit year 2018 - 2019.

TMDL Consistency: Actions that decrease discharges of E. coli are consistent with the TMDL (EC).

Evaluation and Modification: This activity will begin in permit year 2018 - 2019.

T-9: Onsite Sewage Disposal System Maintenance Ordinance (EC)

Goal: Reduce the discharge of E. coli due to mal-functioning onsite sewage disposal systems.

Measurable Goals: Beginning permit year 2016 - 2017, staff will research onsite sewage disposal system locations within the Town, and also research the ordinances of other Virginia localities. In permit year 2018

- 2019, staff will consult with the Town Council; if the Town Council gives general concurrence, then public input will be sought and a draft ordinance may be submitted for the Council's consideration.

TMDL Consistency: Actions that decrease discharges of Sediment and E. coli are consistent with the TMDLs(EC).

Evaluation and Modification: This activity began in permit year 2016-2017.

T-10: Stream Buffers (SED and EC)

Goal: Reduce discharges of Sediment and E. coli by filtering sheet flow through vegetated buffers along streams.

Measurable Goals: In permit year 2016 - 2017, Town staff began to research similar ordinances in Virginia, identify properties that border waterways in the Town, and develop possible stream buffer criteria for new development. In permit year 2018 - 2019, public input will be sought and discussions with the Town Council will be held to obtain direction. If the Council provides general concurrence, staff will work towards submitting an ordinance to the Council for its consideration near the end of permit year 2018 - 2019.

TMDL Consistency: Actions that decrease discharges of Sediment and E. coli are consistent with the TMDLs. (EC & SED)

Evaluation and Modification: This activity will begin in permit year 2018 - 2019. Evaluation and modification are not appropriate at this time.

Capital Improvement Projects – Feasibility and Construction to be Determined

D. STORMWATER VOLUME AND POLLUTANT LOAD ESTIMATION FOR YEAR FIVE

The volume of stormwater discharged and the quantity of pollutants is estimated for all water bodies with a Wasteload Allocation (WLA). These calculations are the same as those used in Year Five of the previous permit as no significant changes have occurred.

In this section, the methods used and results of the calculations are described:

1. Estimated Drainage Area and Percent Impervious, for Sediment and E. coli
2. Annual Precipitation
3. Estimation of Volume of Stormwater Discharged, for Sediment and E. coli Analysis
4. Estimation of Colony Forming Units of E. coli
5. Estimation of Total Suspended Solids Discharged Annually
6. Sediment and E. coli TMDL Studies and Wasteload Allocations
7. Comparison of Discharges to Wasteload Allocations for Sediment and E. coli
8. Issues for Further Study and Clarification

The Town recognizes the need for a better pollutant load estimation methodology. The Town, with the cooperation of the County of Roanoke, anticipates changing its plan assessment methodology to the Watershed Treatment Model, developed by the Center for Watershed Protection, for submission of future annual reports.

Estimated Drainage Area and Percent Impervious, for Sediment, and E. coli

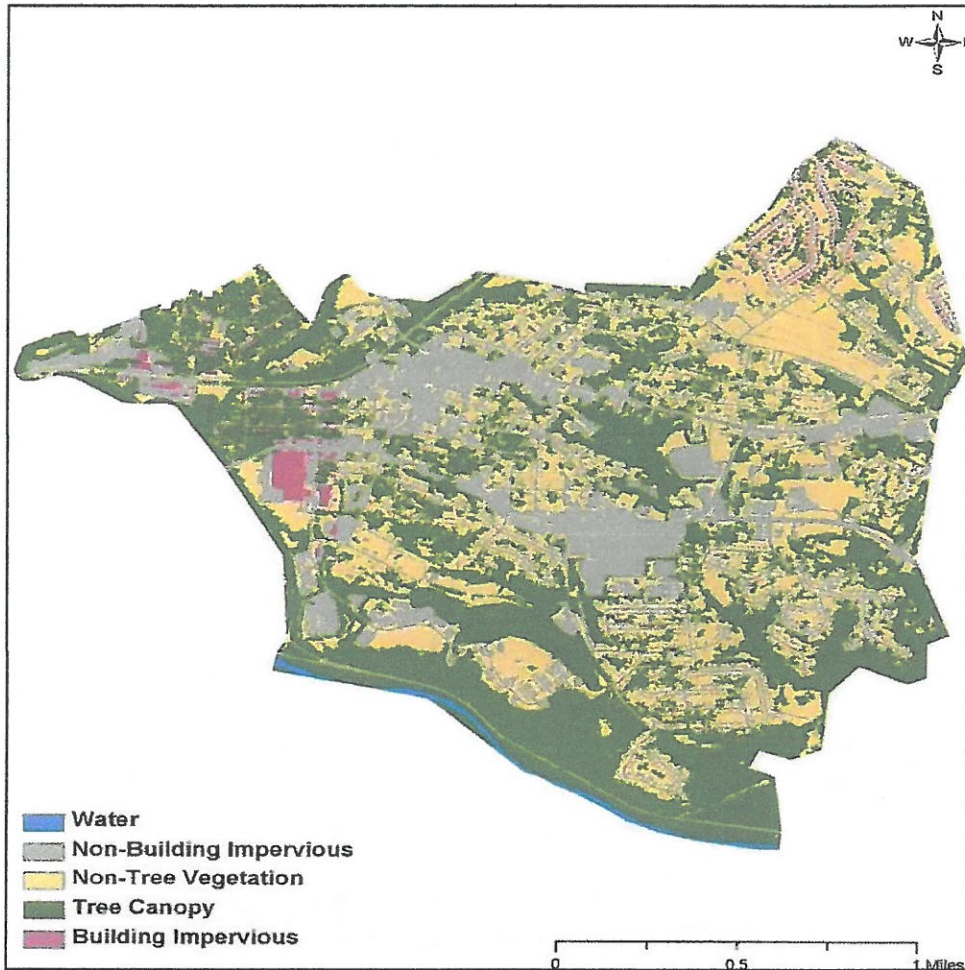
As part of the Town of Vinton Permit Year Five Annual Report – July 1, 2017 through June 30, 2018, this information is being submitted to report the estimate volume of stormwater discharged and the quantity of pollutants identified in the Town’s Wasteload Allocations (WLAs) that is discharged by the regulated small MS4 for each pollutant identified in the local creeks that have a TMDL completed in 2004 and 2006.

This section details a list of all known waters currently receiving discharges or that have potential to receive discharges from the regulated small MS4. The following Table 9 lists the waterways and the Hydrologic Unit Codes (HUC) as identified in the most recent version of the Virginia’s 6th Order National Watershed Boundary Dataset and the estimated drainage areas in the Town of Vinton, served by the regulated small MS4 discharging to these surface waters.

Watershed	Hydrologic Unit	Impaired Receiving Waters	Drainage Area (Estimated in Acres)
Glade Creek	RU13	Glade Creek	711
Roanoke River	RU14	Roanoke River	148
Tinker Creek	RU13	Tinker Creek	489
Wolf Creek	RU14	Roanoke River	663

Table 9. Town of Vinton Watersheds HUC’s, Impaired Receiving Waters, and Drainage Areas inside Town of Vinton

The Percent Impervious for the Town of Vinton was derived from the Town of Vinton Urban Tree Canopy (UTC) Report carried out by the Virginia Department of Forestry in collaboration with the Town and Roanoke Valley Alleghany Regional Commission. The data analysis utilized high resolution (1 meter) aerial imagery acquired in the summer of 2008 and incorporated parcel specific zoning and land use data provided by the Town of Vinton. The UTC report provided the town with an estimate of total impervious cover of **29.4%**.



**Figure 2.
2008 Land
Cover For the
Town of
Vinton,
Urban Tree
Canopy
(UTC) Report**

While the focus of the Town's VSMP permit is on pollution prevention, the permit requires special measures to

address water bodies that are already identified as impaired on the DEQ's 303(d) list. In addition, the permit provides for specific action when a Total Maximum Daily Load (TMDL) Wasteload Allocation (WLA) has been assigned for a specific pollutant of concern. A TMDL establishes the maximum amount of a pollutant that can enter a water body without violating water quality standards.

The Town has several local creeks that have a TMDL completed at the time when the MS4 permit was issued. The creeks, associated pollutants, and wasteload allocations are listed below.

TMDL Waterways and Tributaries*	Year Completed	Parameter	WLA
<i>Tinker Creek Watershed</i>	2004	E. coli (EC)	
Glade Creek			8.78E+10 cfu/year
Tinker Creek			3.42E+11 cfu/year
<i>Roanoke River Watershed</i>	2006	E. coli (EC)	
Roanoke River			3.32E+10 cfu/year
<i>Roanoke River Watershed</i>	2006	Sediment (SED)	
Roanoke River			119.3tons/year

Table 10. Wasteload Allocations for the Town of Vinton Watershed with Completed TMDLs
 *This information is based upon DEQ list of approved and draft TMDL's at <http://www.deq.state.va.us/tmdl/develop.html> for streams located within the urbanized Town of Vinton as defined by the 2010 Census

Annual Precipitation for the Reporting Period

The Town of Vinton gathers its annual precipitation from the Local Climatological Data from NOAA's National Climatic Data Center (NCDC). The Town of Vinton used the data from the Roanoke Regional/Woodrum Field Airport (KROA) due to its close proximity to the Town. This data was collected on a monthly basis from July 1, 2017 through June 30, 2018, and compiled for this report. The total precipitation for the July 1, 2017 through June 30, 2018, period was 38.66 inches.

Estimation of Volume of Stormwater Discharged

Using the Town of Vinton's impervious percentage estimate and annual precipitation, the Town of Vinton has used the formula below to derive the volume, in cubic feet, of runoff from the regulated MS4 for each of the watersheds with an identified wasteload allocation. The results are shown below:

$$R_{cuft} = 36.3021 * X * Y * Z$$

$$36.3021 = \left(\frac{1}{100\%} \right) \left(\frac{1ft}{12in} \right) \left(\frac{0.0015625mi^2}{1acre} \right) \left(\frac{27,880,000ft^2}{1mi^2} \right)$$

- Where:
- R = Runoff Volume Estimate, cubic feet
 - X = 29.4%, Estimated percentage of impervious for Town of Vinton MS4
 - Y = 38.66 inches, Annual precipitation in inches of reporting period July 1, 2017 through June 30, 2018: Data from NOAA, Roanoke Regional Airport Station
 - Z = Area of MS4 (in acres)

Watershed with WLA	Drainage Area of MS4 (ac)	Volume (cubic feet)
Roanoke River	148	6.11E+06
Tinker Creek	489	2.02E+07
Glade Creek	711	2.93E+07

Table 11. Stormwater Runoff Volume Estimation

Estimation of Colony Forming Units of E. Coli

Town of Vinton has utilized the Simple Method (Schueler, 1987) to calculate urban stormwater loading for bacteria. This method is originally derived to calculate bacteria in the form of Fecal Coliform using the National Median Concentration for Chemical Constituents in stormwater factor for fecal coliform. To convert to the E. Coli standard for bacteria to make this calculation consistent with the WLA, Town of Vinton has converted Fecal Coliform to E. Coli using the regression model developed by the Virginia Department of Environmental Quality (DEQ). These methods and results are detailed below.

The Simple Method:

$$L \text{ (cfu/year)} = 103 * R * C_b * A \text{ (Fecal Coliform)}$$

- Where:
- L = Annual load (cfu/year)
 - R_{in} = 38.66 inches, Annual Runoff Estimate
 - = X * Y
 - C_b = Bacteria Concentration (1000/mL)
 - = 15,000/mL (factor for fecal coliform)
 - A = Area (acres)
 - Note: 103 is the conversion Factor for Bacteria

The Virginia Department of Environmental Quality Conversion from Fecal Coliform to E. Coli

$$E \text{ coli} = 2^{[-0.0172+0.91905*\log_2(\text{fecal coliform})]}$$

Watershed with WLA	Drainage Area of MS4 (acres)	Calculated Fecal Coliform (L) (cfu/year) (2017-2018)	Calculated E. Coli (cfu/year) (2017-2018)
Roanoke River	148	2.6E+09	4.43E+08
Tinker Creek	489	8.59E+09	1.34E+09
Glade Creek	711	1.25E+10	1.89E+09

Table 12. Colony Forming Units of E. Coli Estimation

Estimation of Total Suspended Solids (TSS) Discharged Annually

Town of Vinton has utilized the simple method (Schueler, 1987) to calculate urban stormwater loading for total suspended solids. This method identified to the method used for Fecal Coliform with different values for potential concentration and conversion factors. The method and results are detailed below.

The Simple Method:

$$L = 0.226 * R_{in} * C_p * A$$

Where: L = Annual Load (lbs/year)

R_{in} = 38.66 inches, Annual Runoff Estimate
= X * Y

C_p = Pollutant Concentration (mg/L)
= 54.51 mg/L (factor for TSS)

A = Area (acres)

Note: 0.226 is the Conversion Factor for TSS

$$L \text{ annual load (tons)} = \frac{L \text{ lbs (annual load)}}{2000 \text{ lbs}}$$

Watershed with WLA	Drainage Area of MS4 (ac)	Calculated Total Suspended Solids (tons/year) (2017-2018)
Roanoke River	148	10.4 tons/year

Table 13. Total Suspended Solids (TSS) Discharged Annually Estimation

Through its reissued MS4 Permit, effective July 1, 2013, the Town of Vinton has developed TMDL Action Plans for sediment and E. coli as of July 1, 2015. These Action Plans include the steps that the Town intends to take to meet its wasteload allocations. Therefore, a clear understanding of the TMDL studies that developed the wasteload allocations and the Town's current yearly pollutant discharges are critical to ensure that the Town develops effective Action Plans that meet the regulatory requirements and are cost-effective for its citizens.

The calculated E. Coli and Sediment discharges are based solely on land use and precipitation values. Impacts from existing BMPs are not reflected in these calculations. As the County's GIS system is improved to include the Town's BMP data, to better locate and quantify the beneficial effects of BMPs, such BMPs will be integrated into future water quality calculations.

As of October 1, 2015 reporting period, the Town's TMDL Action Plan for Sediment Reduction in the Roanoke River and the TMDL Action Plan for E. Coli Reduction in the Roanoke River, Tinker Creek, and Glade Creek were included as separate documents.

SECTION III
TOWN OF VINTON
SUPPORTING DOCUMENTS
(Please see attached CD)