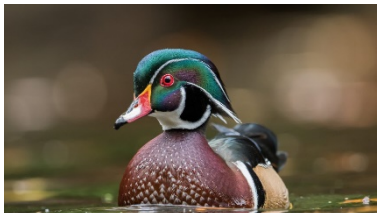
TOTAL MAXIMUM DAILY LOAD (TMDL) ACTION PLAN FOR BACTERIA REDUCTION *(E. Coli)* IN THE ROANOKE RIVER, TINKER CREEK AND GLADE CREEK

Prepared in Compliance with Virginia Pollutant Discharge Elimination System (VPDES) Municipal Separate Storm Sewer Systems (MS4s) General Permit No. VAR040060

A Plan to Address the Town of Vinton's Assigned Waste Load Allocation (WLA) for the Roanoke River, Tinker Creek and Glade Creek Bacteria TMDL

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Revised April 26, 2021

TOWN OF VINTON, VIRGINIA
TMDL ACTION PLAN FOR BACTERIA *(E. coli)* REDUCTION

Contents

I. EXECUTIVE SUMMARY

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

The Town's strategy is to address the permit requirements is to progressively implement Best Management Practices (BMPs) to decrease the amount of E.coli that is discharged into the waterways in order to meet the DEQ-assigned waste load allocation to the maximum extent practicable. The Town will implement BMPs over multiple state permit cycles, using an adaptive iterative approach, to reduce *E. coli* discharges.

This Bacteria TMDL Action Plan has been prepared by Town Staff and approved by the Town Manager. However, nothing in this Action Plan shall be construed as binding the Town to any action until such time that the Vinton Town Council provides final approvals and/or appropriates funding for implementation.

It is expected that this Bacteria Action Plan will be revised from time-to-time to add and/or delete proposed BMPs, revise estimated implementation dates, and to reflect new information. Revised Bacteria Action Plans will be submitted to the DEQ with the MS4 Permit Program Annual Report that is due to DEQ by October 1st of each year.

The following is a tabulation of the Best Management Practices (BMPs) that the Town plans to implement in this permit cycle to decrease discharges of E.coli, to the maximum extent practicable, along with anticipated implementation date. *Note that some of these BMPs are also effective in addressing the Town's sediment wasteload allocations and are also included in the Town of Vinton TMDL Action Plan for Benthic/Sediment Reduction in the Roanoke River.

Some of the Town's modified BMPs will be aligned with Roanoke County's BMPs since the County has been the Town's Erosion Control (ESC) Program Administrator since February 14, 1984 and the Town's Virginia Stormwater Management Program (VSMP) Administrator since April 5, 2016. Additionally, the County operates the Spatial Database Engine (SDE) for the overall County including the Town of Vinton.

BMP # Designation	BMP Name/Task	Implementation Date (Start – Finish)
T-1*: Modified to B-1 and to be Deleted once the task is completed.	Initial Streams Assessment and BMP Planning Stream Digital Assessments – Phase I 1. Glade Creek 2. Tinker Creek 3. Roanoke Rive 4. Wolf Creek Visual Stream Assessment and BMP Planning – Phase II 1. Seven (7) Stream Reaches of Tinker and Glade Creeks 2. Wolf Creek	 Completed January 2017 Completed January 2017 Completed January 2017 Completed January 2017 Completed May 2017 To be completed by May 2022
T-2*: Modified to *B-2	*Enhanced Public Outreach for Bacteria *(E. coli)* – Roanoke County Public and Outreach include the Town Limits (Roanoke County BMP # B-7)	Ongoing
T-3*: Modified to B-3*	Enhanced Employee Training *(E. coli)*	Ongoing
T-4*: Completed and to be Deleted	Town Facilities Assessments and Stormwater Pollution Prevention Plan (SWPPP) for Town Identified Facilities – Five (5) Facilities	**Assessments and SWPPP for All Facilities Completed as of June 2019**
T-5: Deleted	Enhanced Illicit Discharge Detection and Elimination (Bacteria)	N/A
T-6: Deleted	ESC Enhanced Enforcement – Since the Town's ESC Administration is handled by Roanoke County	N/A
B-4 (New)	Business Outreach: Eliminating Illicit Discharges	
T-9: Modified to *B-5	*Public Education: Septic System Repair and Maintenance – Roanoke County Information Dissemination includes the Town Limits (Roanoke County BMP # B-5)	Ongoing
T-7: Modified to B-6	Dog Waste Stations and Signage Installations: 1. Wolf Creek Greenway (Two locations) 2. Gladetown Trail (One location) 3. Glade Creek Greenway Phase 1 (One location) 4. Vinton Farmers' Market (One location) 5. Roland E. Cook Lofts – (Private – One location)	 Completed in 2017 Completed in 2018 Completed in 2019 Completed in 2019 Completed in 2019
T-8: Deleted	Dog Waste Ordinance – It has in the Town Code since 1982 and amended in 2018)	N/A

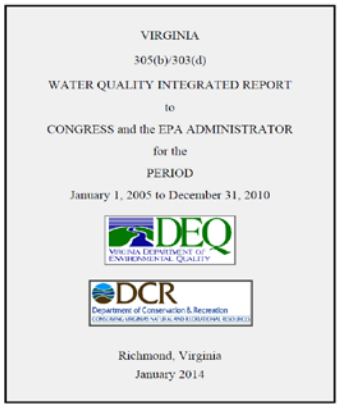
BMP Designation	BMP Name/Task	Implementation Dates (Start – Finish)
B-7*: New	Public Education: Reducing Food Sources Accessible to Wildlife – Roanoke County Information Dissemination includes the Town Limits (Roanoke County BMP # B-4)	Ongoing
B-8*: New	Protect Stream Buffers: No-Mow Policy for Town-Owned Land	Ongoing
T-10*: Modified to B-9*	Protect Stream Buffers: Ordinance • Finalize Ordinance Language • Present to Board of Supervisors for Considerations • Implement ordinance (if approved) Roanoke County BMP # B-2 – to be incorporated in the ESC ordinance and the County is the Town's Administrator.	July 2020 Fall 2020 Fall 2021
T-11*: Modified to B-10	Street Sweeping	Ongoing

***** Also included in the Town of Vinton TMDL Action Plan for Sediment Reduction in the Roanoke River.

II. BACKGROUND

A. General

The Virginia Department of Environmental Quality (DEQ) routinely monitors and tests the Commonwealth's waters (streams, rivers, lakes, and estuaries) to confirm that they meet Virginia's water quality standards (9 VAC 25-260-10). According to Virginia Water Quality Standards, *"all state waters are designated for the following uses: recreational uses (e.g., swimming and boating); the propagation and growth of a balanced indigenous population of aquatic life, including game fish, which might be reasonably expected to inhabit them; wildlife; and the production of edible and marketable natural resources (e.g., fish and shellfish)."*


VIRGINIA
305(b)/303(d)
WATER QUALITY INTEGRATED REPORT
to
CONGRESS and the EPA ADMINISTRATOR
for the
PERIOD
January 1, 2005 to December 31, 2010
DEQ
DCR
Richmond, Virginia
January 2014

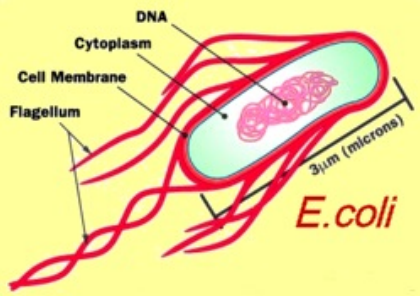
Where DEQ determines that a body of water does not meet Virginia's water quality standards, the water is termed "impaired". Impaired waters are listed on the Virginia Water Quality Assessment 305(b)/303(d) Integrated Report that is issued on even-number years to meet the requirements of the U.S. Clean Water Act sections 305(b) and 303(d) and the Virginia Water Quality Monitoring, Information and Restoration Act. The Town has four (4) streams, including Roanoke River.

DEQ performs studies on impaired waters to determine the "total maximum daily load" that the water can assimilate and still meet water quality standards.

These studies are called TMDL studies. TMDL studies assign "waste load allocations" (WLAs) to permitted point sources of pollution. WLAs are numerical limits of a pollutant of concern that a permitted point source must meet by implementing appropriate strategies, or Best Management Practices (BMPs) using the adaptive iterative approach. BMPs may be implemented over multiple state permit cycles as long as adequate progress to reduce the pollutant of concern is documented.

The Town of Vinton has coverage under the VPDES General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4 General Permit). This MS Permit (General Permit No. VAR040026) is effective November 1, 2018 through October 31, 2023. Pursuant to this permit, all stormwater that passes through a Town-owned or Town-operated storm drain or improved channel is considered to be a point source discharge, and, therefore, subject to WLAs, where appropriate.

The Town has three streams, including Roanoke River with E.coli WLAs; the Roanoke River, Tinker Creek, and Glade Creek. E.coli is a bacterium that is commonly found in the lower intestine of people and warm-blooded animals. It can survive for a limited time outside of the body, and it is used as an indicator organism for fecal contamination.



E.coli diagram

Section II.B. of the MS4 Permit requires the Town to have an updated MS4 Program Plan that includes a specific TMDL Action Plan for pollutants allocated to the MS4 in approved TMDLs.

This specific TMDL Action Plan addresses reduction of E.coli discharged into the three streams with E.coli WLAs.

This Bacteria TMDL Action Plan has been prepared by Town Staff. Public input was sought through public advertisement and a public meeting. The Completed Plan was approved by the Town Manager. However, nothing in this Action Plan shall be construed as binding the Town to any action until such time that the Vinton Town Council provides final approvals and/or appropriates funding for implementation.

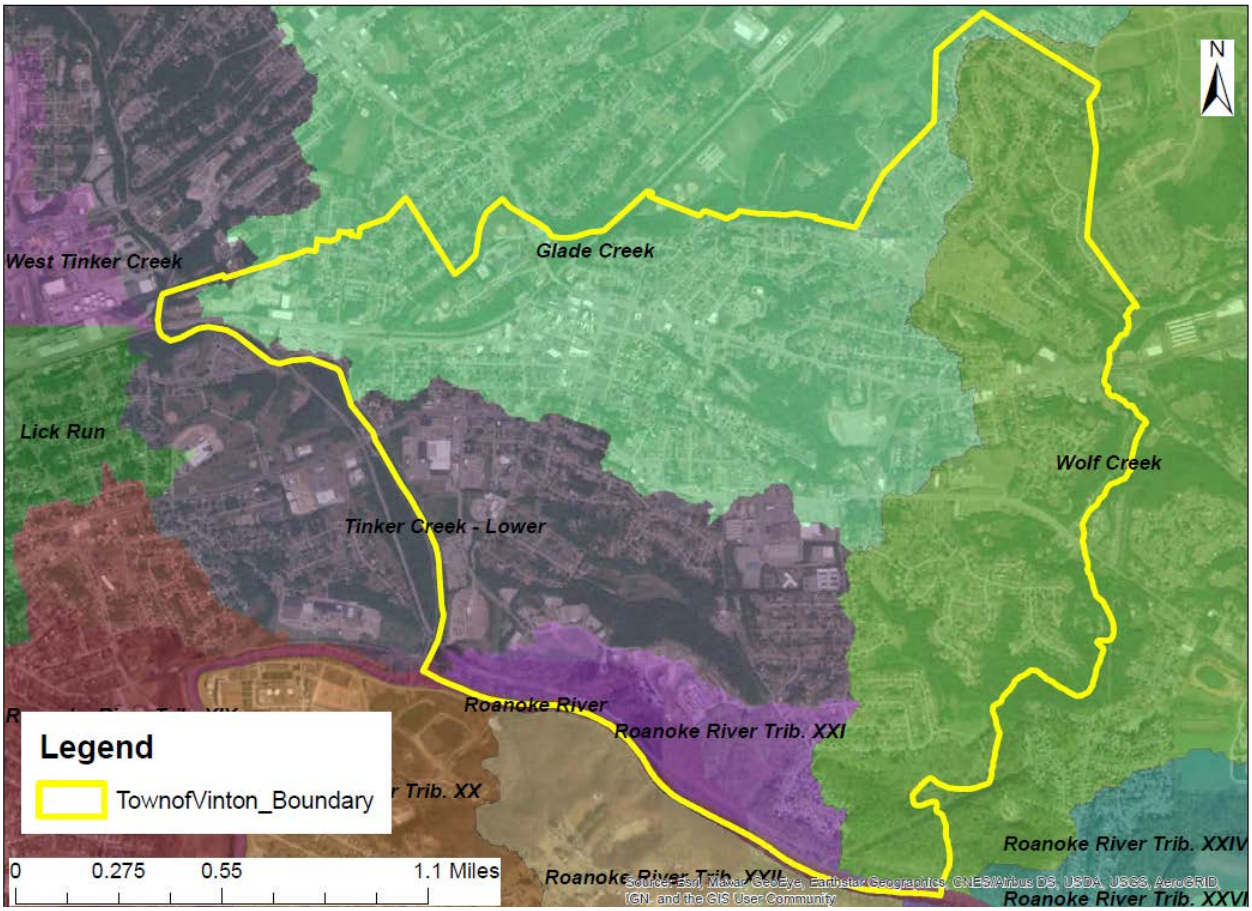
It is expected that this Bacteria TMDL Action Plan will be revised from time-to-time to add, modify, and/or delete BMPs, to adjust estimated implementation dates, and to reflect new information as it becomes available. Progress regarding implementation of this Plan will be included in the MS4 Annual Report that is submitted to DEQ by October 1st of each year in the permit term.

B. Watershed Descriptions

1. Roanoke River

The Roanoke River originates in Montgomery County; flows through Roanoke County, Salem City, Roanoke City, and Town of Vinton; then flows through Roanoke County again; and continues into Bedford and Franklin Counties and Smith Mountain Lake.
The Town of Vinton borders the Roanoke River for 1.6 miles and the Town's entire 3.2 square mile area flows into the Roanoke River.

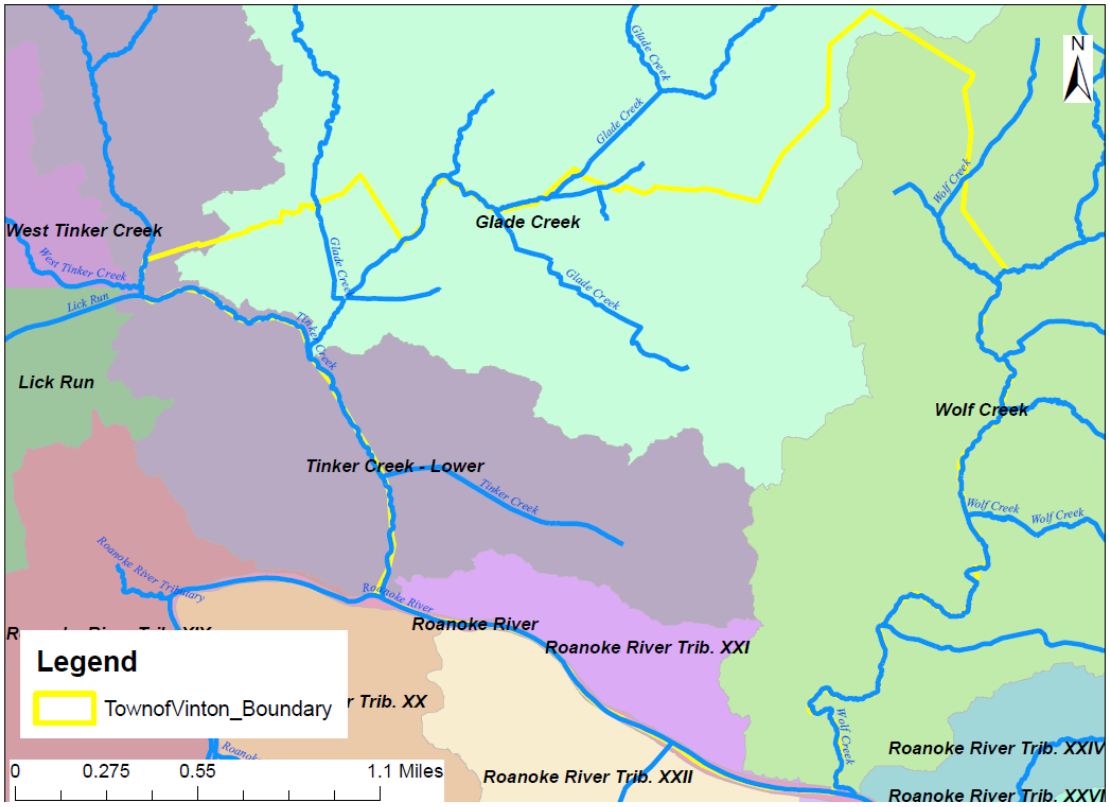
Two streams flow into the Roanoke River that has their own E.coli WLAs – Tinker Creek and Glade Creek. For the purposes of this description, the watersheds of these two streams are nested within the Roanoke River Watershed. More detailed descriptions of the two tributary streams are contained further within this section.



Town of Vinton Watersheds

2. Tinker Creek

Tinker Creek originates in Botetourt County on Tinker Mountain, flows through the Hollins area of Roanoke County, then enters City of Roanoke and discharges into the Roanoke River just downstream from the discharge point at the Western Virginia Water Authority's Roanoke Regional Water Pollution Control Plant. Tinker Creek forms the western boundary between the Town of Vinton and the City of Roanoke. Tinker Creek's estimated drainage area is 489 acres.



Town of Vinton Watersheds and Receiving Waters

3. Glade Creek

Glade Creek originates in Botetourt County near Curry Gap, flows through northeastern Roanoke County including Vinyard Park, a small portion of the City of Roanoke, northwestern Town of Vinton, and discharges into Tinker Creek across from Roanoke City's Fallon Park. Glade Creek's estimated drainage area is 711 acres.

C. Impairment and TMDL Wasteload Allocation

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 current Virginia water quality standard for E.coli to protect primary contact recreation (swimming) is a monthly geometric mean of 126 colony forming units per 100 milliliters (CFU/100 ml), based on a minimum of four monthly samples in a month. If insufficient samples are available to determine a valid geometric mean, then no more than 10% of the samples may exceed 235 CFU/100ml.

1. Roanoke River

The Roanoke River was initially listed as impaired in 1998 for fecal coliform. The likely sources were identified as discharges from municipal separate storm sewer systems, livestock grazing, runoff from urbanized high density areas, septic and other onsite treatment systems, sanitary sewer overflows, wet weather discharges (non-point source), and wildlife other than waterfowl. The Roanoke River is listed as impaired from the Spring Hollow Reservoir water intake, in west Roanoke County, to Smith Mountain Lake.

A TMDL study was performed and approved by U.S. EPA on August 2, 2006 and the Virginia State Water Control Board on June 27, 2007. During the TMDL study, the pollutant of concern was changed from fecal coliform to E.coli due to changes in the Virginia water quality standards.

The TMDL study determined that Vinton was contributing 2,770,000,000,000 (2.77E+12) colony forming units per year and that an approximate **98.8% reduction** was required to remove the impairment. *Vinton's WLA 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.*

2. Tinker Creek

Tinker Creek was initially listed as impaired in 1996 for fecal coliform. The likely sources were identified as discharges from municipal separate storm sewer systems, livestock grazing, runoff from urbanized high density areas, sanitary sewer overflows, wastes from pets, unspecified domestic waste, and wildlife other than waterfowl. Tinker Creek is impaired for its entire length.

A TMDL study was performed and approved by U.S. EPA on August 5, 2004 and the Virginia State Water Control Board on December2, 2004. During the TMDL study, the pollutant of concern was changed from fecal coliform to E.coli due to changes in the Virginia water quality standards.

The TMDL study determined that Vinton required an approximate **98% reduction** from developed lands. *Vinton's WLA 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.*

3. Glade Creek

Glade Creek was initially listed as impaired in 1998 for fecal coliform. The likely sources were identified as discharges from municipal separate storm sewer systems, livestock grazing, runoff from urbanized high density areas, sanitary sewer overflows, wastes from pets, unspecified domestic waste, and wildlife other than waterfowl. Glade Creek is impaired for its entire length.

A TMDL study was performed and approved by U.S. EPA on August 5, 2004 and the Virginia State Water Control Board on December 2, 2004. During the TMDL study, the pollutant of concern was changed from fecal coliform to E.coli due to changes in the Virginia water quality standards.

The TMDL study determined that Vinton required an approximate **96% reduction** from developed lands. Vinton*'s WLA was set at 87,800,000,000 (8.78E+10) colony forming units per year.*

D. Significant Sources of *E. coli* Discharging into MS4

No specific localized significant sources of *E. coli* have been determined. The two TMDL studies identified the following as the most likely sources: discharges from municipal separate storm sewer systems, livestock, runoff from urbanized high-density areas, septic and other onsite treatment systems, sanitary sewer overflows, wet weather discharges (non-point source), wastes from pets, unspecified domestic waste, and wildlife other than waterfowl.

The Town has chosen to focus its efforts on the following strategies in an effort to lower the discharge of *E. coli* from its MS4 system:

Stream Assessment and BMP Planning: To identify potential sources of pollutants and for implementation of a successful project based on site conditions – Completed and to be Deleted once it is completed if *E.coli* sources are not found.
***Enhanced Public Outreach for Bacteria *(E.coli)* – Roanoke Information Dissemination (Mailer) includes the Town Limits**
Enhanced Employee Training (E.coli)
Town Facilities Assessments and Stormwater Pollution Prevention Plan (SWPPP) for Town Facilities
Business Outreach: Eliminating Illicit Discharges
***Public Education: Septic System Repair and Maintenance – Roanoke Information Dissemination (Mailer) includes the Town Limits**
Dog Waste Stations and Signage Installations – GIS/Map Maintained by Roanoke County
***Public Education: Reducing Food Sources Accessible to Wildlife**
Protect Stream Buffers: No-Mow Policy for Town-Owned Land
***Protect Stream Buffers Ordinance:** • **Finalize ordinance** • **Present to Board of Supervisors for consideration** • **Implement ordinance (if approved)** **Roanoke County BMP B-2 – to be incorporated in the ESC ordinance and the County is the Town's ESC Administrator**
Street Sweeping

***BMPs to be fulfilled by Roanoke County Stormwater Division through current and continued coordination and collaboration**

III. BMPs DESIGNED TO REDUCE *E. coli*

A. Stream Assessments

BMP B-1: Stream Assessments – Digital and Physical Assessments

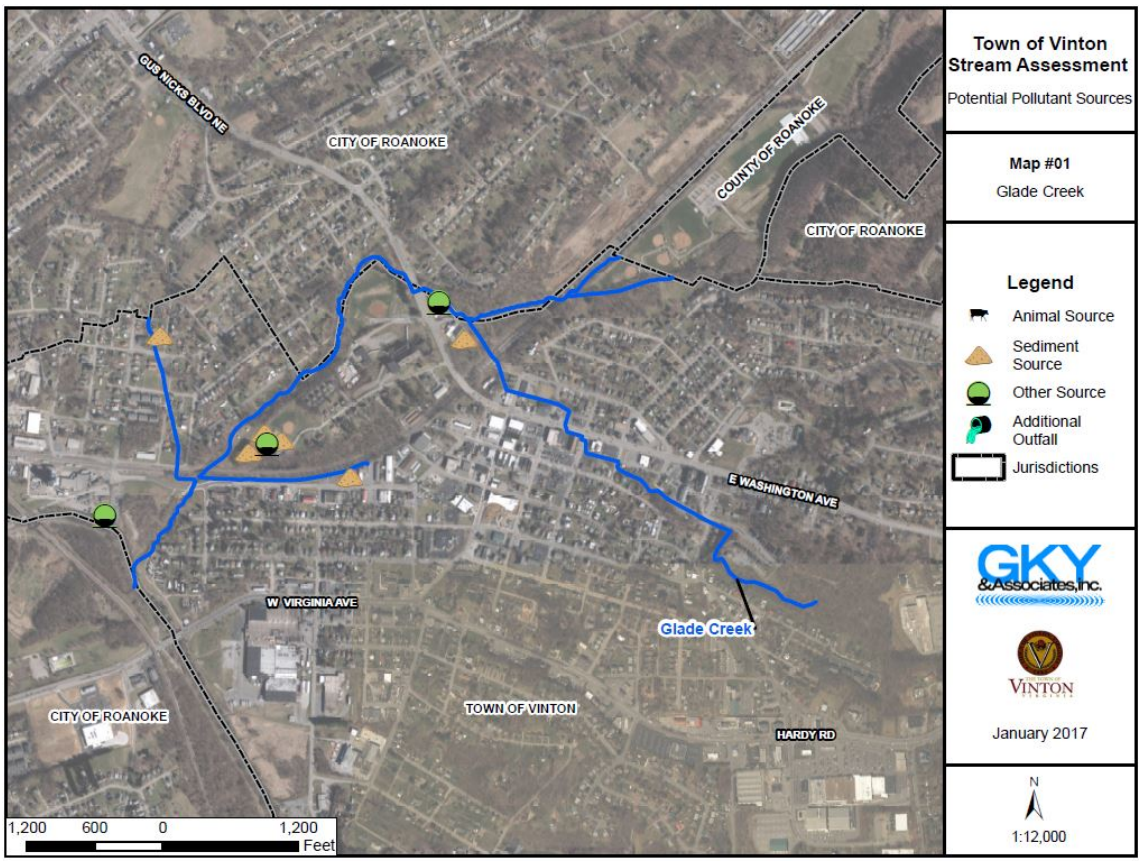
GKY & Associates, Inc., the Town' s consultant completed a digital assessment (Phase 1) of approximately 10 miles of streams in the four (4) watersheds located in the Town's MS4 Area in January 2017. The digital assessment was designed to identify stream reaches with eroding streambanks as well as other potential sediment and bacterial sources. Data collected as part of the digital assessment was entered directly into Roanoke County's Spatial Database Engine (SDE) for use in future pollutant reduction activities (Roanoke County operates the SDE for the overall County including the Town).

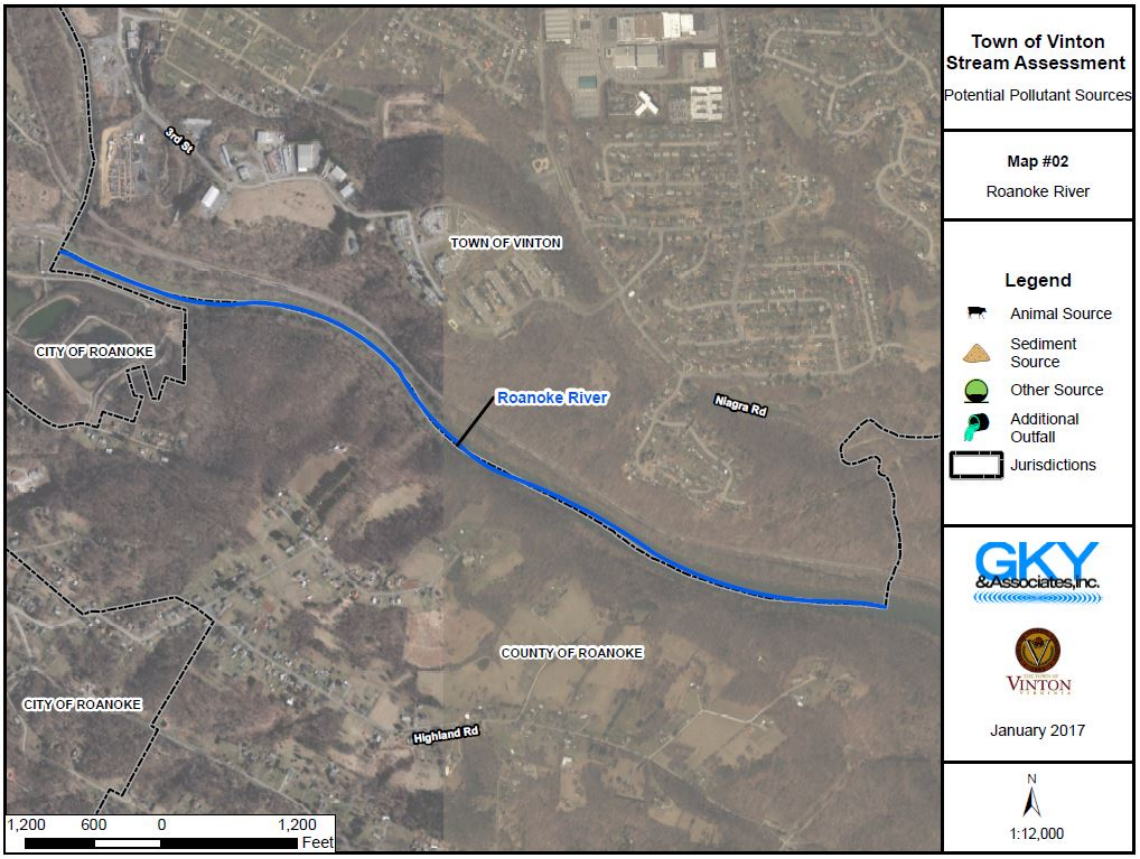
The documentation of potential sources of pollutants of concern was difficult in stream reaches with heavy vegetative canopy as the digital assessment relied on the imagery available in Roanoke County's SDE. However, the following potential sources of pollutants of concern were identified, with no animal sources were identified:

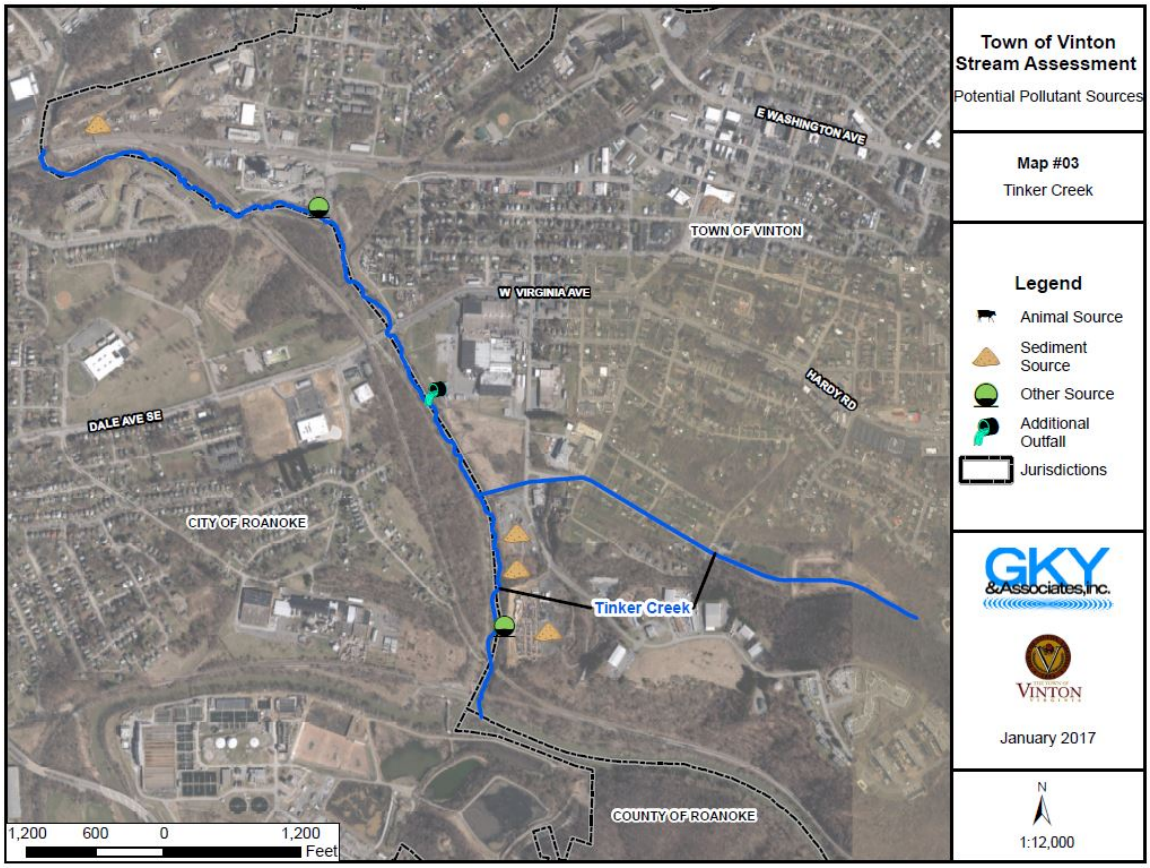
- 18 eroding streambanks;
- 1 armored streambank;
- 10 other potential sediment sources;
- 0 animal sources; and
- 4 other pollutant sources.

Table 1 provides a summary of the potential pollutant sources, by watershed, identified in the SDE, as well as a corresponding Map Number. The Map Numbers correspond to a set of two summary map groups. The first map in the map group identifies the general location of the identified eroding streambanks. The second map provides the general location of the remaining potential pollutant sources including animal sources, sediment sources and other pollutant sources, and identifies the potential additional MS4 outfalls when applicable.

Stream Reach	Miles Assessed	Eroding Stream Reach Segments	Armored Stream Reach Segments	Other Sediment Sources	All Animal Sources	Potential Other Sources	Potential Additional Outfalls	Attachment 1 Map Group #
Glade Creek	3.96	12	1	6	0	2	0	01
Roanoke River	2.27	0	0	0	0	0	0	02
Tinker Creek	2.71	2	0	4	0	2	1	03
Wolf Creek	0.73	5	0	0	0	0	0	04
Total	9.67	19	1	10	0	4	1	


Town of Vinton
Stream Assessment
Potential Pollutant Sources
Map #01
Glade Creek
Legend
Animal Source
Sediment Source
Other Source
Additional Outfall
Jurisdictions
GKY & Associates, Inc.
VINTON
January 2017
N
1:12,000
GUS NICKS BLVD NE
CITY OF ROANOKE
COUNTY OF ROANOKE
CITY OF ROANOKE
E WASHINGTON AVE
W VIRGINIA AVE
Glade Creek
CITY OF ROANOKE
TOWN OF VINTON
HARDY RD
1,200 600 0 1,200
Feet


Town of Vinton
Stream Assessment
Potential Pollutant Sources
Map #02
Roanoke River
Legend
Animal Source
Sediment Source
Other Source
Additional Outfall
Jurisdictions
GKY & Associates, Inc.
VINTON
January 2017
N
1:12,000
3rd St
TOWN OF VINTON
CITY OF ROANOKE
Roanoke River
Niagra Rd
COUNTY OF ROANOKE
CITY OF ROANOKE
Highland Rd
1,200 600 0 1,200
Feet


Town of Vinton
Stream Assessment
Potential Pollutant Sources
Map #03
Tinker Creek
Legend
Animal Source
Sediment Source
Other Source
Additional Outfall
Jurisdictions
GKY & Associates, Inc.
VINTON
January 2017
N
1:12,000
E WASHINGTON AVE
TOWN OF VINTON
W VIRGINIA AVE
HARDY RD
DALE AVE SE
CITY OF ROANOKE
Tinker Creek
COUNTY OF ROANOKE
1,200 600 0 1,200
Feet


Town of Vinton
Stream Assessment
Potential Pollutant Sources
Map #04
Wolf Creek
Legend
Animal Source
Sediment Source
Other Source
Additional Outfall
Jurisdictions
GKY & Associates, Inc.
VINTON
January 2017
N
1:6,000
Wolf Creek Tributary
Mountain View Rd
TOWN OF VINTON
COUNTY OF ROANOKE
E WASHINGTON AVE
600 300 0 600
Feet

B. Illicit Connection or Illicit Discharges to the MS4

***BMP B-2 Enhanced Public Outreach for Bacteria *(E.coli)* – Roanoke County Public Outreach include the Town Limits (Roanoke County BMP # B-7)**

***Certain components of the BMPS as listed below are implemented with continued coordination with Roanoke County Stormwater Division**

In accordance with the MS4 Permit requirements, the Town's Public Education Program targets three high-priority water quality issues that contribute to the degradation of stormwater runoff and receiving waters: excess bacteria, excess sediment, and excess nutrients. The following BMPs, as outlined in the Town's MS4 Program Plan, address these issues:

BMP 1-1. Stormwater Educational Resources - The Town maintains a comprehensive listing of existing stormwater-related agencies and organizations along with pertinent educational programs and resources, which is made available to the public on the Town's stormwater website.

***BMP 1-2. Coordination in the Development and Distribution of Roanoke County Stormwater Newsletter -** Continue to coordinate with Roanoke County Stormwater Division with the development and distribution of Roanoke County Stormwater Informational Mailer to Town of Vinton Residents and Businesses.

BMP 1-3. Stream Monitoring and Education - On behalf of Town of Vinton, Clean Valley Council provides stream monitoring and informational stream seminars for Town of Vinton students and residents.

BMP 1-4. Stormwater Education Program for Schoolchildren - Through the Clean Valley Council, Town of Vinton implements a stormwater education program for its schoolchildren. Different programs target appropriate grade levels.

***BMP 1-5. Stormwater Public Awareness Programs -** The Town of Vinton implements a Stormwater Public Awareness Program by coordinating with Roanoke County Stormwater Division in the distribution of stormwater merchandise, public service announcements, and other high visibility educational media.

BMP 1-6. Town of Vinton Stormwater Webpage - Town of Vinton maintains a Stormwater webpage as a means to inform the public on the various ways to reduce stormwater pollution, placing priority on reducing impacts to impaired waters and addressing other local water pollution concerns**.**

***BMP 1-7. Targeted Education Program -** 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.

BMP 2-3: MS4 Program and Stormwater Pollution Prevention Website - Town of Vinton maintains a webpage that is dedicated to the MS4 Program and Stormwater Pollution Prevention.

High-Priority Water Quality Issue	Target Audiences	Means to Determine Audience Size	Estimated Audience Size	Overall Messages	Means to Deliver Messages	Rationale
BACTERIA	Restaurants and/or Mobile Trucks	Business Licenses/Yellow Pages	43	• An excessive bacterium hinders stream usage and contributes to algae overgrowth, which hurts aquatic life. • All wastewater to sanitary sewers. • Keep exterior trash receptacles and dumpsters covered and do not wash out into storm drain. • Clean kitchen hoods and floor mats; properly dispose of wastewater. • Do not feed wild animals, including geese.	• 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. Feeding wildlife leads to increased bacteria discharged from animal waste.
	Pet Owners (Dogs/Cats): Tags issued by Roanoke County	Pet Licenses	700 dogs and 60 cats	• An excessive bacterium hinders stream usage. • Dog waste ends up in streams. • Pick up after your pet and properly dispose of waste. • Do not feed wild animals, including geese. • Keep trash cans covered and protected from animals • Do not feed pets outdoors.	• County publication sent annually to home/pet owners • PSAs on local cable station	Dog waste is a major source of bacteria in our streams. Feeding wildlife leads to increased bacteria discharged from animal waste.
	Veterinarian Offices	Business Licenses/ Yellow Pages	1	• Excessive bacteria hinders stream usage. • Dog waste ends up in streams. • Pick up after pets and properly dispose of waste. • Do not feed wild animals, including geese. • Keep trash cans covered and protected from animals • Do not feed pets outdoors.	• Brochures placed in Veterinarian offices, annually • PSAs on local cable station	Dog waste is a major source of bacteria in County streams. Feeding wildlife leads to increased bacteria discharged from animal waste.
	Pet Stores/Pet Boarding/ Mobile Pet Grooming/	Business Licenses/ Yellow Pages	3		• Brochures placed in Veterinarian offices, annually • PSAs on local cable station	
	Community Resource Officer	Town Records	1	• An excessive bacterium hinders stream usage. • Dog waste ends up in streams. • Pick up after your pet and properly dispose of waste.	• In-house training	The employee owns and/or handle dog as part of his/her work. Dog waste is a major source of bacteria in our streams.
	Septic System Owners	Water/Sewer Billing Records	58	• Keep septic system maintained; provide periodic pump out. • Repair failing septic system	• County publication sent annually to septic owners.	Malfunctioning or poorly maintained onsite sewage disposal systems may result in discharges of bacteria from human waste.

BMP B-3: Enhanced Employee Training for Bacteria (*E. coli)*

In accordance with the MS4 Permit requirements, The Town's Public Education Program targets three high-priority water quality issues that contribute to the degradation of stormwater runoff and receiving waters: *excess bacteria, excess sediment, and excess nutrients*. Thus, the Town has enhanced its employee training program to recognize bacteria (*E. coli*) as a "high-priority water quality issue." Training courses include the following, as outlined in the MS4 Program Plan, as discussed in the Annual Report in BMP 6-4:

- **Recognition and Reporting of Illicit Discharge** – all applicable field personnel will receive training on a biennial basis in the recognition and reporting of illicit discharges. Among many potential illicit discharges, sediment and bacteria are identified as potential pollutants in this training.

- **Good Housekeeping and Pollution Prevention Practices** – all employees that perform road, street, and parking lot maintenance, or are employed in and around maintenance and public works facilities and at greenway/trail facilities will receive biennial training in good housekeeping and pollution prevention practices. Sediment and bacteria are identified as potential pollutants in this training.

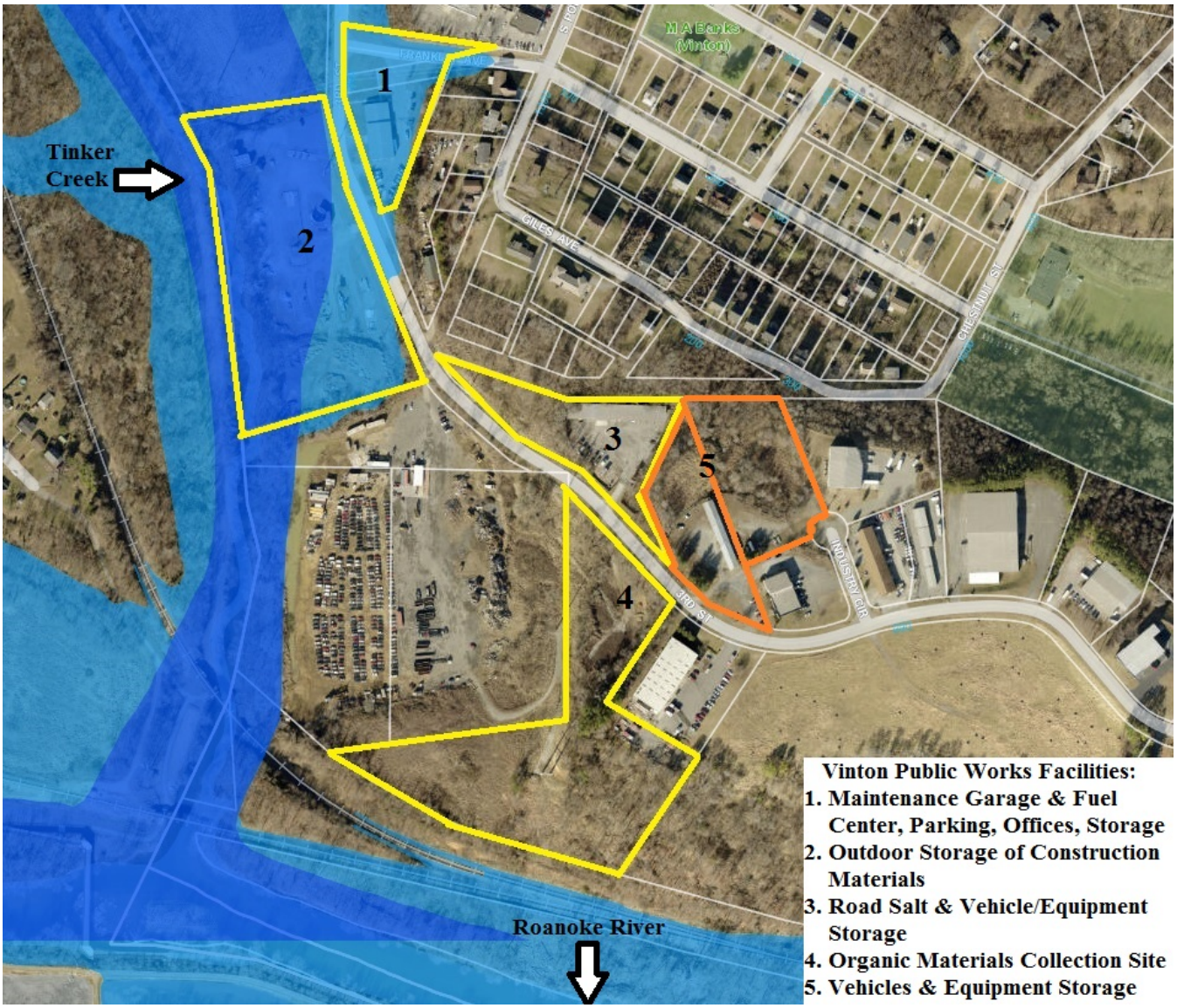
  NOTE: All employees who were required to take Good Housekeeping and Pollution Prevention Practices were required to read and follow the Town's Standard Operating Procedures (SOPs). These procedures were designed to eliminate or minimize pollutant discharges in stormwater, are detailed in BMP 6-5 of the MS4 Program Plan.

- **Contractor Oversight for Environmental Compliance** – all supervisors who oversee Contractors that perform work for the Town or employees involved in developing contracts for Contractors will take this training on a biennial basis. 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. This training discusses the significance of soil erosion from construction sites, the potential harm to receiving waters, and the need to use effective erosion and sediment controls. It also discusses the need to carefully place and maintain portable toilets onsite to ensure bacterial wastes do not enter stormwater runoff. Town employees who oversee Contractors working for the Town must ensure compliance by Contractors.

- **Hazardous Materials (HAZ-MAT) Training** – although not directly related to sediment reduction, the County of Roanoke currently maintains basic hazardous materials training for its employees including Town of Vinton employees, volunteers, in Fire and Rescue. All career (paid) staff are certified to HAZ-MAT Operations. HAZ-MAT certification does not expire from the Virginia Department of Fire Programs; however all career personnel receive annual, internal training on this topic as part of their career development training.

*BMP T-4 – Town Facilities Assessments and Corrections – Completed

All Town-owned properties have been screened for conditions that could result in elevated discharges of bacteria. Those that have been determined to have a high potential will be inspected in the field and a site specific Stormwater Pollution Prevention Plan (SWPPP) will be prepared. Any potential sources of elevated E.coli discharge will be eliminated and steps taken to assure that they do not reoccur. Possible sources of E.coli are sanitary sewer overflows and pet waste along greenways/trails which are adjacent to waterways.



Town Facilities with SWPPP

Name of High-Priority Facility	Activities that Make It High-Priority	High Potential of Discharging Pollutants (Yes or No)	Reasons for High Potential/Or Not	Scheduled SWPPP Development
1. Public Works Building: Fueling Center; Parking Areas; Secondary Containment Areas; Garage/Service Bay; Workshop/Maintenance Area	Fueling Area; Parking Areas; Inside/Outside Storage Areas; Vehicle/Equipment; Maintenance Area	Yes	Fueling activities; parking areas; storage areas; vehicle/equipment maintenance;	June 19, 2015
2. Laydown yard/Outdoor Storage of Construction Materials	Outdoor Storage	Yes	Outdoor storage of construction materials	June 24, 2019
3. Road Salt and Vehicle/Equipment Storage	Storage of salt and vehicle/equipment	Yes	Chemical and storage of vehicle/equipment	September 19, 2018
4. Organic Materials Collection Site	Outdoor storage	Yes	Organic leachate	June 23, 2017
5. Vehicles/Equipment Storage	Indoor and outdoor storage	Yes	Storage of vehicles/ equipment	June 30, 2017

BMP B-4: Business Outreach: Eliminating Illicit Discharges

The Town conducts site inspections of targeted businesses that have an elevated potential to discharge bacteria, such as veterinary clinics, kennels, pet stores, restaurants, vehicle maintenance shops, and car washing facilities. If the business owner is willing, Town staff conduct an inspection of the selected facility and discuss ways to minimize illicit discharges in the day-to-day operations at the facility. If an actual or potential illicit discharge is identified, the Town's inspection staff work with the business owner to eliminate or reduce the risk. A minimum of 5 businesses will be inspected each year.

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

Onsite sewage disposal systems predominately consist of septic tanks with drain fields. There are about 58 septic tanks or other onsite sewage disposal systems located within the Town Limits, with approximately 50% of them installed prior to 1970.

Malfunctioning or poorly maintained onsite sewage disposal systems may result in discharges of bacteria from human waste. Roanoke County information dissemination includes the Town of Vinton.

C. Domestic Pets and Wildlife

BMP B-6: Dog Waste Stations and Signage Installations

It is believed that dog waste is one of the most significant sources of controllable bacteria. Nationally, there are 0.58 dog per household (according to the American Veterinary Medical Association), and each dog, on average, generates 0.42 pounds of fecal material per day. Applying these national averages to the Town, with 3,494 households based on 2010 Census, gives a total of approximately 2,026 dogs that generate approximately 151 tons of fecal material per year.

The Town currently has ordinances that prohibit dogs running at large, requires that house dogs be kept free of flies and nuisance odors, and prohibits depositing waste in public space or on other's property.

The Town has been implementing this BMP since 2017 and has installed five (5) dog waste stations and signage on the town-owned properties such as its greenways, trails, and Farmers' Market. Additionally, apartment buildings have been encouraged to install dog waste station(s), in which Roland E. Cook Lofts, a 21-units apartment building has installed a dog waste station and a signage at their complex. For the locations of existing "Mutt Mitt" dog waste stations, see the online map at https://www.roanokecountyva.gov/2594/GIS-Mapping-Support. Each dog waste station will have signage reminding owners to pick up after their dogs.

BMP B-7: Public Education: Reducing Food Sources Accessible to Wildlife – Roanoke County Information Dissemination (Mailer) includes the Town Limits (Roanoke County BMP B-4)

The Roanoke Valley is blessed with natural beauty and an abundance of wildlife. However, problems often arise when wildlife can access food sources derived, either purposefully or inadvertently, from people. These problems include wildlife becoming dependent on people for food, increased potential for disease for both people and animals, increased property damage, and increased bacteria discharged from animal waste.
By July 2020, Roanoke County will expand its public education program to encourage citizens to reduce food sources accessible to wildlife. Typical messages will include:

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

D. Other BMPs

BMP B-8: Protect Stream Buffers: No Mow Policy for Town-Owned Lands

Stream buffers can be effective in filtering stormwater runoff that sheet flows through the buffer, removing sediments, bacteria, and other pollutants. Unfortunately, some of the privately owned-land along streams in the Town has already been developed, which limits where stream buffers could be provided.

The Town owns properties adjacent to Glade Creek, portion of Tinker Creek and Wolf Creek, which have been developed into greenways and historically, the Town has mowed much of this property up to the top of stream bank. More recently, the Town has recognized that this practice contributes to accelerated stream bank erosion and provides dogs with ready access to the streams.

No Mow Stream Buffers

The Town will formalize its management of stream buffers on Town-owned property in a written policy. The policy will balance the competing goals of providing adequate access to streams for the public, providing adequate views of the streams, excluding dogs, protecting stream banks, and providing vegetative filters. The policy will state general Town criteria, but it will be flexible enough to allow variations in the field for proper overall open space/greenway management. The policy will be prepared by Fall 2021, with implementation occurring in Spring 2022.

*BMP B-9: Protect Stream Buffers: Ordinance

*Roanoke County BMP # B-2 – to be incorporated in the ESC ordinance and the County is the Town's Administrator.

Stream buffers can be effective in dissuading stream access and in filtering stormwater runoff that sheet flows through the buffer, which helps to remove sediment, bacteria, and other pollutants.

Roanoke County currently only has stream buffer requirements for new development along the Roanoke River (Roanoke River Overlay District). In order to expand stream buffer protection, the County has been working on proposed revisions to its Erosion and Sediment Control (ESC) Ordinance to require the maintenance or reestablishment of stream buffers whenever land disturbance activities require an Erosion and Sediment Control Permit.

The proposed changes to the ESC Ordinance will be finalized after additional interaction with stakeholders, which is set for the fall 2020. The final draft ordinance will be presented to the Board of Supervisors by the winter 2020. If the Board approves the new stream buffer requirements, then the effective implementation date of the revised ordinance will likely be one year after adoption.

BMP S-6: Public Street Sweeping and Leaf Collection Program

The street sweeping program offers the greatest benefit to capture roadway contaminants, debris, and sediment before entering the Town's storm sewer collection system.

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, every third week, every fourth week, and on as needed basis (once a while) for one street.

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.

Additionally, with the street sweeper being configured to vacuum debris from drainage inlet continues to optimize both the use and effectiveness of the Town single street sweeper and achieves desired results. Success of this BMP is measured mileage of streets swept; amount of debris vacuumed from drainage inlets; amount of leaf collected; and total expanses of street sweeping and leaf collection programs.

The amount of debris collected by the street sweeping program has and will continue to be tracked, and from July 1, 2019 to June 30, 2020, 93.50 cubic yards of debris was collected under the street sweeping program. The Town will continue to maintain the street sweeping 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 systems, and is of aesthetic benefit.

The leaf collection program minimizes leaf and yard debris that contaminated with pet waste (bacteria) from entering storm sewer system.

The aforementioned BMPs and the Town's Water-Quality Related SOPs will be revised, where appropriate, to include messages from the Bacteria TMDL Action Plan: (1) Use of Dog Waste Stations; (2) Protecting Stream Buffers; (3) Reducing Food Sources Accessible to Wildlife; (4) Septic System Repair & Maintenance; and (5) Eliminating Illicit Discharges.

IV. ANNUAL REPORTING REQUIREMENTS

The MS4 Annual Report will include a summary of actions conducted to implement this Bacteria TMDL Action Plan during the reporting period of July 1st - June 30th for each year of the permit term.

In accordance with the MS4 Permit, the report is submitted to DEQ by October 1st of each year.