Total Maximum Daily Load (TMDL) Action Plan for the Town of Blacksburg, Virginia

This guidance document provides Town staff and citizens with background information and procedures for the development of goals and actions in the efforts to reduce the pollutant loads in local streams. The development of the TMDL Action Plan will be developed as required in the Special Condition of the 2013-2018 General Permit for Discharges of Stormwater from Small (Phase II) MS4s.

Last Updated: June 9, 2015

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Table of Contents

1.0 Introduction

1.1 Definitions

Best Management Practices ("BMPs") – Schedules of activities, prohibitions of practices, maintenance procedures, and other management practices, including both structural and nonstructural practices, to prevent or reduce the pollution of surface waters and groundwater systems.

Existing Sources – Pervious and impervious urban land uses served by the MS4 as of June 30, 2009.

Impervious Cover – A surface composed of material that significantly impedes or prevents natural infiltration of water into soil.

Municipal Separate Storm Sewer System ("MS4") - A conveyance or system of conveyances otherwise known as a municipal separate storm sewer system, including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains:

1 Owned or operated by a federal state, city, town, county, district, association, or other public body, created by or pursuant to state law, having jurisdiction or delegated authority for erosion and sediment control and stormwater management, or a designated and approved management agency under § 208 of the CWA that discharges to surface waters;
2 Designed or used for collecting or conveying stormwater;
3 That is not a combined sewer; and,
4 That is not part of a publicly owned treatment works.

New Sources – Pervious and impervious urban land uses served by the MS4 developed or redeveloped on or after July 1, 2014.

Pollutant(s) of Concern ("POC") – The pollutant(s) impairing a water body for which one or more TMDL(s) has been developed.

Prior Developed Lands ("Redevelopment") – Land that has been previously utilized for residential, commercial, industrial, institutional, recreation, transportation, or utility facilities or structures, and that will have the impervious areas associated with those uses altered during a land-disturbing activity.

Pollutants of Concern ("POC") – The pollutant(s) impairing a water body for which one or more TMDL(s) has been developed such as total suspended solids ("TSS"), bacteria, or Polychlorinated Biphenyls ("PCBs").

Regulated Land – Regulated land refers to the conveyances and drainage area served by the permittee's MS4. For Phase II MS4s regulated land is the conveyances and drainage area that falls within a Census Designated Urbanized Area.

TMDL Implementation Plan – A document guided by an approved TMDL(s) that at a minimum provides details of the corrective actions to address the load allocation of one or more TMDLs. The plan includes measureable goals needed to achieve pollutant(s) source load reductions; outlines a schedule to attain water quality standards along with costs, benefits, and environmental impacts to reduce pollutant(s) and remediate impaired waterbodies.

Total Maximum Daily Load ("TMDL") – The sum of the individual wasteload allocations (WLAs) for point sources, load allocations (LAs) for nonpoint sources, natural background loading and a margin of safety.

Wasteload Allocation ("WLA") - The portion of a receiving waters' pollutant loading capacity that is allocated to existing or future point sources of pollution, such as an MS4.

Unregulated Land – Unregulated land means those acres that are not owned or operated by the MS4 permittee AND are located outside the permittee's regulated land.

For terms not defined above, please refer to the 9VAC25-890-1, 9VAC25-870-10, or 9VAC25-31-10 of the Virginia Administrative Code.

1.2 Background of the TMDL Action Plan

Since 1998 DEQ has developed Total Maximum Daily Loads ("TMDL"), with public input, to restore and maintain the water quality of impaired waterbodies. Section 303(d) of the Clean Water Act requires that wasteload allocations be implemented through the National Pollutant Discharge Elimination System (NPDES) permit program. As point sources, MS4s are assigned individual or aggregate WLAs in TMDLs for receiving streams or watersheds to which the MS4 discharges. Municipalities may also be assigned an LA for those areas outside of the regulated MS4 Service Area that are sources of the POC. TMDLs may quantify both LA and WLA loads from the Census designated urbanized area. Permittees are not required to incorporate approaches for addressing those LAs into their Action Plans. Load allocations are often addressed through TMDL Implementation Plans (IPs) which characterize the suite of corrective actions needed to reduce nonpoint source pollutant loads. This guidance document only addresses the requirements to address WLAs to meet the special conditions for approved total maximum daily loads (TMDL) other than the Chesapeake Bay TMDL" ("Special Condition for Local TMDLs").

The Special Condition for Local TMDLs in the 2013 General VPDES Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (VAR04) ("GP") and the eleven Phase I Individual MS4 permits, as they are reissued, require permittees to develop Action Plans that address all POC(s) for which the permittee has been assigned a WLA under an approved TMDL. The Local TMDL Action Plans should identify BMPs and other management strategies that the permittee will implement to meet the TMDL WLA and achieve compliance with the Special Condition. Local TMDL Action Plans can be implemented in multiple stages over multiple permit cycles using an adaptive iterative approach provided the permittee demonstrates adequate progress toward achieving reductions necessary to meet the WLA(s). Implementation of the TMDL Action Plans is tracked via the permittee's Annual Reports. The goal of the Town of Blacksburg TMDL Action Plan is to restore water quality within local streams and associated tributaries, to achieve full supporting status for the impaired segments, and to de-list the impaired segments from the Virginia 303(d) List of Impaired Waters for bacteria and aquatic life impairments. Additionally, the purpose of this TDML Action Plan is to comply with Section I B Special conditions of the General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems.

The action plan has been developed to be a planning tool to identify the path to reduce the pollutants of concern for all watersheds within the Town of Blacksburg urbanized areas. This action plan will provide

methods and guidance for the Town staff to meet the reductions consistent with the TMDL studies performed on our waters.

1.3 Permit Requirements

With the exception of newly designated permittees, the Phase II Small MS4 GP requires that:

1. Action Plans for local TMDLs approved before July 1, 2008 must be completed by July 1, 2015 and submitted with the Annual Report due October 1, 2015.

2. Action Plans for local TMDLs approved between July 1, 2008 and June 30, 2013 must be completed by July 1, 2016 and submitted with the annual report due October 1, 2016.

Newly designated MS4 permittees should have included a schedule for developing local TMDL Action Plans as part of the MS4 Program Plan and registration statement submitted to obtain initial coverage under the 2013 GP and should follow that approved schedule. Likewise, Phase I permittees must follow the schedule in their individual permit. In accordance with Section I.B.7 of the GP, permittees must include an estimated date by which they will achieve the assigned WLAs as part of the reapplication package.

The Phase II Small MS4 local TMDL Action Plans and updates become effective and enforceable 90 days after the date received by the Department unless specifically denied in writing. DEQ may request additional information in the review process, as needed. In the Action Plan permittees are responsible for establishing schedules and milestones to meet the assigned WLA(s). The approved Action Plan schedule will supersede any implied or explicit completion date or schedule provided in the local TMDL or Implementation Plan. Permittees are strongly encouraged to work closely with the DEQ regional TMDL and MS4 staff throughout the development of the Action Plan(s).

1.4 Applicable WLAs

Prior to Action Plan development, permittees will need to determine the local TMDLs in which the MS4 has been assigned a WLA. Detailed information regarding the portion of each watershed that drains to an MS4 system may not be available during local TMDL development and WLA assignment, so a conservative, land-use based approach is often used. It is important to note that the actual areas within a local TMDL watershed that are subject to a MS4 WLA are those areas that are specifically regulated under the MS4 permit. TMDL studies do not attempt or intend to define the MS4 regulatory area. Rather, the areas used to develop loadings associated with the MS4 permits in local TMDLs (e.g. impervious developed or Census designated urbanized areas) are only surrogates for establishing WLAs and estimating a reasonable pollutant loading that is expected to be contributed by these permitted sources.

1.5 Aggregate WLAs

In some circumstances multiple permittees may be assigned one WLA, or an aggregate WLA within a TMDL, for their discharges to the impaired waterbody. Aggregate WLAs are intended to address a watershed wide pollutant without discrete MS4 boundaries. Aggregated WLAs may occur in a TMDL when permittees are closely interconnected, the TMDL study does not have sufficient information or detail to disaggregate the WLA, or the scale of the TMDL is too great to delineate individual WLAs. This is the case for one of the TMDL studies completed in the Blacksburg regulated area, Stroubles Creek. Efforts are

made to delineate an individual WLA for the Town of Blacksburg and are discussed further in Section 3.0, Summary of Local TMDLs.

1.6 Forthcoming WLAs for Existing TMDLs

Newly designated Phase II and existing Phase II MS4 permittees with expanded urbanized areas as the result of the 2010 Census may drain to impaired waters for which a local TMDL has been developed. These permittees may not currently have a WLA assigned to them under these TMDLs. For the Town of Blacksburg, the 2010 Census had no impact on the watersheds to which the urbanized area drains.

1.7 Existing Permittees with Expanded Area

Existing permittees who were previously assigned a WLA and whose urbanized area expanded as a result of the 2010 Census are required to meet the WLA(s) assigned prior to the identification of an expanded urbanized area. As WLAs are revised and/or finalized by DEQ to incorporate the expanded urbanized area, permittees will be required to address those POC reductions in future permit cycles. The Town did not have any significant change to its regulated urbanized area resulting from the 2010 Census.

1.8 New permittees

New permittees that discharge to impaired waterbodies with one or more approved local TMDL(s) may not have been assigned WLA(s) yet. The Department recommends permittees begin planning for future WLAs by considering land use based reductions as discussed above. The Town is not a newly permitted MS4, therefore all WLAs have already been assigned.

1.9 Action Plan Content

The proposed strategies and the end date by which permittees will demonstrate compliance with their assigned WLA(s) will be determined by the permittee; however, the Action Plan should also include justification for these choices. Permittees should address the following in their Action Plan(s):

1. The name(s) of the Final TMDL reports, *(Section 2.0: Introduction to the TMDL Watersheds of Blacksburg).*
2. The pollutant(s) causing the impairment(s), *(Section 3.0: Summary of Local TMDLs).*
3. The WLA(s) assigned to the MS4 as aggregate or individual WLAs, *(Section 3.0: Summary of Local TMDLs).*
4. Significant sources of POC(s) from facilities of concern owned or operated by the MS4 operator that are not covered under a separate VPDES permit. A significant source of pollutant(s) from a facility of concern means a discharge where the expected pollutant loading is greater than the average pollutant loading for the land use identified in the TMDL *(Section 7.0: Pollutants of Concern (POCs) from Facilities Owned or Operated by the MS4).*
5. Existing or new management practices, control techniques, and system design and engineering methods, that have been or will be implemented as part of the MS4 Program Plan that are applicable to reducing the pollutant identified in the WLA, *(Section 9.0: Implementation Actions).*
6. Legal authorities such as ordinances, state and other permits, orders, specific contract language, and interjurisdictional agreements applicable to reducing the POCs identified in

each respective TMDL, *(Section 9.2: Legal Authorities, Permits, Contracts and Interjurisdictional Agreements).*

7. Enhancements to public education, outreach, and employee training programs to also promote methods to eliminate and reduce discharges of the POC(s) for which a WLA has been assigned, *(Section 9.0: Implementation Actions).*
8. A schedule of interim milestones and implementation of the items in 5, 6, and 7; *(Section 10.0: Measurable Goals and Milestones for Attaining Water Quality Standards)*
9. Methods to assess TMDL Action Plans for their effectiveness in reducing the pollutants identified in the WLAs, *(Section 11.0: Assessment Methods for Determining Effectiveness),* and
10. Measurable goals and the metrics that the permittee and Department will use to track those goals (and the milestones required by the permit). Evaluation metrics other than monitoring may be used to determine compliance with the TMDLs; *(Section 10.0: Measurable Goals and Milestones for Attaining Water Quality Standards).*

2.0 Introduction to the TMDL Watersheds of the Town of Blacksburg

Stroubles Creek

TMDL: *Benthic TMDL for Stroubles Creek in Montgomery County, Virginia*
Prepared by: The Department of Biological Systems Engineering, Virginia Tech
October 9, 2003 and Revised October 16, 2003
POC: Sediment

Stroubles Creek is a tributary of the New River, which drains to the Ohio River and the Gulf of Mexico. The Stroubles Creek watershed is approximately 25% Residential, 25% University, 25% Agricultural and 10% Commercial. The commercial area is a small area but it is very concentrated. Stroubles Creek is piped underneath the downtown corridor of Blacksburg and is impacted by many of the commercial businesses that it flows beneath.

Stroubles Creek watershed has an area of 5,415 acres within the limits of the Town of Blacksburg. Slate Branch is a tributary of Stroubles Creek. Stroubles Creek was originally listed as impaired in 1996 with a benthic impairment. A TMDL was completed in 2003 and a TMDL Implementation Plan was authored in 2006. The Stroubles Creek TMDL assigned an **aggregate** WLA for Stroubles Creek of **210.8 tons/year** of sediment for the MS4 permitted entities of VDOT, Virginia Tech and the Town of Blacksburg.

In 2006 Stroubles Creek was also listed as impaired for Escherichia coli, but this impairment is scheduled for a TMDL study in 2014 and will not be addressed in this action plan.

North Fork Roanoke River

TMDL: *Benthic TMDL Development for the Roanoke River, Virginia*
Prepared By: The Louis Berger Group
March 2006
POC: Sediment

The North Fork of the Roanoke River is a Tributary of the Upper Roanoke River watershed. These waters drain to the Atlantic Ocean through the Albemarle Sound in North Carolina. Several minor tributaries of the North Fork drain the eastern side of Blacksburg. Some of the tributaries are un-named; others have names such as Indian Run. The North Fork watershed is 60% residential, 35% agriculture and undeveloped land and less than 10% is a mixture of commercial, and municipal.

The North Fork has an area of 573 acres within the Town limits, the smallest watershed in Town. The North Fork was originally listed as impaired in 1996 for benthics and in 1998 for bacteria. TMDLs for both impairments were completed in 2006. The Roanoke River was originally listed as impaired for PCB's in fish tissue in 1996 near the cities of Salem and Roanoke. A TMDL study including the Town of Blacksburg was completed in 2009.

The total 2006 TMDL wasteload allocation for the Town of Blacksburg for sediment was **82.8** tons per year. The bacterial TMDL study combined Wilson Creek and the North Fork tributaries and the associated wasteload allocation is described below.

Wilson Creek

TMDL: *Bacteria TMDLs for Wilson Creek, Ore Branch and Roanoke River Watersheds, Virginia and Prepared By: George Mason University and the Louis Berger Group*
February 2006
POC: Bacteria

Wilson Creek is a tributary of the North Fork of the Roanoke River. This watershed begins in Blacksburg, Virginia and drains through southern Virginia as the Staunton River and then to northeastern North Carolina to the Albemarle Sound. The Albemarle Sound is a large estuary that drains to the Atlantic Ocean. The Wilson Creek Watershed is 30% residential, 25% commercial, 25% undeveloped and the remaining portion is a mixture of agriculture, industrial and municipal uses.

Wilson Creek watershed has an area of 1,509 acres within the limits of the Town of Blacksburg. Cedar Run is a tributary of Wilson Creek. Wilson Creek was originally listed as impaired in 1998 for exceeding levels of fecal coliform and Escherichia coli. A TMDL was completed for Wilson Creek and the Upper Roanoke River in 2006.

The total wasteload allocation for the Town of Blacksburg in 2006 was 3.15E+09 colony forming units per year for both the Wilson Creek and North Fork Roanoke River watersheds.

3.0 Summary of Local TMDLs

3.1 Stroubles Creek Sediment TMDL

Biological monitoring of Stroubles Creek over a period of 5 years has indicated that the water body did not support the "general standard" of water quality in Virginia. Along with a number of standards for specific

pollutants, Virginia also has a general standard, which states that a water body must be free of pollutants or environmental stresses that substantially alter the aquatic biological community.

Impairment, at the time, was defined by two or more ratings (over the assessment period) of "moderate" or "severe" based on the Environmental Protection Agency's (EPA's) Rapid Bio-assessment Protocol (RBP) II. Bio-monitoring has been conducted on Stroubles Creek since 1994. Originally listed in 1996 with a benthic impairment, Stroubles Creek was also included on the 1998 and 2002 303(d) TMDL priority lists in Virginia. During the most recent assessment period (2002), Stroubles Creek's benthic community was monitored 9 times; each assessment received a "moderately impaired" rating. The overall rating for each of these assessment periods has consistently been "moderately impaired", leading to Stroubles Creek's placement on Virginia's 303(d) list of impaired water bodies with a benthic impairment. As such, it does not fully support the Clean Water Act's ***aquatic life*** use. The impairment extends from the Duck Pond outlet downstream to its confluence with Walls Branch, for a total of 4.98 stream miles.

A TMDL study was conducted on Stroubles Creek from April 2002 through October 2003 and approved by EPA in January 2004. The TMDL specified the maximum sediment load that Stroubles Creek can handle in a manner that is protective of the habitat for benthic macro-invertebrates, in particular, and aquatic life, in general, so that it is in compliance with Virginia water quality standards.

The Stroubles Creek TMDL assigned an aggregate WLA for Stroubles Creek of 210.8 tons/year for the MS4 permitted entities of VDOT, Virginia Tech and the Town of Blacksburg. This document identifies this aggregate WLA and utilizes the Watershed Treatment Model to separate the WLA that should be applied to the Blacksburg MS4 area. An analysis was performed in this action plan to identify the Town of Blacksburg portion of the allocation as **187.85** tons/year. This is discussed in detail in the Required Reductions section.

3.2 Roanoke River Bacterial and Sediment TMDLs

Monitoring performed by the Commonwealth of Virginia identified water bodies within the Roanoke River watershed that did not meet the Escherichia coli (E. coli) standards and therefore did not protect the ***recreation beneficial*** use. In addition, monitoring also identified portions of the main stem of the Roanoke River not attaining the ***aquatic life*** use based on impaired benthic macro-invertebrate communities. The bacteria impaired segments were first listed as impaired on one of Virginia's 303(d) Total Maximum Daily Load (TMDL) Priority List and Reports starting in 1996. The benthic impaired segments were first listed as impaired on Virginia's 1996 303(d) Total Maximum Daily Load Priority List and Report. TMDLs were developed and approved for these impaired segments in 2004 and 2006. These TMDLs developed bacteria and sediment reductions necessary to meet the E. coli and aquatic life water quality standards. The goal of the Roanoke River TMDL Implementation Plan (IP) is to restore water quality within the Roanoke River and associated tributaries, to achieve full supporting status for the impaired segments, and to de-list the impaired segments from the Virginia 303(d) List of Impaired Waters for bacteria and aquatic life impairments.

3.3 Roanoke River PCB TMDL (after 7/1/2008)

Virginia's 2008 section 303(d) list classifies several waterbodies in the Roanoke River basin as impaired for Polychlorinated Biphenyls (PCB) from elevated PCB concentrations found in fish tissue and sediment samples. The Virginia Department of Environmental Quality (VADEQ) first collected monitoring data on PCB contamination in the basin in 1971. Regular fish tissue and sediment sampling for PCBs began in 1993, and a rotating basin monitoring schedule is ongoing as part of the Statewide Fish Tissue and Sediment monitoring program. The Virginia Department of Health (VDH) has issued fish consumption advisories for several sections of the Roanoke River and tributaries since 1998 on the basis of the fish tissue data collected by VADEQ.

PCBs are a group of synthetic chemicals that consist of 209 individual compounds (known as congeners). Physically, they are either oily liquids or solids and are colorless to light yellow in color with no known smell or taste. PCBs made in the United States were marketed under the trade name "Aroclor" and most are identified by a four-digit numbering code in which the first two digits indicate that the parent molecule is a biphenyl. PCBs possess excellent dielectric and flame-resistant properties derived from the stable molecular structure. These same properties cause PCBs to accumulate in the fatty tissue of biota and bio-accumulate in the food chain (http://www.epa.gov/ttn/atw/hlthef/polychlo.html).

Although it is now illegal to manufacture, distribute, or use PCBs, before 1974 they were used in numerous products including, capacitors, transformers, plasticizers, surface coatings, inks, adhesives, pesticide extenders, paints, carbonless duplicating paper, etc. After 1974, PCB use was restricted to producing capacitors and transformers, and in 1979 the manufacture and use of PCBs was completely banned. Historically, PCBs had been introduced into the environment through discharges from point sources and through spills and releases. Although point source contributions are now controlled, facilities could be unknowingly discharging PCB loads as a result of historical contamination. Sites with PCB-contaminated soils can also act as precipitation-driven nonpoint sources. In addition, the widespread use of PCBs before their ban coupled with their stable molecular structure has caused a generalized distribution of the pollutant in air, soil, and water at background concentrations. Once in a waterbody, PCBs become associated with sediment particles. PCBs are very resistant to breakdown and thus remain in river and lake sediments for many years.

The objective of the Roanoke River PCB TMDL study is to identify the sources of Polychlorinated Biphenyl (PCB) contamination in the watershed and determine the reductions in pollutant loadings necessary to achieve the applicable water quality standards. The impairment listings for stream and reservoir segments in the study area are based on the historical fish tissue and sediment monitoring data record. This TMDL study was designed to address select PCB impairments included on Virginia's 1998 303(d) list. More recent monitoring studies have resulted in the listing of additional PCB-impaired stream and reservoir segments in the watershed, including updates on Virginia's 2008 303(d) list (Table ES-1) and a forthcoming violation listing (2010) of the ***public water supply*** use.

This TMDL was published in April 9, 2010 and will not be included in the TMDL Action Plan this year. Work is currently being done to incorporate actions and BMPs that would address PCBs in fish tissue into the next years Action Plan.

4.0 Sediment TMDL Wasteload Allocations

Below are the watersheds which have a sediment TMDL waste load allocation. The watershed name, area, waste load allocation to the MS4 and total reduction required is listed in the table below. These values are referenced from the original TMDL studies. A more detailed drainage basin analysis will be evaluated as part of this Action Plan and the total acreage will change.

Stream Name	Acreage (ac)	WLA (tons/yr)
Stroubles Creek (NE59)	5,415	210.88*
Wilson Creek and Roanoke River (RU07, RUO6)	1,360	82.8

*This number is the waste load allocation allocated to MS4s numbers VAR040019, VAR040049, and VAR040016. This number is revised later in the document to reflect the specific estimated allocation for the Town of Blacksburg only.

5.0 Bacteria TMDL Wasteload Allocations

Below are the watersheds which have a bacteria TMDL waste load allocation. The area, percent impervious, waste load allocation and total reduction required is listed in the table below. A more detailed drainage basin analysis will be evaluated as part of this Action Plan and the total acreage will change.

Stream Name	Acreage	WLA (cfu/yr)
Wilson Creek and Roanoke River (RU07, RUO6)	1,360	3.15 E+09

6.0 PCBs in Fish Tissue TMDL Wasteload Allocations

Below are the watersheds which have a bacteria TMDL waste load allocation. The area, percent impervious, waste load allocation and total reduction required is listed in the table below.

Stream Name	Acreage	WLA (mg/yr) tPCBs
Wilson Creek and Roanoke River (RU07, RUO6)	1,360	7.8

**This WLA is not included in this TMDL Action Plan as it was approved after 2010.*

7.0 Pollutants of Concern (POCs) from Facilities Owned or Operated by the MS4

The Town of Blacksburg has analyzed all Town Owned or Operated facilities within our regulated urbanized area. Below are the facilities that are contained within this area. Currently no facility has been found to contain significant sources of POCs from these facilities. Investigation of the facilities will be an ongoing process and if any facilities are identified as discharging a POC this will be included in this section of the TMDL Action Plan.

#	Site	Pollutant(s) of Concern	Site Condition
1	Red Maple Water Tank	Sediment	Stabilized
2	Neil Street Water Tank	Sediment	Stabilized
3	Maple Ridge Pump Station	Sediment and Bacteria	Stabilized. No bacterial contributions.
4	Blacksburg Rescue Squad	Sediment	Under Construction. Covered under VAR10G421.
5	Community Center Complex	Sediment	Stabilized
6	Dundas Heights Open Space	Sediment and Bacteria	Stabilized. No bacterial contributions.
7	Windsor Hills Pump Station	Sediment	Stabilized
8	Cork Drive Open Space	Sediment	Forested
9	McBryde Village Park	Sediment	Forested
10	Dundas Heights Park Land	Sediment	Forested
11	Owens Street Park	Sediment	Stabilized
12	Kabrich Open Space	Sediment	Stabilized
13	Clay St Water Tank	Sediment	Stabilized
14	Wong Park	Sediment	Stabilized
15	Oddfellows Hall	Sediment	Stabilized
16	African American Cemetery	Sediment	Stabilized
17	Cooks Clean Center	Sediment	Stabilized
18	Progress Street Parking Lot	Sediment	Stabilized
19	Dickerson Estates Park	Sediment	Forested
20	DOWNTOWN FIRE & RESCUE	Sediment	Stabilized
21	Knob Hill Open Space	Sediment	Stabilized
22	Price House	Sediment	Stabilized
23	Church Street Parking Lot	Sediment	Stabilized
24	Clay Street Spring Park	Sediment	Stabilized & Forested
25	The Armory Building	Sediment	Stabilized
26	Farmers Market	Sediment	Stabilized
27	Black House and Thomas Conner	Sediment	Stabilized
28	Municipal Building	Sediment	Stabilized
29	Blacksburg Motor Company	Sediment	Stabilized
30	Municipal Golf Course	Sediment	Stabilized
31	Huckleberry Trail	Sediment	Stabilized
32	Oak Manor Well House	Sediment	Stabilized
33	Highland Park Pump Station	Sediment and Bacteria	Stabilized. No bacterial contributions.

#	Site	Pollutant(s) of Concern	Site Condition
34	Graves Open Space	Sediment	Stabilized
35	Crestview Water Tank and Park	Sediment and Bacteria	Stabilized. No bacterial contributions.
36	Sheffield Open Space	Sediment	Stabilized
37	Hardie Hills Open Space	Sediment and Bacteria	Stabilized. No bacterial contributions.
38	Kipps Ball Fields	Sediment	Stabilized
39	Landsdowne Open Space	Sediment and Bacteria	Stabilized. No bacterial contributions.
40	Downtown Police Station	Sediment	Stabilized
41	Nellies Cave Park	Sediment and Bacteria	Stabilized. No bacterial contributions.
42	Dehart Open Space	Sediment	Stabilized
43	Gardenspring Open space	Sediment	Stabilized
44	Hubbard Street Fire Station	Sediment and Bacteria	Stabilized. No bacterial contributions.
45	Tall Oaks Pump Station	Sediment	Stabilized
46	Cedar Run Open Space	Sediment and Bacteria	Stabilized. No bacterial contributions.
47	CRC PH II Pump Station	Sediment	Stabilized
48	Cedar Hill Park	Sediment and Bacteria	Stabilized. No bacterial contributions.
49	Cedar Run Pump Station	Sediment and Bacteria	Stabilized. No bacterial contributions.
50	Public Works Complex	Sediment and Bacteria	Stabilized. No bacterial contributions.
51	Cedar Run Springs and Open Space	Sediment	Stabilized
52	Cedar Run Open Space	Sediment and Bacteria	Stabilized. No bacterial contributions.
53	CRC PH I Pump Station	Sediment	Stabilized
54	Blacksburg Transit	Sediment and Bacteria	Stabilized. No bacterial contributions.
55	South Point Park	Sediment	Stabilized
56	Hospital Pump Station	Sediment	Stabilized
57	Industrial Park Pump Station	Sediment and Bacteria	Stabilized. No bacterial contributions.
58	Westview Cemetery	Sediment	Stabilized

8.0 Action Plan Development Process

8.1 Required Reductions

To most accurately represent the TMDL required reductions, a multi-phased analysis was completed. This process is the first iteration of this estimate for the required reductions. Should additional or more correct information present itself, the Town will re-work these estimates in an iterative manner to achieve better information.

Below the process of analysis of data is described to identify how the required reductions were identified.

Estimation of Current Pollutant Loads

1. Identify the "Urbanized Area" within the Town of Blacksburg jurisdictional limits. Not all of the Town is contained inside the regulated urbanized area. Using the ArcGIS program, the areas within the Town that are not within an urbanized area were removed from the analysis dataset. See this map in Appendix A-1, Town of Blacksburg Urbanized Area.
2. Exclude urbanized areas in watersheds where no TMDL study has been completed. The Town has one watershed, Toms Creek, which does not have an approved TMDL study. This watershed area has been removed from the dataset to be analysed. See map in Appendix A-2, Urbanized Areas within TMDL watersheds.
3. Remove areas within the Town that are covered under another MS4 permit. There are a few areas within the Town contained within the Virginia Tech MS4 permit (VAR040049) and VDOTs MS4 permit (VAR040016). The areas within Virginia Tech's permit were easily removed from the dataset as they correspond to the land owned by Virginia Tech. The areas within the VDOT limited access rights of way were also removed from the dataset to represent the area regulated by the VDOT permit. See this map in Appendix A-3, Town of Blacksburg Other MS4 Areas.
4. Evaluate the land use within the regulatory MS4 areas. The 2013 land use has been evaluated only within the areas that are shown to be in the watersheds with TMDL allocations and that are not covered by other MS4 jurisdictions. This dataset will be used to evaluate the loadings associated with the Town's MS4 areas for each watershed and each pollutant of concern. See this map in Appendix A-4, 2013 Land Use for the Town of Blacksburg MS4 Regulated Area.
5. Evaluate the hydrologic soil group for each soil type in the regulated areas. Each soil type has a hydrologics soil group (HSG) value A, B, C or D. All values within the regulated area are identified. This is broken down by watershed to facilitate input into the Watershed Treatment Model.
6. Input land use and soils data into the Watershed Treatment Model (2013) for analysis. The Watershed Treatment Model accepts data such as land use, soil percentage (by watershed), asphalt/concrete, buildings, and gravel). The following land use categories were grouped into the forest/open space category (light brush/dirt/mulch, light forest/tree canopy, brush/bush, and dense forest). The lawn category was reclassified as managed turf. See this map in Appendix A-5, Conversion of Land Use Designations to Land Cover Categories.
7. Review the Roanoke River estimated sediment loads from the WTM and compare with TMDL loads. The watershed treatment model resulted in the following estimated loads in the Town's TMDL watersheds. The Roanoke River TMDL for sediment did not estimate an initial sediment

load for the Blacksburg MS4 area, only a reduction requirement. This exercise will use the Watershed Treatment Model loading estimate as the existing load and the WLA as the future goal. This will identify the estimated reduction required under today's conditions. For sediment, a conversion of pounds per year (lb/yr) to tons per year (tons/yr) was required to make this comparison.

Sediment Load	WTM (tons/yr)	WLA (tons/yr)	Reduction Required
Wilson Creek and Roanoke River (RU07, RUO6)	191.7	82.8	57%

8. Review the Stroubles Creek estimated sediment loads from the WTM and compare with TMDL loads. The Stroubles Creek TMDL for sediment did not calculate the waste load allocation (WLA) for the Blacksburg MS4 area, only a composite allocation for the three MS4 permits in existence at the time. This exercise applied the reduction percentage that was necessary to meet the composite WLA to the estimated current day loading for the Blacksburg area.

Sediment Load	WTM (tons/yr)	WLA (tons/yr)	Reduction Required
Stroubles Creek (NE59)	375.7	187.85	50%

9. Review the estimated bacterial loads from the WTM and compare with TMDL loads. The bacteria estimate units used in the TMDL is measuring E.coli. while the WTM model uses fecal coliforms. Converting between the two have multiple challenges, we used the WTM number for our planning purposed and the percent reduction outlined in the TMDL to estimate the WLA of bacteria in fecal coliforms.

Stream Name	WTM (billions/yr) (fecal coliform)	WLA (cfu/yr) (E.coli)	Reduction Required
Wilson Creek and Roanoke River (RU07, RUO6)	438047.3	3.15 E+09	99.5%

10. BMP Implementation Planning. The next step in the Action Plan process is to identify the benchmark time period to make the required reductions and plan the necessary improvement to complete the efforts in that time period.

8.2 Benchmark Time Period Establishment

In this initial phase of the Blacksburg TDML Action Plan, the time period established to attain water quality goal in 4 permit cycles. This will provide for an appropriate planning period, and three additional cycles to begin an iterative implementation of the water quality improvement. This will allow sufficient time for the Town of Blacksburg to evaluate the plan, implement water quality improvements and evaluate their effectiveness.

Permit Cycle	Years	Goals and Objectives	Percent Reduction
#1	(2013 – 2018)	Planning and Scoping	0%
#2	(2018 – 2023)	Implementation of BMPs	25%
#3	(2023 – 2018)	Evaluation and Implementation	50%
#4	(2028 – 2033)	Final Evaluation and Implementation	100%

8.3 Calculating Reductions for the Permit Cycle

The planning and scoping for the TMDL Action plan has begun and will continue for this permit cycle. This will include a more detailed analysis of the improvements in water quality that are being achieved by the existing stormwater facilities. In this document an estimate of the water quality improvements from existing facilities has been performed for initial planning purposes, but better information regarding the specific facilities and the upstream drainage areas will be provided.

Due to the age of the TMDL study performed on the Stroubles Creek Watershed (2003), all existing stormwater quality BMPs are considered to be installed after the assessment of the watershed was done. Neither the State nor the Town of Blacksburg enforced the installation of water quality BMPs until 2004 and 2008 respectively, therefore these facilities did not exist during the time of the TMDL study on Stroubles Creek. Additionally, there are no known water quality facilities that were installed prior to the TMDL report year.

Due to the age of the TMDL study performed on the Roanoke River Watershed (2006), all existing stormwater quality BMPs are considered to be installed after the assessment of the watershed was done. Neither the State nor the Town of Blacksburg enforced the installation of water quality BMPs until 2004 and 2008 respectively, and there are no known water quality facilities that were installed prior to the 2006 in the Roanoke River watershed. If there are BMPs that are discovered to have been installed prior to 2006 in this watershed, they will be identified and evaluated to how best to assess their effectiveness.

The Reductions for the BMPs installed after the TMDL establishment will be calculated utilizing the Table 7-1 which estimates the efficiencies for each BMP. This table may be updated if more information becomes available.

9.0 Implementation Actions

Due to the complexity of the land uses in the Stroubles Creek and Roanoke River watersheds, implementation action necessary to reduce the sediment and bacterial loads have been identified through a review of the land use and source data and other pollutant delivery mechanisms. An analysis of those actions and control measures that are appropriate for the geography, topography and demographics of

this region was also incorporated into the selection of the actions selected. Described in the sections below are the:

- Selection and quantification of appropriate implementation actions to reduce sediment and bacteria loading.
- Steps needed toward meeting water quality standards.
- Associated costs and benefits associated with the implementation of the BMPs.

9.1 Public Education & Outreach Practices and Employee Training Practices

The proposed public education and outreach practices are intended to control sediment and bacteria to address the TMDL POCs in the Stroubles Creek and Roanoke River watersheds. Upon annual evaluation and review, additional programs may be added or revised to further address sediment and bacteria in the TMDL areas.

The Town of Blacksburg will enhance its public education and outreach and employee training programs to also promote methods to eliminate and reduce discharges of the pollutants identified in the WLA. Examples of these public education and outreach practices include:

- Storm drain marking programs.
- Town demonstration projects enhancement and tours.
- Grease program education and enforcement.
- Illicit discharge education.
- Town stormwater webpage enhancement.

Examples of the employee training practices include:

- Erosion and Sediment Control training for all appropriate staff.
- Spill response for emergency services staff.
- Fertilizer, pesticide and landscape materials training for all applicator staff.
- Enhancing written operation and maintenance procedures for town facility operations.
- Biennial training of O&M procedures.

9.2 Control Measures and Management Practices

The proposed control measures and management practices intended to control sediment and bacteria were identified through multiple sources. Appropriate control measures are those that will reduce pollutants while functioning in this mountainous geographical region and efforts that are consistent with the particular demographic of the Blacksburg area. Quantifiable control measures proposed are listed in table 7-1 along with the sediment and bacteria efficiencies associated with each measure.

Table 7-1: Best Management Practices for Treatment of Sediment and Bacteria in the Town of Blacksburg

Action Category	Action Description	Sediment	Bacteria
Pet Waste	Pet Waste Education Campaign	n/a	25
	Pet Waste Station	n/a	-
Sanitary Sewer	No Overflow Campaign	n/a	tbd

	Review of the I/I Program	n/a	tbd
Stormwater	Permeable Pavement	90	n/a
	Infiltration Trench	75	90
	Bioretention	70	90
	Vegetated Swale	65	0
	Constructed Wetland	50	80
	Manufactured BMP	80	80
	Wet Pond	50	70
	Detention Pond	50	30
	Extemded Detention	tbd	30
	Riparian Buffer (forested)	70	57
	Riparian Buffer (grassed)	50	50
	Rooftop Disconnection	tbd	n/a
	Soil Amendments	tbd	n/a
	Wet Swale	tbd	70
Stream and Watercourse	Stream Restoration	310 lbs/ft/year	n/a
	Stream Bank Protection	50	n/a
Roadway & Urban Landscape	Street Sweeping	Variable – depending on type of sweeping performed	n/a
	Impervious Land Use Conversion	Variable	n/a

The BMP pollutant reduction efficiency values reported in Table 5-1 are averages and are subject to revision based on actual conditions present at the sites where each BMP is implemented. This is a planning level document and more accurate reduction efficiencies would be dependent on site conditions, BMP design and implementation. Additional information pertaining to stormwater BMPs can be found on the Virginia Stormwater BMP Clearinghouse and the Virginia Stormwater Management Handbook websites.

Some BMPs identified during the IP development process could not be quantified for various reasons. A continual effort to streamline these efficiencies and update the table with any new information will be performed on an annual basis.

9.3 Legal Authorities, Permits, Contracts and Interjurisdictional Agreements

Ordinances

Currently the existing Erosion and Sediment Control ordinance (*Town Code: Article II, Section 10-200*) addresses the discharge of sediment during construction while the Stormwater Management Ordinance (*Town Code: Division 8, Section 5-800*) addresses the discharge of sediment during the post development phase of new construction. In addition, the Illicit Discharge Ordinance (Town Code: Section 18-624) prohibits the discharge any materials or item other than stormwater to the storm sewer system.

The Erosion and Sediment Control ordinance is consistent with State regulations and applies erosion control measures for all land disturbances. A erosion control plan is required for any project that disturbs 10,000 square feet or more.

The Stormwater Management ordinance is consistent with State regulation and applies permanent water quantity and quality measures for all new development that disturbs 5,000 square feet or more, with the exception of linear projects and single family residences.

The Illicit discharge ordinance prohibits the following:

1. To cause or allow any illicit discharges, including but not limited to the discharge of sewage, industrial wastes or other wastes, into the storm sewer system, or any component thereof, or onto driveways, sidewalks, parking lots, or any other areas draining to the storm sewer system.
2. Connect, or allow to be connected, any sanitary sewer to the storm sewer system, including any unauthorized sanitary sewer connection to the storm sewer system as of the date of the adoption of this article.
3. Discharge any materials or item other than stormwater to the storm sewer system by spill, dumping, or disposal of any type without a valid federal and/or state permit or unless otherwise authorized by law.
4. Throw, place, or deposit or cause to be thrown, placed, or deposited in the storm sewer system anything that impedes or interferes with the free flow of stormwater therein.

A review of all ordinances will be continues as a part of this process to identify if there are any changes to state code or recommended language that can aid in the reduction of the pollutants of concern.

Permits

Currently no other permits (except the MS4 Permit #VAR040019 and any active VAR10 permits) are held by the Town. Should any new permits be initiated that would be applicable to reducing the pollutants listed in the WLAs, this document will be updated.

Orders

Currently the Town of Blacksburg is not a party to any orders at this time.

Contracts or Interjurisdictional Agreements

Currently the Town has not entered into any contracts or interjurisdictional agreements that would be applicable to reducing the pollutants of concern identified in the TMDLs.

9.4 Steps Needed to Meet Water Quality Standards

The process of improving the water quality with the above-mentioned actions will time, effort and significant outreach to the community. The steps that are anticipated at this time to meet water quality standards are outlined below.

1. Approval of the TMDL Action Plan by DEQ,.
2. Implementation of Outreach Programs and structural BMPs in accordance with the milestones set forth in the Action Plan.

3. Assessment of the effectiveness of the implemented BMPs and programs using metrics to determine compliance with the TMDL.
4. If a method is determined to be insufficient to meet the goals set forth, then a modification request will be made to update the Action Plan with a measure is intended to be more effective in meeting water quality standards.

9.5 Associated Costs

The costs for the control measures listed below are derived from many sources. Table 8-1 shows the cost of each BMP per acres treated, as well as the source of the cost estimate. These costs are primarily for construction and installation and they do not address the long term maintenance costs for these systems. Long term maintenance costs are something that the Town will continue to research so we may plan appropriately for not only the installation, but for the effective maintenance of these facilities. If new information is discovered that is determined to be more accurate that what is presented below, the table will be revised accordingly.

Table 7-1: Best Management Practices for Treatment of Sediment and Bacteria in the Town of Blacksburg			
BMP Type	BMP	Cost	Reference
Pet Waste	Pet Waste Education Campaign	$ 5,000	1
	Pet Waste Station	$ 4,070	2
Sanitary Sewer	No Overflow Campaign	$ 5,000	1
	Review of the I/I Program	Unknown	TBD
Stormwater	Permeable Pavement	$ 240,000	3
	Infiltration Trench	$ 6,000	4
	Bioretention	$ 10,000	5
	Vegetated Swale	$ 18,150	6
	Constructed Wetland	$ 2,900	6
	Manufactured BMP	$ 20,000	7
	Wet Pond	$ 8,350	6
	Detention Pond	$ 3,800	6
	Extended Detention	Unknown	TBD
	Riparian Buffer (forested)	$ 3,500	8
	Riparian Buffer (grassed)	$360	5
	Rooftop Disconnection	Unknown	TBD
	Soil Amendments	Unknown	TBD
	Wet Swale	Unknown	TBD
Stream and Watercourse	Stream Restoration	$ 300 per linear ft	Local Projects
	Stream Bank Protection	$150 per linear ft	TBD
Roadway & Urban Landscape	Street Sweeping	$ 520 per curb ml	9
	Impervious Land Use Conversion	Unknown	TBD

1. VADEQ. 2013. Three Creek, Mill Swamp, and Darden Mill Run Watersheds TMDL Implementation Plan
2. Technical Report.
3. James River Association. 2013. Linking Local TMDLs to the Chesapeake Bay TMDL in the James River Basin. Prepared by The Center for Watershed Protection. Available at: http://www.jamesriverassociation.org/what-we-do/LinkingLocalTMDLstotheBayTMDL.pdf
4. King, D., and P. Hagan. 2011. Costs of Stormwater Management Practices in Maryland Counties. Prepared for Maryland Department of the Environment. Available at: http://www.mde.state.md.us/programs/Water/TMDL/TMDLImplementation/Documents/King_Hagan_Stormwater%20Cost%20Report%20to%20MDE_Final%20Draft_12Oct2011.pdf
5. VADEQ. 2011. Bacterial Implementation Plan Development for the James River and Tributaries – City of Richmond Technical Report.
6. VADCR. 2006. Water Quality Implementation Plan for Blacks Run and Cooks Creek (Fecal Coliform and Aquatic Life TMDLs).
7. Schueler, T., D. Hirschmann, M. Novotney, and J. Zielinski. 2007. Urban Stormwater Retrofit Practices Version 1.0. Urban Watershed Restoration Manual No. 3, Center for Watershed Protection. Prepared for U.S. Environmental Protection Agency.
8. VADCR. 2013. Spout Run Water Quality Improvement Plan.
9. Rivanna River Basin Commission. 2012. Moores Creek Bacteria Implementation Plan 2012 Update.
10. Schilling, J.G. 2005. Street Sweeping – Report No. 1, State of the Practice. Prepared for Ramsey- Washington Metro Watershed District (http://www.rwmwd.org). North St. Paul, Minnesota. June 2005.

10.0 Measurable Goals and Milestones for Attaining Water Quality Standards

The ultimate goal of this implementation plan is to bring Stroubles Creek and the Roanoke River into compliance with water quality standards, which will result in its removal from the 303(d) list of impaired waters. Progress towards this goal will be measured by improvement in the Stream Condition Index based on biological monitoring, but milestones along the way will include both water quality measurements and the implementation of best management practices.

The major goal to bring Stroubles Creek and the Roanoke River into compliance is broken down into the following sub-goals and objectives. These address the watershed issues outlined in the previous sections of this report:

10.1 Implementation Schedule for Stroubles Creek Sediment POC

TMDL Action Plan Implementation Schedule for Stroubles Creek (Sediment)			
	Existing Load	***Reduction***	***Final Load***
Permit Cycle #1	375.7 tons/yr		
Outreach Campaign		TBD	**375.7 (0%)**
Permit Cycle #2			
Street Sweeping Practices		90 tons/yr	**285.7 (25%)**
Permit Cycle #3			
Permeable Pavement		90%	
Infiltration Trench		75%	
Bioretention		70%	
Vegetated Swale		65%	
Constructed Wetland		50%	
Manufactured BMP		80%	
Wet Pond		50%	
Detention Pond		50%	
Extended Detention		TBD	
Riparian Buffer (forested)		70%	
Riparian Buffer (grassed)		50%	
Stream Restoration		310 lbs/ft/year	
Stream Bank Protection		50	
			235.7 (50%)
Permit Cycle #4			
Permeable Pavement		90%	
Infiltration Trench		75%	
Bioretention		70%	
Vegetated Swale		65%	
Constructed Wetland		50%	
Manufactured BMP		80%	
Wet Pond		50%	
Detention Pond		50%	
Extended Detention		TBD	
Riparian Buffer (forested)		70%	
Riparian Buffer (grassed)		50%	
Stream Restoration		310 lbs/ft/year	
Stream Bank Protection		50	
			185.7 (100%)

10.2 Implementation Schedule for Roanoke River Sediment POC

TMDL Action Plan Implementation Schedule for Roanoke River & Wilson Creek (Sediment)			
	Existing Load	***Reduction***	***Final Load (ton/yr)***
Permit Cycle #1	191.7 tons/yr		
Outreach Campaign		TBD	
			191.7 (0%)
Permit Cycle #2			
Street Sweeping Practices		90 tons/yr	163.7 (25%)
Permit Cycle #3			
Permeable Pavement		90%	
Infiltration Trench		75%	
Bioretention		70%	
Vegetated Swale		65%	
Constructed Wetland		50%	
Manufactured BMP		80%	
Wet Pond		50%	
Detention Pond		50%	
Extended Detention		TBD	
Riparian Buffer (forested)		70%	
Riparian Buffer (grassed)		50%	
Stream Restoration		310 lbs/ft/year	
Stream Bank Protection		50	
			135.7 (25%)
Permit Cycle #4			
Permeable Pavement		90%	
Infiltration Trench		75%	
Bioretention		70%	
Vegetated Swale		65%	
Constructed Wetland		50%	
Manufactured BMP		80%	
Wet Pond		50%	
Detention Pond		50%	
Extended Detention		TBD	
Riparian Buffer (forested)		70%	
Riparian Buffer (grassed)		50%	
Stream Restoration		310 lbs/ft/year	
Stream Bank Protection		50	
			79.7 (100%)

10.3 Implementation Schedule for Wilson Creek Bacteria POC

TMDL Action Plan Implementation Schedule for Wilson Creek (Bacteria)			
	Existing Load	***Reduction***	***Final Load (cfu)***
Permit Cycle #1	5.36E+12		
Pet Waste Outreach Campaign		25%	
			4.02E+12 (25%)
Permit Cycle #2			
No Overflow Campaign		TBD	
Review of the I/I Program		TBD	
			2.68E+12 (50%)
Permit Cycle #3			
Infiltration Trench		90%	
Bioretention		90%	
Constructed Wetland		80%	
Manufactured BMP		80%	
Wet Pond		70%	
Detention Pond		30%	
Extended Detention		30%	
Riparian Buffer (forested)		57%	
Riparian Buffer (grassed)		50%	
			1.34E+12 (75%)
Permit Cycle #4			
Infiltration Trench		90%	
Bioretention		90%	
Constructed Wetland		80%	
Manufactured BMP		80%	
Wet Pond		70%	
Detention Pond		30%	
Extended Detention		30%	
Riparian Buffer (forested)		57%	
Riparian Buffer (grassed)		50%	
Riparian Buffer (forested)		70%	
Riparian Buffer (grassed)		50%	
			0 (100%)

11.0 Assessment Methods for Determining Effectiveness

The TMDL Action Plan has been developed using the Watershed Treatment Model to estimate the pollutant input into the system and the effectiveness of the proposed BMPs. Since both structural and non-structural BMPs are used in this Action Plan, demonstration of adequate progress will be achieved through reporting of BMP implementation and its input into the Watershed Treatment Model.

Additional resources for assessment may be incorporated into this Action Plan if it is determined to provide a more accurate reflection of the system. Examples of other resources for assessment are: Chesapeake Bay TMDL Action Plan and other Nutrient and Sediment TMDLs, the Environmental and Water

Resource Institute's 2014 Pathogens in Urban Stormwater Report, or other recommendations and studies that have been used to identify treatment approaches and assessment actions.

12.0 Potential Funding Sources

The stormwater BMPs listed in this document can be incorporated into the design of both public and private properties. Many BMPs vary in size and complexity and can be utilized on sites both small and large.

Potential funding sources available for the implementation of the proposed control measures and practices were identified during development of this Action plan. Funding options vary in applicability to specific watershed conditions, including pollutant sources and land uses, as well as the potential project sponsor(s). A brief description of the programs and their requirements include, but are not limited to, those described below.

Federal Clean Water Act Section 319 Incremental Funds – Through Section 319 of the Federal Clean Water Act, Virginia is awarded grant funds to implement TMDLs. Stakeholder organizations can apply, on a competitive basis through a Request for Proposals process administered by VADEQ, for 319 grants to implement BMPs and educational components included in a TMDL IP.

United States Fish and Wildlife Service (USFWS) – The Fish and Wildlife Service administers a variety of natural resource assistance grants to governmental, public and private organizations, groups and individuals. Natural resource assistance grants are available to state agencies, local governments, conservation organizations, and private individuals.

Virginia Agricultural Best Management Practices Tax Credit Program – For all taxable years, any individual or corporation engaged in agricultural production for market, who has in place a soil conservation plan approved by the local SWCD, is allowed a credit against the tax imposed by Section 58.1-320 of an amount equaling 25%. of the first $70,000 expended for agricultural best management practices by the individual. Any practice approved by the local SWCD Board must be completed within the taxable year in which the credit is claimed. The credit is only allowed for expenditures made by the taxpayer from funds of his/her own sources. The amount of the credit cannot exceed $17,500 or the total amount of the tax imposed by this program (whichever is less) in the year the project was completed. If the amount of the credit exceeds the taxpayer's liability for such taxable year, the excess may be carried over for credit against income taxes in the next five taxable years until the total amount of the tax credit has been taken. It is also approved for use in supplementing the cost of repairs to streamside fencing. Details concerning eligible BMPs and other program details are available at: http://www.dcr.virginia.gov/soil_and_water/costshar.shtml#tools and http://dswcapps.dcr.virginia.gov/htdocs/agbmpman/csmanual.pdf.

Virginia Clean Water Revolving Loan Fund – EPA awards grants to states to capitalize their Clean Water State Revolving Funds (CWSRFs). The states, through the CWSRF, make loans for high-priority water quality activities. As loan recipients make payments back into the fund, money is available for new loans to be issued to other recipients. Eligible projects include point source, nonpoint source and estuary

protection projects. Point source projects typically include building wastewater treatment facilities, combined sewer overflow and sanitary sewer overflow correction, urban stormwater control, and water quality aspects of landfill projects. Nonpoint source projects include agricultural, silvicultural, rural, and some urban runoff control; on-site wastewater disposal systems (septic tanks); land conservation and riparian buffers; leaking underground storage tank remediation, etc. Additional information is available at: http://water.epa.gov/grants_funding/cwsrf/cwsrf_index.cfm.

Urban and Community Forestry Assistance Program (U&CF) – Funds for U&CF Program are provided by the USDA Forest Service and are administered by the Virginia Department of Forestry. The U&CF Program is designed to encourage projects that promote tree planting, the care of trees, the protection and enhancement of urban and community forest ecosystems, and education on tree issues in cities, towns and communities across the nation. Grants may be awarded to state agencies, local and regional units of government, approved non-profit organizations, neighborhood associations, civic groups, public educational institutions (college level) or community tree volunteer groups for proposals which meet some, or all, of the specific program objectives. Non-governmental organizations must be designated a 501-c-3 non-profit organization or submit their application through such an organization or a government entity. The typical proposal is in the $5,000 to $10,000 range.

Virginia Stormwater Local Assistance Fund (SLAF) – SLAF funds stormwater projects including: (1) new stormwater best management practices, (2) stormwater BMP retrofits, (3) stream restoration, (4) low impact development projects, 5) buffer restorations, (6) pond retrofits, and (7) wetlands restoration. Eligible recipients are local governments, meaning any county, city, town, municipal corporation, authority, district, commission, or political subdivision created by the General Assembly or pursuant to the Constitution or laws of the Commonwealth. The fund is administered by VADEQ.

Virginia Water Quality Improvement Fund – This is a permanent, non-reverting fund established by the Commonwealth of Virginia in order to assist local stakeholders in reducing point and nonpoint nutrient loads to surface waters. Eligible recipients include local governments, SWCDs, and individuals. Grants for point sources and nonpoint sources are administered through VADEQ. Most WQIF grants provide matching funds on a 50/50 cost-share basis. Additional information is available at:

http://www.deq.virginia.gov/Programs/Water/CleanWaterFinancingAssistance/WaterQualityImprovementFund.aspx.