

Implementation Plan for Fecal Coliform TMDL (Total Maximum Daily Load) for Mill Creek and Powhatan Creek



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1.0 EXECUTIVE SUMMARY

1.1 Introduction

This Implementation Plan (IP) is a companion document to the report, “Bacteria Total Maximum Daily Load for Mill Creek and Powhatan Creek” (DEQ 2008). The Mill and Powhatan Creeks TMDL Study set allocations to limit bacteria pollutant loads discharged to the Mill Creek and Powhatan Creek watersheds to levels that were modeled to achieve compliance with the state water quality criteria for bacteria for primary contact recreation. This IP bridges the gap between those specified pollutant load allocations and actual reductions in bacteria counts in Mill and Powhatan Creek by recommending a set of actions to be taken in the watersheds during a fifteen year project timeframe.

Two sets of regulatory requirements for the development of TMDL IPs are applicable in the state of Virginia.

- §303(d) of the Federal Water Pollution Control Act of 1972 commonly known as the Clean Water Act (CWA)
- Virginia Water Quality Monitoring, Information and Restoration Act of 1997 (WQMIRA)

CWA strives “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.” The inception of the federal TMDL program is found in section 303(d) of that legislation. WQMIRA requires the State to develop reports assessing water quality of state waters, to provide data to develop programs addressing water quality impairments, to develop TMDLs and to develop IPs.

1.2 Review of Mill Creek and Powhatan Creek Bacteria TMDL

Mill Creek (VAT-G10E-03) was initially listed as impaired on Virginia’s 2002 303(d) Report on Impaired Waters due to exceedances of Virginia’s water quality standard for fecal coliform. In January 2003, Virginia adopted a water quality standard for enterococci bacteria for saltwater and transition zones. Mill Creek was listed as not supporting the Recreation Use on Virginia’s 2006 305(b)/303(d) Water Quality Assessment Integrated Report (VADEQ, 2006) due to water quality violations of the enterococci bacteria standard.

Powhatan Creek has two segments that have been identified as impaired and do not support the Recreation Use. Segment VAT-G10E-01, the tidal segment of Powhatan Creek, was listed in Virginia’s 1998 303(d) TMDL Priority List and Report because of violations of the fecal coliform water quality standard. The tidal segment of Powhatan Creek is currently listed as impaired on Virginia’s 2006 305(b)/303(d) Water Quality Assessment Integrated Report due to violations of the enterococci bacteria standard.

Sufficient exceedances of the fecal coliform bacteria standard in the nontidal segment (VAT-G10R-02) led to a listing in the 2002 305(b)/303(d) Water Quality Assessment Integrated Report. The non-tidal segment of Powhatan Creek is listed as impaired on Virginia’s 2006

305(b)/303(d) Water Quality Assessment Integrated Report due to violations of the *E. coli* bacteria standard.

A TMDL study for the Mill Creek and Powhatan Creek watersheds, completed by DEQ in March 2008, examined the watershed characteristics and the sources of fecal coliform to the creeks. Using monitoring data, bacterial source tracking (BST), and watershed models, DEQ assigned maximum allowable loads to each source in the watersheds in order to bring Mill and Powhatan Creeks into compliance with the water quality standard for primary contact recreation. Table 1-1 outlines the source reductions necessary (as estimated by the model) in order for Mill and Powhatan Creeks to achieve water quality standards.

Table 1-1: TMDL Reduction in Fecal Coliform Loadings from Existing Conditions

Impaired Waterbody	Agriculture	Wildlife Direct Deposit	Residential	Forest	Marinas and Canal
Mill Creek	92%	92%	92%	0%	0%
Powhatan Creek	92%	92%	92%	0%	100%

The core of this IP is a set of actions found in Section 7 aimed to reduce the levels of fecal coliform bacteria in Mill and Powhatan Watersheds. The actions chiefly target bacteria from human and pet (“anthropogenic”) sources. This reflects the staged implementation recommended by the Virginia Department of Environmental Quality and referenced in the TMDL Study.

1.3 Public Participation

Two public meetings were held in the watershed to engage the public in the development of the TMDL Implementation Plan for the Mill and Powhatan Creek Watersheds. A work group composed of representatives from County departments, the Hampton Roads Planning District Commission (HRPDC), and state and federal agencies was formed to guide development of the TMDL IP.

1.4 Implementation Actions

The management actions outlined in this IP capitalize on existing and planned programs and efforts within the Mill and Powhatan Creek watersheds and will be implemented in four phases. Ongoing actions have already been initiated in response to other regulatory programs, but are expected to reduce bacteria loads to the waterbodies. Phase I actions are those that have been recently initiated or will be initiated in the near future in response to the TMDL and are scheduled for completion within five years. Phase II activities are those that are planned for implementation within the next five to ten years and may not have approved funding sources yet. Phase III actions may require regulatory changes, so they may be implemented as necessary if actions undertaken in the previous phases do not significantly improve water quality within the study area. All management actions were divided into the following eight management categories:

- Sanitary Sewer System Improvements

- Septic System Programs
- Stormwater Quality Programs
- Boating Programs
- Pet Waste Programs
- Aquatic Resources Restoration
- Land Use Management
- Wildlife Contribution Controls

1.5 Associated Costs and Benefits

The primary benefit of the implementation of the management actions described in this IP is the reduction of bacteria levels in the Mill Creek and Powhatan Creek watersheds. The programs and actions contained within this IP will serve to reduce the anthropogenic sources of bacteria within the watersheds. Because many of the programs mentioned in this report also serve purposes beyond reducing bacteria and cover areas larger than the Mill and Powhatan Creek watersheds, the costs of reducing bacteria levels can be difficult to estimate. James City County staff estimated costs for management categories using knowledge of current program costs and best professional judgment.

1.6 Measurable Goals and Milestones

The goal of the TMDL developed for Mill and Powhatan Creeks is to bring the impaired water segments within the watersheds into compliance with the water quality standard for bacteria for primary contact recreation. Once the water segment achieves compliance with the bacteria criteria, then the segment can be removed from the 303(d) Impaired Waters List. Throughout the fifteen year project timeframe, DEQ will continue its monitoring of stations in the Mill and Powhatan watersheds. Currently, this monitoring program includes 1 monitoring station at the mouth of Mill Creek and 3 stations on Powhatan Creek. Project progress will be tracked throughout the timeframe of the implementation plan, and the effectiveness of the management actions proposed in this IP will be evaluated at the end of five, ten, and fifteen years.

1.7 Stakeholders Roles and Responsibilities

Stakeholders are individuals who live or have land management responsibilities in the watershed, including government agencies, businesses, private individuals and special interest groups. Stakeholder participation and support is essential for achieving the goals of this TMDL effort. Stakeholders for this project were identified at the beginning of IP development and invited to sit on the Technical Advisory Committee along with agency representatives and County staff.

1.8 Watershed Planning Efforts

In 2001, James City County hired the Center for Watershed Protection to develop the Powhatan Creek Watershed Management Plan. In 2009, the County hired Vanasse Hangen Brustlin, Inc (VHB) and began the process of developing a watershed management plan for Mill Creek. The Mill Creek Watershed Management Plan will follow the outline and approach established during the development of the Powhatan Creek plan and is expected to be complete summer 2010.

As part of the James City County watershed planning process, three special studies were performed to gain a better scientific understanding of the Powhatan stream system; these included the stream and floodplain assessment, the conservation area study, and the Stormwater Management Master Plan. The stream and floodplain assessment consisted of an instream habitat survey for the majority of the non-tidal watershed and reported on stream channel stability and habitat conditions in each of the subwatersheds. The conservation area study identified the presence of rare, threatened or endangered (RTE) species, contiguous forest and high quality wetlands and identified potential threats and impacts to their existence. The stormwater master plan developed specific stormwater criteria for subwatersheds, identified existing stormwater practices for retrofit possibilities, and located potential regional stormwater facilities.

The watershed management plan provides a summary of the findings from the Powhatan Creek baseline report, the three special studies, and the stakeholder process conducted by the Center for Watershed Protection, the James River Association and James City County. A specific watershed management plan and accompanying maps were drafted for the twelve subwatersheds based on the eight tools of watershed protection.

The goals of the study were to prevent further degradation of the water quality of Powhatan Creek, maintain the quality of the creek's wetlands, maintain biological and habitat diversity, and promote habitat connectivity. The sub-watershed boundaries of the Powhatan Watershed Plan were compared to the boundaries for the TMDL. The Powhatan TMDL study subwatersheds were delineated to match, to the extent possible, those created for the Powhatan Watershed Plan. This was done to ensure that information developed as a part of the Powhatan TMDL could also be used for implementation of the Powhatan Watershed Plan.

1.9 Potential Funding Sources

One of the objectives of this TMDL Implementation Plan is to maximize utilization of existing programs and resources to achieve the goal of reducing bacteria levels within the Mill and Powhatan Watersheds. In general, funding for these programs and the management actions described in this IP will come from four sources as they are available:

- Locality funds
- Private / nonprofit funds
- Virginia State funds
- Federal funds

Table 7-1 Management Options for Implementation of Mill and Powhatan Creek TMDL

Management Category	Management Option	Development Phase
Sanitary Sewer Improvements	Implementation of SSES Plan	Ongoing
	Implement schedule of Regional SSO Consent Order	Ongoing
	Participation in HRFOG education program	Ongoing
Septic System Programs	CBPA Septic Tank Pump Out and Inspection Information Program	Ongoing
	Update septic system locations through pump out program	Ongoing
	Field survey to estimate septic system failure rates	Phase I
	Implement procedures to address failing septic systems	Phase I
	Develop an onsite wastewater treatment funding program	Phase II
	Increase enforcement actions for failing systems	Phase III
Stormwater Quality Programs	Enforcement of Illicit Discharge provisions within the Stormwater Management Ordinance	Ongoing
	County rain barrel rebate program	Ongoing
	Private BMP Inspection and Maintenance Programs	Ongoing
	IDDE screening in Mill and Powhatan Creek watersheds	Phase I
	Coliscan Monitoring in Mill and Powhatan Creeks	Phase I
	Participation in Regional Bacteria Source Tracking Study	Phase I
	Estimate Stormwater contribution to bacteria loading	Phase II
	Investigate retrofits for wet ponds that would reduce bacteria	Phase I
Boating Programs	Retrofit wet ponds to reduce bacteria concentrations	Phase II
	Sewer improvements and pumpout facility at County Marina	Phase I
	Expanded Boater Education Program	Phase II
	Investigate No Discharge designation for Powhatan Creek	Phase III
Pet Waste Programs	Examine environmental benefits of No Wake Zones	Phase III
	Participation in HRSTORM regional education program	Ongoing
	County "Scoop the Poop" campaign	Ongoing
	Pet waste collectors in County Parks	Phase I
	Free pet waste stations for neighborhoods	Phase I
Aquatic Resource Restoration	Investigate viability of Pet Waste Ordinance	Phase III
	County Stream Restoration Program	Ongoing
	Add wetlands restoration program	Phase III
Land Use Management	Identify areas for sea grass restoration	Phase III
	Chesapeake Bay Preservation Area Ordinance	Ongoing
	Implementation of Special Stormwater Criteria	Ongoing
	Enforcement JCC Erosion and Sediment Control Ordinance	Ongoing
	Implementation of JCC Guidelines for Design and Construction of Stormwater Management BMPs	Ongoing
	PRIDE Program	Ongoing
	Watershed Plan for Powhatan Creek Watershed	Complete
	Watershed Plan for Mill Creek Watershed	Phase I
	Implement bacteria priority areas in Powhatan Watershed	Phase II
	Special stormwater criteria incentives for Mill Creek Watershed	Phase I
Wildlife Contribution Controls	Local Delegation of VSMP	Phase III
	BMP Buffer Management	Ongoing