

**HENRICO COUNTY
ESCHERICHIA COLI TMDL ACTION PLAN**

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SECTION 1. OVERVIEW

Henrico County's Escherichia coli TMDL Action Plan addresses the wasteload allocations (WLAs) for Escherichia coli that are associated with approved TMDLs for applicable watersheds in the County (see Section 3). The Plan has been developed in accordance with the requirements of the County's MS4 Permit and applicable recommendations contained in the *Local TMDL MS4 Guidance* (Guidance), distributed by the Virginia Department of Environmental Quality in April 2015.

As stated in the Guidance,

This document is provided as guidance and, as such, sets forth standard operating procedures for the agency. However, it does not mandate any particular method nor does it prohibit any particular method for the analysis of data, establishment of a wasteload allocation, or establishment of a permit limit. If alternative proposals are made, such proposals should be reviewed and accepted or denied based on their technical adequacy and compliance with appropriate laws and regulations.

The Guidance also states

Beyond illicit discharges, existing programmatic practices, ordinances, and outreach currently in place under the MS4 program may be sufficient to address anthropogenic sources of bacteria. For these TMDLs, permittees are encouraged to consider practices such as public outreach and education to influence behaviors. This may include signage and supplies to encourage the collection and removal of pet waste at areas of high concentration, such as dog parks; residential outreach through fliers or pamphlets included with utility bills; and other education programs.

As such, the Plan reflects the requirements of the County's MS4 Permit and any recommendations described in the Guidance that are appropriate.

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SECTION 2. MS4 PERMIT LANGUAGE

PART I.D. TMDL ACTION PLAN AND IMPLEMENTATION

TMDL Action Plans other than the Chesapeake Bay TMDL

- a) The Permittee shall update, as necessary, and maintain a local TMDL action plan designed to reduce loadings for pollutants of concern if the permittee discharges the pollutants of concern to an impaired water for which a TMDL has been approved by the U.S. Environmental Protection Agency (EPA) as described in Part I.D.2 a 1 and 2:
 - 1) For TMDLs approved by EPA prior to April 1, 2015 and in which an individual or aggregate wasteload has been allocated to the permittee (see Attachment 3 to the Fact Sheet), the permittee shall develop and initiate or update as applicable the local TMDL action plans to meet the conditions of Part I.D.2 c, d, e, f, and g, as applicable, no later than 18 months after the permit effective date and continue implementation of the action plan. Updated action plans shall include:
 - a) An evaluation of the results achieved by the previous action plan; and
 - b) Any adaptive management strategies incorporated into updated action plans based on action plan evaluation.
 - 2) For TMDLs approved by EPA on or after April 1, 2015, and prior to the effective date of this permit, and in which an individual or aggregate wasteload has been allocated to the permittee, the permittee shall develop and initiate implementation of action plans to meet the conditions of Part I.D.2 c, d, e, f, and g, as applicable no later than 30 months after the permit effective date.
- b) The permittee shall complete implementation of the TMDL action plans as determined by the schedule. TMDL action plans may be implemented in multiple phases over more than one permit cycle using the adaptive iterative approach provided adequate progress is achieved in the implementation of BMPs designed to reduce pollutant discharges in a manner that is consistent with the assumptions and requirements of the applicable TMDL.
- c) Each local TMDL action plan developed by the permittee shall include the following:
 - 1) The TMDL project name;
 - 2) The EPA approval date of the TMDL;
 - 3) The wasteload allocated to the permittee (individually or in aggregate), and the corresponding percent reduction, if applicable;
 - 4) Identification of the potential significant sources of the pollutants of concern discharging to the permittee's MS4 that are not covered under a separate VPDES permit. For the purposes of this requirement, a significant source of

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pollutants 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;

- 5) The BMPs designed to reduce the pollutants of concern in accordance with Part I.D.2 d and e;
 - a) Any calculations required in accordance with Part I.D.2 d and e;
 - b) For action plans developed in accordance with Part I.D.2 d and e, an outreach strategy to enhance the public's education (including employees) on methods to eliminate and reduce discharges of the pollutants; and
 - c) A schedule of anticipated actions planned for implementation during this permit term.

- d) Bacterial TMDLs.
 - 1) The permittee shall implement at least six strategies designed to reduce the load of bacteria to the MS4. Table 3 provides a list of strategies which correspond to sources identified in Part I.D.2 c 4. Additional strategies that are equivalent or better than the strategies provided in Table 3 may be used as approved by the Department.

Table 3 Strategies for Bacteria Reduction Stormwater Control/Management Strategy	
Source	Strategies (provided as an example and not meant to be all inclusive or limiting)
Domestic pets (dogs and cats)	Provide signage to pick up dog waste, providing pet waste bags and disposal containers. Adopt and enforce pet waste ordinances or policies, or leash laws or policies. Place dog parks away from environmentally sensitive areas. Maintain dog parks by removing disposed of pet waste bags and cleaning up other sources of bacteria. Protect riparian buffers and provide unmanicured vegetative buffers along streams to dissuade stream access.
Urban wildlife	Educate the public on how to reduce food sources accessible to urban wildlife (e.g., manage restaurant dumpsters and grease traps, residential garbage, feed pets indoors). Install storm drain inlet or outlet controls. Clean out storm drains to remove waste from wildlife. Implement and enforce urban trash management practices. Implement rooftop disconnection programs or site designs that minimize connections to reduce bacteria from rooftops

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	Implement a program for removing animal carcasses from roadways and properly disposing of the same (either through proper storage or through transport to a licensed facility).
Illicit connections or illicit discharges to the MS4	Implement an enhanced dry weather screening and illicit discharge, detection, and elimination program beyond the requirements of Part I E 3 to identify and remove illicit connections and identify leaking sanitary sewer lines infiltrating to the MS4 and implement repairs. Implement a program to identify potentially failing septic systems. Educate the public on how to determine whether their septic system is failing. Implement septic tank inspection and maintenance program. Implement an educational program beyond any requirements in Part I E 1 though E 6 to explain to citizens why they should not dump materials into the MS4.
Dry weather urban flows (irrigations, car washing, powerwashing, etc.)	Implement public education programs to reduce dry weather flows from storm sewers related to lawn and park irrigation practices, car washing, powerwashing and other nonstormwater flows. Provide irrigation controller rebates. Implement and enforce ordinances or policies related to outdoor water waste. Inspect commercial trash areas, grease traps, washdown practices, and enforce corresponding ordinances or policies.
Birds (Canadian geese, gulls, pigeons, etc.)	Identify areas with high bird populations and evaluate deterrents, population controls, habitat modifications and other measures that may reduce bird-associated bacteria loading. Prohibit feeding of birds.
Other sources	Enhance maintenance of stormwater management facilities owned or operated by the permittee. Enhance requirements for third parties to maintain stormwater management facilities. Develop BMPs for locating, transporting, and maintaining portable toilets used on permittee-owned sites. Educate third parties that use portable toilets on BMPs for use. Provide public education on appropriate recreational vehicle dumping practices.

e) Local sediment, phosphorous, and nitrogen TMDLs (Not applicable to this plan).

- 1) The permittee shall select and implement strategies designed to reduce the loads associated with sediment, phosphorus, or nitrogen to the permittee's MS4. The permittee may implement this requirement through one or more of the following:

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- a) One or more of the BMPs from the Virginia Stormwater BMP Clearinghouse listed in 9VAC25-870-65 or other approved BMPs found on the Virginia Stormwater BMP Clearinghouse website;
 - b) One or more BMPs approved by the Chesapeake Bay Program. Pollutant load reductions generated by annual practices, such as street and storm drain cleaning, shall only be applied to the compliance year in which the annual practice was implemented; or
 - c) Land disturbance thresholds lower than Virginia's regulatory requirements for erosion and sediment control and post development stormwater management.
- 2) The permittee may meet the local TMDL requirements for sediment, phosphorus, or nitrogen through BMPs implemented or sediment, phosphorus, or nitrogen credits acquired. BMPs implemented and nutrient and sediment credits acquired to meet the requirements of the Chesapeake Bay TMDL in Part I.D.1 may also be utilized to meet local TMDL requirements as long as the BMPs are implemented or the credits are generated in the watershed for which local water quality is impaired.
- 3) The permittee shall calculate the anticipated load reduction achieved from each BMP and include the calculations in the action plan required in Part I.D.2 c.5.
- 4) No later than 36 months after the effective date of this permit, the permittee shall submit to the department an update on the progress made toward achieving local TMDL action plan goals and the anticipated end dates by which the permittee will meet each wasteload allocation for sediment, phosphorus, or nitrogen. The proposed end date may be developed in accordance with Part II.B.3.
- f) Prior to submittal of the action plan required in Part I.D.2 a, the permittee shall provide an opportunity for public comment for no fewer than 15 days on the proposal to meet the local TMDL action plan requirements.
- g) The MS4 Program Plan as required by Part I.A.6 of this permit shall incorporate each local TMDL action plan. Local TMDL action plans may be incorporated by reference into the MS4 Program Plan provided that the Program Plan includes the date of the most recent local TMDL action plan and identification of the location where a copy of the local TMDL action plan may be obtained.
- h) For each reporting period, each annual report shall include a summary of actions conducted to implement each local TMDL action plan

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SECTION 3. APPLICABLE ESCHERICHIA COLI WASTELOAD ALLOCATIONS

Wasteload Allocation (cfu/year)	Watershed(s)	TMDL Report	EPA Approval Date	SWCB Approval Date	The WLA is aggregated between the Henrico County MS4 and these MS4 permittees:
1.04E+11	Chickahominy River and Tributaries	E. coli TMDL Development for Chickahominy River and Tributaries, VA (A Nested TMDL Approach)	9/19/2012	3/25/2013	VDOT MS4 (VAR040115)
3.99E+10	Bailey Creek portion of Fourmile Creek Watershed	Bacteria TMDL for Fourmile Creek, Henrico County, Virginia	9/20/2004	7/31/2008	
1.05E+13	Tuckahoe Creek and Tributaries	Bacteria TMDL for Tuckahoe Creek, Little Tuckahoe Creek, Anderson, Broad, Georges and Readers Branches, and Deep Run, Henrico, Goochland and Hanover Counties, Virginia	9/20/2004	7/31/2008	
1.58E+12	White Oak Swamp	Bacteria TMDL for White Oak Swamp, Henrico County, Virginia	9/20/2004	7/31/2008	
1.18E+12	Almond Creek	Bacterial TMDL Development for the James River and Tributaries - City of Richmond	11/4/2010	6/29/2012	MS4 VDOT
5.78E+11	Gillies Creek				MS4 VDOT
3.50E+13	James River (lower) Impaired				MS4 VDOT
1.36E+12	James River (tidal)				MS4 VDOT
5.69E+12	James River (upper) delisted				MS4 VDOT
4.74E+13	James River (lower) delisted				MS4 VDOT
-	Upham Brook and Tributaries	TMDL Development for the Upham Brook Watershed	7/24/2008	4/28/2009	WLA to be addressed in TMDL
4.31E+11	Turkey Island Creek; James River and Tributaries, Westover to Chippokes Point; James River and Tributaries, Chippokes Point to Claremont	Bacteria TMDL Development for the Turkey Island Creek and James River Westover to Claremont Watershed in Charles City, Henrico, Prince George, and Surry Counties, Virginia	12/22/2015	10/01/2015	VDOT MS4 (VAR040115)

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SECTION 4. ESCHERICHIA COLI TMDL PLANNING

4.1 Legal Authority

Henrico County maintains legal authorities (ordinances, permits, policies, contract language, and enforcement mechanisms) sufficient to:

- Control the contribution of pollutants to the MS4;
- Prohibit illicit discharges and improper disposal;
- Require compliance with applicable stormwater requirements; and
- Perform inspections and enforce compliance.

Legal authority is documented in the County's MS4 Program Plan and reviewed/updated as necessary consistent with Permit Part I.A.3.

4.2 BMPs and strategies designed to reduce E.Coli (Permit Part I.D.2.c.5 and Part I.D.2.e)

The BMPs that have been implemented as part of the MS4 Program Plan that are applicable to reducing the pollutant identified in the WLA are listed in the following sections of this TMDL Action Plan.

The County's illicit discharge detection and elimination program is described in Part I.B.2.e of the MS4 Program Plan and annual implementation details are provided in the Part I.B.2.e Annual Report Supplement.

- Provide signage to pick up dog waste, providing pet waste bags and disposal containers.
- Place dog parks away from environmentally sensitive areas.
- Install storm drain inlet or outlet controls.
- Clean out storm drains to remove waste from wildlife
- Implement a program for removing animal carcasses from roadways and properly disposing of the same (either through proper storage or through transport to a licensed facility).
- Educate the public on how to determine whether their septic system is failing.
- Implement septic tank inspection and maintenance program.
- Enhance maintenance of stormwater management facilities owned or operated by the permittee.
- Enhance requirements for third parties to maintain stormwater management facilities.

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4.3 Outreach Strategy (Permit Part I.D.2.c.5.b)

Henrico County conducts various public education and outreach and employee training programs that promote elimination and/or reduction of *Escherichia coli*. These efforts include programs such as:

Septic Pumpout Program

As part of the Chesapeake Bay Program, Henrico County is required to implement a program that ensures septic systems within CBPAs are pumped out at least once every 5 years. The Department of Public Works administers this program. The Department has recently received a grant from the state to establish a Septic Pump-Out Assistance Program that covers the cost of a pump-out to eligible homeowners.

Sewer Connection

Generally, all proposed residential structures must be connected to public sewer if public sewer is within 300 feet of the development and unless otherwise approved by the Planning Commission, all other developments must provide public sewer connections, including any necessary extensions.

Septic System Installation, Repair, and Replacement

The Environmental Health section of the Henrico County Health Department currently coordinates the septic system program in the County. Responses to a septic system malfunction include:

- a. A property owner with a malfunctioning septic system with the potential for health and environmental contamination is required to apply for an application to contract repairs through the Health Department. Citizen complaints are investigated by the Health Department who then advises property owners of actions which need to be taken:
 - i. The applicant may be required to pump the system if it is imposing an immediate threat; or
 - ii. The applicant may be required to hook up to the sanitary sewer system, or,
 - iii. The applicant may be required to repair the septic system through contracting with a private company after obtaining a permit from the County Health Department.
- b. In situations where a property owner refuses to warrant the request for action for repair, the Health Department may initiate legal proceedings that may lead to requiring the property owner to vacate until requested repairs have been completed.

All proposed development that relies on septic systems must also provide reserve drain fields. The Health Department strongly recommends that septic systems

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(existing and proposed) be pumped out every five years. A brochure is available to residents that educates them on how to maintain a septic system.

Pet Waste Program

The pet waste pick-up program includes distributing pet bag dispensers and installation of pet waste stations installed on certain Henrico County properties. Resident reported pet waste issues are addressed by mailing pet waste postcards to educate homeowners on the importance of picking up after their pet.

Fats, Oil, and Grease (FOG) Program

The Department of Public Utilities assesses strong waste surcharges on the water and sewer utility bills of food preparation businesses and other non-domestic dischargers that have the potential to discharge FOG into the sanitary sewer system. Additionally, DPU routinely investigates these businesses to determine compliance with a local discharge limit FOG. Any violations of the local limit are communicated to Building Inspections, who may then conduct a follow up inspection of the facility's grease interceptor. If a sanitary sewer overflow is the result of FOG, DPU will investigate the source and, if possible, address to prevent recurrence through means of enforcement and/or education and outreach.

Residential Education Program

The residential education program includes items such as mailings concerning the Septic Pump-Out Program, brochures advertising the Septic Pump-Out Assistance Program, residential pet waste postcards, and pet waste bag distribution at County public outreach events/special events. Signage concerning proper pet waste disposal are also placed at various public properties throughout the County.

4.4 Identification of Potential Significant Sources (Permit Part I.D.2.c.4)

All Henrico County properties were assessed in the MS4 Municipal Management Area (MMMA) System described in Part I.B.2.i of the MS4 Program Plan. These assessments did not reveal any significant sources of *E. coli* from facilities of concern owned or operated by the County of Henrico that are not covered under a separate VPDES permit.

4.5 Schedule of anticipated actions during this permit term (Permit Part I.D.2.c.5.c)

Henrico County will maintain a schedule of anticipated actions planned for implementation during the permit term. The schedule will include planned BMP projects, programmatic actions, milestones, and expected reductions.

Henrico County will continue to implement the following activities:

1. Provide signage to pick up dog waste, providing pet waste bags and disposal

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- containers.
2. Place dog parks away from environmentally sensitive areas.
 3. Install storm drain inlet or outlet controls. (requirement for private lots?)
 4. Clean out storm drains to remove waste from wildlife
 5. Implement a program for removing animal carcasses from roadways and properly disposing of the same (either through proper storage or through transport to a licensed facility).
 6. Educate the public on how to determine whether their septic system is failing.
 7. Implement septic tank inspection and maintenance program.
 8. Enhance maintenance of stormwater management facilities owned or operated by the permittee.
 9. Enhance requirements for third parties to maintain stormwater management facilities.

4.6 Evaluation of Results and Adaptive Management

Henrico County has evaluated implementation of the previous *Escherichia coli* TMDL Action Plan based on program activities completed during the prior permit term, including annual reporting records, implementation tracking, inspection and maintenance records, illicit discharge detection and elimination (IDDE) activities, storm drain and infrastructure maintenance activities, public education and outreach efforts, septic system program implementation, pet waste management activities, and other relevant MS4 program documentation.

Because bacteria reductions from many of these measures are primarily achieved through behavior change, source prevention, inspection, maintenance, and operational controls rather than through direct end-of-pipe quantification, the County's evaluation is based principally on documented implementation of required and selected BMPs, continued program coverage, and identification of opportunities for refinement through the adaptive management process.

Henrico County will continue to implement this updated Action Plan using an iterative adaptive management approach consistent with the MS4 Permit. Future updates to the Action Plan will consider implementation results, available program data, watershed conditions, and regulatory requirements in effect at the time of update.

4.7 Public Participation (Permit Part I.D.2.f)

Prior to submittal of this Action Plan and/or substantive updates, Henrico County will provide an opportunity for public comments for no fewer than 15 days. The County will:

- Post the draft Action Plan (or a summary with instructions for obtaining the full document) on the County website;
- Provide instructions for submitting comments during the comment period; and
- Summarize comments received and document responses in the final Action Plan.

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4.8 Annual Reporting and Progress Update Requirements

Annual report due date / reporting period (Permit VA0088617):

- Annual report due: October 1 of each year
- Reporting period: July 1 – June 30

For each reporting period, the annual report will include a summary of actions conducted to implement this local TMDL Action Plan consistent with Permit Part I.D.2.g.

Permit progress update requirement (Permit Part I.D.2.e.4): No later than 36 months after the effective date of the permit, Henrico County must submit to DEQ an update on progress toward achieving local TMDL Action Plan goals and anticipated end dates by which the County will meet each.