JAMES RIVER BACTERIA TMDL ACTION PLAN

CITY OF LYNCHBURG
PERMIT [VAR040008]

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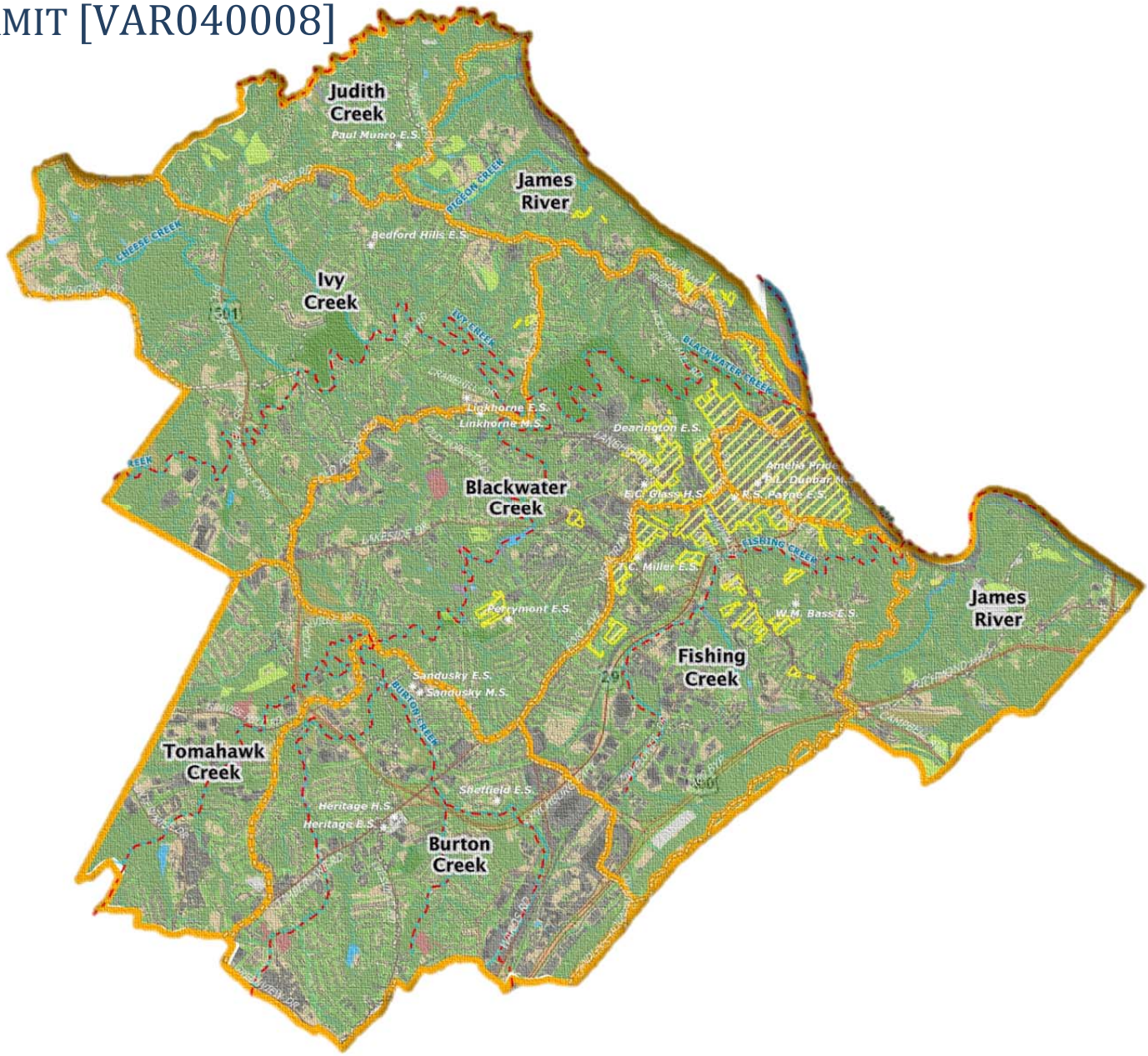

Bacteria TMDL Action Plan

Prepared By

LYNCHBURG WATER RESOURCES

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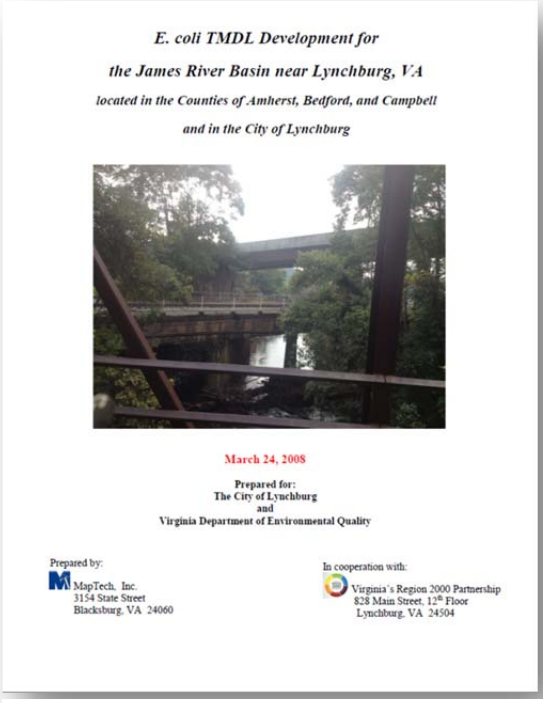
ACRONYMS

BMP	Best Management Practice
CFU	Colony-Forming Units
CSO	Combined Sewer Overflow
CWA	Clean Water Act
DEQ	Department of Environmental Quality
LA	Load Allocation
ESC	Erosion and Sediment Control
EPA	Environmental Protection Agency
LTCP	Long Term Control Plan
MCM	Minimum Control Measure
MEP	Maximum Extent Practicable
MOS	Margin of Safety
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollution Discharge Elimination System
SSO	Sanitary Sewer Overflow
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
VPDES	Virginia Pollution Discharge Elimination System
VSMP	Virginia Stormwater Management Program
WLA	Waste Load Allocation

1 INTRODUCTION & PURPOSE

Mandated by Congress under the Clean Water Act (CWA), the National Pollutant Discharge Elimination System (NPDES) storm water program includes the Municipal Separate Storm Sewer System (MS4), Construction, and Industrial General Permits. In Virginia the NPDES Program is administered by the Virginia Department of Environmental Quality (DEQ) through the Virginia Stormwater Management Program (VSMP) and the Virginia Pollutant Discharge Elimination System (VPDES). The City of Lynchburg (City) is authorized to discharge stormwater from its MS4 under the VPDES General Permit for Discharge of Stormwater from Small MS4s (MS4 General Permit). As part of the MS4 General Permit authorization, the City has developed and implemented a MS4 Program Plan with best management practices (BMPs) to address the six minimum control measures (MCMs) and the special conditions for applicable total maximum daily loads (TMDLs), as outlined in the MS4 General Permit. Implementation of these BMPs is consistent with the provisions of an iterative MS4 Program constituting compliance with the standard of reducing pollutants to the "maximum extent practicable."



E. coli TMDL Development for

the James River Basin near Lynchburg, VA

located in the Counties of Amherst, Bedford, and Campbell

and in the City of Lynchburg

March 24, 2008

Prepared for:
The City of Lynchburg
and
Virginia Department of Environmental Quality

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Figure 1. James River and Tributaries TMDL

The Virginia Department of Environmental Quality (DEQ) listed the James River (VAC-H03R-04), Ivy Creek (VAC-H03R-03), Fishing Creek (VAC-H03R-02) and Blackwater Creek (VAC-H03R-01) as impaired on Virginia's 1996 303(d) Total Maximum Daily Load Priority List and Report (VADEQ, 1996). Tomahawk Creek (VAC-H03R-07), Burton Creek (VAC-H03R-05), and Judith Creek (VAC-H03R-06) were added to the 2004 305(b)/303(d) Integrated Water Quality Assessment Report. All seven streams were assessed as impaired for violations of the State's water quality standard for *E. coli* in the 2010 305(b)/303(d) integrated report. Following the listing, the "James River and Tributaries Bacteria TMDL for James River and Tributaries" was developed and approved by the State Water Control Board in 2007.

Subsequent to the TMDL being developed, the City of Lynchburg was in the process of re-evaluating the Combined Sewer Overflow (CSO) Program and the Long Term Control Plan (LTCP). Under the previous program, the goal was for complete separation of the CSO areas and the City had diligently worked for the past 30 years on separating the combined sewer system. In July 2015, the City received a new Consent Order from DEQ that moved the program away from complete separation to keeping the remaining combined area and making improvements within the system and Wastewater Treatment Plant (WWTP) to treat the additional flow. This change in approach prompted a revision of the "James River and Tributaries Bacteria TMDL" and the load allocations to the MS4 and CSO areas within the City of Lynchburg. The City has been actively participating in the redevelopment of the associated stakeholder meetings.

The City of Lynchburg has prepared this James River Bacteria TMDL Action Plan to meet the requirements of *Section I.B. Special Condition for approved local TMDLs* in the City's MS4 Permit. This TMDL Action Plan will address the waste load allocation assigned to the MS4 area from the draft redeveloped TMDL. The City will proceed with finalizing this draft plan and hold a public comment period at the time the redeveloped James River Bacteria TMDL and implementation plan are approved. The City utilized DEQ's Local TMDL Action Plan Guidance Document in the development of this document.

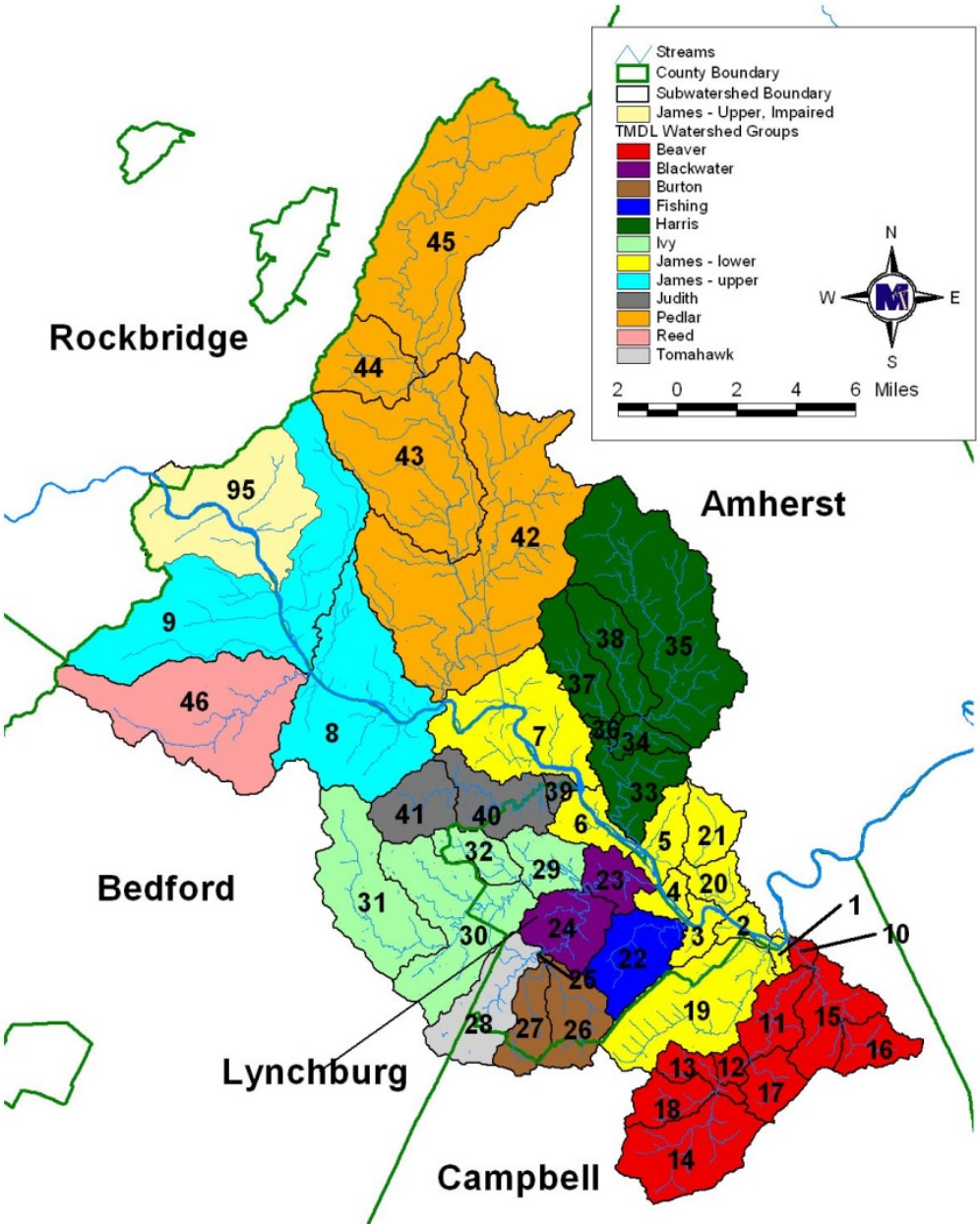

Figure 2. James River and Tributaries TMDL Study Area

1.1 Total Maximum Daily Loads

A TMDL is the total maximum daily load, or the amount of pollutant a water body can assimilate and still meet water quality standards for its designated use. Typically, TMDLs are represented numerically in three main components:

- Waste load Allocations (WLA) for point source contributions and MS4 Permit operators
- Load Allocations (LA) for non-point source contributions and natural background sources
- Margin of Safety (MOS)

Point source pollution is any single identifiable source from which pollutants are discharged. If point source discharges, including a permitted MS4, are present in the TMDL watershed, then any allocations assigned to that permittee must be in the form of a WLA. The City's MS4 outfalls are defined as point source discharges and therefore fall under this category in the TMDL. Pollution that is not from an identifiable source, such as a pipe or a ditch, but rather originates from multiple sources over a relatively large area, is considered to be non-point source pollution. These sources are typically categorized into agricultural, livestock, and wildlife, with Load Allocations (LAs) assigned for each. The Margin of Safety (MOS) is a required component that accounts for the modeling uncertainty in the response of the waterbody to loading reductions and is implicitly incorporated into a TMDL computation. The TMDL is expressed in the following equation:

$$TMDL = \Sigma\ WLA + \Sigma\ LA + MOS$$

The TMDL represents the sum of calculable sources plus a margin of safety that is required to not exceed the current state water quality standard for recreation, which includes monthly geometric means not exceeding 126 cfu/100 ml and no more than 10% exceedance of the 235 cfu/100 mL for single samples. The cfu/ml unit represents a volumetric concentration of viable bacteria cells that can multiply under controlled conditions.

1.2 MS4 Aggregate Waste Load Allocation (WLA)

The four MS4 permittees identified in the TMDL document are the City of Lynchburg, Virginia Department of Transportation (VDOT), Central Virginia Community College, and the Central Virginia Training Center (CVTC). The James River Bacteria TMDL established an aggregate waste load allocation for the City of Lynchburg and VDOT within the Blackwater Creek, Ivy Creek, Judith Creek, Tomahawk Creek, Burton Creek, Fishing Creek and Lower James watersheds.

1.3 MS4 Permit Requirement

The City of Lynchburg operates its MS4 regulated area within the James River Bacteria TMDL watersheds and is therefore subject to the TMDL WLAs assigned in the TMDL. The special conditions for the TMDL listed in Section I of the MS4 General Permit require the City to develop a TMDL Action Plan that identifies the BMPs and other interim milestones activities to be implemented during the remaining terms of this state permit that specifically includes:

- A list of legal authorities applicable to reducing discharge of *E.coli* from the MS4;
- A list of management practices and controls, beyond those required within the six minimum control measures of the MS4 General Permit, that are implemented as part of Lynchburg's MS4 Program and applicable to reductions in *E.coli* discharge from the MS4;
- Enhancement of the Lynchburg Public Education and Outreach Plan and employee training program to promote methods to eliminate and reduce discharges of *E.coli* into the Lynchburg's MS4;
- An identification and assessment of facilities that are owned and operated by the MS4, not covered under a separate VPDES permit, with the potential (greater than the average expected loading) to be significant sources of *E.coli* discharge to the MS4;
- A methodology to assess the effectiveness of the City's Action Plan in reducing the discharge of *E.coli* from the City's MS4.

2 APPLICABLE TMDL FOR CITY OF LYNCHBURG

2.1 James River and Tributaries Bacteria TMDL

The *James River and Tributaries TMDL* assigns a waste load allocation (WLA) for *Escherichia coli*, or more commonly referred to as *E. coli,* that is a type of bacteria normally found in the lower intestines of warm-blooded animals and can cause serious illness if ingested. The WLA or "pollution budget" for a stream sets limits on the amount of pollution that a stream can tolerate and still maintain water quality standards. Nine of the twelve watersheds listed in this study are located in the City of Lynchburg and have been assigned a WLA.

Stream Name Impairment ID	Impairment(s) Contracted	Initial Listing Year	2012 River Miles	2012 Listing Violation %	Impairment Location Description
Blackwater Creek VACH03R_BKW01A00	*E. coli*	1996	10.3	33 & 20 EC	Blackwater Creek main stem from the confluence of Tomahawk and Burton Creeks downstream to the Blackwater Creek confluence on the James River.
Burton Creek VAC-H03R_BUN01A06	*E. coli*	2006	3.45	42 EC	Burton Creek from its headwaters to the confluence with Tomahawk Creek.
Burton Creek X-Trib VAC -H03R_XXA01A08	*E. coli*	2008	3.43	33 EC	Burton Creek Unnamed Tributary from its headwaters to its mouth on Burton Creek.
Dreaming Creek VAC -H03R_DMG01A08	*E. coli*	2008	4.69	25 EC	Dreaming Creek from its headwaters to its mouth on Burton Creek.
Fishing Creek VAC-H03R_FSG01A00	*E. coli*	1996	5.44	42 EC	Fishing Creek main stem from its confluence with the James River upstream to its headwater
Ivy Creek VAC -H03R_IVA01A00	*E. coli*	1998	20.8	21, 17, 17 & 19 EC	Ivy Creek mainstem from its headwaters downstream to its confluence with Blackwater Creek.
James River VAC-H03R_JMS01A00	*E. coli*	1996	3.84	25 EC	James River mainstem from the Business Route 29 bridge downstream to the mouth of Williams Run.
James River VAC-H03R_JMS04A02	*E. coli*	1996	4.11	25 EC	James River main stem from Reusens dam downstream to Business Route 29.
James River – Lower VAC-H03R_IVA01A00	*E. coli*	1996	2.58	25 EC	James River mainstem from the upper watershed boundary at the confluence of Williams Run downstream to the mouth of Archer Creek.
Judith Creek VAC-H03R_JTH01A06	*E. coli*	2006	10.54	11 & 22 EC	Judith Creek from its headwaters to the confluence with the James River.
Tomahawk Creek VAC-H03R_THK01A06	*E. coli*	2006	5.89	33 & 20 EC	Tomahawk Creek from its headwaters to its confluence with Burton Creek.

Table 1. Impairments within the James River Basin at Lynchburg, VA

2.2 Summary of Waste Load Allocation and Allocation Scenarios

Impaired Watershed	Waste Load Allocation assigned to MS4*
Blackwater Creek	1.85E+14 cfu/yr
Burton Creek[1]	3.21E+12 cfu/yr
Fishing Creek	2.54E+13 cfu/yr
Ivy Creek	2.54E+12 cfu/yr
James River - Lower	1.31E+13 cfu/yr
Judith Creek	1.36E+11 cfu/yr
Tomahawk Creek	7.87E+11 cfu/yr

Table 2. City of Lynchburg Waste Load Allocation
***Aggregate WLA includes discharges from City of Lynchburg and VDOT MS4 areas**
[1]Allocations for Dreaming Creek and Burton Creek Unnamed Tributary X included in overall WLA for Burton Creek.

Impairment	Agricultural Loads		Human Direct (Straight Pipe)	Residential	SSO Loads	CSO Loads
	Livestock Direct	Cropland, Pasture				
Blackwater Creek	0	70	80	70	100	LTCP
Burton Creek	0	10	80	10	100	NA
Fishing Creek	0	20		20	100	LTCP
Ivy Creek	0	70	80	70	100	NA
James river - lower	0	0	80	0	100	LTCP
Judith Creek	0	50	80	50	100	NA
Tomahawk Creek	0	40	80	40	100	NA

Table 3. Scenario for James River and Tributaries Load Reduction to achieve water quality standard

***Values expressed as percentage reduction**

2.3 Impaired Watersheds

The City of Lynchburg is approximately 50 square miles and is situated along the James River in the heart of Central Virginia. The City lies in the middle of the study area with all its tributaries draining to the James River. This section provides an overview of the watersheds of the City of Lynchburg and the impaired stream sections.

Figure 3. Watersheds of the City of Lynchburg

2.3.1 Blackwater Creek

The Blackwater Creek watershed begins at the confluence of Burton Creek and Tomahawk Creek and flows north-east before its confluence with the James River near the Riverfront Skate Park. The Blackwater Creek watershed lies within the City limits and covers 6,112 acres. There are approximately 3 acres within the CSO area within this watershed. In 2010, 10.3 stream miles were listed on the 303(d) impaired waters list for bacteria. Blackwater Creek also includes drainage from the Ivy Creek, Burton Creek and Tomahawk Creek watersheds.

Impairment	Agricultural Loads		Human Direct (Straight Pipe)	Residential	SSO Loads	CSO Loads
	Livestock Direct	Cropland, Pasture				
Blackwater Creek	0	70	80	70	100	LTCP

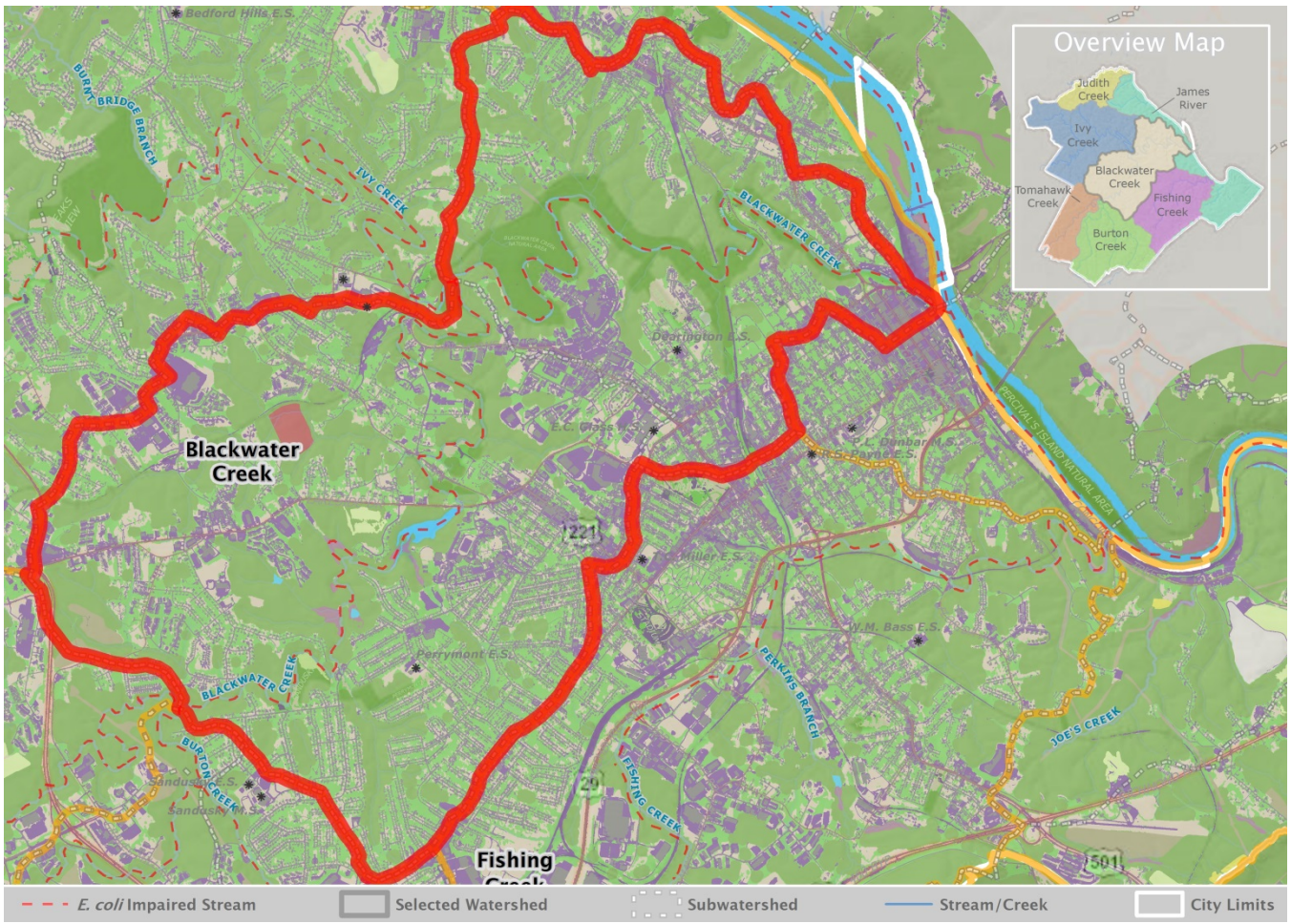

Figure 4. Blackwater Creek Watershed

2.3.2 Burton Creek

There are two sub watersheds that make up the study area for Burton Creek in the TMDL whose headwaters originate in Campbell County before entering into the City along Greenview Drive and Wards Road, respectively. Burton Creek, from its headwaters downstream to confluence with Tomahawk Creek (3.45 stream miles), was listed as impaired on the 2006 303(d) impaired waters list for bacteria. The Burton Creek Unnamed Tributary (locally known as Dreaming Creek), from its headwaters to its mouth on Burton Creek (3.43 stream miles), was listed as impaired on the 2008 303(d) impaired waters list for bacteria. These sub-sheds cover 6,617 acres of which 5,053 acres are in the City of Lynchburg.

Impairment	Agricultural Loads		Human Direct (Straight Pipe)	Residential	SSO Loads	CSO Loads
	Livestock Direct	Cropland, Pasture				
Burton Creek	0	10	80	10	100	NA

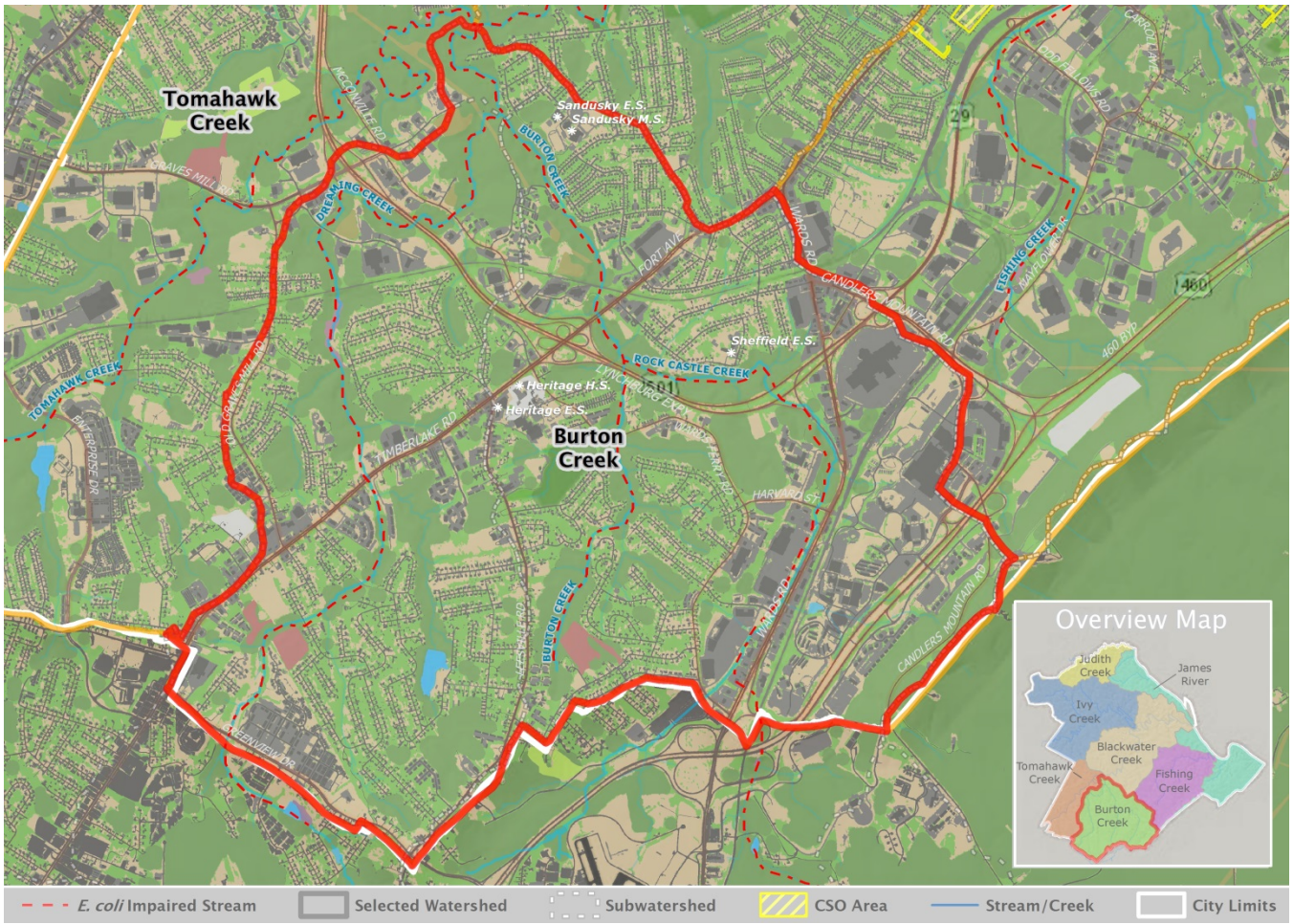

Figure 5. Burton Creek Watershed (includes Dreaming Creek and Unnamed Tributary)

2.3.3 Fishing Creek

The Fishing Creek watershed has a drainage area of 4,590 acres that is predominately within the City of Lynchburg. Its headwaters start in the vicinity of Candler's Mountain and flows north east to its confluence with the James River at the West Rock industrial facility. There are approximately 307 acres within the CSO area within this watershed. In 2010, DEQ listed 5.44 miles of Fishing Creek 303 (d) impaired waters list for bacteria.

Impairment	Agricultural Loads		Human Direct (Straight Pipe)	Residential	SSO Loads	CSO Loads	Partially Identified Source
	Livestock Direct	Cropland, Pasture					
Fishing Creek	0	20		20	100	LTCP	100

Figure 7. Fishing Creek Watershed

2.3.4 Ivy Creek

The headwaters of Ivy Creek originate in Bedford County before entering into the City through the Lynchpin Industrial Park. Ivy creek continues to flow southeast until its confluence with Blackwater Creek, near the Ed Page entrance to the Blackwater Creek Trail. The Ivy Creek watershed covers 23,942 acres and is the largest watershed in the study area that flows through the City. The area of the Ivy Creek drains approximately 6,436 acres within the City. There are approximately 3.9 acres within the CSO area within this watershed. In 2010, DEQ listed 20.8 miles of Ivy Creek on the 303(d) impaired waters list for bacteria.

Impairment	Agricultural Loads		Human Direct (Straight Pipe)	Residential	SSO Loads	CSO Loads
	Livestock Direct	Cropland, Pasture				
Ivy Creek	0	70	80	70	100	NA

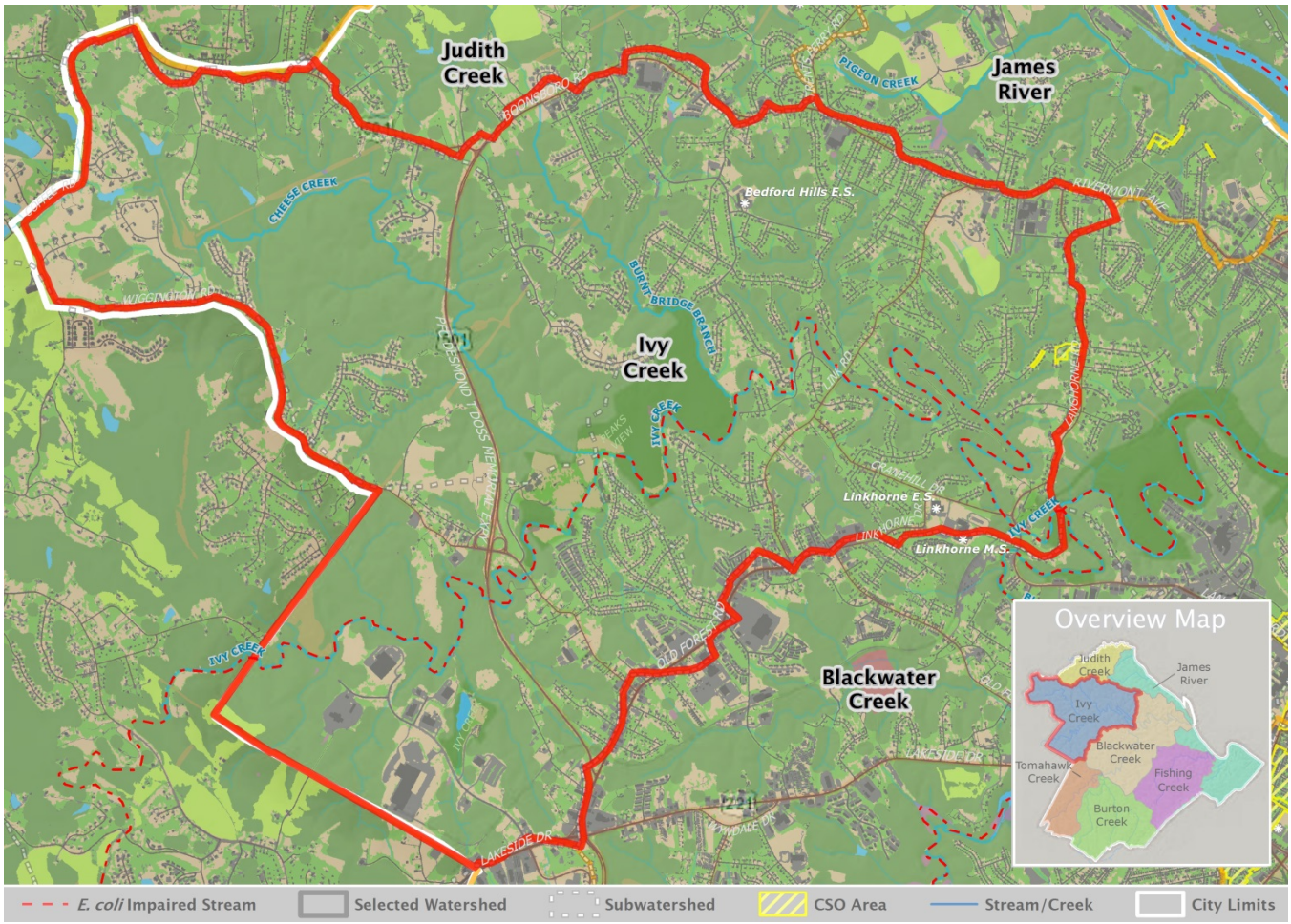

Figure 8. Ivy Creek Watershed

2.3.5 James River – Lower

The James River flows along the north eastern boundary of the City, ultimately reaching the Chesapeake Bay. The City borders the river from the confluence of Judith Creek and the James at the northern boundary to the Monacan Bridge over the James River at the southern boundary. Approximately 4,893 acres of the City drain directly to the James River or through its tributaries. There are approximately 520 acres within the CSO area within this watershed. In 2014, DEQ listed approximately 18 miles of the James River on the 303(d) impaired waters list for bacteria.

Impairment	Agricultural Loads		Human Direct (Straight Pipe)	Residential	SSO Loads	CSO Loads
	Livestock Direct	Cropland, Pasture				
James River Lower	0	0	80	0	100	LTCP

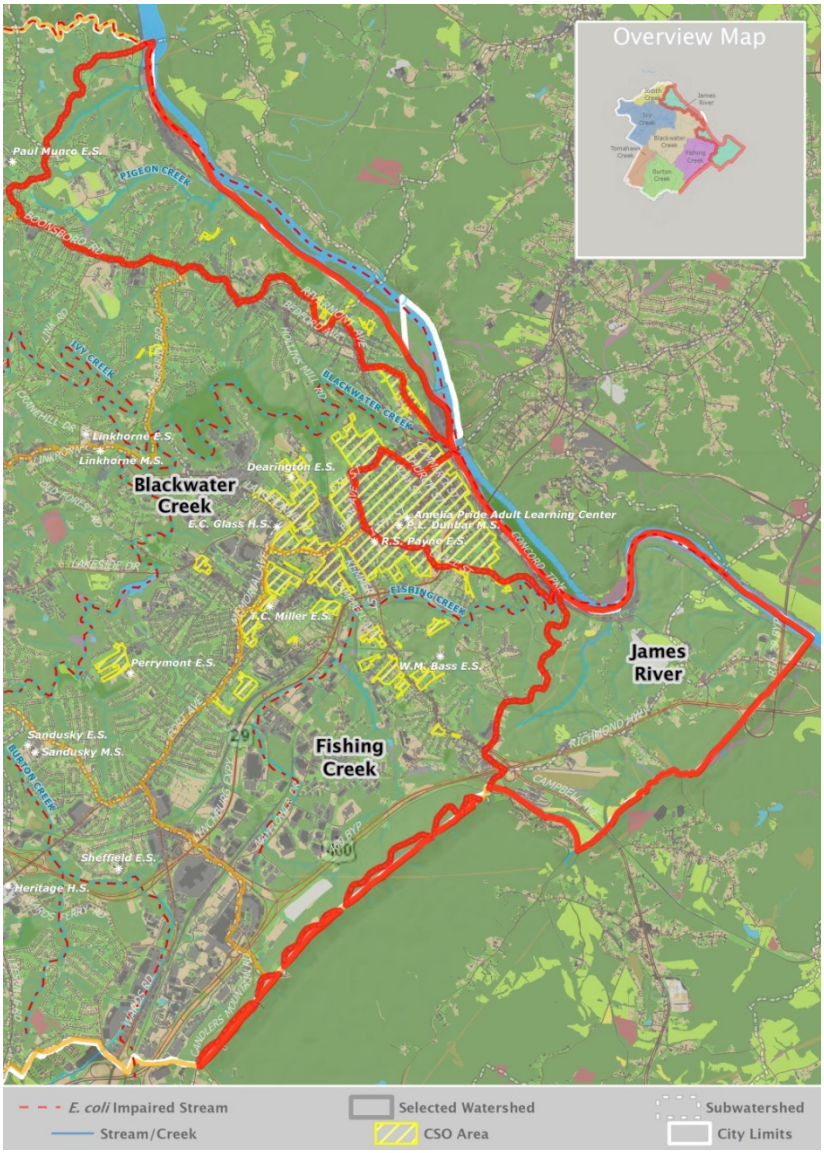

Figure 9. Lower portion of James River Watershed near Lynchburg

2.3.6 Judith Creek

Judith Creek originates in Bedford County and flows east along the limits of the City before its confluence with the James River. The watershed is approximately 8,387 acres in area with 1,815 acres within the City. In 2006, 10.54 miles of Judith Creek were listed on the 303(d) impaired waters list for bacteria.

Impairment	Agricultural Loads		Human Direct (Straight Pipe)	Residential	SSO Loads	CSO Loads
	Livestock Direct	Cropland, Pasture				
Judith Creek	0	50	80	50	100	NA

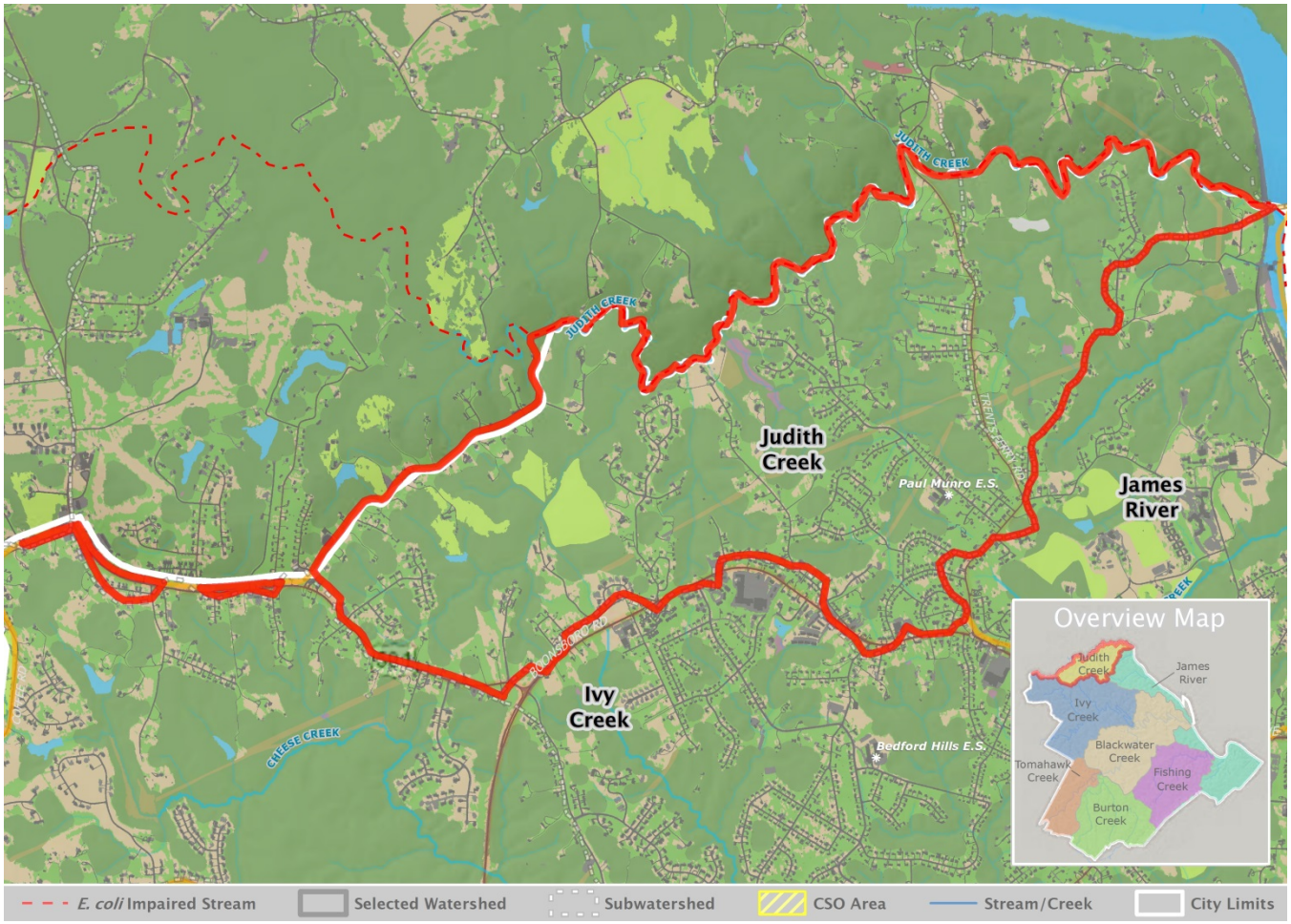

Figure 10. Judith Creek Watershed

2.3.7 Tomahawk Creek

The Tomahawk Creek flows south east before its confluence with Burton Creek. Its headwaters originate in Campbell County generally beginning along Waterlick Road. Approximately 2,608 acres are located within the City of Lynchburg from Laxton Road until the confluence with Burton Creek. In 2010, 5.89 miles of Tomahawk Creek were listed on the 303(d) impaired waters list for bacteria.

Impairment	Agricultural Loads		Human Direct (Straight Pipe)	Residential	SSO Loads	CSO Loads
	Livestock Direct	Cropland, Pasture				
TOMAHAWK CREEK	0	40	80	40	100	NA

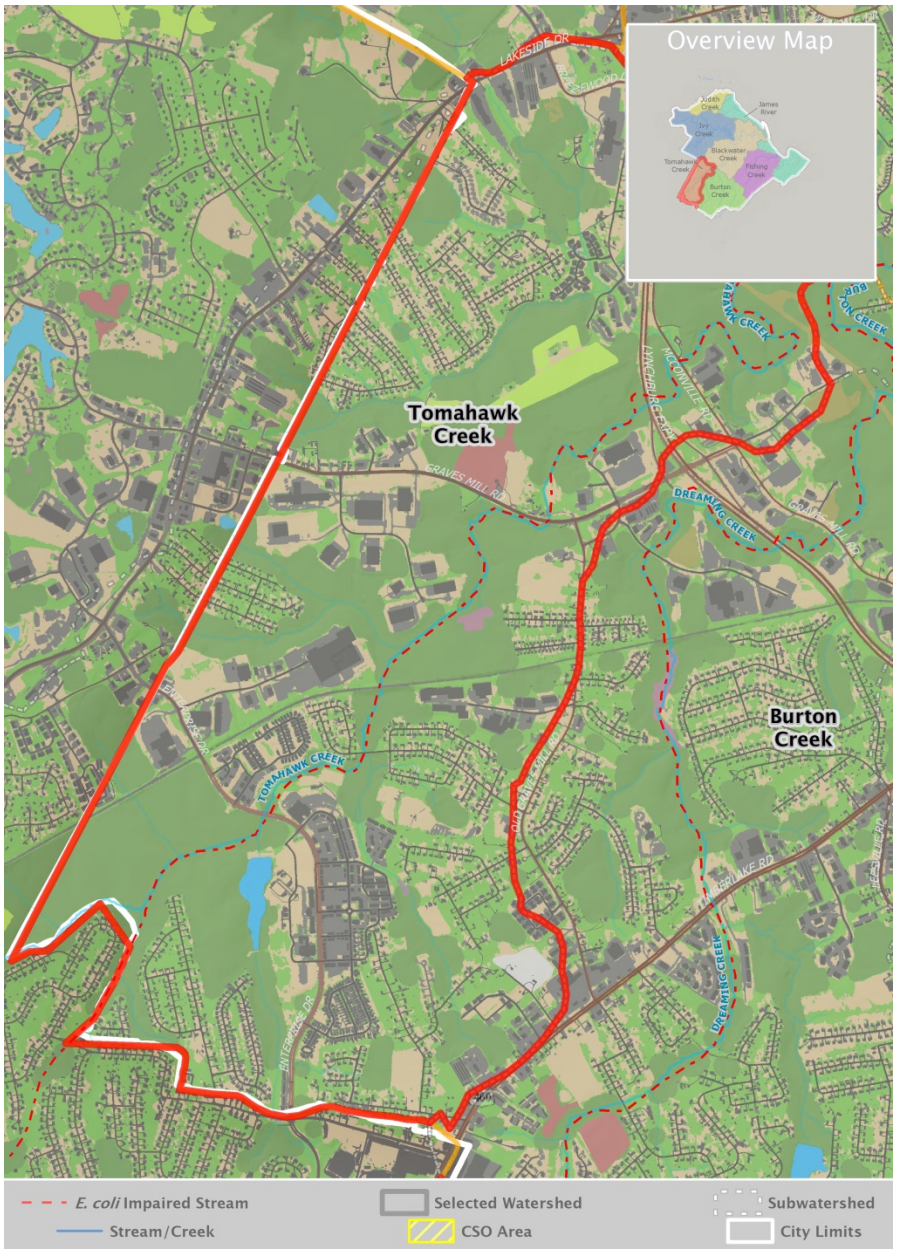

Figure 11. Tomahawk Creek Watershed

3 CHARACTERIZATION OF POLLUTANT LOAD IN THE CITY OF LYNCHBURG

The City reviewed the TMDL, the City's MS4 Program Plan, and City owned properties to characterize the pollutant loading of potential *E. coli* sources from the City's stormwater system. The City also reviewed its CSO LTCP and Sanitary Sewer Program for pollutant loading.

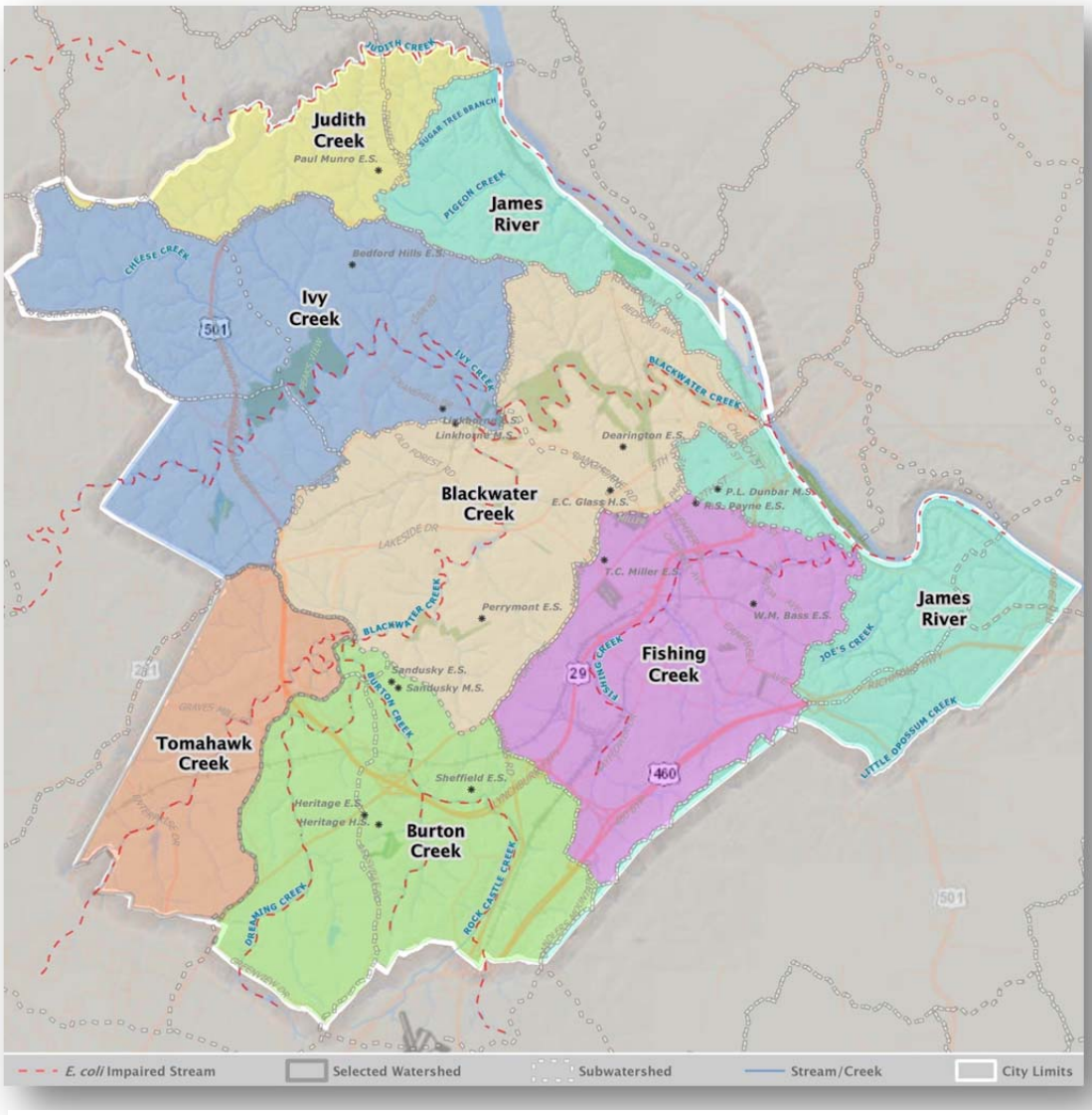

Figure 12. James River and Tributaries TMDL watersheds in City of Lynchburg

3.1 Potential Sources of Bacteria

The James River Bacteria TMDL considered a wide range of sources including agricultural, pet waste and direct discharges. The following is a summary of sources considered for the City's Waste Load Allocation. For the purposes of this report agricultural and livestock sources are not considered applicable sources to the City's MS4.

3.1.1 Pet Waste

The TMDL assumed that an average of 0.534 dogs and 0.598 cats resided in each household and made up the primary pets that contributed to the bacteria loading. As of the 2010 Census, the population of the City of Lynchburg was 75,568 and the number of housing units can be estimated at 33,530. Based on the estimated number of housing units, approximately 17,905 dogs and 20,050 cats call Lynchburg home. While the pet population exists in mostly residential neighborhoods, it can be assumed that bacteria waste can enter into waterways from other areas utilized by the public. These areas are those generally frequented by pet owners and can include parks or dog park, trails or other recreational areas.

3.1.2 Public Sewer System

The City owns, operates and maintains the Lynchburg Regional Wastewater Treatment Plant (LRWWTP) that treats over 11 million gallons of wastewater daily and a sewer collection system of approximately 441 miles of gravity sewer lines that services both residential and commercial customers. The system receives flow from Amherst, Bedford and Campbell Counties, in addition to the City's customers. The LRWWTP operates under VPDES Permit No. VA0024970 and VPDES General Permit No. VAN040075. Sanitary sewer overflows (SSOs) have the potential to occur as a result of wet weather events, blockages in the system, or system defects. As part of our ongoing efforts to minimize and eliminate SSOs, the City has implemented a Sanitary Sewer Evaluation Survey (SSES) and has developed and is implementing a Capacity, Maintenance, Operations, and Management (CMOM) Program.

3.1.3 Combined Sewer Overflow (CSO)

The City of Lynchburg has a combined sewer system that encompasses approximately 1,300 acres where stormwater inlets are combined with the sanitary system. The City operates under a CSO Consent Special Order dated July 31, 2015 and Long Term Control Plan (LTCP) that establish the level of control necessary for the CSO Program to meet its established allocations for the Bacteria TMDL. The LTCP is in compliance with EPA's CSO Policy by meeting both the Demonstration Approach and Presumptive Approach of the policy. This will be further verified once all the control measures have been implemented through a post construction monitoring program as outlined in the CSO Consent Special Order. The CSO overflow points are located in the Blackwater Creek, Fishing Creek and Lower James River watersheds of the TMDL study area.

3.1.4 Septic System and Straight Pipe

Septic systems that are not properly maintained can leak excessive nutrients and bacteria into local streams. Stormwater runoff can then transport the bacteria into local waterways. Properties that are located within 200 feet of a stream and not using a septic system may be directly discharging wastes to local waterways via a straight pipe. The City estimates there are 3,500 properties served by septic systems. These numbers were estimated by looking at utility billing accounts that were listed as water or stormwater only. This implies there is no sanitary sewer connection and the property served by a septic system or discharge via straight pipe. The Department of Water Resources will utilize best available information to update properties served by septic systems within the City.

The TMDL used data from the US Census Bureau from 1990, 2000 and 2010 to estimate the number of failed septic systems within the City.

Impairment	Houses with Sewer	Houses with Septic	Estimated Homes with Straight Pipes	Estimated Homes with Failing Septic System
Blackwater Creek	9,522	458	7	9
Burton Creek	5,391	2,102	4	42
Fishing Creek	4,271	93	0	2
Ivy Creek	3,985	4,235	11	85
James River - Lower	3,781	2,019	15	41
Judith Creek	489	663	4	14
Tomahawk Creek	2,491	3,079	5	62

Table 4. Estimate of failed septic systems and straight pipes by watershed

3.1.5 City –Owned and Operated Facilities

Properties owned and/or operated by the City of Lynchburg were assessed to determine their potential for presence of sources of *E. coli* either to the City's MS4 or directly to a waterway. The following figure describes the assessment of City owned facilities and the findings were documented alongside the assement of high-priority facilities that was required in the Good Housekeeping requirements of MCM 6.

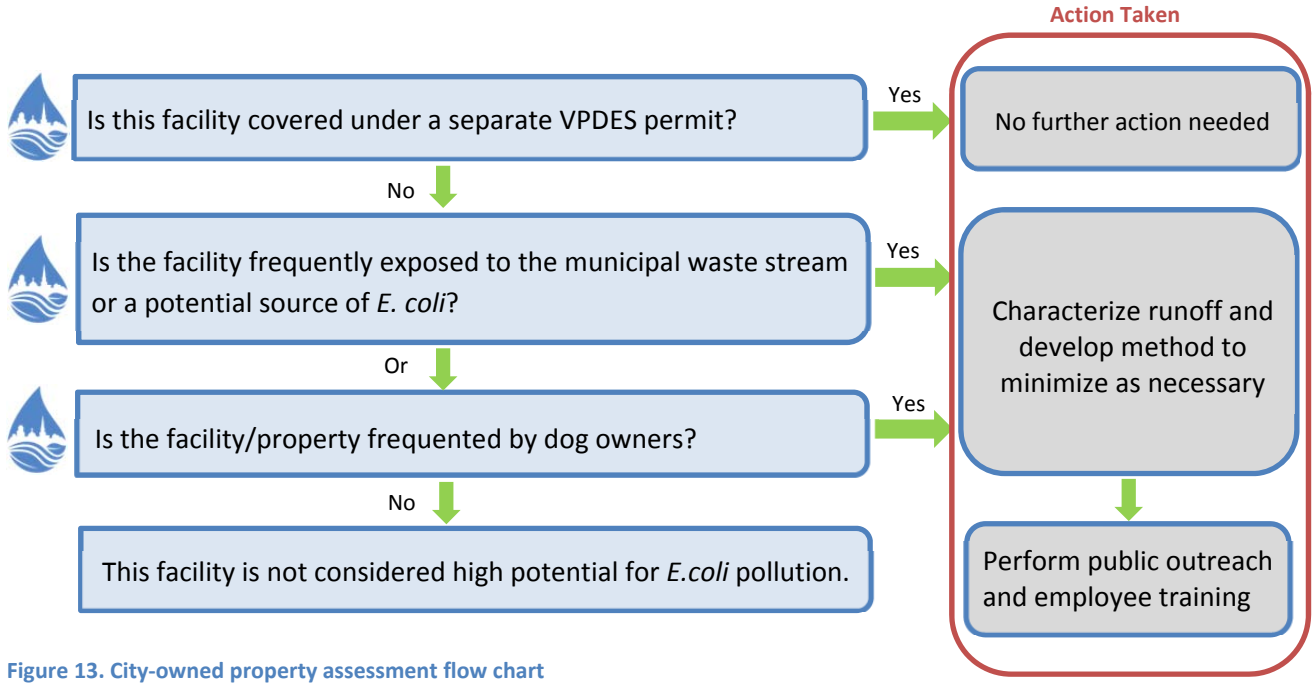

Figure 13. City-owned property assessment flow chart

The following properties have been identified as being a potential source of *E. coli*:

- *Blackwater Creek Athletic Area and Dog Park* – The dog park provides an off leash area for dogs and is frequented by local residents. The dog park is located a short distance from Blackwater Creek. The park area has signage for visitors to pick up after their pets and on-site pet stations are available. The property is considered a potentially significant source.

- *Riverfront Park* – This park attracts many visitors for events along the riverfront and its access to trail systems. This park is frequented by dog owners visiting the park and residents that live downtown. Pet waste stations have been placed along the park trail and in the downtown area to encourage both visitors and residents to pick up after their pets. The property is considered a potentially significant source.

- *Blackwater Creek Trail* – This is one of the most popular trails in the City stretching 3 miles along Blackwater Creek and is frequented by dog owners. The property is considered a potentially significant source.

- *Public Works Refuse Facility* – The potential for bacteria discharges are present at the facility because of open storage of trucks. Truck maintenance is handled indoors and washing occurs at an indoor fleet facility. The property is considered a potentially significant source.

4 BEST MANAGEMENT PRACTICES TO ADDRESS *E. COLI*

The City of Lynchburg MS4 Permit covers stormwater discharges from the urbanized area included in the Census data. The City's MS4 Program Plan includes the programmatic best management practices the City employs to meet the permit requirements. Implementation of this plan results in significant reductions of pollutants that may be discharged from the MS4. The following documents the City's ongoing efforts, its legal authorities and other methods to reduce bacteria pollution.

4.1 Current Program Review

4.1.1 Minimum Control Measure 1 (Public Education and Outreach)

The MS4 Public Education and Outreach Plan outlines educational information on water quality issues that impact water quality. The current Program Plan incorporates two water quality messages that address bacteria or *E. coli* pollution. The first water quality message MCM 1.2, *Pet waste pollution prevention* addresses the impacts of pet waste and provides information to pet owners regarding the importance of picking up after their pet. The second water quality message to address bacteria is MCM 1.4, *Septic maintenance*. This message provides homeowners with septic systems information on the importance of maintaining their systems.

4.1.2 Minimum Control Measure 2 (Public Participation)

The City posts the MS4 General Permit, Program Plan, and Annual Reports to the Lynchburg Water Resources Stormwater page. Along with this information this Action Plan will be posted and kept on the City website, link, for the public to view.

The City offers volunteer community events such as stream clean-ups, the March on Litter, storm drain marking and workshops to educate the public on keeping our waterways clean. This has resulted in thousands of pounds of trash being kept out of local streams.

4.1.3 Minimum Control Measure 3 (Illicit Discharge Detection and Elimination)

The City's MS4 Program includes an Illicit Discharge Detection and Elimination program that prohibits non-stormwater discharges to the storm sewer system. The program outlines the legal authority, policy and procedures used to address non-stormwater discharges. The City performs annual outfall reconnaissance screening and water quality testing of stormwater outfalls to identify potential illicit discharges.

4.1.4 Minimum Control Measure 4 (Construction)

The City's Construction Program includes mechanisms to ensure compliance and enforcement on regulated construction sites that are enforced through Lynchburg's Erosion and Sediment Control (ESC) and Stormwater Management (SWM) Ordinances that are consistent with the Virginia Erosion and Sediment Control and Virginia Storwmater Management Program (VSMP) Laws and Regulations and includes:

- Required plan approval prior to commencement of a regulated land disturbance activity;
- Construction site inspections and enforcement; and
- Certification of post-construction SWM facilities

Through inspections and enforcement, especially in regards to stormwater pollution prevention plan (SWPPP) inspections, potential for *E.coli* discharges (i.e. port-a-johns) is minimized. Minimum Control Measure 4 in The City of Lynchburg MS4 Program Plan describes construction site runoff control BMPs.

4.1.5 Minimum Control Measure 5 (Post-Construction)

Lynchburg's MS4 Program includes a Post-Construction SWM Program that ensures water quality criteria in the Virginia Stormwater Management Regulations has been achieved on new and re-development projects through implementation of a Stormwater Management Ordinance. Included within the ordinance are requirements for as-built certifications for SWM BMPs and long-term maintenance agreements to ensure that SWM facilities are designed and installed in accordance with appropriate law and regulations. Although the facilities are designed to achieve target phosphorus reductions, many water quality BMPs also are effective at *E.coli* removal. Minimum Control Measure 5 BMPs in the Lynchburg MS4 Program Plan describe post-construction stormwater management BMPs.

4.1.6 Minimum Control Measure 6 (Good Housekeeping)

Lynchburg's MS4 Program includes a Pollution Prevention and Good Housekeeping program that includes operations and maintenance standard operating procedures, requirements for SWPPPs for municipal facilities and an employee training program. Operating policies and procedures and the development of SWPPPs for key municipal properties help to minimize exposure of pollutants to rainfall on municipal properties from day-to-day activities. Training for key municipal staff includes the recognition and reporting of illicit discharges and review of good housekeeping policies and procedures. Minimum Control Measure 6 BMPs in the Lynchburg MS4 Program Plan describe Good Housekeeping and training.

4.2 Legal Authorities

The City of Lynchburg has the following legal authorities for implementation of this plan. Link to City Code.

Chapter 7	Animals and Fowl
Chapter 16.1	Erosion and Sediment Control Ordinance
Chapter 16.2	Stormwater Management Ordinance
Chapter 16.3	Stormwater Utility Ordinance
Chapter 21.2	Solid Waste Collection and Disposal
Chapter 26	Nuisance Ordinance
Chapter 34	Sanitary Sewer Ordinance
Chapter 35.1	Zoning Ordinance

4.3 Strategies Beyond Minimum Control Measures

Additional practices beyond the MCMs to address each of the sources described in the TMDL scenario listed in Section 3 are addressed with practices and controls in as described in the following sub-sections.

4.3.1 Pet Waste

In addition to the outreach message previously described, the City has implemented pet waste stations in public spaces that are frequented by dogs. These stations include bag dispenser, waste receptacle and signage encouraging pet owners to pick up after their pets. To date there have been 14 pet waste stations installed at City facilities including the Dog Park, Riverfront Park, and the Downtown Bluffwalk. Additional stations may be installed on an as needed basis.

4.3.2 Garbage Collection Program

The Department of Public Works provides garbage and recycling collection services to City of Lynchburg residents. The City provides trash canisters and requires that garbage be bagged prior to collection. Garbage collection and proper disposal has the potential to decrease bacteria discharges from household waste.

4.3.3 Public Sewer System

The Department of Water Resources implements a Capacity, Management, Operations and Maintenance (CMOM) program for the efficient management of the sanitary sewer system that will serve to minimize the occurrence of sanitary sewer overflows (SSOs). The program includes routine inspection, maintenance and rehabilitation of the collection system that will help minimize the risk of sanitary sewer overflows (SSOs).

4.3.4 Combined Sewer Overflow (CSO)

In accordance with the Consent Special Order and the CSO Long Term Control Plan the City will be making significant investments into the LRWWTP that will increase the wet weather pumping capacity to 80 MGD and allow the plant to maximize the capture and treatment of the combined flow. Additional improvements in the combined system will result in the City meeting or exceeding the bacteria reduction goals for the CSO Program. This will be verified upon through post construction monitoring upon completion of all the projects identified in

the LTCP. Additional controls will be implemented should the post construction monitoring indicate that the predicted level of bacteria removal and performance was not achieved.

4.3.5 Septic Systems and Straight Pipe

New development is required to connect to the sanitary sewer system whenever the property is served by sewer or within 50 feet of the property. If a septic system fails, City Code requires that property owners connect to the sanitary system when there is sanitary sewer available and the septic system cannot be repaired according to Virginia Department of Health Regulations. The Lynchburg Health Department oversees the permits for new and existing septic systems.

There are no known straight pipe discharges to surface waters within the City. As previously described, the City's IDDE Program includes a proactive approach to reduce illicit discharges with annual outfall screening to seek out and remove non-stormwater discharges into the MS4. As part of MCM3, the City will continue annual outfall screening and to add new outfalls to mapping as they are discovered. In the case that annual dry-weather screening should identify an illicit discharge, including sewage, the existing policies and procedures will be utilized to eliminate the discharge through an IDDE investigation and enforcement of the City's IDDE Ordinance.

4.3.6 Source Controls at City-Owned and Operated Facilities

The review of City owned facilities indicates that the primary source of *E.coli* pollution is pet waste. The City has installed signage and pet waste stations at the Dog Park and along park trails to encourage pet owners to pick up after their pets as described previously in this section. The City will continue to maintain the stations and evaluate the need for additional stations. There is the potential for *E. coli* sources at the City's Public Works refuse facility. Potential sources will be addresses through a Stormwater Pollution Prevention Plan (SWPPP) that is required to be developed by the MS4 General Permit by July 1, 2017.

4.3.7 Public Education and Outreach

As previously discussed, the City of Lynchburg public education and outreach plan includes two messages that address *E. coli* as a pollutant of concern. The information provided promotes the elimination and reduction of *E. coli* from pet waste and septic systems.

4.3.8 Employee Training

The City's training program includes training for all applicable field staff as a target audience to address the pollutant of concern as required by the City's MS4 Permit. Staff training includes recognizing and reporting of illicit discharges and on good housekeeping procedures.

5 ADAPTIVE MANAGEMENT

DEQ's draft guidance memo for Local TMDL Action Plans (April, 2015) states that, "*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)*". The City of Lynchburg will continue to implement the MS4 Program Plan as described in Sections 4 to reduce the potential for E. coli discharge to surface waters. The method of assessment will be implemented through the annual reporting process with the ability to review the effectiveness of each MS4 Program Plan strategy. The City reserves the right to modify its TMDL Action Plan over time for reasons including but not limited to the implementation of more effective BMPs and the exclusion of ineffective BMPs.