



DRAFT

VDOT Action Plan for Local Bacteria TMDLs

Virginia Department of Transportation Small Municipal Separate Storm Sewer System (MS4)

In Compliance with:

VPDES Permit for Discharges of Stormwater from MS4 (VA0092975)
Coverage from July 01, 2017 to June 30, 2022

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ACRONYMS

BMP	Best Management Practice
CUA	Census Urbanized Area
DEQ	Virginia Department of Environmental Quality
EPA	United States Environmental Protection Agency
ESC	Erosion and Sediment Control
MEP	Maximum Extent Practicable
MCM	Minimum Control Measure
MS4	Municipal Separate Storm Sewer System
PCBs	Polychlorinated Biphenyls
POC	Pollutant of Concern
ROW	Right-of-Way
Rt.	Route
SWCB	State Water Control Board
SWM	Stormwater Management
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
VDOT	Virginia Department of Transportation
VPDES	Virginia Pollutant Discharge Elimination System
WLA	Waste Load Allocation
WTM	Watershed Treatment Model

EXECUTIVE SUMMARY

The Virginia Department of Transportation (VDOT) developed this Action Plan in accordance with the requirements of the Special Condition for Local Total Maximum Daily Loads (TMDLs) described in VDOT's Individual Permit VA0092975. The Individual Permit requires permittees to develop a TMDL Action Plan for pollutants allocated to the Municipal Separate Storm Sewer system (MS4) in approved TMDLs. The TMDL Action Plan is to identify the Best Management Practices (BMPs) and other interim milestone activities which can be used to satisfy the TMDL.

VDOT developed this Action Plan for Bacteria TMDLs, approved prior to 2013, that allocate a Waste Load Allocation (WLA) to VDOT's MS4. Table ES1 summarizes the TMDL project name, U.S. Environmental Protection Agency (EPA) approval date of the TMDL, the WLA allocated to VDOT and the corresponding percent reduction.

Table ES1: TMDLs Issued Prior to 2013 that assigned a Bacteria WLA to VDOT

TMDL Project Name	EPA Approval Date	WLA Allocated (E Coli, cfu/year)	Percent Reduction
Accotink Creek (Lower)	12/18/08	1.73E+12	97%
Chickahominy River and Tributaries	9/19/12	1.51E+11	Not available
Crab Creek Watershed	8/10/2004	3.40 E+08	99%
Difficult Run	11/07/08	9.44E+12	90%
Hoffler Creek, Cities of Portsmouth and Suffolk	12/14/11	5E+11 cfu/day ²	95.6%
Hunting Creek, Cameron Run, Holmes Run	11/10/10	3.62E+14	83%-98%
James River and Tributaries, City of Richmond	11/04/10	1.58E+14	0.1%-97.5%
James River Watershed (Lynchburg)	12/4/2007	8.98 E +13	80%-98%
Neabsco Creek Watershed	7/10/08	1.05E+12 cfu/day	75%
Occoquan River Watershed	11/15/2006	1.61 E+12	81%-94%

TMDL Project Name	EPA Approval Date	WLA Allocated (E Coli, cfu/year)	Percent Reduction
Opequon and Abrams Creek Watersheds	2/18/2004	3.1 E+12	96%
Rivanna River Watershed	1/05/09	7.63E+12	95%
Tidal Four Mile Run Watershed	6/14/10	3.76E+13	88%-94%
Tidal Freshwater Rappahannock River Watershed	5/5/2008	3.89 E +11	62.8%
Upper Roanoke River Watershed	8/2/2006	1.23E+10 ¹	Roanoke River: 98.8% Ore Branch: 99.5% Wilson Creek: 99.5%

¹WLA is aggregated with other MS4s. ² WLA is in Enterococci (cfu/day)

In accordance with the MS4 Individual Permit, this Action Plan includes:

- A discussion of VDOT's MS4 Program and its ability to address the pollutant(s) of concern (POC);
- An assessment of VDOT's MS4 regulated area (the area regulated by the MS4 Individual Permit which covers areas discharging to an MS4 that is owned and/or operated by VDOT and located within the urbanized areas of Virginia as identified by the 2010 Decennial Census), including facilities, in the TMDL watershed (the "study area");
- A needs assessment for additional BMPs;
- A list of all additional management practices, control techniques and system design and engineering methods beyond those implemented as part of the adaptive MS4 Program Plan; and,
- A BMP selection process for implementation and interim milestones.

Under VDOT's coverage by the previous small MS4 General Permits (2008-2013 and 2013-2017), VDOT annually performed characterizations of the stormwater discharged, and had identified and selected BMPs in a manner consistent with the assumptions and requirements of the Local Bacteria TMDLs. VDOT used the Watershed Treatment Model (WTM) to perform the annual characterizations and BMP selection. WTM is capable of calculating annual stormwater discharge and bacteria and sediment loading, as well as incorporating pollutant removal credit for various BMPs. VDOT integrated these previous efforts with the requirements of the new MS4 Individual Permit to develop this updated TMDL Action Plan.

1.0 BACKGROUND

Regulatory Framework

Previously, VDOT was authorized to discharge stormwater from its MS4 by coverage under the Virginia Pollutant Discharge Elimination System (VPDES) General Permit for Discharge of Stormwater from Small MS4s within the urbanized areas of Virginia. The General Permit was valid from 2013 to 2018. Subsequently, the Virginia Department of Environmental Quality (DEQ) staff determined that due to the unique nature of the VDOT MS4 and associated regulated service area, an Individual Permit for the system was more appropriate than to continue coverage under the Small MS4 General Permit. The DEQ issued the Individual Permit (MS4 Permit No. VA0092975) on June 29, 2017.

As part of the previous permit authorization (2013 – 2018), VDOT developed and implemented an MS4 Program Plan with BMPs to address the six minimum control measures (MCMs) and the special conditions for applicable TMDLs outlined in the General Permit. The General Permit specified that within thirty-six months after permit coverage, the permittee must develop and implement Local TMDL Action Plans for TMDLs approved between July 2008 and June 2013 and within twenty-four months for TMDLs developed prior to July 2008. VDOT developed twenty TMDL Action Plans in accordance with the General Permit requirements.

In accordance with the Individual Permit, VDOT must update approved Local TMDL Action Plans no later than twelve months after the effective date of VDOT's MS4 Individual Permit for TMDLs approved by the EPA prior to July 1, 2013. This requires the update of twenty Local TMDL Action Plans by July 1, 2018.

Pollutants of Concern (POC)

DEQ developed TMDLs with pollutant loading limits for various watersheds across the Commonwealth. The TMDLs became effective upon approval by the State Water Control Board (SWCB). VDOT's MS4 Program was assigned a portion of the MS4 WLAs for various TMDLs in the Census Urbanized Area (CUA) of these watersheds.

The three POCs addressed in the VDOT Local TMDL Action Plans are sediment, bacteria, and polychlorinated biphenyls (PCBs). Most of the Local TMDL Action Plans to date have been written for specific watersheds and often address more than one TMDL or POC. For example, the Opequon and Abrams Creek Watersheds have both a Sediment and Bacteria TMDL. Of the twenty existing Local TMDL Action Plans, all but five include bacteria as a POC, nine address sediment, while only one addresses PCBs as the POC. The following table summarizes the Local TMDL Action Plans which were prepared in previous permit cycles.

Table 1: VDOT Local TMDL Action Plans Prior to 2013

TMDL Project Name	Sediment	Bacteria	PCBs	EPA Approval Date
Accotink Creek (Lower)		X		12/18/08
Bull Run	X			9/26/06
Chickahominy River and Tributaries		X		9/19/12
Crab Creek Watershed	X	X		8/10/04
Difficult Run	X	X		11/7/08
Goose Creek and Little River Watersheds	X			4/26/04
Hoffler Creek, Cities of Portsmouth and Suffolk		X		12/14/11
Hunting Creek, Cameron Run, Holmes Run		X		11/10/10
James River and Tributaries, City of Richmond		X		11/4/10
James River Watershed (Lynchburg)		X		12/4/07
Neabsco Creek Watershed		X		7/10/08
Occoquan River Watershed		X		11/15/06
Opequon and Abrams Creek Watershed	X	X		2/18/04
Popes Head Creek	X			9/26/06
Potomac River Watershed			X	10/31/07
Rivanna River Watershed	X	X		Sediment – 6/11/08 Bacteria – 1/5/09
Stroubles Creek Watershed	X			1/28/04
Tidal Four Mile Run Watershed		X		6/14/10
Tidal Freshwater Rappahannock River Watershed		X		5/5/08
Upper Roanoke River Watershed	X	X		Sediment – 5/10/06 Bacteria – 8/2/06

Local Bacteria TMDL Action Plan

This document serves as the Local Bacteria TMDL Action Plan, updated in accordance with the Individual Permit. This document addresses the fifteen watersheds where VDOT received a WLA prior to 2013. The updated specific information for the fifteen watersheds with Bacteria TMDLs are included as appendices to this document. These watersheds, depicted on Figure 1, include:

- Accotink Creek (Lower)
- Chickahominy River and Tributaries
- Crab Creek Watershed
- Difficult Run
- Hoffler Creek, Cities of Portsmouth and Suffolk
- Hunting Creek, Cameron Run, Homes Run

- James River Watershed (Lynchburg)
- James River and Tributaries, City of Richmond
- Neabsco Creek Watershed
- Occoquan River watershed
- Opequon and Abrams Creek Watersheds
- Rivanna River Watershed
- Tidal Four Mile Run Watershed
- Tidal Freshwater Rappahannock River Watershed
- Upper Roanoke River Watershed

The updated Local TMDL Action Plans for watersheds that VDOT has also been assigned a WLA of sediment or PCBs are addressed in the VDOT Action Plan for Local Sediment TMDLs or the VDOT Action Plan for Local PCB TMDLs (both dated June 2018), respectively.

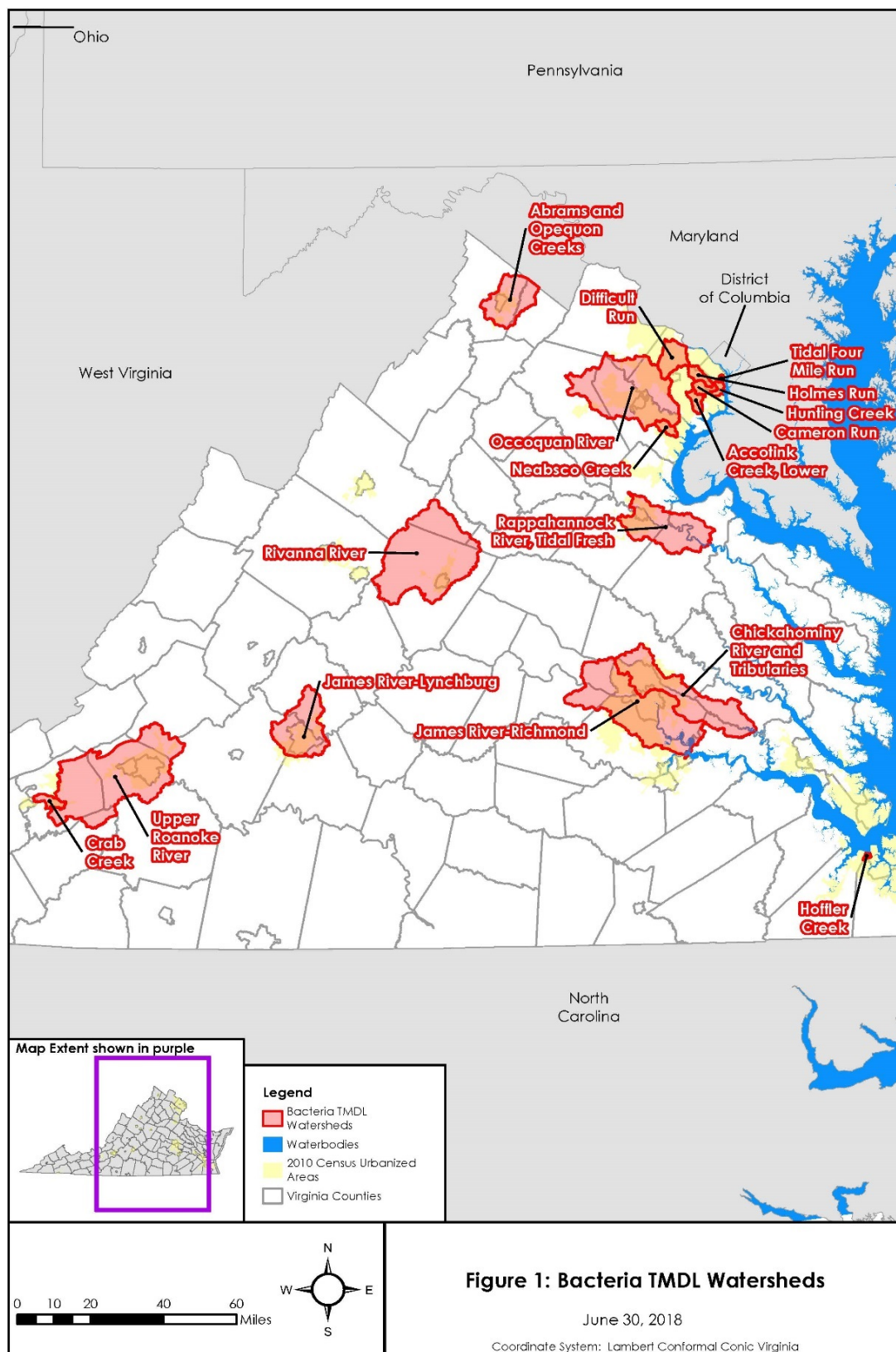
Action Plan for Local Bacteria TMDL Requirements

In accordance with VDOT's Individual Permit, each updated Local TMDL Action Plan (regardless of the POC) includes the following details:

1. The TMDL project name;
2. The EPA approval date of the TMDL;
3. The WLA allocated to VDOT and corresponding percent reduction, if applicable;
4. An inventory map of all permittee owned or operated facilities, including roadway systems, located within the TMDL watershed;
5. An evaluation of each facility and roadway category to determine if it is a significant source of the POC with the potential to discharge stormwater to VDOT's MS4 and not covered under a separate VPDES Permit for the discharge of industrial stormwater;
6. An outreach strategy to enhance the public's education (including employees) on methods to eliminate and reduce discharges of the pollutant;
7. A list of interim milestone activities to address the pollutant to be implemented prior to the expiration of this Individual Permit; and,
8. The contact person(s) and/or position or departments for the Local TMDL Action Plan.

In accordance with VDOT's Individual Permit, in addition to the points detailed above, the updated Action Plan for Local Bacteria TMDL must include the following details:

1. Identification of the MCMs implemented under Part I.C.1 through 6 of the MS4 Individual Permit that also accomplish reduction in potential loadings of bacteria;
2. A description of BMPs commonly used to control anthropogenic sources of bacteria; and,
3. Any BMPs VDOT has implemented or plans to implement to reduce the loading of bacteria from anthropogenic sources under VDOT's legal authority in the TMDL watershed.



2.0 VDOT'S MS4 PROGRAM PLAN

In accordance with the Individual Permit, VDOT must maintain, implement, and enforce to the extent of legal authority an MS4 Program Plan designed to reduce the discharge of pollutants from the regulated MS4, to the maximum extent practicable (MEP), to protect water quality to comply with the Virginia State Water Control Law and the federal Clean Water Act.

VDOT's MS4 Program Plan (dated June 2018) follows MCMs required by the MS4 Permit. VDOT's MS4 program strives to improve environmental compliance, quality and stewardship in VDOT's MS4 regulated area through the effective management, implementation, and enforcement of sound technical guidelines, criteria, and practices for stormwater management (SWM) and erosion and sediment control (ESC). The following sections demonstrate how VDOT's MS4 Program Plan addresses the bacteria POC.

2.1 Existing BMPs in MS4 Program Plan Applicable to POCs

VDOT's collective efforts under the MS4 Program result in significant reduction of all pollutants that may be discharged from its regulated MS4. Therefore, pollutant removal from implementation of the six MCMs in VDOT's MS4 Program (hence forth referred to as VDOT's MS4 Core BMPs) is accounted for in evaluation of VDOT's goal for meeting the WLA target. VDOT's MS4 Core BMPs, included in the table below, are those in VDOT's MS4 Program Plan that are particularly effective in reducing bacteria discharges.

Table 2: VDOT's MS4 Core BMPs Applicable to Bacteria

BMP #	BMP Description
1(A)	Maintain and Update Stormwater Webpage
1(B)	Signage at Rest Areas
2(C)	Participation in Development of Local TMDLs
3(A)	Storm Sewer Map
3(B)	Prohibition of Non-Stormwater Discharge
3(C)	Illicit Discharge Detection and Elimination Program
4(A)	Annual Standards and Specifications
4(B)	Annual Reporting and Effectiveness Review
5(A)	Annual Standards and Specifications
5(B)	Long-Term Care and Maintenance of SWM Facilities
6(A)	Procedures for Operation and Maintenance Activities
6(B)	Turf and Landscape Management
6(C)	Training of VDOT Forces
6(D)	Oversight of VDOT Maintenance Contractors
SC2(A)	Action Plans for Approved Local TMDLs

2.2 Parties Responsible for Action Plan

The Commissioner of Highways is responsible for compliance with the MS4 General Permit, including the Special Condition for Local TMDLs. VDOT's Environmental Division has been tasked with the development of the Local TMDL Action Plans. Implementation and planning for individual BMPs within this plan varies and may involve multiple divisions and Districts within the VDOT organizational structure.

2.3 Regulatory Mechanisms to Address POCs ("Legal Authorities")

The following list identifies laws, programs, and other regulatory mechanisms implemented by VDOT that are applicable to reducing the POCs in the watersheds associated with the Local Bacteria TMDL Action Plan.

- VDOT's MS4 Program Plan
- Virginia ESC Law and Regulations
- Virginia SWM Program, Law and Regulations
- VDOT ESC and SWM Standards and Specifications (most recent DEQ-approved version)
- VDOT's ESC Contractor Certification Program
- VDOT's Post-Construction New Product Evaluation Program

2.4 Enhanced Public Education & Outreach Strategy

VDOT has taken and will continue to take great strides in enhancing its public education and outreach to promote methods to eliminate and reduce discharges of the POCs, including bacteria. As identified in Table 2, Public Education and Public Involvement are addressed through a variety of BMPs under MCM1 and MCM2 of VDOT's MS4 Program Plan.

In addition to public education through VDOT's MS4 Program Plan, VDOT also makes concerted efforts to inform VDOT employees of TMDLs in their local area. This effort includes visits and presentations to the residencies regarding the TMDLs where VDOT has received a WLA, distribution of the TMDL Action Plan to VDOT employees that work in the watershed, and development and distribution of TMDL Fact Sheets to VDOT staff. VDOT also communicates the presence and necessary requirements for Local TMDLs through internal newsletters.

3.0 ASSESSMENT OF SIGNIFICANT SOURCES WITHIN VDOT'S REGULATED AREA IN TMDL WATERSHEDS

The majority of VDOT's MS4 area is composed of right-of-way (ROW) within urbanized areas that encompass roadways owned or operated (herein referred to as 'maintained') by VDOT. Additionally, VDOT operates a number of support facilities that are essential to maintaining the roads or providing transportation services to the public. These facilities include district complexes, residencies (residence offices), area headquarters, maintenance complexes, safety/rest areas, park and ride sites, and permanent storage areas/lots. Only those portions of the system and the VDOT facilities located within the designated urbanized area as defined by the 2010 Bureau of Census (known as the CUA) are regulated by the Individual Permit.

3.1 Roadways

There are several classes of roadways that VDOT either owns or operates in the CUA of the watersheds associated with the Local Bacteria TMDL Action Plan. The following table summarizes the estimated mileage in each watershed. Details regarding the roads, along with mapping, for each TMDL watershed are provided in the watershed-specific appendix.

Table 3: Regulated Miles for each Local Bacteria TMDL Action Plan Watershed

TMDL Project Name	Interstate & Associated Ramps (miles)	US Highway (miles)	State Highway (miles)	Secondary and Local (miles)
Accotink Creek (Lower)	19	2	19	154
Chickahominy River and Tributaries	109	83	39	349
Crab Creek Watershed	7	13	4	19
Difficult Run	7	8	59	412
Hoffler Creek, Cities of Portsmouth and Suffolk	0	3	0	11
Hunting Creek, Cameron Run, Holmes Run	88	27	52	466
James River and Tributaries, City of Richmond	89	124	242	1,194
James River Watershed (Lynchburg)	0	89	16	209
Neabsco Creek Watershed	8	0	5	173

TMDL Project Name	Interstate & Associated Ramps (miles)	US Highway (miles)	State Highway (miles)	Secondary and Local (miles)
Occoquan River Watershed	37	56	158	1,117
Opequan and Abrams Creek Watersheds	26	35	18	165
Rivanna River Watershed	9	48	13	172
Tidal Four Mile Run Watershed	0	2	4	11
Tidal Freshwater Rappahannock River Watershed	21	39	35	412
Upper Roanoke River Watershed	54	133	96	512
TOTAL	474	662	760	5,376

Roadway drainage networks may be a significant conduit for discharges of bacteria in a watershed, although the roadway itself is not expected to serve as a pollutant source and highway drainage is typically associated with lower levels of bacteria than urban runoff from other land use categories.

3.2 Facilities

As described above, in addition to the roadway network, VDOT operates many facilities within the watersheds and MS4 regulated areas associated with the Action Plan for Local Bacteria TMDLs.

Table 4 summarizes all the VDOT facilities located within the Local Bacteria TMDL Watersheds. As part of the MS4 Program, VDOT has identified some facilities as a “High Priority Facility” per VDOT’s Individual Permit (Part 1, C.6.e), as identified in the MS4 Program Plan. A Stormwater Pollution Prevention Plan (SWPPP) is developed and implemented for each High Priority Facility. The SWPPP identifies source controls, maintenance schedules of BMPs, policies and procedures at the facility to ensure source reductions, inspection schedules and checklists, and a log of inspection findings and corrective actions. Each facility with a SWPPP is annually reviewed. Further information, such as assessment for bacteria, most recent SWPPP inspection, and mapped location, is described in the TMDL watershed-specific appendices.

Facilities with onsite septic systems are also noted in Table 4. As described in BMP 6(B) of the MS4 Program Plan, facilities with onsite septic in a local watershed with a Bacteria TMDL that allocate a WLA to VDOT’s MS4 are inspected once every five years.

Table 4: Facilities for each Watershed Associated with a Local Bacteria TMDL Action Plan

TMDL Project Name	No. of Facilities	No. Serving as a Potential Source of Bacteria	No of Facilities with Septic Systems	No. of Facilities with a SWPPP
Accotink Creek (Lower)	3	1	0	1
Chickahominy River and Tributaries	6	1	0	2
Crab Creek Watershed	2	1	0	1
Difficult Run	3	1	0	1
Hoffler Creek, Cities of Portsmouth and Suffolk	0	0	0	0
Hunting Creek, Cameron Run, Holmes Run	2	1	1 (Merrifield Area Headquarters)	2
James River and Tributaries, City of Richmond	12	1	1 (Chester Area Headquarters)	2
James River Watershed (Lynchburg)	2	0	0	1
Neabsco Creek Watershed	10	0	0	0
Occoquan River Watershed	20	1	0	7
Opequon and Abrams Creek Watersheds	2	1	1 (Winchester Area Headquarters)	1
Rivanna River Watershed	3	0	0	0
Tidal Four Mile Run Watershed	0	0	0	0
Tidal Freshwater Rappahannock River Watershed	8	1	1 (Fredericksburg Rest Area)	3
Upper Roanoke River Watershed	15	0	0	8
TOTAL	88	9	4	29

In order to secure ROW for future highway improvements, VDOT occasionally acquires properties to be used for future ROW and enters into leaseback agreements with the original landowners. While these properties are officially part of VDOT's MS4 system, those lessees are responsible for all activities, operation and maintenance of the properties, including any regulatory requirements. As such, leased properties (lessees) have been omitted from this document and associated TMDL assessment, planning, and implementation efforts.

3.3 Regulated MS4 Outfalls

VDOT maintains a map of its MS4 Outfalls and Points of Discharge within the MS4 regulated area. A map of the MS4 outfalls is shown for each TMDL watershed in the appendices. A summary of the MS4 outfalls is shown in the table below.

Table 5: Regulated MS4 Outfalls for each Watershed Associated with a Local Bacteria TMDL Action Plan

TMDL Project Name	No. of Regulated MS4 Outfalls
Accotink Creek (Lower)	89
Chickahominy and Tributaries	993
Crab Creek Watershed	24
Difficult Run	705
Hoffler Creek, Cities of Portsmouth and Suffolk	6
Hunting Creek, Cameron Run, Homes Run	278
James River and Tributaries, City of Richmond	3,610
James River Watershed (Lynchburg)	279
Neabsco Creek Watershed	240
Occoquan River watershed	1,869
Opequon and Abrams Creek Watersheds	361
Rivanna River Watershed	399

TMDL Project Name	No. of Regulated MS4 Outfalls
Tidal Four Mile Run Watershed	3
Tidal Freshwater Rappahannock River Watershed	1,279
Upper Roanoke River Watershed	989
TOTAL	11,124

4.0 BMPS

Reducing loadings through nonstructural practices is a primary means to decrease bacteria in the receiving waterbodies. Nonstructural practices include source controls and maintenance, public education and participation. Multiple Bacteria TMDLs in Virginia describe this approach as an acceptable method for MS4s to address numeric WLAs.

The vast majority of bacteria sources noted in the TMDLs assigning VDOT a WLA are from agricultural/pasture lands. A second key contributor are failing septic systems and straight pipes (or the connection of a sanitary pipe directly to a stream). Finally, forest/wildlife and residential/pets make up for most of the remaining contributions. Of these, wildlife and residential areas may be the only land uses relevant to VDOT, both of which VDOT has no control or jurisdiction over.

Research shows that bacteria concentrations in runoff from freeways is among the lowest of all land use classifications (only institutional is lower) and total runoff volume from DOT ROW areas is small, mainly because the acreage contained within DOT ROWs as a percent of the total watershed area is usually very small. Therefore, total mass loadings of bacteria from s as a percent of the TMDL watershed is generally very small and DOTs may sometimes be considered a *de minimis contributor*.

As numerous TMDL reports note, in general, for MS4/VSMP permits, the Commonwealth expects the permittee to specifically address the TMDL WLA for stormwater through the iterative implementation of programmatic BMPs. To this end, VDOT will continue implementing the Core BMPs in the MS4 Program Plan, described in Section 2.0, to limit bacteria discharged from its MS4 to address bacteria WLAs.

For specific information regarding an individual watershed, see the appropriate appendix.

5.0 METHOD TO ASSESS TMDL ACTION PLAN

VDOT will annually evaluate the implementation of the MS4 Program Plan as well as the BMPs identified in this Action Plan for effectiveness in addressing the bacteria WLAs.

The annual evaluation will include an assessment on the appropriateness and effectiveness of the identified BMPs in the MS4 Program Plan and the Action Plan to reduce bacteria discharges in the specific watershed. During this evaluation, VDOT will also determine if additional BMPs are necessary to demonstrate that adequate progress is being made to reduce the pollutant discharge.

VDOT will annually report its progress on implementation of the BMPs in the Local Bacteria TMDL Action Plan, other interim milestone activities, and applicable results from the evaluation. If, because of the annual evaluation, a Program Plan and/or Action Plan modification is appropriate, VDOT will perform the modification in accordance with its MS4 Program Plan procedures and in accordance with the MS4 Individual Permit.

VDOT will assess the effectiveness of the Action Plan in addressing the bacteria WLAs in each watershed no later than forty-eight months after the permit effective date. The evaluation will include an assessment on the appropriateness and effectiveness of the identified BMPs in the MS4 Program Plan to reduce bacteria discharges in each specific watershed. During this evaluation, VDOT will also evaluate newly available information.

5.1 Method to Assess VDOT Facilities within TMDL Watershed

As part of VDOT's collective MS4 Program and site-specific SWPPPs, VDOT will continue to perform annual comprehensive site compliance evaluations at VDOT facilities with SWPPPs.

5.2 Schedule

Below is a summary of the Local Bacteria TMDL Action Plan implementation schedule.

Table 6: Local TMDL Action Plan Implementation Schedule

Milestones	Schedule
Update TMDL Action Plan	12 months after the permit effective date (July 1, 2018)
Submit TMDL Action Plan to DEQ	July 1, 2018
Begin Implementation of TMDL Action Plan	90 days after submittal of Action Plan to DEQ
Annual evaluations of Local Sediment TMDL Action Plan	July 1, 2019 July 1, 2020
Submit Assessment of Effectiveness to DEQ	48 months following issuance of permit (July 1, 2021)

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Appendix I
Accotink Creek (Lower)

The information included in this appendix is specific to this watershed TMDL. Refer to the main sections of this Action Plan for additional information.

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IA BACKGROUND

DEQ first placed the lower 7.35-mile segment of the Lower Accotink Creek on the biennial 303(d) list in 2004 due to violations of the state's fecal coliform bacteria standard for recreation. Consequently, DEQ developed a TMDL with bacteria loading limits for the Accotink Creek (Lower) watershed. The EPA approved the TMDL on December 18, 2008. The SWCB approved the TMDL on April 28, 2009. VDOT's MS4 Program was assigned a portion of the MS4 WLAs for bacteria in the CUA of the Accotink Creek (Lower) watershed. A map depicting the Accotink Creek (Lower) watershed is shown in Figure I1.

The Accotink Creek (Lower) TMDL uses aggregated WLAs for permitted MS4s in the watershed that includes VDOT's MS4, as well as the MS4s serving Fairfax County, Fairfax County Public Schools, Fort Belvoir, and Northern Virginia Community College. The TMDL directs that the WLAs be achieved with a "Percent Reduction Method" that compares water quality data to applicable water quality criteria. It identifies a percent reduction of the current bacteria loads required to meet water quality standards for the watershed.

The TMDL for the Accotink Creek (Lower) assigned a 97% reduction for bacteria to MS4 permittees included in the aggregated WLAs. Therefore, VDOT's TMDL Action Plan for the Accotink Creek (Lower) TMDL aims to reduce loads that existed at the time of the TMDL development to the MEP for bacteria by implementing programmatic BMPs.

Other Related Local TMDLs

A 5.22-mile segment of the upper Accotink Creek was also listed on the 303(d) list in 1998 for violations of the state's fecal coliform bacteria standard for recreation. A separate Bacteria TMDL was developed by DEQ and the Virginia Department of Conservation and Recreation for the upper segment of the Accotink Creek and approved by the SWCB on June 17, 2004. The Accotink Creek (Lower) TMDL did not include VDOT's MS4 Program in the WLA.

IB ASSESSMENT OF SIGNIFICANT SOURCES WITHIN VDOT'S REGULATED AREA IN TMDL WATERSHED

IB.1 Roadways

There are several classes of roadways that VDOT either owns or operates in the CUA of the Lower Accotink Creek watershed, including approximately nineteen miles of interstate and associated ramps, two miles of US highways, nineteen miles of state highways, and 154 miles of secondary and local roadways. Roadway drainage networks may be a significant conduit for discharges of bacteria in a watershed, although the roadway itself is not expected to serve as a pollutant source and highway drainage is typically associated with lower levels of bacteria than urban runoff from other land use categories.

IB.2 Facilities

In addition to the roadway network, VDOT operates three facilities in the study area: the Newington Area Headquarters, Saratoga Park & Ride, and Backlick North Park & Ride, shown in Figure I2 and listed in Table I1.

An assessment for sources of bacteria from the facilities was conducted. For the purposes of the assessment, a potential source of bacteria from the facility means a potential anthropogenic source of bacteria due to the presence of septic systems, active portable toilets, etc. The table below lists each facility and the results of the site assessment. Based on the assessment, none of the facilities are a significant source of bacteria. For facilities with SWPPPs, an annual assessment effort for TMDL POCs, including bacteria, will be conducted.

Table I1: Facilities in the Study Area

Facility	Potential Source of Bacteria	Significant Source	SWPPP	Date of Last Assessment
Backlick North Park & Ride	No	No	No	NA *
Newington Area Headquarters	Yes (portable toilet)	No	Yes	5/6/2015
Saratoga Park & Ride	No	No	No	12/30/2014

* VDOT has assessed this type of facility in the past and has determined that it is not a significant source of bacteria.

IB.3 Existing Structural BMPs

As of June 2018, there are thirty-five VDOT or VDOT associated structural BMPs (twenty-two extended detention basins, two retention basins, one dry detention basin, nine manufactured treatment devices, and one underground sand filter) and two BMPs under construction (two extended detention basins) in the watershed, shown in Figure I3. There are no other VDOT facilities or structural BMPs in the watershed and VDOT's MS4 regulated area.

IB.4 Regulated MS4 Outfalls

In this study area, VDOT has mapped eighty-nine regulated outfalls and one point of discharge as of June 2018, shown in Figure I4.

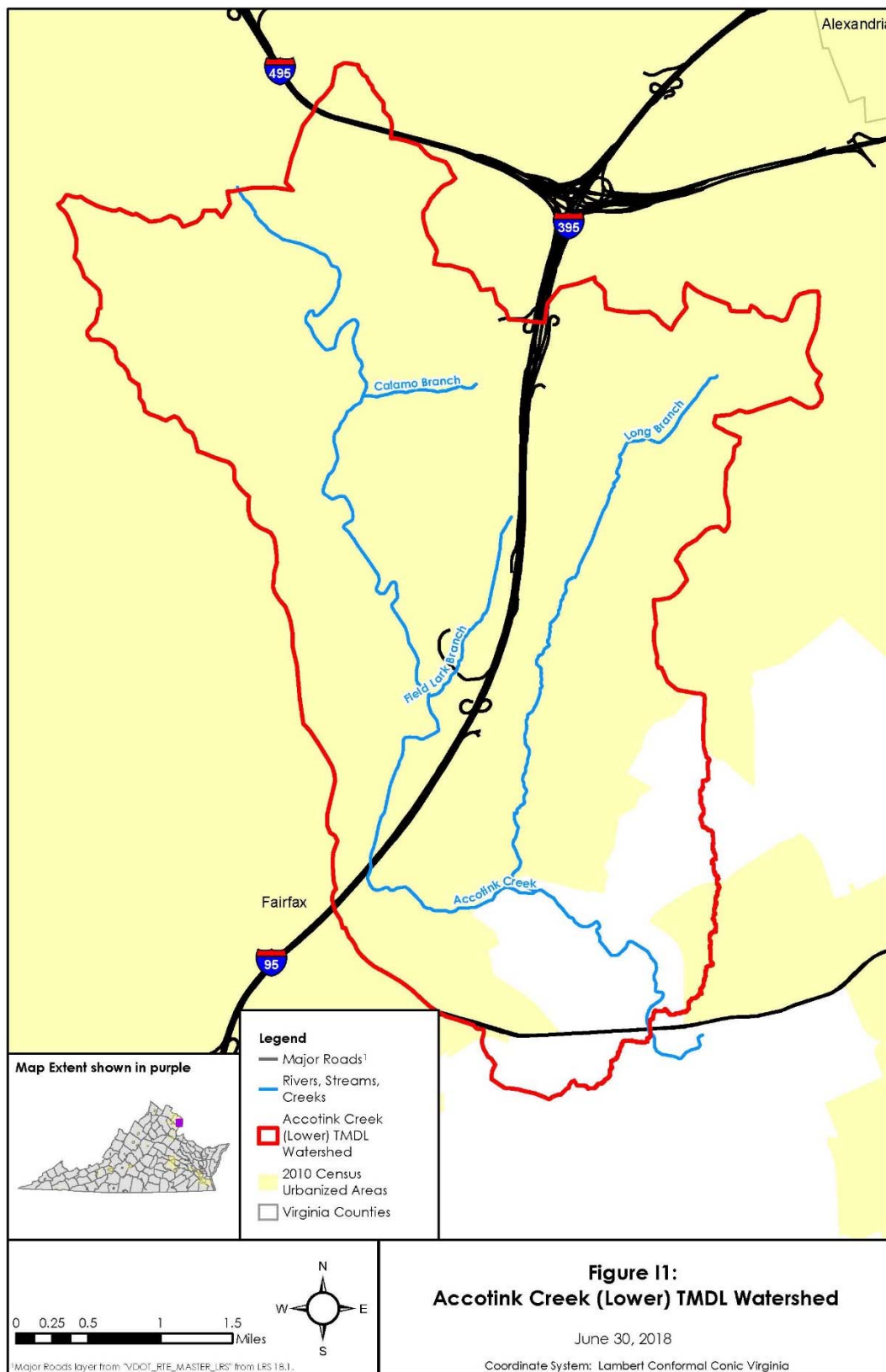
DRAFT

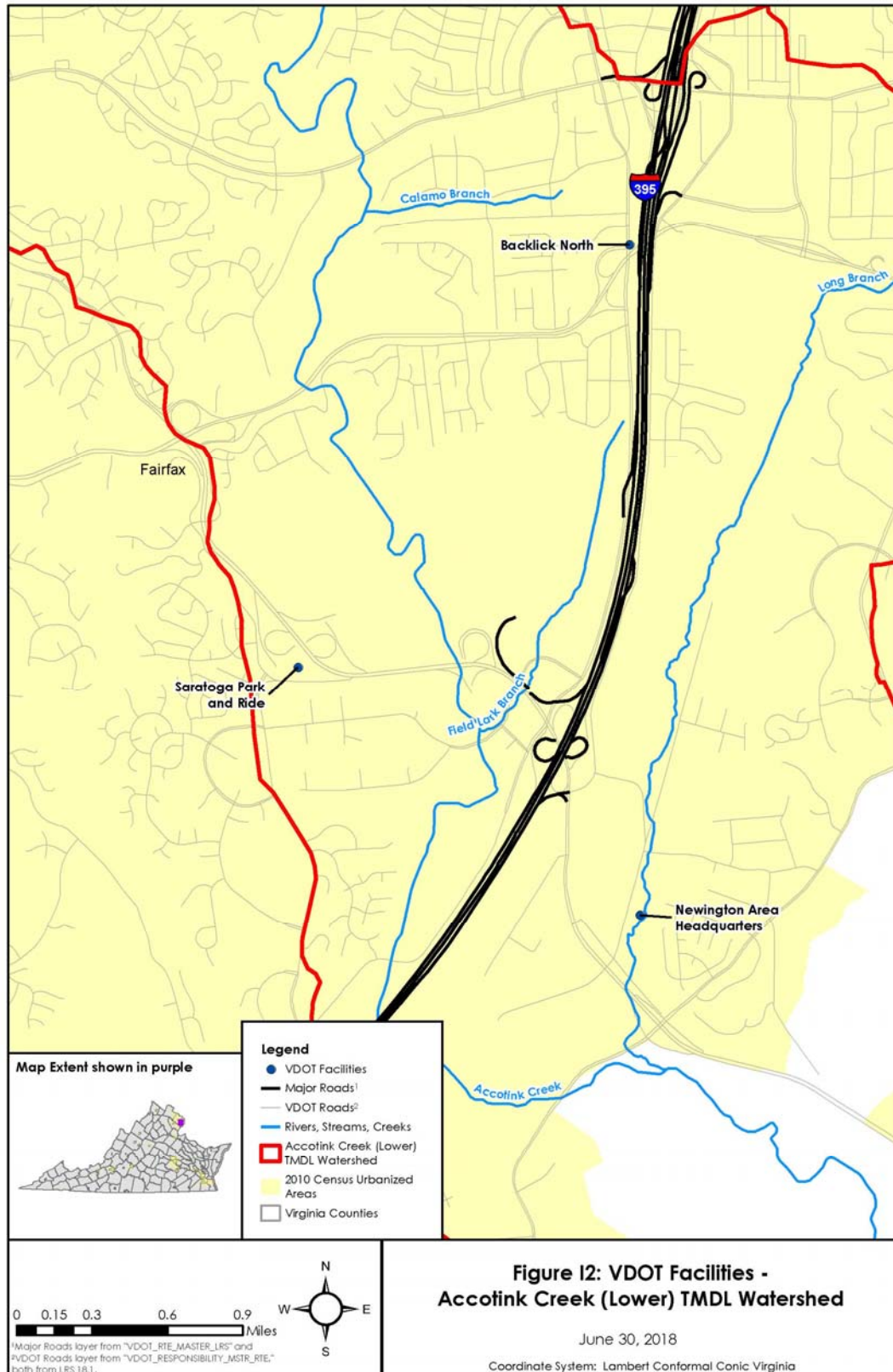
IC BMPS

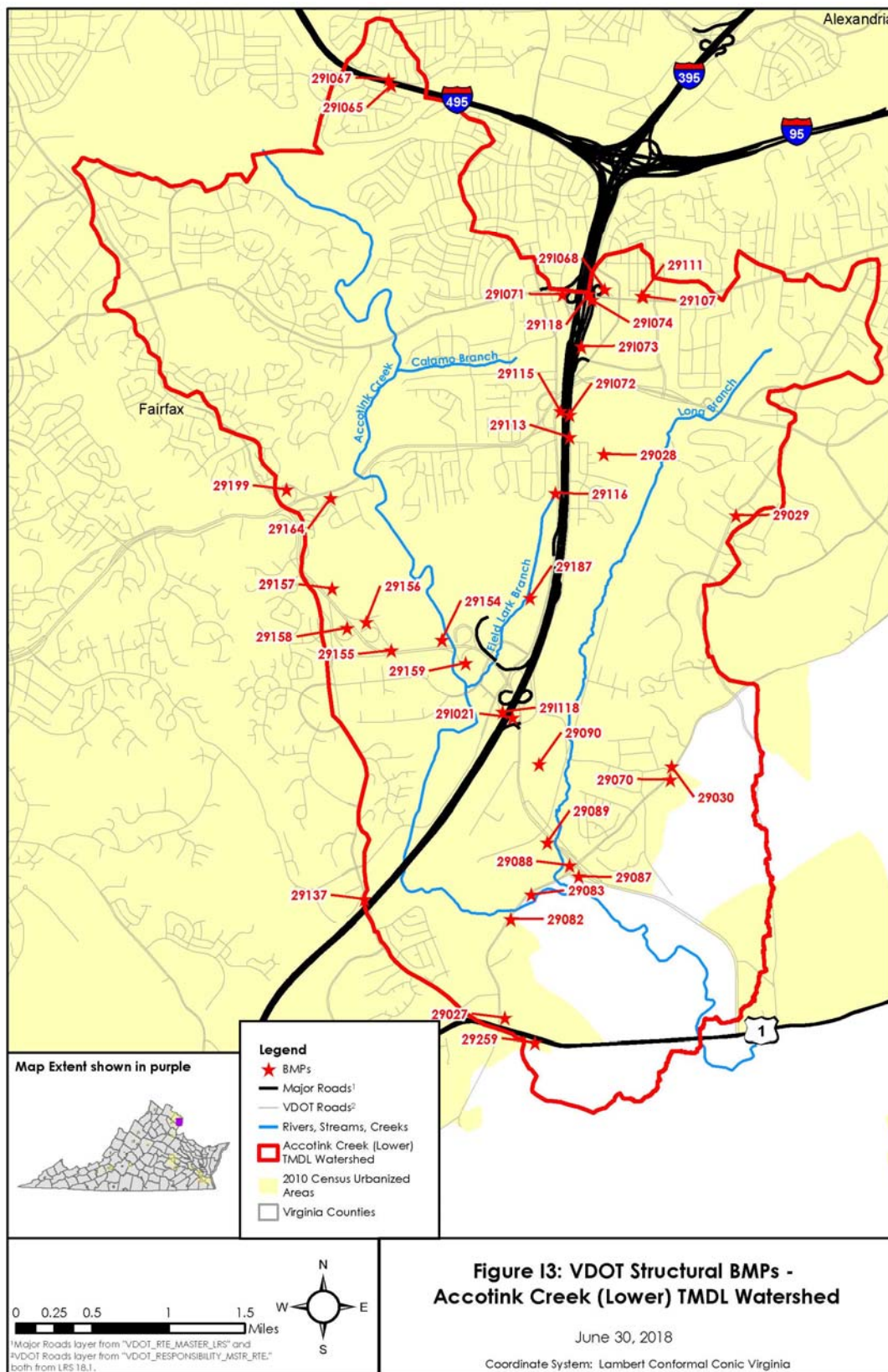
The TMDL for Accotink Creek (Lower) assigned a WLA to MS4 permittees, including VDOT, in the Lower Accotink Creek watershed.

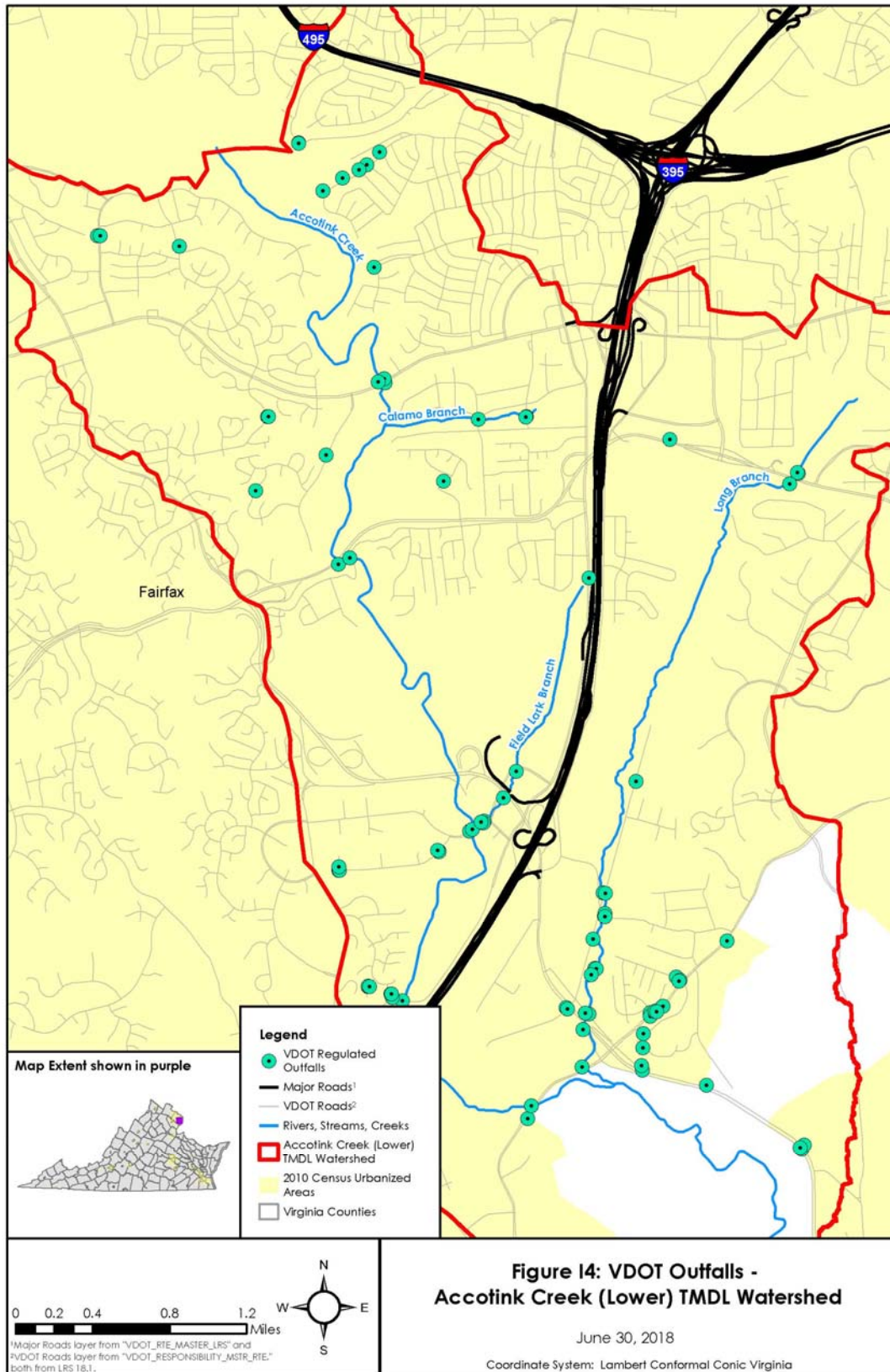
The Core BMPs in VDOT's MS4 Program which address bacteria are listed in Table 2 of this Action Plan. VDOT will continue practicing these programmatic BMPs to the MEP in accordance with the goals of the TMDL. The following actions summarize VDOT's plan to address the bacteria WLA assigned in the Accotink Creek (Lower) TMDL:

- Continued implementation of VDOT's MS4 Core BMPs.
- For facilities with SWPPPs, an annual assessment effort for TMDL POCs, including bacteria, will be conducted.









Appendix II

Chickahominy River and Tributaries

The information included in this appendix is specific to this watershed TMDL. Refer to the main sections of this Action Plan for additional information.

IIA	Background	II.1
IIB	Assessment of Significant Sources Within VDOT's Regulated Area in TMDL Watershed ..	II.2
IIB.1	Roadways.....	II.2
IIB.2	Facilities.....	II.2
IIB.3	Existing Structural BMPs.....	II.3
IIB.4	Regulated MS4 Outfalls.....	II.3
IIC	BMPs	II.4

IIA BACKGROUND

DEQ first placed a 7.54-mile segment of the Chickahominy River on the biennial 303(d) list in 2004 due to violations of the state's fecal coliform bacteria standard for recreation. This segment was delisted in 2006 and relisted in 2008. Several tributaries to the Chickahominy River have also been listed as impaired for violations to the bacteria standard for recreation. In 2002, 4.50 miles of Collins Run were added to the 303(d) list. A 0.21-mile segment of Stony Run was added to the 2004 303(d) list. In 2006, 3.76 miles of Boatswain Creek and 6.69 miles of Beaverdam Creek were added to the 303(d) list.

Consequently, DEQ developed a TMDL with bacteria loading limits for the Chickahominy River and Tributaries. The EPA approved the TMDL on September 19, 2012. The SWCB approved the TMDL on March 25, 2013. VDOT's MS4 Program was assigned a portion of the MS4 WLAs for bacteria in the CUA of the Chickahominy River watershed. A map depicting the Chickahominy River watershed is shown in Figure II.1.

The Chickahominy River and Tributaries Bacteria TMDL uses aggregated WLAs for permitted MS4s in the watershed that includes VDOT's MS4, as well as the MS4s serving J. Sargeant Reynolds Community College, Henrico County, Hanover County, Town of Ashland, and Richmond City. The TMDL directs that the WLAs for MS4 permits may be addressed through the iterative implementation of programmatic BMPs.

IIB ASSESSMENT OF SIGNIFICANT SOURCES WITHIN VDOT'S REGULATED AREA IN TMDL WATERSHED

IIB.1 Roadways

There are several classes of roadways that VDOT either owns or operates in the 2010 CUA of the Chickahominy River watershed, including approximately 109 miles of interstate and associated ramps, eighty-three miles of US highways, thirty-nine miles of state highways, and 349 miles of secondary and local roadways. Roadway drainage networks may be a significant conduit for discharges of bacteria in a watershed, although the roadway itself is not expected to serve as a pollutant source and highway drainage is typically associated with lower levels of bacteria than urban runoff from other land use categories.

IIB.2 Facilities

In addition to the roadway network, VDOT operates six facilities in the study area: Basie Road Area Headquarters, I-95/Chemical Storage Area, Meadow Road Complex (a Department of General Services facility), Short Pump Area Headquarters (parcel holding for future facility), and two Park & Rides – Mechanicsville and Glenside – shown in Figure II2 and listed in Table II1.

An assessment for sources of bacteria from the facilities was conducted. For the purposes of the assessment, a potential source of bacteria from the facility means a potential anthropogenic source of bacteria due to the presence of septic systems, active portable toilets, etc. The table below lists each facility and the results of the site assessment. Based on the assessment, none of the facilities are a significant source of bacteria. For facilities with, an annual assessment effort for TMDL POCs, including bacteria, will be conducted.

Table II1: Facilities in the Study Area

Facility	Potential Source of Bacteria	Significant Source	SWPPP	Date of Last Assessment
I-95/Chemical Storage Area	Yes (portable toilet)	No	Yes	4/22/2015
Basie Road Area Headquarters	No	No	Yes	04/27/2015
Glenside Park & Ride	No	No	No	N/A *
Meadow Road Complex	No	No	No	N/A*
Mechanicsville Park & Ride	No	No	No	N/A *
Short Pump Area Headquarters	No	No	No	N/A*

* VDOT has assessed this type of facility in the past and has determined that it is not a significant source of bacteria.

IIB.3 Existing Structural BMPs

As of June 2018, there are twelve VDOT or VDOT associated structural BMPs (seven extended detention basins, one grass swale, two retention basins, and three miscellaneous) in the watershed, shown in Figure II3. There are no other VDOT facilities or structural BMPs in the watershed and VDOT's MS4 regulated area.

IIB.4 Regulated MS4 Outfalls

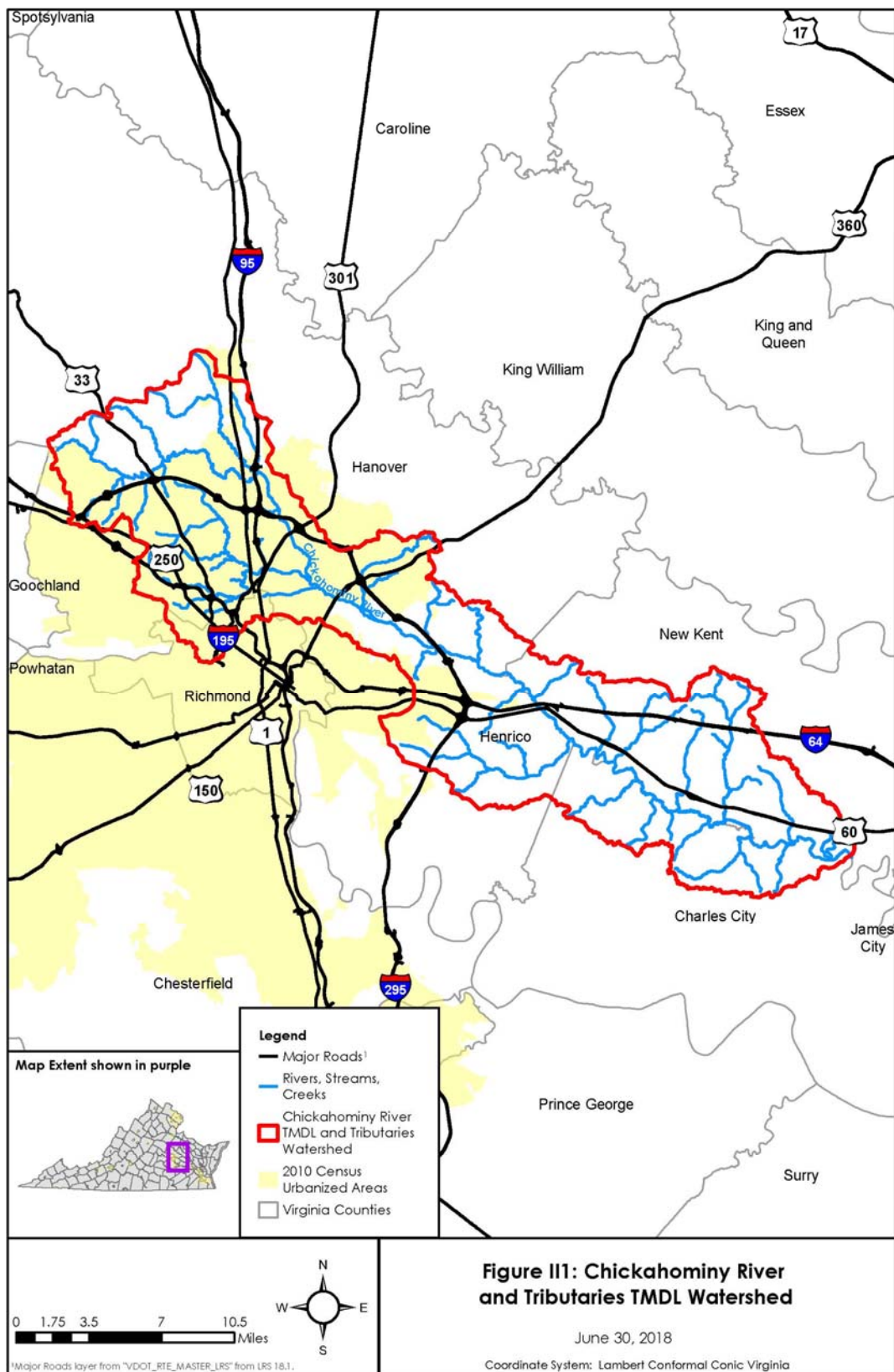
In this study area, VDOT has mapped 993 regulated outfalls and 112 points of discharge as of June 2018 shown in Figure II4.

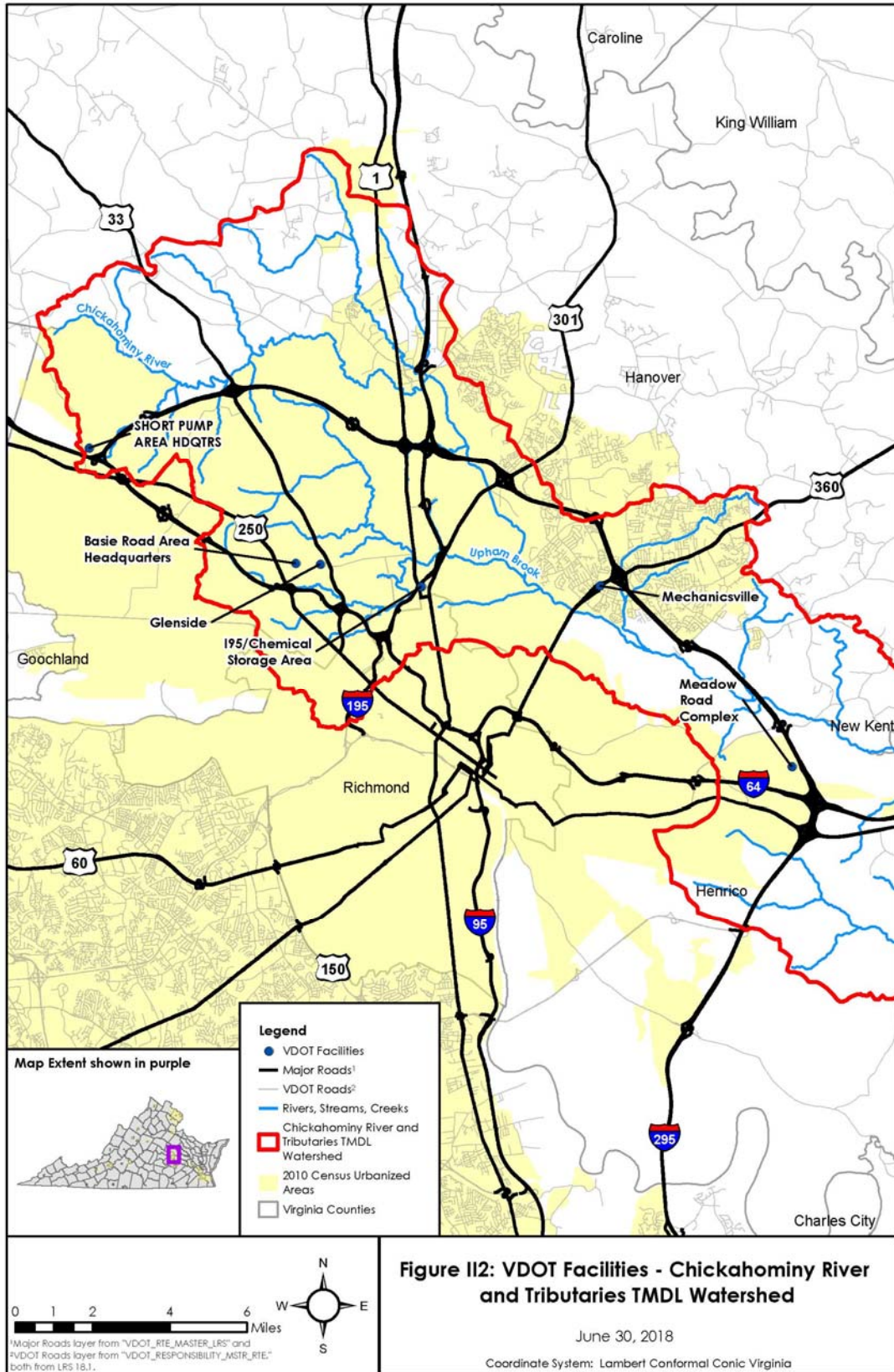
IIC BMPS

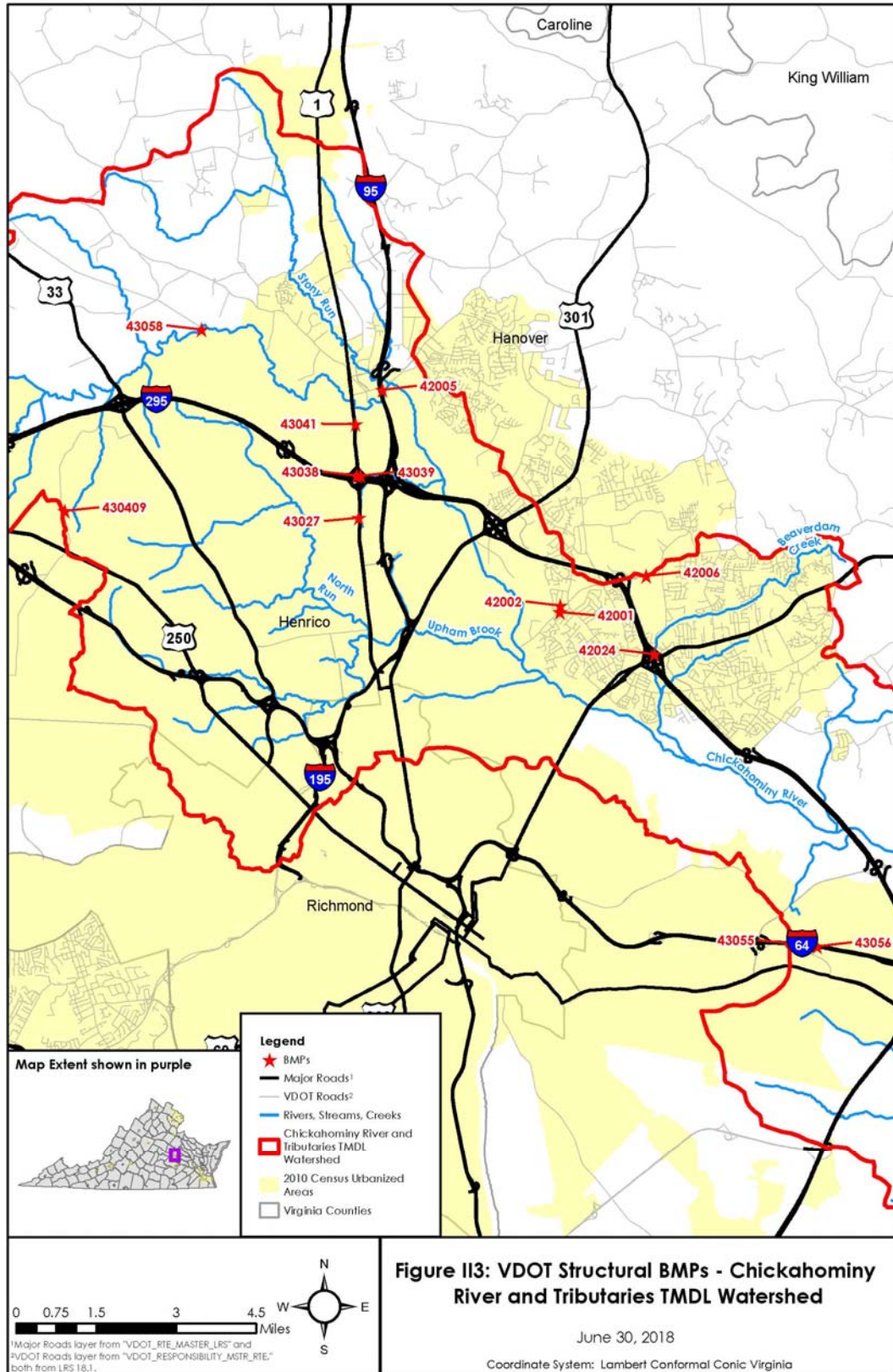
The TMDL for the Chickahominy River and Tributaries assigned WLAs to MS4 permittees, including VDOT, in the various impaired watersheds.

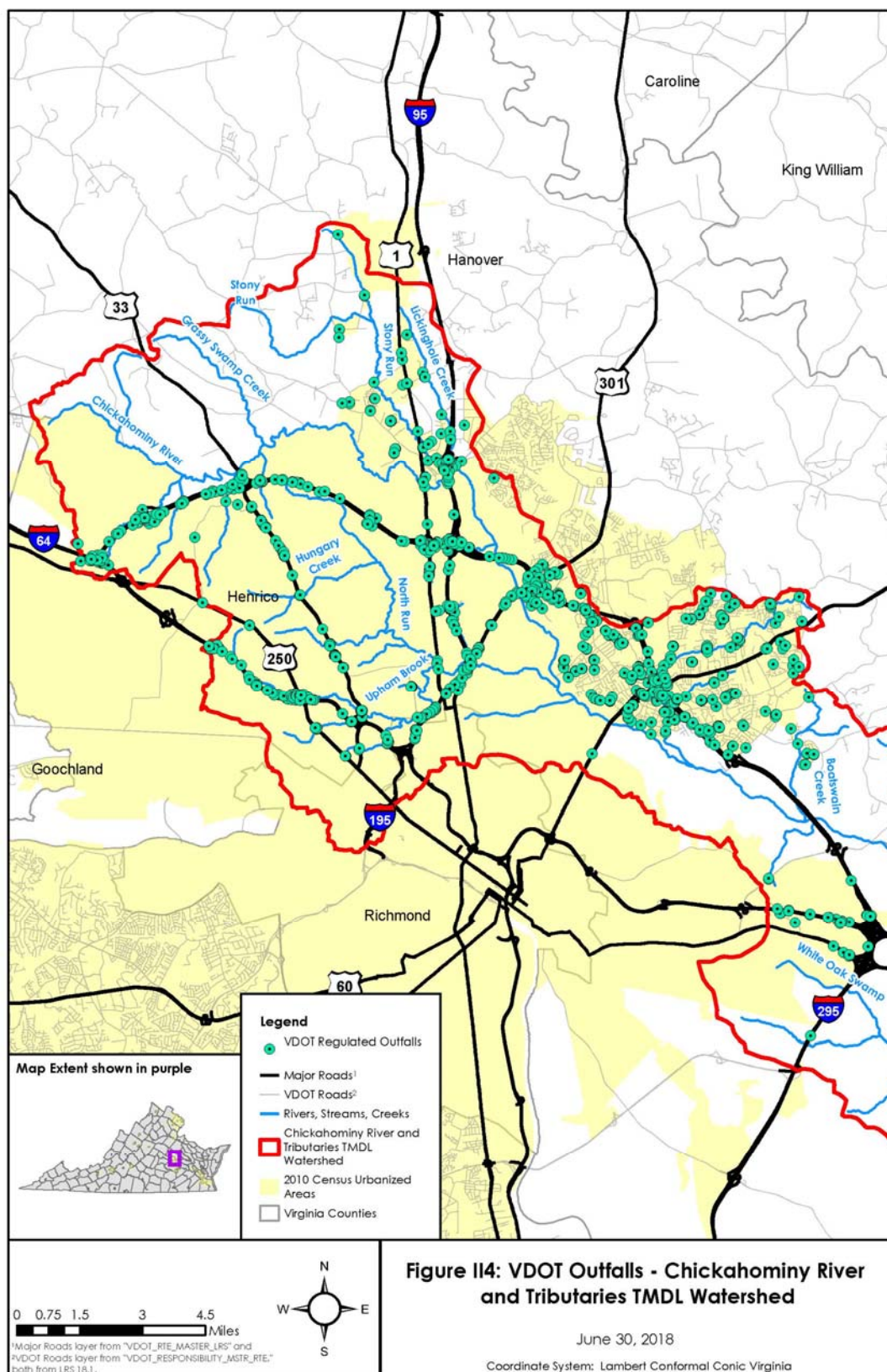
The Core BMPs in VDOT's MS4 Program which address bacteria are listed in Table 2 of this Action Plan. VDOT will continue practicing these programmatic BMPs to the MEP in accordance with the goals of the TMDL. The following actions summarize VDOT's plan to address the bacteria WLAs assigned in the Chickahominy River and Tributaries TMDL:

- Continued implementation of VDOT's MS4 Core BMPs.
- For facilities with SWPPPs, an annual assessment effort for TMDL POCs, including bacteria, will be conducted.









Appendix III

Crab Creek Watershed

The information included in this appendix is specific to this watershed TMDL. Refer to the main sections of this Action Plan for additional information.

IIIA	Background	III.1
IIIB	Assessment of Significant Sources Within VDOT's Regulated Area in TMDL Watershed .	III.2
IIIB.1	Roadways	III.2
IIIB.2	Facilities	III.2
IIIB.3	Existing Structural BMPs	III.2
IIIB.4	Regulated MS4 Outfalls	III.3
IIIC	BMPs	III.4

IIIA BACKGROUND

DEQ first placed the entire 12-mile segment of Crab Creek on the biennial 303(d) list in 1996 due to violations of the state's fecal coliform bacteria standard for recreation and benthic impairments. Consequently, DEQ developed TMDLs with bacteria and sediment loading limits for the Crab Creek watershed. The EPA approved the TMDLs on August 10, 2004. The SWCB approved the TMDLs on April 30, 2004. VDOT's MS4 Program was assigned a portion of the MS4 WLAs for bacteria and sediment discharges to Crab Creek watershed. A map depicting the Crab Creek watershed is shown in Figure III.1.

The Crab Creek Watershed TMDLs use aggregated WLAs for permitted MS4s in the watershed that includes VDOT's MS4, as well as the MS4 serving the Town of Christiansburg. The MS4s serving the Montgomery County and the City of Radford are also within the Crab Creek Watershed TMDL, although no WLAs were assigned to these MS4s at the time of TMDL development because they were not permitted until 2013.

The TMDLs direct that the WLAs be achieved with a "Percent Reduction Method" that compares water quality data to applicable water quality criteria. It identifies a percent reduction of the current bacteria and sediment loads required to meet water quality standards for the watershed. This appendix discusses the Action Plan for the Crab Creek Watershed Bacteria TMDL.

The TMDL for Crab Creek Watershed assigned a 99% reduction for bacteria to MS4 permittees included in the aggregated WLA. Therefore, VDOT's TMDL Action Plan for the Crab Creek Watershed TMDL aims to reduce loads that existed at the time of the TMDL development to the MEP for bacteria by implementing programmatic BMPs.

IIIB ASSESSMENT OF SIGNIFICANT SOURCES WITHIN VDOT'S REGULATED AREA IN TMDL WATERSHED

IIIB.1 Roadways

There are several classes of roadways that VDOT either owns or operates in the CUA of the Crab Creek Watershed, including approximately seven miles of interstate and associated ramps, thirteen miles of US highways, four miles of state highways, and nineteen miles of secondary and local roadways. Roadway drainage networks may be a significant conduit for discharges of bacteria in a watershed, although the roadway itself is not expected to serve as a pollutant source and highway drainage is typically associated with lower levels of bacteria than urban runoff from other land use categories.

IIIB.2 Facilities

In addition to the roadway network, VDOT operates two facilities in the study area: the Christiansburg Residency and Wades Lane Storage Lot, shown in Figure III2 and listed in Table III1.

An assessment for sources of bacteria from the facilities was conducted. For the purposes of the assessment, a potential source of bacteria from the facility means a potential anthropogenic source of bacteria due to the presence of septic systems, active portable toilets, etc. The table below lists each facility and the results of the site assessment. Based on the assessment, none of the facilities are a significant source of bacteria. For facilities with SWPPPs, an annual assessment effort for TMDL POCs, including bacteria, will be conducted.

Table III1: Facilities in the Study Area

Facility	Potential Source of Bacteria	Significant Source	SWPPP	Date of Last Assessment
Christiansburg Residency Complex	Yes (portable toilet)	No	Yes	4/11/2017
Wades Lane Storage Lot	No	No	No	N/A *

* VDOT has assessed this type of facility in the past and has determined that it is not a significant source of bacteria.

IIIB.3 Existing Structural BMPs

As of June 2018, there are five VDOT or VDOT associated structural BMP (two extended detention basin, one infiltration trench, and one filter practice) and one BMP under construction (one

manufactured) in the watershed, shown in Figure III.3. There are no other VDOT facilities or structural BMPs in the watershed and VDOT's MS4 regulated area.

IIIB.4 Regulated MS4 Outfalls

In this study area, VDOT has mapped twenty-four regulated outfalls and five points of discharge as of June 2018, shown in Figure III.4.

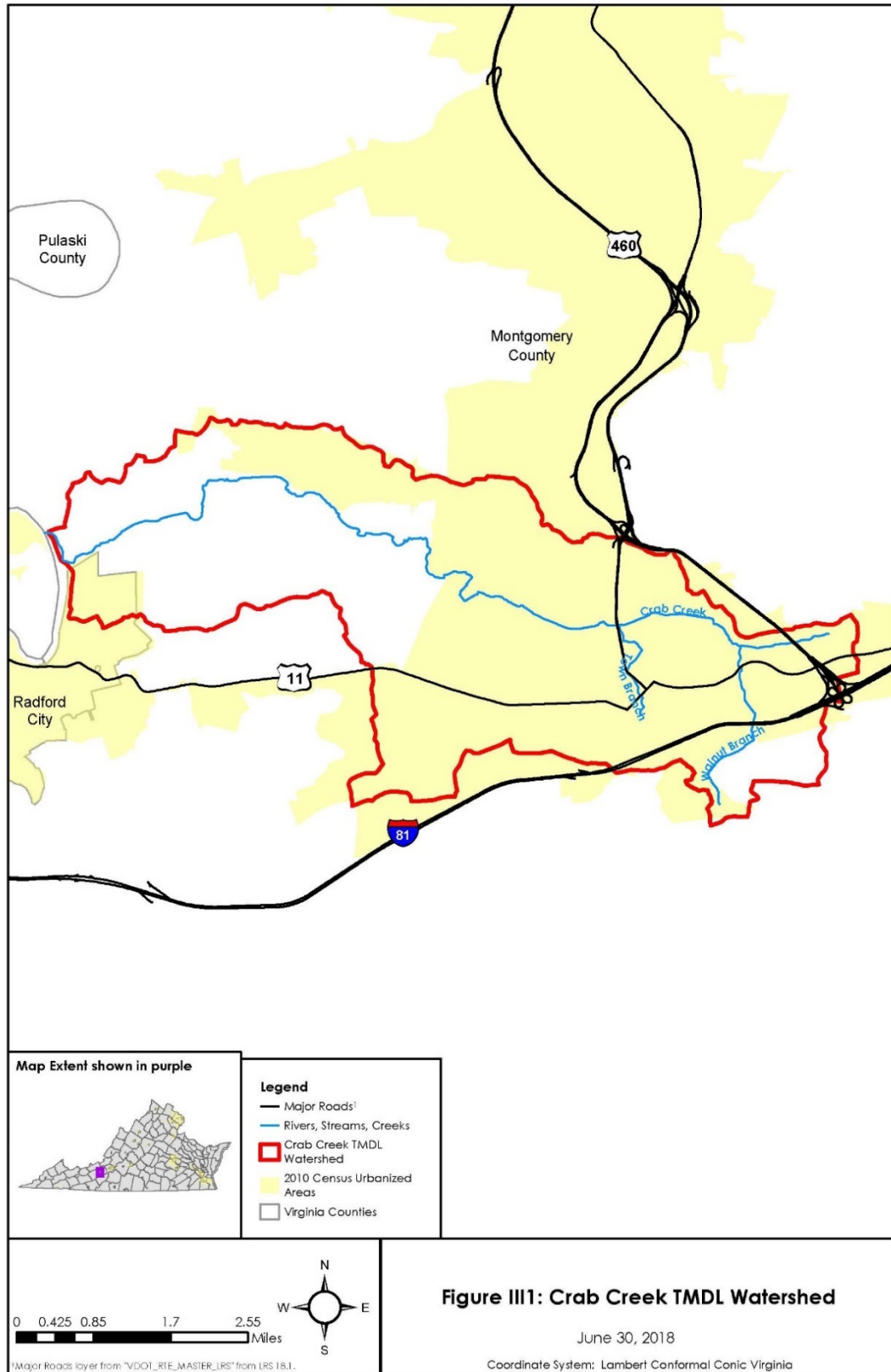
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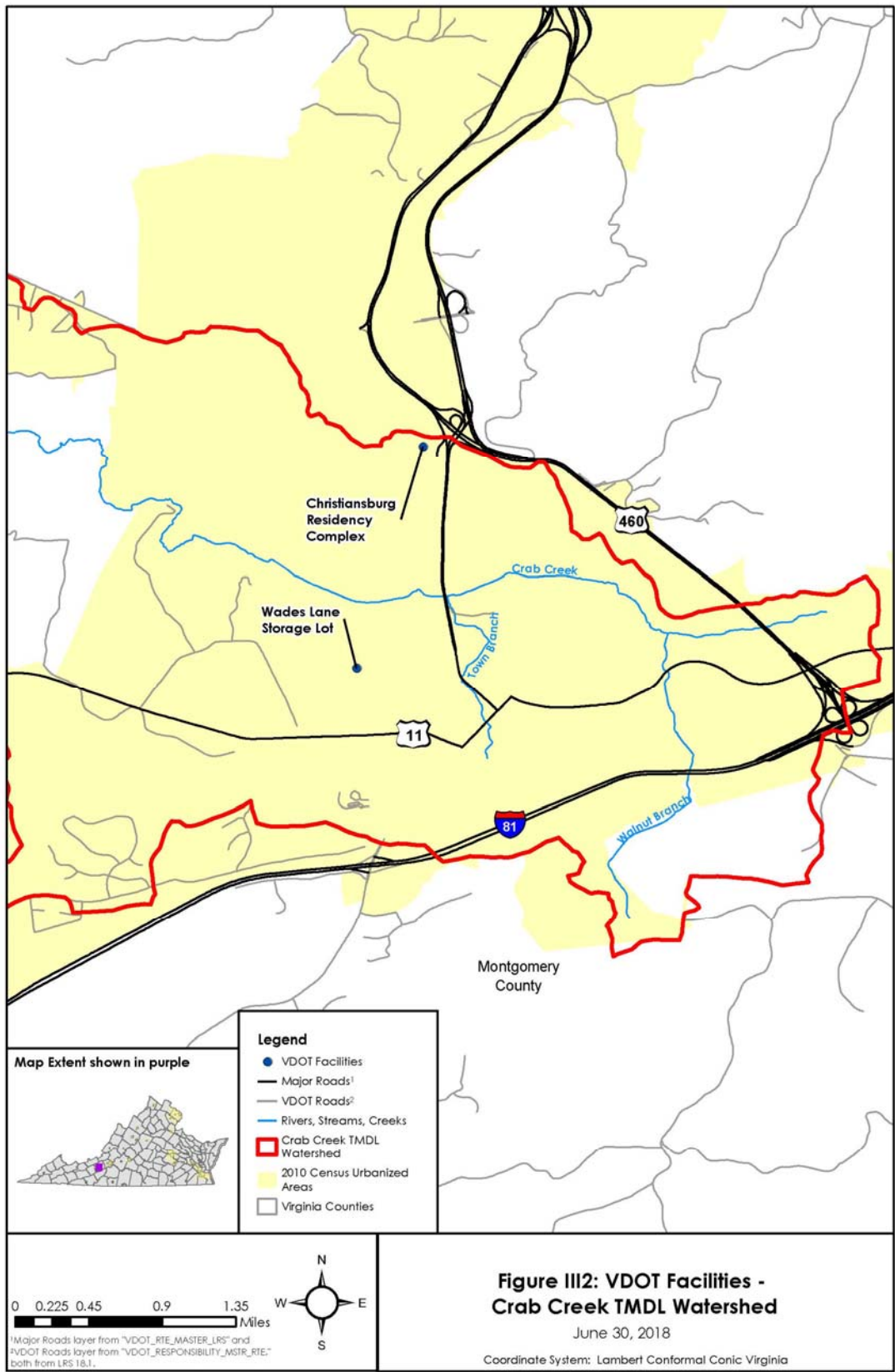
IIIC BMPS

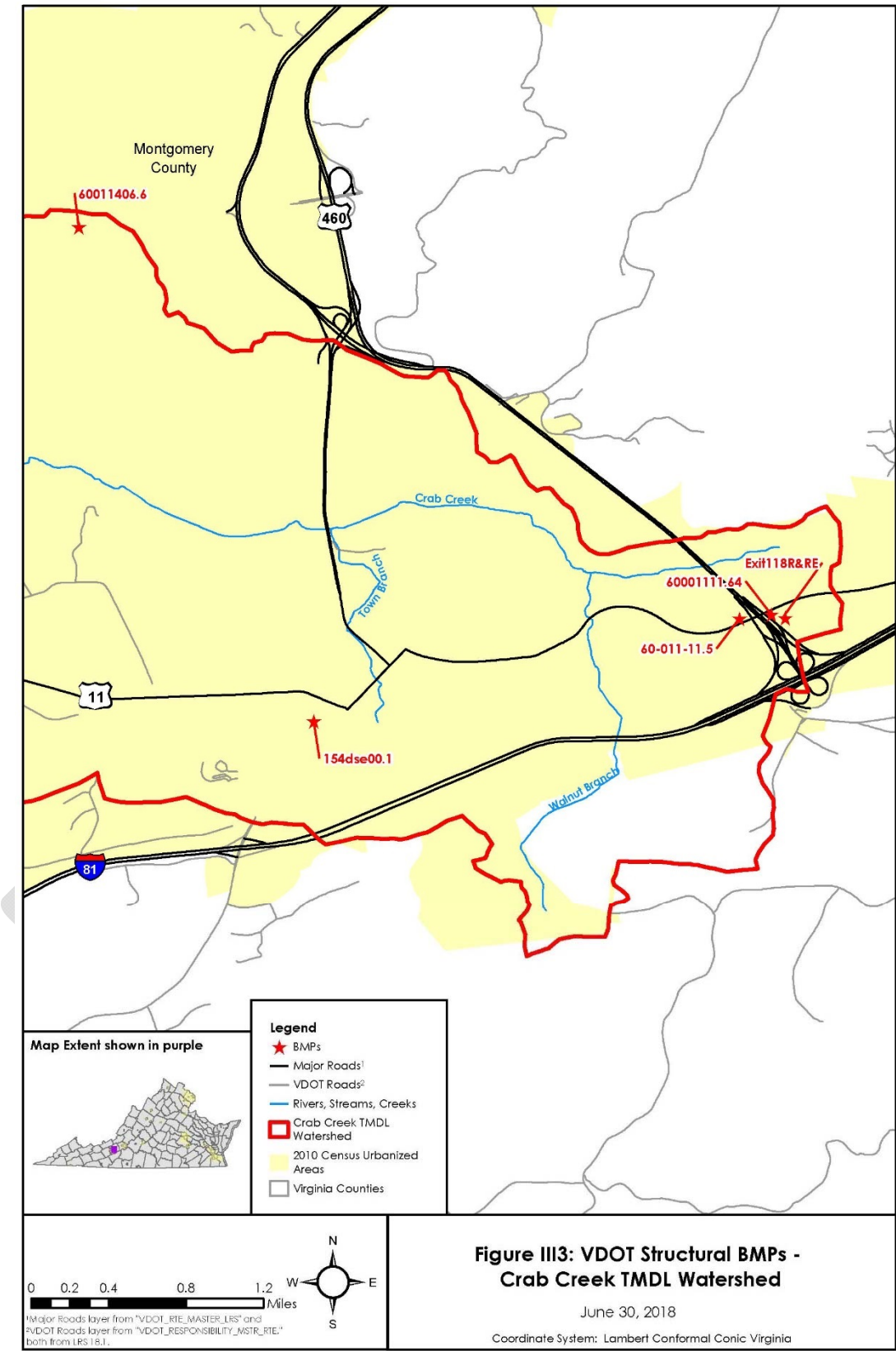
The TMDL for the Crab Creek Watershed assigned a bacteria WLA to MS4 permittees, including VDOT.

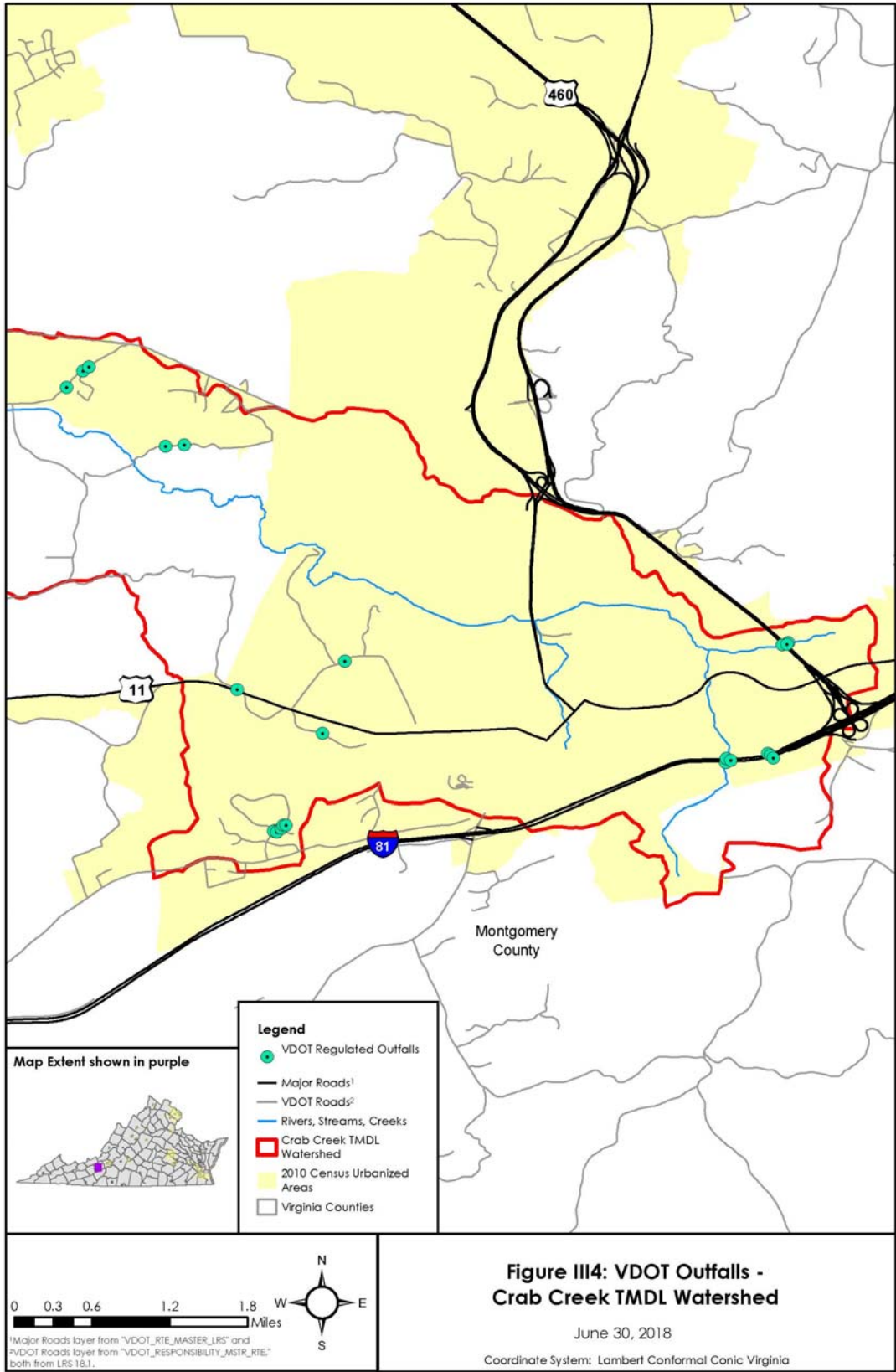
The Core BMPs in VDOT's MS4 Program which address bacteria are listed in Table 2 of this Action Plan. VDOT will continue practicing these programmatic BMPs to the MEP in accordance with the goals of the TMDL. The following actions summarize VDOT's plan to address the bacteria WLA assigned in the Crab Creek Watershed TMDL:

- Continued implementation of VDOT's MS4 Core BMPs.
- For facilities with SWPPPs, an annual assessment effort for TMDL POCs, including bacteria, will be conducted.









Appendix IV

Difficult Run

The information included in this appendix is specific to this watershed TMDL. Refer to the main sections of this Action Plan for additional information.

IVA	Background	IV.1
IVB	Assessment of Significant Sources Within VDOT's Regulated Area in TMDL Watershed .	IV.2
IVB.1	Roadways	IV.2
IVB.2	Facilities	IV.2
IVB.3	Existing Structural BMPs	IV.3
IVB.4	Regulated MS4 Outfalls	IV.3
IVC	BMPs	IV.4

IVA BACKGROUND

DEQ first placed the 2.93-mile segment of Difficult Run on the biennial 303(d) list in 2004 due to violations of the state's bacteria standard for recreation in 2004. The bacteria violation was delisted in 2012 and subsequently re-listed in 2014.

DEQ developed a TMDL with bacteria loading limits for the Difficult Run watershed in 2008. The EPA approved the TMDL on November 7, 2008. The SWCB approved the TMDL on April 28, 2009. VDOT's MS4 Program was assigned a portion of the MS4 WLA for bacteria in the CUA of the Difficult Run watershed. A map depicting the Difficult Run watershed is shown in Figure IV1.

The Difficult Run TMDL use aggregated WLAs for permitted MS4s in the watershed that includes VDOT's MS4, as well as the MS4s serving Fairfax City, Fairfax County, Town of Vienna, Fairfax County Public Schools, and George Washington Memorial Parkway. The Metropolitan Washington Airport Authority is an MS4 in the watershed that was not recognized in the TMDL. The TMDL directs that the WLAs be achieved with a "Percent Reduction Method" that compares water quality data to applicable water quality criteria. It identifies a percent reduction of the current bacteria and sediment loads required to meet water quality standards for the watershed.

The TMDLs for Difficult Run assigned a 90% reduction for bacteria MS4 permittees included in the aggregated WLA. Therefore, VDOT's TMDL Action Plan for the Difficult Run TMDL aims to reduce loads that existed at the time of the TMDL development to the MEP for bacteria.

The same 2.93-mile length segment of Difficult Run was also listed on the 303(d) list in 1998 for violations of the benthic standard. DEQ developed a sediment TMDL for this impairment, in which VDOT was assigned a WLA. This is addressed in VDOT's TMDL Action Plan for Sediment TMDLs.

IVBASSESSMENT OF SIGNIFICANT SOURCES WITHIN VDOT'S REGULATED AREA IN TMDL WATERSHED

IVB.1 Roadways

There are several classes of roadways that VDOT either owns or operates in the CUA of the Difficult Run watershed, including approximately seven miles of interstate and associated ramps, eight miles of US highways, fifty-nine miles of state highways, and 412 miles of secondary and local roadways. Roadway drainage networks may be a significant conduit for discharges of bacteria in a watershed, although the roadway itself is not expected to serve as a pollutant source and highway drainage is typically associated with lower levels of bacteria than urban runoff from other land use categories.

IVB.2 Facilities

In addition to the roadway network, VDOT operates three facilities in the study area: Reston Area Headquarters and the Park & Rides - Reston North / Wiehle Avenue and Reston East - shown in Figure IV2 and listed in Table IV1.

An assessment for sources of bacteria from the facilities was conducted. For the purposes of the assessment, a potential source of bacteria from the facility means a potential anthropogenic source of bacteria due to the presence of septic systems, active portable toilets, etc. The table below lists each facility and the results of the site assessment. Based on the assessment, none of the facilities are a significant source of bacteria. For facilities with SWPPPs, an annual assessment effort for TMDL POCs, including bacteria, will be conducted.

Table IV1: Facilities in the Study Area

Facility	Potential Source of Bacteria	Significant Source	SWPPP	Date of Last Assessment
Reston Area Headquarters	No	No	Yes	5/7/2017
Reston East Park & Ride	No	No	No	N/A *
Reston North / Wiehle Ave Park & Ride	Yes (portable toilet)	No	No	N/A *

* VDOT has assessed this type of facility in the past and has determined that it is not a significant source of bacteria.

IVB.3 Existing Structural BMPs

As of June 2018, there are twelve structural BMPs (nine extended detention basins and three dry detention basins) in the watershed, shown in Figure IV3. There are no other VDOT facilities or structural BMPs in the watershed

IVB.4 Regulated MS4 Outfalls

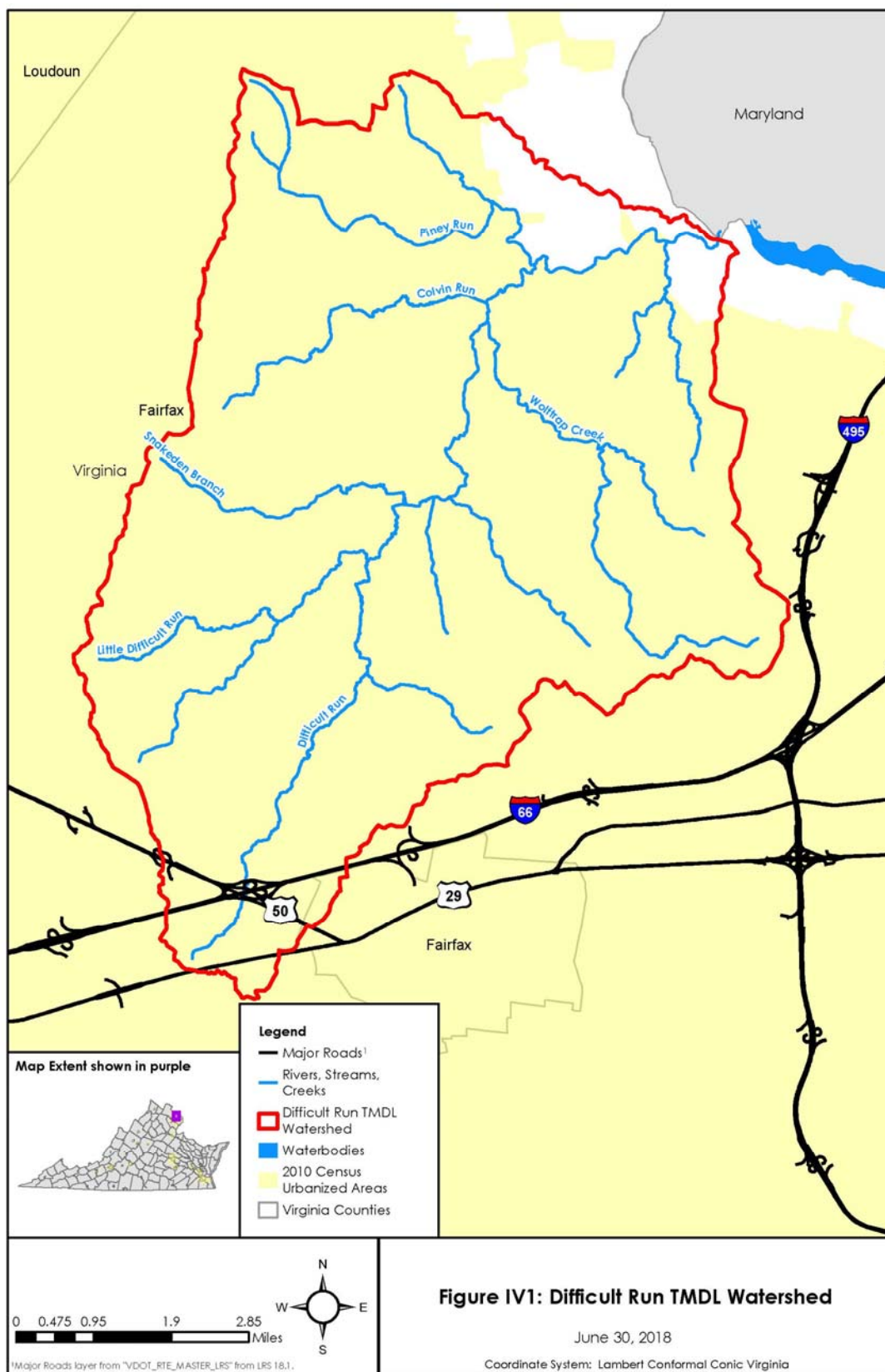
In this study area, VDOT has mapped 705 regulated outfalls and 393 points of discharge as of June 2018, shown in Figure IV4.

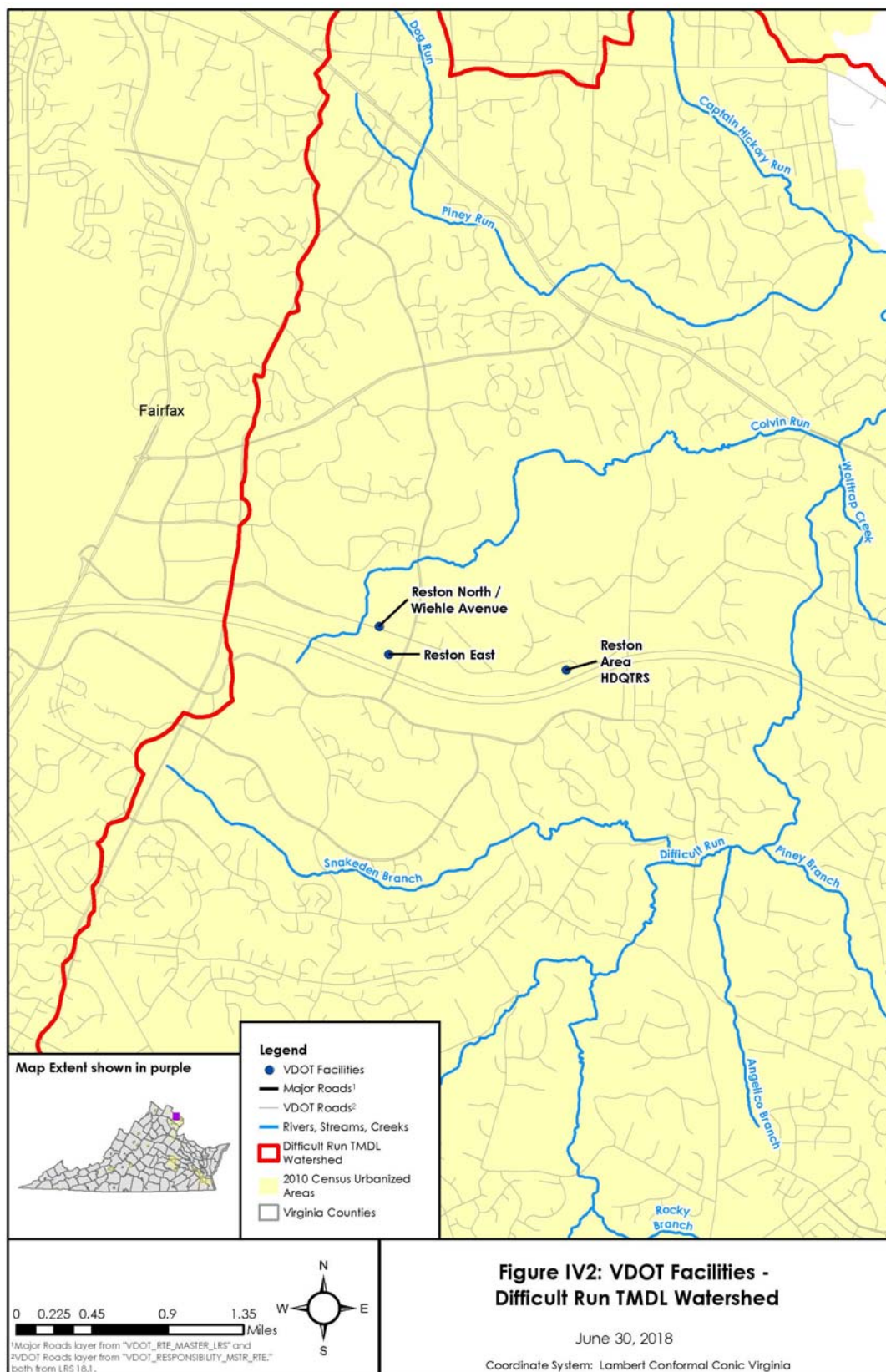
IVCBMPS

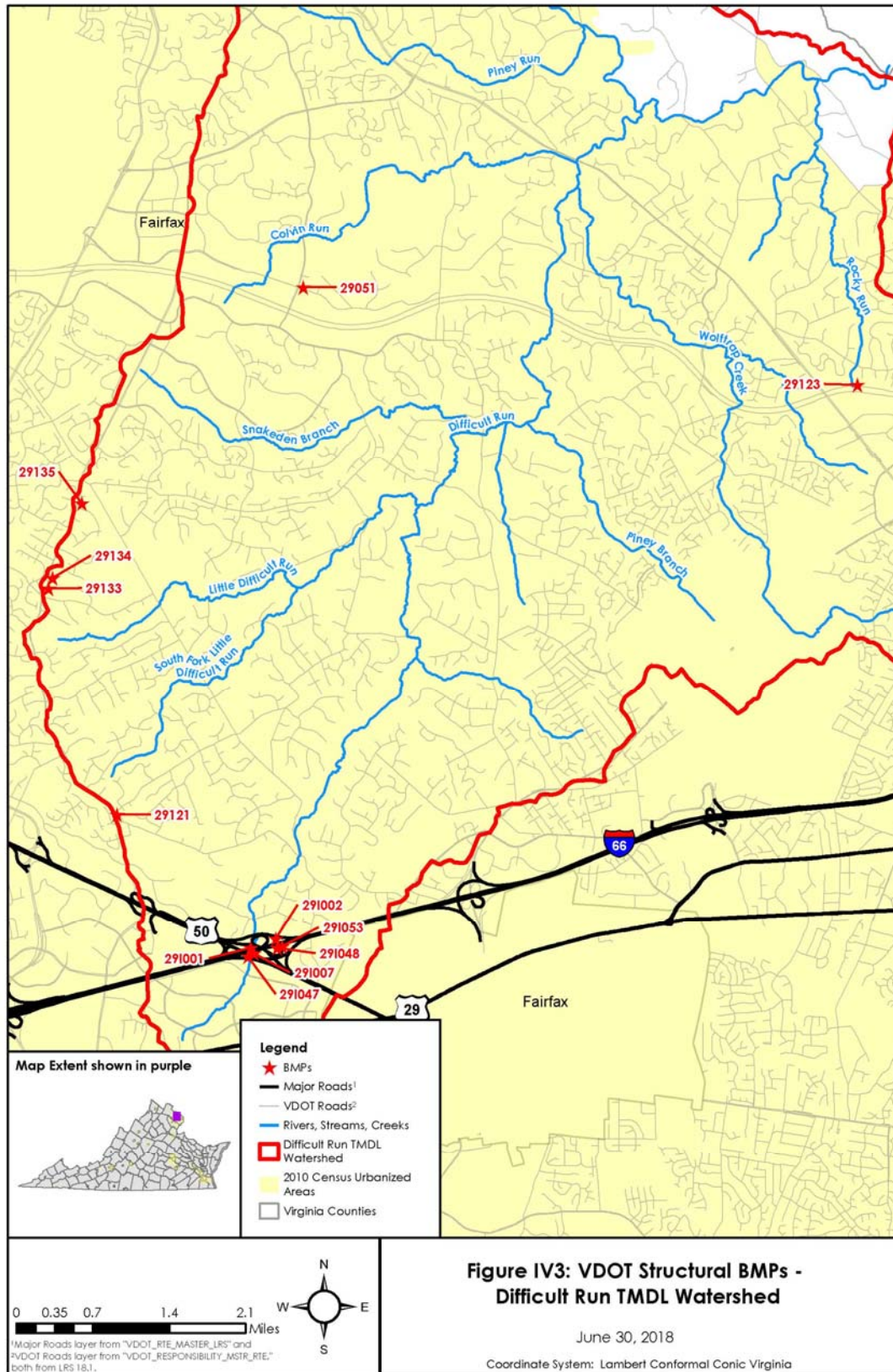
The TMDL for Difficult Run assigned a bacteria WLA to MS4 permittees, including VDOT.

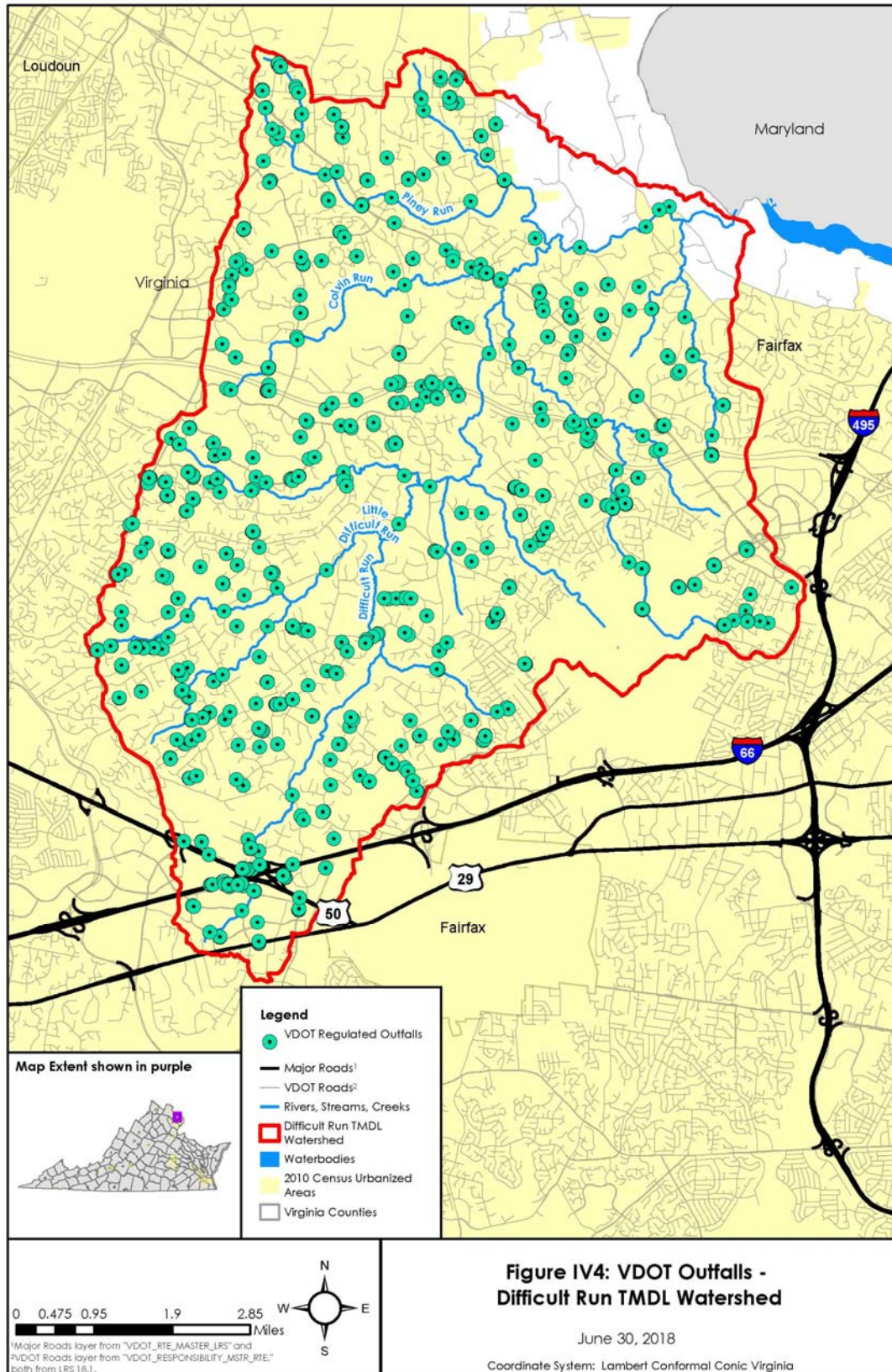
The Core BMPs in VDOT's MS4 Program which address bacteria are listed in Table 2 of this Action Plan. VDOT will continue practicing these programmatic BMPs to the MEP in accordance with the goals of the TMDL. The following actions summarize VDOT's plan to address the bacteria WLAs assigned in the Difficult Run TMDL:

- Continued implementation of VDOT's MS4 Core BMPs.
- For facilities with SWPPPs, an annual assessment effort for TMDL POCs, including bacteria, will be conducted.









Appendix V

Hoffler Creek, Cities of Portsmouth and Suffolk

The information included in this appendix is specific to this watershed TMDL. Refer to the main sections of this Action Plan for additional information.

VA	Background	V.1
VB	Assessment of Significant Sources Within VDOT's Regulated Area in TMDL Watershed ..	V.2
VB.1	Roadways	V.2
VB.2	Facilities	V.2
VB.3	Existing Structural BMPs	V.2
VB.4	Regulated MS4 Outfalls	V.2
VC	BMPs	V.3

VA BACKGROUND

DEQ first placed the full 2.3-mile segment of Hoffler Creek on the biennial 303(d) list in 2008 due to violations of the state's fecal coliform bacteria standard for recreation.

Consequently, DEQ developed a TMDL with bacteria loading limits for the Hoffler Creek, Cities of Portsmouth and Suffolk watershed. The EPA approved the TMDL on December 14, 2011. The SWCB approved the TMDL on June 29, 2012. VDOT's MS4 Program was assigned a portion of the MS4 WLA for bacteria in the CUA of the Hoffler Creek watershed. A map depicting the Hoffler Creek watershed is shown in Figure V1.

The Hoffler Creek, Cities Portsmouth and Suffolk TMDL uses aggregated WLAs for permitted MS4s in the watershed that includes VDOT's MS4, as well as the MS4s serving the Cities of Portsmouth and Suffolk. The TMDL directs that the WLAs be achieved with a "Percent Reduction Method" that compares water quality data to applicable water quality criteria. It identifies a percent reduction of the current bacteria loads required to meet water quality standards for the watershed.

The TMDL for Hoffler Creek, Cities of Portsmouth and Suffolk assigned a 95.6% reduction for bacteria to MS4 permittees included in the aggregated WLAs. Therefore, VDOT's TMDL Action Plan for the Hoffler Creek, Cities of Portsmouth and Suffolk TMDL aims to reduce loads that existed at the time of the TMDL development to the MEP for bacteria by implementing programmatic BMPs.

VB ASSESSMENT OF SIGNIFICANT SOURCES WITHIN VDOT'S REGULATED AREA IN TMDL WATERSHED

VB.1 Roadways

There are a couple of roadways that VDOT either owns or operates in the CUA of the Hoffler Creek watershed, including approximately three miles of US highways and eleven miles of secondary and local roadways. Roadway drainage networks may be a significant conduit for discharges of bacteria in a watershed, although the roadway itself is not expected to serve as a pollutant source and highway drainage is typically associated with lower levels of bacteria than urban runoff from other land use categories.

VB.2 Facilities

Beyond the roadway network, VDOT does not operate any facilities in the study area.

VB.3 Existing Structural BMPs

As of June 2018, there are no VDOT or VDOT associated structural BMPs in the watershed. There are no other VDOT facilities or structural BMPs in the watershed and VDOT's MS4 regulated area.

VB.4 Regulated MS4 Outfalls

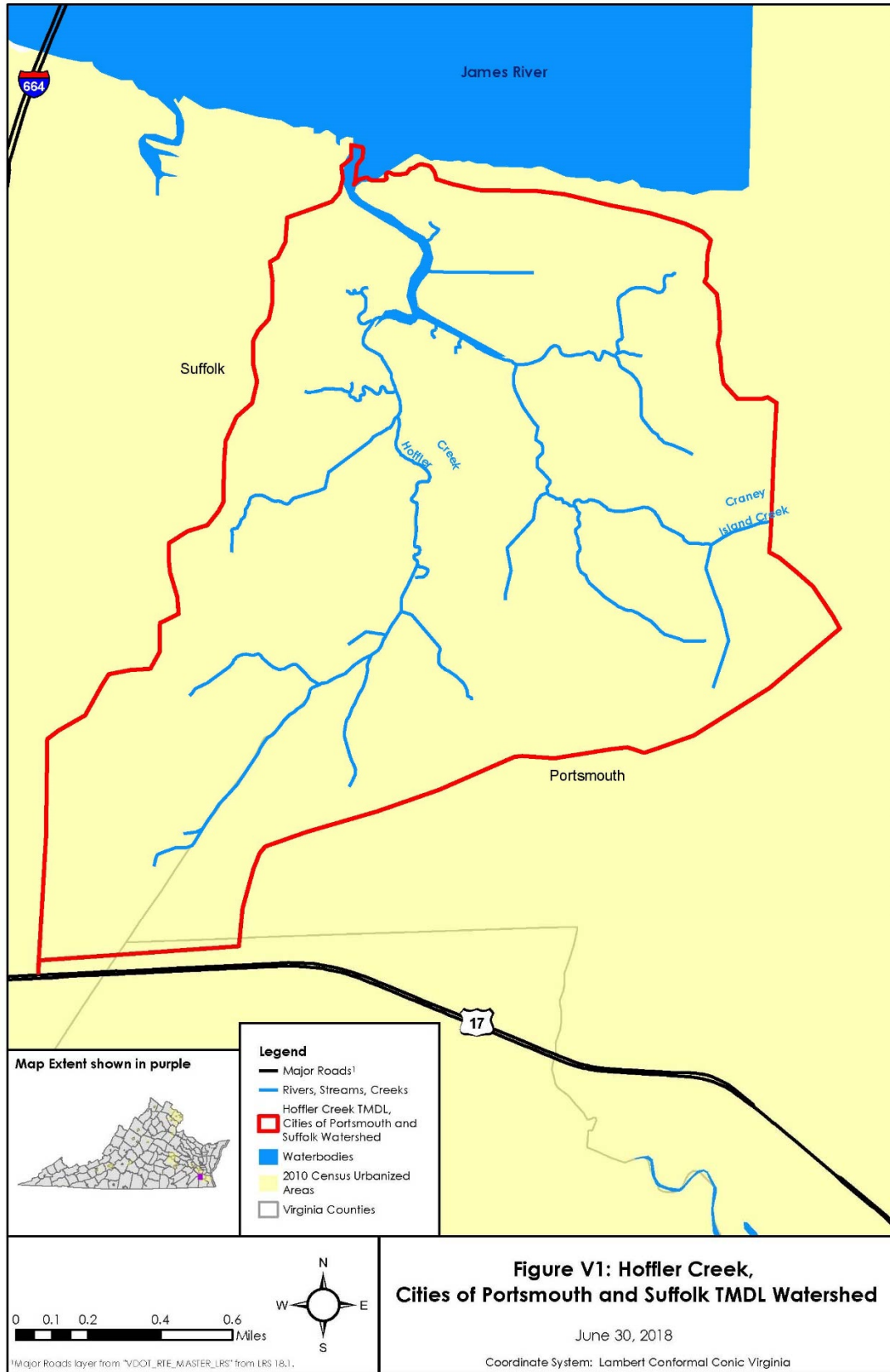
In this study area, VDOT has mapped six regulated outfalls as of June 2018, shown in Figure V2.

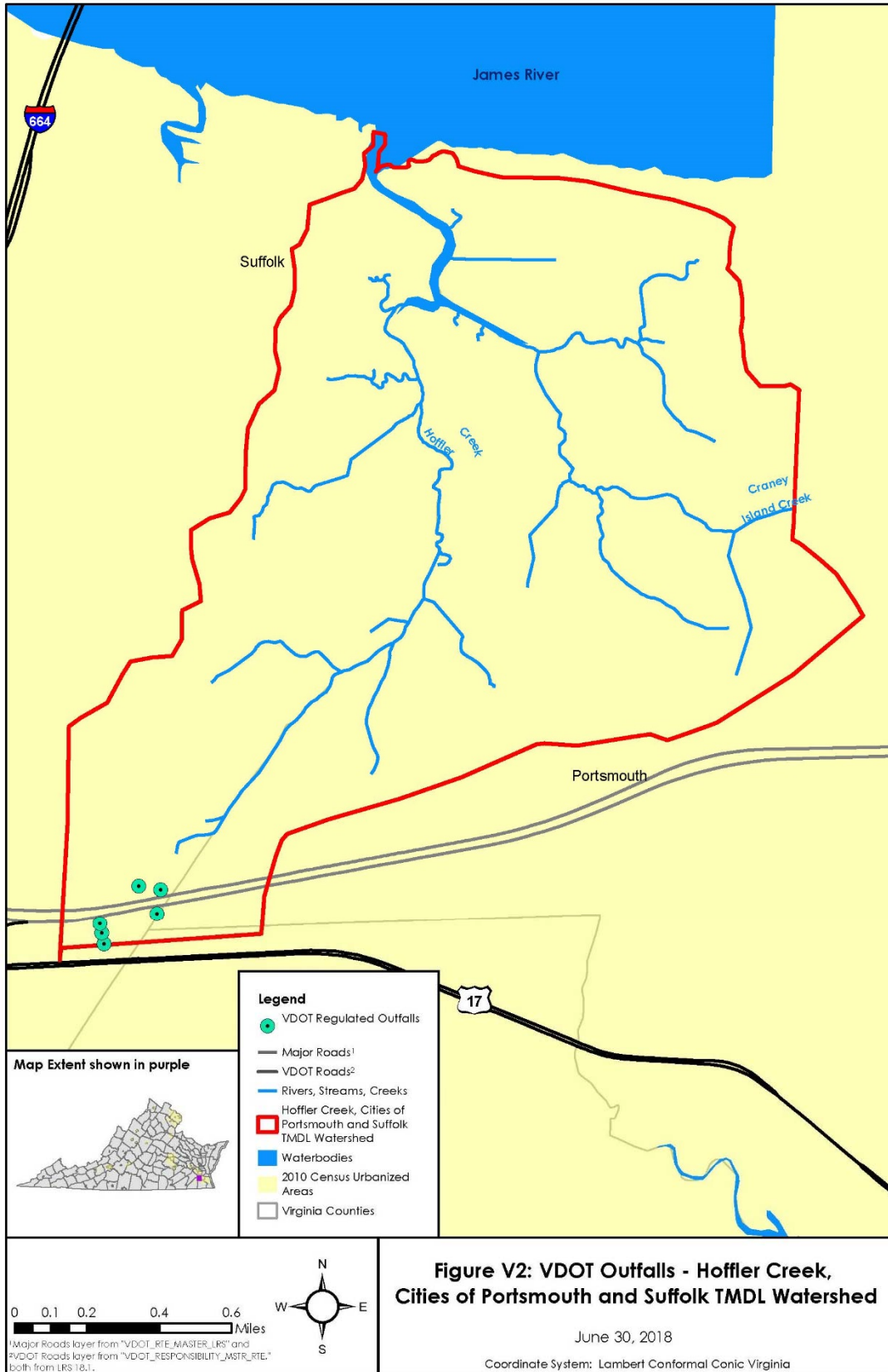
VC BMPS

The TMDL for Hoffler Creek, Cities of Portsmouth and Suffolk assigned a bacteria WLA to MS4 permittees, including VDOT.

The Core BMPs in VDOT's MS4 Program which address bacteria are listed in Table 2 of this Action Plan. VDOT will continue practicing these programmatic BMPs to the MEP in accordance with the goals of the TMDL. The following actions summarize VDOT's plan to address the bacteria WLAs assigned in the Hoffler Creek, Cities of Portsmouth and Suffolk TMDL:

- Continued implementation of VDOT's MS4 Core BMPs.





Appendix VI

Hunting Creek, Cameron Run, Holmes Run

The information included in this appendix is specific to this watershed TMDL. Refer to the main sections of this Action Plan for additional information.

VIA	Background	VI.1
VIB	Assessment of Significant Sources Within VDOT's Regulated Area in TMDL Watershed ..	VI.2
VIB.1	Roadways	VI.2
VIB.2	Facilities	VI.2
VIB.3	Existing Structural BMPs	VI.2
VIB.4	Regulated MS4 Outfalls	VI.3
VIC	BMPs	VI.4

VIA BACKGROUND

DEQ first placed the entire 0.53 square miles of Hunting Creek's tidal waters on the biennial 303(d) list in 1998 due to violations of the state's fecal coliform bacteria standard for recreation.

Consequently, DEQ developed a TMDL with bacteria loading limits for the Hunting Creek watershed. The EPA approved the TMDL on November 10, 2010. The SWCB approved the TMDLs on August 4, 2011. VDOT's MS4 Program was assigned a portion of the MS4 WLA for bacteria in the CUA of the Hunting Creek watershed. A map depicting the Hunting Creek watershed is shown in Figure VI1.

A 2.08-mile segment of Cameron Run was added to the 303(d) list in 2006 for bacteria impairments. It remained listed through 2012 and was delisted in 2014. In 2004, 3.58 miles of Holmes Run were added to the 303(d) list in 2004 for bacteria impairments and remain listed through 2014. These two impaired segments were included in the TMDL for the Hunting Creek watershed.

The Hunting Creek, Cameron Run and Holmes Run Bacteria TMDLs use aggregated WLAs for permitted MS4s in the watershed that includes VDOT's MS4, as well as the MS4s serving the City of Alexandria, City of Falls Church, Arlington County, Fairfax County, Fairfax County Public Schools, and George Washington Memorial Parkway. The TMDL directs that the WLAs be achieved with a "Percent Reduction Method" that compares water quality data to applicable water quality criteria. It identifies a percent reduction of the current bacteria loads required to meet water quality standards for the watershed.

The TMDLs assigned varying reductions to the MS4 permittees included in the aggregated WLAs based on watershed and jurisdictional area. An 83% reduction for bacteria was assigned to MS4 permittees included in the Holmes Run and Cameron Run watersheds. The MS4 load reductions for Hunting Creek were broken out by jurisdictional area: 98% reduction in Arlington County, 92% in the City of Alexandria, and 83% in Fairfax County and the City of Falls Church. Therefore, VDOT's TMDL Action Plan for the Hunting Creek watershed TMDL aims to reduce loads that existed at the time of the TMDL development to the MEP for bacteria by implementing programmatic BMPs.

The Watersheds are also listed on the 303(d) list for violations to the PCB standard. A separate PCB TMDL was developed by DEQ for the Potomac River watershed, including Hunting Creek, Cameron Run and Holmes Run, and approved by the SWCB on April 11, 2008. The Potomac River PCB TMDL also assigned VDOT's MS4 Program a WLA. This WLA is addressed in VDOT's TMDL Action Plan for PCB TMDLs.

VIB ASSESSMENT OF SIGNIFICANT SOURCES WITHIN VDOT’S REGULATED AREA IN TMDL WATERSHED

VIB.1 Roadways

There are several classes of roadways that VDOT either owns or operates in the CUA of the Hunting Creek watershed, including approximately eighty-eight miles of interstate and associated ramps, twenty-seven miles of US highways, fifty-two miles of state highways, and 466 miles of secondary and local roadways. Roadway drainage networks may be a significant conduit for discharges of bacteria in a watershed, although the roadway itself is not expected to serve as a pollutant source and highway drainage is typically associated with lower levels of bacteria than urban runoff from other land use categories.

VIB.2 Facilities

In addition to the roadway network, VDOT operates two facilities in the study area: the Van Dorn Maintenance Complex and the Merrifield Area Headquarters, shown in Figure VI2 and listed in Table VI1.

An assessment for sources of bacteria from the facilities was conducted. For the purposes of the assessment, a potential source of bacteria from the facility means a potential anthropogenic source of bacteria due to the presence of septic systems, active portable toilets, etc. The table below lists each facility and the results of the site assessment. Based on the assessment, none of the facilities are a significant source of bacteria. For facilities with SWPPPs, an annual assessment effort for TMDL POCs, including bacteria, will be conducted.

Table VI1: Facilities in the Study Area

Facility	Potential Source of Bacteria	Significant Source	SWPPP	Date of Last Assessment
Merrifield Area Headquarters	Yes (septic system)	No	Yes	5/6/2015
Van Dorn Maintenance Complex	No	No	Yes	5/7/2015

VIB.3 Existing Structural BMPs

As of June 2018, there are forty-five VDOT or VDOT associated structural BMPs (twenty-two extended detention basins, six treebox filters, four bioretention filters, two sand filter basins, one pipe detention, one Contech ES CDS unit, three ADS-Baysaver Tech Bay Separator, and three other manufactured hydrodynamic BMPs) and three BMPs under construction (three treebox

filters) in the watershed, shown in Figure VI3. There are no other VDOT facilities or structural BMPs in the watershed and VDOT's MS4 regulated area.

VIB.4 Regulated MS4 Outfalls

In this study area, VDOT has mapped 278 regulated outfalls and twelve points of discharge as of June 2018, shown in Figure VI4.

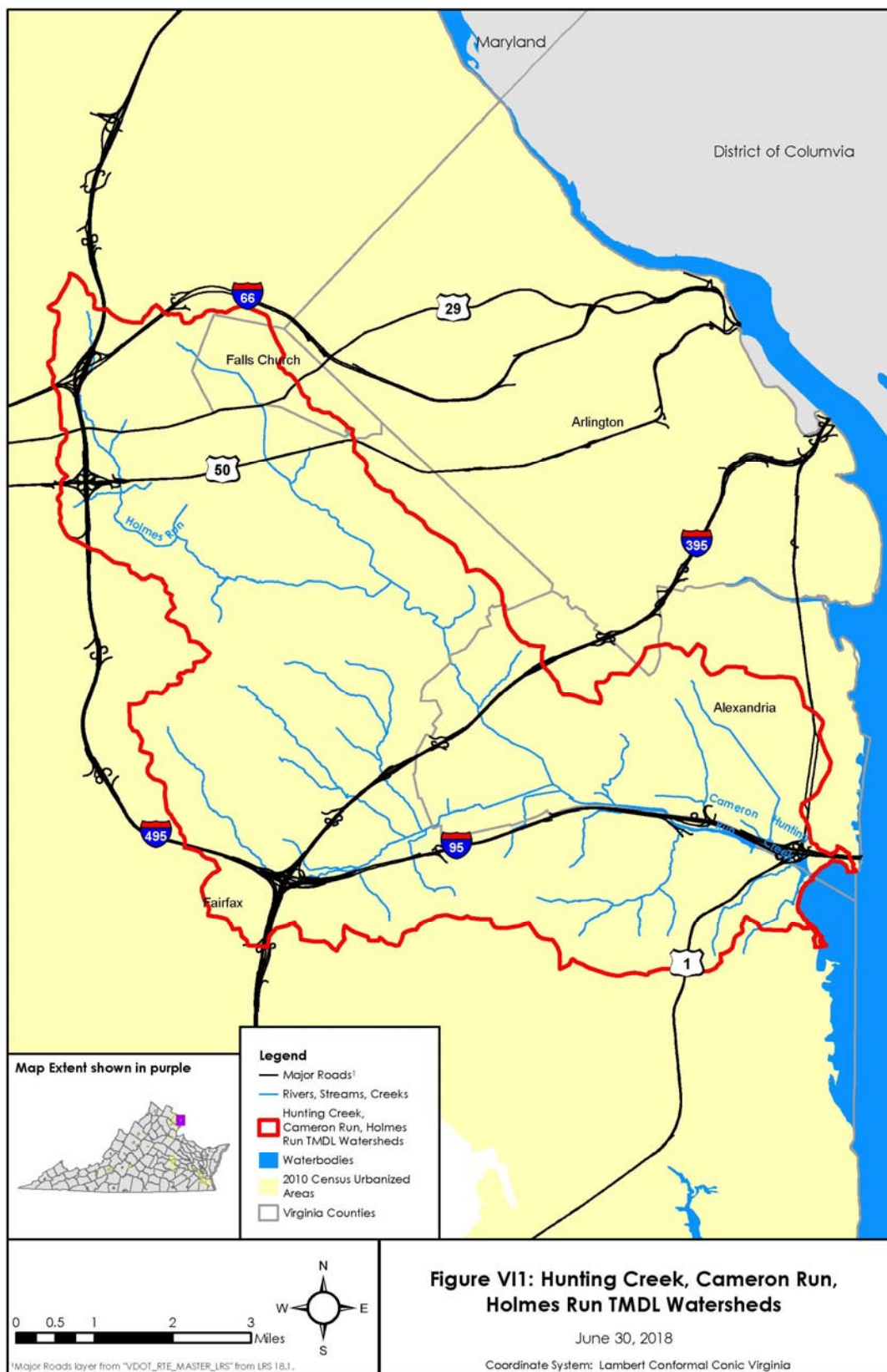
DRAFT

VIC BMPS

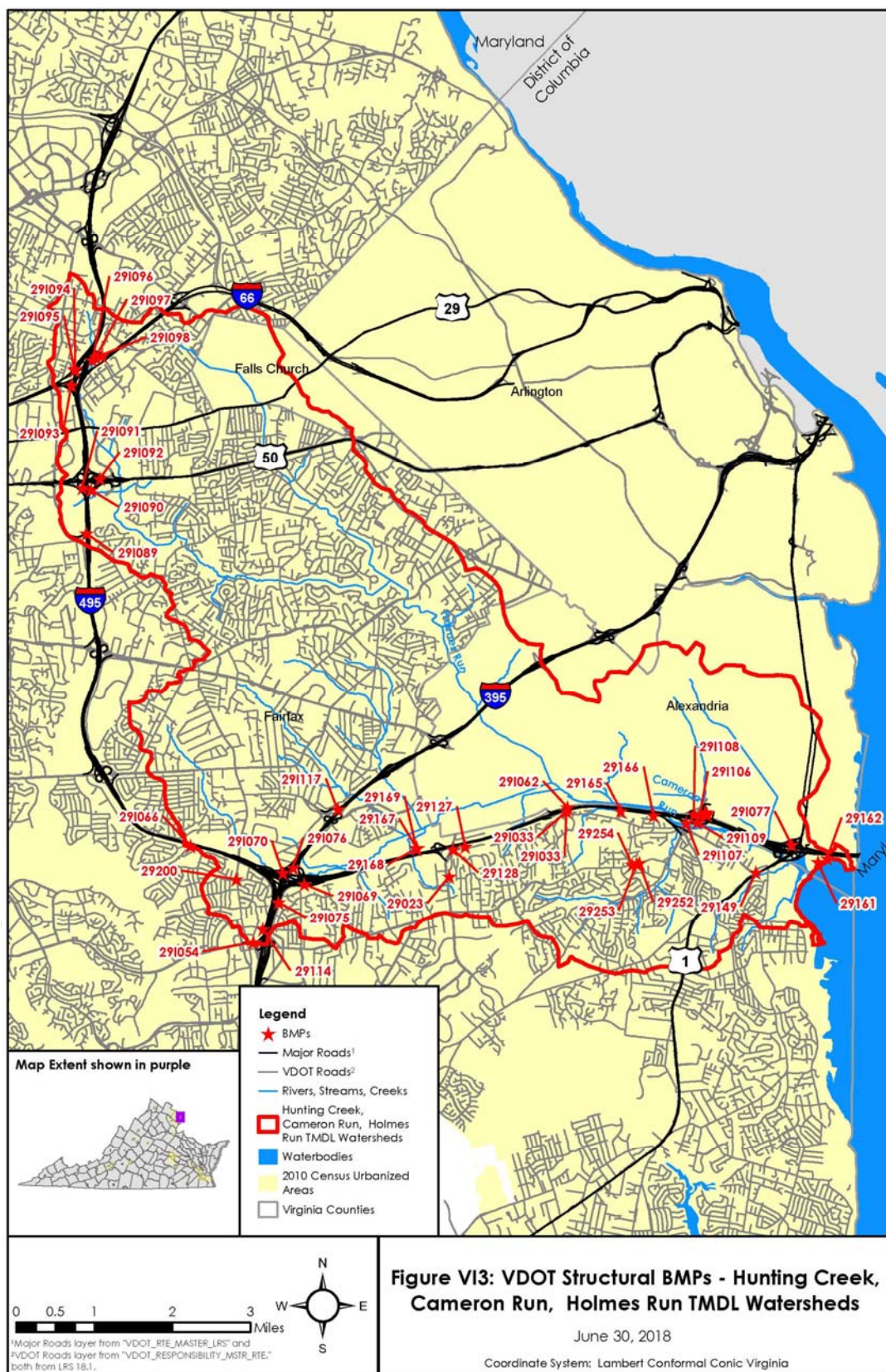
The TMDL for Hunting Creek, Cameron Run, and Holmes Run assigned WLAs to MS4 permittees, including VDOT, in the various impaired watersheds.

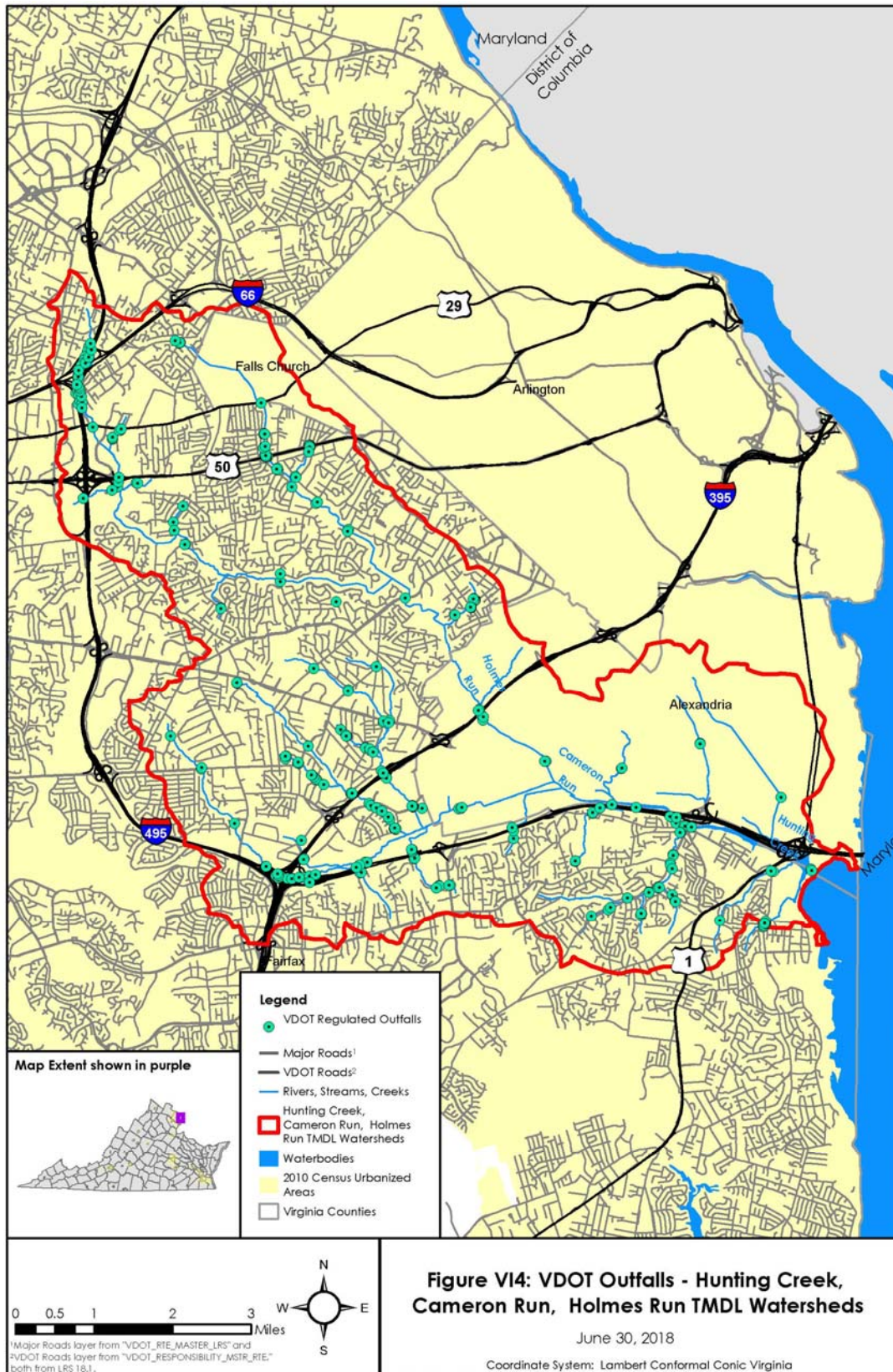
The Core BMPs in VDOT's MS4 Program which address bacteria are listed in Section 2.0 of this Action Plan. VDOT will continue practicing these programmatic BMPs to the MEP in accordance with the goals of the TMDL. The following actions summarize VDOT's plan to address the bacteria WLAs assigned in the Hunting Creek, Cameron Run, and Holmes Run TMDL:

- Continued implementation of VDOT's MS4 Core BMPs.
- For facilities with SWPPPs, an annual assessment effort for TMDL POCs, including bacteria, will be conducted.









Appendix VII

James River Watershed (Lynchburg)

The information included in this appendix is specific to this watershed TMDL. Refer to the main sections of this Action Plan for additional information.

VIIA	Background	VII.1
VIIB	Assessment of Significant Sources Within VDOT's Regulated Area in TMDL Watershed	VII.2
VIIB.1	Roadways.....	VII.2
VIIB.2	Facilities	VII.2
VIIB.3	Existing Structural BMPs.....	VII.3
VIIB.4	Regulated MS4 Outfalls.....	VII.3
VIIC	BMPs	VII.4

VIIA BACKGROUND

DEQ first placed the 18.43-mile segment of the James River in the Lynchburg area on the biennial 303(d) list in 2004 due to violations of the state's fecal coliform bacteria standard for recreation. The upper 8.18 miles of the segment was delisted for bacteria impairments in 2010, but the bacteria impairment for the upper section was re-listed in 2014. The lower segments remain listed through 2014. Several tributaries to the James River have also been listed as impaired for violations to the bacteria standard for recreation. In 2004, 10.24 miles of Blackwater Creek, 5.45 miles of Fishing Creek, and 5.37 miles of Ivy Creek were all added to the 303(d) list for bacteria impairments. A 3.47-mile segment of Burton Creek, 10.55 miles of Judith Creek, and 5.9 miles of Tomahawk Creek were each added to the 303(d) list for bacteria impairments in 2006.

DEQ developed a TMDL with bacteria loading limits for the James River Watershed (Lynchburg) in 2007. The EPA approved the TMDL on December 04, 2007. The SWCB approved the TMDL on July 31, 2008. VDOT's MS4 Program was assigned a portion of the MS4 WLAs for bacteria in the CUA of the James River Watershed (Lynchburg). A map depicting the James River Watershed (Lynchburg) is shown in Figure VII.1.

The James River Watershed (Lynchburg) TMDL uses aggregated WLAs for permitted MS4s in the watershed that includes VDOT's MS4, as well as the MS4 serving the City of Lynchburg. Additional MS4s now exist in the watershed, including Bedford County, the Central Virginia Training Center, and the Central Virginia Community College, that were not recognized during the TMDL development in 2007. The TMDL directs that the WLAs be achieved with a "Percent Reduction Method" that compares water quality data to applicable water quality criteria. It identifies a percent reduction of the current bacteria loads required to meet water quality standards for the watershed.

The aggregate WLAs for MS4 permittees in the James River Watershed (Lynchburg) TMDL in 2007 was calculated by "isolating the load coming from the impervious segments of the residential land use in each impairment subwatershed that lies within the City limits". Thus, the percent reductions assigned to residential land in each impairment subwatershed are the percent reductions to the aggregated WLAs. The residential land use bacteria loading reductions assigned in the TMDL are: 80% in the James River impairment, 98% in the Ivy Creek impairment, 80% in the Fishing Creek impairment, 91% in the Blackwater Creek impairment, 95% in the Tomahawk Creek impairment, 98% in the Burton Creek impairment, and 94% in the Judith Creek impairment. Therefore, VDOT's TMDL Action Plan for the James River Watershed (Lynchburg) TMDL aims to reduce loads that existed at the time of the TMDL development to the MEP for bacteria by implementing programmatic BMPs.

DEQ is currently revising this TMDL to adjust for changes to the City of Lynchburg's Long Term Control Plan for Combined Sewer Overflows. VDOT will reevaluate this TMDL and its assigned bacteria WLA when appropriate and applicable to VDOT's MS4 permit.

VIIB ASSESSMENT OF SIGNIFICANT SOURCES WITHIN VDOT'S REGULATED AREA IN TMDL WATERSHED

VIIB.1 Roadways

There are several classes of roadways that VDOT either owns or operates in the CUA of the James River Watershed (Lynchburg), including approximately eighty-nine miles of US highways, sixteen miles of state highways, and associated ramps and 209 miles of secondary and local roadways. Roadway drainage networks may be a significant conduit for discharges of bacteria in a watershed, although the roadway itself is not expected to serve as a pollutant source and highway drainage is typically associated with lower levels of bacteria than urban runoff from other land use categories.

VIIB.2 Facilities

In addition to the roadway network, VDOT operates two facilities in the study area: the Lynchburg District Complex and the Old Madison Heights Storage, shown in Figure VII2 and listed in Table VII1.

An assessment for sources of bacteria from the facilities was conducted. For the purposes of the assessment, a potential source of bacteria from the facility means a potential anthropogenic source of bacteria due to the presence of septic systems, active portable toilets, etc. The table below lists each facility and the results of the site assessment. Based on the assessment, none of the facilities are a significant source of bacteria. For facilities with SWPPPs, an annual assessment effort for TMDL POCs, including bacteria, will be conducted.

Table VII1: Facilities in the Study Area

Facility	Potential Source of Bacteria	Significant Source	SWPPP	Date of Last Assessment
Lynchburg District Complex	No	No	Yes	8/25/2015
Old Madison Heights Storage	No	No	No	N/A *

* VDOT has assessed this type of facility in the past and has determined that it is not a significant source of bacteria.

VII.B.3 Existing Structural BMPs

As of June 2018, there are twenty-one VDOT or VDOT associated structural BMPs (twelve extended detention basins, two retention basins, two dry detentions, three pipe detentions, one treebox filter, and one level spreader) in the watershed, shown in Figure VII.3. There are no other VDOT facilities or structural BMPs in the watershed and VDOT's MS4 regulated area.

VII.B.4 Regulated MS4 Outfalls

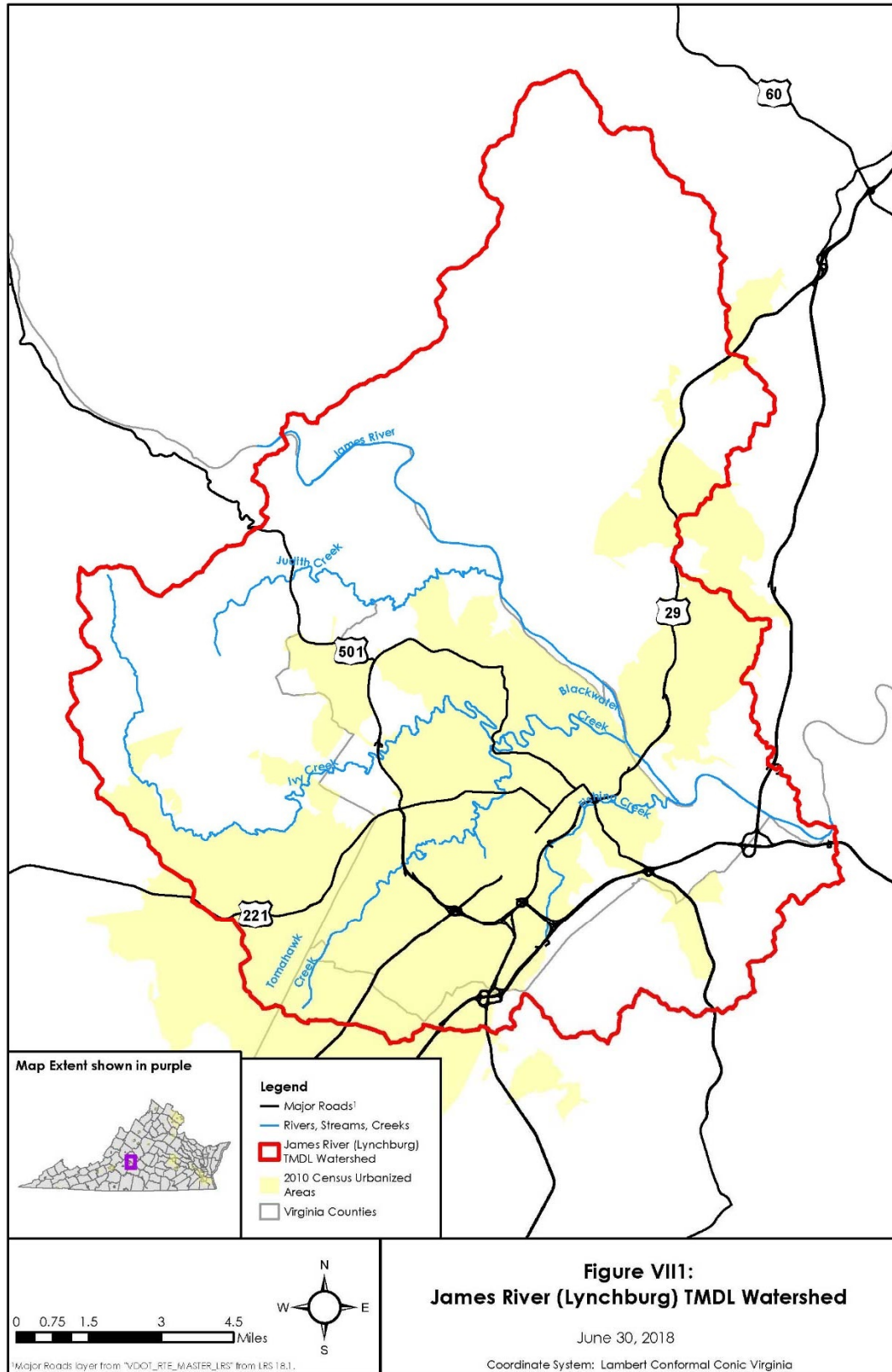
In this study area, VDOT has mapped 279 regulated outfalls and sixteen points of discharge as of June 2018, shown in Figure VII.4.

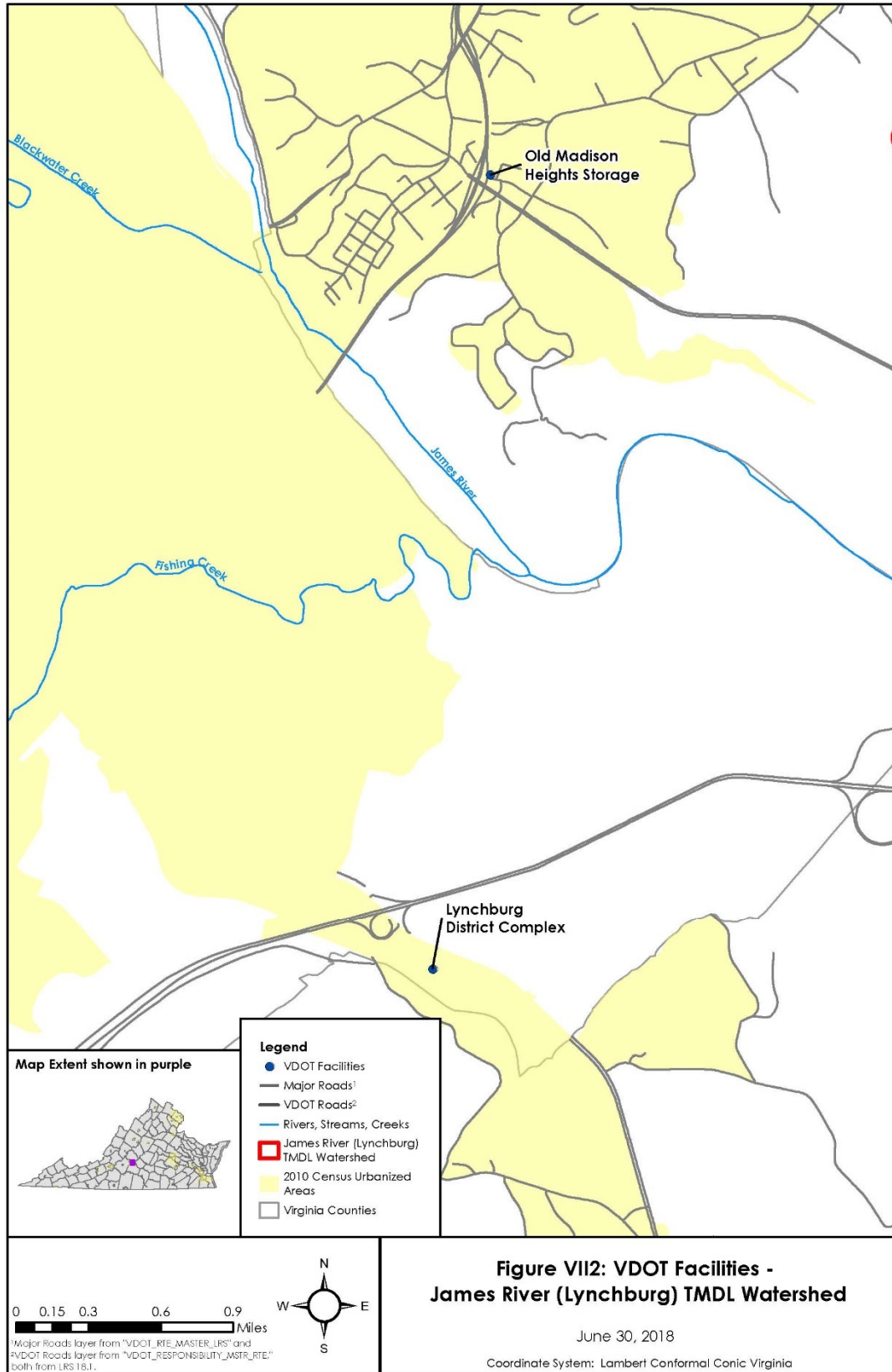
VIIC BMPS

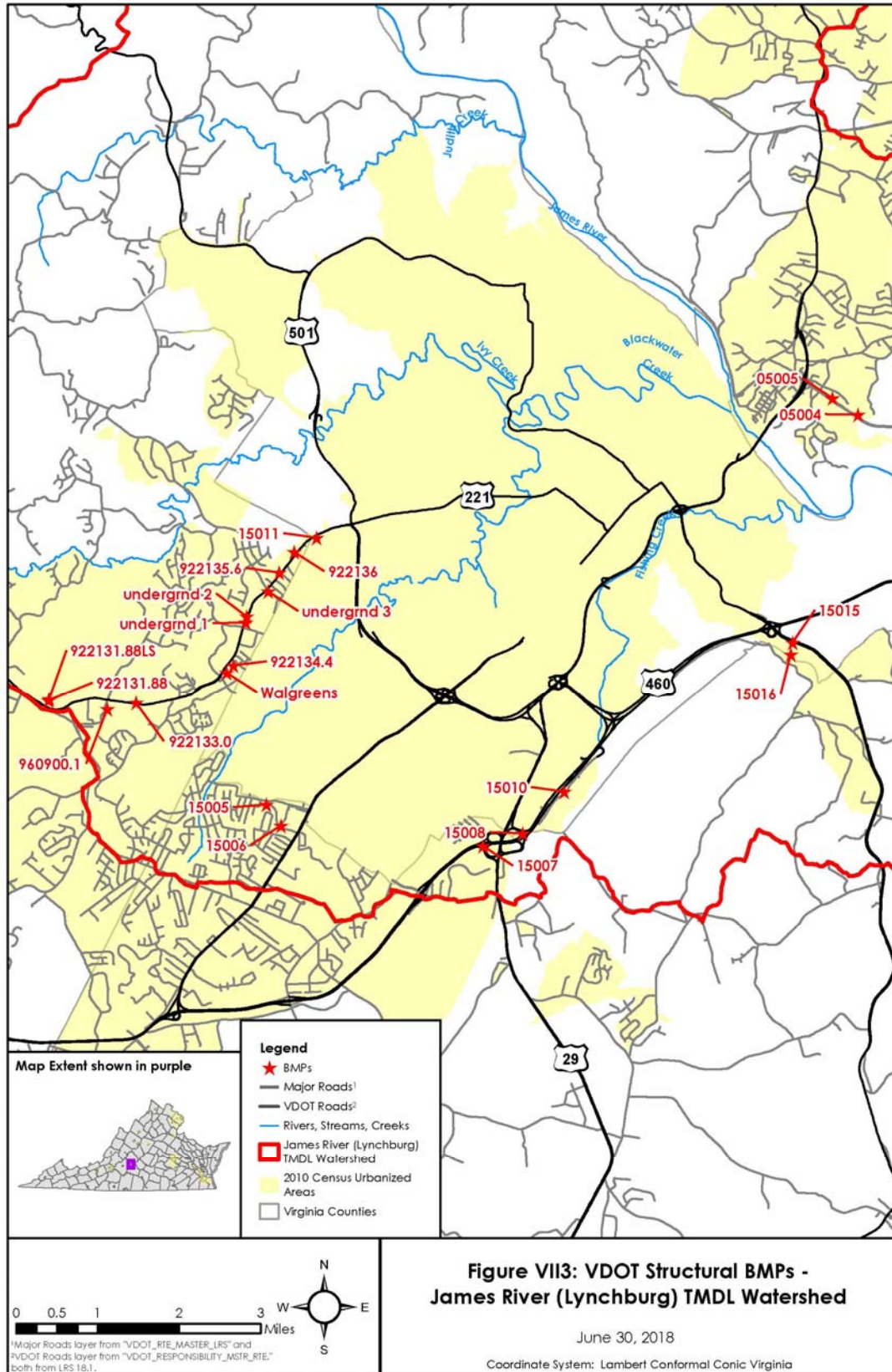
The TMDL for the James River Watershed (Lynchburg) assigned WLAs to MS4 permittees, including VDOT, in the various impaired watersheds.

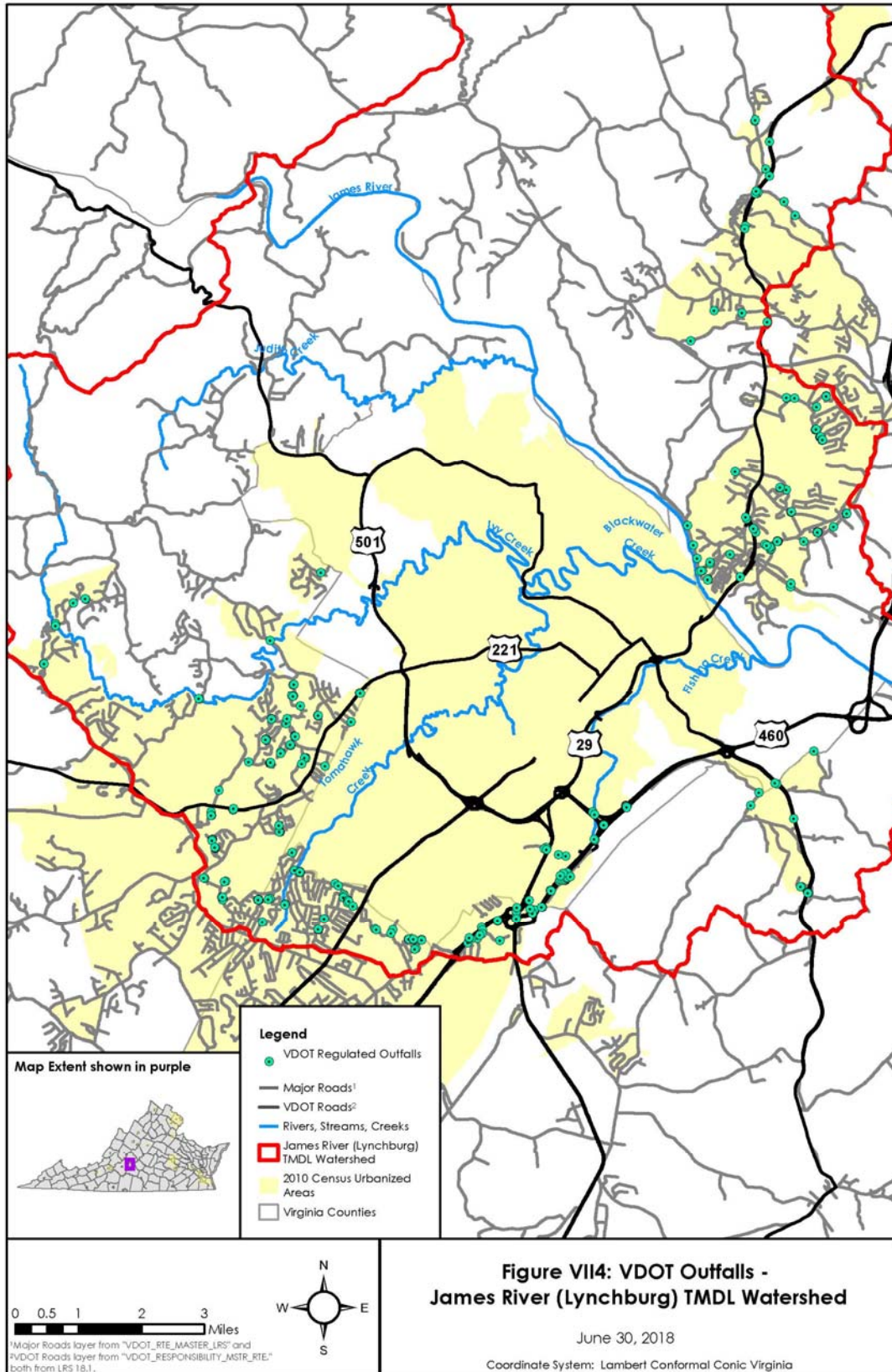
The Core BMPs in VDOT's MS4 Program which address bacteria are listed in Table 2 of this Action Plan. VDOT will continue practicing these programmatic BMPs to the MEP in accordance with the goals of the TMDL. The following actions summarize VDOT's plan to address the bacteria WLAs assigned in the James River Watershed (Lynchburg) TMDL:

- Continued implementation of VDOT's MS4 Core BMPs.
- For facilities with SWPPPs, an annual assessment effort for TMDL POCs, including bacteria, will be conducted.









Appendix VIII

James River and Tributaries, City of Richmond

The information included in this appendix is specific to this watershed TMDL. Refer to the main sections of this Action Plan for additional information.

VIIIA Background	VIII.1
VIIIB Assessment of Significant Sources Within VDOT's Regulated Area in TMDL Watershed.....	VIII.2
XIIIB.1 Roadways.....	VIII.2
XIIIB.2 Facilities	VIII.2
XIIIB.3 Existing Structural BMPs.....	VIII.3
XIIIB.4 Regulated MS4 Outfalls.....	VIII.3
VIIIC BMPs	VIII.4

VIIIA BACKGROUND

DEQ first placed a 3-mile segment of the James River and an adjacent 10.84 square miles of the tidally-influenced James River on the biennial 303(d) list in 1996 due to violations of the state's fecal coliform bacteria standard for recreation. In 1996, an additional 3-mile segment of the James River immediately upstream of the aforementioned segments was also added to the 303(d) list for bacteria impairments but was delisted in 2008. An additional 7.3 miles of the upper James River was added to the 303(d) list for bacteria impairments in 2004, delisted in 2006, and relisted in 2014.

Several tributaries to the James River in and around Richmond have also been listed as impaired for violations to the bacteria standard for recreation. In 1998, 2.4 miles of Almond Creek and 3.7 miles of Reedy Creek were added to the 303(d) list. In 2002, 1.2 miles of Goode Creek and 8.1 miles of Powhite Creek were added to the 303(d) list. Powhite Creek was delisted in 2014. A 7-mile segment of Bernards Creek, 5.8 miles of Gillie Creek, and 1.8 miles of No Name Creek were all added to the 303(d) list in 2004. Falling Creek initially had 3.8 miles added to the 303(d) list in 2002, which in 2004 were separated into a 3.1-mile riverine segment and a lower estuarine segment. The estuarine segment of Falling Creek was delisted in 2006 while the riverine segment remained on the 303(d) list for bacteria impairments until it was delisted in 2014.

Consequently, DEQ developed a TMDL with bacteria loading limits for the James River watershed and tributaries. The EPA approved the TMDL on November 4, 2010. The SWCB approved the TMDL on June 29, 2012. VDOT's MS4 Program was assigned a portion of the MS4 WLAs for bacteria in the CUA of the James River watershed. A map depicting the James River and Tributaries (City of Richmond) TMDL watershed is shown in Figure VIII.1.

The James River and Tributaries, City of Richmond TMDL uses aggregated WLAs for permitted MS4s in the watershed that includes VDOT's MS4, as well as the MS4s serving the City of Richmond, Chesterfield County, Henrico County, and John Tyler Community College. There are also MS4 permits for Defense Supply Center – Richmond and Hunter Holmes McGuire VA Hospital in the watershed, but these permitted areas were given separate WLAs in the TMDL. The TMDL directs that the WLAs for MS4 permits may be addressed through the iterative implementation of programmatic BMPs. Therefore, VDOT's TMDL Action Plan for the James River and Tributaries, City of Richmond TMDL aims to reduce loads that existed at the time of the TMDL development to the MEP for bacteria by implementing programmatic BMPs.

Two of the tributaries to the James River in this TMDL watershed, Fourmile Creek and Tuckahoe Creek, were also listed on the 303(d) list in 1998 for violations to the bacteria standard. Separate sediment TMDLs were also developed by DEQ for the Fourmile Creek watershed and the Tuckahoe Creek watershed, both approved by the SWCB on July 31, 2008. VDOT's MS4 program was not mentioned in this TMDL.

VIIIB ASSESSMENT OF SIGNIFICANT SOURCES WITHIN VDOT'S REGULATED AREA IN TMDL WATERSHED

VIIIB.1 Roadways

There are several classes of roadways that VDOT either owns or operates in the CUA of the James River and Tributaries, City of Richmond watershed, including approximately eighty-nine miles of interstate and associated ramps, 124 miles of US highways, 242 miles of state highways, and 1,194 miles of secondary and local roadways. Roadway drainage networks may be a significant conduit for discharges of bacteria in a watershed, although the roadway itself is not expected to serve as a pollutant source and highway drainage is typically associated with lower levels of bacteria than urban runoff from other land use categories.

VIIIB.2 Facilities

In addition to the roadway network, VDOT operates twelve facilities in the study area: the Bon Air Area Headquarters, Chester Area Headquarters, Chesterfield Residency Complex, Central Office-Old/Main, Central Office-Old Hospital, Central Office-Annex, Fulton Warehouse, Powhite Parkway Storage Lot, Pocahontas Parkway Bridge (Route 895)-Special Facility, Fair Oaks Park & Ride, Gaskins Road Park & Ride, and Parham Road Park & Ride, shown in Figure VIII.2 and listed in Table VIII.1.

An assessment for sources of bacteria from the facilities was conducted. For the purposes of the assessment, a potential source of bacteria from the facility means a potential anthropogenic source of bacteria due to the presence of septic systems, active portable toilets, etc. The table below lists each facility and the results of the site assessment. Based on the assessment, none of the facilities are a significant source of bacteria. For facilities with SWPPPs, an annual assessment effort for TMDL POCs, including bacteria, will be conducted.

Table VIII.1: Facilities in the Study Area

Facility	Potential Source of Bacteria	Significant Source	SWPPP	Date of Last Assessment
Bon Air Area Headquarters	No	No	Yes	4/16/2015
Central Office-Annex	No	No	No	N/A *
Central Office-Old Hospital	No	No	No	N/A *
Central Office-Old Main	No	No	No	N/A *
Chester Area Headquarters (Includes Salt & Storage Areas)	Yes (septic system)	No	Yes	4/28/2015
Chesterfield Residency Complex	No	No	No	4/21/15

Facility	Potential Source of Bacteria	Significant Source	SWPPP	Date of Last Assessment
Fair Oaks Park & Ride	No	No	No	N/A *
Fulton Warehouse	No	No	No	N/A *
Gaskins Road Park & Ride	No	No	No	N/A *
Parham Road Park & Ride	No	No	No	N/A *
Pocahontas Parkway Bridge (Route 895)-Special Facility Storage Area	No	No	No	N/A *
Powhite Parkway Storage Lot	No	No	No	4/16/2015

* VDOT has assessed this type of facility in the past and has determined that it is not a significant source of bacteria.

VIIIB.3 Existing Structural BMPs

As of June 2018, there are ninety-six VDOT or VDOT associated structural BMPs (seventy-six extended detention basins, one retention basin, five dry detention basins, one level spreader, one bioretention filter, two bioswales, one grassed swale, three treebox filter, and six miscellaneous BMPs) and four BMPs under construction (four bioswales) in the watershed, shown in Figure VIII.3. There are no other VDOT facilities or structural BMPs in the watershed and VDOT's MS4 regulated area.

VIIIB.4 Regulated MS4 Outfalls

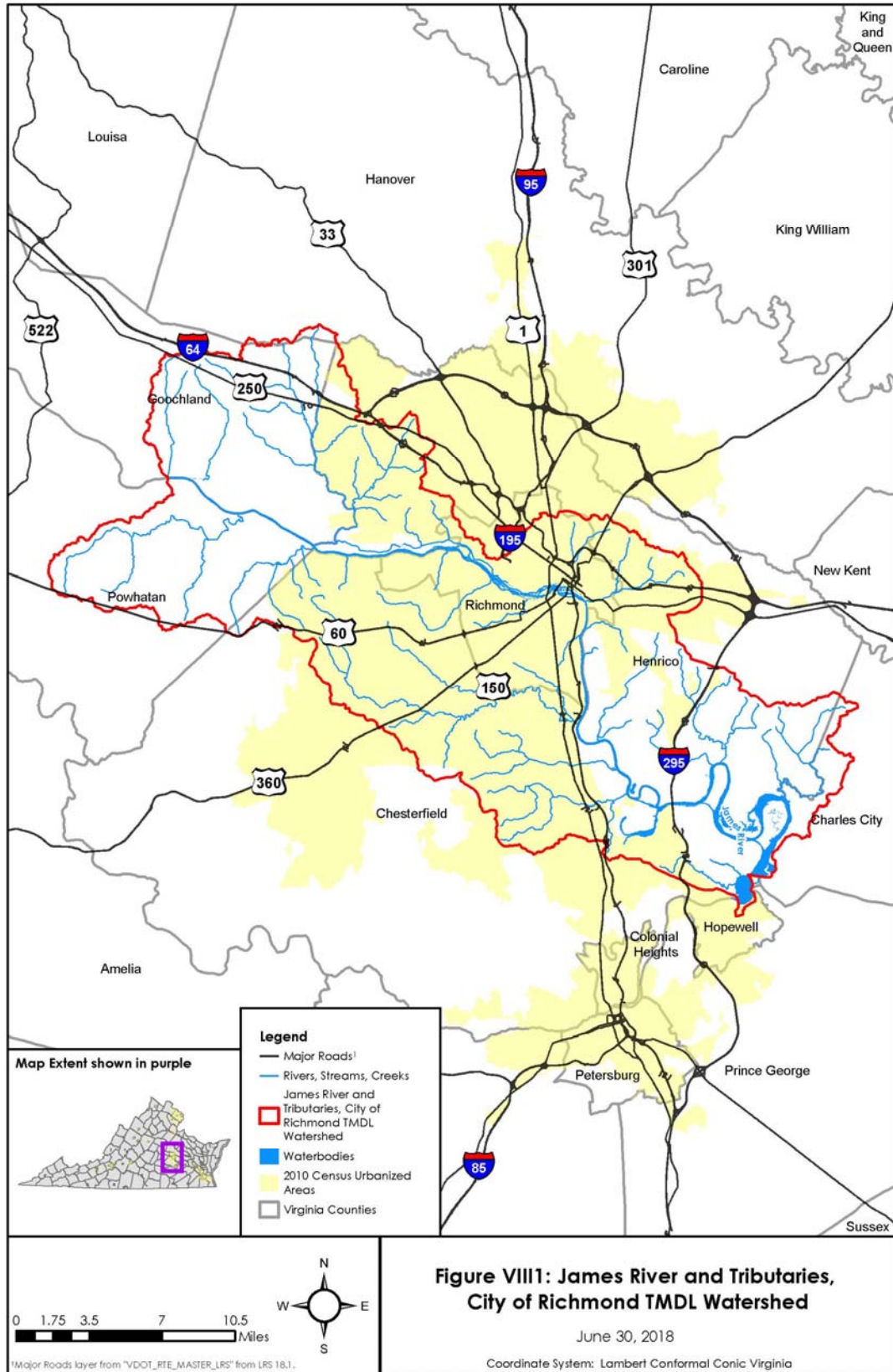
In this study area, VDOT has mapped 3,610 regulated outfalls and 300 points of discharge as of June 2018, shown in Figure VIII.4.

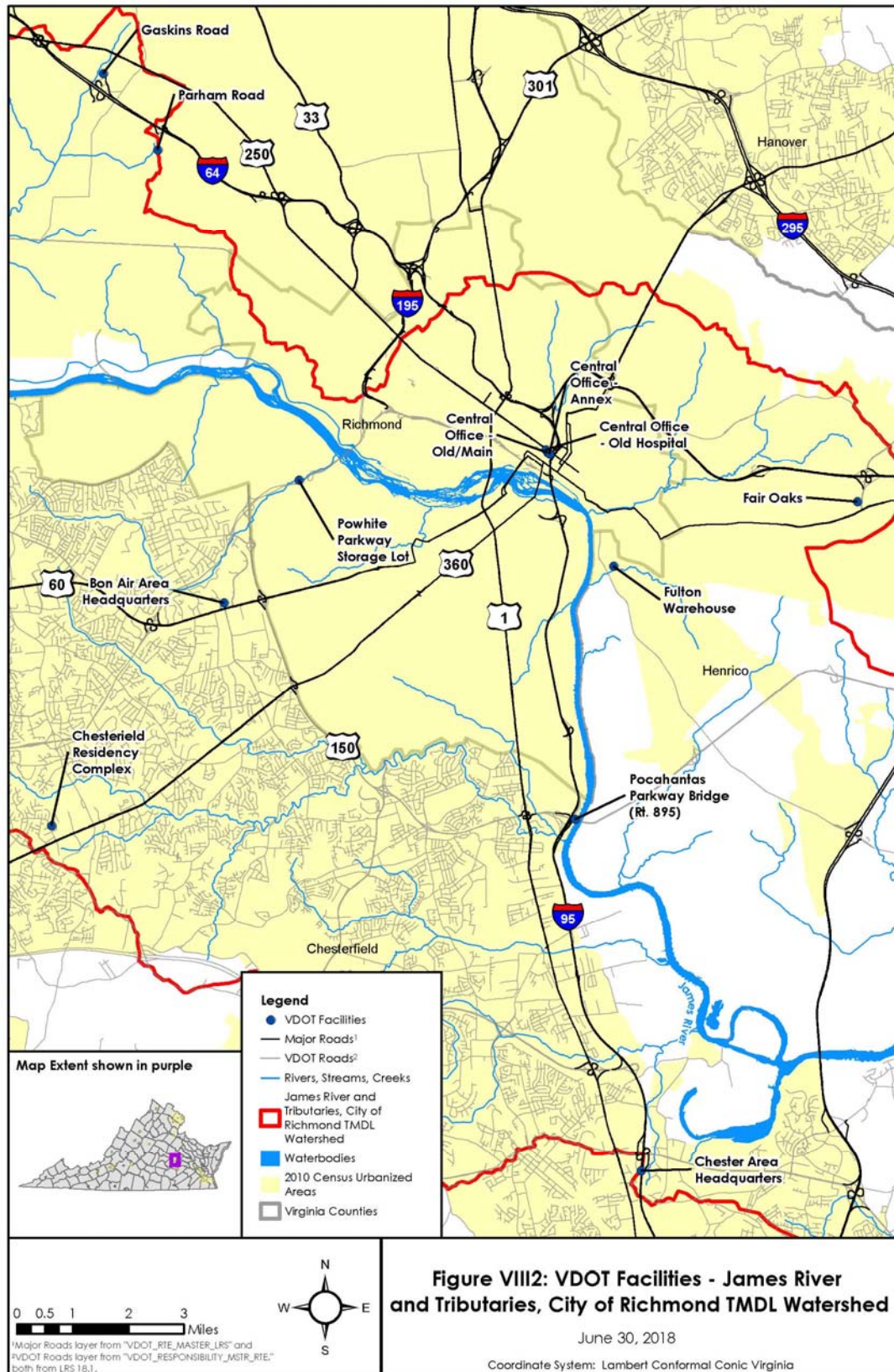
VIIIC BMPS

The TMDL for the James River and Tributaries, City of Richmond, assigned WLAs to MS4 permittees, including VDOT, in the various impairment watersheds.

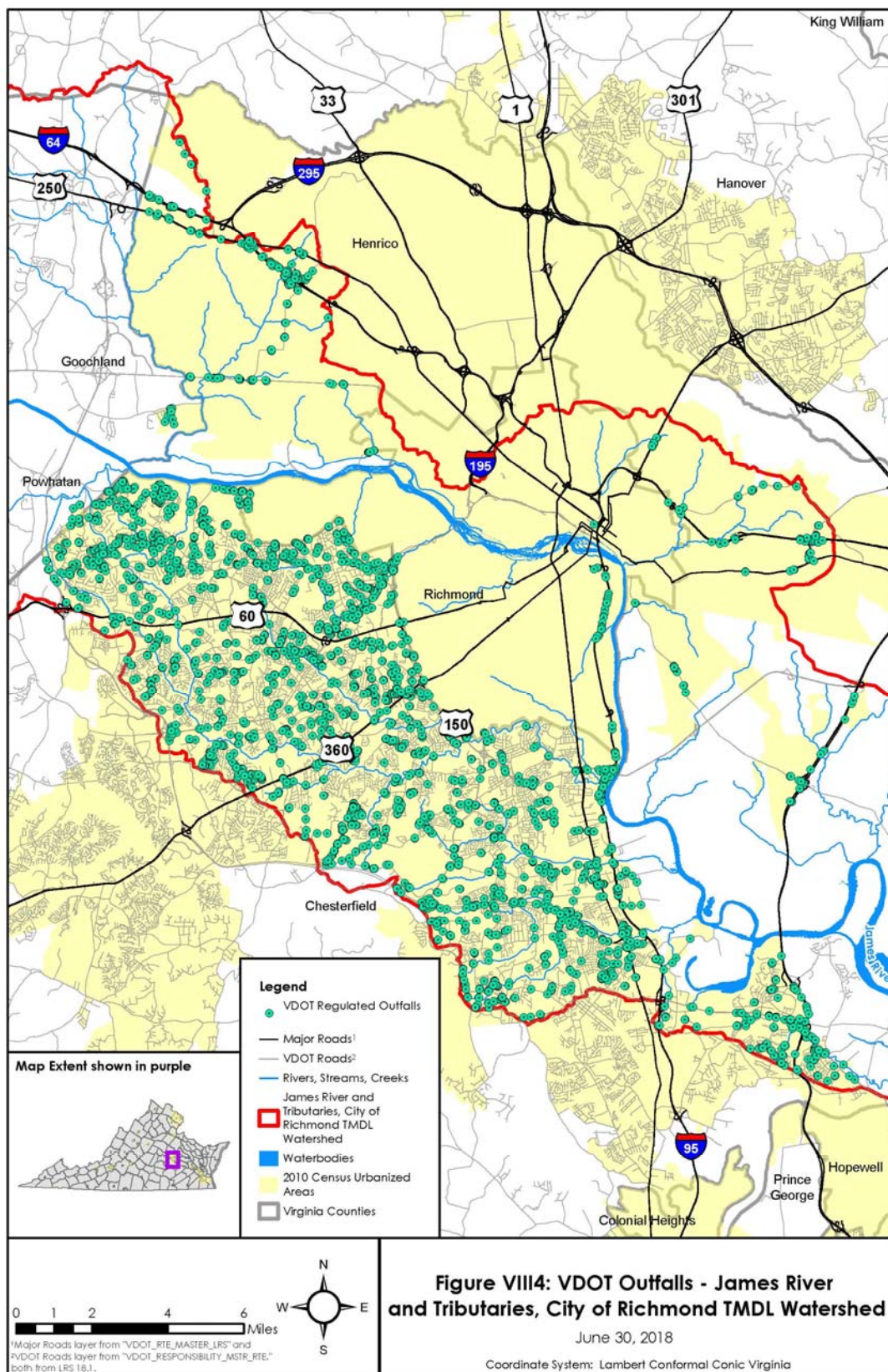
The Core BMPs in VDOT's MS4 Program which address bacteria are listed in Table 2 of the Action Plan. VDOT will continue practicing these programmatic BMPs to the MEP in accordance with the goals of the TMDL. The following actions summarize VDOT's plan to address the bacteria WLAs assigned in the James River and Tributaries, City of Richmond TMDL:

- Continued implementation of VDOT's MS4 Core BMPs.
- For facilities with SWPPPs, an annual assessment effort for TMDL POCs, including bacteria, will be conducted.









Appendix IX

Neabsco Creek Watershed

The information included in this appendix is specific to this watershed TMDL. Refer to the main sections of this Action Plan for additional information.

IXA	Background	IX.1
IXB	Assessment of Significant Sources Within VDOT's Regulated Area in TMDL Watershed .	IX.2
IXB.1	Roadways	IX.2
IXB.2	Facilities	IX.2
IXB.3	Existing Structural BMPs	IX.3
IXB.4	Regulated MS4 Outfalls	IX.3
IXC	BMPs	IX.4

IXA BACKGROUND

DEQ first placed the downstream 8.4 miles of Neabsco Creek on the biennial 303(d) list in 2002 due to violations of the state's fecal coliform bacteria standard for recreation.

Consequently, DEQ developed a TMDL with bacteria loading limits for the Neabsco Creek watershed. The EPA approved the TMDL on July 10, 2008. The SWCB approved the TMDL on April 28, 2009. VDOT's MS4 Program was assigned a portion of the MS4 WLA for bacteria in the CUA of the Neabsco Creek watershed. A map depicting the Neabsco Creek watershed is shown in Figure IX1.

The Neabsco Creek Watershed TMDL uses aggregated WLAs for permitted MS4s in the watershed that includes VDOT's MS4, as well as the MS4s serving Prince William County, Prince William County Public Schools, and Northern Virginia Community College. The TMDL directs that the WLA be achieved with a "Percent Reduction Method" that compares water quality data to applicable water quality criteria. It identifies a percent reduction of the current bacteria loads required to meet water quality standards for the watershed.

The TMDL for Neabsco Creek Watershed assigned a 75% reduction for bacteria to MS4 permittees included in the aggregated WLA. Therefore, VDOT's TMDL Action Plan for the Neabsco Creek Watershed TMDL aims to reduce loads that existed at the time of the TMDL development to the MEP for bacteria by implementing programmatic BMPs.

Other Related Local TMDLs

Neabsco Creek is also listed on the 303(d) list for violations to the benthic standard due to PCBs. A separate TMDL was developed by DEQ for the Potomac River watershed, including Neabsco Creek Watershed, and approved by the SWCB on April 11, 2008. The Neabsco Creek Watershed TMDL also assigned VDOT's MS4 Program a WLA for PCBs. VDOT addresses this WLA in its Action for Local PCB TMDLs.

IXBASSESSMENT OF SIGNIFICANT SOURCES WITHIN VDOT'S REGULATED AREA IN TMDL WATERSHED

IXB.1 Roadways

There are several classes of roadways that VDOT either owns or operates in the CUA of the Neabsco Creek watershed, including approximately eight miles of interstate and associated ramps, five miles of state highways, and 173 miles of secondary and local roadways. Roadway drainage networks may be a significant conduit for discharges of bacteria in a watershed, although the roadway itself is not expected to serve as a pollutant source and highway drainage is typically associated with lower levels of bacteria than urban runoff from other land use categories.

IXB.2 Facilities

In addition to the roadway network, VDOT operates ten facilities in the study area: the Dale City Car Only Rest Area Complex North, the Dale City Car Only Rest Area Complex South, Dale City Park & Ride, Lindendale Park & Ride, Hillendale Park & Ride, Cloverdale Subdivision Park & Ride, Cherry Drive Park & Ride, Kirkdale Drive Park & Ride, PRTC Transit Center, and Princedale Park & Ride as shown in Figure IX2 and listed in Table IX1.

Table IX1: Facilities in the Study Area

Facility	Potential Source of Bacteria	Significant Source	SWPPP	Date of Last Assessment
Cloverdale Subdivision Park & Ride	No	No	No	N/A *
Cherrydale Drive Park & Ride	No	No	No	N/A *
Dale City Car Only Rest Area Complex North	No	No	No	N/A *
Dale City Car Only Rest Area Complex South	No	No	No	N/A *
Dale City Park & Ride	No	No	No	N/A *
Hillendale Park & Ride	No	No	No	N/A *
Kirkdale Drive Park & Ride	No	No	No	N/A *
Lindendale Park & Ride	No	No	No	N/A *

Facility	Potential Source of Bacteria	Significant Source	SWPPP	Date of Last Assessment
Princedale Park & Ride	No	No	No	N/A *
PRTC Transit Center	No	No	No	N/A *

* VDOT has assessed this type of facility in the past and has determined that it is not a significant source of bacteria.

IXB.3 Existing Structural BMPs

As of June 2018, there are seventeen VDOT or VDOT associated structural BMPs (twelve extended detention basins and five treebox filters) in the watershed, shown in Figure IX3. There are no other VDOT facilities or structural BMPs in the watershed and VDOT's MS4 regulated area.

IXB.4 Regulated MS4 Outfalls

In this study area, VDOT has mapped 240 regulated outfalls and twelve points of discharge as of June 2018, shown in Figure IX4.

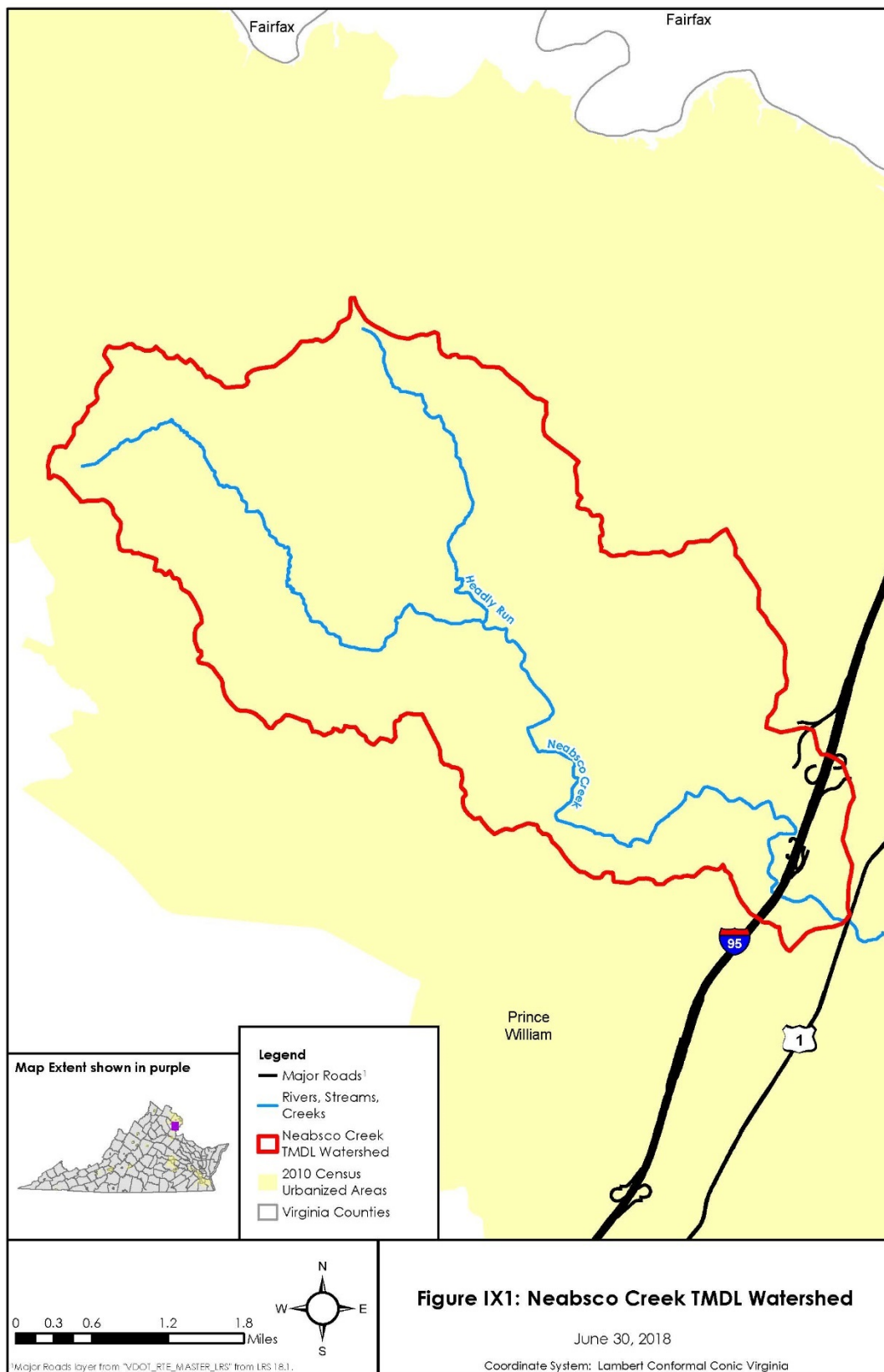
IXC BMPS

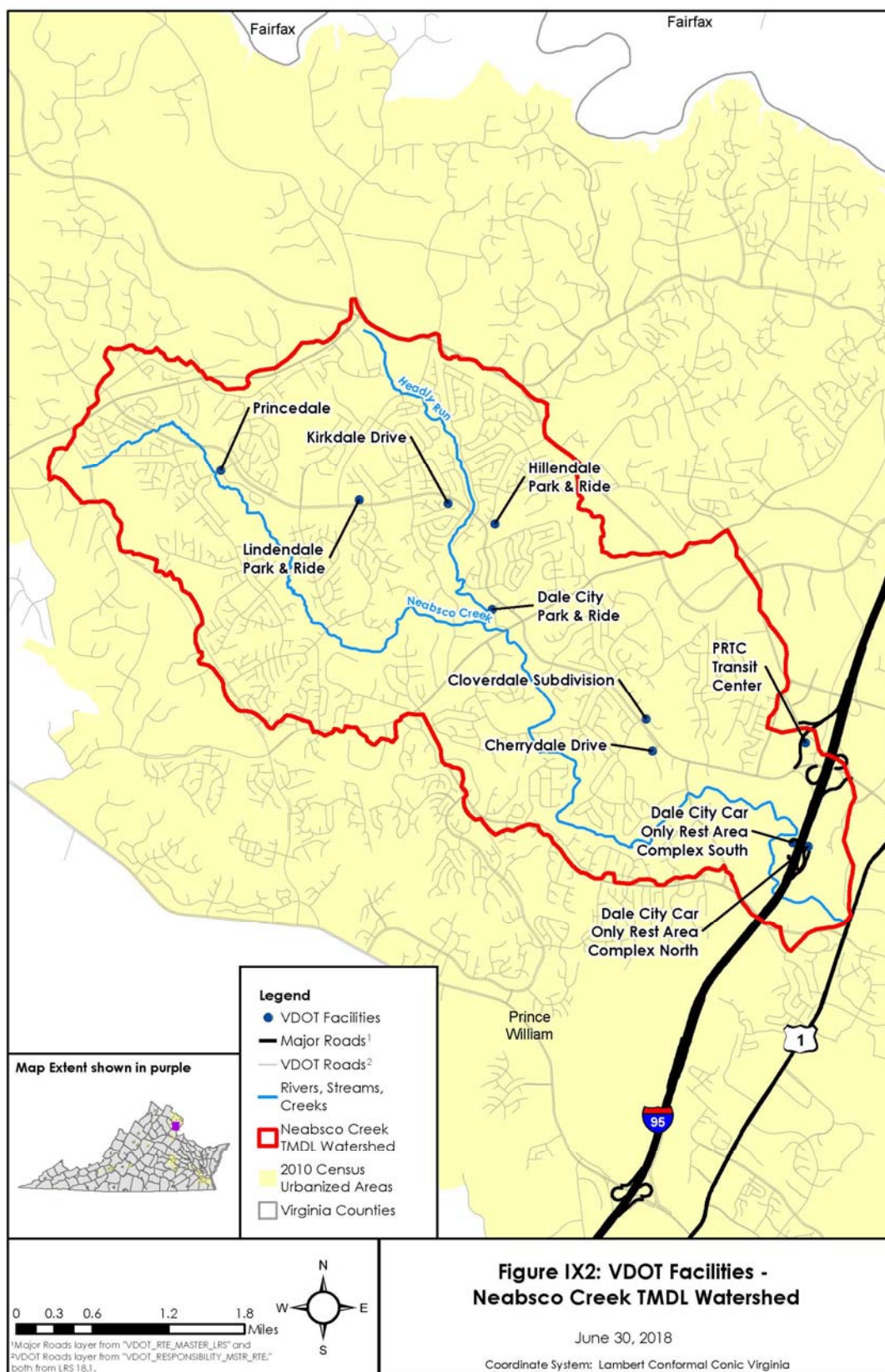
The TMDL for Neabsco Creek Watershed assigned WLAs to MS4 permittees, including VDOT, in the various impaired watersheds. These WLAs are to be addressed through the iterative implementation of programmatic BMPs.

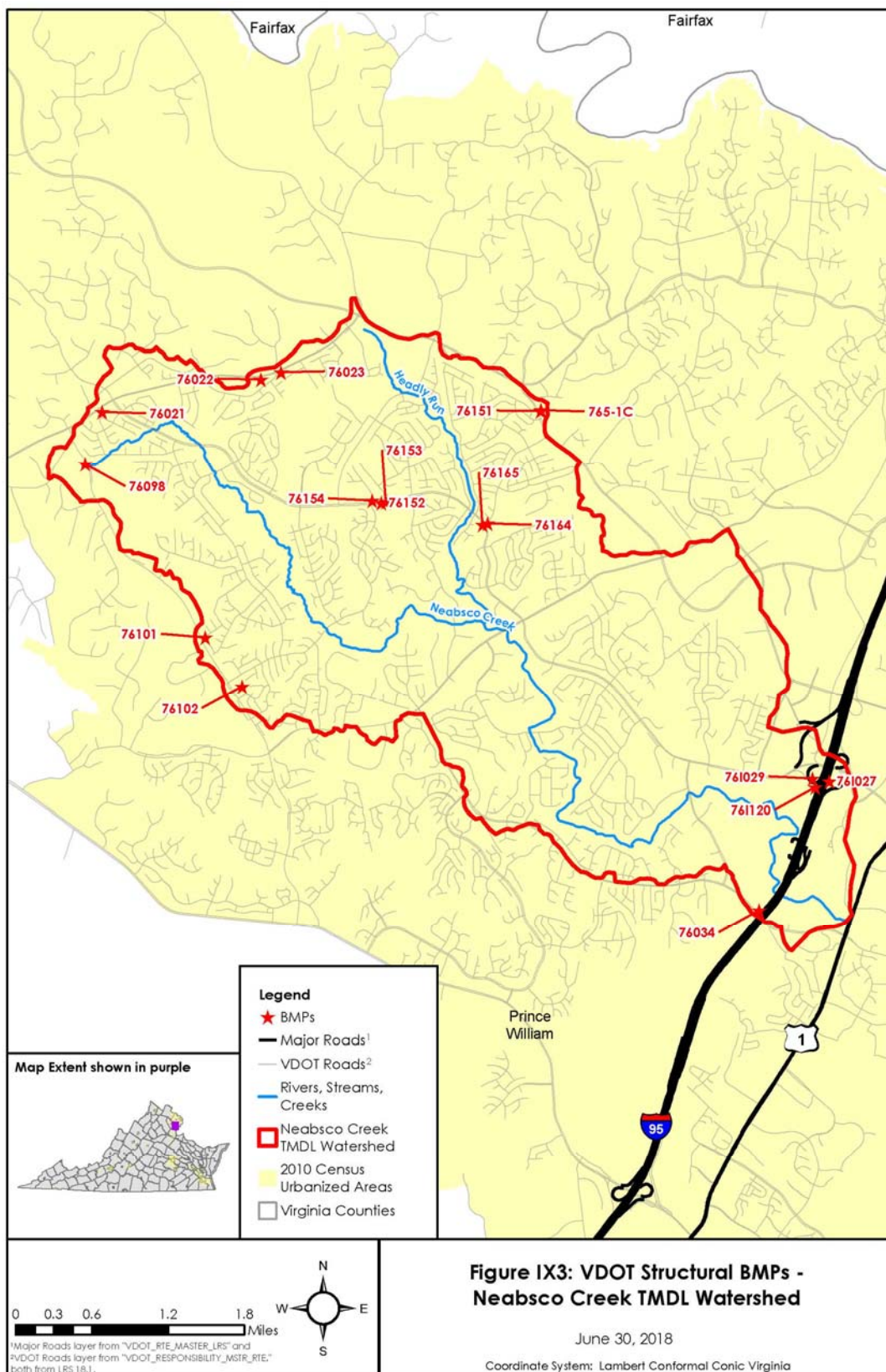
The Core BMPs in VDOT's MS4 Program which address bacteria are listed in Table 2 of this Action Plan. The quantified reduction of bacteria from these non-structural practices is not presented because bacteria pollutant removal efficiencies are not readily available; however, VDOT will continue practicing these programmatic BMPs to the MEP in accordance with the goals of the TMDL.

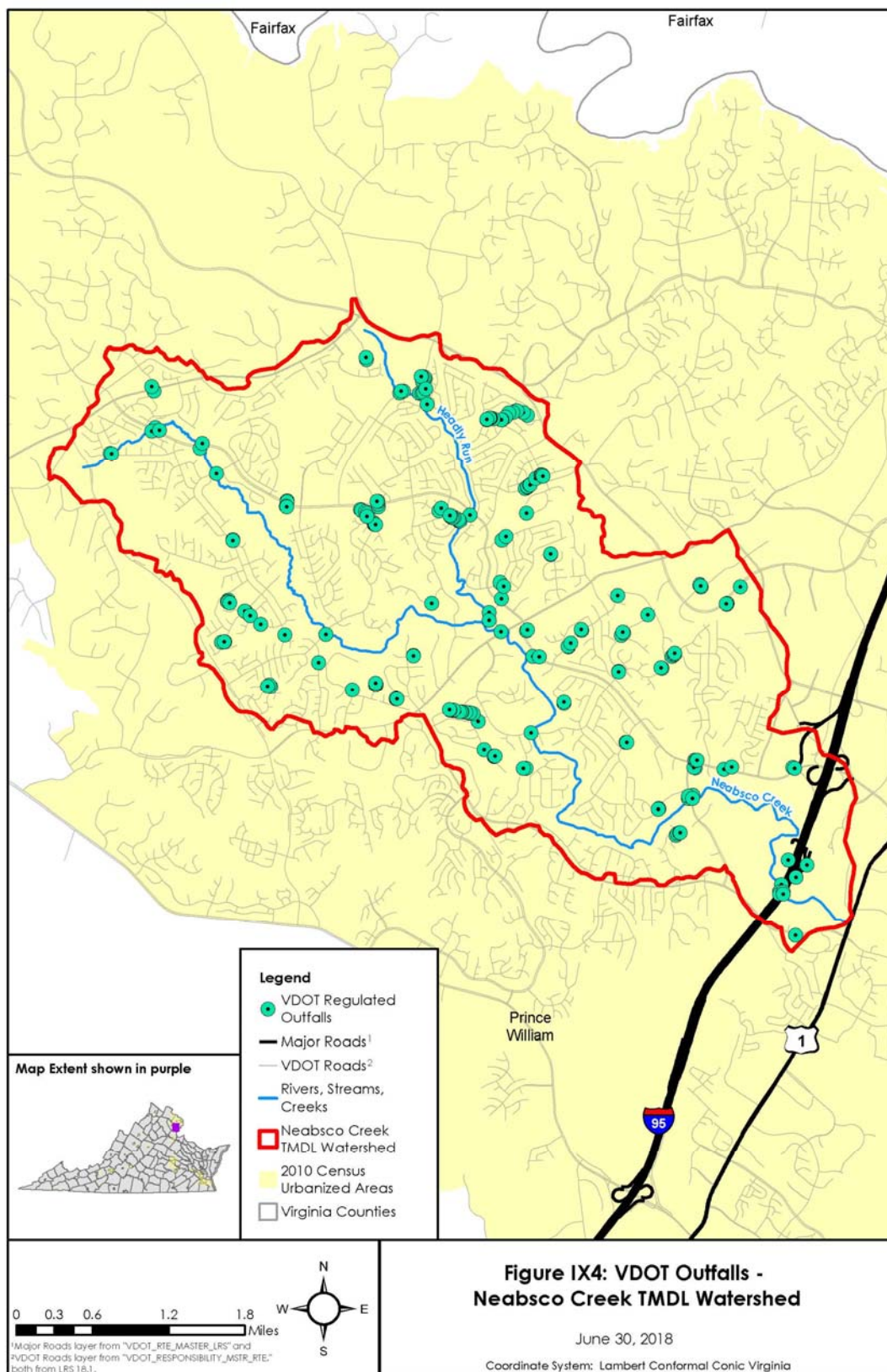
The bacteria WLAs assigned in the Neabsco Creek Watershed TMDL will be achieved through the continued implementation of VDOT's MS4 Core BMPs to the MEP, as discussed in Section 5.0. The following actions summarize VDOT's plan to address the bacteria WLAs assigned in the Neabsco Creek Watershed TMDL:

- Continued implementation of VDOT's MS4 Core BMPs.
- For facilities with SWPPPs, an annual assessment effort for TMDL POCs, including bacteria, will be conducted.









Appendix X

Occoquan River Watershed

The information included in this appendix is specific to this watershed TMDL. Refer to the main sections of this Action Plan for additional information.

XA	Background	X.1
XB	Assessment of Significant Sources Within VDOT's Regulated Area in TMDL Watershed ..	X.3
	XB.1 Roadways.....	X.3
	XB.2 Facilities	X.3
	XB.3 Existing Structural BMPs.....	X.4
	XB.4 Regulated MS4 Outfalls.....	X.5
XC	BMPs	X.6

XA BACKGROUND

DEQ first placed a 1.6-mile segment of the Occoquan River on the biennial 303(d) list in 2004 due to violations of the state's fecal coliform bacteria standard for recreation. An additional 3.4 miles of the Occoquan River immediately downstream was added to the 303(d) list in 2006, bringing the total impairment length to 5 miles. Several tributaries to the Occoquan River have also been listed as impaired for violations to the bacteria standard for recreation. In 2002, a 7.59-mile segment of Kettle Run was added to the 303(d) list for violations of the state's bacteria standard for recreation. Two segments of Broad Run, one 1.51 miles long and the other 7.26 miles long, were added to the 303(d) list in 2002, followed by a third, 1.06-mile segment in 2004, all for bacteria impairments. In 2004, a 4.92-mile segment of Popes Head Creek was added to the 303(d) list for bacteria impairments. A 2.34-mile segment of South Run was added to the 303(d) list in 2004 for bacteria impairments, delisted in 2010, and relisted again in 2012. A 4.80-mile segment of Bull Run was added to the 303(d) list for bacteria impairments in 2004, was delisted in 2010. A 3.03-mile segment of Little Bull Run was listed for bacteria impairments on the 2004 303(d) list but was delisted in 2006.

Consequently, DEQ developed a TMDL with bacteria loading limits for the Occoquan River Watershed. The EPA approved the TMDL on November 15, 2006. The SWCB approved the TMDL on July 31, 2008. VDOT's MS4 Program was assigned a portion of the MS4 WLAs for bacteria in the CUA of the Occoquan River watershed. A map depicting the Occoquan River watershed is shown in Figure X1.

The Occoquan River Watershed TMDL uses aggregated WLAs for permitted MS4s in the watershed that includes VDOT's MS4, as well as the MS4s serving the City of Manassas, City of Manassas Park, City of Fairfax, Fairfax County, Fairfax County Public Schools, Loudon County, Prince William County, Prince William County Schools, and NOVA Manassas Campus. Fauquier County and the Town of Clifton are permitted MS4s in the watershed that were not recognized during the time of TMDL development. The TMDL directs that the WLAs be achieved with a "Percent Reduction Method" that compares water quality data to applicable water quality criteria. It identifies a percent reduction of the current bacteria loads required to meet water quality standards for the watershed.

The TMDL for the Occoquan River Watershed assigned an aggregate MS4 WLA for each impaired segment. Aggregate bacteria WLA reductions assigned in the TMDL are: 94% for the Occoquan River, 89% for Bull Run, 94% for Popes Head Creek, and 81% for the downstream segment of Broad Run. Therefore, VDOT's TMDL Action Plan for the Occoquan River Watershed TMDL aims to reduce loads that existed at the time of the TMDL development to the MEP for bacteria by implementing programmatic BMPs.

Other Related Local TMDLs

DEQ initially placed a 4.8-mile segment of Bull Run to the Occoquan River was also listed on the biennial 303(d) list in 1994, and then again in 1998 for violations of the benthic standard. DEQ developed a sediment TMDL for Bull Run which was approved by the SWCB on June 27, 2007. A

4.92-mile segment of Popes Head Creek to the Occoquan River was also listed on the 303(d) list in 1998 for violations of the benthic standard. DEQ developed a sediment TMDL for Popes Head Creek which was approved by the SWCB on June 27, 2007. Both of these TMDLs are included in VDOT's MS4 program in the assigned sediment WLA. As such, VDOT prepared two separate TMDL Action Plans for these watersheds to address the requirements of the special conditions in VDOT's MS4 permit.

Two tributaries to the Occoquan River watershed, Cedar Run and Licking Creek, were included in a Bacteria TMDL developed by DEQ and approved by the SWCB on December 2, 2004. These two tributaries are not included in the study area of the Occoquan River Watershed TMDL for which this Action Plan was developed. VDOT's MS4 program was not mentioned in this TMDL.

XB ASSESSMENT OF SIGNIFICANT SOURCES WITHIN VDOT'S REGULATED AREA IN TMDL WATERSHED

XB.1 Roadways

There are several classes of roadways that VDOT either owns or operates in the CUA of the Occoquan River watershed, including approximately thirty-seven miles of interstate and associated ramps, fifty-six miles of US highways, 158 miles of state highways, and 1,117 miles of secondary and local roadways. Roadway drainage networks may be a significant conduit for discharges of bacteria in a watershed, although the roadway itself is not expected to serve as a pollutant source and highway drainage is typically associated with lower levels of bacteria than urban runoff from other land use categories.

XB.2 Facilities

In addition to the roadway network, VDOT operates twenty facilities in the study area: the Oakwood Drive, McConnell Public Safety and Transportation Operations Center, NOVA District Facility, Manassas Rest Area/Welcome Center Complex, Manassas Rest Area Complex East, Fairfax Area Headquarters Complex Residency Complex/District Office, Manassas Residency / Area Headquarters Complex, Manassas Area Headquarters Storage Area, NOVA Maintenance Facility, and the West Parcel Area Headquarters (R/W), Gainesville Area Headquarters, Lake Ridge Area Headquarters, and Chantilly Area Headquarters, as well as the Cushing Road (also referred to as the Manassas Commuter Lot), Centreville United Methodist Church, and the Park and Rides at Stringfellow Road, Lake Ridge, Manassas Mall, Fair Ridge Drive, and Portsmouth Road, shown in Figure X2 and listed Table X1.

An assessment for sources of bacteria from the facilities was conducted. For the purposes of the assessment, a potential source of bacteria from the facility means a potential anthropogenic source of bacteria due to the presence of septic systems, active portable toilets, etc. The table below lists each facility and the results of the site assessment. Based on the assessment, none of the facilities are a significant source of bacteria. For facilities with, an annual assessment effort for TMDL POCs, including bacteria, will be conducted.

Table X1: Facilities in the Study Area

Facility	Potential Source of Bacteria	Significant Source	SWPPP	Date of Last Assessment
Centreville United Methodist Church Park & Ride	No	No	No	N/A *
Chantilly Area Headquarters	No	No	Yes	5/4/2015
Cushing Road Park & Ride	No	No	No	2/25/2016

Facility	Potential Source of Bacteria	Significant Source	SWPPP	Date of Last Assessment
Fairfax Area Headquarters Complex	No	No	No	N/A *
FairRidge Drive Park & Ride	No	No	No	N/A *
Gainesville Area Headquarters	No	No	Yes	5/6/2015
Lake Ridge Area Headquarters	Yes (portable toilet)	No	Yes	5/5/2015
Lake Ridge Park & Ride	No	No	No	N/A *
Manassas Area Headquarters Storage Area	No	No	Yes	4/29/2014
Manassas Mall Park & Ride	No	No	No	N/A *
Manassas Residency / Area Headquarters Complex	No	No	Yes	5/6/2015
Manassas Rest Area / Welcome Center Complex	No	No	No	N/A *
Manassas Rest Area Complex East	No	No	No	N/A *
McConnell Public Safety and Transportation Operations Center	No	No	No	N/A *
NOVA District Facility	No	No	No	N/A *
NOVA Maintenance Facility	No	No	Yes	5/6/2015
Oakwood Drive Park & Ride	No	No	No	N/A *
Portsmouth Road Park & Ride	No	No	No	N/A *
Stringfellow Road Park & Ride	No	No	No	N/A *
West Parcel Area Headquarters (R/W)	No	No	Yes	5/7/2015

* VDOT has assessed this type of facility in the past and has determined that it is not a significant source of bacteria.

XB.3 Existing Structural BMPs

As of June 2018, there are one hundred and ninety-one VDOT or VDOT associated structural BMPs (146 extended detention basins, nine dry detention basins, five retention basins, one basin, six bioretention filters, two grassed swales, three treebox filters, nine miscellaneous filtration types, and ten miscellaneous hydrodynamic BMPs) and three BMPs under construction (one

extended detention basin, one dry detention basin, and one dry swale) in the watershed, shown in Figure X3. There are no other VDOT facilities or structural BMPs in the watershed and VDOT's MS4 regulated area.

XB.4 Regulated MS4 Outfalls

In this study area, VDOT has mapped 1,869 regulated outfalls and 439 points of discharge as June 2018, shown in Figure X4.

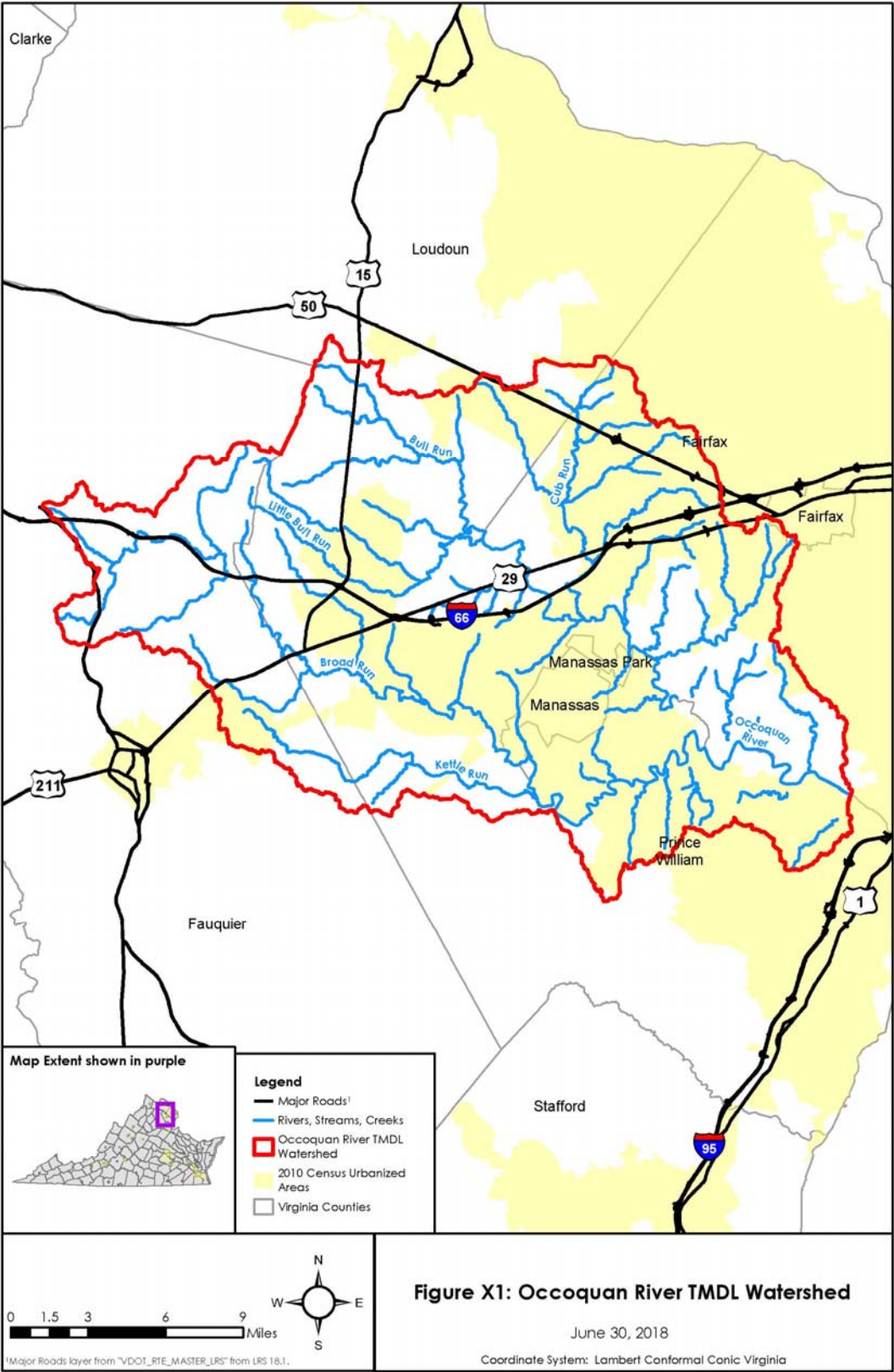
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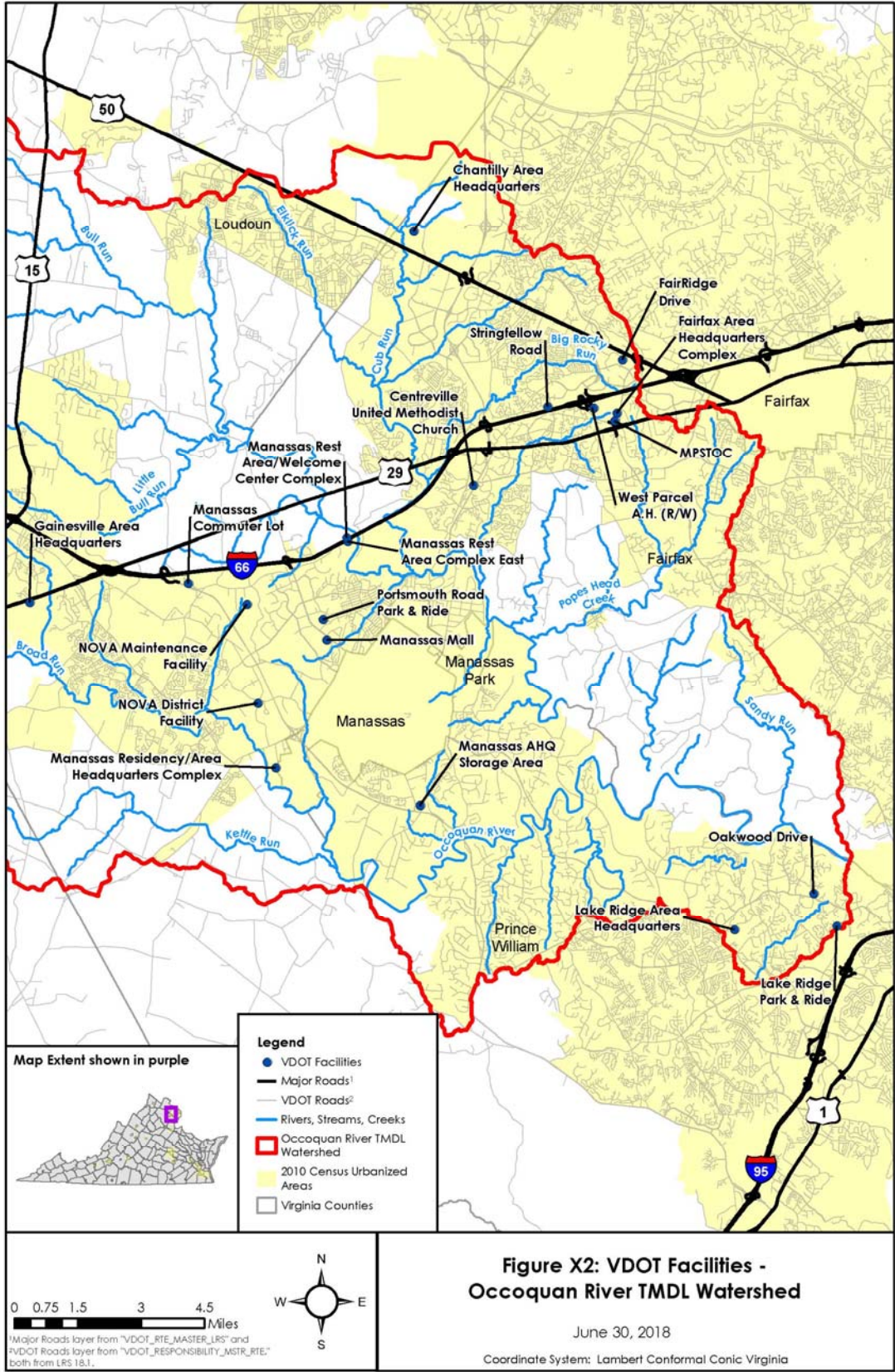
XC BMPS

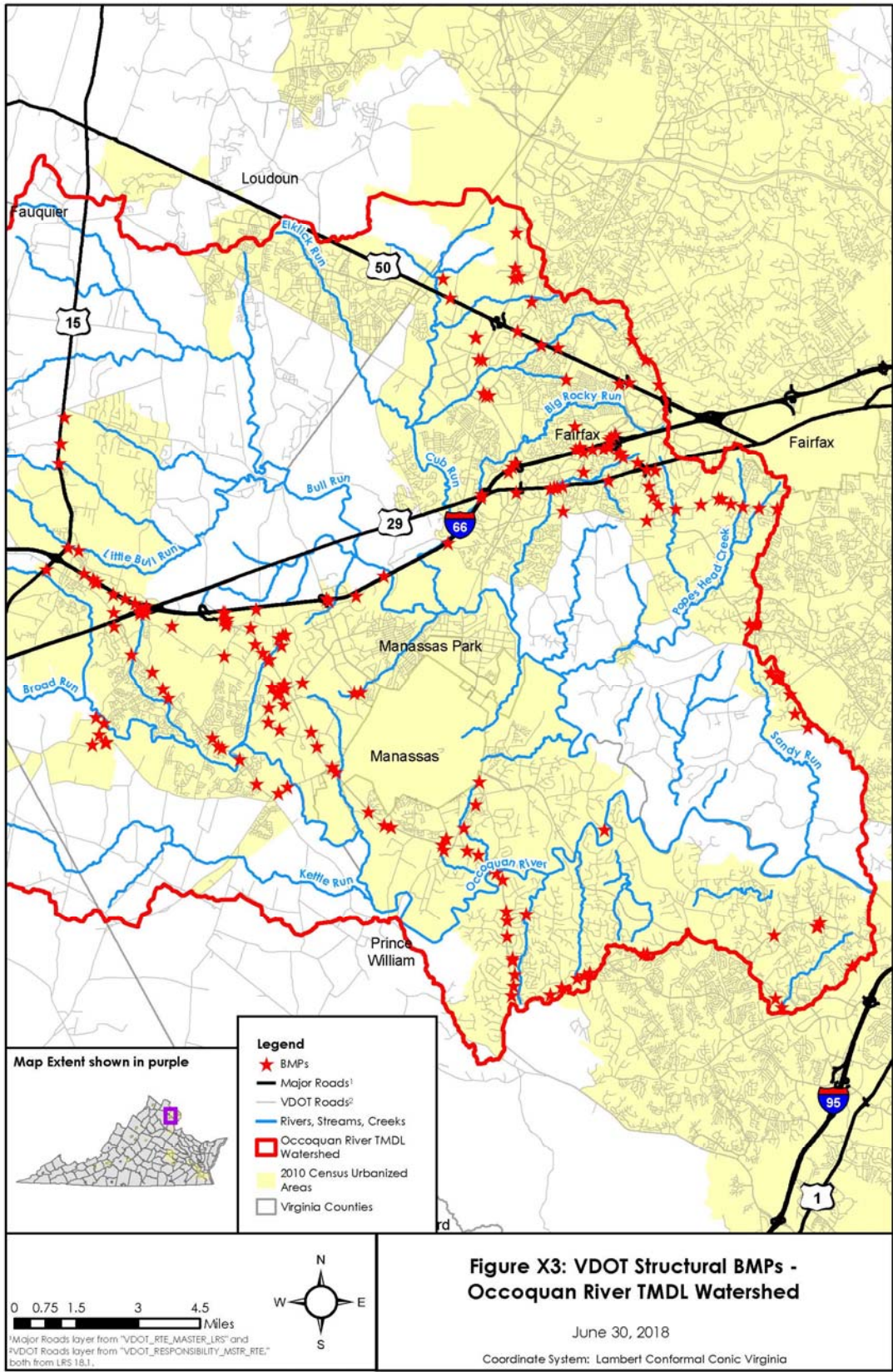
The TMDL for Occoquan River Watershed assigned WLAs to MS4 permittees, including VDOT, in the various impaired watersheds.

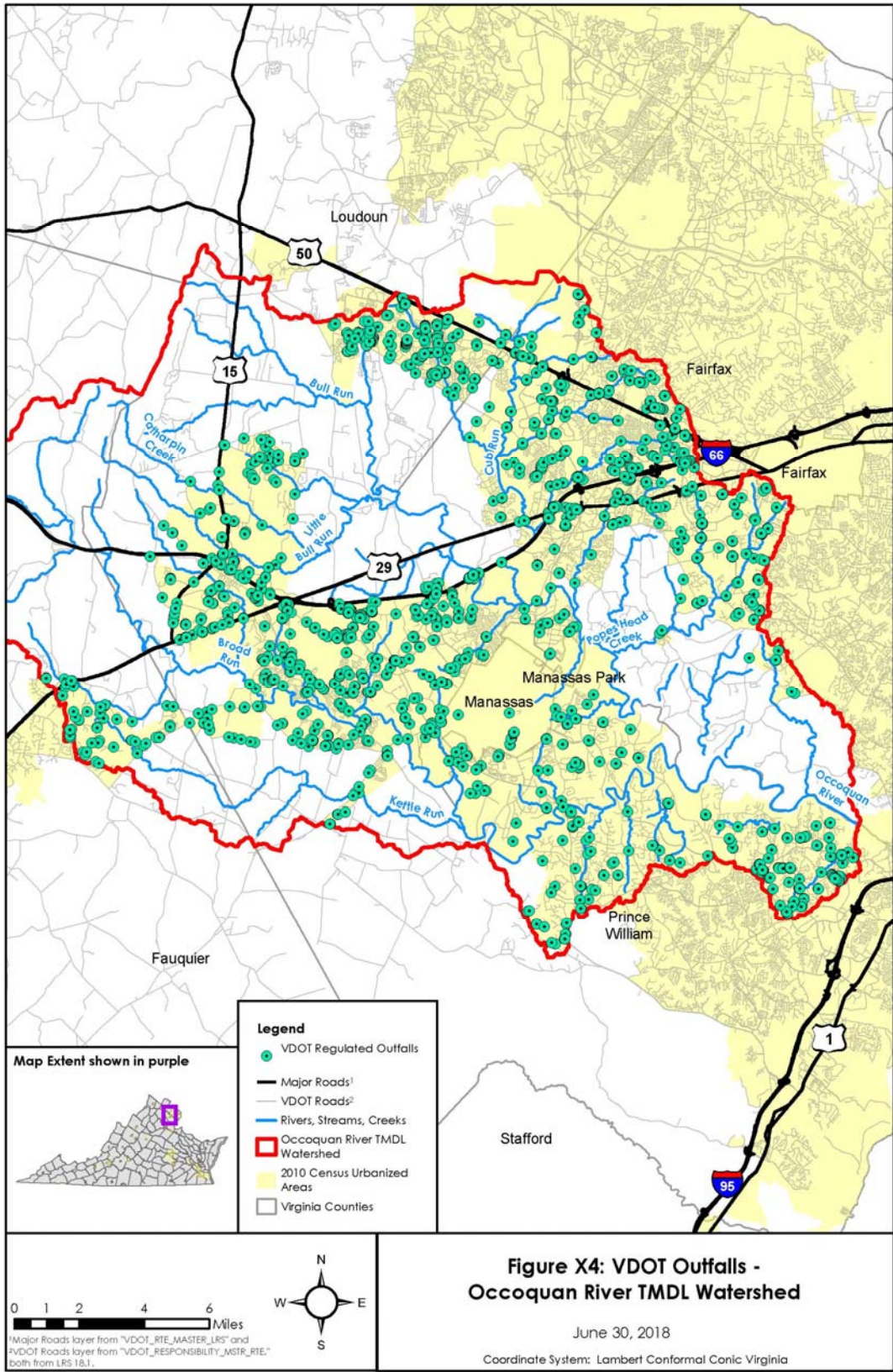
The Core BMPs in VDOT's MS4 Program which address bacteria are listed in Table 2 of this Action Plan. VDOT will continue practicing these programmatic BMPs to the MEP in accordance with the goals of the TMDL. The following actions summarize VDOT's plan to address the bacteria WLAs assigned in the Occoquan River Watershed TMDL:

- Continued implementation of VDOT's MS4 Core BMPs.
- For facilities with SWPPPs, an annual assessment effort for TMDL POCs, including bacteria, will be conducted.









Appendix XI

Opequon and Abrams Creek Watersheds

The information included in this appendix is specific to this watershed TMDL. Refer to the main sections of this Action Plan for additional information.

XIA	Background	XI.1
XIB	Assessment of Significant Sources Within VDOT's Regulated Area in TMDL Watershed .	XI.2
XIB.1	Roadways	XI.2
XIB.2	Facilities	XI.2
XIB.3	Existing Structural BMPs	XI.2
XIB.4	Regulated MS4 Outfalls	XI.3
XIC	BMPs	XI.4

XI A BACKGROUND

DEQ first placed Abrams Creek, Upper Opequon Creek, and Lower Opequon Creek on the biennial 303(d) list in 1998 due to violations of the state's fecal coliform bacteria standard for recreation. Abrams Creek and Lower Opequon Creek have also been listed on the 303(d) list in 1998 due to benthic impairments. Consequently, DEQ developed a TMDL with bacteria loading limits for Abrams Creek and Lower Opequon Creek watershed. The EPA approved the TMDL on February 18, 2004. The SWCB approved the TMDL on December 20, 2005. DEQ also developed a TMDL with bacteria loading limits for Abrams Creek, Upper Opequon Creek, and Lower Opequon Creek. The SWCB approved the TMDL on December 20, 2005. VDOT's MS4 Program was assigned a portion of the MS4 WLAs for bacteria in the CUA of the Opequon watershed. A map depicting the Opequon and Abrams Creek Watersheds TMDL watershed is shown in Figure XI.1.

The Opequon and Abrams Creek Watersheds Bacteria TMDL use an aggregate WLA for permitted MS4s in the watershed that includes VDOT's MS4, as well as the City of Winchester MS4. The approved Bacteria TMDL recognizes that the potential pollutant sources from the three stream segments and associated watersheds are likely different. The Abrams Creek subwatershed has a potential pollutant source from urban activities, and the Upper and Lower Opequon watersheds have a potential pollutant source from agricultural activities. Therefore, the Bacteria TMDL establishes different reduction approaches for each of the three watersheds. In the case of the Abrams Creek watershed, the two permitted MS4s are assigned a combined WLA for bacteria. In the case of the Upper and Lower Opequon watersheds, MS4s are not assigned a bacteria WLA.

The TMDL directs that the WLA be achieved with a "Percent Reduction Method" that compares water quality data to applicable water quality criteria. It identifies a percent reduction of the current bacteria and sediment loads required to meet water quality standards for the watersheds. MS4 permittees in the TMDL watershed, including VDOT's MS4, were assigned a 96% reduction for bacteria in the Abrams Creek subwatershed. Therefore, VDOT's TMDL Action Plan for the Opequon and Abrams Creek Watersheds Bacteria and Sediment TMDLs aims to reduce loads that existed at the time of the TMDL development to the MEP for bacteria in Abrams Creek by implementing programmatic BMPs.

XIBASSESSMENT OF SIGNIFICANT SOURCES WITHIN VDOT’S REGULATED AREA IN TMDL WATERSHED

XIB.1 Roadways

There are several classes of roadways that VDOT either owns or operates in the CUA of the Opequon and Abrams Creek Watersheds, including approximately twenty-six miles of interstate and associated ramps, thirty-five miles of US highways, eighteen miles of state highways, and 165 miles of secondary and local roadways. Roadway drainage networks may be a significant conduit for discharges of bacteria in a watershed, although the roadway itself is not expected to serve as a pollutant source and highway drainage is typically associated with lower levels of bacteria than urban runoff from other land use categories.

XIB.2 Facilities

In addition to the roadway network, VDOT operates two facilities in the study area, Winchester Area Headquarters and Clearbrook & Winchester Rest Area / Welcome Center shown in Figure XI2 and listed in Table XI1. The Stephens City Area Headquarters is located just south of the study area but does not discharge into the study area.

An assessment for sources of bacteria from the facilities was conducted. For the purposes of the assessment, a potential source of bacteria from the facility means a potential anthropogenic source of bacteria due to the presence of septic systems, active portable toilets, etc. The table below lists each facility and the results of the site assessment. Based on the assessment, none of the facilities are a significant source of bacteria. For facilities with SWPPPs, an annual assessment effort for TMDL POCs, including bacteria, will be conducted.

Table XI1: Facilities in the Study Area

Facility	Potential Source of Bacteria	Significant Source	SWPPP	Date of Last Assessment
Clearbrook & Winchester Rest Area / Welcome Center	No	No	No	NA*
Winchester Area Headquarters	Yes (septic system)	No	Yes	3/29/2017

* VDOT has assessed this type of facility in the past and has determined that it is not a significant source of bacteria.

XIB.3 Existing Structural BMPs

As of June 2018, there are twenty-three VDOT or VDOT associated structural BMPs (fifteen extended detention basins, three manufactured treatment devices, one bioswale, two dry detentions, and two retention basins) in the watershed, shown in Figure XI3. There are no other VDOT facilities or structural BMPs in the watershed and VDOT’s MS4 regulated area.

XIB.4 Regulated MS4 Outfalls

In this study area, VDOT has mapped 361 regulated outfalls and twenty-five points of discharge as June 2018, shown in Figure XI4.

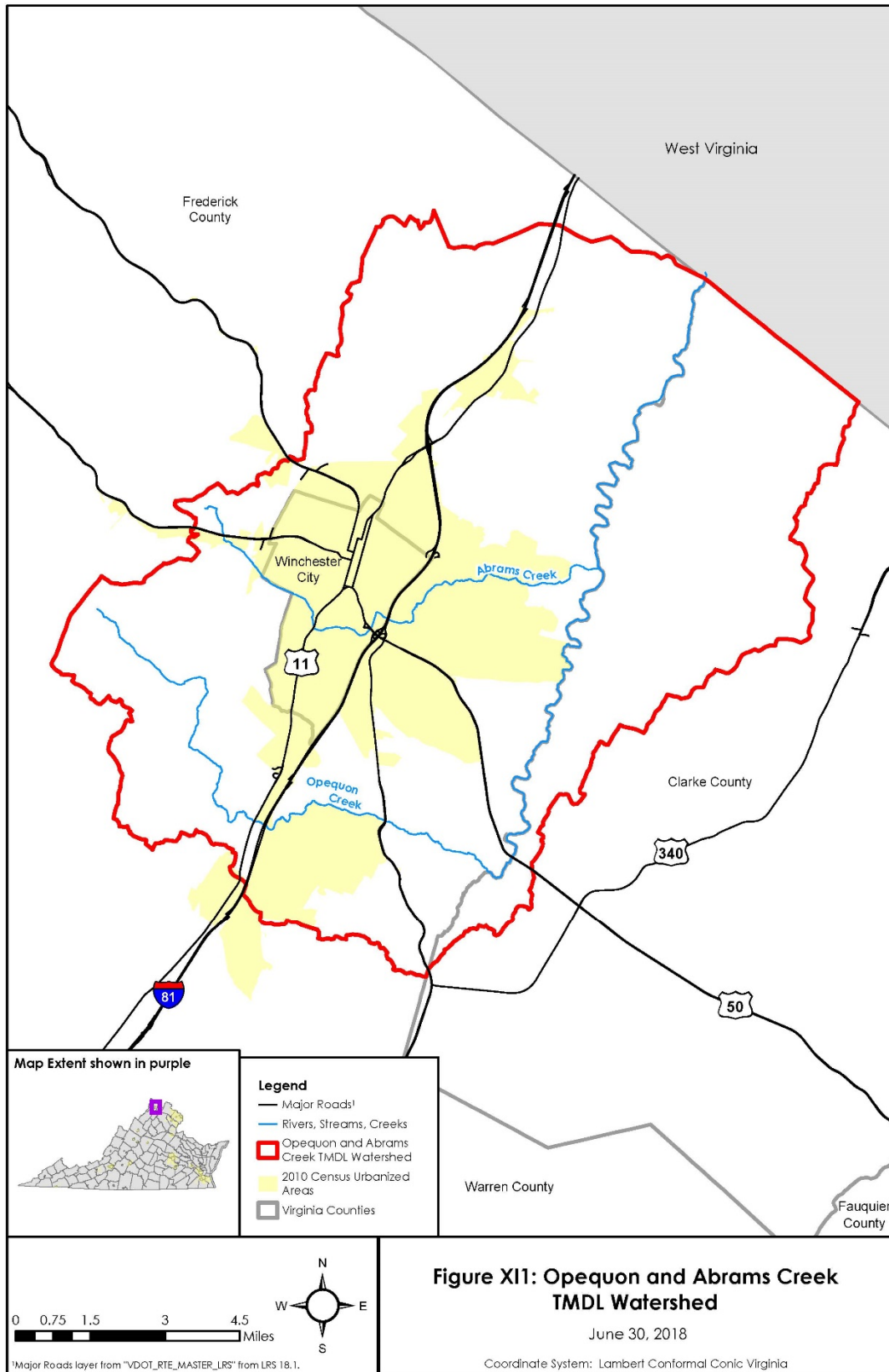
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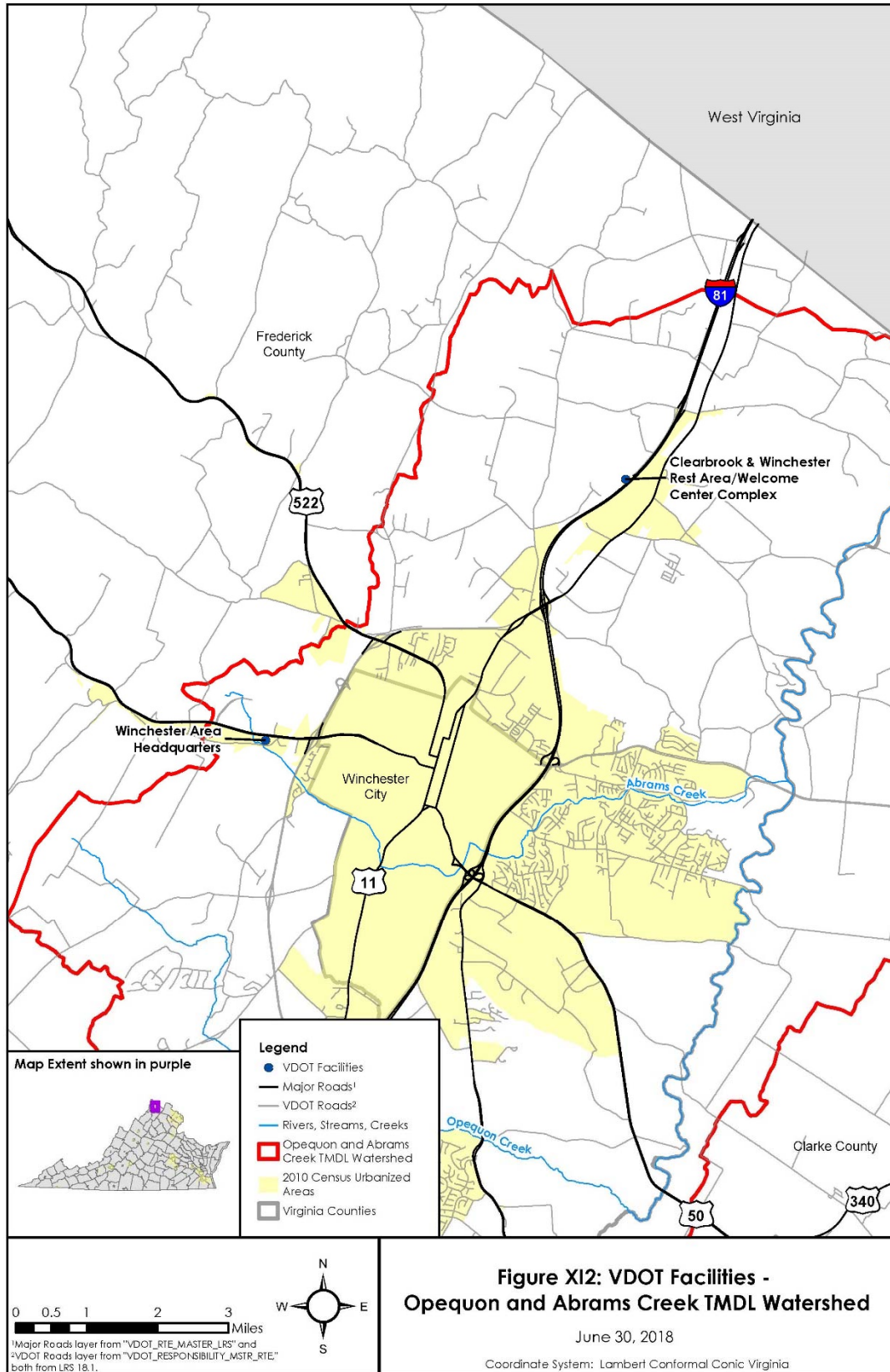
XIC BMPS

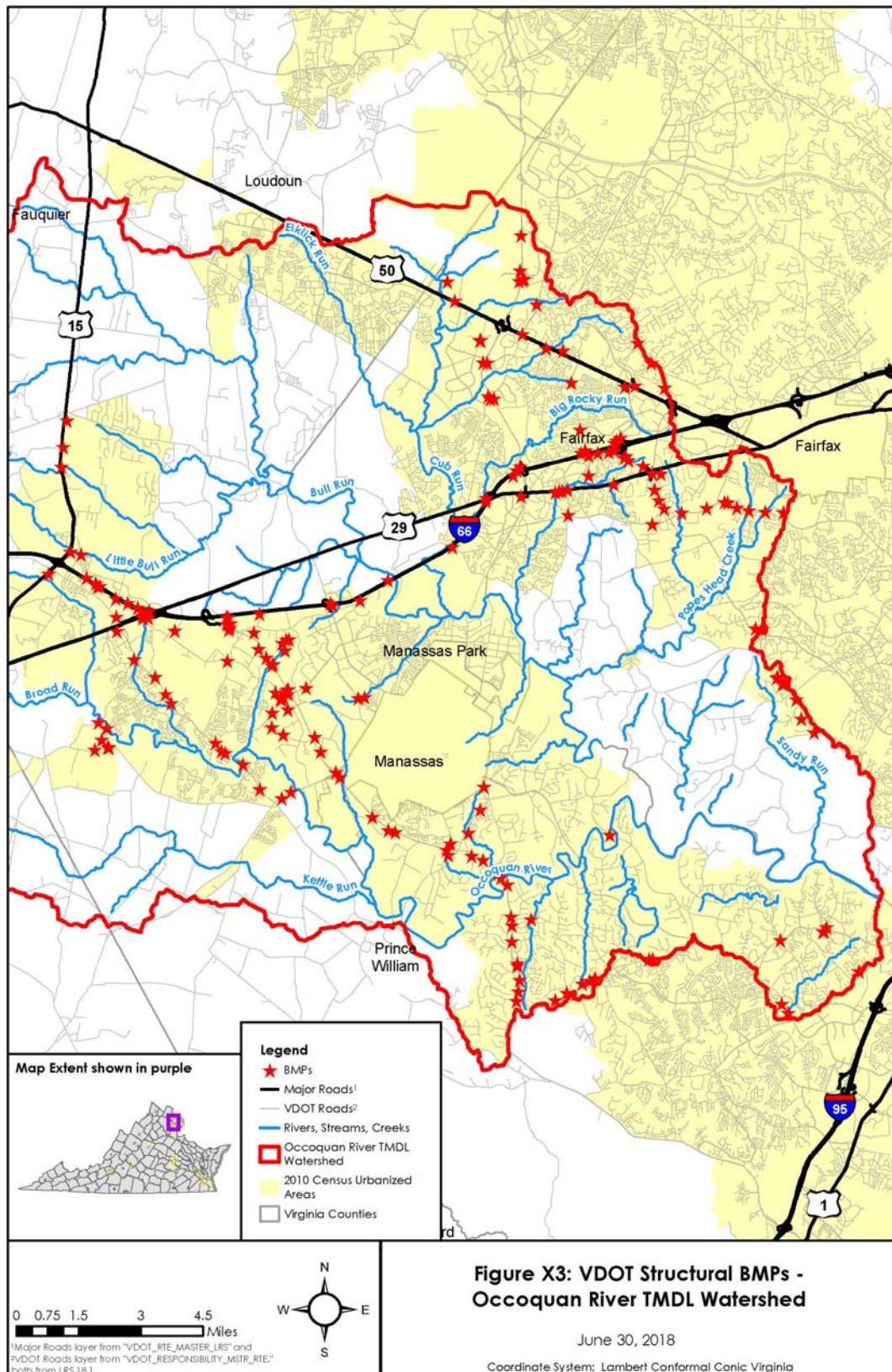
The TMDLs for the Opequon and Abrams Creek Watersheds assigned a WLA to MS4 permittees, including VDOT, in the Abrams Creek watershed.

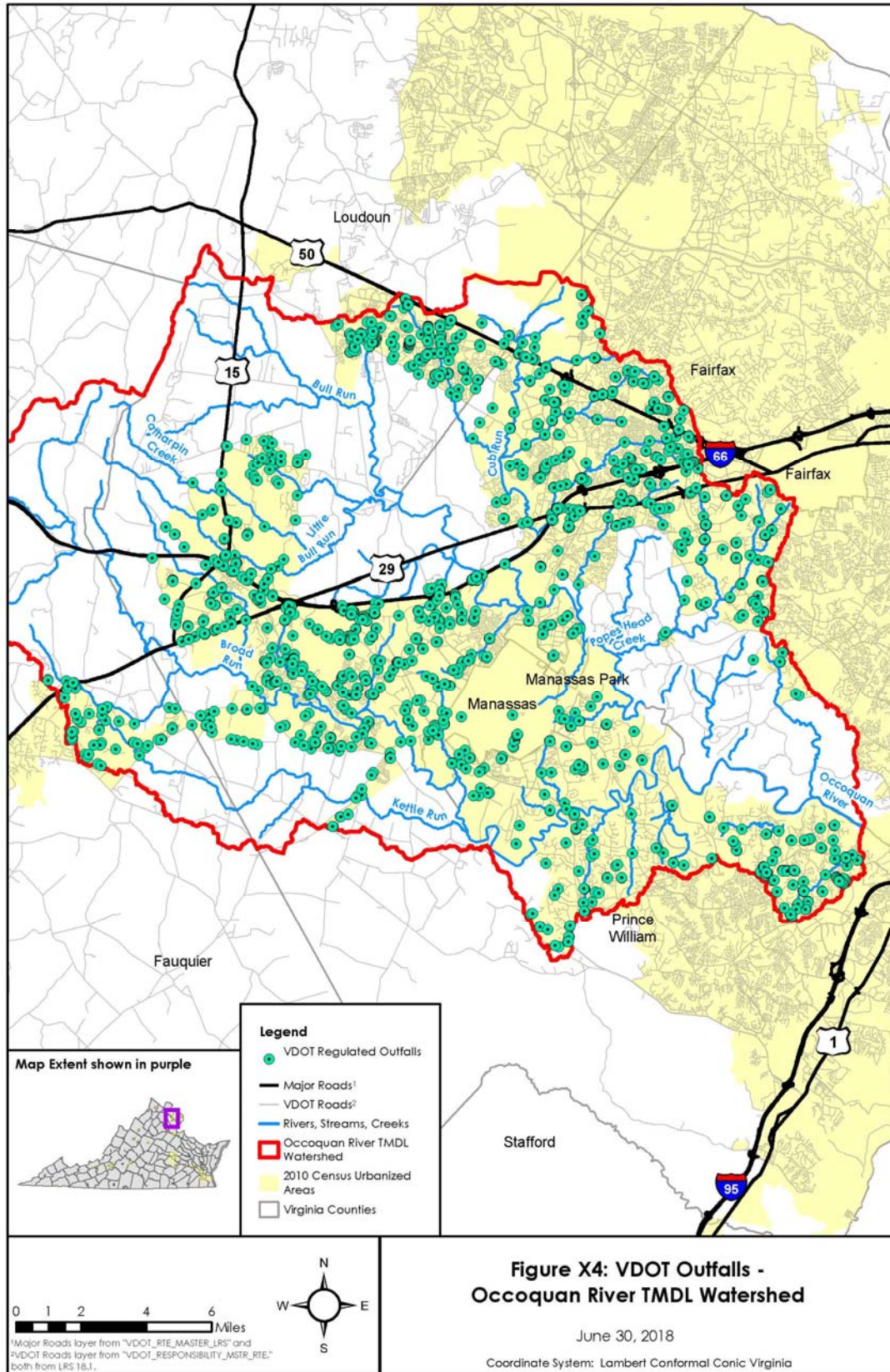
The Core BMPs in VDOT's MS4 Program which address bacteria are listed in Table 2 of this Action Plan. VDOT will continue practicing these programmatic BMPs to the MEP in accordance with the goals of the TMDL. The following actions summarize VDOT's plan to address the bacteria WLA assigned in the Opequon and Abrams Creek Watersheds TMDL:

- Continued implementation of VDOT's MS4 Core BMPs.
- For facilities with SWPPPs, an annual assessment effort for TMDL POCs, including bacteria, will be conducted.









Appendix XII

Rivanna River Watershed

The information included in this appendix is specific to this watershed TMDL. Refer to the main sections of this Action Plan for additional information.

XIIA	Background	XII.1
XIIB	Assessment of Significant Sources Within VDOT's Regulated Area in TMDL Watershed	XII.2
	XII.1 Roadways.....	XII.2
	XII.2 Facilities.....	XII.2
	XII.3 Existing Structural BMPs.....	XII.2
	XII.4 Regulated MS4 Outfalls.....	XII.3
XIIC	BMPs	XII.4

XIIA BACKGROUND

DEQ first placed the lower 5.92-mile segment of the Rivanna River on the biennial 303(d) list in 1996 due to benthic impairments. The upper 5.28-mile segment of the Rivanna River was included on the 303(d) list in 2006 for benthic impairments.

Consequently, DEQ developed a benthic TMDL with bacteria loading limits for the Rivanna River watershed. The EPA approved the TMDL on January 05, 2009. The SWCB approved the TMDL on April 28, 2009. VDOT's MS4 program was assigned two individual WLAs for sediment discharges to the Rivanna River, one for their regulated area in the Charlottesville urbanized area and a second for their regulated area in the Albemarle County urbanized area. A map depicting the Rivanna River Watershed TMDL is shown in Figure XII.1.

The upper 5.28-mile segment of the Rivanna River was also listed in the 303(d) list for violations of benthic standard. Bacteria impairments led to the addition of a 4.01-mile segment of Meadow Creek to the 303(d) list in 2002 and a 4.80-mile segment of Beaver Creek to the 303(d) list in 2004. In 2006, 10.38 miles of the North Fork Rivanna River, 10.44 miles of Mechums River, and 25.96 miles of Preddy Creek and its tributaries were all added to the 303(d) list for bacteria impairments. Beaver Creek was delisted in 2010. DEQ developed a Bacteria TMDL with bacterial loading limits for the Rivanna River Watershed. The SWCB approved the Bacteria TMDL on April 28, 2009. VDOT's MS4 was assigned a WLA for bacteria.

The TMDLs direct that the WLAs be achieved with a "Percent Reduction Method" that compares water quality data to applicable water quality criteria. It identifies a percent reduction of the current bacteria and sediment loads required to meet water quality standards for the watershed.

The TMDLs for the Rivanna River Watersheds assigned a 95% reduction for bacteria to MS4 permittees included in the aggregated WLAs. Therefore, VDOT's TMDL Action Plan for the Rivanna River Watershed TMDLs aims to reduce loads that existed at the time of the TMDL development to the MEP for bacteria by implementing programmatic BMPs.

XIIB ASSESSMENT OF SIGNIFICANT SOURCES WITHIN VDOT'S REGULATED AREA IN TMDL WATERSHED

XII.1 Roadways

There are several classes of roadways that VDOT either owns or operates in the CUA of the Rivanna River watershed, including approximately nine miles of interstate and associated ramps, forty-eight miles of US highways, thirteen miles of state highways, and 172 miles of secondary and local roadways. Roadway drainage networks may be a significant conduit for discharges of bacteria in a watershed, although the roadway itself is not expected to serve as a pollutant source and highway drainage is typically associated with lower levels of bacteria than urban runoff from other land use categories.

XII.2 Facilities

In addition to the roadway network, VDOT operates three facilities in the study area: Pantops Shopping Center Park & Ride, Azalea Park Park & Ride, and Darden Towe Memorial Park Park & Ride shown in Figure XII2 and listed in Table XII1.

An assessment for sources of bacteria from the facilities was conducted. For the purposes of the assessment, a potential source of bacteria from the facility means a potential anthropogenic source of bacteria due to the presence of septic systems, active portable toilets, etc. The table below lists each facility and the results of the site assessment. Based on the assessment, none of the facilities are a significant source of bacteria. For facilities with SWPPPs, an annual assessment effort for TMDL POCs, including bacteria, will be conducted.

Table XII1: Facilities in the Study Area

Facility	Potential Source of Bacteria	Significant Source	SWPPP	Date of Last Assessment
Azalea Park Park & Ride	No	No	No	N/A *
Darden Towe Memorial Park Park & Ride	No	No	No	N/A *
Pantops Shopping Center Park & Ride	No	No	No	N/A *

* VDOT has assessed this type of facility in the past and has determined that it is not a significant source of bacteria.

XII.3 Existing Structural BMPs

As of June 2018, there are nineteen VDOT or VDOT associated structural BMPs (eight extended detention basins, one dry detention basin, three bioretention filters, one pipe detention, one level spreader, two basins, two underground detention storages, and 399 regulated outfalls and

forty-eight points of discharge as of June 2018, shown in Figure XII.3. There are no other VDOT facilities or structural BMPs in the watershed and VDOT's MS4 regulated area.

XII.4 Regulated MS4 Outfalls

In this study area, VDOT has mapped 399 regulated outfalls and 48 points of discharge as of June 2018, shown in Figure XII.4.

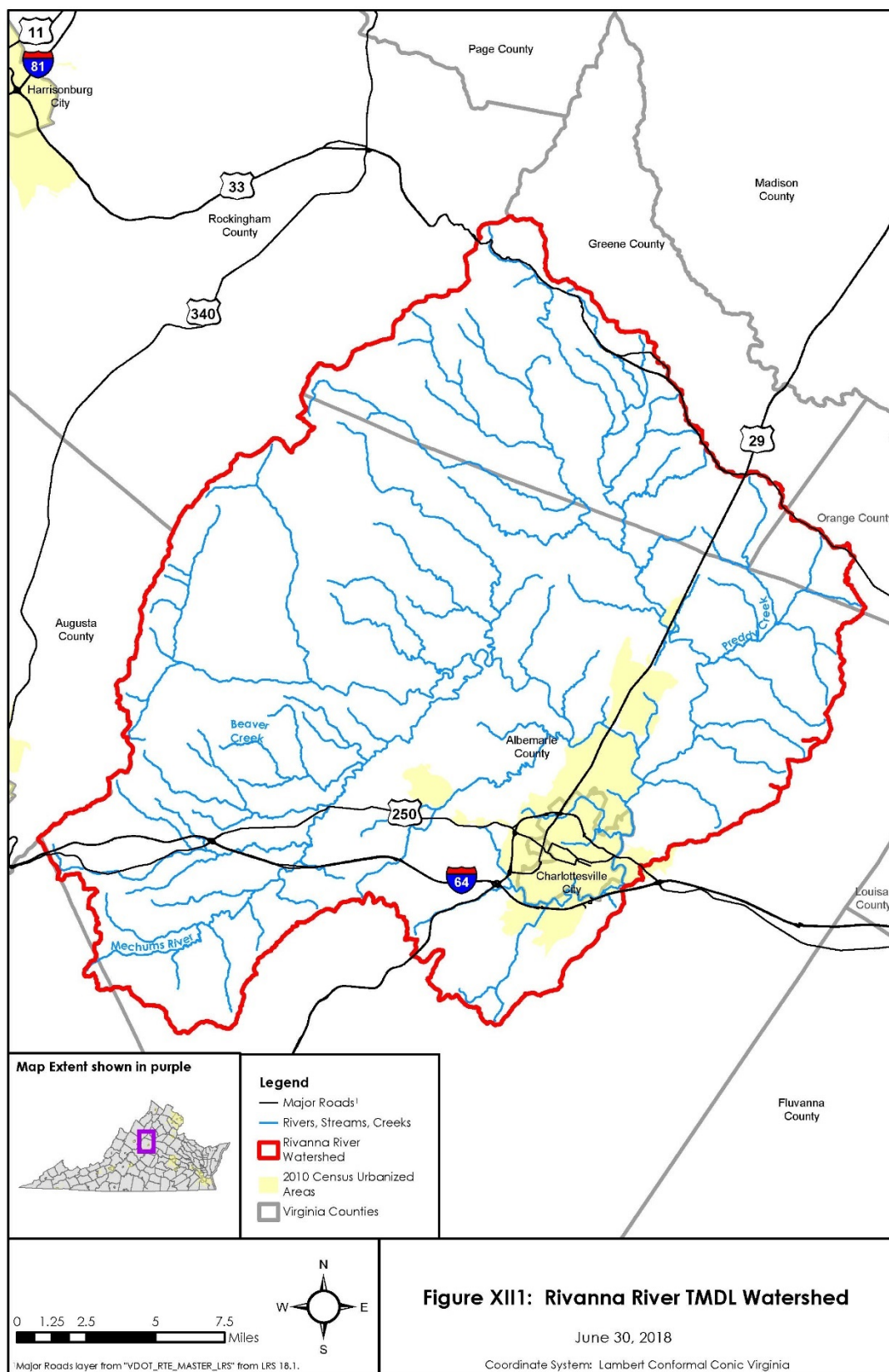
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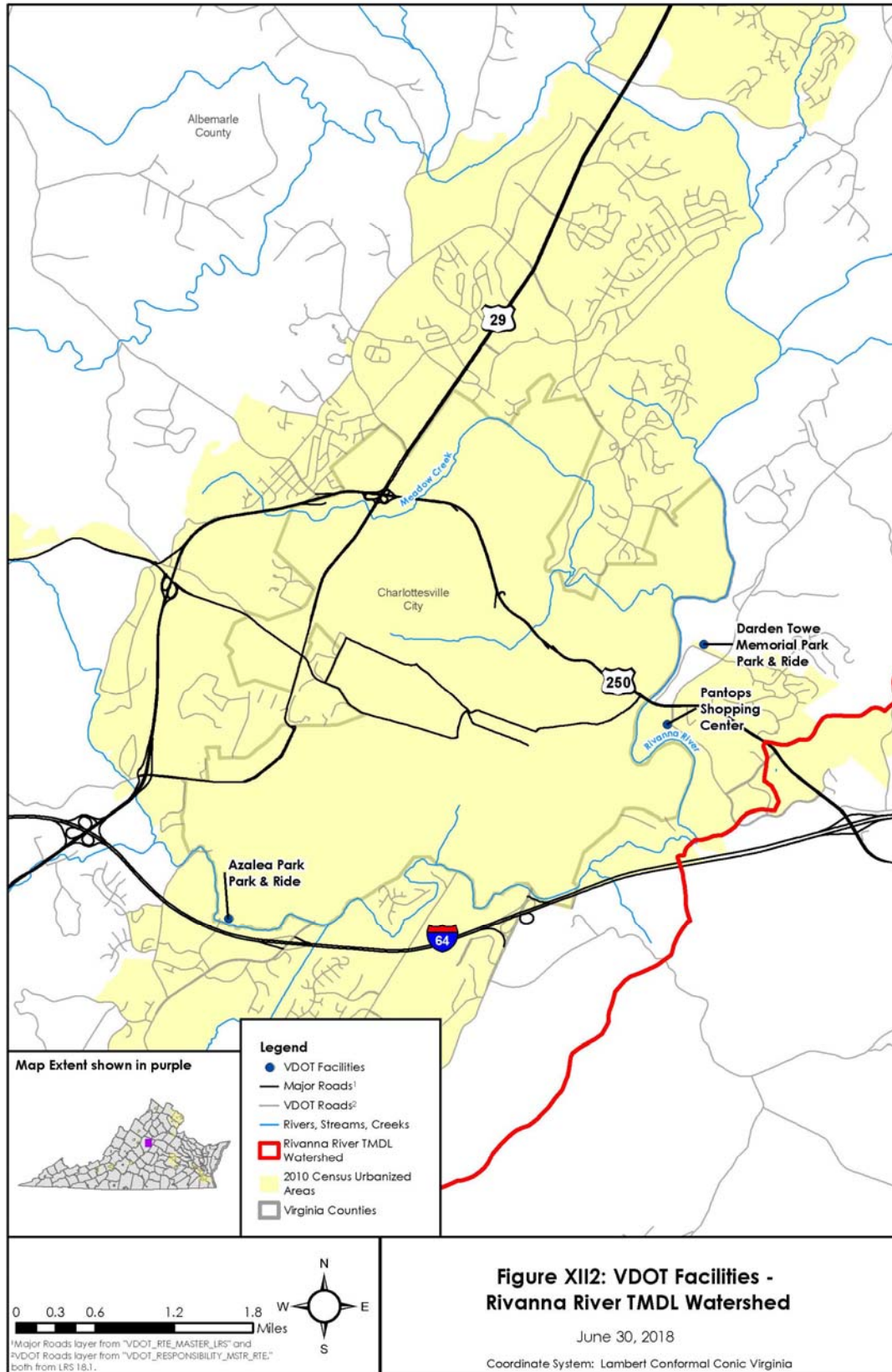
XIIC BMPS

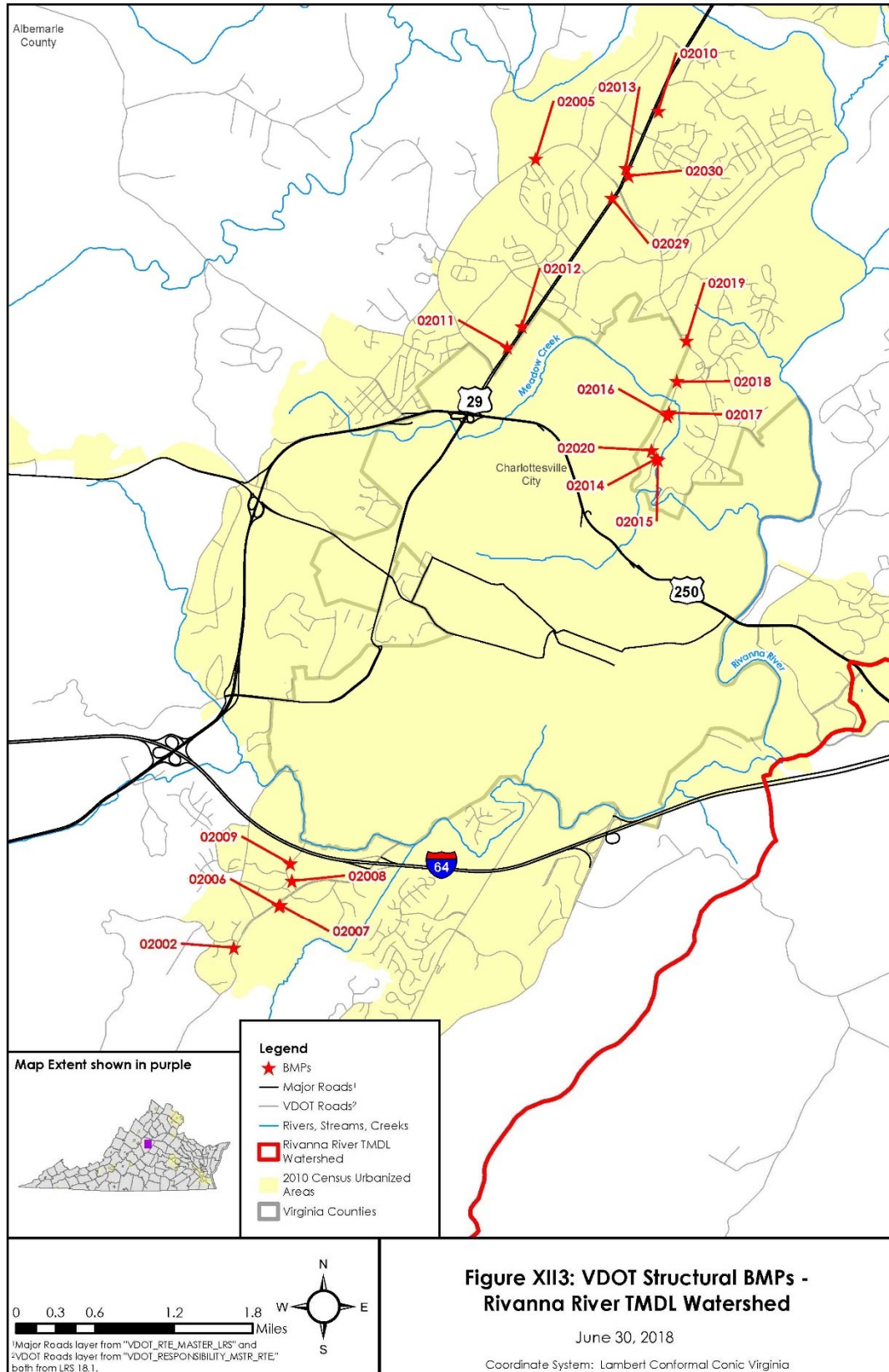
The TMDL for the Rivanna River Watershed assigned WLAs to MS4 permittees, including VDOT, in the various impaired watersheds.

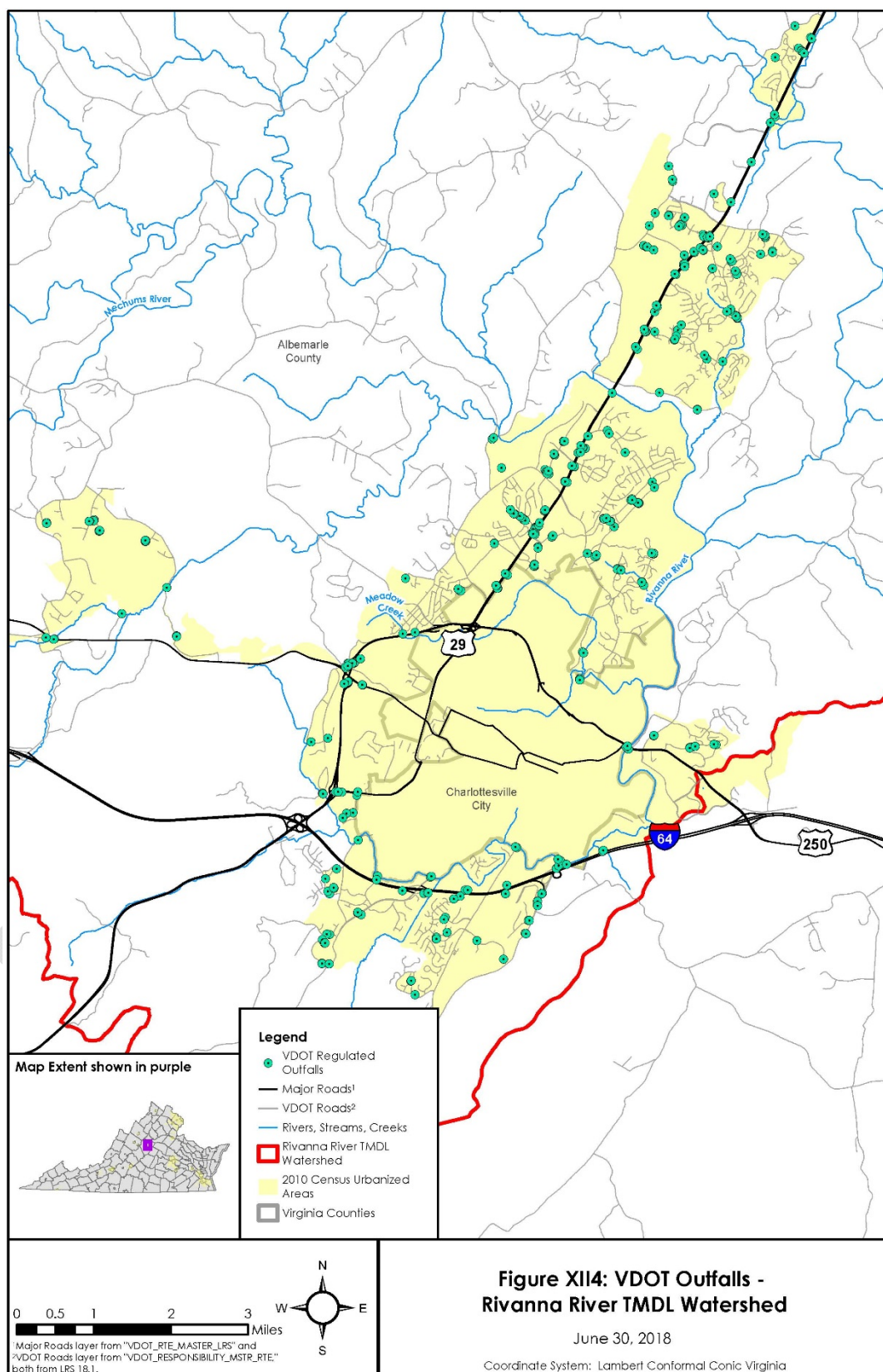
The Core BMPs in VDOT's MS4 Program which address bacteria are listed in Table 2 of this Action Plan. VDOT will continue practicing these programmatic BMPs to the MEP in accordance with the goals of the TMDL. The following actions summarize VDOT's plan to address the bacteria WLAs assigned in the Rivanna River Watershed TMDL:

- Continued implementation of VDOT's MS4 Core BMPs.









Appendix XIII

Tidal Four Mile Run Watershed

The information included in this appendix is specific to this watershed TMDL. Refer to the main sections of this Action Plan for additional information.

XIIIA Background	XIII.1
XIIIC Assessment of Significant Sources Within VDOT's Regulated Area in TMDL Watershed.....	XIII.2
XIIIB.1 Roadways.....	XIII.2
XIIIB.2 Facilities	XIII.2
XIIIB.3 Existing Structural BMPs.....	XIII.2
XIIIB.4 Regulated MS4 Outfalls.....	XIII.2
XIIID BMPs	XIII.3

XIIIA BACKGROUND

DEQ first placed the lower 0.05 square mile length of the Tidal Four Mile Run on the biennial 303(d) list in 1996 due to violations of the state's fecal coliform bacteria standard for recreation. A 7.9-mile segment of the upper (non-tidal) Four Mile Run was also listed on the 303(d) list in 1994 for violations of the state's fecal coliform bacteria standard for recreation.

Consequently, DEQ developed a TMDL with bacteria loading limits for the Tidal Four Mile watershed. The EPA approved the TMDL on June 14, 2010. The SWCB approved the TMDL on September 30, 2010. VDOT's MS4 Program was assigned a portion of the MS4 WLAs for bacteria in the CUA of the Tidal Four Mile watershed. A map depicting the Tidal Four Mile Run watershed is shown in Figure XIII.1.

The Tidal Four Mile Run Watershed TMDL uses aggregated WLAs for permitted MS4s in the watershed that includes VDOT's MS4, as well as the MS4s serving Arlington County, City of Alexandria, and George Washington Memorial Parkway. Arlington County Public Schools is an MS4 in the watershed that was not recognized in the TMDL. The TMDL directs that the WLAs be achieved with a "Percent Reduction Method" that compares water quality data to applicable water quality criteria. It identifies a percent reduction of the current bacteria loads required to meet water quality standards for the watershed.

The TMDL for the Tidal Four Mile Run Watershed assigned an 88% reduction in Arlington County and 94% reduction in the City of Alexandria for bacteria to MS4 permittees included in the aggregated WLAs. Therefore, VDOT's TMDL Action Plan for the Tidal Four Mile Run Watershed TMDL aims to reduce loads that existed at the time of the TMDL development to the MEP for bacteria by implementing programmatic BMPs.

XIIIC ASSESSMENT OF SIGNIFICANT SOURCES WITHIN VDOT'S REGULATED AREA IN TMDL WATERSHED

XIIIB.1 Roadways

There is one class of roadway that VDOT either owns or operates in the CUA of the Tidal Four Mile Run watershed, including approximately two miles of US highways, four miles of state highways, and eleven miles of secondary and local roadways. Roadway drainage networks may be a significant conduit for discharges of bacteria in a watershed, although the roadway itself is not expected to serve as a pollutant source and highway drainage is typically associated with lower levels of bacteria than urban runoff from other land use categories.

XIIIB.2 Facilities

Beyond the roadway network, VDOT does not operate any facilities in the study area.

XIIIB.3 Existing Structural BMPs

As of June 2018, there are no VDOT or VDOT associated structural BMPs in the watershed. There are no other VDOT facilities or structural BMPs in the watershed and VDOT's MS4 regulated area.

XIIIB.4 Regulated MS4 Outfalls

In this study area, VDOT has mapped three regulated outfalls as of June 2018, shown in Figure XIII.2.

XIIID BMPS

The TMDL for Tidal Four Mile Run Watershed assigned a bacteria WLAs to MS4 permittees, including VDOT.

The Core BMPs in VDOT's MS4 Program which address bacteria are listed in Table 2 of this Action Plan. VDOT will continue practicing these programmatic BMPs to the MEP in accordance with the goals of the TMDL. The following actions summarize VDOT's plan to address the bacteria WLAs assigned in the Tidal Four Mile Run Watershed TMDL:

- Continued implementation of VDOT's MS4 Core BMPs





Appendix XIV

Tidal Freshwater Rappahannock River Watershed

The information included in this appendix is specific to this watershed TMDL. Refer to the main sections of this Action Plan for additional information.

XIVA Background	XIV.1
XIVB Assessment of Significant Sources Within VDOT's Regulated Area in TMDL Watershed	XIV.2
XIVB.1 Roadways	XIV.2
XIVB.2 Facilities	XIV.2
XIVB.3 Existing Structural BMPs	XIV.3
XIVB.4 Regulated MS4 Outfalls	XIV.3
XIVC BMPs	XIV.4

XIVA BACKGROUND

DEQ first placed a 3.8 square mile segment of the Tidal Freshwater Rappahannock River on the biennial 303(d) list in 2002 due to violations of the state's fecal coliform bacteria standard for recreation. The furthest downstream 1.36 square miles were delisted in 2010, and the next 1.21 square miles immediately upstream were delisted in 2012.

Consequently, DEQ developed a TMDL with bacteria loading limits for the Tidal Freshwater Rappahannock River watershed. The EPA approved the TMDL on May 05, 2008. The SWCB approved the TMDL on April 28, 2009. VDOT's MS4 Program was assigned a portion of the MS4 WLAs for bacteria in the CUA of the Rappahannock River watershed. A map depicting the Tidal Freshwater Rappahannock River watershed is shown in Figure XIV1.

The Tidal Freshwater Rappahannock River Watershed Bacteria TMDL uses aggregated WLAs for permitted MS4s in the watershed that includes VDOT's MS4, as well as the MS4s serving the City of Fredericksburg, Spotsylvania County, Stafford County, Stafford County Public Schools, and University of Mary Washington. Germanna Community College is an MS4 in the watershed that was not recognized in the TMDL. The TMDL directs that the WLAs be achieved with a "Percent Reduction Method" that compares water quality data to applicable water quality criteria. It identifies a percent reduction of the current bacteria loads required to meet water quality standards for the watershed.

The TMDL for the Tidal Freshwater Rappahannock River Watershed assigned a 62.8% reduction for bacteria to MS4 permittees included in the aggregated WLAs. Therefore, VDOT's TMDL Action Plan for the Tidal Freshwater Rappahannock River Watershed Bacteria TMDL aims to reduce loads that existed at the time of the TMDL development to the MEP for bacteria by implementing programmatic BMPs.

XIVB ASSESSMENT OF SIGNIFICANT SOURCES WITHIN VDOT'S REGULATED AREA IN TMDL WATERSHED

XIVB.1 Roadways

There are several classes of roadways that VDOT either owns or operates in the CUA of the Tidal Freshwater Rappahannock River watershed, including approximately twenty-one miles of interstate and associated ramps, thirty-nine miles of US highways, thirty-five miles of state highways, and 412 miles of secondary and local roadways. Roadway drainage networks may be a significant conduit for discharges of bacteria in a watershed, although the roadway itself is not expected to serve as a pollutant source and highway drainage is typically associated with lower levels of bacteria than urban runoff from other land use categories.

XIVB.2 Facilities

In addition to the roadway network, VDOT operates eight facilities in the study area: the Chancellor and Falmouth Area Headquarters, Fredericksburg Rest Area / Welcome Center Complex, Fredericksburg Residency, Fredericksburg District Complex, and Park & Rides at Falmouth, Houser Drive, and Old Salem Church, shown in Figure XIV2 and listed in Table XIV1.

An assessment for sources of bacteria from the facilities was conducted. For the purposes of the assessment, a potential source of bacteria from the facility means a potential anthropogenic source of bacteria due to the presence of septic systems, active portable toilets, etc. The table below lists each facility and the results of the site assessment. Based on the assessment, none of the facilities are a significant source of bacteria. For facilities with SWPPPs, an annual assessment effort for TMDL POCs, including bacteria, will be conducted.

Table XIV1: Facilities in the Study Area

Facility	Potential Source of Bacteria	Significant Source	SWPPP	Date of Last Assessment
Chancellor Area Headquarters	No	No	Yes	8/26/2014
Falmouth Area Headquarters	No	No	Yes	8/26/2014
Falmouth Park & Ride	No	No	No	12/15/2014
Fredericksburg District Complex	No	No	Yes	8/27/2014
Fredericksburg Residency	No	No	No	8/27/2014

Facility	Potential Source of Bacteria	Significant Source	SWPPP	Date of Last Assessment
Fredericksburg Rest Area/Welcome Center Complex	Yes (septic system)	No	No	N/A *
Houser Drive Park & Ride	No	No	No	N/A *
Old Salem Church Park & Ride	No	No	No	N/A *

* VDOT has assessed this type of facility in the past and has determined that it is not a significant source of bacteria.

XIVB.3 Existing Structural BMPs

As of June 2018, there are twenty-nine VDOT or VDOT associated structural BMPs (twenty extended detention basins, one riprap berm, two generic treebox filters, four dry detention basins, one bioretention filter, and one contech vortech) and four BMPs under construction (two extended detention basins, one dry detention basin, and one stream restoration) in the watershed, shown in Figure XIV3. There are no other VDOT facilities or structural BMPs in the watershed and VDOT's MS4 regulated area.

XIVB.4 Regulated MS4 Outfalls

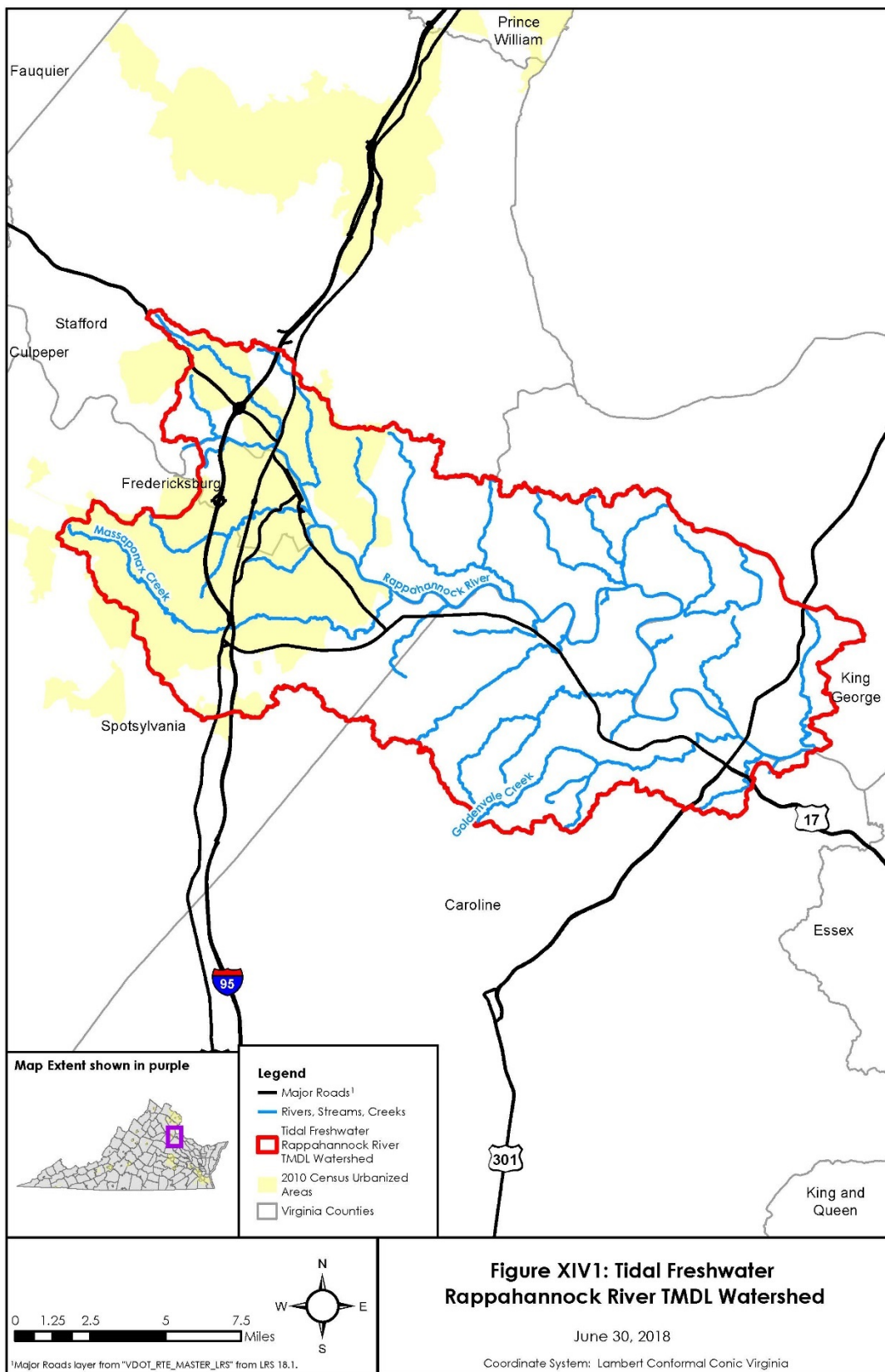
In this study area, VDOT has mapped 1,279 regulated outfalls and 200 points of discharge as of June 2018, shown in Figure XIV4.

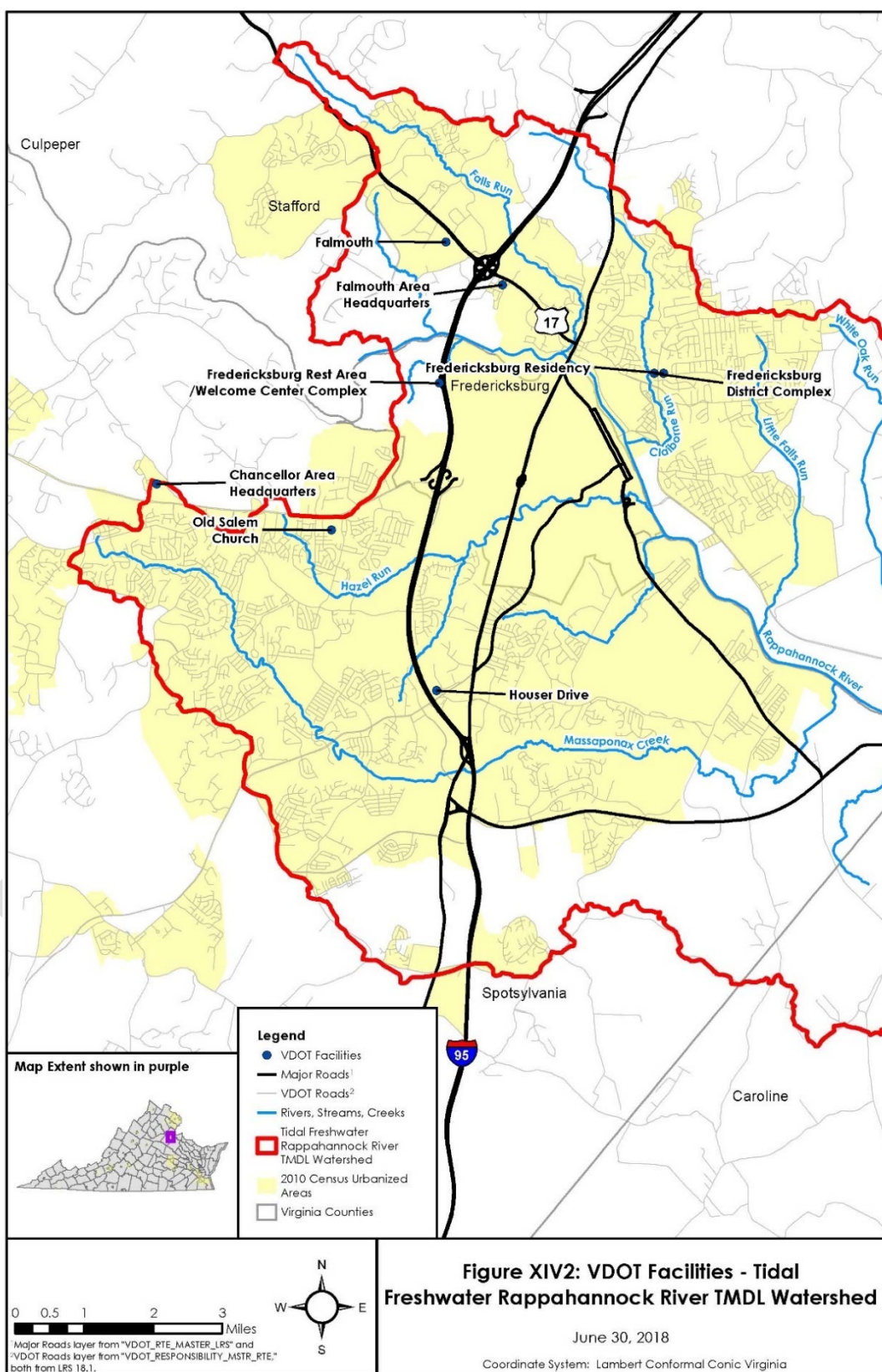
XIVC BMPS

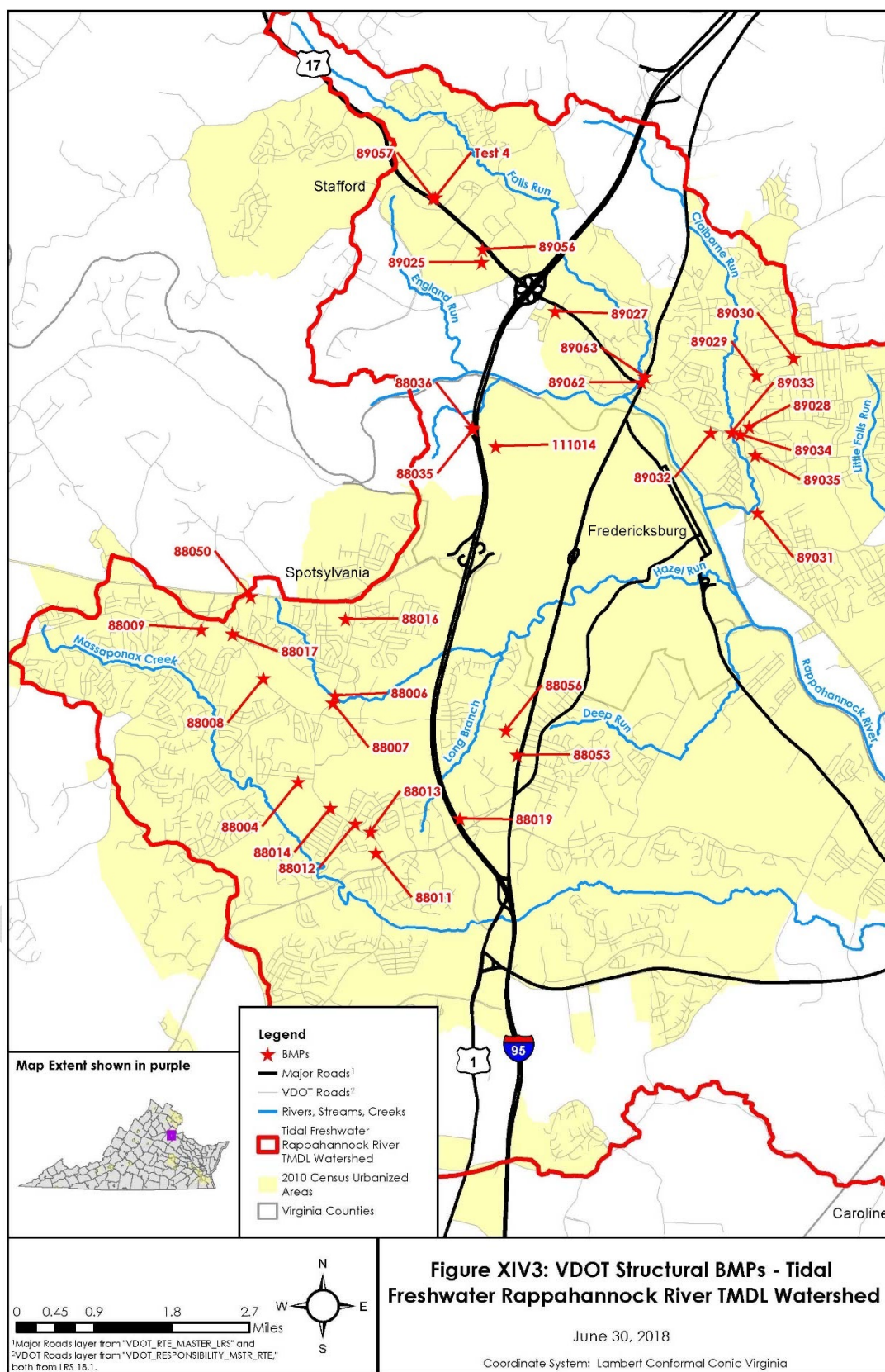
The TMDL for the Tidal Freshwater Rappahannock River assigned WLAs to MS4 permittees, including VDOT, in the various impaired watersheds.

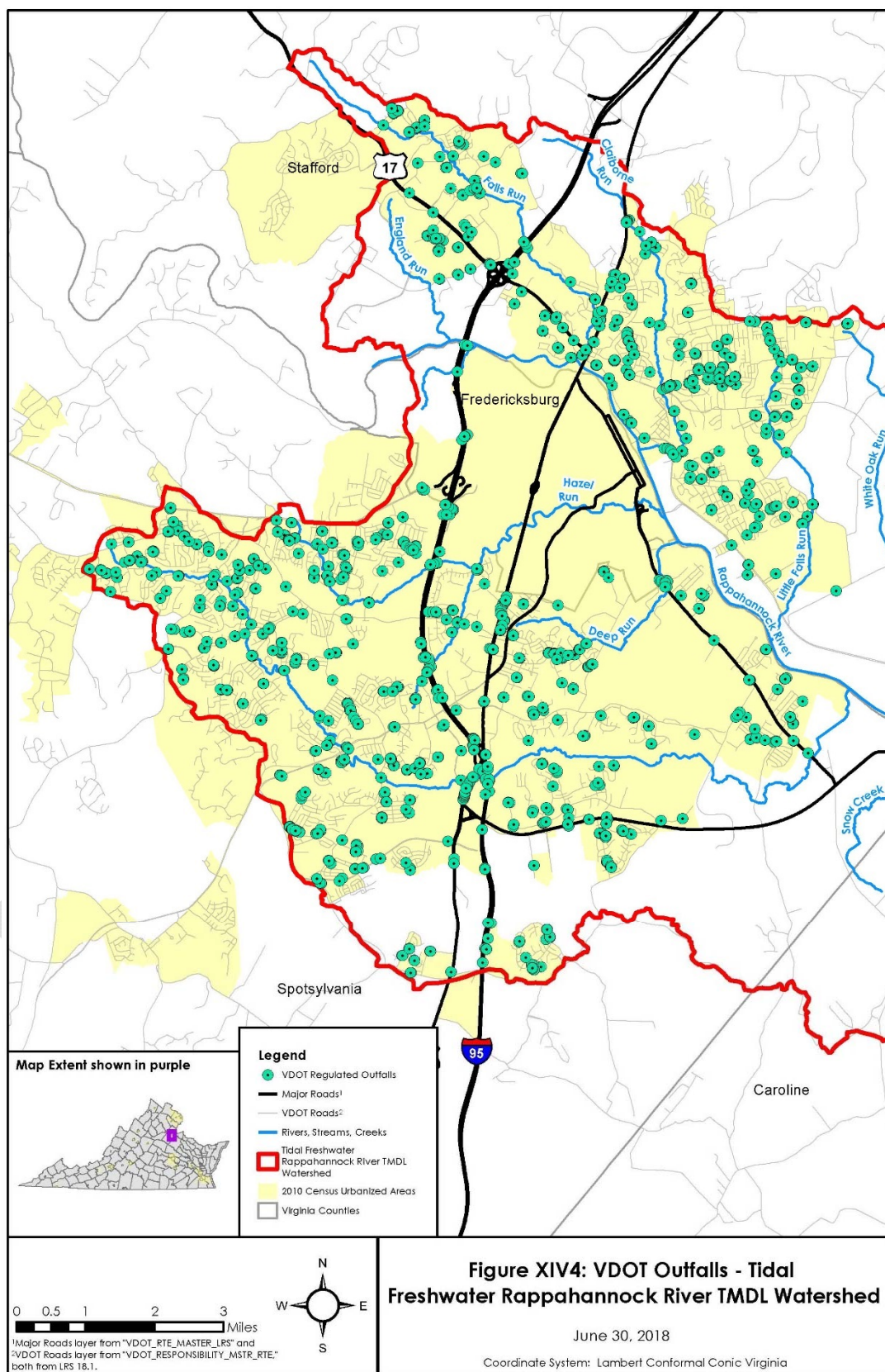
The Core BMPs in VDOT's MS4 Program which address bacteria are listed in Table 2 of this Action Plan. VDOT will continue practicing these programmatic BMPs to the MEP in accordance with the goals of the TMDL. The following actions summarize VDOT's plan to address the bacteria WLAs assigned in the Tidal Freshwater Rappahannock River TMDL:

- Continued implementation of VDOT's MS4 Core BMPs.
- For facilities with SWPPPs, an annual assessment effort for TMDL POCs, including bacteria, will be conducted.









Appendix XV
Upper Roanoke River Watershed

The information included in this appendix is specific to this watershed TMDL. Refer to the main sections of this Action Plan for additional information.

XVA	Background	XV.1
XVB	Assessment of Significant Sources Within VDOT's Regulated Area in TMDL Watershed	XV.2
XVB.1	Roadways.....	XV.2
XVB.2	Facilities	XV.2
XVB.3	Existing Structural BMPs.....	XV.3
XVB.4	Regulated MS4 Outfalls.....	XV.3
XVC	BMPs	XV.4

XVA BACKGROUND

In 1998, two segments of the Roanoke River (9.78 miles and 2.24 miles) and the entire length of Ore Branch and Wilson Creek, tributaries to the Roanoke River, were added to the biennial 303(d) list for violations to the bacteria standard for recreation. Consequently, DEQ developed a TMDL with bacteria loading limits for the Upper Roanoke River watershed. The EPA approved the TMDL on August 02, 2006. The SWCB approved the TMDL on June 27, 2007. VDOT's MS4 Program was assigned a portion of the MS4 WLAs for bacteria in the CUAs of the Roanoke River watershed. A map depicting the Roanoke River watershed is shown in Figure XV1.

The Roanoke River Bacteria TMDL uses separate WLAs for permitted MS4s in the watersheds that include Roanoke County, City of Roanoke, Town of Vinton, Botetourt County, City of Salem, VDOT Roanoke Urban Area, Virginia Western Community College, Virginia Medical Center, VDOT Montgomery County Urban Area, Town of Blacksburg, and the Town of Christiansburg MS4 permits. VDOT's MS4 area is now consolidated and the Virginia Polytechnic Institute and State University, US Department of Veteran Affairs Salem Medical Center, Bedford County, and Town of Troutville are MS4s in the watershed that were not recognized in the TMDL. The TMDLs direct that the WLAs be achieved with a "Percent Reduction Method" that compares water quality data to applicable water quality criteria. It identifies a percent reduction of the current bacteria loads required to meet water quality standards for the watersheds.

The TMDLs for the Upper Roanoke River Watershed assigned MS4 permittees a 98.8% reduction for bacteria for the Roanoke River, and a 99.5% reduction for bacteria for Wilson Creek and Ore Branch. Therefore, VDOT's TMDL Action Plan for the Upper Roanoke River Watershed TMDLs aims to reduce loads that existed at the time of the TMDL development to the MEP for bacteria by implementing programmatic BMPs.

A 9.87-mile segment and a 1.46-mile segment of the Roanoke River are also listed due to benthic impairments. Consequently, DEQ developed a TMDL with sediment loading limits for the Roanoke River watershed. The EPA approved the TMDL on May 10, 2006. The SWCB approved the TMDL on September 07, 2006. VDOT's MS4 Program was assigned two individual WLAs for sediment discharges to the Roanoke River. This is addressed in VDOT's Action Plan for Local Sediment TMDLs. The encompassing watershed for the three bacteria-impaired streams overlaps the entire Roanoke River sediment TMDL watershed. The bacteria impairment in the Roanoke River extends below the benthic impairment; therefore, the Bacteria TMDL watershed covers a larger drainage area.

XVB ASSESSMENT OF SIGNIFICANT SOURCES WITHIN VDOT'S REGULATED AREA IN TMDL WATERSHED

XVB.1 Roadways

There are several classes of roadways that VDOT either owns or operates in the CUA of the Upper Roanoke River watersheds, including approximately fifty-four miles of interstate and associated ramps, 133 miles of US highways, ninety-six miles of state highways, and over 512 miles of secondary and local roadways. Roadway drainage networks may be a significant conduit for discharges of bacteria in a watershed, although the roadway itself is not expected to serve as a pollutant source and highway drainage is typically associated with lower levels of bacteria than urban runoff from other land use categories.

XVB.2 Facilities

In addition to the roadway network, VDOT operates fifteen facilities in the study area: Salem Residency – South West Area Headquarters, Salem District Complex, Mason Creek Bulk Storage Lot- Upper, Airport Area Headquarters (TAMS), Hanging Rock Area Headquarters & Traffic Center, Route 11 Storage Area, Starkey Area Headquarters, Route 641 Storage Lot, and, Old Cave Spring Storage Lot, Cove Road Storage Lot, Park & Rides at I-81 Exit 140, Rt. 419, 311 & 863, Hanging Rock, I-81 Exit 118, I-81 Exit 114, shown in Figure XV2 and listed in Table XV1.

An assessment for sources of bacteria from the facilities was conducted. For the purposes of the assessment, a potential source of bacteria from the facility means a potential anthropogenic source of bacteria due to the presence of septic systems, active portable toilets, etc. The table below lists each facility and the results of the site assessment. Based on the assessment, none of the facilities are a significant source of bacteria. For facilities with SWPPPs, an annual assessment effort for TMDL POCs, including bacteria, will be conducted.

Table XV1: Facilities in the Study Area

Facility	Potential Source of Bacteria	Significant Source	SWPPP	Date of Last Assessment
I-81 Exit 140 Park & Ride	No	No	No	N/A *
Route 419, 311 & 863 Park & Ride	No	No	No	N/A *
I-81 Exit 118 Park & Ride	No	No	No	N/A *
I-81 Exit 114 Park & Ride	No	No	No	N/A *
Route 11 Storage Area	No	No	Yes	4/22/2015
Route 641 Storage Lot	No	No	No	N/A *

Facility	Potential Source of Bacteria	Significant Source	SWPPP	Date of Last Assessment
Airport Area Headquarters (TAMS)	No	No	Yes	4/22/2015
Cove Road Storage Lot	No	No	Yes	4/22/2015
Hanging Rock Area Headquarters	No	No	Yes	4/23/2015
Hanging Rock Park & Ride	No	No	No	N/A *
Mason Creek Storage Lot	No	No	Yes	4/22/2015
Old Cave Spring Storage Lot	No	No	Yes	4/21/2015
Salem District Complex	No	No	Yes	4/21/2015
Salem Residency and South West Area Headquarters	No	No	Yes	4/22/2015
Starkey Area Headquarters	No	No	No	N/A *

* VDOT has assessed this type of facility in the past and has determined that it is not a significant source of bacteria.

XVB.3 Existing Structural BMPs

As of June 2018, there are forty-one VDOT or VDOT associated structural BMPs (thirty-two extended detention basins, three grassed swales, one level spreader, one permeable pavement, two bioretention filters, one pipe detention, and one basin) and five BMPs under construction (three extended detention basins, one grassed swale, and one basin) in the watershed, shown in Figure XV3. There are no other VDOT facilities or structural BMPs in the watershed and VDOT's MS4 regulated area.

XVB.4 Regulated MS4 Outfalls

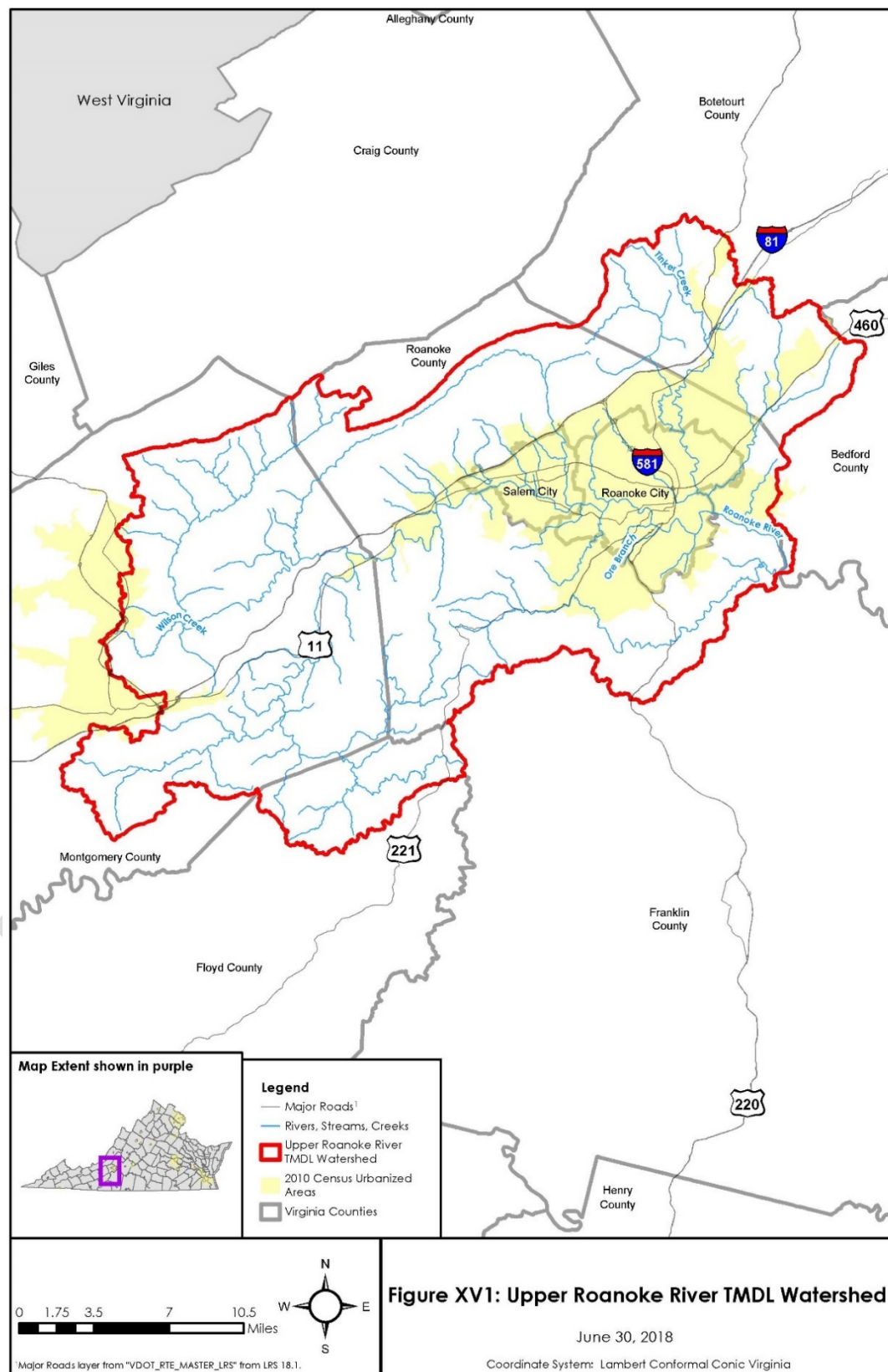
In this study area, 989 regulated outfalls and thirty-two points of discharge as of June 2018, shown in Figure XV4.

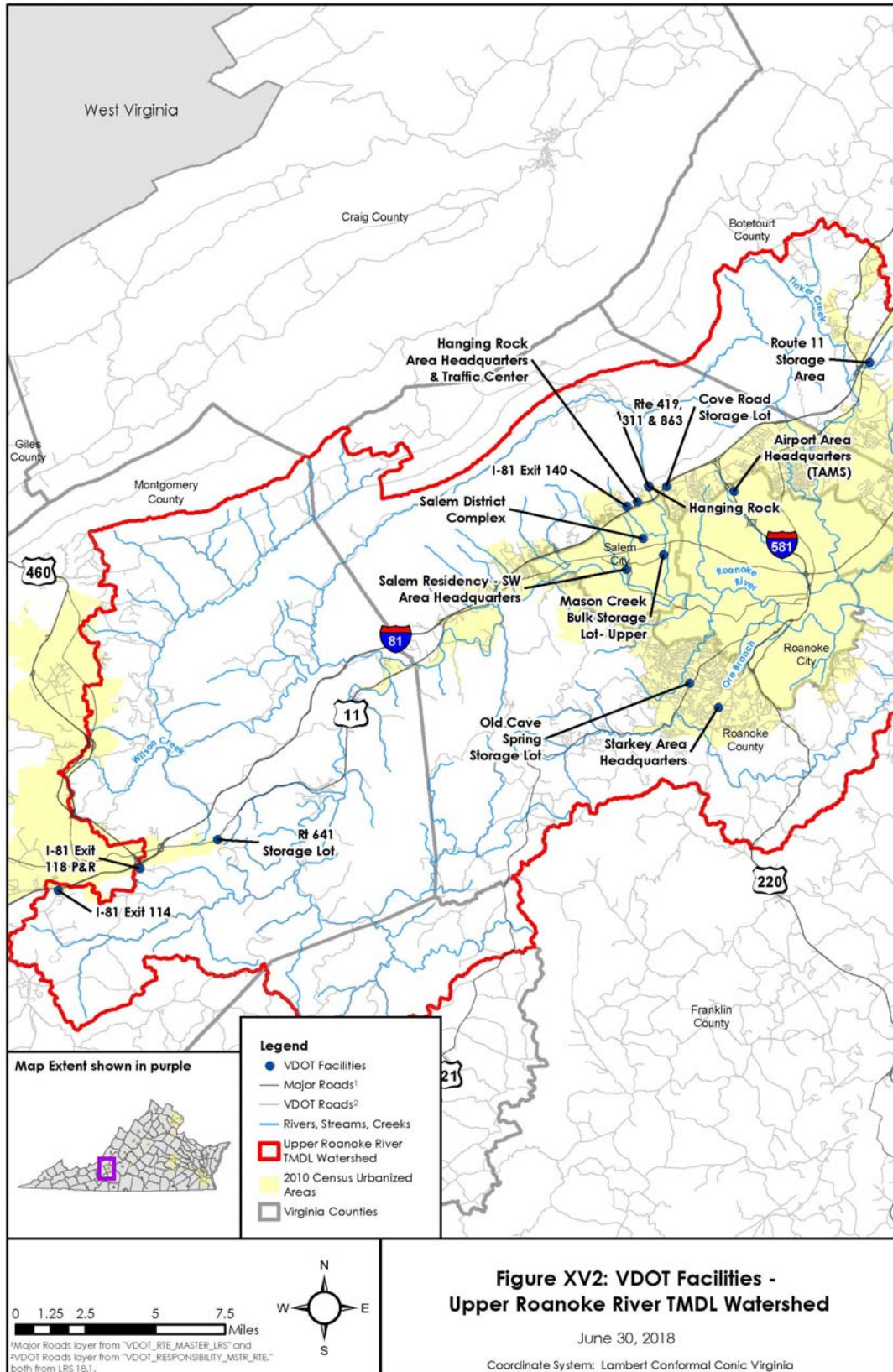
XVC BMPS

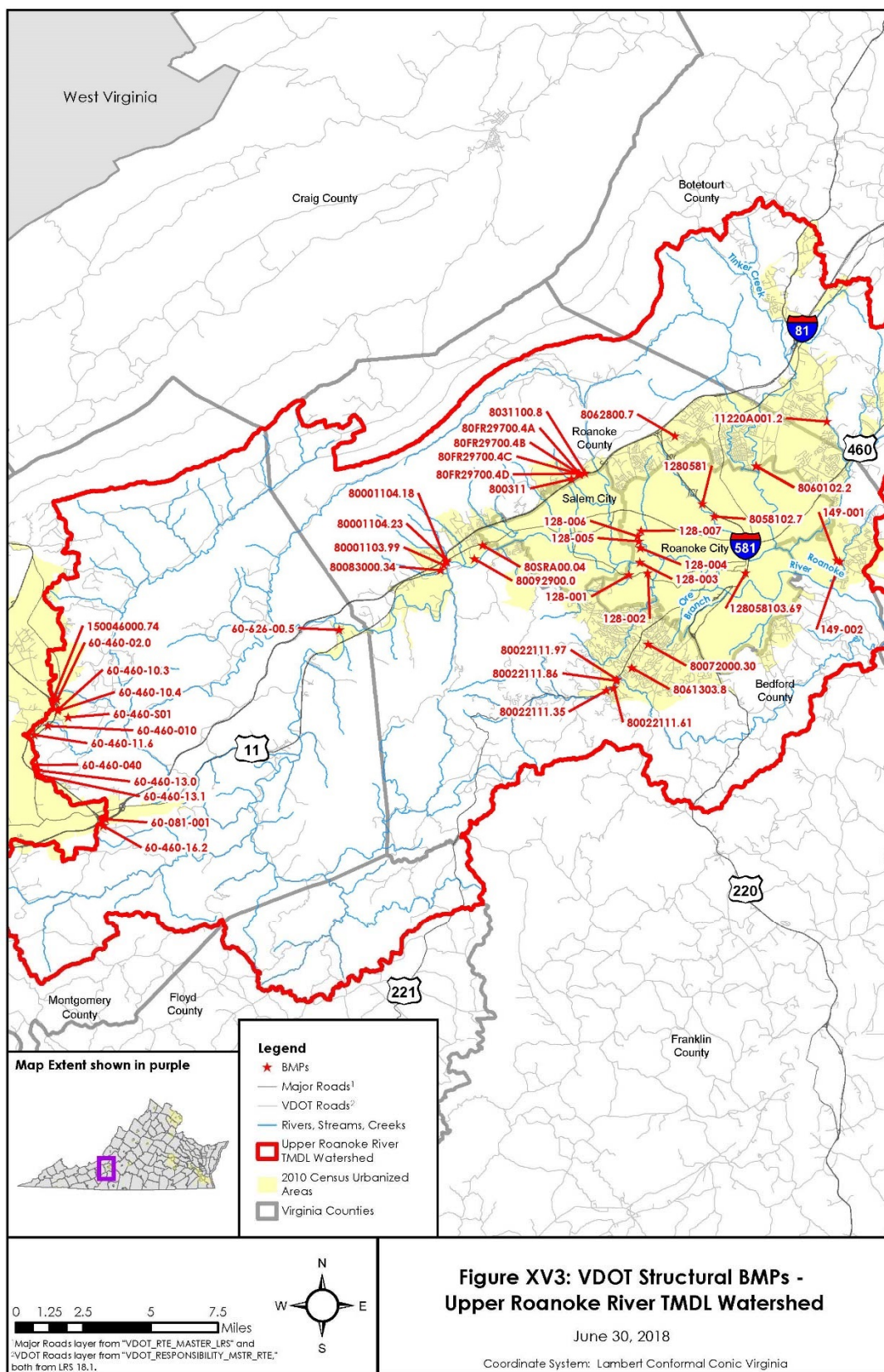
The TMDLs for the Upper Roanoke River Watershed assigned WLAs to MS4 permittees, including VDOT, in the various impaired watersheds.

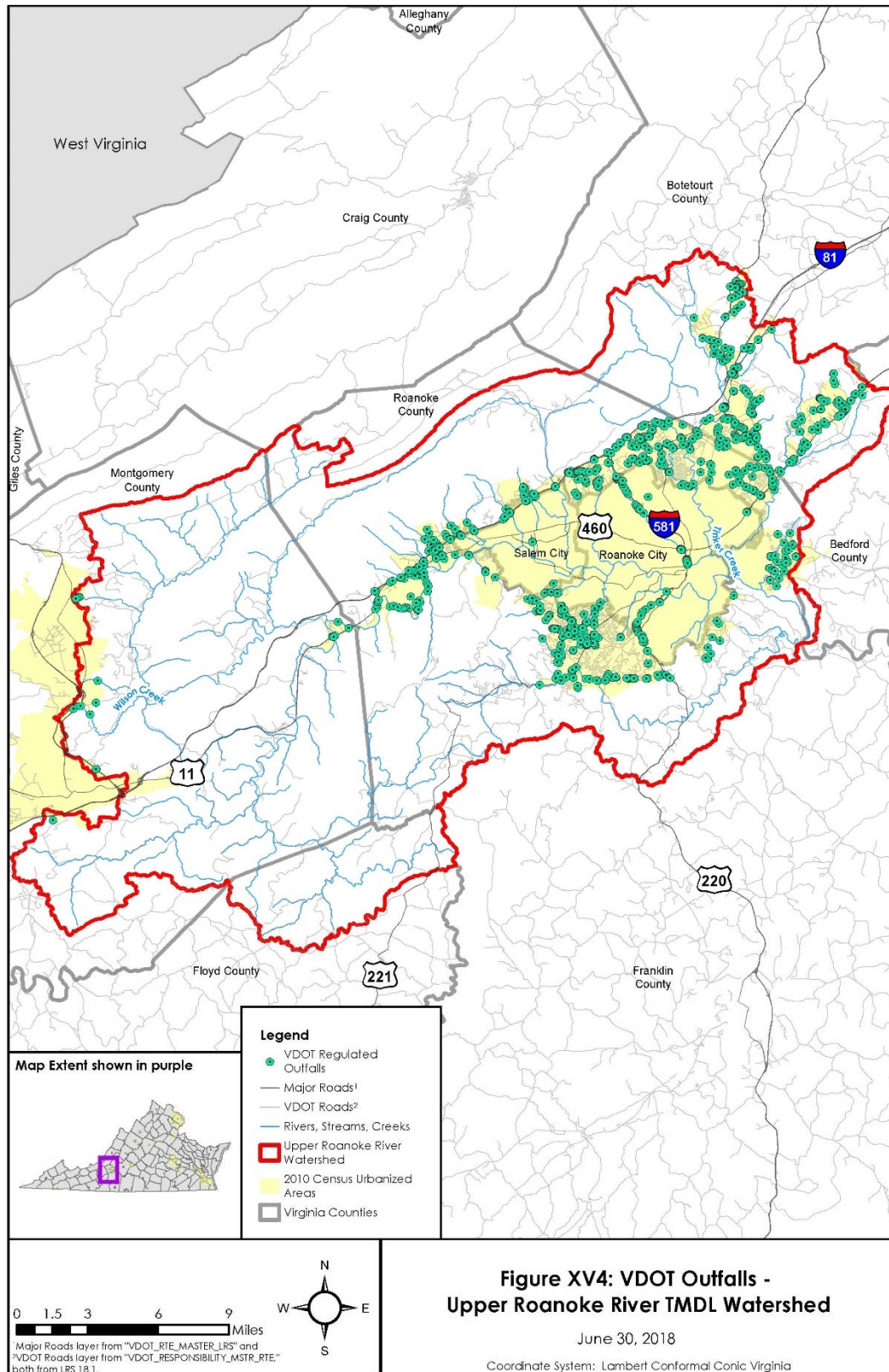
The Core BMPs in VDOT's MS4 Program which address bacteria are listed in Table 2 of this Action Plan. VDOT will continue practicing these programmatic BMPs to the MEP in accordance with the goals of the TMDL. The following actions summarize VDOT's plan to address the bacteria WLAs assigned in the Upper Roanoke River Watershed TMDL:

- Continued implementation of VDOT's MS4 Core BMPs.
- For facilities with SWPPPs, an annual assessment effort for TMDL POCs, including bacteria, will be conducted.









Appendix XVI
Bacteria TMDL References

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