

# **Elizabeth River Bacteria TMDL Action Plan**

**Prepared for:**

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## **ABBREVIATIONS**

BMP	Best Management Practice
City	City of Chesapeake
CWA	Clean Water Act
HRPDC	Hampton Roads Planning District Commission
HRSD	Hampton Roads Sanitation District
LA	Load Allocation
MOU	Memorandum of Understanding
MS4	Municipal Separate Storm Sewer System
TMDL	Total Maximum Daily Load
VDEQ	Virginia Department of Environmental Quality
VSMP	Virginia Stormwater Management Program
VPDES	Virginia Pollutant Discharge Elimination System
WLA	Waste Load Allocation

## 1.0 INTRODUCTION

### 1.1 Background

With a continued commitment to water quality improvement, the City of Chesapeake (City) has developed this Action Plan to address the Bacterial Total Maximum Daily Load (TMDL) for the Elizabeth River Watershed as outlined in our Municipal Separate Storm Sewer (MS4) permit. The City is pleased to have this opportunity to provide more specific information regarding existing management programs as well as its proposed implementation strategies specific to Chesapeake's unique environment that will be implemented to improve the water quality of this valuable resource. Due to the City's proximity to the Chesapeake Bay and its unique waterfront lifestyle, the Elizabeth River provides direct economic benefits and an enhanced quality of life for residents; therefore, the City is devoted to seeing the Elizabeth River clean-up efforts succeed.

This report provides specific programmatic and structural best management practices (BMPs) implemented by the City to address bacterial contamination, both existing and planned. The City understands its role and responsibilities in the implementation of relevant local strategies through an adaptive management approach to support a reasonable assurance of TMDL compliance. The City is dedicated to improving the quality of both the Chesapeake Bay and local waterways.

Chesapeake has had a long-standing commitment to storm water management. The City implemented its Storm Water Management Program in 1991--making Chesapeake one of Virginia's forerunners in VPDES implementation. The City's comprehensive program addresses the quality and quantity of our storm water runoff while meeting state and federal regulations.

The City is designated as a Phase 1 MS4 and is authorized to discharge stormwater from municipal-owned or -operated storm sewer outfalls under Virginia Stormwater Management Program ("VSMP") MS4 Permit No. VA0088625. This permit requires the City to address pollutants of concern ("POC") in accordance with state requirements where it has been allocated a waste load in an approved TMDL. A TMDL establishes the maximum amount of a pollutant that can enter a water body without violating water quality standards.

The City's most recent MS4 permit was issued by the Virginia Department of Environmental Quality (DEQ) with an effective date of July 1, 2016 and will expire June 30, 2021. This TMDL Action Plan documents how the City intends to meet the "TMDL Action Plans other than the Chesapeake Bay TMDL" requirement found in Part I.D.2 of its Phase I MS4 Permit. This document, required to be completed within 24 months of permit issuance or not later than July 1, 2018, addresses that requirement and serves as the City's MS4 specific TMDL Action Plan to identify the BMPs and other activities to be implemented to address the bacteria waste load allocation assigned to the City's regulated MS4 area by:

- evaluating significant sources of bacteria;
- assessing the adequacy of existing programs and legal authorities;
- identifying new action items and associated schedules and milestones; and,
- determining how the effectiveness of the plan will be assessed.

## 1.2 Regulated Areas

Regulated areas are lands that produce runoff that drain through the City’s stormwater system and discharge through pipes and/or ditches to the natural waterways within and adjoining the City. These are the lands covered by the City’s MS4 Permit and to which a waste load allocation has been assigned. Direct discharges from land to the surrounding waters that do not pass through the City’s stormwater system are not regulated under the City’s MS4 permit. However, most policies and pollutant reduction practices recommended in this Action Plan apply city-wide and address discharges from both regulated and non-regulated lands.

The City of Chesapeake has delineated their MS4 regulated area following the guidance set forth in the “Chesapeake Bay TMDL Special Condition Guidance – GM15-2005” (dated May 18, 2015). The regulated areas have not changed since the delineation and were used in the development of this TMDL Action Plan. The City’s geographic information system (“GIS”) data was used in the delineation of the MS4 regulated areas and allowable exclusions. Table 1-1 summarizes the total acreage within each TMDL watershed and the Chesapeake MS4 acreage within each TMDL watershed. The extent of the regulated MS4 service area and the impaired waters covered by this TMDL are provided graphically in **Figure 1-1**.

**Table 1-1. TMDL Watershed and Chesapeake MS4 Acreage**

TMDL Watershed	Total Area (acres)	Chesapeake MS4 Area in the TMDL Watershed (acres)
<b>TMDL #1</b>		
Lower Eastern Branch, Lower Southern Branch, Upper Mainstem, Broad Creek, Indian River	82,735	34,878
<b>TMDL #2</b>		
Western Branch	23,951	8,365
<b>TMDL #4</b>		
Paradise Creek	1,716	0

## 1.3 Permit Compliance Crosswalk

Guidance Memo No. GM-16-2006, “TMDL Action Planning for Local Total Maximum Daily Loads as required in the Small MS4 General Permit (VAR04) Effective July 1, 2013 and MS4 Individual Permits”, was published by VDEQ on November 21, 2016 for use in developing local TMDL Action Plans. **Table 1-2** provides an overview of the organization of this plan and how each section addresses Chesapeake’s MS4 permit requirements and VDEQ guidance.

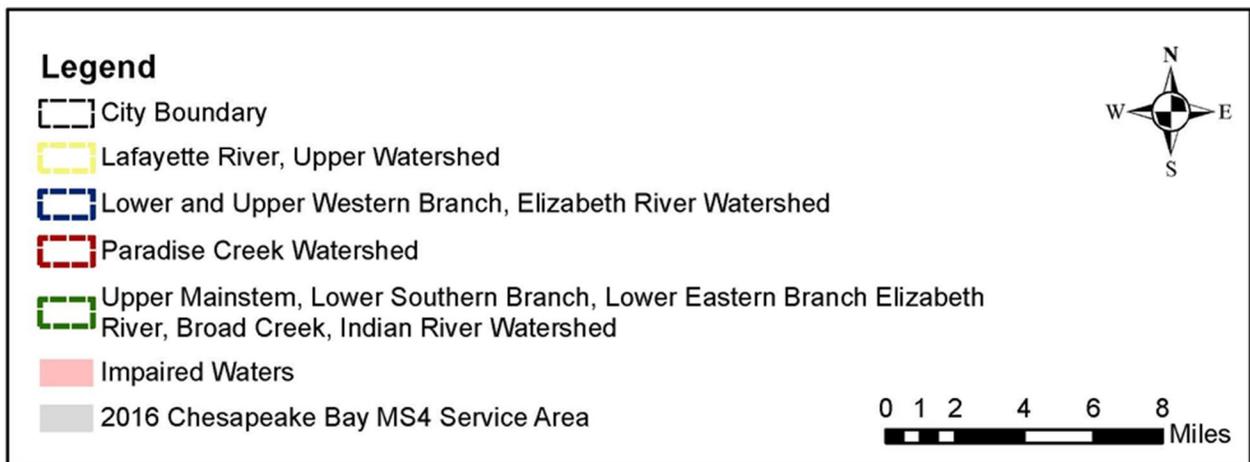
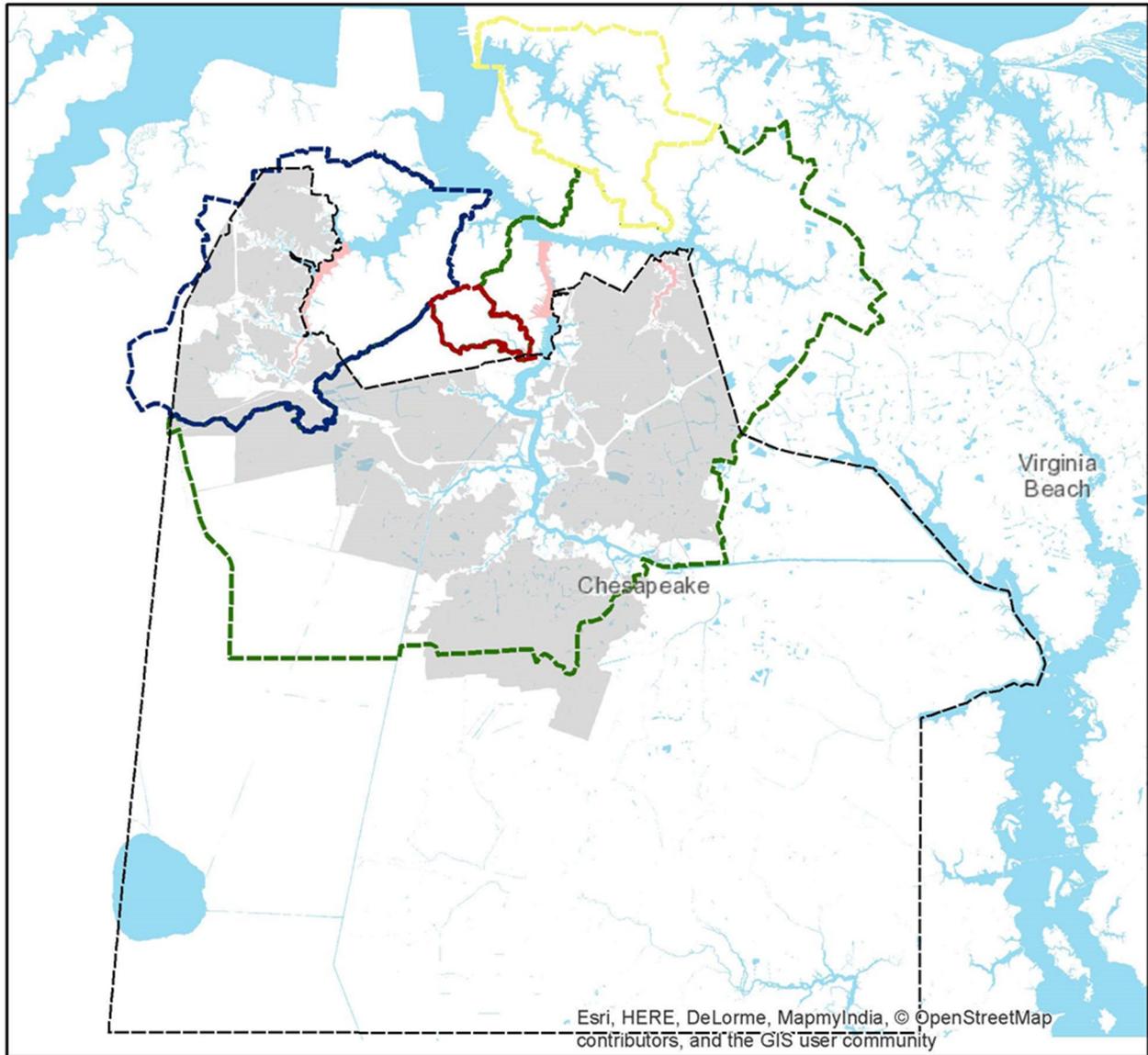


Figure 1-1. Impaired Waters Addressed by this TMDL Action Plan

**Table 1-2. Action Plan and Permit Compliance Crosswalk**

<b>Action Plan Section</b>	<b>Action Plan Element</b>	<b>DEQ Local TMDL Action Plan Guidance</b>	<b>MS4 Permit Requirement Reference Section</b>
Section 2.0	TMDL Report	The name(s) of the final TMDL report(s)	Not Applicable
Section 2.0	Pollutant of Concern	The pollutant(s) causing the impairment(s)	Not Applicable
Section 2.0	Bacteria TMDLs	The WLA(s) assigned to the MS4 as aggregate or individual WLAs	Not Applicable
Section 3.0	Evaluation of Significant Sources of Bacteria	Significant sources of POC(s) from facilities of concern owned or operated by the MS4 operator that are not covered under a separate VPDES permit	Section I.D.2.b)4)
Section 4.0	Existing and Planned Management Controls	Existing or new management practices, control techniques, and system design and engineering methods that have been or will be implemented as part of the MS4 Program Plan	Section I.D.2.b)2)
Section 5.0	Legal Authorities	Legal authorities such as ordinances, state and other permits, orders, specific contract language, and inter-jurisdictional agreements applicable to reducing the POCs	Section I.D.2.b)1)
Section 6.0	Enhanced Education, Outreach, and Training	Enhancements to public education, outreach, and employee training programs to reduce discharges of the POC(s)	Section I.D.2.b)3)
Section 7.1	Schedule and Milestones	A schedule of interim milestones and implementation of the items in 4, 5, and 6;	Section I.D.2.b)5)
Section 7.2	Assessment of Effectiveness	Methods to assess TMDL Action Plans for their effectiveness in reducing POC(s)	Section I.D.2.b)5)
Section 7.3	Measurable Goals	Measurable goals and the metrics that the permittee and Department will use to track goals (and milestones required by the permit)	Section I.D.2.b)5)

**2.0 APPLICABLE TMDL REPORT, POLLUTANT OF CONCERN, AND WASTE LOAD ALLOCATION**

Based on the water quality assessment presented in the April 2010 “*Bacterial Total Maximum Daily Load (TMDL) for the Elizabeth River Watershed*”, herein referred to as the Elizabeth River TMDL, prepared by the Louis Berger Group, Inc. for the Virginia Department of Environmental Quality (“VDEQ”), the Elizabeth River does not support its designated use of primary contact recreation (e.g. swimming and fishing). In accordance with Section 303d of the Clean Water Act and the US Environmental Protection Agency’s (“EPA”) Water Quality Planning and Management Regulations (40 CFR Part 130), VDEQ has developed a TMDL for the POC *enterococcus* bacteria in the Elizabeth River and the City has been allocated a waste load allocation (“WLA”). The TMDL was approved by the EPA on July 20, 2010 and by the State Water Control Board (“SWCB”) on September 30, 2010.

The City of Chesapeake is subject to three (3) separate TMDLs that assign WLAs for discharges of bacteria to impaired waters. **Table 2-1** summarizes the approved TMDL WLAs for *enterococcus*.

**Table 2-1. Elizabeth River TMDL Enterococcus Waste Load Allocations (WLAs)**

<b>TMDL Watershed</b>	<b>Waste Load Allocation (WLA)</b>
Western Branch, Elizabeth River – Upper	9.86E+12 cfu/day
Paradise Creek – Lower, tributary to Southern Branch, Elizabeth River	5.34E+09 cfu/day
Southern Branch, Elizabeth River – Lower Indian River – Eastern Branch, Elizabeth River	3.04E+13 cfu/day

### 3.0 SIGNIFICANT SOURCES OF THE POLLUTANT OF CONCERN

The MS4 Permit requires the City to assess all significant sources of the POC from facilities of concern owned or operated by the City that are not covered under a separate VPDES permit. This topic is covered more fully in Section 4.0 of this plan. However, as a whole, it is important to understand the magnitude of each of the bacterial sources in the affected watersheds so that effective programs can be developed and implemented to address the TMDL in a cost-effective manner. **Table 3-1** summarizes the nature and magnitude of the bacterial sources and the required reductions in each of the impacted watersheds.

**Table 3-1. Bacteria Sources and Required Reductions for each TMDL Watershed**

Bacterial Source	Impaired Watershed					
	Western Branch, Elizabeth River – Upper		Paradise Creek – Lower, tributary to Southern Branch, Elizabeth River		Southern Branch, Elizabeth River – Lower Indian River – Eastern Branch, Elizabeth River	
	Percent of Existing Load (%)	Required Reduction in Source (%)	Percent of Existing Load (%)	Required Reduction in Source (%)	Percent of Existing Load (%)	Required Reduction in Source (%)
Sanitary Sewer Overflows	5.9	100	5.5	100	5.7	100
Failed Septic Systems	< 0.1	100	< 0.1	100	<0.1	100
Pets	69.9	100	80.7	100	45.3	100
Wildlife	22.6	78	13.7	65	15.9	68
Livestock	1.6	100	0.0	---	33.1	100
<b>Total</b>	<b>100.0</b>		<b>100.0</b>		<b>100.0</b>	

Table 3-1 illustrates that the vast majority of source load reduction requirements are associated with pet waste in each of the TMDL watersheds. Each watershed also has nominal removal requirements for bacterial sources resulting from sanitary sewer overflows and failing septic system. Chesapeake has substantial existing programs in place to address these bacterial sources. There are numerous types of City-owned facilities that contribute bacteria loadings from pet waste

to the Elizabeth River including parks, schools, recreation areas, and ponds. The land uses associated with these sources are primarily recreation, residential, and mixed-use in nature.

An anomaly of the TMDL is the rather high source loadings associated with livestock sources within certain segments of the Elizabeth River watershed. Waste load allocations in the TMDL were performed on the basis of ratios of urbanized areas for the cities located in the Elizabeth River watershed. Therefore, the waste load allocation attributable to Chesapeake is an artifact of the process of apportionment rather than being based on actual land use which affects livestock loadings. In practical terms, Chesapeake has no real requirement to address livestock loads within the regulated MS4 service area.

#### 4.0 EXISTING MANAGEMENT PRACTICES

Part 1.D.2.b)2) of the MS4 Permit requires the City to "... identify and maintain an updated list of all additional management practices, control techniques ... that have been implemented as part of the MS4 Program Plan that are applicable to reducing the pollutant identified in the WLA."

Restoring water quality in impaired watersheds is typically accomplished as documented in an Implementation Plan (IP) developed upon completion and approval of a TMDL. To date, no IP for the Elizabeth River watershed has been developed. However, the City currently engages in many practices and programs unilaterally and in conjunction with other stakeholders which help to reduce the levels of bacteria in the Elizabeth River watershed. These ongoing actions have been initiated in response to various programs, and are expected to continue to reduce bacteria loads to the targeted TMDL waterbodies. The existing practices outlined below have been included to provide an overview of the extensive programs that the City and other stakeholders are engaged in outside of the TMDL process to protect Elizabeth River water quality. Key stakeholders identified during the development of this Action Plan include:

- City of Chesapeake;
- City of Norfolk;
- City of Portsmouth;
- Hampton Roads Planning District Commission (HRPDC);
- Hampton Roads Sanitation District (HRSD);
- Virginia Department of Environmental Quality (VDEQ);
- Virginia Department of Health (VDH);
- Elizabeth River Project; and,
- Friends of Indian River.

Throughout this section, existing management practices performed by the City to address bacterial sources of water quality impairments are highlighted. These practices have both great depth and breadth. It is worth noting that these practices are not new; conversely, since the Elizabeth River TMDL came to fruition in 2010, the City has been implementing and adding programs to address the bacterial issue even prior to the requirement to do so. In fact, many of the programs discussed below were initiated to specifically address the 2010 TMDL, examples of which include the City's pet waste management and public education programs.

The City of Chesapeake has an aggressive storm water management program in place to address water quality improvements related to the Elizabeth River bacterial TMDL including, but not limited to:

- a BMP program that includes routine inspections;
- maintenance, repair and cleaning of the City-owned and operated MS4 including ditches, pipes, structures, outfalls, and BMPs;
- sweeping of curb and gutter streets within the City of Chesapeake;
- a Spill Response and Illicit Discharge Detection and Elimination Program to prevent, identify, and eliminate discharges to the City's MS4;
- a program to inspect storm water structures to identify and eliminate illicit discharges;
- a Sanitary Sewer Overflow (SSO) and cross connection elimination program;
- annual dry weather screening of the MS4 system;

- local and regional coordination and participation on committees such as the Hampton Roads Joint Environmental Committee, Elizabeth River Project Steering Committee and Implementation Teams, and the Friends of Indian River;
- a public education and outreach program to address water quality improvement; and,
- construction of water quality improvement projects.

VDEQ *Guidance Memo No. 16-2006, TMDL Action Planning for Local Total Maximum Daily Loads as Required in the Small MS4 General Permit (VAR04) Effective July 1, 2013 and MS4 Individual Permits*, dated November 21, 2016, stipulates that any illicit discharges (e.g., illicit discharges, leaking pipes, sanitary sewer overflows) must be addressed by the permittee in the TMDL Action Plan. However, DEQ has also recognized that existing programmatic practices, ordinances, and outreach currently in place may be sufficient to address bacterial sources and permittees are encouraged to consider practices such as public education and outreach to influence behaviors. Accordingly, the remainder of this section of the TMDL Action plan is organized by: (1) activities which address illicit discharges; and (2) other programmatic activities which improve bacterial water quality.

#### **4.1 Activities Addressing Illicit Discharges**

##### *4.1.1 Sanitary Sewer Overflows*

The Department of Public Utilities makes notification of sanitary sewer spills to DEQ through the DEQ/HRPDC Sanitary Sewer Overflow Reporting System (SSORS). SSORS is a web-based spill reporting and tracking system developed by the HRPDC that simplifies the initial notification and 5-day letter reporting requirements for sanitary sewer overflows. Once Chesapeake logs into the SSORS system and enters necessary data, a report is automatically sent to DEQ and, for spills exceeding 1,000 gallons, to the Virginia Health Department.

Data collected in SSORS includes the date and time of reporting, date and time of the incident, location of the incident, possible receptors/affected water body, material spilled, amount spilled, amount cleaned up, amount reaching state waters, and corrective actions taken. SSORS provides a summary of spill reports, upon request, that can be downloaded into Microsoft Excel or similar programs.

##### *4.1.2 Sanitary Sewer System Maintenance and Repair*

Part I, Section B.2.e)2) of the MS4 permit requires the City to continue implementing a program to minimize the exfiltration from the sanitary system to the MS4. While the Department of Public Works is not responsible for the inspection and maintenance of the sanitary sewer system, the Department works closely with the Department of Public Utilities to identify and correct deficiencies within the sanitary sewer network in part through implementation of a preventative maintenance inspection program for sanitary sewer infrastructure. This program uses the services of full-time Public Utilities Maintenance and Operations Crews and a closed-circuit television (CCTV) truck to assess the sanitary sewer system conditions as well as locate and detect illicit discharges to the stormwater system. The system is instrumental in allowing the Departments of Public Works and Public Utilities to cooperatively identify and remove cross-connections between the sanitary and storm sewer systems.

During fiscal year 2017, the City completed 649,440 linear feet ("LF") of closed-circuit television ("CCTV") inspections and cleaning of sanitary sewer lines City-wide. The City will continue

inspection and repair programs for the sanitary sewer system to maintain system integrity and minimize exfiltration from the sanitary system to the MS4, and a minimum of 189,000 linear feet of sanitary sewer will be inspected annually.

Recent projects undertaken by the Chesapeake Public Utilities Department have been substantial and have significantly reduced infiltration and SSOs to the impaired waterways, and additional efforts to renew the sanitary sewer system will continue in the future. Some of the sanitary sewer related projects included in the Capital Improvement Plan ending June 30, 2020 are listed in **Table 4-1**.

The City also has in place a robust Cost Participation Program (CPP) which provides the opportunity for neighborhoods without public water and sewer to petition the City for these services. During Phase I of the CPP, the following neighborhoods have received water and sewer services:

- Albemarle Acres Water/Sewer
- Bridgewood Water/Sewer
- Etheridge Rd. Water/Sewer
- Jolliff, Moore, Jaye Water/Sewer
- Kempsville 1029-1140 Water/Sewer

The City is currently in Phase II of the CPP which includes the Manning Court-Wampler Place-Vico Drive-Jolliff Road project. This project will connect an additional 49 homes to sanitary sewer in the Elizabeth River watershed.

**Table 4-1. Recently Completed Sanitary Sewer Evaluation and Rehabilitation Projects**

Project Name	Project #	Page #
Gravity Sewer Renewal - Bainbridge Assoc. Sewer w/HRSD	16-170	I-6
Sewer Renewal - 18th Street	15-170	I-24
Sewer Renewal - Additional Consent Order Capital Requirement	05-180	I-25
Sewer Renewal - Chesapeake Ave - Guerriere to Ohio Sewer	18-170	I-26
Sewer Renewal - Liberty Street (500 Block to Collingswood)	26-170	I-27
Sewer Renewal - Phase I SSES Implementation	32-120	I-28
Sewer Renewal - Raleigh Place (Pump Station #7 Basin)	33-170	I-29
Sewer Renewal - Westwood and Redstart Avenue	42-170	I-30
Sewer Replacement - Orville Ave Alleyway - Bainbridge to Seaboard	31-170	I-31

**4.1.3 Illicit Discharge Detection and Elimination (IDDE)**

The City’s IDDE program has existed since the inception of the stormwater management program dating back more than 20 years. The IDDE program is a coordinated inter-departmental effort involving the City’s Public Works, Fire, Health, Public Utilities, and Development and Permits Departments.

The City addresses illicit discharges to the stormwater system in accordance with Section 1.B.2.I) of the MS4 permit with the goal of detecting the presence of potential illicit connections and unauthorized discharges by conducting dry weather screening. To comply with this requirement the City screens at least fifty sites annually to identify and eliminate any potential illicit discharges to the local waterways. The screening sites are selected throughout the city based on:

- areas of concern such as pet kennels, commercial car washes, car dealerships, restaurants, or other potential high risk sites;
- sites requiring further investigation, as identified through previous screening;
- the age and density of development, with a focus on older residential, commercial and industrial areas;
- the general land uses in the city;
- areas with environmentally sensitive downstream features; and,
- areas having a history of complaints.

The screening is conducted during dry weather to identify any non-stormwater discharge sources entering the storm system. Screening inspections occur at least 72 hours after the most recent precipitation event measuring 0.10 inch or more in depth. If active flow is detected at the dry weather screening sites, a field screening analysis is conducted. If the initial screening shows the likelihood of an illicit discharge, based on sample results falling outside a targeted range of values or evidence of an odor typical of sanitary sewage, further analyses may be run using field testing equipment. Field crews complete a field screening data form for each dry weather inspection performed. Each Annual Report prepared for the MS4 permit includes: the total number of outfalls included as a part of the City's MS4; the total number of sites screened during the reporting period; a list of the dry weather screening locations; and any follow up actions including a summary of each investigation for any suspected illicit discharge. The investigation summary for any suspected illicit discharge includes: the date the suspected discharge was observed; how the investigation was resolved, including any associated follow-up; and resolution of the investigation and the date it was closed.

If an illicit discharge is discovered during dry weather monitoring and action is required based on the screening values, efforts are made to contain the discharge, take necessary corrective actions, and report the discharge immediately to the Department of Environmental Quality (DEQ). If the discharge is suspected to require coverage under a storm water permit, the owner/manager is notified to contact VDEQ regarding obtaining a storm water permit, and VDEQ is notified by the City.

The City also maintains a list of high risk dischargers to the MS4 that do and do not have a VPDES industrial discharge permit. Inspection of facility discharges to the MS4 are prioritized by Chesapeake based on: historical discharges; local water quality impairments for pollutants; DMR violations; and citizen complaints. Chesapeake inspects, but does not necessarily monitor, all VPDES industrial permitted outfalls that tie into to the City's MS4 at least once every five years while it inspects non-VPDES-permitted facilities that tie into the MS4 based on their risk of contributing a significant pollutant load to the MS4.

Many potential illicit discharges are also reported by citizens through the City's Customer Contact Center. Each report is investigated by City Public Works staff, and other departments or agencies are brought in as needed. Citizens can report suspected issues by calling 382-CITY.

## **4.2 Programmatic Activities to Improve Bacterial Water Quality**

### *4.2.1 Septic System Programs*

Most of the City's household sanitary sewage is discharged to the public sewer system. Records indicate that numerous properties in the City continue to use a septic system, including about 759 properties within the Elizabeth River Watershed. Septic Systems in the City continue to be reduced as new connections to the public sewer are made through sewer extensions. These sewer extensions allow property owners to connect to the sanitary sewer system and abandon/remove their septic tanks, effectively reducing the risk of septic tank discharges. Since 2006, at least 247 septic tank systems were abandoned and the homes were connected to sanitary sewer.

Septic systems in the City will continue to be reduced as new connections to the public sewer are made through sewer extensions which allow property owners to connect to the sanitary sewer system and abandon/remove their septic tanks, effectively reducing the risk of septic tank discharges. Section 78-52 of the City Code requires the owner of any premises or other building to connect to public sewer when accessible.

In its Eastern Branch Environmental Restoration Strategy adopted November 2014, the Elizabeth River Project (ERP) set a goal to establish a regional task force on septic tanks, with the Eastern Branch, including Indian River, as the pilot focus area. The purpose of the task force is to increase tracking of existing septic tanks, enforce tank pump outs, provide education and consider incentives and grant programs for replacing tanks with wastewater hookups. The regional task force has been established in partnership with the ERP, municipalities including the City, the Virginia Department of Health (VDH), and the Hampton Roads Sanitation District (HRSD). The City has been and will remain a stakeholder on the Task Force. The various City Departments, including Public Works, Utilities, and Health will continue to cooperate to ensure that the effective review and implementation of septic tank pumpouts is accomplished.

### *4.2.2 Pet Waste Programs*

Pet waste can enter the MS4 when it is left on a surface that drains to a storm sewer. Dog parks, dog kennels, and veterinary facilities are examples of specific land uses with a potential high risk for bacteria to enter the MS4.

The Department of Public Works has a multitude of programs to address proper disposal of pet waste. Recognizing that bacterial impairments are a city-wide problem, the City has adopted the HRPDC "Scoop-the Poop" campaign. Public outreach for the pet waste program is conducted by the HRPDC through their askHRGreen program as well as by Public Works staff. The City's "Scoop the Poop" program is an ongoing campaign that has been coordinated through the Hampton Roads Planning District Commission and adopted by the City. The "Scoop the Poop" campaigning varies from year to year, but is incorporated in outreach campaigns through civic presentations, school programming, special events such as "Bark in the Park", festivals, and other media venues and brochure development. Additionally, proper pet waste disposal is a key component of the City's Bay Star Homes programs.

The City has afforded citizens much assistance in managing pet waste by encouraging environmental stewardship, including providing and delivering hundreds of individual pet waste bag holders to local veterinarians, Chesapeake Animal Services, and the Chesapeake Humane Society

for dissemination to their customers. Included with each individual pet waste bag holder is an information brochure on the importance of picking up after your dog.

In conjunction with HRPDC, the City procured and installed five (5) new pet waste stations during the 2017 fiscal year. **Table 4-2** presents a cumulative list of pet waste stations in the Elizabeth River Watershed that have been issued through grants to neighborhood associations. In addition to the pet waste stations provided through the grant program, the City has also installed pet waste stations in the following parks in the Elizabeth River Watershed:

- Deep Creek Park
- Elizabeth River Park
- City Park
- Western Branch park
- Oak Grove Lake Park
- Rivers Edge
- Great Bridge Waterways and History Foundation Visitor Center.

**Table 4-2. Pet Waste Stations Provided through Grants**

Neighborhood	# of Housing Units	# of Pet Waste Stations Provided
Alden Square	110	1
Arboretum	-	1
Bells Mill Park	-	1
Chesapeake Crossing Senior Community	159	1
Chesapeake Crossing Senior Community II	180	1
Chesapeake Humane Society	-	1
Clover Meadows Condominium	92	1
Crossroads Townhomes	92	1
Greenbrier Woods Apartments	272	2
Parks & Recreation – SoNo Park	-	2
Preserve of the Elizabeth	175	2
St. Andrews	136	1
Stonebridge Plaza	-	1
Wimbledon Chase Condominium Association	160	1
Kristina’s Park at Wingfield Point	-	1

**4.2.3 Wildlife Contribution Controls**

While the City has no requirement to address wildlife contributions, it will nonetheless explore opportunities which may present benefits. Specifically, the City will investigate whether additional signage discouraging wildlife feeding may be beneficial at select locations including areas surrounding publicly maintained wet ponds and will encourage installation of vegetated buffers around BMPs to discourage occupancy by geese. The City is also exploring the option to develop BMP buffer guidance for residents, homeowners’ associations, and civic leagues.

#### 4.2.4 Structural Best Management Practices

Over time, both the City and private concerns have implemented hundreds of structural best management practices (BMPs) providing direct water quality benefits to the Elizabeth River. Collectively, these BMPs treat a significant land area and provide a significant bacterial loading reduction.

The City has instituted an aggressive inspection and maintenance program to ensure these facilities maintain their pollutant removing capabilities. Inspection of City-owned and public BMPs are conducted annually and City maintenance crews perform maintenance on the City-owned BMPs based on inspection discrepancies or on the preventative maintenance program. Re-inspections of storm water facilities are conducted to ensure maintenance has been completed.

The City also performs regular inspections of privately-owned structural BMPs. For private facilities with or without a maintenance agreement in place, the facilities are inspected at a minimum frequency of once every 5-years. If a condition is discovered on a private BMP and maintenance is required, the owner of the BMP is notified by an inspection report to correct all maintenance items. The BMP is then re-inspected to ensure all maintenance items are corrected. If problems persist, enforcement action is an option. .

The City will continue implementing and maintaining projects identified as part of its Chesapeake Bay TMDL Action Plan. While the primary purpose is the of the Chesapeake Bay TMDL Action Plan is the reduction of nutrients and sediments to the Chesapeake Bay, the City has and will continue to invest significant resources to capital projects identified in the plan which will also serve to reduce anthropogenic sources of bacteria within not only the impacted watersheds covered by the bacteria TMDL, but across the entire watershed on both regulated and unregulated lands. Because the Elizabeth River watershed is a direct tributary to the Chesapeake Bay, implementing BMPs to help achieve the Bay TMDL Bay goals will also help to reduce bacteria levels in the river.

#### 4.2.5 Water Quality Monitoring

In addition to the monitoring protocols implemented as part of the IDDE program, the City implements water quality monitoring as warranted by specific problems, including problems typically manifested as acute events related to bacterial contamination. In the past, the City has partnered with HRSD and other stakeholders to identify the source of contamination using bacterial source tracking (BST) techniques. This has recently been accomplished in the Indian River watershed, and the City will continue to accomplish local monitoring for bacterial source identification and removal as circumstances arise and merit targeted investigation. The City is also in the process of developing a bacteria monitoring program to characterize stormwater discharged from the MS4 to identify potential bacteria sources and to determine the effectiveness of structural BMPs which drain to impaired waters.

The City, in partnership with the Elizabeth River Project and HRSD, conducted a comprehensive microbial source tracking study documented in the report titled *“Indian River Microbial Source Tracking”* dated February 2, 2018. Samples were taken in Indian River upstream of the Indian River Bridge between August 2016 and July 2017. The overall goal of the study was to characterize and partition sources of fecal indicator bacteria (FIB) during dry weather. The study found that elevated enterococci concentrations were ever-present and that human fecal contamination was not a

dominant contributor of fecal bacteria during dry weather. In addition, the study found evidence of dog, wildlife, environmental, and goose sources of contamination with dog fecal markers having the highest rate of detection in samples. The study, therefore, supports the actions put forward in this TMDL Action Plan.

## 5.0 LEGAL AUTHORITIES

Chesapeake has developed an MS4 Program Plan in accordance with Virginia Stormwater Management Law, Virginia Stormwater Management Regulations, and MS4 Permit requirements. The Program Plan was most recently revised and submitted to VDEQ in June 2017.

Part 1.D.2.b)1) of the MS4 Permit requires the City to "... develop and maintain a list of its legal authorities such as ordinances, permits, orders, specific contract language, and inter-jurisdictional agreements applicable to reducing the pollutant identified in a WLA."

A review of City Codes and Ordinances was conducted during development of this TMDL Action Plan. No new or modified legal authorities are currently planned or necessary to meet the Special Condition requirements of the permit. The City has adequate legal authority to address not only the permit-related waste load allocation (WLA), but pollution attributable to other bacterial sources included in the TMDL.

General ordinances and policies which enable execution of this TMDL Action Plan include:

- Zoning Ordinance (Articles 2, 4, 5, 10, 12, 13, 18, 19, 20) - <https://library.municode.com/va/chesapeake/codes/zoning>
- Public Utilities Policies (Cost Participation and Private Sewer Pump Stations) - <http://www.cityofchesapeake.net/government/city-departments/departments/Public-Utilities-Department/engineering/policies.htm>
- Public Facilities Manual - <http://www.cityofchesapeake.net/government/City-Departments/Departments/Department-of-Development-and-Permits/construction-engineering/pfm.htm>

A more specific list of applicable ordinances addressing both LA and WLA pollutant sources are listed below. The list of legal authorities is extensive and provides the opportunity for improving bacterial water quality in the Elizabeth River and its tidal tributaries. A full copy of the City ordinances can be found online at [https://library.municode.com/va/chesapeake/codes/code\\_of\\_ordinances](https://library.municode.com/va/chesapeake/codes/code_of_ordinances).

- Sec. 10-23. -It shall be unlawful for any owner or person in control of any animal to: (a) allow any animal to defecate on the property of other persons without their consent or that of the authorized agent or person having control of the premises; or (b) allow any animal to defecate on public property, except that defecation by an animal shall not constitute a violation if the owner or person having control of the animal immediately removes the material defecated and disposes of it in a safe and sanitary manner. (Ord. No. 98-O-159, 10-27-98)
- Sec. 10-42 - It shall be unlawful for any dog, cat, or other domestic, companion animal, livestock, fowl, exotic, or wild animal held under captivity, to run at large in the City. (Ord. of 6-13-63, §§ 3-14, 7; Ord. of 1-25-65; Ord. of 1-26-65; Ord. of 4-8-69, § 1; Code 1970, §§ 4-16, 4-23; Ord. of 2-22-71; Ord. of 2-22-77, § 4-16; Ord. of 12-12-78; Ord. of 4-27-82; Ord. of 11-18-86; Ord. No. 98-O-067, 5-12-98; Ord. No. 99-O-011, 1-26-99; Ord. No. 07-O-001, 1-9-07; Ord. No. 11-O-101, 10-11-11; Ord. No. 12-O-008, 2-14-12)
- Sec. 10-101 - Commercial dog breeders shall ... dispose of dog waste in accordance with state and federal laws and regulations. (Ord. No. 11-O-101, 10-11-11)

- Sec. 26-364 - All non-stormwater connections to public stormwater management facilities must be approved by the city unless specifically exempted. Any non-stormwater discharge into stormwater management facilities except as authorized shall be illegal unless specifically exempted. (Ord. No. 14-O-060, 5-27-14)
- Sec. 38-7 - It shall be unlawful for any person to install or repair a septic tank or other sewage disposal system before obtaining a permit from the health officer specifying system design standards such as tank size, length of drainfield, and location of tank and drainfield. (Code 1970, § 12-7; Ord. of 8-17-76)
- Sec. 46-14 - Outdoor meetings and events. Any private property owner desiring to use property for an open air, tent or other outdoor meeting or event attended by 50 or more people shall provide adequate sanitary facilities on the premises for the persons attending. (Ord. of 5-31-66; Code 1970, § 17-35; Ord. of 11-15-77; Ord. of 12-20-88; Ord. of 5-9-89; Ord. No. 12-O-021, 2-28-12)
- Sec. 46-20 - Any person who urinates or defecates in public or in a place open to public view shall be guilty of a class 4 misdemeanor. (Code 1970, § 17-56; Ord. of 1-25-83)
- Sec. 50-6 - (a) No person shall discharge or otherwise place any substance in the waters of any lake, stream, bay or other body of water in or adjacent to any park or any tributary, stream, storm sewer or drain flowing into such water which will or may result in the pollution of such waters; (c) No person shall discharge sewage at a campground except into a designated holding tank. (Code 1970, § 17B-6; Ord. of 10-12-76; Ord. No. 92-O-149, § 17B-6, 10-13-92)
- Sec. 50-22 - In dog parks, the responsible party must clean up and dispose of waste left by their dogs and provide any necessary equipment for removal and disposal. (Ord. No. 02-O-039, 4-9-02; Ord. No. 14-O-012, 2-11-14)
- Sec. 62-7 - It shall be unlawful to throw or to cause to accumulate on streets, sidewalks or on private premises any filth or manure or any other article or substance which would render the premises unclean, unsightly, unsafe or affect the health of the community. (Code 1970, § 21-7; Ord. of 3-14-72)
- Sec. 66-13 - Any person who shall make any defective private sewer where the sewer passes under a public street, highway, easement or right-of-way, shall be guilty of a misdemeanor. (Ord. of 10-22-63, § 14; Code 1970, § 24-14)
- Sec. 78-52 – An improved piece of property located within the city's public utility franchise area and bordering upon a street or alley along which a public sewer line has been laid shall be connected to the public sewer line. (Ord. of 12-9-69, § 1; Code 1970, § 28-11; Ord. of 11-13-79; Ord. of 3-25-80; Ord. of 6-3-82; Ord. of 9-13-83; Ord. of 6-27-89; Ord. No. 01-O-077, 7-24-01; Ord. No. 06-O-034, 4-11-06; Ord. No. 08-O-155, 11-25-08; Ord. No. 14-O-095, 7-22-14; Ord. No. 15-O-104, 7-28-15; Ord. No. 15-O-130, 10-27-15)

## 6.0 ENHANCED EDUCATION, OUTREACH, AND TRAINING

The City’s education, outreach, and training program has been developed over time in an iterative manner based on periodic assessments of potential sources and the effective means of reducing these sources. As previously noted, education and outreach on proper disposal of pet waste is a requirement of the MS4 permit. The City will review the effectiveness of its pet waste education program annually and make changes as warranted.

The City also proposes to enhance its pet waste program by providing brochures, pet waste bag dispensers, and/or performing other initiatives directed at homeowner education on the need and value to pick up pet waste promptly in back yards and other places out of the public eye. The City may also develop targeted outreach to businesses such as veterinary clinics, kennels, and pet stores. Further, the City’s training program addresses all potential sources of illicit discharges, including bacteria. Implementation is documented in annual reports to DEQ.

The City conducts education and outreach activities on a variety of stormwater issues, including illicit discharges and bacterial pollution. Some activities are conducted annually while others vary from year to year. Each of these events provide additional opportunities for enhanced public education and outreach. **Table 6-1** summarizes public outreach and education events conducted in 2017.

**Table 6-1. Public Education and Outreach Events (2017)**

Outreach Event	Date
Chesapeake’s Notable Yards	March 27
Great American Cleanup	May 1
Clean the Bay Day	June 3
Chesapeake Recycles Day	March 11
	April 22
	June 10
	September 9
	October 21
	November 18

The City uses multiple media outlets such as websites, cable television, local television, regional television, radio stations, publications, and a Customer Service Center to disseminate stormwater information. The City also provides several other successful programs to providing citizen engagement opportunities. For example, rain barrel classes and planting workshops are held in partnership with the Chesapeake Master Gardeners. At each of these events, an educational session is provided explaining the importance of keeping our waterways clean and to provide the role that individual citizens play in this effort.

At the same time, the City lists information regarding TMDL pollutants of concern, including bacteria, on its web site and as part of the City’s Public Education and Outreach Plan. The City also periodically provides educational stormwater utility bill inserts. As a result, all City households are provided information promoting the elimination and reduction of bacterial sources of pollution.

The City currently implements many of its public education and outreach programs through the HRPDC Regional Stormwater Management Program. The HRPDC askHRGreen.org program has

focused on bacteria issues since inception using a mix of media outlets and methods to reach pet owners in the region. Items installed throughout the City, such as pet waste collection stations, and other tools emphasize the “bag-it, trash it” message.

Also in cooperation with AskHRGreen.org, the City has continued the City-wide Bay Star Homes program recognizing residents who pledge to avoid behaviors harmful to waterways. Participants receive a garden flag with the Bay Star Homes logo to spread awareness of the program. Dozens of homes in the City are participants. <http://askhrgreen.org/programs/bay-star-homes/>

Chesapeake is in the third year of a four-year partnership contract with the non-profit Elizabeth River Project. The Homeowner Engagement and Grant Program recruits Elizabeth River/Chesapeake Bay watershed residents to: engage in various stormwater pollution prevention actions; install residential stormwater management practices (BMPs) that result in actual pollutant reductions; and engage the larger community in learning how they can make a difference in improving local water quality. A complete Contract Year 2 Summary Report from the Elizabeth River Project was completed on October 31, 2017 regarding retrofits and BMP construction on private lands. **Table 6-2** summarizes activities completed in the second year under the contract.

**Table 6-2. Summary of Activities Completed Under the ERP Contract**

Description	Number
River Star Homes Recruited (Homeowner Education/Engagement Program)	291
Comprehensive Site (Opportunity) Assessments Completed at River Star Homes	57
Living Shorelines Installed	1
Shoreline Buffer Projects Completed	2
Super-Sized Rain Barrels Installed	45
Rain Gardens Installed	4
Organic Lawn Care Plans Created	29
Organic Lawn Care Plans Implemented	12

The Elizabeth River Project (ERP) will be focusing on an enhanced Pet Waste Education Program for the Eastern Branch of the Elizabeth River beginning in the summer of 2018. The City intends to support this ERP program and partner with ERP as appropriate. Additionally, the annual ERP Riverfest celebration is planned for a Chesapeake site located within the Eastern Branch watershed of the Elizabeth River. This will be a great opportunity to engage and educate the public on keeping the local waterways clean.

In light of the above highlights, Chesapeake believes that these education and outreach efforts meet the requirements for an enhanced program.

## **7.0 TMDL ACTION PLAN PROGRESS**

### **7.1 Schedule and Milestones**

The City will continue to execute its existing MS4 program in accordance with the approved MS4 Program Plan, dated June 2017. Additional actions identified in Section 4.0 and outlined below will be implemented and documented in the MS4 annual report as previously described.

Ongoing activities, implemented since 2010, will continue to be undertaken and include the following:

- performing inspection and dry weather screening program;
- completing high risk industrial/commercial outfall inspections;
- installing or retrofitting structural BMPs and restoration projects;
- installing pet waste stations;
- accomplishing pet waste baggie give-aways;
- actively promoting Bay Star Homes campaign;
- funding the River Star Homes contract with the Elizabeth River Project;
- participating on the Regional Septic Task Force; and,
- coordinating with HRSD on bacteria source tracking monitoring efforts as warranted
- continue Public Utilities infrastructure maintenance programs and investments, and continue to implement and grow the Cost Participation Program.

In addition, the following future activities are proposed:

- developing a targeted public education campaign regarding timely collection of pet waste at home or work;
- developing a bacteria monitoring program to characterize stormwater discharged from the MS4 to identify potential bacteria sources;
- investigate whether additional signage discouraging wildlife feeding may be beneficial at select locations including areas surrounding publicly maintained wet ponds;
- encouraging installation of vegetated buffers around BMPs to discourage occupancy by geese and other wildfowl; and,
- evaluating City park BMPs for buffer plantings both to discourage geese and to prevent pet waste contamination.

### **7.2 Assessing Effectiveness**

Unlike structural stormwater management controls, the practices put in place to reduce bacteria pollution do not have assigned reduction efficiencies. Further, ambient in-stream water quality monitoring programs, while effective at measuring overall progress toward bacteria reduction targets, are not appropriate indicators of MS4 permit compliance or for the success of programmatic activities in the near term. The City will assess the effectiveness of its efforts by reviewing the accomplishment for the previous year against permit requirements during submission of each Annual Report to DEQ.

### **7.3 Measurable Goals**

The City's measurable goal will be to reduce bacteria loads to the impaired waterbodies covered by the applicable TMDL through implementation of the existing and planned management controls in Section 4.0. Progress toward implementing the actions in this plan will be reported annually to DEQ in each MS4 permit annual report.

### **7.4 Estimated End Date**

The permit requires an estimated end date for achieving the wasteload allocations. The City estimates an end date of 30 years, or July 1, 2046, to achieve the wasteload allocations based on the limited data available regarding structural and non-structural BMP efficiencies at the time of this Action Plan development. Updates to this Action Plan are anticipated in future permit cycles. As the overall tracking process continues, the City will have the ability to document its progress and to more fully assess achievement dates for both individual and overall facets of the Action Plan.

**8.0 PUBLIC COMMENTS RECEIVED**

Comment	Received From	Date	City Response
<p>Regarding Wildlife Contribution Controls, we strongly support encouraging the installation of vegetated buffers around BMPs to discourage occupancy by geese and the development of BMP buffer guidance for residents, homeowners' associations, and civic leagues. We see vegetated buffers around BMPs as an important feature toward improving water quality while providing additional wildlife habitat. The Friends of Indian River would be interested in working with the City to implement such efforts.</p>	<p>Rogard Ross, on behalf of the Friends of Indian River</p>	<p>6/27/18</p>	<p>The City currently recommends that property owners leave a vegetated buffer around stormwater management lakes and ponds to prevent erosion, discourage wildlife, and improve water quality. There is currently no requirement or formal policy.</p>
<p>Regarding Education, Outreach, and Training, we urge the city to develop targeted "Scoop the Poop" outreach to businesses such as veterinary clinics, kennels, and pet stores.</p> <p>a) one immediate place to begin can be at Chesapeake Animal Services by including "Scoop the Poop" information along with all dog adoptions at the facility.</p> <p>b) another option to consider is including a flier with the mailing of city water bills or property tax bills.</p>	<p>Rogard Ross, on behalf of the Friends of Indian River</p>	<p>6/27/18</p>	<p>Targeted outreach to veterinary clinics, kennels, and pet stores is one of the strategies outlined in the Action Plan. The City will continue to pursue these actions, as well as partnering with the Elizabeth River Project on a targeted pet waste campaign.</p> <p>Targeted outreach at the Animal Services Facility is a great idea. The Public Works Department will work with Animal Services to educate pet owners and future pet owners.</p> <p>The City does include fliers in stormwater utility bills from time to time. The City will consider this suggestion to create content aimed at preventing pet waste.</p>