



City of Alexandria, Virginia

Municipal Separate Storm Sewer System (MS4) Program Plan



WINDMILL HILL LIVING SHORELINE

In compliance with Permit No. VAR040057, "General Virginia Pollutant Discharge Elimination System Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems."

Department of Transportation and Environmental Services
2900-B Business Center Drive
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Record of Document Updates & Changes

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Initial Document	N/A	May 1, 2019
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PY2 Update	Updated the draft Bay TMDL Action Plan to the final Plan. Included the final local TMDL Action Plans for Bacteria and PCBs.	July 1, 2020
PY2 Update	Updated Call.Click.Connect to Alex311 throughout.	July 1, 2020
PY3 Updates	Updated the title of a Public Facilities with SWPPPs to include Vehicle Wash Facility	July 1, 2021
PY3 Update	Updated the end date for the Nutrient Management Plans to reflect updated information	July 1, 2021
PY3 Update	Added Landscape Waste and Dewatering SOPs	July 1, 2021
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PY3 Update	Added reference to virtual events, speaking engagements, training, as well as the distribution of materials digitally, as appropriate.	July 1, 2021
PY3 Update	Updates made to the Water Quality Workgroup including the name and frequency of meetings.	July 1, 2021
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PY4 Update	Updated the frequency of the meetings for the SWWG.	July 1, 2022
PY4 Update	Updated the Local TMDL section to note that the annual report does include a summary of actions.	July 1, 2022
PY5 Update	Updated the IDDE section (page 17 and the Program Manual found in Appendix C) to include afterhours information.	September 28, 2022
PY5 Update	Updated organizational chart.	September 28, 2023
PY5 Update	Updated Twitter to X, formerly Twitter	September 28, 2023
PY5 Update	Updated the Employee Compliant Reporting Information	September 28, 2023
PY5 Update	Updated information for the City’s Nutrient Management Plans	September 28, 2023

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Appendix G – Phase II Chesapeake Bay TMDL Action Plan

Appendix H – Local TMDL Action Plans

CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."



9/28/2022

Signature

Date

Jesse Maines

Name

Division Chief, Department of T&ES
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City of Alexandria

Title

City of Alexandria

Municipal Separate Storm Sewer System (MS4) Program Plan

A. Introduction

This document represents the City of Alexandria (City) plan to meet the requirements of 9VAC25-890-40 “General VPDES (Virginia Pollutant Discharge Elimination System) Permit for Discharges from Small Municipal Separate Storm Sewer Systems (MS4s). The City was originally issued an MS4 general permit on July 8, 2003 (Permit No. VAR40057). The City was reissued a five-year MS4 general permit in 2008 and again in 2013. The current five-year permit was re-issued on November 1, 2018 and expires on October 31, 2023. To achieve the regulatory water quality goals, the permit requires the City to control the discharge of pollutants to the maximum extent practicable (MEP) by addressing permit special conditions and the following six minimum control measures (MCMs).

Six Minimum Control Measures

1. Public Education and Outreach
2. Public Involvement and Participation
3. Illicit Discharge Detection and Elimination
4. Construction Site Stormwater Runoff Control
5. Post-Construction Stormwater Management for New Development and Development on Prior Developed Lands
6. Pollution Prevention and Good Housekeeping for Facilities Owned or Operated by the Permittee within the MS4 Service Area

On January 9, 2017, the Environmental Protection Agency (EPA) promulgated revised regulations governing how small MS4s obtain coverage under National Pollutant Discharge Elimination System (NPDES) general permits. The *Final MS4 General Permit Remand Rule* established two alternative approaches for administering the permits: (1) traditional general permit approach and (2) procedural approach. The Virginia Department of Environmental Quality (DEQ) developed the 2018-2023 permit in accordance with the traditional general permit approach, and as a result, the permit contains very specific, enforceable requirements and it is not necessary for the details of the MS4 program plan to be included as enforceable terms of the permit. DEQ interprets EPA’s remand rule to mean that program plans are meant to describe how permittees will meet the requirements of the permit and allow for the plan to be revised in accordance with an adaptive management approach. All enforceable provisions of the MS4 program are contained within the permit and approval of the MS4 program plan by DEQ is not necessary.

In addition to the 2018-2023 permit containing more specific requirements, several other changes have been made as compared to the previous permit which will require changes to the City’s stormwater management program. This document outlines the requirements contained in the 2018-2023 permit and describes how the City will meet the requirements of the new permit through October 31, 2023.

The new permit requires the City to update the MS4 Program Plan no later than six months after the permit effective date (e.g., May 1, 2019) unless otherwise specified in another permit condition. In addition, the permit requires that the permittee shall post the most up-to-date version of the MS4 Program Plan on the permittees website within 30 days of updating the plan. This version of the MS4 Program Plan supersedes

the previously dated program plans. Revisions to the MS4 Program plan are expected through the life of this permit as part of the iterative process to reduce stormwater pollution and protect water quality. As such, revisions made to the plan as a result of the iterative process shall be summarized as part of the annual report.

A key obligation contained in the permit is the requirement to submit an Annual Report by October 1st of each year. This Program Plan identifies how the City will maintain compliance with its MS4 General Permit, while the Annual Report documents the status of implementation of the Program Plan for each permit year. In effect, the Program Plan comprises a road map for compliance, which requires continuous management efforts and substantial resource commitments on the part of the City.

B. Stormwater Management Program Organization

While stormwater activities and functions are divided among several different departments and divisions, the Department of Transportation and Environmental Services (T&ES) has the primary responsibility for coordinating compliance with the permit. VPDES permit compliance activities are coordinated through the Stormwater Division within the Department of Transportation and Environmental Services (T&ES-SWM). While T&ES-SWM is responsible for overall permit coordination, including the submittal of annual reports and program plan updates, several other departments and divisions have important roles in implementing the VPDES permit. The following organizational chart provides an overview of relationships between the different departments and division and outlines roles and responsibilities.

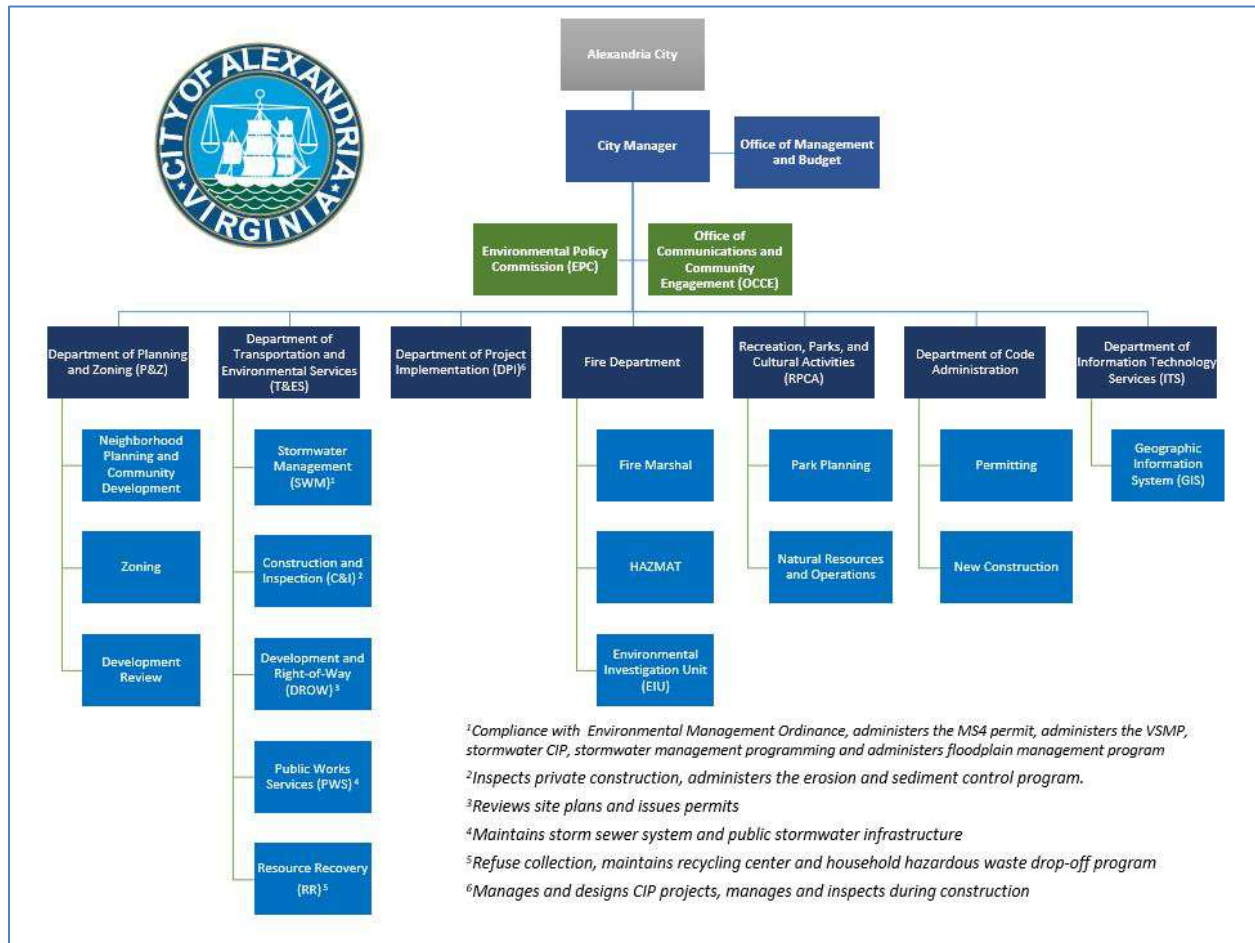


Figure 1. Organization of the City of Alexandria's Stormwater Management Program

The following acronyms and abbreviations are used in this Plan are listed in the table below.

Department and Division Acronyms

Acronym	Department or Division
ARENEW	Alexandria Renew Enterprises
Code	Department of Code Administration
DPI	Department of Project Implementation
EIU	Environmental Industrial Unit coordinating group (from T&ES, Health Department, FD, RPCA, P&Z, General Services, Alexandria Renew Enterprises, Alexandria City Public Schools, Virginia American Water and OCPI)
EPC	Environmental Policy Commission
FD	Fire Department
GS	Department of General Services
GS-FSD	Department of General Services, Fleet Services Division
ITS	Department of Information Technology Services
ITS-GIS	Department of Information Technology Services, Geographic Information Systems Division
NVRC	Northern Virginia Regional Commission
OCPI	Office of Communications & Public Information
P&Z	Department of Planning and Zoning
RPCA	Department of Recreation, Parks, and Cultural Activities
SWCB	Virginia State Water Control Board
T&ES	Department of Transportation and Environmental Services
T&ES-DROW	T&ES, Development and Right of Way Services
T&ES-SWM	T&ES, Stormwater Management Division
T&ES-C&I	T&ES, Construction and Inspection Division
T&ES-PWS	T&ES, Public Works Services Division
T&ES-RR	T&ES, Resource Recovery Division

C. Minimum Control Measures

The following describes the best management practices (BMPs) that the City will utilize and implement to meet each of the six minimum control measures (MCMs). Included with each BMP is a description of:

- Policies, ordinances, schedules, inspection forms, written procedures, and other documents necessary for BMP implementation.
- The objective and expected results of each BMP in meeting the measurable goals of the minimum control measure.
- Roles and responsibilities for BMP implementation.
- The implementation schedule for the proposed BMP.
- Documentation and the method that will be utilized to determine the effectiveness of the BMP.

1.0 MCM #1: Public Education and Outreach

Permit Reference Part I.E.1.

Relevant Excerpts:

- a. *The permittee shall implement a public education and outreach program designed to:*
 1. *Increase the public's knowledge of how to reduce stormwater pollution, placing priority on reducing impacts to impaired waters and other local water pollution concerns;*
 2. *Increase the public's knowledge of hazards associated with illegal discharges and improper disposal of waste, including pertinent legal implications; and*
 3. *Implement a diverse program with strategies that are targeted toward individuals or groups most likely to have significant stormwater impacts.*
- b. *The permittee shall identify no less than three high-priority stormwater issues to meet the goal of educating the public in accordance with Part I E 1 a. High-priority issues may include the following examples: Chesapeake Bay nutrients, pet wastes, local receiving water impairments, TMDLs, high-quality receiving waters, and illicit discharges from commercial sites.*
- c. *The high-priority public education and outreach program, as a whole, shall:*
 1. *Clearly identify the high-priority stormwater issues;*
 2. *Explain the importance of the high-priority stormwater issues;*
 3. *Include measures or actions the public can take to minimize the impact of the high-priority stormwater issues; and*
 4. *Provide a contact and telephone number, website, or location where the public can find out more information.*
- d. *The permittee shall use two or more of the strategies listed in Table 1 below per year to communicate to the public the high-priority stormwater issues identified in accordance with Part I E 1 b including how to reduce stormwater pollution.*
- e. *The permittee may coordinate its public education and outreach efforts with other MS4 permittees; however, each permittee shall be individually responsible for meeting all of its state permit requirements.*
- f. *The MS4 program plan shall include:*
 1. *A list of the high-priority stormwater issues the permittee will communicate to the public as part of the public education and outreach program;*
 2. *The rationale for selection of each high-priority stormwater issue and an explanation of how each education or outreach strategy is intended to have a positive impact on stormwater discharges;*
 3. *Identification of the public audience to receive each high-priority stormwater message;*
 4. *The strategies from Table 1 of Part I E 1 d to be used to communicate each high-priority stormwater message; and*
 5. *The anticipated time periods the messages will be communicated or made available to the public.*

Table 1 Strategies for Public Education and Outreach	
Strategies	Examples (provided as examples and are not meant to be all inclusive or limiting)
Traditional written materials	Informational brochures, newsletters, fact sheets, utility bill inserts, or recreational guides for targeted groups of citizens
Alternative materials	Bumper stickers, refrigerator magnets, t-shirts, or drink koozies
Signage	Temporary or permanent signage in public places or facilities, vehicle signage, bill boards, or storm drain stenciling
Media Materials	Information disseminated through electronic media, radio, televisions, movie theater, or newspaper
Speaking engagements	Presentations to school, church, industry, trade, special interest, or community groups
Curriculum materials	Materials developed for school-aged children, students at local colleges or universities, or extension classes offered to local citizens
Training materials	Materials developed to disseminate during workshops offered to local citizens, trade organization, or industrial officials



Program Plan Update Requirement

The City developed the required Public Education and Outreach Plan in the previous permit cycle (2013-2018). The plan has been updated in accordance with the new requirements in Part I.E.1.a of the current general permit. The plan is incorporated below.

Public Education and Outreach Plan Development

The City seeks to change pollution causing behaviors through effective public education and outreach and has developed the Public Education and Outreach Plan in accordance with Part I.E.1 of the MS4 permit. The plan is integrated into the BMPs below for MCM #1 and has been revised with this updated Program Plan. The public education outreach program is designed to provide general pollution prevention awareness and to target specific audiences to increase their knowledge about the steps that can be taken to reduce stormwater pollution and the hazards associated with illegal discharges and improper disposal of waste. The plan specifically focuses on reducing impacts to impaired waters and other local water pollution concerns through the identification of high-priority stormwater issues.

Identification of High-Priority Stormwater Issues: The MS4 permit requires that the City identify a minimum of three high-priority stormwater issues that contribute to stormwater pollution, provide a rationale for their selection, and explain how each education and outreach strategy is intended to have a positive impact of stormwater discharges.

The public education and outreach program will focus on the following high-priority stormwater issues identified by the City:

1. Chesapeake Bay Nutrients (phosphorus and nitrogen);
2. Pet Waste; and,
3. Illicit Discharges.

Each of these high-priority stormwater issues will be addressed through the City's local efforts and participation in the Northern Virginia Regional Commission (NVRC) Clean Water Partners program. The NVRC Clean Water Partners memorandum of agreement can be found in Appendix A. The following rationale provides the basis of selecting the top three high-priority issues and explains their importance:

1. *Chesapeake Bay Nutrients*

The Chesapeake Bay TMDL was developed by EPA in December 2010 to address nutrient and sediment contributions from the agricultural, wastewater, and urban stormwater sectors. Excess nutrients can cause algae blooms, and when the algae die, they consume oxygen in the water, creating dead spots where aquatic life cannot survive. Sediment deposited in stream beds can smother aquatic life and harm fish. In response to the Bay TMDL and state reduction requirements, Virginia has adopted a Phase 1, Phase 2, and Phase 3 Watershed Implementation Plans (WIP). These plans identify specific strategies for reducing the pollutants of concern in order to meet the Bay TMDL. Specific nutrient and sediment reduction targets have been included in the MS4 permit since the 2013-2018 cycle and are found in Part II TMDL Special Conditions under section A of the current permit. These reductions will be achieved through the implementation of a toolbox approach that includes current approved methods and possible future-approved methods. Primarily, these reductions will be met through redevelopment under the Virginia Stormwater Management Program regulations coupled with the City's more stringent local ordinance, retrofits of regional facilities, retrofits on City properties and rights-of-way, bi-lateral trading with ARenew, and stream restoration. In addition, nutrient pollution can be significantly impacted through public education via messaging that targets the misapplication of fertilizers to urban lawns.

2. *Pet Waste*

Bacteria from pet waste has been identified as one of the top three high-priority stormwater issues to target for education and outreach activities. While wildlife is considered potential large contributors to the bacteria load associated with parks and open space, pets are associated with residential lands and the potential bacteria sources associated with urban lands. Non-tidal and Tidal Four Mile Run stream segments are listed as impaired by DEQ for fecal coliform and TMDLs have been developed for both. Additionally, bacteria TMDLs (*E. coli*) have been developed and approved for Hunting Creek, Cameron Run, and Holmes Run watersheds. Potential key sources of bacteria from the MS4-permitted area may include pets and wildlife. Since public education and outreach is not an effective strategy to manage bacteria from wildlife, the City is focusing on targeting efforts on pet owners in the City.

3. *Illicit Discharges*

The improper handling and disposal of waste materials can pose potential impacts to local water quality and has been identified as one of the top three high-priority stormwater issues. More specifically, the City has documented improper disposal of restaurant and food preparation materials (cooking oils, waste grease, food waste, trash), cleaning materials (soaps, wash water), and other general household materials (paint, pesticides, cleansers) into the storm drain system as having occurred within the City. Public complaint reporting and observations from proactive investigations have identified these as potential sources of pollution and messaging will be targeted to preventing these and other illicit discharges.

Strategies for Public Education and Outreach: As documented in Table 1 of the permit, the City may employ several different strategies for public education and outreach. The City currently uses and will continue to use most of the strategies listed in the table. For the specific strategies used for each high-priority stormwater issues, please see the sections below.

BMP 1A - Traditional Written Materials

Traditional written materials are a proven and reliable strategy. The City has created general stormwater educational flyers/brochures and pamphlets that are distributed at various outreach events. The pamphlets include:

- Best Management Practices for Landscaping and Lawn care Companies;
- Best Management Practices for Restaurant and Food Handling Businesses;
- Best Management Practice for Automotive Garages and Service Centers;
- Make Your Home the Solution to Stormwater Pollution
- Pet Waste;
- Polychlorinated Biphenyls; and
- Household Hazardous Waste & Electronics Recycling Program.

BMP 1B - Alternative Materials

Also distributed at outreach events are promotional items, or alternative materials, that include the City's Eco-City Clean Waterways logo. T&ES-SWM makes it a priority to select promotional items that are useful and related to stormwater while the logo brings awareness of the City's goal of improved water quality and clean waterways.



BMP 1C - Signage

The City requires all new and redevelopment projects to provide and install signage or labeling to identify new surface structural stormwater BMPs. This requirement is implemented during the City site plan approval process.

Additionally, the City has installed stream crossing signs at hike and/or bike trails that cross major waterways. The City maintains and replaces these signs as needed. The signs promote awareness of Alexandria's surface water resources, water bodies, and drainage basins.



The City was one of the first localities in Northern Virginia to implement a storm drain marking program. The City continues to require new development and redevelopment to mark storm drain inlets within the development and located within 50 feet of the project with information on the drainage destination of waters entering the structures. In addition, City staff continue to promote the storm drain marking program at community events and to work with interested residents to implement storm drain marking.

BMP 1D - Media Materials

The City continues to host a stormwater quality web page and has created a dedicated web page at www.alexandriava.gov/Stormwater. The page has information about the City's Stormwater Management Program, the Chesapeake Bay Action Plan, the City's Virginia Stormwater Management Program (VSMP), the MS4 Program – to include the Program Plan and each annual report for the current permit cycle – and provides information for residents to learn how they can protect local streams and rivers. In addition, pages linked to this main page contain external links for the Chesapeake Bay Preservation Act, VSMP requirements, and the Construction General Permit. It also contains information and links for the City's Environmental Management and Erosion and Sediment Control ordinances as well as the Clean Water Partner's www.onlyrain.org website. Staff continues to add new content to the site and update existing content.

In addition, to the City highlights upcoming events or important information, and posts information on the T&ES Facebook page and "X" (formerly Twitter) account. These tools are used to promote water quality events such as volunteer stream cleanups, "build your own" rain barrel workshops, pre-made rain barrel sales events, and other water quality related topics.

To distribute important information, the City uses *Alexandria eNews*, which is a service that allows users to receive information through email on nearly 100 topics (including stormwater related messages). Users sign up for these email alerts and can choose what specific informational topics. For example, individuals may choose to receive news with a specific focus on environmental and water quality issues, and/or information on volunteer opportunities, tips, and workshops. T&ES and the Office of Communication & Public Information (OCPI) work closely together to widely distribute eNews messages and other Citywide information.

In 2016, the City developed a video about stormwater pollution prevention and the City's Stormwater Program. This video can be found on the City's Stormwater website via a YouTube link and is also aired on both the government access channel (Channel 70) and the community access channel (Channel 69).

Finally, the City maintains its online resident reporting capabilities via Alex311 as indicated under BMP 3D.

BMP 1E - Speaking Engagements

T&ES-SWM staff often presents at various meetings and events including out rain barrel workshops, homeowner association meetings, and stream clean-ups. In addition, staff has also presented to students at Northern Virginia Community College about stormwater and the importance of pollution prevention. These activities all create awareness regarding the importance of preventing stormwater pollution. Speaking engagements may be in-person and virtual/online.

Coordination with Regional Efforts: In addition to local efforts, the City continues to participate with other MS4 communities in regional public education efforts through the Northern Virginia Regional Commission (NVRC) Clean Water Partners program. The program leverages local resources to reach a larger regional audience through a mix of media such as radio, TV, online and print. NVRC focuses on nutrients from lawns and gardens, pet waste, and illicit discharge as their three high-priority stormwater issues.

Assessment: In the beginning of the previous permit cycle (2013-2018), the City included used motor oil recycling as one of the three high-priority issues. However, based on the annual NVRC surveys showing that individuals are less likely to change their own oil, the City replaced the motor oil issue with illicit discharges in 2015. The City will continue to evaluate each high-priority stormwater issues yearly to determine if any changes should be made.

The City will implement the local education and outreach activities to address each of the three high-priority issues during this permit cycle. The City will also annually assess the effectiveness of each of these strategies toward meeting MS4 permit goals. If these selected BMPs are determined to not be meeting the goals, the City revise the program accordingly and document any changes in this Program Plan.

High Priority Issue #1 - Chesapeake Bay Nutrients

The following table provides the strategies that the City will use to communicate the importance of reducing the amount of nutrients in the Chesapeake Bay. In addition, each strategy includes a description, the corresponding potential positive impact, parties responsible for implementation, the time period or schedule that the message will be communicated, documentation, and measurable goal.

Strategy Name	Description	Impact on Stormwater Discharges	Public Audience	Responsible Parties	Implementation Schedule	Documentation	Measurable Goal
Traditional Written Materials	Distribute proper fertilization pamphlets and other written materials at outreach events	Provide education and outreach written materials on the proper use and application of fertilizers to reduce and minimize the impact of nutrients on waterways	Individuals attending outreach events	T&ES-SWM	Distribute materials at outreach events.	Sample written materials distributed	Dates and location of outreach events with the approximate number of attendees
Signage	Place BMP identification signs at surface structural stormwater BMPs (bioretention, swales, green roofs, etc.)	Increase awareness of structural stormwater BMPs used to treat stormwater by removing nutrients and improving water quality	Individuals that pass by existing surface structural stormwater BMPs	T&ES-SWM in coordination with private developers	Install surface structural stormwater BMP signs at when each BMP is installed	Location map with BMPs	The total number of BMPs within the City
Media Materials	Use eNews (City electronic news distribution system), social media (Facebook or “X” (formerly Twitter)), television, and/or websites to convey message	Provide education and outreach on the proper use and application of fertilizers to reduce and minimize the impact of nutrients	General public	T&ES-SWM in coordination with OCPI and NVRC Clean Water Partners for regional efforts	Annually distribute 1 eNews and 1 social media post. Implement television advertising and post information on the City’s Stormwater Quality webpage	eNews, social media posts, screen captures of webpage	The number of individuals signed up to receive the City’s eNews. The number of Facebook Page followers and “X” (formerly Twitter) followers. The number of visits to the Stormwater Management webpage. Clean Water Partners Only Rain Summary Report of Findings
Speaking Engagements	Present at no less than 2 events per year and include a message about excess nutrient in stormwater	Provide education on the proper use and application of fertilizers to reduce and minimize the impact of nutrients	Individuals attending the activity, event, or class	T&ES-SWM	Annually present at no less than 2 events per year	Presentation materials	Dates and locations of presentations with the approximate number of attendees

High Priority Issue #2 - Pet Waste

The following table provides the strategies that the City will use to communicate the importance of reducing the amount of nutrients in the Chesapeake Bay. In addition, each strategy includes a description, the corresponding potential positive impact, parties responsible for implementation, the time period or schedule that the message will be communicated, documentation, and measurable goal.

Strategy Name	Description	Impact on Stormwater Discharges	Public Audience	Responsible Parties	Implementation Schedule	Documentation	Measurable Goal
Traditional Written Materials	Distribute pet waste pamphlets and other written materials at outreach events and give to the Animal Welfare League of Alexandria to provide in the pet adoption package	Provide education and outreach written materials on the proper disposal of pet waste to reduce the amount of bacteria that is carried to waterways	Individuals attending outreach events and adopting pets	T&ES-SWM in coordination with the Animal Welfare League of Alexandria	Distribute materials at outreach events and continuously distribute materials as pets are adopted	Sample written materials distributed	Dates and location of outreach events with the approximate number of attendees Number of pamphlets handed out with pet adoptions
Signage	Installation, maintenance, and re-stocking of pet waste stations with appropriate signage	Provide waste stations and/or bags for waste stations to make it convenient for pet owners to properly dispose of pet waste to reduce the amount of bacteria that is carried to waterways	Individuals using the area with their pet	T&ES-SWM in coordination with RPCA and general public	Provide bags to refill pet waste stations as needed	Photo of new pet waste station, documentation of existing pet waste stations	Number of existing and new pet waste stations Number of pet waste bags used and distributed to refill stations
Media Materials	Use eNews (City electronic news distribution system), social media (Facebook or “X” (formerly Twitter)), television, and/or websites to convey message	Provide education and outreach on the proper disposal of pet waste to reduce the amount of bacteria that is carried to waterways	General public	T&ES-SWM in coordination with OCPI and NVRC Clean Water Partners for regional efforts	Annually distribute 1 eNews and 1 social media post. Implement television advertising and post information on the City’s Stormwater Quality webpage	eNews, social media posts, screen captures of webpage	The number of individuals signed up to receive the City’s eNews. The number of Facebook Page followers and “X” (formerly Twitter) followers. The number of visits to the Stormwater Management webpage. Clean Water Partners Only Rain Summary Report of Findings
Speaking Engagements	Present at no less than 2 events per year and include a message about proper disposal of pet waste	Provide education on the proper disposal of pet waste to reduce the amount of bacteria that is carried to waterways	Individuals attending the activity, event, or class	T&ES-SWM	Annually present at no less than 2 events per year	Presentation materials	Dates and locations of presentations with the approximate number of attendees

High Priority Issue #3 - Illicit Discharges

The following table provides the strategies that the City will use to communicate the importance of reducing, recognizing, and reporting illicit discharges. In addition, each strategy includes a description, the corresponding potential positive impact, parties responsible for implementation, the time period or schedule that the message will be communicated, documentation, and measurable goal.

Strategy Name	Description	Impact on Stormwater Discharges	Public Audience	Responsible Parties	Implementation Schedule	Documentation	Measurable Goal
Traditional Written Materials	Distribute household hazardous waste pamphlets and other written materials at outreach events.	Provide education and outreach written materials on the proper disposal of household hazardous waste to reduce illicit discharges	Individuals attending outreach events and adopting pets	T&ES-SWM in coordination with T&ES-RR	Distribute materials at outreach events	Sample written materials distributed	Dates and location of outreach events with the approximate number of attendees
Signage	Install storm drain markers	Reduce dumping and increase awareness by visually alerting residents that anything that goes down the storm drain goes to the local waterway and is not treated	Individuals traveling past storm drains with the markers	T&ES-SWM in coordination with P&Z, private developers, and general public	Provide markers to public and private developers as needed	Graphic of the storm drain marker and sample plan sheet with the requirement for private developers to place the markers on all storm drains within 50-ft of the project	Number of markers placed
Media Materials	Use eNews (City electronic news distribution system), social media (Facebook or “X” (formerly Twitter)), television, and/or websites to convey message	Provide education and outreach on the proper disposal of non-stormwater materials to reduce illicit discharges along with recognizing and reporting illicit discharges	General public	T&ES-SWM in coordination with OCPI and NVRC Clean Water Partners for regional efforts	Annually distribute 1 eNews and 1 social media post. Implement television advertising and post information on the City’s Stormwater Quality webpage	eNews, social media posts, screen captures of webpage	The number of individuals signed up to receive the City’s eNews. The number of Facebook Page followers and “X” (formerly Twitter) followers. The number of visits to the Stormwater Management webpage. Clean Water Partners Only Rain Summary Report of Findings
	Have a reporting mechanism on the City’s website so that residents can report potential illicit discharges	Ensure the reporting of potential illicit discharges is convenient so that City staff can investigate and determine the source	General public	T&ES-SWM and EIU	Have the reporting mechanism continuously available	Screen capture of the webpage with the reporting mechanism	The number of stormwater pollution related complaints received
Speaking Engagements	Present at no less than 2 events per year and include a message about illicit discharges	Provide education on the proper disposal of non-stormwater materials to reduce illicit discharges	Individuals attending the activity, event, or class	T&ES-SWM	Annually present at no less than 2 events per year	Presentation materials	Dates and locations of presentations with the approximate number of attendees

General Stormwater Pollution Prevention Public Education and Outreach

The following table provides the strategies that the City will use to communicate the general importance of water quality and stormwater pollution prevention. In addition, each strategy includes a description, the corresponding potential positive impact, parties responsible for implementation, the time period or schedule that the message will be communicated, documentation, and measurable goal.

Strategy Name	Description	Impact on Stormwater Discharges	Public Audience	Responsible Parties	Implementation Schedule	Documentation	Measurable Goal
Traditional Written Materials	Distribute other written materials about water quality and stormwater pollution prevention at outreach events.	Provide education and outreach written materials on about water quality and stormwater pollution prevention to increase awareness of the harmful effects of stormwater pollution	Individuals attending outreach events	T&ES-SWM	Distribute materials at spring and fall outreach events	Sample written materials distributed	Dates and location of outreach events with the approximate number of attendees
Alternative Materials	Distribute promotional items (giveaways) at education and outreach events. Include the Eco-City Alexandria Clean Waterways logo on these items, where possible.	Provide promotional items to increase awareness of the harmful effects of stormwater pollution	General public	T&ES-SWM	Distribute items at spring and fall outreach events	Photos of graphics of some of the items distributed	Dates and location of outreach events with the approximate number of attendees
Signage	Install and maintain stream crossing signs	Promote awareness of Alexandria’s surface water resources, water bodies, and drainage basins	Individuals traveling past stream crossing signs	T&ES-SWM	Annually, check the stream crossing signs, and replace and/or maintain as needed	Photo of one of the stream crossing signs	Number of existing signs and number of signs added or replaced
Media Materials	Use social media (Facebook or “X” (formerly Twitter)), website, and/or television including airing the City’s stormwater pollution prevention video on the government/community access channel	Provide education and outreach on the proper disposal of non-stormwater materials on about water quality and stormwater pollution prevention to increase awareness of the harmful effects of stormwater pollution	General public	T&ES-SWM in coordination with OCPI and NVRC Clean Water Partners for regional efforts	Annually distribute 1 social media post Continuously maintain information on the City’s Stormwater Quality webpage Air the stormwater pollution prevention video at least daily on the government/community access channel	Screen captures of social media posts, webpage and video	The number of individuals signed up to receive the City’s eNews and the number of Facebook Page followers and Twitter followers The number of visits to the Stormwater Management webpage.
Speaking Engagements	Present at no less than 2 events per year to include message about water quality and stormwater pollution prevention	Provide education on stormwater pollution prevention to improve water quality	Individuals attending the activity, event, or class	T&ES-SWM	Annually present at no less than 2 events per year	Presentation materials	Dates and locations of presentations with the approximate number of attendees

2.0 MCM #2: Public Involvement and Participation

Permit Requirement: Part I.E.2.

Relevant Excerpts

- a. *The permittee shall develop and implement procedures for the following:*
 1. *The public to report potential illicit discharges, improper disposal, or spills to the MS4, complaints regarding land disturbing activities, or other potential stormwater pollution concerns;*
 2. *The public to provide input on the permittee's MS4 program plan;*
 3. *Receiving public input or complaints;*
 4. *Responding to public input received on the MS4 program plan or complaints; and*
 5. *Maintaining documentation of public input received on the MS4 program and associated MS4 program plan and the permittee's response.*
- b. *No later than three months after this permit's effective date, the permittee shall develop and maintain a webpage dedicated to the MS4 program and stormwater pollution prevention. The following information shall be posted on this webpage:*
 1. *The effective MS4 permit and coverage letter;*
 2. *The most current MS4 program plan or location where the MS4 program plan can be obtained;*
 3. *The annual report for each year of the term covered by this permit no later than 30 days after submittal to the department;*
 4. *A mechanism for the public to report potential illicit discharges, improper disposal, or spills to the MS4, complaints regarding land disturbing activities, or other potential stormwater pollution concerns in accordance with Part I E 2 a (1); and*
 5. *Methods for how the public can provide input on the permittee's MS4 program plan in accordance with Part I E 2 a (2).*
- c. *The permittee shall implement no less than four activities per year from two or more of the categories listed in Table 2 below to provide an opportunity for public involvement to improve water quality and support local restoration and clean-up projects.*
- d. *The permittee may coordinate the public involvement opportunities listed in Table 2 with other MS4 permittees; however, each permittee shall be individually responsible for meeting all of the permit requirements.*
- e. *The MS4 program plan shall include:*
 1. *The webpage address where mechanisms for the public to report (i) potential illicit discharges, improper disposal, or spills to the MS4, (ii) complaints regarding land disturbing activities, or (iii) other potential stormwater pollution concerns;*
 2. *The webpage address that contains the methods for how the public can provide input on the permittee's MS4 program; and*
 3. *A description of the public involvement activities to be implemented by the permittee, the anticipated time period the activities will occur, and a metric for each activity to determine if the activity is beneficial to water quality. An example of metrics may include the weight of trash collected from a stream cleanup, the number of participants in a hazardous waste collection event, etc.*

BMP 2A – Public Reports, Input, and Participation Procedures

Description, Objective and Expected Results: Providing an opportunity for public input and comment allows the City to take advantage of the expertise of residents, strengthens community understanding of the program objectives, and ensures community support. The City is also committed to complying with all local, state, and federal public notice requirements for local ordinances or legislative actions related to the stormwater management program.

To address Part I.E.2.a of the permit, the following public notice and participation procedures and methods have been developed, as presented below, and will be implemented during the 2018-2023 permit cycle:

Public Reports of Illicit Discharges, Complaints, and/or Input

Alex311 is the City’s web-based problem reporting form and call center (703-746-HELP) that can be used by residents and others to report suspected illicit discharges (including improper disposal or spills), complaints (including ones regarding land disturbing issues), and other input. The reporting form can be found on the homepage at www.alexandriava.gov and is available on subordinate webpages (<https://www.alexandriava.gov/93364>). Responses to submitted reports are entered into the Alex311 system and can be made viewable to the public or if an email address is provided, staff may respond via email. Typically, suspected illicit discharge reports are responded to via phone or email if the proper contact information is available. Additionally, the main phone number (703-746-6499) for T&ES-SWM can be used by the public and is found on several City Stormwater webpages, including the Illicit Discharge webpage (<https://www.alexandriava.gov/93348>). The City also utilizes 911 for reports of suspected hazardous illicit discharges. In an event an IDDE is reported “after hours” (defined as for weekdays, 4 p.m. to 7 a.m., weekends and holidays), the City will follow Emergency Standby Procedures, which indicates that if the event is thought to be hazardous or cause wildlife death to contact 911; otherwise to call the Fire Marshall’s Dispatch Center.

MS4 Program Plan

In accordance to Part I.C.3, this MS4 Program Plan will be posted on the City’s Stormwater MS4 Program webpage (<https://www.alexandriava.gov/93364>) no later than 30 days of updating the plan. The webpage includes a general email address (MS4ProgramPlan@alexandriava.gov) and the main phone number for T&ES-SWM for the public to use to submit input and feedback on the plan. The emails will be kept in a separate email account and compiled. Input and/or feedback that requires a response, will be responded to within 14 days of receipt. If corresponding updates are required to the MS4 Program Plan as a result of the input and/or feedback, these updates will be made within 60 days of receipt and the updated plan will be posted on the website. Documentation of the input and/or feedback and the City’s response will be kept electronically in a folder on the City’s server, which is periodically backed-up.

Implementation and Schedule:

- Maintain Alex311 along with the main phone number for T&ES-SWM. Reference these items on the City’s webpage.
- Post the updated MS4 Program Plan no later than 30 days after update for public input and feedback. Updates to the Program Plan shall be completed as needed and posted on the City’s MS4 webpage within 30 days of the update.
- Each annual report shall be posted online within 30 days of submittal to the department. Annual reports shall be retained online for the duration of the permit.

Responsible Party: T&ES-SWM is responsible for responding to stormwater related complaints received through the Alex311 system, maintaining the T&ES-SWM phone number, and posting the MS4 Program plan and is assisted by OCPI.

Documentation and Measurable Goal: In the annual report, the City will include a screen capture of the Alex311 page and the webpage with the phone number for T&ES -SWM. In addition, the City will provide a summary of any public input on the MS4 program received and how the City responded.

BMP 2B – MS4 Program and Stormwater Pollution Prevention Webpage

Description, Objectives and Expected Results: The City has developed a website dedicated to stormwater pollution prevent, water quality and the MS4 Program at www.alexandriava.gov/Stormwater that has links to other aspects of the stormwater management program. According to 2016 Census data, over 81% of households in the United States have access to the internet. The site provides information about the program, serves as a forum to distribute educational materials, and includes information on where to report suspected illegal dumping.

In accordance with Part I.E.2.b, the MS4 Program and Stormwater Pollution Prevention webpage contains or will contain by the applicable due date:

1. Current MS4 permit and coverage letter;
2. Most current MS4 Program Plan;
3. Annual reports;
4. T&ES-SWM main phone number and link to Alex311 for reporting illicit discharging or other potential stormwater pollution concerns; and
5. Email address for providing input on the MS4 Program Plan.

The website is a tool to provide water quality and pollution prevention information to the general public in an easily accessible format. It also provides a way to make documents accessible to the public for review and comment.

Implementation and Schedule:

- Continue to host the website and update it with the most recent MS4 Program Plan and annual reports, as they are completed.
- Continue to maintain the Alex311 web portal.

Responsible Party: T&ES-SWM is responsible for keeping site content up-to-date and for assessing options for increasing site traffic. ITS is responsible for website hosting and technical development.

Documentation and Measure of Effectiveness: The City will provide the webpage address and a snapshot of the webpage.

BMP 2C – Local Activities Public Involvement

Description, Objective and Expected Results: By implementing at least four activities per year, the City will increase overall stormwater quality awareness and education, strengthen private environmental stewardship efforts, and provide citizens with a broad range of environmentally related volunteer and engagement opportunities.

In accordance with Part I.E.2.c, the City will implement no less than four activities per year from two or more of the categories listed in Table 2, below.

Table 2 Public Involvement Opportunities	
Public involvement opportunities	Examples (provided as example and are not meant to be all inclusive or limiting)
Monitoring	Establish or support citizen monitoring group
Restoration	Stream or watershed clean-up day, adopt-a-water way program,
Educational events	Booth at community fair, demonstration of stormwater control projects, presentation of stormwater materials to schools to meet applicable education Standards of Learning or curriculum requirements, watershed walks, participation on environmental advisory committees
Disposal or collection events	Household hazardous chemicals collection, vehicle fluids collection
Pollution prevention	Adopt-a-storm drain program, implement a storm drain marking program, promote use of residential stormwater BMPs, implement pet waste stations in public areas, adopt-a-street program.

Monitoring

The City has been conducting stream monitoring workshops twice a year and anticipates continuing these semi-annual workshops to convey the importance of water quality for education and outreach purposes. Monitoring is done using the Virginia Save Our Streams methodology where benthic macroinvertebrates are sampled. The City considers these workshops as activities that go above the permit requirements since the four activities required by the permit are met through the restoration and education activities described below.

Restoration

The City will implement at least two clean-ups per year; if there are no extenuating health and safety concerns such as the COVID-19 pandemic. Examples of cleanups include the Alice Ferguson Foundation Trash Free Potomac Watershed Initiative, Clean the Bay Day, or Clean Virginia Waterways Cleanup. Typically, the City provides and/or distributes the supplies for the clean-ups including trash grabbers, gloves, and bags, in addition to staff time and support.

Educational Events

The City will participate in at least two educational events per year, such as Alexandria Earth Day, the Student Environmental Action Showcase (SEAS), or Bike to Work Day. Typically, the City has a table at the event with various educational materials and promotional give-away items. These events may also be virtual due to health and safety concerns. Staff answers questions that the public may have regarding stormwater quality and pollution prevention. In some cases, staff also has an activity for the public to take part in to reinforce the message.

Disposal or Collection Event

The City's T&ES-RR operates the Household Hazardous Waste & Electronics Collection facility at 3224 Colvin Street to give residents the opportunity to unwanted cleaning materials and other liquids and electronics. The City provides frequent eNews and other notifications of the facility as an activity that goes above the permit requirements since the four activities required by the permit are met through the restoration and education activities described above.

Pollution Prevention

The City will continue the storm drain marker program by supplying volunteers with the material to put markers on storm drains. The markers are a visual reminder that anything that goes into the drain will go to local waterways. In addition, the City requires private developers to mark all storm drains internal to the project and within 50-feet of the project site. Finally, the City has installed and continues to maintain several pet waste stations. The City also supplies bags for some pet waste stations which were privately installed but are in common areas.

Implementation and Schedule:

- Annually implement at least two stream clean-ups in the spring, summer, or fall.
- Annually participate in at least two educational events in the spring, summer, or fall.
- Continuously implement the storm drain marker program and maintain City-owned pet waste stations.

Responsible Party: T&ES-SWM and RPCA support these efforts, send out information via Environmental News eNews, and develop press releases for OCPI when necessary, and act as site hosts for clean-up events. T&ES-RR collects the bags of trash after stream clean-up events. RPCA and the Earth Day Committee serve as the City's primary point of contact for the Alexandria Earth Day event.

Documentation and Measurable Goal: The City will document its sponsorship, participation, and promotion of clean-ups and educational events in the Annual Report and provide an approximate number of participants. Event organizers assess the success of the event each year and make changes as appropriate to ensure that the event is a success. The number of individuals marking storm drains each permit year will also be documented.

3.0 MCM #3: Illicit Discharge Detection and Elimination

Permit Reference: Section II.B.3.

Relevant Excerpts:

- a. *The permittee shall develop and maintain an accurate MS4 map and information table as follows:*
1. *A map of the storm sewer system owned or operated by the permittee within the census urbanized area identified by the 2010 decennial census that includes, at a minimum:*
 - (a) *MS4 outfalls discharging to surface waters, except as follows:*
 - 1) *In cases where the outfall is located outside of the MS4 permittee's legal responsibility, the permittee may elect to map the known point of discharge location closest to the actual outfall; and*
 - 2) *In cases where the MS4 outfall discharges to receiving water channelized underground, the permittee may elect to map the point downstream at which the receiving water merges above ground as an outfall discharge location. If there are multiple outfalls discharging to an underground channelized receiving water, the map shall identify that an outfall discharge location represents more than one outfall. This is an option a permittee may choose to use and recognizes the difficulties in accessing outfalls to underground channelized stream conveyances for purposes of mapping, screening, or monitoring.*
 - (b) *A unique identifier for each mapped item required in Part I E 3;*
 - (c) *The name and location of receiving waters to which the MS4 outfall or point of discharge discharges;*
 - (d) *MS4 regulated service area; and*
 - (e) *stormwater management facilities owned or operated by the permittee.*
 2. *The permittee shall maintain an information table associated with the storm sewer system map that includes the following information for each outfall or point of discharge for those cases in which the permittee elects to map the known point of discharge in accordance with Part I E 3 a (1) (a):*
 - (a) *A unique identifier as specified on the storm sewer system map;*
 - (b) *The latitude and longitude of the outfall or point of discharge;*
 - (c) *The estimated regulated acreage draining to the outfall or point of discharge;*
 - (d) *The name of the receiving water;*
 - (e) *The 6th Order Hydrologic Unit Code of the receiving water;*
 - (f) *An indication as to whether the receiving water is listed as impaired in the Virginia 2016 305(b)/303(d) Water Quality Assessment Integrated Report;*
 - (g) *The predominant land use for each outfall discharging to an impaired water; and*
 - (h) *The name of any EPA approved TMDLs for which the permittee is assigned a wasteload allocation.*
 3. *No later than July 1, 2019, the permittee shall submit to DEQ a GIS-compatible shapefile of the permittee's MS4 map as described in Part I E 3 a. If the permittee does not have an MS4 map in a GIS format, the permittee shall provide the map as a PDF document.*
 4. *No later than October 1 of each year, the permittee shall update the storm sewer system map and outfall information table to include any new outfalls constructed or TMDLs approved or both during the immediate preceding reporting period.*
 5. *The permittee shall provide written notification to any downstream adjacent MS4 of any known physical interconnection established or discovered after the effective date of this permit.*
- b. *The permittee shall prohibit, through ordinance, policy, standard operating procedures, or other legal mechanism, to the extent allowable under federal, state, or local law, regulations, or ordinances, unauthorized nonstormwater discharges into the storm sewer system. Nonstormwater discharges or flows identified in 9VAC25-890-20 D 3 shall only be addressed if they are identified by the permittee as a significant contributor of pollutants discharging to the MS4. Flows that have been identified by the department as de minimis discharges are not significant sources of pollutants to surface water.*
- c. *The permittee shall maintain, implement, and enforce illicit discharge detection and elimination (IDDE) written procedures designed to detect, identify, and address unauthorized nonstormwater discharges, including illegal dumping, to the small MS4 to effectively eliminate the unauthorized discharge. Written procedures shall include:*
1. *A description of the legal authorities, policies, standard operating procedures or other legal mechanisms available to the permittee to eliminate identified sources of ongoing illicit discharges including procedures for using legal enforcement authorities.*
 2. *Dry weather field screening protocols to detect, identify, and eliminate illicit discharges to the MS4. The protocol shall include:*
 - (a) *A prioritized schedule of field screening activities and rationale for prioritization determined by the permittee based on such criteria as age of the infrastructure, land use, historical illegal discharges, dumping or cross connections;*

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Program Plan Update Requirement

The City must have and maintain an accurate storm sewer system map and an outfall information table that meet the requirements of Part I.E.3.a of the permit. A GIS compatible shapefile of the map must be submitted to DEQ no later than July 1, 2019. The City developed an Illicit Discharge Detection and Elimination Program Manual during the 2013-2018 permit cycle. The manual was recently updated and is included in Appendix C.

BMP 3A – Storm Sewer System Outfall Map and Outfall Information Table

Description: The City has developed and maintains an updated storm sewer system outfall map showing all stormwater outfalls discharging to the waters of the Commonwealth, points of discharge, pipes, catch basins, and inlets. Periodic quality assurance and quality control is performed as needed. Associated with the map is a table for all outfalls.

Objective and Expected Results: This measure ensures that the City has a full understanding of the storm sewer system and enables the City to respond to reports of potential illicit discharges, perform maintenance, and conduct outfall field screening as required in the permit.

Implementation and Schedule:

- Maintain an up-to-date storm sewer system outfall map and outfall information table for review upon request by the public or by DEQ (made available to DEQ within 14 days upon request).
- The map and outfall information table will be updated by October 1st of each year with any changes in the system occurring on or before June 30th of the reporting year.
- No later than July 1, 2019, GIS shapefiles were provided to DEQ so that the City's MS4 map can be recreated.
- Downstream regulated MS4s shall be notified in writing of any physical interconnections as they are identified by the City.

Responsible Party: T&ES-SWM maintains the storm sewer system map and outfall information table in coordination with T&ES-I&ROW and ITS.

Documentation and Measurable Goal: The City will continuously collect any new data, primarily through development and re-development plans, and record updates to the City's storm sewer outfall map and associated table. The MS4 map and information table can be found in Appendix C. The City will provide a summary of annual activities regarding map updates and submit the corresponding shapefiles to DEQ no later than July 1, 2019. On July 30, 2020, the City re-sent written notifications of physical interconnection were given to George Washington Memorial Parkway, Arlington County, Fairfax County, and Virginia Department of Transportation by the City shared during the previous permit cycle. Copies of these notifications can be found in Appendix C.

BMP 3B – Prohibition on Illicit Discharges

Description: In 2004, the City Attorney determined that the City’s existing enforcement and right-of-entry tools meet MS4 permit requirements. These are found in Title 11, Chapter 13 of the City Code “Environmental Offenses.” In recent years, the City did recognize the need for civil penalties for offenses that are not categorized as criminal. As a result, the City adopted an updated Environmental Offenses ordinance in February 2018 to include civil penalties related to certain illicit discharges along with criminal penalties

Objective and Expected Results: This measure ensures that the legal tools are in place to effectively prohibit illicit discharges to the storm sewer system and to conduct necessary enforcement in the case of an illicit discharge.

Implementation and Schedule: This BMP is continuously implemented. The City Attorney has reviewed the City Code in the context of the new permit requirements and has determined that no additional changes are required.

Responsible Party: T&ES-SWM with support from the EIU and T&ES-PWS.

Documentation and Measure of Effectiveness:

- Have adopted appropriate enforcement and right-of-entry provisions in the City Code.
- Enforcement policies and procedures for incidents of illicit discharges are contained in the City’s IDDE manual (See Appendix C).
- Annually report the number of illicit discharges identified and report how the discharges were controlled or eliminated.
- After a significant enforcement activity, or where a pattern of illicit discharges indicates the need for more rigorous enforcement, the City will review policies, procedures, and ordinances and make recommendations for program enhancements, as appropriate.

BMP 3C – Illicit Discharge Detection and Elimination Written Procedures

During the 2013-2018 permit cycle, the City developed the Illicit Discharge Detection and Elimination Program manual which included written policies and procedures for the detection, investigation, and elimination of illicit discharges. Additionally, the City’s IDDE Program manual provides policies, procedures, methodologies and legal authority for dealing with illicit discharges. Outfall field screening shall be performed in accordance with the IDDE Program manual which includes the requirement outlined in Part I.E.3.c of the 2018-2023 permit. The City’s IDDE Program manual was recently updated to ensure current methodology and compliance with the current permit and can be found in Appendix C.

Objective and Expected Results: The purpose of this BMP is to detect and eliminate illicit discharges.

Implementation and Schedule:

- Suspected illicit discharges will be investigated in accordance with the IDDE Program manual which outlines the methods to determine the source and follow-up investigations. Those discharges suspected of being sanitary sewage or those believed to be a risk to human health and public safety are to be investigated first.

- Perform dry weather field screening on at least 50 outfalls annually such that no more than 50% are screened in the previous 12-month period.
 - Outfalls shall be prioritized for field screening by the City in accordance with the rationale and procedure found in the IDDE Program manual.
 - Inspections will be documented using paper and/or electronic forms which contain the information outlined in Part I.E.3.c.d.
- Enforcement actions and legal penalties as outlined in the IDDE Program manual shall be used for incidents of illicit discharge, when necessary.
- Incidents of illicit discharge, as well as the outcome of investigations and any follow up investigations or actions will be tracked in the City’s database. The corresponding procedures are outlined in the IDDE Program manual.

Responsible Party: T&ES-SWM

Documentation and Measurable Goal: The City will maintain, implement and enforce the written procedures found in the City’s IDDE Program manual. This includes documenting and tracking reported suspected illicit discharges or illicit discharges discovered during dry weather field screening, and the results of any investigations in accordance with the requirements in Part I.E.3.c.(2) of the 2018-2023 permit. The City will include with each annual report the results of outfall screenings for that permit year. Any follow-up actions required for illicit discharges discovered during the field screening shall also be included. The annual report shall also include a summary of each investigation performed for reported suspected illicit discharges to include investigation results, resolution, and date of investigation closure.

BMP 3D – Alex311

Description: The City’s Alex311 system consists of a web-based problem reporting form and call center (703-746-HELP or 311) that can be used by residents and others to report suspected illicit discharges and other environmental concerns. The web-based reporting form can be found on the homepage at www.alexandriava.gov and is available on subordinate webpages. Reports of illicit discharges and investigation results are tracked using Cityworks™ asset management software and Permit Plan software. Reports of illicit discharges are investigated by the Fire Marshal’s Environmental Investigation Unit (EIU), T&ES-SWM and T&ES-PWS on occasion. The City’s policies and procedures for responding to reports of illicit discharges are found in the City’s Illicit Discharge Detection and Elimination (IDDE) manual, which is included in Appendix C.

Objective and Expected Results: The purpose of Alex311 is to empower residents to report potential stormwater pollution or illicit discharges.

Implementation and Schedule: The City will maintain the web-based Alex311 reporting form. The City will continue to promote the availability of this tools through the website and education and outreach brochures.

Responsible Party: T&ES- SWM and T&ES-PWS respond to complaints and ITS manages the web portal.

Documentation and Measurable Goal: In the Annual Report, the City will provide a screen capture of Alex311 web form and report the number and types of stormwater related incidents handled.

BMP 3E – Household Hazardous Waste (HHW) Program

Description: Household hazardous waste (HHW) has been identified by the City as a significant potential source of illicit discharges to the storm sewer system. To help prevent such discharges, the City has a long-standing HHW program. In addition to HHW, the program also accepts used oil, antifreeze, and other automotive fluids. The City produces a brochure that provides information on the types of materials that may be left at program drop-off points. The information is also available on the City's website.

Objective and Expected Results: The HHW program reduces illegal dumping by providing residents with an opportunity to properly dispose of hazardous household waste materials and used oil, antifreeze, and automotive fluids.

Implementation and Schedule: The City will continue to provide HHW collection services to all residents. In addition, the City will continue to produce and distribute materials promoting the program and provide program information on the City's website.

Responsible Party: T&ES-RR operates the HHW facility.

Documentation and Measurable Goal: In the Annual Report, the City will provide copies of the program website and brochure, track and report the number of residents taking advantage of the City's program, and report the number of barrels of HHW accepted by the City. The City will also report on any efforts by T&ES-RR to enhance program effectiveness.

BMP 3F – Identification of Permitted Stormwater Discharges

Description: Annually, T&ES-SWM staff obtains the data related to permitted stormwater discharges in the City from the DEQ website and incorporates it into the City's GIS data. This provides a visual tool for identifying permitted and non-permitted discharges during outfall field screening, and when investigating reports of illicit discharges, such as those received via Alex311 or the T&ES main phone line.

Objective and Expected Results: The purpose of this effort is to provide T&ES-SWM staff with the ability to quickly identify and better monitor permitted discharges. It also provides staff with a tool to identify if a reported discharge has a permit, so they may locate the source quickly, if it is determined it is not a permitted discharge.

Implementation and Schedule: The City will download updated information from DEQ's website to incorporate changes into a GIS map.

Responsible Party: Updated information will be kept by T&ES-SWM.

Documentation and Measurable Goal: Staff with T&ES-SWM will maintain an up-to-date map and a list of State-permitted stormwater discharges within the City limits. A map of these permitted discharges will be submitted in the annual report.

BMP 3G – Prohibition of Outdoor Cleaning of Restaurant Equipment

Description: The City has included as standard language on all special use permits (SUPs) issued for restaurant facilities, a prohibition against outdoor cleaning of equipment and the deposition of cooking residue into the storm sewer system.

Objective and Expected Result: Outdoor cleaning of restaurant equipment has been identified by the City as a potential source of stormwater pollution. Prohibiting outdoor cleaning of equipment will reduce the likelihood that cooking residue will enter the storm sewer system.

Implementation and Schedule: This BMP is continuously implemented for all SUPs issued for restaurant facilities.

Responsible Party: P&Z is responsible for ensuring compliance with the overall SUP approval process, with review assistance from T&ES-SWM.

Documentation and Measurable Goal: All applicable SUPs will contain the appropriate prohibition against outdoor cleaning of restaurant equipment and the deposition of restaurant cooking residue into the storm sewer system. The City will include a sample SUP (if one was approved during the permit year) in each annual report.

4.0 MCM #4: Construction Site Stormwater Runoff Control

Permit Reference: Part I.E.4.

Relevant Excerpt:

- a. *The permittee shall utilize its legal authority, such as ordinances, permits, orders, specific contract language, and interjurisdictional agreements, to address discharges entering the MS4 from regulated construction site stormwater runoff. The permittee shall control construction site stormwater runoff as follows:*
 - 1) *If the permittee is a city, county, or town that has adopted a Virginia Erosion and Sediment Control Program (VESCP), the permittee shall implement the VESCP consistent with the Virginia Erosion and Sediment Control Law (§ 62.1-44.15:51 et seq. of the Code of Virginia) and Virginia Erosion and Sediment Control Regulations (9VAC25-840)*
- b. *The permittee shall require implementation of appropriate controls to prevent nonstormwater discharges to the MS4, such as wastewater, concrete washout, fuels and oils, and other illicit discharges identified during land disturbing activity inspections of the MS4. The discharge of nonstormwater discharges other than those identified in 9VAC25-890-20 D through the MS4 is not authorized by this state permit.*
- c. *The permittee's MS4 program plan shall include:*
 - 1) *If the permittee implements a construction site stormwater runoff control program in accordance with Part I E 4 a (1), the local ordinance citations for the VESCP program;*
 - 2) *If the permittee implements a construction site stormwater runoff control program in accordance with Part I E 4 a (3):*
 - (a) *The most recently approved standards and specifications or if incorporated by reference, the location where the standards and specifications can be viewed; and*
 - (b) *A copy of the most recent standards and specifications approval letter from the department;*
 - 3) *A description of the legal authorities utilized to ensure compliance with Part I E 4 a to control construction site stormwater runoff control such as ordinances, permits, orders, specific contract language, policies, and interjurisdictional agreements;*
 - 4) *Written inspection procedures to ensure the erosion and sediment controls are properly implemented and all associated documents utilized during inspection including the inspection schedule;*
 - 5) *Written procedures for requiring compliance through corrective action or enforcement action to the extent allowable under federal, state, or local law, regulation, ordinance, or other legal mechanisms; and*
 - 6) *The roles and responsibilities of each of the permittee's departments, divisions, or subdivisions in implementing the construction site stormwater runoff control requirements in Part I E 4.*



Program Plan Update Requirement

The City must ensure that impacts to water quality are minimized from construction activities, and that they meet all applicable local, state and federal requirements. The following details the City's program and adherence to the general permit.

Description of Legal Authorities

The construction site stormwater runoff control program includes Chapter 4 of Title 5 of the Code of the City of Alexandria, the "Erosion and Sediment Control" ordinance. Chapter 4 implements requirements of the Virginia Erosion and Sediment Control Law (VESCL) and attendant regulations. The City amended the ordinance and adopted the changes at the June 10, 2015 City Council Legislative Meeting. The changes were precipitated when the Erosion and Sediment Control program was transferred from the Virginia Department of Conservation and Recreation (DCR) to DEQ. This transfer required a renumbering of state law and code. To more closely align the City code with the revised State code, editorial revisions to Title 5, 20 Chapter 4 of the Code of Alexandria. No substantive changes were made to the ordinance and it remains consistent with the VESCL and attendant regulations. The June 10, 2015 City Council docket and amendments to the ordinance are included in Appendix D.

The City submitted the requisite applications to DEQ to receive designation as a local Virginia Stormwater Management Program (VSMP) authority for land-disturbing activities. The City submitted the application for final approval on January 15, 2014, which included amendments to Article XIII of the Zoning Ordinance (the Environmental Management Ordinance). This application included pending amendments to the Environmental Management Ordinance (EMO) that went through the local approval process and was subsequently adopted by the City Council on March 15, 2014. However, actions in the 2014 General Assembly required DEQ to make late changes to the VSMP regulations as incorporated into the EMO. The DEQ comments on the January 15, 2014 VSMP application were reviewed based on the late-incorporated changes to the VSMP regulations and received May 6, 2014 – after the EMO was adopted. These late changes to the VSMP were minor; however, the City was required to incorporate the changes. On June 12, 2014, the City sent a letter to DEQ requesting “Provision Approval” to administer the local VSMP effective July 1, 2014 until the minor amendments could be adopted into the EMO. These required amendments went through the approval process and was adopted by the City Council on October 18, 2014. The City submitted final documentation to DEQ and received Full Approval on November 4, 2014. The approval letter is included in Appendix D.

During the previous permit cycle (2013-2018), the City reviewed the Erosion and Sediment Control (E&SC) Ordinance for consistency with the changes to the EMO. Amendments made to the E&SC ordinance were adopted by City Council on June 10, 2015. Documentation is provided in Appendix D.

Written Plan Review Procedures

T&ES is the plan approving authority with respect to this MCM – with P&Z being the ultimate plan approving authority. The Principal Planner in T&ES-SWM is the program administrator for the E&S program and the VSMP. The City reviews erosion and sediment control plans and stormwater management plans for proposed land-disturbing activities of 2,500 square feet or greater. Projects must receive approval prior to the commencement of land-disturbing activities. The City’s *Development Review Process* plan review procedures provided in Appendix D are used to ensure that plans meet ordinance requirements.

Written Inspection and Enforcement Procedures

City inspectors maintain certification status to perform erosion and sediment control inspections and appropriate staff have received DEQ Stormwater Inspector Training in order to perform periodic comprehensive onsite stormwater pollution prevention plan (SWPPP) inspections. Inspectors complete inspection reports and note corrective action, if applicable. Failure to comply can trigger penalties in the E&S ordinance or Article XIII of the Alexandria Zoning Ordinance. The City’s formalized policies and procedures for construction site inspections are outlined in *Policies and Procedures for Construction Site Runoff Control Inspections* which can be found in Appendix D. This document includes a description of legal authority, written procedures to ensure the erosion and sediment controls are properly implemented, inspections documents, inspection schedule, and procedures for requiring compliance.

Roles and Responsibilities

T&ES-DROW and T&ES-C&I, along with T&ES-SWM review and approve E&S plans. T&ES-SWM and T&ES-DROW review and approve stormwater management plans.

Construction site inspection and enforcement is conducted by T&ES-C&I in consultation with the E&S and VSMP program administrator. The City’s inspection and enforcement program is unique in that inspectors’ responsibilities go beyond E&S and stormwater responsibilities. Inspectors with T&ES-C&I are tasked to

perform multiple inspections and enforcement multiple permits required by the City. Most onsite activities require the oversight of the City's onsite inspector. These activities may range from the installation of onsite infrastructure, placement of fill material, enforcement of excavation permits. Because of the multiple functions performed by the inspection staff, onsite visits are conducted at a frequency that may require the inspector to visit the site multiple times daily. Because of this, the City can provide enhanced construction oversight for projects within the City.

BMP 4A – Maintain Erosion and Sediment Control Program Consistency

Objective and Expected Results: The 2018-2023 MS4 permit requires the City to ensure land disturbing activities obtain the proper permits and approval prior to commencement of land disturbing activities and ensure that discharges into the MS4 from those land disturbing activities meet the requirements set forth in the VESCL and regulations.

Implementation and Schedule: The City will continue to implement the Erosion and Sediment Control Program consistent with State regulations.

Responsible Party: The Principal Planner from T&ES-SWM is the Erosion and Sediment Control Program Administrator. Staff from T&ES-DROW and T&ES-C&I perform site plan reviews and construction site inspections.

Documentation and Measurable Goal: The effectiveness of the City's program is measured by consistency with State regulations as determined by staff from the T&ES-SWM. Should differences be identified between the City and State Program requirements, the City will take action to address them.

BMP 4B – Site Control Implementation

Description: The City has incorporated language into its plan review checklist, policies and procedures, and Environmental Management Ordinance (Sec. 13-111) which requires applicable proposed land disturbing activities to secure coverage under the construction general permit prior to commencing land-disturbance. Proper controls are required to be implemented at these sites to prevent nonstormwater discharges to the MS4. These nonstormwater discharges include wastewater, concrete washout, fuels and oils, and other illicit discharges. To ensure that these controls are in place, the City has developed a policies and procedures document entitled *Policies and Procedures for Construction Site Runoff Control Inspections* which can be found in Appendix D.

Objective and Expected Result: This measure implements proper controls to prevent nonstormwater discharges to the MS4.

Implementation and Schedule: Continuously ensure that the proper controls are implemented to prevent nonstormwater discharges to the MS4 in accordance with *Policies and Procedures for Construction Site Runoff Control Inspections*.

Responsible Party: T&ES-SWM, and T&ES-DROW

Documentation and Measure of Effectiveness: The City's policies and procedures for preventing non stormwater discharges to the MS4 from construction sites can be found in Appendix D.

BMP 4C – Construction General Permit Inspections and Tracking

Description: The City received local VSMP authority approval to administer the Construction General Permit effective July 1, 2014. All applicable construction sites must submit a stormwater pollution prevention plan (SWPPP) to the City for review and approval in order to secure coverage under the General VPDES Permit for Stormwater Discharges Associated with Construction Activities prior to final site plan release. The City has incorporated language into its plan review checklist, policies and procedures, and Environmental Management Ordinance (Sec. 13-111) which requires applicable proposed land disturbing activities to secure coverage prior to commencing land-disturbance.

Administration of the Erosion and Sediment Control Program and Part I.E..4.c of the permit requires the City to conduct inspections and have written inspection procedures, including an inspection schedule, of land-disturbing activities. T&ES-C&I inspectors perform other duties beyond E&SC inspections. The City's Progressive Compliance and Enforcement Strategy uses the fact that inspectors may visit a site up to two times daily to perform a whole list of duties as a way to provide added E&SC oversight. During these more frequent site visits, inspectors may provide verbal direction regarding E&SC and stormwater measures. This verbal direction is considered formal, but may not always be documented formally in an inspection report unless a required inspection and report is due, or if a major corrective action is required. Due to this enhanced oversight, City inspectors provide continual direction which tends to keep a site in order and not create the need for enforcement action; however, any necessary enforcement action will be included in the associated annual report.

Land disturbing activities are tracked by T&ES-DROW through the plan review process. The information is recorded and logged when final approved plan mylars and grading plans are released. Reports are sent to T&ES-SWM who provides the data quarterly to DEQ.

Inspectors and plan reviewers are required to maintain the appropriate certification of competency from the state.

Objective and Expected Results: This measure implements permit requirements to ensure that all construction site owners and operators secure a separate VPDES stormwater permit for construction activities and implement a SWPPP. In addition, land-disturbing activities are properly tracked and comply with an approved erosion and sediment control plan and VSMP permit where applicable.

Implementation and Schedule:

- Continue to require applicable land-disturbing activities secure coverage under the construction general permit.
- Review and approve SWPPPs submitted as part of plan review for projects required to seek coverage under the VPDES stormwater permit for construction activities and ensure SWPPP implementation.
- Continue to maintain a database log for tracking all land disturbing activities and provide reports to DEQ on a quarterly basis.
- Continue to inspect land-disturbing activities in compliance with the E&S ordinance, the EMO and written policies and procedures.
- Ensure inspectors and plan reviewers obtain and hold certificates of competence in accordance with 9VAC25-850-40 and keep records on file.

- Continue to utilize its legal authority to require compliance with an approved plan or require plan revisions or modifications if the inspection shows an approved plan to be inadequate to control stormwater runoff.

Responsible Parties: T&ES-SWM, T&ES-DROW, and T&ES-C&I

Documentation and Measurable Goal: The City’s plan review policies and procedures as well as checklists used during plan reviews can be found in Appendix D along with the City’s inspection policies and procedures document entitled *Policies and Procedures for Construction Site Runoff Control Inspections*.

Article XIII of the Zoning Ordinance (the Environmental Management Ordinance) can be found via the City’s website at <http://alexandriava.gov/CityCode>.

The City will track and inspect regulated land disturbing activities and will document the following in the annual report:

- Total number of inspections conducted.
- Total number and type of enforcement actions taken during the reporting period as well as a summary of the enforcement actions.

5.0 MCM #5: Post Construction Stormwater Management

Permit Reference: Part I.E.5

Relevant Excerpt:

- a. *The permittee shall address post-construction stormwater runoff that enters the MS4 from the following land disturbing activities by implementing a post-construction stormwater runoff management program as follows:*
 - 1) *If the permittee is a city, county, or town, with an approved Virginia Stormwater Management Program (VSMP), the permittee shall implement the VSMP consistent with the Virginia Stormwater Management Act (§ 62.1-44.15:24 et seq. of the Code of Virginia) and VSMP Regulations (9VAC25-870) as well as develop an inspection and maintenance program in accordance with Parts I E 5 b and c;*
- b. *The permittee shall implement an inspection and maintenance program for those stormwater management facilities owned or operated by the permittee that discharges to the MS4 as follows:*
 - 1) *The permittee shall develop and maintain written inspection and maintenance procedures in order to ensure adequate long-term operation and maintenance of its stormwater management facilities;*
 - 2) *The permittee shall inspect stormwater management facilities owned or operated by the permittee no less than once per year. The permittee may choose to implement an alternative schedule to inspect these stormwater management facilities based on facility type and expected maintenance needs provided that the alternative schedule and rationale is included in the MS4 program plan. The alternative inspection frequency shall be no less than once per five years; and*
 - 3) *If during the inspection of the stormwater management facility conducted in accordance with Part I E 5 b (2), it is determined that maintenance is required, the permittee shall conduct the maintenance in accordance with the written procedures developed under Part I E 5 b (1).*
- c. *For those permittees described in Part I E 5 a (1) or (2), the permittee shall:*
 - 1) *Implement an inspection and enforcement program for stormwater management facilities not owned by the permittee (i.e., privately owned) that includes:*
 - a) *An inspection frequency of no less than once per five years for all privately owned stormwater management facilities that discharge into the MS4; and*
 - b) *Adequate long-term operation and maintenance by the owner of the stormwater management facility by requiring the owner to develop and record a maintenance agreement, including an inspection schedule to the extent allowable under state or local law or other legal mechanism;*
 - 2) *Utilize its legal authority for enforcement of the maintenance responsibilities if maintenance is neglected by the owner; and*
 - 3) *The permittee may develop and implement a progressive compliance and enforcement strategy provided that the strategy is included in the MS4 program plan.*
- d. *The permittee shall maintain an electronic database or spreadsheet of all known permittee owned or permittee-operated and privately owned stormwater management facilities that discharge into the MS4. The database shall also include all BMPs implemented by the permittee to meet the Chesapeake Bay TMDL load reduction as required in Part II A. A database shall include the following information as applicable:*
 - 1) *The stormwater management facility or BMP type;*
 - 2) *The stormwater management facility or BMPs location as latitude and longitude;*
 - 3) *Acres treated by the stormwater management facility or BMP, including total acres, pervious acres, and impervious acres;*
 - 4) *The date the facility was brought online (MM/YYYY). If the date brought online is not known, the permittee shall use June 30, 2005;*
 - 5) *The 6th Order Hydrologic Unit Code in which the stormwater management facility is located;*
 - 6) *Whether the stormwater management facility or BMP is owned or operated by the permittee or privately owned;*
 - 7) *Whether or not the stormwater management facility or BMP is part of the permittee's Chesapeake Bay TMDL action plan required in Part II A or local TMDL action plan required in Part II B, or both;*
 - 8) *If the stormwater management facility or BMP is privately owned, whether a maintenance agreement exists; and*
 - 9) *The date of the permittee's most recent inspection of the stormwater management facility or BMP.*

- e. *The electronic database or spreadsheet shall be updated no later than 30 days after a new stormwater management facility is brought online, a new BMP is implemented to meet a TMDL load reduction as required in Part II, or discovered if it is an existing stormwater management facility.*
- f. *The permittee shall use the DEQ Construction Stormwater Database or other application as specified by the department to report each stormwater management facility installed after July 1, 2014, to address the control of post-construction runoff from land disturbing activities for which the permittee is required to obtain a General VPDES Permit for Discharges of Stormwater from Construction Activities.*
- g. *No later than October 1 of each year, the permittee shall electronically report the stormwater management facilities and BMPs implemented between July 1 and June 30 of each year using the DEQ BMP Warehouse and associated reporting template for any practices not reported in accordance with Part I E 5 f including stormwater management facilities installed to control post-development stormwater runoff from land disturbing activities less than one acre in accordance with the Chesapeake Bay Preservation Act regulations (9VAC25-830) and for which a General VPDES Permit for Discharges of Stormwater from Construction Activities was not required.*
- h. *The MS4 program plan shall include:*
 - 1) *If the permittee implements a VSMP in accordance with Part I E 5 a (1) and (2):*
 - a) *A copy of the VSMP approval letter issued by the department;*
 - b) *Written inspection procedures and all associated documents utilized in the inspection of privately owned stormwater management facilities;*
 - c) *Written procedures for compliance and enforcement of inspection and maintenance requirements for privately owned BMPs.*
 - 2) *If the permittee implements a post-development stormwater runoff control program in accordance with Part I E 5 a (3):*
 - a) *The most recently approved standards and specifications or if incorporated by reference, the location where the standards and specifications can be viewed; and*
 - b) *A copy of the most recent standards and specifications approval letter from the department.*
 - 3) *A description of the legal authorities utilized to ensure compliance with Part I E 5 a for post-construction stormwater runoff control such as ordinances (provide citation as appropriate), permits, orders, specific contract language, and interjurisdictional agreements;*
 - 4) *Written inspection procedures and all associated documents utilized during inspection of stormwater management facilities owned or operated by the permittee;*
 - 5) *The roles and responsibilities of each of the permittee's departments, divisions, or subdivisions in implementing the post-construction stormwater runoff control program; and*
 - 6) *The stormwater management facility spreadsheet or database incorporated by reference and the location or webpage address where the spreadsheet or database can be reviewed.*



Program Plan Update Requirement

The City must meet applicable regulatory requirements to ensure that post-construction stormwater controls are properly installed and adequately maintained to minimize impacts to water quality from development and redevelopment. The following is an overview of the City's program to meet these requirements and adhere to the general permit.

Description of Legal Authorities

The City's post-construction stormwater requirements are found in Article XIII of the Zoning Ordinance – the Environmental Management Ordinance (EMO). As described in the "Description of Legal Authorities" under MCM#4, the City has amended the EMO and created the appropriate policies and procedures to receive full approval by DEQ as a local VSMP authority.

Written Stormwater Facility Design and Installation Procedures

Stormwater management facilities must be properly designed and installed, to ensure proper function. The City reviews development site plans to ensure water quality and water quantity designs meet the requirements found in the VSMP regulations, the Virginia Stormwater BMP Clearinghouse, and approved design standards. Projects must use the Virginia Runoff Reduction Method spreadsheet to demonstrate compliance and project plans must contain a note that the stormwater facility will be installed under the supervision of the design professional and certified that it is constructed and installed as designed. Stormwater facilities must be installed under the general supervision of the design engineer, and as-built plan submission must be signed/sealed by the design professional and include a signed/sealed separate certification that the facility was installed as designed.

Written Inspection, Compliance, and Enforcement Procedures

Stormwater facilities require periodic inspections to determine if maintenance is needed to ensure proper long-term functioning in order to provide water quality benefits. The City inspects privately-owned facilities at least once every five years and requires private owners to perform maintenance as needed per Section 13-109(G) of the EMO. The City inspects public facilities at least once annually and performs maintenance as needed. Policies, procedures, checklists, and guidelines for the program are found in Appendix E.

Roles and Responsibilities

T&ES-SWM conducts inspection of private stormwater management facilities at least once every five years. T&ES-PWS conducts inspections of public facilities at least annually and performs maintenance as needed. T&ES-SWM, with support from the City Attorney, conducts enforcement procedures as necessary.

Individual Residential Lot Special Criteria

During the 2013-2018 permit cycle, the City revised its ordinances concerning maintenance agreements for BMPs used to treat stormwater solely from individual residential lots, to exempt single-family residential detached projects from meeting state phosphorus requirements. The revision eliminated the requirement of BMP maintenance agreements for *individual residential lots* separately built and not part of a larger common plan of development or sale. Instead, homeowner outreach and education is provided which includes mailing of City developed information sheets to the homeowners for each specific type of stormwater BMP on the property.

Reporting of Historical BMPs

DEQ Guidance Memo 15-2005 dated May 18, 2015 instructs localities on compliance with Special Conditions related to the development and implementation of the Chesapeake Bay TMDL Action Plan. The City submitted the full database of “Historical BMPs” to DEQ by September 1, 2015. Based on Part IV 2 of the Guidance, localities may receive nutrient and sediment reduction credits for historical water quality BMPs installed between January 1, 2006 and June 30, 2009 if this data is submitted to DEQ by September 1, 2015 and included the Chesapeake Bay TMDL Action Plan. The Phase 1 Chesapeake Bay TMDL Action Plan includes the requisite reporting.

BMP 5A –VSMP Implementation consistent with Regulations

Description: During the 2013-2018 permit cycle, the City amended the EMO for consistency with the VSMP regulations and maintained consistency with the Chesapeake Bay Act requirements. The City received provisional approval as a local VSMP authority effective July 1, 2014 and received full approval in November 2014. The revised and adopted ordinance (Article XIII.–Environmental Management) can be found in Appendix D.

Section 13-109 of the EMO, as amended, requires that development and redevelopment projects subject to VSMP Part II.B technical criteria conform to the design specifications of the Virginia Stormwater BMP Clearinghouse for stormwater facility BMPs, and utilize the Virginia Runoff Reduction Method spreadsheet to demonstrate compliance with water quality and quantity requirements. Grandfathered projects and those meeting the “Time Limits” associated with coverage under the construction general permit are subject to the Part II. C technical criteria and may use stormwater facility BMPs previously approved by the City and adhere to the design guidelines in the Alexandria Supplement to the Northern Virginia BMP Handbook. The City has also adopted a Green Building Policy to encourage development to meet green building standards such as LEED certification or equivalent, which includes incentives to comply with stormwater management requirements by implement Low Impact Development (LID) or Green Infrastructure (GI) techniques. BMP use may be limited in accordance with policies established by the director of T&ES in accordance with 13-104(c) of the City Code. In 2018, TES-SWM implemented a policy through Memorandum to Industry 01-18, *Use of Manufactured/Proprietary Stormwater BMPs*, requiring development and redevelopment projects to treat at least 65% of the required state phosphorous removal through nonproprietary surface BMPs.

Objective and Expected Results: The EMO requires that post-construction runoff is properly managed and that BMP design guidelines are consistent with the requirements of the VSMP regulations.

Implementation and Schedule: The City will continue to implement a stormwater management program, including design standards, that is compliant with the Chesapeake Bay Preservation Area Designation and Management Regulations and the VSMP regulations, and incorporated in the EMO.

Responsible Party: T&ES-SWM staff has primary responsibility for ensuring City consistency with the VSMP and the Chesapeake Bay Preservation Area Designation and Management Regulations. T&ES-SWM is supported by T&ES-DROW to ensure compliance.

Documentation and Measurable Goal: A copy of the VSMP approval letter issued by DEQ is found in Appendix D. The effectiveness of the City’s program is measured by consistency with the VSMP as determined by staff from the T&ES-SWM and VDEQ review of annual VSMP reporting provided by the City.

BMP 5B – Public Stormwater Facility Inspection and Maintenance

Description: For the purposes of this program plan, “public” stormwater management facilities are those owned or operated by the City. Public stormwater management facilities include those installed as a requirement of development and redevelopment, as a target of opportunity during infrastructure work, and those installed to meet the nutrient and sediment target reductions under the permit special conditions for the Chesapeake Bay TMDL. Inspection and maintenance of all public stormwater management facilities is the responsibility of the City.

During the 2013-2018 permit cycle, the City developed written policies and procedures for the inspection and maintenance of public stormwater management facilities to ensure adequate long-term operation and maintenance. The policies and procedures document entitled *Policies and Procedures for Post-Construction BMP Inspection and Maintenance* were updated in April 2019 and can be found in Appendix E.

Objective and Expected Results: Maintenance of public stormwater management facilities is essential to ensuring that these investments continue to provide their intended water quality benefits.

Implementation and Schedule:

- The City will inspect each public stormwater management facility no less than once per year.
- Regular maintenance will be performed according to the maintenance schedule and guideline specific to each BMP.
- The DEQ BMP Warehouse will be used to report BMPs brought online during the reporting period.

Responsible Party: T&ES-PWS is responsible for this effort, with assistance from T&ES-SWM.

Documentation and Measurable Goal: The annual report will include the number of public stormwater management facilities inspected with a description of significant maintenance, repair or retrofit activities performed (not including routine maintenance such as grass mowing or trash collection) during the reporting period.

BMP 5C – Private Stormwater Facility Inspection and Enforcement

Description: For the purposes of this program plan, “private” stormwater management facilities are those not owned or operated by the City. In accordance with Part I.E.5.c.1 of the permit, private stormwater management facilities need to be inspected no less than once per five years. In addition, the owner of the facility must develop and record a maintenance agreement, which includes an inspection schedule. During the 2013-2018 permit cycle, the City developed written policies and procedures for the inspection and enforcement of maintenance for private stormwater management facilities. The policies and procedures document entitled *Policies and Procedures for Post-Construction BMP Inspection and Maintenance* were updated in April 2019 and can be found in Appendix E.

As discussed above, these requirements will not apply to stormwater management facilities built on individual residential lots separately built and not part of a larger common plan of development or sale. The City will use homeowner outreach and education to promote maintenance of BMPs on individual residential lots.

Objective and Expected Results: Maintenance of private BMP facilities is essential to ensuring that these investments continue to provide their intended water quality benefits.

Implementation and Schedule: The VSMP permit regulations require the City to implement a BMP inspection program based on the Virginia Stormwater Management Regulations. The City will continue to implement an inspection program in accordance with the following:

- Inspect each applicable private stormwater management facility not less than once per five years.
- Enforcement procedures will follow the procedures outlined in the City's *Policies and Procedures for Post-Construction BMP Inspection and Maintenance*. Legal authority is also described in this document.
- The DEQ BMP Warehouse is used to report BMPs brought online during the reporting period.
- Ensure stormwater management facility inspectors have appropriate certifications and keep them on file.

Responsible Party: T&ES-SWM staff is responsible for this effort, with assistance from T&ES-PWS.

Documentation and Measurable Goal: The City will document the number of BMPs inspected each year and provide statistics on the number of facilities for which follow-up enforcement action was required including the type of enforcement action. Sample copies of the letters to the private stormwater management facility owners will be provided.

BMP 5D – Stormwater Facility Inventory and Reporting

Description: Stormwater management facilities and/or BMPs that were implemented to improve water quality are tracked in an electronic database. Information tracked includes the following, as required in Part I.E.5.d of the permit:

- 1) Stormwater management facility or BMP type;
- 2) Stormwater management facility or BMPs location as latitude and longitude;
- 3) Acres treated by the stormwater management facility or BMP, including total acres, pervious acres, and impervious acres;
- 4) Date the facility was brought online (MM/YYYY). If the date brought online is not known, a date of June 30, 2005 will be used.
- 5) 6th Order Hydrologic Unit Code (HUC) in which the stormwater management facility is located;
- 6) Whether the facility stormwater management facility or BMP is owned or operated by the permittee or privately owned;
- 7) Whether or not the stormwater management facility or BMP is part of the permittee's Chesapeake Bay TMDL action plan required in Part II A or local TMDL action plan required in Part II B, or both;
- 8) If the stormwater management facility or BMP is privately owned, whether a maintenance agreement exists; and
- 9) The date of the permittee's most recent inspection of the stormwater management facility or BMP.

Objective and Expected Results: The purpose of this BMP is to continue to maintain a database for tracking required information for stormwater management facilities/BMPs installed in the City. This information enables a better understanding of areas being treated and is used to support Chesapeake Bay Action Plan reporting. The facilities and/or BMPs will be reported to DEQ through the DEQ Construction Stormwater Database or the DEQ BMP Warehouse, as appropriate as required in Parts I.E.5.e and I.E.5.f of the permit.

Implementation and Schedule:

- The database will be updated no later than 30 days after the stormwater management facility is brought online, implementation of a new BMP to meet the Chesapeake Bay TMDL or discovered if it is a new existing facility. For the City, the facility is considered being brought online when the as-built plan is approved and the certification documentation is received.
- The DEQ Construction Stormwater Database will continue to be used to report each stormwater management facility installed after July 1, 2014, to address the control of post-construction runoff from land disturbing activities where a General VPDES Permit for Discharge of Stormwater from Construction Activities was required. The City reports the stormwater management facilities to the DEQ Construction Stormwater Database with the CGP notice of termination (NOT).
- The stormwater management facilities and BMPs implemented during the reporting period (July 1 to June 30 of each year) and not reported through the DEQ Construction Stormwater Database (as described above) will be reported using the DEQ BMP Warehouse no later than October 1 of each year.

Responsible Party: T&ES-SWM is responsible for this BMP.

Documentation and Measurable Goal: The City will provide a spreadsheet of all certified BMPs brought online during the reporting period. The database information will include the information outlined in Part I.E.5.d. The annual report will also include confirmation statements that (1) the permittee submitted stormwater management facility information through the Virginia Construction Stormwater database, as applicable, and that (2) stormwater management facilities and BMPs were electronically reported using the DEQ BMP Warehouse.

BMP 5E – Stormwater Facility Maintenance Agreements

Description: During the site plan review process, projects other than single-family residential that are separately built and not part of a larger common plan of development or sale, are required to implement stormwater facility BMPs must submit a BMP maintenance agreement (including inspection schedule) and guidelines for review. This requirement is stricter than the VSMP maintenance agreement requirements, since these agreements are also required for BMPs on land disturbances less than 1 acre. Following approval of the draft, the project owner must execute the agreement and provide proof of recordation in land records prior to release of the site plan. T&ES-SWM performs the review. Individual residential lot criteria requires annual educational materials mailed to applicable facility owners. The information is captured in the City's database and the agreement is saved on the City's network. A copy of the City's BMP maintenance agreement form is included in Appendix E.

Objective and Expected Results: Legally executed and enforceable maintenance agreements help ensure that stormwater management facilities continue to provide their intended water quality functions.

Implementation and Schedule:

- Continue to review and ensure that all appropriate stormwater management facilities and/or BMPs have executed maintenance agreements with inspection schedules, and that these are recorded in Land Records.
- Plans shall be tracked in the City's BMP database to ensure that appropriate maintenance agreements are received. Copies of the maintenance agreement will be saved on the City's network.

- A combination of homeowner outreach and education will be implemented for owners of stormwater management facilities on individual residential lots (as discussed above).

Responsible Party: T&ES-DROW staff ensure that the BMP maintenance agreement is submitted during site plan review. Staff from T&ES-SWM are responsible for ensuring that the necessary content is in the maintenance agreement and they that are recorded, executed, and enforced. The City Clerk of the Circuit Court files the agreements with the appropriate land records.

Documentation and Measurable Goal: A sample BMP maintenance agreement from the reporting year will be provided.

6.0 MCM #6: Pollution Prevention and Good Housekeeping for Municipal Facilities

Permit Requirement: Part I.E.6

Relevant Excerpt:

- a. The permittee shall maintain and implement written procedures for those activities at facilities owned or operated by the permittee, such as road, street, and parking lot maintenance; equipment maintenance; and the application, storage, transport, and disposal of pesticides, herbicides, and fertilizers designed to:
 - 1) Prevent illicit discharges;
 - 2) Ensure the proper disposal of waste materials, including landscape wastes;
 - 3) Prevent the discharge of wastewater or permittee vehicle wash water or both into the MS4 without authorization under a separate VPDES permit;
 - 4) Require implementation of best management practices when discharging water pumped from utility construction and maintenance activities;
 - 5) Minimize the pollutants in stormwater runoff from bulk storage areas (e.g., salt storage, topsoil stockpiles) through the use of best management practices; Prevent pollutant discharge into the MS4 from leaking municipal automobiles and equipment; and
 - 6) Ensure that the application of materials, including fertilizers and pesticides, is conducted in accordance with the manufacturer's recommendations.
- b. The written procedures established in accordance with Part I E 6 a shall be utilized as part of the employee training program at Part I E 6 m.
- c. Within 12 months of state permit coverage, the permittee shall identify which of the high-priority facilities have a high potential of discharging pollutants. The permittee shall maintain and implement a site specific stormwater pollution prevention plan (SWPPP) for each facility identified. High-priority facilities that have a high potential for discharging pollutants are those facilities that are not covered under a separate VPDES permit and which any of the following materials or activities occur and are expected to have exposure to stormwater resulting from rain, snow, snowmelt or runoff:
 - 1) Areas where residuals from using, storing or cleaning machinery or equipment remain and are exposed to stormwater;
 - 2) Materials or residuals on the ground or in stormwater inlets from spills or leaks;
 - 3) Material handling equipment;
 - 4) Materials or products that would be expected to be mobilized in stormwater runoff during loading or unloading or transporting activities (e.g., rock, salt, fill dirt);
 - 5) Materials or products stored outdoors (except final products intended for outside use where exposure to stormwater does not result in the discharge of pollutants);
 - 6) Materials or products that would be expected to be mobilized in stormwater runoff contained in open, deteriorated or leaking storage drums, barrels, tanks, and similar containers;
 - 7) Waste material except waste in covered, nonleaking containers (e.g., dumpsters);
 - 8) Application or disposal of process wastewater (unless otherwise permitted); or
 - 9) Particulate matter or visible deposits of residuals from roof stacks, vents or both not otherwise regulated (i.e., under an air quality control permit) and evident in the stormwater runoff.
- d. Each SWPPP as required in Part I E 6 c shall include the following:
 - 1) A site description that includes a site map identifying all outfalls, direction of stormwater flows, existing source controls, and receiving water bodies;
 - 2) A description and checklist of the potential pollutants and pollutant sources;
 - 3) A description of all potential nonstormwater discharges;
 - 4) Written procedures designed to reduce and prevent pollutant discharge;
 - 5) A description of the applicable training as required in Part I E 6 m;
 - 6) Procedures to conduct an annual comprehensive site compliance evaluation;
 - 7) An inspection frequency of no less than once per year and maintenance requirements for site specific source controls. The date of each inspection and associated findings and follow-up shall be logged in each SWPPP; and
 - 8) A log of each unauthorized discharge, release, or spill incident reported in accordance with Part III G including the following information:
 - a) Date of incident;
 - b) Material discharged, released, or spilled; and
 - c) Estimated quantity discharged, released or spilled.
- e. No later than June 30 of each year, the permittee shall annually review any high-priority facility owned or operated by the permittee for which a SWPPP has not been developed to determine if the facility has a high potential to discharge pollutants as described in Part I E 6 c. If the facility is determined to be a high-

priority facility with a high potential to discharge pollutants, the permittee shall develop a SWPPP meeting the requirements of Part I E 6 d no later than December 31 of that same year.

- f. The permittee shall review the contents of any site specific SWPPP no later than 30 days after any unauthorized discharge, release, or spill reported in accordance with Part III G to determine if additional measures are necessary to prevent future unauthorized discharges, releases, or spills. If necessary, the SWPPP shall be updated no later than 90 days after the unauthorized discharge.
- g. The SWPPP shall be kept at the high-priority facility with a high potential to discharge and utilized as part of staff training required in Part I E 6 m. The SWPPP and associated documents may be maintained as a hard copy or electronically as long as the documents are available to employees at the applicable site.
- h. If activities change at a facility such that the facility no longer meets the criteria of a high-priority facility with a high potential to discharge pollutants as described in Part I E 6 c, the permittee may remove the facility from the list of high-priority facilities with a high potential to discharge pollutants.
- i. The permittee shall maintain and implement turf and landscape nutrient management plans that have been developed by a certified turf and landscape nutrient management planner in accordance with § 10.1-104.2 of the Code of Virginia on all lands owned or operated by the permittee where nutrients are applied to a contiguous area greater than one acre. If nutrients are being applied to achieve final stabilization of a land disturbance project, application shall follow the manufacturer's recommendations.
- j. Permittees with lands regulated under § 10.1-104.4 of the Code of Virginia, including state agencies, state colleges and universities, and other state government entities, shall continue to implement turf and landscape nutrient management plans in accordance with this statutory requirement.
- k. The permittee shall not apply any deicing agent containing urea or other forms of nitrogen or phosphorus to parking lots, roadways, and sidewalks, or other paved surfaces.
- l. The permittee shall require through the use of contract language, training, standard operating procedures, or other measures within the permittee's legal authority that contractors employed by the permittee and engaging in activities with the potential to discharge pollutants use appropriate control measures to minimize the discharge of pollutants to the MS4.
- m. The permittee shall develop a training plan in writing for applicable staff that ensures the following:
 - 1) Field personnel receive training in the recognition and reporting of illicit discharges no less than once per 24 months;
 - 2) Employees performing road, street, and parking lot maintenance receive training in pollution prevention and good housekeeping associated with those activities no less than once per 24 months;
 - 3) Employees working in and around maintenance, public works, or recreational facilities receive training in good housekeeping and pollution prevention practices associated with those facilities no less than once per 24 months;
 - 4) Employees and contractors hired by the permittee who apply pesticides and herbicides are trained or certified in accordance with the Virginia Pesticide Control Act (§ 3.2-3900 et seq. of the Code of Virginia). Certification by the Virginia Department of Agriculture and Consumer Services (VCACS) Pesticide and Herbicide Applicator program shall constitute compliance with this requirement;
 - 5) Employees and contractors serving as plan reviewers, inspectors, program administrators, and construction site operators obtain the appropriate certifications as required under the Virginia Erosion and Sediment Control Law and its attendant regulations;
 - 6) Employees and contractors implementing the stormwater program obtain the appropriate certifications as required under the Virginia Stormwater Management Act and its attendant regulations; and
 - 7) Employees whose duties include emergency response have been trained in spill response. Training of emergency responders such as firefighters and law-enforcement officers on the handling of spill releases as part of a larger emergency response training shall satisfy this training requirement and be documented in the training plan.
- n. The permittee shall maintain documentation of each training event conducted by the permittee to fulfill the requirements of Part I E 6 m for a minimum of three years after the training event. The documentation shall include the following information:
 - 1) The date of the training event;
 - 2) The number of employees attending the training event; and
 - 3) The objective of the training event.

- o. The permittee may fulfill the training requirements in Part I E 6 m, in total or in part, through regional training programs involving two or more MS4 permittees; however, the permittee shall remain responsible for ensuring compliance with the training requirements.
- p. The MS4 program plan shall include:
 - 1) The written procedures for the operations and maintenance activities as required by Part I E 6 a;
 - 2) A list of all high-priority facilities owned or operated by the permittee required in accordance with Part I E 6 c, and whether or not the facility has a high potential to discharge;
 - 3) A list of lands for which turf and landscape nutrient management plans are required in accordance with Part I E 6 i and j, including the following information:
 - a) The total acreage on which nutrients are applied;
 - b) The date of the most recently approved nutrient management plan for the property; and
 - c) The location in which the individual turf and landscape nutrient management plan is located;
 - 4) A summary of mechanisms the permittee uses to ensure contractors working on behalf of the permittees implement the necessary good housekeeping and pollution prevention procedures, and stormwater pollution plans as appropriate; and
 - 5) The written training plan as required in Part I E 6 m.



Program Plan Update Requirement

The general permit requires that the updated program plan to include 1) continued maintenance and implementation of SWPPPs, 2) continued maintenance and implementation of nutrient management plans, and 3) development and implementation of a training plan. The following BMPs provide an overview of the City's program to meet these requirements and adhere to the general permit.

BMP 6A – Written Pollution Prevention and Good Housekeeping Procedures

Description: For the purposes of this program plan, municipal facilities are those facilities owned or operated by the permittee. Permit Part I.E.6.a requires the maintenance and implementation of written procedures for public facilities for best practices for stormwater pollution prevention. During the 2013-2018 permit cycle, the City developed standard operating procedures (SOPs) to minimize or prevent pollutant discharge from daily operations such as road, street, and parking lot maintenance; equipment maintenance; and the application, storage, transport, and disposal of pesticides, herbicides, and fertilizers. These SOPs can be found in Appendix F.

Objectives and Expected Results: These SOPs were designed to meet the requirements of Part I.E.6.a with the purpose of preventing stormwater pollution prevention from these facilities to the maximum extent practicable.

Implementation and Schedule:

- Continue to maintain the implement the SOPs.
- Annually, utilize the SOPs as part of the employee training program and in accordance with Permit Part I.E.6.b.
- Review SOPs once per permit cycle to ensure they include up-to-date information and effective procedures.

Responsible Party: T&ES-SWM will take the lead to maintain the SOPs and they will be implemented within T&ES-SWM, T&ES-PWS, RPCA, and GS.

Documentation and Measure of Effectiveness: The City will include a list of the SOPs in the annual report and document if any have been developed or modified during the reporting period.

BMP 6B – Stormwater Pollution Prevention Plans for High-Priority Facilities

Description: Permit Part I.E.6.c requires the maintenance and implementation of SWPPPs for facilities that have been identified as high-priority facilities with a high potential for discharging pollutants. Part I.E.6.d through I.E.6.h outlines the required SWPPP content and requirements for review and updates.

Objective and Expected Results: Maintaining and implementing SWPPPs for high-priority municipal facilities will greatly reduce the potential for pollutant discharges in stormwater runoff through the implementation and periodic inspection of good housekeeping and pollution prevention best practices for municipal facilities.

Implementation and Schedule: During the 2013-2018 permit cycle, the City identified its high-priority municipal facilities that may require the development and implementation of a SWPPP. This list was further refined for those high-priority municipal facilities with a high potential for discharging pollutants. Also completed during the previous permit cycle, the City developed an inspection checklist to be used at municipal facilities. The checklist covers good housekeeping practices, material storage and handling, as well as maintenance practices. The checklist is included in the SWPPPs and will be updated as needed.

The City will continually maintain and implement SWPPPs for the identified municipal facilities. Facilities implementing SWPPPs shall keep an updated copy onsite, and SWPPPs will be incorporated into the pollution prevention training given to municipal employees. The following table provides the list of high-priority facilities and whether the facility has the high potential for discharging pollutants.

Responsible Party: The maintenance and implementation of the SWPPPs is the responsibility of the department or division with the high priority facilities with the high potential for discharging pollutants. T&ES-SWM will oversee the maintenance and implementation of the SWPPPs to ensure proper implementation of the plans by working with the departments and divisions listed above.

Documentation and Measure of Effectiveness: A list of the municipal facilities with SWPPPs will be included in the annual report along with a documentation of any SWPPPs developed, removed, or modified during the reporting period. The annual report will also include a description of any changes to the SWPPPs during the reporting period.

Facility	Facility Location	Site Activity	SWPPP Location
Middle Yard at 3220 Colvin Street (“Sign Shop”)	3220 Colvin Street	Equipment and Material Storage	3220 Colvin Street
Household Hazardous Waste & Electronics Recycling Center	3224 Colvin Street	Waste Storage and Transfer	2900 Business Center Drive – Resource Recovery Office
Equipment and Materials Storage and Vehicle Wash Facility	133 South Quaker Lane	Vehicle, Material and Equipment Storage and Vehicle Wash Facility	2900-B Business Center Dr. - Operations Office
Material Storage Yard	3130 Business Center Drive	Material and Waste Storage	2900-B Business Center Dr. - Operations Office
Field Operations Center	2900-A/B Business Center Drive	Vehicle, Material and Equipment Storage	2900-B Business Center Dr. - Operations Office
Leaf Mulch Facility	4125 Eisenhower Avenue	Material Storage	3220 Colvin Street
Transportation Division Impound Lot	5249 Eisenhower Avenue	Vehicle Storage	5249 Eisenhower Avenue
Impound Lot	3000 Business Center Drive	Vehicle Storage	5249 Eisenhower Avenue
Vehicle and Equipment Maintenance Center	3550 Wheeler Avenue	Vehicle, Material and Equipment Storage	3550 Wheeler Avenue
Fuel Island	3400 Duke Street	Vehicle Fueling and Fuel Transfer	3550 Wheeler Avenue

BMP 6C - Turf and Landscape Nutrient Management

Description: Landscape nutrients, if improperly applied, have the potential to pollute the local waterways, the Potomac River and the Chesapeake Bay. Part I.E.6.i requires the maintenance and implementation of turf and landscape nutrient management plans (NMPs) that were developed under the 2013-2018 permit cycle.

The list of municipal lands where nutrient management plans are required and have been completed is presented below. This list includes the location and corresponding acreage for each plan and will be updated as needed.

Objective and Expected Results: By implementing NMPs developed by a certified nutrient planner consistent with § 10.1-104.2 of the Code of Virginia on applicable municipal lands, stormwater impacts can be minimized.

Implementation and Schedule:

- Turf and landscape NMPs will be maintained and implemented continuously.
- Continue to ensure that municipal employees responsible for applying nutrients on municipal land receive and maintain proper certification.
- Continue to require that all contractors engaging in the application of nutrients abide by manufacturer's recommendations.

Responsible Party: RPCA, T&ES-PWS and GS, in coordination with T&ES-SWM.

Documentation and Measure of Effectiveness: The annual report will include any new turf and landscape NMPs developed and the corresponding location and total acreage of each land area and the expiration date of the approved NMP.

Facility	Street Address	Latitude	Longitude	Acres	Plan End Date	Total
Angel Park	201 W. Taylor Run Parkway	38°48'35"N	77°4'30"W	2.5	3/31/2026	3.1%
Armistead Boothe Park	520 Cameron Station Blvd	38°48'18.9"N	77°07'37.5"W	1.2	3/31/2026	1.5%
Ben Brenman Park	4800 Ben Brenman Park Dr.	38°48'30"N	77° 6'52"W	10.7	3/31/2026	13.1%
Braddock Park	1005 Mt. Vernon Ave	38°49'15.5"N	77° 3'13.3"W	5.1	3/31/2026	6.3%
Charles Barrett Elementary School	1115 Martha Custis Drive	38°50'32"N	77° 4'37"W	1.2	3/31/2026	1.5%
Chinquapin Park	3210 King St.	38°49'15.5"N	77° 3'13.3"W	2.9	3/31/2026	3.6%
Duke St Dog Park	4657 Duke St	38°48'43.5"N	77° 6'45.8"W	1.1	11/30/2023	1.3%
Founders Park	351 North Union Street	38°48'27"N	77° 2'20"W	3.7	11/30/2023	4.5%
Four Mile Run Park	3700 Commonwealth Ave	38°50'24"N	77° 3'34"W	7.3	11/30/2023	8.9%
George Washington Middle School	1005 Mt. Vernon Ave	38°49'15.6"N	77°03'13.4"W	2.8	3/31/2026	3.4%
Harborside Park	487 S. Union St	38°47'58.8"N	77°02'28.5"W	1.3	11/30/2023	1.6%
Hensley Park	4200 Eisenhower Ave	38°48'12"N	77° 6'29"W	4.7	3/31/2026	5.8%
Luckett Park	3540 Wheeler Ave	38°48'26.3"N	77°05'22.8"W	1.3	3/31/2026	1.6%

Facility	Street Address	Latitude	Longitude	Acres	Plan End Date	Total
Montgomery Park	901 North Royal Street	38°48'51"N	77° 2'27"W	1.1	11/30/2023	1.3%
Mount Vernon Community Center	2601 Commonwealth Ave.	38°49'41"N	77° 3'34"W	1.2	3/31/2026	1.5%
Oronoco Park	100 Madison Street	38°48'40"N	77° 2'23"W	3.8	11/30/2023	4.7%
Polk Elementary School	5000 Polk Ave.	38°49'18"N	77° 6'57"W	7.7	3/31/2026	9.4%
Potomac Yards Park	2501 Potomac Ave	38°49'44.2"N	77° 2'52.6"W	5.5	3/31/2026	6.7%
Rivergate Park	2 Montgomery Street	38°48'46"N	77° 2'17"W	2.8	11/30/2023	3.4%
Simpson Park	426 E. Monroe Ave	38°49'18"N	77° 3'4"W	5.3	3/31/2026	6.5%
Lyles-Crouch Traditional Academy	530 S St Asaph St.	38°47'58"N	77° 2'47"W	1.9	3/31/2026	2.3%
West Point	1 Oronoco St.	38°48'12"N	77° 2'21"W	3.3	3/31/2026	4.0%
Windmill Hill Dog Park	501 South Union Street	38°47'58"N	77° 2'30"W	3.2	11/30/2023	3.9%
			Total	81.6		100.00%

BMP 6D – Prohibiting Deicing Agents with Urea

Description: Nutrients, if improperly applied, have the potential to pollute the local waterways, the Potomac River and the Chesapeake Bay. Part I.E.6.k prohibits the use of deicing agents containing urea or other forms of nitrogen or phosphorus to parking lots, roadways, and sidewalks, or other paved surfaces.

Objective and Expected Results: By not using deicing agents with urea or other nutrients, stormwater impacts from deicing agents can be minimized.

Implementation and Schedule: The City will not apply deicing agents containing urea or other forms of nitrogen or phosphorus to roadways, parking lots, sidewalks, or other paved surfaces per permit Part I.E.6.k.

Responsible Party: RPCA, T&ES-PWS and GS, in coordination with T&ES-SWM.

Documentation and Measure of Effectiveness: The annual report will include a statement confirming that the City did not apply deicing agents containing urea or other forms of nitrogen or phosphorus to roadways, parking lots, sidewalks, or other paved surfaces.

BMP 6E – Contractor Controls and Oversight

Description: Contractors perform work on behalf of the City must use the appropriate control measures and standard procedures to control impacts to the MS4 from stormwater discharges. Contractors must follow the appropriate laws and regulations, and secure applicable permits as required.

Objective and Expected Results: Through the use of contract language, training, standard operating procedures, or other measures within the City’s legal authority will require the use of the appropriate control measures by City Contractors and ensure that operations do not contribute to stormwater pollution.

Implementation and Schedule: Continue to ensure that contractors follow proper procedures and employ required control measures. The mechanisms used by the City to ensure City contractors implement the necessary good housekeeping and pollution prevention procedures include having SOPs in place for activities that could lead to stormwater pollution, requiring necessary permits and certifications, adding language in contracts, and ensuring that City employees charged with oversight of City capital projects receive annual water quality training.

Responsible Party: Various divisions in T&ES and DPI are responsible for implementation.

Documentation and Measure of Effectiveness: Provide an annual summary on the types of tools used to ensure compliance.

BMP 6F – Training

Description: A written training plan is required as outlined in Part I.E.6.m of the permit. Employees performing applicable duties shall be trained in recognizing and reporting illicit discharges no less than once every 24 months. Staff whose normal duties require a considerable amount of field work play a valuable role in identifying and addressing illicit discharges. Training will provide the appropriate tools for field staff to recognize, document relevant information and report the incident for follow up by the appropriate staff.

City staff engages in daily activities that have the potential to adversely impact water quality. The likelihood of these impacts occurring may be minimized or avoided by providing staff training on pollution prevention and good housekeeping. Employees performing applicable duties shall be trained in pollution prevention and good housekeeping no less than once every 24 months.

In addition, employees hired by the City who apply pesticides and herbicides shall be trained or certified with the Virginia Pesticide Control Act. Certification by the Virginia Department of Agriculture and Consumer Services (VDACS) Pesticide and Herbicide Applicator program shall constitute compliance with this requirement.

The City’s employees and contractors serving as plan reviewers, plan inspectors, program administrators, construction site operators and those implementing the City’s stormwater program will obtain and maintain the appropriate certification as required under the Virginia Erosion and Sediment Control Law and the Virginia Stormwater Management Act. The employees whose duties include emergency response will be properly trained in spill reporting which may be satisfied through a larger emergency response training program.

Objective and Expected Results: Providing the proper training to City employees will ensure that good housekeeping procedures are followed so that operations do not contribute to stormwater pollution. In addition, field personnel trained in recognizing and reporting illicit discharges are additional eyes in the field that can alert other staff of potential illicit discharges with the goal of improving water quality.

Implementation and Schedule: The City will provide biennial training for the field positions listed below. Training will take place annually with the topic alternating between (1) recognizing and reporting illicit discharges and (2) pollution prevention and good housekeeping. Training tools may include, but are not

limited to, videos, presentation, manuals, desktop exercises, and field exercises, as appropriate. Training may be coordinated with SWPPP training in BMP 6B and may be conducted with the entire group or smaller functional areas as appropriate to minimize impact on carrying out normal duties. See the Training Plan below for more information on staff positions and the schedule for planned training to be provided. The plan is integrated into this BMP and is presented below.

Responsible Party: T&ES-SWM will coordinate the overall effort with the assistance from listed agencies and personnel. Other municipal departments or divisions may provide training as appropriate.

Documentation and Measure of Effectiveness: A list of training events held, the date, number of staff receiving training and the objective of the training will be provided in each associated annual report. Sign-in sheets and materials, such as emails pertaining to trainings, will be retained for a minimum of three years.

TRAINING PLAN

The City will provide biennial training for the field positions listed below. Training will take place annually with the topic alternating between (1) recognizing and reporting illicit discharges and (2) pollution prevention and good housekeeping. Pollution Prevention and Good Housekeeping Training for applicable staff will be provided in PY1, PY3, and PY5. Recognizing and Reporting Illicit Discharges Training will be concentrated in PY2 and PY4. The table below provides the general Training Plan and Schedule to comply with the permit requirements outlined in Part I.E.6.m.

Department	Division	Approximate Number of Applicable Employees	IDDE Training	PPGH Training
Transportation and Environmental Services	Street Maintenance	16	PY2 & PY4	PY1, PY3, & PY5
	Sewer Maintenance	22	PY2 & PY4	PY1, PY3, & PY5
	Refuse Collection	17	PY2 & PY4	PY1, PY3, & PY5
	Traffic Operations	19	PY2 & PY4	PY1, PY3, & PY5
	C&I	6	PY2 & PY4	
RPCA	Park Ops	52	PY2 & PY4	PY1, PY3, & PY5
General Services	Facility Maintenance	18		PY1, PY3, & PY5
	Fleet Services	16		PY1, PY3, & PY5
Code Administration	New Construction	16	PY2 & PY4	

Department	Division	Approximate Number of Applicable Employees	IDDE Training	PPGH Training
	Maintenance Code	6	PY2 & PY4	

Emergency response employees with Hazmat certification are required to have 24 hours of training annually in order to retain certification.

BMP 6G – Street Sweeping and Leaf Collection Programs

Description: The City continues to implement a street sweeping program in the MS4 area. The leaf collection program also continues to operate to remove leaves from properties, sidewalk and roadways within the City.

Objective and Expected Results: Removing trash, debris, organic material and sediment from roadways ensures that these materials do not enter the storm sewer system and later get deposited in local waterways, the Potomac River and the Chesapeake Bay. Removing leaves from properties within the City keeps this organic material out of the storm sewer system and removes possible sources of nutrients and impacts on biological and chemical oxygen demand in surface waters.

Implementation and Schedule:

- Continue to perform street sweeping.
- Continue to operate the leaf collection program.

Responsible Party: T&ES-RR is responsible for implementing the street sweeping and leaf collection programs.

Documentation and Effectiveness: Each annual report will include statistics for street sweeping and leaf collection.

BMP 6H – Catch Basin and Inlet Cleaning Program

Description: The City has a long-standing program to inspect and clean stormwater catch basins and inlets. Catch basin cleaning varies year by year depending on the weather.

Objective and Expected Results: The catch basin and inlet cleaning program is meant to both reduce spot flooding and drainage problems as well as to prevent materials, including floatables and vegetative debris captured in inlets, from continuing to local streams.

Implementation and Schedule: The City will continue catch basin and inlet cleaning operations.

Responsible Party: T&ES-PWS is responsible for implementing the City's catch basin and inlet cleaning program.

Documentation and Measure of Effectiveness: The City will report catch basin and inlet cleaning statistics in the annual report.

BMP 6I – Employee Complaint Reporting

Description: Trusting employees to be the “eyes and ears” of the City and providing a reporting mechanism empowers employees and encourages ownership. It also allows the quick and efficient routing of possible problems so that they may be addressed. The City utilizes the Alex311 reporting system for all requests. This allows issues to be routed and addressed in the same manner as citizen complaints.

Objective and Expected Results: City employees are trained and encouraged to report potential stormwater pollution or illicit discharges to improve water quality.

Implementation and Schedule: The City will continue to operate Alex311 for internal and external reporting. This will continue to be maintained.

Responsible Party: T&ES-PWS and T&ES-SWM are the main agencies addressing water quality concerns, with staff City-wide having access to report a complaint.

Documentation and Measure of Effectiveness: A screen capture of the web portal will be included in each annual report.

BMP 6J – Environmental Stakeholder Groups

Description: The City receives input on the stormwater program from several stakeholder groups including the Environmental Policy Commission (EPC), the Stormwater Quality Work Group (SWWG) (also referred to as the Water Quality Work Group), the Fire Department’s Environmental and Industrial Use Unit (EIU), and the Eco-City Alexandria Implementation Group.

The EPC is appointed by the City Council and makes recommendations on environmental issues, including stormwater management. The City Manager has established two internal stakeholder groups to work on stormwater issues and make policy decisions to ensure regulatory compliance and shape the stormwater program. The first group, the Water Quality Steering Committee, transitioned into the Eco-City Alexandria Implementation Group during the final permit cycle of the 2013-2018 permit and is comprised of deputy city managers, department heads, and staff from T&ES-SWM, and is charged with making policy decisions and setting the course for the City’s environmental programming. The second group, the Stormwater Work Group (SWWG) as an internal stakeholder group comprised of City staff from the deputy director, division chief and supervisory level. The SWWG’s mission is to develop and coordinate the City’s response across various City departments to permit requirements, including the Chesapeake Bay TMDL. The WQWG is charged with supporting development of policy, programs and plans to administer the Virginia Stormwater Management (VSMP) Local Program and the MS4 general permit. The Fire Marshal’s Environmental Investigation Unit (EIU) acts as the lead for coordination of environmental issues, including water quality investigation, enforcement, and documentation.

Objective and Expected Results: Stakeholder groups create ties across the organization among the various departments and divisions that are responsible for implementing the MS4 Program Plan, allows for interactions and collaborative problem solving, fosters team building, and creates organizational ownership for the program. They also provide a forum for the exchange of ideas and allows for the input of staff expertise from varied disciplines to help create a more holistic stormwater program.

Implementation and Schedule:

- The EIU will continue to focus on environmental issues and meet periodically.

- The EPC will meet monthly.
- Eco-City Alexandria Implementation Group will meet as needed.
- The SWWG will meet as needed.

Responsible Parties: The various stakeholder groups are comprised of residents, interested parties, and City staff. They are responsible for meeting and their corresponding work with support from T&ES-SWM technical staff.

Documentation and Measure of Effectiveness: Sample meeting agendas and/or presentations from meetings held during the reporting period will be included in the annual report.

D. TMDL Special Conditions

While the focus of the MS4 permit is on pollution prevention, the general permit includes special conditions to address the Chesapeake Bay TMDL and local TMDLs where a wasteload allocation (WLA) has been approved by the State Water Control Board (SWCB) and is assigned to sources in the City. These special conditions were first introduced in the 2013-2018 permit. The City's MS4 Program Plan carries forward previous documented actions to address pollutants of concern for impaired waters and incorporates new requirements as applicable. The sections below describe how the City will address these special conditions.

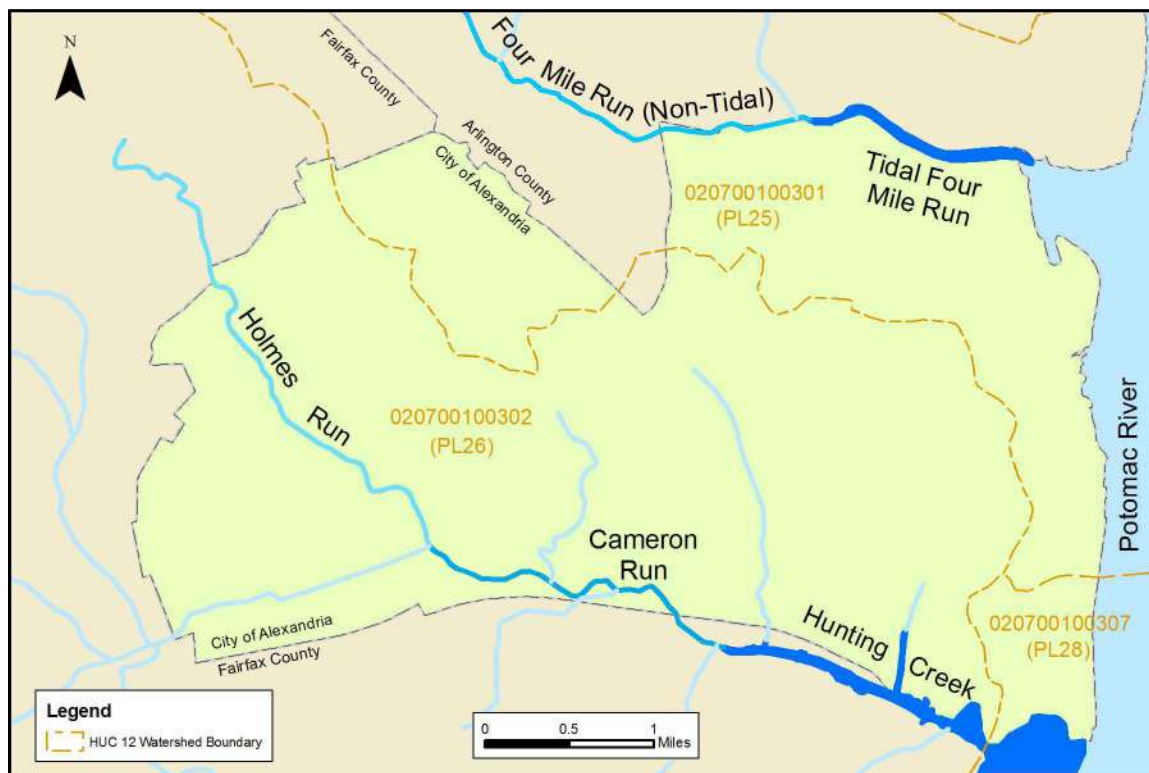


Figure 2. Alexandria's Waterways with Local TMDLs

1. Chesapeake Bay TMDL Special Condition

Finalized in December 2010 by the United States Environmental Protection Agency (EPA), the Chesapeake Bay TMDL and the associated Phase I and Phase II Watershed Implementation Plans (WIPs) developed by the Commonwealth of Virginia, set limits on nitrogen, phosphorus and sediment entering the Bay. (The Phase III WIP is currently under development.) Pollutant reduction targets have been incorporated into the City's MS4 General Permit, with a total of 40% reductions in the L2 Scoping loads required by the end of this permit cycle. As a condition in the permit, the means and methods to achieve these reductions must be included in the City's Chesapeake Bay TMDL Action Plan. The City was required to prepare the Phase I Action Plan by June 30, 2015 based on the requirements in the 2013-2018 permit and using DEQ Guidance Memo No. 15-2005 dated May 18, 2015. The City was required to prepare the Draft Phase II Action Plan and submit it with the registration statement for permit reissuance in May 2018.

In accordance with the permit, an updated Phase II Action Plan was submitted no later than November 1, 2019 or 12 months after the permit effective date. The City provided an opportunity for public comment on the additional BMPs proposed to meet the reductions which had not been previously approved by DEQ in the Phase I Action Plan. A summary of comments received, the City's response, documentation of corresponding public meeting(s) and revisions made resulting from public participation is documented with the final Action Plan which is included in Appendix G.

The annual reports will include a list of BMPs implemented during the reporting period but not reported to the DEQ BMP Warehouse, the corresponding estimated reduction of pollutants, documentation of any acquired credits to meet the reductions in accordance with the permit, progress toward meeting the required pollutant reductions, and a list of BMPs planned to be implemented during the next reporting period.

2. Local TMDL Special Condition

The City has four existing TMDLs with an approved WLA for the MS4 area, two of which were approved prior to July 2008 and two of which were approved between July 2008 and June 2013.

A TMDL for bacteria related to fecal coliform was approved in 2004 for the non-tidal portion of Four Mile Run, and in 2007 a TMDL for PCBs was approved for the Tidal Potomac watershed. Given that these TMDLs were approved prior to July 2008, TMDL Action Plans were completed by June 30, 2015 and were submitted with the 2015-2016 annual report. The updated PCB Action Plan for the Tidal Potomac watershed can be found in Appendix H.

In 2010, the SWCB issued approval of bacteria TMDLs for Tidal Four Mile Run, and the Hunting Creek, Cameron Run, and Holmes Run watersheds (see Figure 2). In both recent TMDLs, bacterial water quality is based on levels of *E. coli*. Since these TMDLs were approved between July 2008 and June 2013, the corresponding TMDL Action Plans were completed by June 30, 2016 and were submitted with the 2016-2017 annual report. Based on guidance and conversations with DEQ staff, the City developed a comprehensive Bacteria TMDL Action Plan that addresses bacteria impairments for those affected watersheds. Beginning with the Non-Tidal Four Mile Run TMDL Action Plan which was due by June 30, 2015, the City incorporated the successive TMDLs for Hunting Creek, Cameron Run, and Holmes Run to create a comprehensive updated Bacteria TMDL Action Plan which can be found in Appendix H.

In accordance with the permit, these Local TMDL Action Plans were updated prior to May 2020 (18 months after permit effective date). The permit also has a requirement for plan to be developed for TMDLs approved by EPA between July 1, 2013 and June 30, 2018 that have WLA no later than May 2021 (30 months after permit effective date); however, the City does not have any new TMDLs that meet this criteria. The permit provides a list of items to be included in each Local TMDL Action Plan in Part II.B.3. Based on the type of TMDL (bacteria, sediment, phosphorus, nitrogen, or PCBs), there is list of different strategies the City must choose from to address the impairment.

Prior to submittal of the Local TMDL Action Plans, the City provided an opportunity for public comment for no less than 15 days. The annual report includes a summary of actions conducted to implement each local TMDL action plan.

The table below presents the City’s TMDLs with associated WLAs and corresponding information.

Approved TMDLs	Action Plan Completion Date
<i>Fecal Coliform TMDL Development for Four Mile Run, Virginia</i> <ul style="list-style-type: none"> • Bacteria – fecal coliform • First listed – 1998 • SWCB approval – 4/11/2008 	June 30, 2015
<i>Total Maximum Daily Loads of Polychlorinated Biphenyls (PCBs) for Tidal Portions of the Potomac and Anacostia Rivers in the District of Columbia, Maryland, and Virginia</i> <ul style="list-style-type: none"> • PCBs in Fish Tissue • EPA approval – 4/11/2008 	
<i>Bacteria TMDL for the Tidal Four Mile Run Watershed</i> <ul style="list-style-type: none"> • Bacteria – <i>E. coli</i> • First listed – 1996 • SWCB approval – 9/30/2010 	June 30, 2016
<i>Bacteria TMDLs for the Hunting Creek, Cameron Run, and Holmes Run Watersheds</i> <ul style="list-style-type: none"> • Bacteria – <i>E. coli</i> • First listed – 1998, 2008, 2004 (respectively) • SWCB approval – 8/4/2011 	

E. Annual Report and Program Evaluation

Annual Report

The City will submit annual reports to DEQ each year covering the period of July 1st through June 30th. The annual report will be submitted to DEQ no later than October 1st of each year. The information provided to DEQ will be in accordance with MCM-specific items in the general permit, as well as the provisions of Part I.E, which includes the following:

Permit Section	Annual Report Requirements
I.E.1.g	<ol style="list-style-type: none"> 1) A list of the high-priority stormwater issues the permittee addressed in the public education and outreach program; and 2) A list of the strategies used to communicate each high-priority stormwater issue.
I.E.2.f	<ol style="list-style-type: none"> 1) A summary of any public input on the MS4 program received (including stormwater complaints) and how the permittee responded; 2) A webpage address to the permittee's MS4 program and stormwater website; 3) A description of the public involvement activities implemented by the permittee; 4) A report of the metric as defined for each activity and an evaluation as to whether or not the activity is beneficial to improving water quality; and 5) The name of other MS4 permittees with whom the permittee collaborated in the public involvement opportunities.
I.E.3.e	<ol style="list-style-type: none"> 1) A confirmation statement that the MS4 map and information table have been updated to reflect any changes to the MS4 occurring on or before June 30 of the reporting year; 2) The total number of outfalls screened during the reporting period as part of the dry weather screening program; and 3) A list of illicit discharges to the MS4 including spills reaching the MS4 with information as follows: <ol style="list-style-type: none"> a. The source of illicit discharge; b. The dates that the discharge was observed, reported, or both; c. Whether the discharge was discovered by the permittee during dry weather screening, reported by the public, or other method (describe); d. How the investigation was resolved; e. A description of any follow-up activities; and f. The date the investigation was closed.
I.E.4.d	<ol style="list-style-type: none"> 1) If the permittee implements a construction site stormwater runoff program in accordance with Part I E 4 a (3): <ol style="list-style-type: none"> a. A confirmation statement that land disturbing projects that occurred during the reporting period have been conducted in accordance with the current department approved standards and specifications for erosion and sediment control; and b. If one or more of the land disturbing projects were not conducted with the department approved standards and specifications, an explanation as to why the projects did not conform to the approved standards and specifications. 2) Total number of inspections conducted; and 3) The total number and type of enforcement actions implemented and the type of enforcement actions.

I.E.5.i	<ol style="list-style-type: none"> 1) If the permittee implements a Virginia Stormwater Management Program in accordance with Part I E 5 a (1) and (2): <ol style="list-style-type: none"> (a) The number of privately owned stormwater management facility inspections conducted; and (b) The number of enforcement actions initiated by the permittee to ensure long-term maintenance of privately owned stormwater management facilities including the type of enforcement action; 2) Total number of inspections conducted on stormwater management facilities owned or operated by the permittee; 3) A description of the significant maintenance, repair, or retrofit activities performed on the stormwater management facilities owned or operated by the permittee to ensure it continues to perform as designed. This does not include routine activities such as grass mowing or trash collection; 4) A confirmation statement that the permittee submitted stormwater management facility information through the Virginia Construction Stormwater General Permit database for those land disturbing activities for which the permittee was required to obtain coverage under the General VPDES Permit for Discharges of Stormwater from Construction Activities in accordance with Part I E 5 f or a statement that the permittee did not complete any projects requiring coverage under the General VPDES Permit for Discharges of Stormwater from Construction Activities; and 5) A confirmation statement that the permittee electronically reported BMPs using the DEQ BMP Warehouse in accordance with Part I E 5 g and the date on which the information was submitted.
I.E.6.q	<ol style="list-style-type: none"> 1) A summary of any operational procedures developed or modified in accordance with Part I E 6 a during the reporting period; 2) A summary of any new SWPPPs developed in accordance Part I E 6 c during the reporting period; 3) A summary of any SWPPPs modified in accordance with Part I E 6 f or the rationale of any high priority facilities delisted in accordance with Part I E 6 h during the reporting period; 4) A summary of any new turf and landscape nutrient management plans developed that includes: <ol style="list-style-type: none"> (a) Location and the total acreage of each land area; and (b) The date of the approved nutrient management plan; and 5) A list of the training events conducted in accordance with Part I E 6 m, including the following information: <ol style="list-style-type: none"> (a) The date of the training event; (b) The number of employees who attended the training event; and (c) The objective of the training event.
II.A.13	<ol style="list-style-type: none"> 1) A list of BMPs implemented during the reporting period but not reported to the DEQ BMP Warehouse in accordance with Part I E 5 g and the estimated reduction of pollutants of concern achieved by each and reported in pounds per year; 2) If the permittee acquired credits during the reporting period to meet all or a portion of the required reductions in Part II A 3, A 4, or A 5, a statement that credits were acquired; 3) The progress, using the final design efficiency of the BMPs, toward meeting the required cumulative reductions for total nitrogen, total phosphorus, and total suspended solids; and

	4) A list of BMPs that are planned to be implemented during the next reporting period.
II.B.9	1) A summary of actions conducted to implement each local action plan.

Evaluation of Effectiveness: During the annual reporting process, the City will provide an annual evaluation of the MS4 Program implementation, include a review of each MCM to determine the MS4 program’s effectiveness and whether or not changes to the MS4 Program Plan are necessary.

Record Keeping: The City will retain records required by the MS4 permit for at least three years and make them available to DEQ and the public as requested.

City of Alexandria
Municipal Separate Storm Sewer System (MS4) Program Plan

Appendix A – MCM #1: Public Education and Outreach

**NORTHERN VIRGINIA
CLEAN WATER PARTNERS PROGRAM**

MEMORANDUM OF AGREEMENT

In order to establish an effectively coordinated stormwater education and outreach program, the parties whose authorized agents are signatories to the Memorandum of Agreement do hereby enter into the following Memorandum of Agreement.

SECTION I PURPOSE OF MEMORANDUM

The purpose of this Memorandum is to establish and maintain a coordinated stormwater education program in the Northern Virginia region, hereinafter referred to as the "Program". The signatories, hereinafter referred to as the "Northern Virginia Clean Water Partners," or "Partners," comprise a group of local governments, public school systems, institutions of higher education, drinking water and sanitation authorities, and businesses that choose to work together to inform individuals about the pollution potential of common activities, so that individuals can take direct action to reduce stormwater pollution. To meet this goal, the Partners work together to:

- Identify high priority water quality issues for the region;
- Identify the target audience(s) for outreach;
- Educate the region's residents on simple ways to reduce pollution around their homes;
- Monitor changes in behavior through surveys and other data collection techniques; and
- Pilot new cost-effective opportunities for public outreach and education.

By working together the Partners are able to leverage their funds and services to develop and place English and Spanish bilingual educational products with common messages and themes, thereby extending the campaign's reach.

SECTION II GENERAL DEFINITIONS

The term "Northern Virginia" refers, at a minimum, to the area comprising the Northern Virginia planning district, as specified in Section III.

The terms "Clean Water Partners," "Partners," "Participants," and "Partnership" refer to all entities which enter into this Agreement and abide by its terms.

"Contributing Partners" refers to those partners who contribute direct funds to the Program.

SECTION III AREA OF COVERAGE

Contribution and Participation in this Agreement and Program is available to any local government, public authority or institution of higher education within the confines of the Northern Virginia planning district, or adjacent planning districts.

SECTION IV OPERATIONAL ARRANGEMENTS

A. Staff Services

NVRC shall provide staff support for the Program, to the extent that funds are available. This may include procuring multi-media advertising services, procuring behavior change surveys, coordinating and hosting meetings, and maintaining website hosting and domain services. All contracts and administrative agreements approved by the Partnership shall be submitted to the NVRC Board for review and execution. The Executive Director of NVRC shall be the chief administrative agent of the Partnership and in this capacity shall be responsible to the Partnership for managing its staff support.

Upon the conclusion of each fiscal year NVRC shall prepare an annual report summarizing the status, progress and effectiveness, to the extent possible, of all significant outreach efforts during the previous fiscal year. This report shall include a preliminary work program for the upcoming fiscal year, and it shall be presented to the Partnership for approval. The report will be prepared so that it can be used to support individual permit requirements.

B. Meeting Space

NVRC shall provide adequate space and facilities for the meeting of the Program participants.

C. Budget

An annual budget for the Program shall be developed and funded through a special assessment of the Contributing Partners for inclusion in the annual NVRC budget. The annual operating budget shall be submitted by the NVRC staff to each Participant for its approval. Prior to the assessment of a participating local government, the allocation of program costs must be approved by its governing body.

The funding formula for the Program is as follows: \$ 0.05 per capita based on the most recent decennial census unless more current population estimates are available from the Weldon Cooper Center for Public Service of the University of Virginia.

SECTION V TERMS

This Memorandum shall exist subject to amendment or dissolution in accordance with the following provisions:

A. Amendments

This Agreement may be amended at any time by the concurrence of all Participants. Proposed amendments shall be presented in writing to the NVRC staff and must be approved unanimously by all Participants.

The acceptance of additional Parties to this Agreement shall not require an amendment to this Agreement, but shall require the consent of a simple majority of the Partner participants. Each new Participant shall be bound to the terms of this Agreement as evidenced by the signature of its authorized agent.

B. Severability

Each paragraph and provision of this Agreement is severable from the entire Agreement and if any provision is declared invalid or unenforceable the remaining provisions shall nevertheless remain in effect.

C. Dissolution

This Agreement may be dissolved at any time by majority agreement of all participant Partners.

If a single Partner unit wishes to withdraw from the Agreement, notice of intent to withdraw must be provided at least six months prior to the end of the fiscal year, in order to provide the remaining parties with an opportunity to make any necessary budget adjustments.

This Agreement shall take effect after appropriate action by ordinance, resolution or otherwise pursuant to the law of the governing body of each participating political subdivision.

[SIGNATURE PAGE TO FOLLOW]

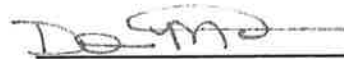
IN WITNESS WHEREOF, the City of Alexandria and NVRC have caused this document to be executed as of the date of the last signature shown:

CITY OF ALEXANDRIA, VIRGINIA

By: 
Mark Jinks, City Manager


Date: 5-15-18

Approved as to Form:

By:  Asst. City Atty.
James L. Banks, Jr., City Attorney

Date: 5/17/2018

NORTHERN VIRGINIA REGIONAL COMMISSION

By: 

Title: Exec. Director

Date: 5/17/18

City of Alexandria
Municipal Separate Storm Sewer System (MS4) Program Plan
Appendix B – MCM #2: Public Involvement and Participation

Schedule of Services for Memorial Day Week

Updated 1:28 p.m. Tue, May 21

Make A Plan Now: Metrorail Station Closures Begin May 25

Updated 5:53 p.m. Thu, May 16

Stormwater Management

Stormwater runoff occurs when rain or snowmelt flows over the ground. Hard surfaces, like roofs, driveways, parking lots, and streets prevent stormwater from naturally soaking into the ground. If not managed properly, stormwater runoff can create stormwater pollution and/or flooding issues.

Page updated on [Mar 29, 2019 at 11:45 AM](#)

UPCOMING EVENTS

JUNE Clean the Bay Day

01

9:00 AM / Oronoco Bay Park

JUNE Environmental Policy

03

Commission Work Session

7:30 PM / City Hall, Room 2000

RELATED CONTENT

- [Stormwater Management](#)
- [Chesapeake Bay](#)
- [Sanitary Infrastructure](#)
- [Stormwater Utility Fee Information](#)

What Do We Do?

The Stormwater Management Program helps protect water quality in the City. The program has three focus areas: 1) Stormwater Quality, 2) Flooding and Drainage Issues, and 3) Public Infrastructure Maintenance & Operations. Residents also partner with the City to protect water quality and decrease the impact of flooding. Working together we can manage stormwater more effectively to protect our local water resources and our community.

City of Alexandria's Stormwa...



- [Rain Barrels and Water Harvesting](#)
- [Resource Protection Areas \(RPAs\)](#)
- [Stream Restoration](#)
- [Total Maximum Daily Loads \(TMDLs\)](#)
- [Urban Streams: Enjoying Our Stream Safely](#)
- [Virginia Stormwater Management Program \(VSMP\)](#)

SHARE

[Write as Rain Campaign](#)

Alexandria is participating in the inaugural “Write as Rain” campaign, a regional effort with the Northern Virginia Clean Water Partners designed to get residents thinking about how their actions on the street can impact local streams and rivers. When it rains, spot our hidden messages around the City to inspire clean water thinking!

[Stormwater Utility Fee Information](#)

The City has adopted a Stormwater Utility Fee to provide funding for the stormwater management program to reduce the impact of stormwater pollution and flooding, and ensure that Alexandria is in compliance with state and federal stormwater regulations.

[What You Can Do to Protect Water Quality](#)

Our everyday activities can impact stormwater quality in positive or negative ways. It’s up to all of us to do our parts. Learn what you can do to get involved and help out around your home, yard, or

business to help improve water quality in our local streams, the Potomac River, and the Chesapeake Bay.

Stormwater Quality

Stormwater carries pollutants from hard surfaces to our local waterways, and can contribute to poor water quality. Learn more about stormwater quality, what stormwater BMPs are, and what the City is doing to protect our local streams, the Potomac River, and the Chesapeake Bay.

Flooding & Drainage

Flooding is the number 1 natural disaster in our country. Learn more about what the City is doing to help improve flooding and drainage issues, how you can be flood smart, and what you can do to help protect your property.

Public Infrastructure Maintenance & Operations

Maintaining the storm system is a big job. Learn about what it takes to operate, maintain, and repair over 210 miles of streets, 185 miles of storm sewer pipes,

13,500 storm sewer structures, and
hundreds of stormwater BMPs.

Illegal Discharges

Did you know that only rain should enter the storm system? Learn more about what illegal discharges are, why only rain and snow melt should enter the storm sewer system, and what to do if you see a weird color in a stream.



Alexandria City
Hall
301 King Street
Alexandria, VA
22314

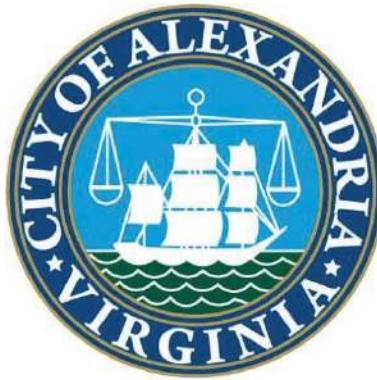
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City of Alexandria
Municipal Separate Storm Sewer System (MS4) Program Plan
Appendix C – MCM #3: Illicit Discharge Detection and Elimination



**City of Alexandria, Virginia
Illicit Discharge Detection and Elimination Program
Policies and Procedures**

5/9/2014

Revised: 4/28/2019

Revised: September 22, 2022



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A. Introduction and Purpose

The purpose of the City of Alexandria, Virginia Illicit Discharge Detection and Elimination (IDDE) Program is to protect the public health, safety and welfare by reducing the discharge of pollutants from the City's Municipal Separate Storm Sewer System (MS4), to protect water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act and its attendant regulations.

This document serves as a guideline for staff in the investigation and effective elimination of illicit discharges into the MS4 and local waterways. These written procedures are designed to detect, identify, and address unauthorized nonstormwater discharges, including illegal dumping, to the small MS4 to effectively eliminate the unauthorized discharge. Execution of this program and the procedures found in this document is the primary responsibility of the Department of Transportation and Environmental Services (T&ES) Stormwater Management Division (SWM).

As required by the City's 2018 – 2023 MS4 general permit, the City will maintain, implement and enforce IDDE written procedures to include:

1. A description of legal authorities, policies, standard operating procedures or other legal mechanisms to eliminate identified sources of ongoing illicit discharges;
2. Dry weather screening protocols;
3. Investigation timeframes;
4. Methodologies to determine the source of all illicit discharges;
5. Methodologies for conducting follow-up investigations; and
6. Mechanism to track and document all illicit discharge investigations.

The protocols for outfall dry weather screening are found in Section C. City staff will also respond to illicit discharge complaints reported to the City. All investigations will follow the procedures outlined in the Section D of this document.

The following sections outline the City's IDDE Program and how the requirements of the 2018-2023 MS4 permit will be addressed. All investigations will be performed in accordance with all state, federal, and local laws and regulations.

B. Legal Authority

Legal authority regulating the discharge of materials into the stormwater system is provided by the Virginia Statewide Fire Prevention Code and the City of Alexandria, Virginia Code of Ordinances. Applicable excerpts from these codes are presented below.

1. The Virginia Statewide Fire Prevention Code (2012)

Section 5003.3 Release of hazardous materials.

Hazardous materials in any quantity shall not be released into a sewer, storm drain, ditch, drainage canal, creek stream, river, lake, or tidal waterway or on the ground, sidewalk, street, highway or into the atmosphere.

Exceptions:

1. The release or emission of hazardous materials is allowed when in compliance with federal, state, or local governmental agencies, regulations, or permits.
2. The release of pesticides is allowed when used in accordance with registered label directions.
3. The release of fertilizer and soil amendments is allowed when used in accordance with manufacturer's specifications.

2. City of Alexandria, Virginia Code of Ordinances

Sec. 11-13-2 Illegal dumping prohibited.

- a) It shall be unlawful for any person to dump any waste on any property, in any waters or in any sanitary sewer or stormwater system, except as authorized by law or by applicable permit. It shall be the burden of the alleged violator to show proof of any applicable permits.
- b) In the event waste is dumped from a motor vehicle or water craft in violation of this section, the owner of such motor vehicle or water craft shall be presumed to be the person ejecting such waste, and such owner shall have the burden of coming forward with evidence to rebut the presumption.
- c) It shall be unlawful for any person to throw, drain, or otherwise discharge, cause, or allow others under its control to throw, drain or otherwise discharge into the stormwater system any substance, whether liquid or solid, other than stormwater with the exception of the following:
 1. Water line flushing;
 2. Landscape irrigation;
 3. Diverted stream flows;
 4. Rising groundwaters;
 5. Uncontaminated groundwater infiltration;
 6. Uncontaminated pumped groundwater;

7. Discharges from potable water sources, foundation drains, irrigation waters, springs, or water from crawl spaces or footing drains;
 8. Lawn watering;
 9. Individual residential car washing;
 10. Flows from riparian habitats and wetlands;
 11. Dechlorinated swimming pool discharges;
 12. Street washwater;
 13. Discharges from firefighting activities; and
 14. Discharges for which a valid Virginia Pollutant Discharge Elimination System (VPDES) or National Pollutant Discharge Elimination System (NPDES) permit has been issued.
- d) If any of the foregoing exceptions are identified as significant sources of pollutants, and thus cause a negative impact on the quality of the waters of the Commonwealth of Virginia, such situation or occurrence shall be deemed unlawful.

C. Dry Weather Field Screening

1. Prioritization

Several different criteria will be used to create a prioritized list of outfalls for dry weather field screening. The first criteria to be utilized is the historical illicit discharge information. Outfalls where illicit discharges were confirmed during the previous permit year (initiated either through dry weather field screening or by a complaint) will be prioritized and included on the list for dry weather screening for the current reporting year.

Additionally, a desktop exercise using zoning and development data, land use data, storm drain system information, aerial photography and other pertinent information will be conducted no less than once every five years to identify high priority areas. For example, these areas may include locations with a high percentage of commercial businesses. A list of these outfalls will be developed and categorized as meriting priority investigation due to the higher potential to have illicit discharges.

Finally, outfalls that discharge directly to a receiving water with a nutrient or bacteria related TMDL with designated waste load allocation (WLA) will receive prioritization. The list of stream segments within the City that fall into this category are presented in the table below.

Stream	Report Title	Upstream Limit	Downstream Limit
Four Mile Run	<i>Fecal Coliform TMDL Development for Four Mile Run, Virginia</i>	City limits	Between confluence with Long Branch and Mount Vernon Avenue
Tidal Four Mile Run	<i>Bacteria TMDL for the Tidal Four Mile Run Watershed</i>	Rivermile 1.46 (between confluence with Long Branch and Mount Vernon Avenue)	Confluence with the Potomac River
Hunting Creek, Cameron Run, and Holmes Run	<i>Bacteria TMDLs for the Hunting Creek, Cameron Run, and Holmes Run Watersheds</i>	<u>Hunting Creek</u> – Telegraph Road Bridge <u>Cameron Run</u> – Confluence with Backlick Run <u>Holmes Run</u> – Mouth of Lake Barcroft	<u>Hunting Creek</u> – Mouth of embayment (Jones Point) <u>Cameron Run</u> - Telegraph Road Bridge <u>Holmes Run</u> – Confluence with Backlick Run

As required by Part I.E.3.c of the permit, a minimum of 50 outfalls will be inspected annually such that no more than 50% are screened in the previous 12-month period. The 50% criterion is not applicable if all outfalls have been screened in the previous three years.

Annually, the list of 50 outfalls to be screened will be developed using the following prioritization methodology:

1. Outfalls that had confirmed illicit discharges the previous permit year (no more than 20 outfalls)
2. Outfalls that are in the high priority areas
3. Outfalls that discharge directly into a receiving water with a nutrient or bacteria related TMDL with WLA

After the list is developed, it will be checked to confirm that not more than 25 outfalls were also screened during the last permit cycle.

2. Screening Procedures

The purpose of field screening is to conduct field investigative work and involves rapid field screening of prioritized outfalls followed by indicator monitoring at suspect outfalls to characterize flow types and trace sources.

a. Equipment

Staff shall be equipped with basic field mapping, outfall field screening forms (hard copy or electronic), and necessary equipment during field screening investigations. A blank outfall field screening form can be found in Appendix A and a checklist of field screening equipment can be found in Appendix B.

b. Field Screening Investigation

As described above, field screening must be completed for at least 50 outfalls annually. Field screenings will be conducted using the City's outfall field screening form and procedures outlined in this document. Dry weather field screening shall only be conducted after 48 hours following a measurable storm event (more than 0.1 inch). The field screening form is presented in sections below along with corresponding descriptions.

Each outfall investigation must include:

- 1) Completed outfall field screening form
- 2) Digital picture(s)

Outfall Field Screening Form

Section 1: Background Data

Facility ID:		Outfall Location:	
Watershed / HUC:		Local Subwatershed:	
Today's date:		Military Time:	
Screening performed by:		Photo #(s):	
Weather, Temp.(°F):		Time since last precipitation:	Amount:
Local Land Use (Check all that apply): <input type="checkbox"/> Ultra-Urban Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Suburban Residential <input type="checkbox"/> Open Space / Park			

Section 1: Background Data

This section is used to indicate background information for each outfall. Each outfall has a unique identifier that will be used for the facility ID. A picture of each outfall must be taken and the photo number recorded. If the database is being used, the photo can be uploaded directly into the database

and the number does not need to be recorded. Rainfall data will be taken from NOAA's National Climatic Data Center using the station: **WASHINGTON REAGAN NATIONAL AIRPORT, VA US, GHCND:USW00013743**. <http://www.ncdc.noaa.gov/> This data will include the time (in hours or days) since the last precipitation event. Note that dry weather investigations shall only be conducted after 48 hours following a measurable (more than 0.1 inch).

Section 2: Outfall Description

MATERIAL	OUTFALL SHAPE	NUMBER PIPES	OUTFALL DIAMETER	SUBMERGED
<input type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> Concrete <input type="checkbox"/> DIP <input type="checkbox"/> PVC <input type="checkbox"/> Steel <input type="checkbox"/> Clay Tile (CT) <input type="checkbox"/> Brick (BRK)	<input type="checkbox"/> Circular <input type="checkbox"/> Elliptical <input type="checkbox"/> Box <input type="checkbox"/> Flared End	<input type="checkbox"/> Single <input type="checkbox"/> Double <input type="checkbox"/> Triple	<input type="checkbox"/> 12" <input type="checkbox"/> 50" <input type="checkbox"/> 15" <input type="checkbox"/> 54" <input type="checkbox"/> 18" <input type="checkbox"/> 60" <input type="checkbox"/> 20" <input type="checkbox"/> 72" <input type="checkbox"/> 24" <input type="checkbox"/> Other <input type="checkbox"/> 36" <input type="checkbox"/> 40" <input type="checkbox"/> 42" <input type="checkbox"/> 48"	In Water: <input type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> Fully In Sediment: <input type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> Half Full <input type="checkbox"/> Over Half <input type="checkbox"/> Fully

Section 2: Outfall Description

This section is used to record basic information about each outfall including material, shape, size, and submergence. If flow is present, continue to Section 3 to record data. If no flow is present, skip to Section 5.

Section 3: Quantitative Indicators for Flowing Outfalls: Field measurements? ☐ YES ☐ NO (If No, Skip to Section 4)

Estimated Discharge Rate				
A: Width of Flow	B: Approx. Avg. Depth	A x B = C: Area	Length of flow/ Time = D	C x D = E. Est. Flow Rate
PARAMETER	RESULT (UNIT)	Equip. Used	ACTION LEVEL	
Temperature	°F		<input type="checkbox"/> Yes <input type="checkbox"/> No	
pH	Unitless		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Conductivity	mS/cm		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Ammonia	ppm		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Chlorine	ppm		<input type="checkbox"/> Yes <input type="checkbox"/> No	

Section 3: Quantitative Indicators for Flowing Outfalls

This section is used to record data for flowing outfalls. The estimated discharge rate is computed based on velocity and cross-sectional area. First, the width of flow (in feet) and approximate average depth (in feet) is measured. The cross-sectional flow area is computed by multiplying the width of flow by the approximate average depth of flow. Next, staff shall measure and mark off a fixed flow length (in feet) and drop a leaf or other lightweight material into the discharge. The time (in seconds) it takes the material to travel across the predefined length is recorded. The velocity of flow is computed as the length of the flow path divided by the travel time. Lastly, cross-sectional flow area (in square feet) is multiplied by flow velocity (feet/second) to calculate the estimated flow rate (in cubic feet/second).

The indicator parameters of temperature, pH, ammonia, conductivity, and chlorine are initially tested by using field sampling equipment including test strips and probes. If any of these parameters exceed the action level as specified in Appendix C, this is to be noted on the field screening form.

Section 4: Physical Indicators for Flowing Outfalls Only

Are Physical Indicators Present? ☐ Yes ☐ No *(If No, Skip to Section 5)*

PHYSICAL INDICATOR	FLOW INDICATOR DESCRIPTION	FLOW INDICATOR RELATIVE SEVERITY INDEX (1-3)		
Odor	<input type="checkbox"/> Sewage <input type="checkbox"/> Rancid <input type="checkbox"/> Petroleum <input type="checkbox"/> Sulfide/Rotten Egg	<input type="checkbox"/> 1 – Faint	<input type="checkbox"/> 2 – Easily detected	<input type="checkbox"/> 3 – Noticeable from a distance
Color	<input type="checkbox"/> Clear <input type="checkbox"/> Brown <input type="checkbox"/> Gray <input type="checkbox"/> Yellow <input type="checkbox"/> Green <input type="checkbox"/> Orange <input type="checkbox"/> Red <input type="checkbox"/> White/Cloudy	<input type="checkbox"/> 1 – Faint	<input type="checkbox"/> 2 – Clearly visible	<input type="checkbox"/> 3 – Clearly visible in outfall flow
Surface/Floatables	<input type="checkbox"/> Sewage (Toilet Paper, etc.) <input type="checkbox"/> Suds <input type="checkbox"/> Petroleum / Oil Sheen <input type="checkbox"/> Other	<input type="checkbox"/> 1 – Few/slight; origin not obvious	<input type="checkbox"/> 2 – Some; indication of origin	<input type="checkbox"/> 3 – Some; origin clear /obvious

Section 4: Physical Indicators for Flowing Outfalls Only

This section is used to record physical indicator data for outfalls that are flowing.

- A. Odor- an indication of any smells from the discharge and/or outfall.
1. A score of 1 is assigned when the odor is faint or when the field crew cannot agree on its presence or origin.
 2. A score of 2 is assigned when the odor is moderate within the discharge and/or outfall.

3. A score of 3 is assigned when the odor is noticeable from a distance.
- B. Color- the color of the discharge when a sample is taken in a clear sample bottle and held up to the light.
1. A score of 1 is assigned when the color in the sample bottle is faint.
 2. A score of 2 is assigned when the color in the sample bottle is highly visible.
 3. A score of 3 is assigned when the color is visible in the outfall discharge.
- C. Floatables- the presence of floatable materials in the outfall discharge (not including trash).
1. A score of 1 is assigned when there are a few floatables with no known origin.
 2. A score of 2 is assigned when there are moderate floatables with indications of an origin.
 3. A score of 3 is assigned when there are a large number of floatables or the origin is obvious. Sewage is always designated a 3.

Section 5: Physical Indicators for Both Flowing and Non-Flowing Outfalls

Are physical indicators that are not related to flow present? ☐ Yes ☐ No

(If No, Skip to Section 6)

INDICATOR	DESCRIPTION	INDICATOR	DESCRIPTION
Outfall Damage	<input type="checkbox"/> Spalling, Cracking or Chipping <input type="checkbox"/> Corrosion	Pipe benthic growth	<input type="checkbox"/> Brown <input type="checkbox"/> Orange <input type="checkbox"/> Green <input type="checkbox"/> Black
Deposits/Stains	<input type="checkbox"/> Oily <input type="checkbox"/> Flow Line <input type="checkbox"/> Paint		

Section 5: Physical Indicators for Both Flowing and Non-Flowing Outfalls

This section describes physical indicators around all outfalls that can be indicators of past illicit discharges. Breakage in the outfall, deposits or stains along the outfall, an overgrowth of vegetation or inhibition of vegetation, poor pool quality, and benthic growth in the pipe are all potential indicators of past, transitory, or intermittent illicit discharges.

Section 6: Overall Outfall Illicit Discharge Characterization

☐ None ☐ Unlikely ☐ Potential (presence of two or more indicators) ☐ Suspect (one or more indicators with a severity of 3) ☐ Obvious

Section 6: Overall Outfall Illicit Discharge Characterization

This section is an overall characterization of the severity of the illicit discharge, if present. The provided rating system and descriptions below are intended to provide general guidance and consistency; however, the field inspector may override the rating system as necessary.

1. Unlikely shows no signs of an illicit discharge. No further action is necessary.
2. Potential has two or more indicators present. Follow-up on this outfall is moderate priority.
3. Suspect has at least one indicator with a rank 3 severity. This outfall is a likely illicit discharge and follow-up is high priority.
4. Obvious has an obvious illicit discharge based on quantitative and/or physical indicators.

Section 7: Follow Up Needed? ☐ Yes ☐ No

1. Return for In-depth sampling?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
2. Return to Re-inspect for Flow?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
3. Grab sample collected?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<i>If yes, Sample ID:</i>
4. If yes, collected from:	<input type="checkbox"/> Flow	<input type="checkbox"/> Pool	

Section 7: Follow Up Needed?

This section documents the need and type of follow up actions to be performed. See Section D for information regarding follow-up timelines and procedures. After completion of the outfall field screening, staff should also report any non-tidal submerged outfalls, outfalls that are blocked with sediment or plant material, majorly damaged outfalls, or other outfall repair needed using Cityworks so that they can be addressed by T&ES Public Work Services or others.

If the electronic database is not used in the field, data from the screening form must be entered into the City's database for record keeping and future analysis.

3. Documentation

In accordance with the MS4 Permit, the total number of outfalls screened during the reporting period as part of the dry weather screening program will be reported. In addition, the outfall field screening forms will be kept electronically on the City's server for no less than five years.

D. Illicit Discharge Investigations

1. Investigation Causes

Illicit discharge investigations are performed when:

1. An illicit discharge complaint or report has been received by the City, or
2. An illicit discharge is found during annual field screening of outfalls.

Every effort will be made to coordinate efforts between the Fire Marshal's Office and T&ES-SWM. If the situation warrants it and when possible, staff from both departments should be present during illicit discharge investigations. In cases of highly visible suspected illicit discharges, the Fire Marshal will issue an emergency notification through the Environmental Industrial Unit (EIU) to alert applicable City staff of the situation. Whenever hazardous materials are suspected, notification will be made immediately to the Fire Department. In an event an IDDE is reported "after hours" (defined as for weekdays, 4 p.m. to 7 a.m., weekends and holidays), the City will follow Emergency Standby Procedures, which indicates that if the event is thought to be hazardous or cause wildlife death to contact 911; otherwise to call the Fire Marshall's Dispatch Center.

Illicit discharges may be from common household, commercial, or industrial sources. In addition, construction sites with insufficient practices to control stormwater and water main breaks are potential sources of illicit discharges of sediment. Discharges authorized under a separate VPDES or state permit require no further action.

2. Investigation Timeframes

Priority of investigations shall be given to discharges of sanitary sewage and those believed to be a risk to human health and public safety.

Timeframes for investigations will be as follows. Timeframes may be extended if a qualifying rain event occurs:

1. Illicit discharge complaints will be investigated within one business day of T&ES-SWM receipt.
2. Potential illicit discharges, as categorized and identified during outfall screening, will be investigated within seven business days. Staff will return during different day and time intervals to determine if it is an intermittent discharge or set up a caulk dam to trap the discharge. Staff will perform a minimum of three visits over a span of 30 business days if the source of the discharge cannot be determined.
3. Suspect illicit discharges, as categorized and identified during outfall screening, will be investigated within one business day. Staff will return during different day and time intervals or set up a caulk dam to trap the discharge. Staff will perform a minimum of three visits over a span of 30 business days if the source of the discharge cannot be determined.
4. Obvious discharges, as categorized and found during outfall screenings, will be investigated immediately. Staff will perform a minimum of three visits over a span of 30

business days if the source of the discharge cannot be determined. Illicit discharges reported by the public will most likely fall into this category.

5. Illicit discharges that are continuous or expected to occur more frequently than a one-time discharge will include follow-up investigations a minimum of three times over a 12-month period to verify that the discharge has been eliminated. The procedures related to the investigation of these types of discharges are found below.

3. Investigation Procedure

An illicit discharge investigation may result in an easily identifiable source or may be complex and require tracking through the storm drain system and other resource extensive methods. Investigations should utilize the instructions in this document, storm sewer mapping, and may also require coordination with staff from Fairfax County and Arlington County, depending on the tracking of the potential illicit discharge.

a. Dry Weather Discharge Investigations

If dry weather screening identifies a flowing outfall, the procedures outlined in Section C.2 should be followed and corresponding information documented. Tests conducted and samples taken as part of these investigations shall follow the protocols below. These protocols in conjunction with the flow chart method (Appendix D) and the documented benchmark concentrations, shall be utilized to determine the most likely type of discharge.

Preliminary Sampling and Testing

Protocols are as follows:

1. All preliminary testing is conducted in the field.
2. Determination of parameters tested will be based upon suspected discharge.
3. Make sure testing probes and sample bottles have been properly cleaned, stored, and calibrated if required.
4. During sampling, use all applicable personal protective equipment (PPE).
5. During sample collection, do not disturb any sediments or benthic growth that may contaminate or skew results.
6. Rinse sample collection device three times with sample water before collecting the sample.
7. Fill sample bottle to top without touching inside of bottle lid or rim.
8. Initiate specific test procedures immediately.
9. Compare sample test results to benchmark concentration levels as set by state and federal standards.
 - a. Use action levels found in Appendix C
 - b. If industrial sources are present, additionally use industrial benchmarks from Appendix E.
 - c. If testing results exceed benchmark concentrations then the action level has been reached, staff will then begin tracking the source of the illicit discharge.

10. Label any waste bottles immediately with all chemicals used for testing and dispose of properly.

Contract Laboratory Services

If the type of discharge cannot be determined after the preliminary field sampling and testing, a laboratory sample may be taken from the flow in accordance with the laboratory sampling protocol located in Appendix F. This sample may be sent to a contract lab to help determine the type of discharge.

If the discharge is determined to be a sanitary sewer overflow, the overflows will be reported as described in the City's Sanitary Sewer Overflow Response Plan Procedure TES-Maint-2012-08 which can be found in Appendix G.

Storm Drain Network Investigation and Tracking

Depending on the type of discharge suspected, it may be necessary to track the discharge through the storm drain network to determine its source. When performing storm drain network investigations, staff strategically inspects manholes, inlets, and channels within the storm drain network system to look for visual indicators and/or measure chemical/physical indicators to isolate discharges to a specific segment of the network. A key component of this investigation is the use of the City's mapped storm drain system. Also, in accordance with the MS4 permit, the City has delineated drainage areas for each outfall. Once the pipe segment has been identified additional investigations are used to isolate the source of the discharge.

Staff must first decide which method to use to conduct the network investigation.

1. Work progressively up the trunk -this method is used in small drainage area investigations.
 - a. Begin with the manhole closest to the outfall (or illicit discharge location) and inspect for the illicit discharge.
 - b. Move progressively up the largest diameter pipe flowing to the outfall (the trunk) inspecting for discharges at each manhole or inlet until no discharge is present.
 - c. Isolate the discharge between two drainage structures.
 - d. Begin appropriate investigation.
2. Split the storm drain network-this method is used in large or complex drainage areas.
 - a. Review the map of the storm drain network leading to the suspect outfall.
 - b. Identify the major branches that lead to the largest diameter pipe flowing to the trunk.
 - c. Identify manholes and/or inlets to inspect at the farthest downstream node of each contributing branch and one immediately upstream.
 - d. Working up the network, investigate manholes and/or inlets on each contributing branch and trunk, until the source is narrowed to a specific section of the trunk or contributing branch.
 - e. Once the discharge is narrowed to a specific section of trunk, begin appropriate investigation.

- f. If narrowed to a contributing branch, move up or split the branch until a specific pipe segment is isolated, and begin appropriate investigation.
3. Move down the storm drain network-this method is used in very large drainage areas with many potential sources of illicit discharge.
 - a. Begin by inspecting manholes and/or inlets at the head of the storm drain network.
 - b. Verify that each upstream branch has no contributing illicit discharges before moving down the pipe to a junction manhole or inlet.
 - c. If a discharge is found, perform appropriate investigation to determine the source of the discharge.
 - d. Verify the discharge has been fixed or removed before moving down the pipe.

Drainage Area Investigations

Drainage area investigations are used when an illicit discharge has distinct indicator characteristics that allow staff to quickly ascertain the specific industrial or commercial source of the discharge. Drainage area investigations are not to be used on suspected sewage discharges.

When performing drainage area investigations:

1. Review current GIS data for the drainage area.
2. Review current permit data for the drainage area.
3. Determine potential discharges within the drainage area.
4. Perform other types of investigations when necessary.

Dye Testing

If the illicit discharge is suspected to be from the sanitary sewer, dye testing may be conducted by introducing non-toxic dye into toilets, sinks, shop drains and other plumbing fixtures. Before beginning testing, staff should:

1. Review storm drain and sanitary sewer maps to determine lateral sewer connections and how they can be accessed;
2. Notify property owners and gain access to the property;
 - a. For commercial and industrial properties, staff will carry identification to document their legal authority to enter.
 - b. For residential properties, staff should coordinate with the owner or resident to ensure access to the property.
3. Notify emergency personnel of the days and times dye testing is being performed.
4. Verify all necessary equipment is available for use.

The following guidelines should be used for dye testing:

1. Choose the most appropriate color and type of dye for the facility. When testing multiple fixtures, it is advisable to use two different color dyes and alternate between them.

2. Select the fixtures to test.
 - a. In industrial facilities, check most floor drains.
 - b. For plumbing fixtures, check a representative fixture (i.e. a bathroom sink).
 - c. If working with multiple floors, start at the basement and work up.
 - d. Make sure to flush with plenty of water to ensure the dye moves through the system.
3. Choose the closest sanitary sewer manhole to make observations (typically a sewer lateral). If not possible, choose a downstream manhole.
4. When the dye is introduced, the staff member placing the dye calls the monitoring staff member at the manhole to inform them that the dye has been placed.
5. When the dye is observed, the staff member observing calls the staff member placing the dye to verify that the dye has entered the sanitary sewer system.
6. If dye is not observed (typically within one hour);
 - a. Check storm drains for the presence of dye;
 - b. Check for the presence of a septic system;
 - c. The sewer line may be clogged or leaking.

In some cases, dye may also be used for testing connections that do not involve sanitary discharges or pipes. The general procedures outlined above should also be followed in these instances.

CCTV Video Testing

Closed circuit television video testing may be performed by T&ES Public Works Services staff in cases where the discharge cannot be determined by other types of investigations or in cases where other testing is not practical (large residential neighborhoods).

b. Complaint Driven Investigations

If a report or complaint is received through the City's various mechanisms, typically the investigation differs slightly from the dry weather investigations.

Staff shall first do a visual inspection using Section 4 of the Outfall Screening Form. In cases where the type and source can be determined through visual investigations, no further screening is necessary, and staff may proceed to enforcement (see Section E), as applicable. For example, a report of brown water confirmed through a visual inspection may be the result of a documented watermain break, which would explain the discoloration. Therefore, staff would only need to document the report and investigation - no corresponding enforcement would be necessary. If the discharge is determined to be an intermittent discharge, staff may use a caulk dam and/or check the suspect discharge area during varying day and time intervals.

If the type and source of the suspected discharge is not determined through visual inspection, staff may use a combination of methods to determine the source of the discharge. These are described in Section D.3.a and are listed below in typical order of implementation (though the order and methods implemented are at the discretion of the staff completing the investigation).

1. Storm drain network investigation and tracking
2. Drainage area investigation
3. Preliminary sampling and testing
4. Contract laboratory sampling
5. Dye testing
6. CCTV video testing.

Suspected sanitary sewer overflows shall be investigated before any other suspected illicit discharge and be reported as described in the City's Sanitary Sewer Overflow Response Plan Procedure TES-Maint-2012-08 which can be found in Appendix G.

4. Cases of Undetermined Sources

If within six months of beginning an investigation, the source cannot be identified:

1. The City will document all steps of the investigation and document that the source remains unidentified.
2. If the discharge is intermittent, the City will document a minimum of three separate investigations within 30 business days that were made to attempt to observe flowing discharge and that these investigations were unsuccessful.

5. Documentation

In accordance with the MS4 Permit, illicit discharge investigations will document the following:

1. Whether the discharge was discovered by the permittee during dry weather screening, reported by the public, or other method (describe);
2. The dates that the illicit discharge was initially observed, reported, or both;
3. The results of the investigation, including the source, if identified;
4. Any follow-up activities to the investigation;
5. Resolution of the investigation; and
6. The date that the investigation was closed.

E. Enforcement for Illicit Discharges

The ultimate goal of the program is to eliminate illicit discharges to the separate storm sewer system. If a responsible party is identified, compliance may be accomplished through various methods such as discussion with the responsible party and impromptu education performed by staff. Awareness is a key tool that may be used to prevent future illicit discharges. However, in cases where there is a responsible party and the situation warrants, criminal or civil enforcement action may be necessary.

1. Determination of Responsibility

The person initiating the discharge shall be responsible for all associated response and materials to remediate the discharge. If a responsible party cannot be immediately located or determined, the owner of the property may be deemed responsible for the discharge and costs of associated response and materials.

2. Enforcement

The City enforces the prohibition of illicit discharges through two types of penalties – criminal and civil. The type of enforcement action depends on the type of material dumped and/or the intent of the individual at fault. The types of penalties and violations can be found in City Code Sec. 11-13-8 Violations.

a. Enforcement through Criminal Penalties

Criminal penalties are considered a Class 1 misdemeanor and can be issued for:

1. Dumping hazardous, household hazardous, bulk or industrial waste; or
2. Dumping of any other waste with intentional disregard for the water quality of the waters of the Commonwealth of Virginia.

Violation of a criminal offense is considered a Class 1 misdemeanor. Criminal penalties are typically issued through the Fire Marshal and prosecuted through the Commonwealth Attorney. The violation form is found in Appendix H. In Virginia, the authorized punishments for conviction of a Class 1 misdemeanor are confinement in jail for not more than twelve months and a fine of not more than \$2,500, either or both (Code of Virginia 18.2-11).

If three citations for the same or similar violation within a 24-month period are issued, it will be presumed that the provisions of this section are knowingly and willfully being violated. As a result, the burden of proof shall lie with the defendant to rebut such presumption. Each day of violation shall constitute a separate offense.

b. Enforcement through Civil Penalties

If the violation does not constitute a criminal penalty as described above, any other violation of the code of Environmental Offenses is a civil penalty and is punishable as a Class 4 civil violation. Any City law enforcement officer, duly designated sworn special police officer, the

director of transportation and environmental services or designee, the director of public health or designee, the director of code administration or designee, or the chief fire marshal or any deputies has the authority to issue civil penalties.

Below are the steps for issuing a civil penalty:

1. After performing an illicit discharge investigation and determining the responsible party, a civil penalty may be issued as warranted.
2. A “Notice of Violation and Order to Correct” form found in Appendix I must be completed to issue a civil penalty. The form includes the following information:
 - a. Name of violator – Name of individual and/or entity in violation;
 - b. Nature of violation – The section of City Code that has been violated and a short, written description of the specific facts that led to the issuance of the civil penalty;
 - c. Location of violation – Physical address where violation occurred;
 - d. Date and time of violation – The time and date the civil penalty is issued;
 - e. Penalty amount – Amount of penalty; and
 - f. Signature of City employee – Signature of the issuing officer/staff.
3. A warning may be issued for nonhazardous waste discharges that did not enter the storm drain in situations where the responsible party has agreed to or has already begun the cleanup and recovery of the discharge.
4. Notes shall be taken before, during, and after any interaction.
5. The “Notice of Violation and Order to Correct” form will be given directly to the violator whenever possible. In the absence of the violator, the notice can also be served via certified mail with a return receipt or posted at the location of the violation. The form will be noted with “refused to sign” if violator refuses to sign form.
6. Both hard and electronic copies of any issued notice of violation forms and any photos that may have been taken at the site of the violation will be recorded and saved.
7. Copies of civil penalties with associated fines shall be sent to the City Attorney’s office and to the Department of Finance via email or interoffice mail for enforcement.

Punishments for a Class 4 civil violations are fines as presented below and found under City Code Section 1-1-11 Civil Violations.

1. First offense = \$100
2. Second offense (with same operative facts) = \$250
3. Third offense (with same operative facts) = \$500 and may be considered criminal and will be handled by the fire marshal’s office.

3. Abatement

a. Responsibility for Abatement

Abatement and remediation of the illicit discharge and all associated damages will be performed by the responsible party. This may be in addition to any penalty imposed for criminal and civil violations. Each day that the violation and damage is not corrected/remedied, serves as a separate offense. In cases where a civil penalty or criminal summons has been issued but the responsible party fails to clean up the site as required, the court may order the required cleanup of the area. Additionally, the responsible party may be court ordered to perform public service relating to the correction or remediation of a polluted area. A list of contractors and environmental cleaning companies may be supplied to private property owners.

The City may perform abatement of illicit discharges in the following circumstances:

1. The responsible party fails to perform the required cleanup after being issued a civil penalty or criminal summons; or
2. The responsible party cannot be identified.

In cases where the responsible party is unknown or when deemed necessary by the Fire Marshal or the T&ES-SWM staff, cleanup may be initiated by the City using an authorized individual or firm. When the responsible party is known or determined at a later date, costs associated with such cleanup are borne by the party responsible for the discharge.

b. Abatement Time Frame and Verification

The time frame allowed for abatement and remediation of the discharge will be determined by the type of abatement, the equipment and resources needed, and the complexity of the incident. Upon completion of remediation of the discharge, the responsible party must submit documentation to T&ES-SWM and Office of the Fire Marshal verifying that the discharge has been abated and that any required repairs have been completed. City staff will confirm removal and cleanup of the illicit discharge on site.

4. Documentation

A copy of the Notice of Violation and Order to Correct form issued to violators shall be maintained by the City. Once the violations have been addressed, the documentation will be updated to reflect the resolution. For each notice, the documentation shall specify:

1. The nature of the violation;
2. The date the violation was observed and reported;
3. The results of the investigation;
4. The follow up to the investigation;
5. The resolution of the investigation; and
6. The date that the investigation was closed.

Appendices

Appendix A - Outfall Field Screening Form

City of Alexandria, Virginia Outfall Field Screening

Section 1: Background Data

Facility ID:		Outfall Location:	
Watershed / HUC:		Local Subwatershed:	
Today's date:		Military Time:	
Screening performed by:		Photo #(s):	
Weather, Temp.(°F):		Time since last precipitation:	Amount:
Local Land Use (Check all that apply): <input type="checkbox"/> Ultra-Urban Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Suburban Residential <input type="checkbox"/> Open Space / Park			

Section 2: Outfall Description

MATERIAL	OUTFALL SHAPE	NUMBER PIPES	OUTFALL DIAMETER	SUBMERGED
<input type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> Concrete <input type="checkbox"/> DIP <input type="checkbox"/> PVC <input type="checkbox"/> Steel <input type="checkbox"/> Clay Tile (CT) <input type="checkbox"/> Brick (BRK)	<input type="checkbox"/> Circular <input type="checkbox"/> Elliptical <input type="checkbox"/> Box <input type="checkbox"/> Flared End	<input type="checkbox"/> Single <input type="checkbox"/> Double <input type="checkbox"/> Triple	<input type="checkbox"/> 12" <input type="checkbox"/> 50" <input type="checkbox"/> 15" <input type="checkbox"/> 54" <input type="checkbox"/> 18" <input type="checkbox"/> 60" <input type="checkbox"/> 20" <input type="checkbox"/> 72" <input type="checkbox"/> 24" <input type="checkbox"/> Other <input type="checkbox"/> 36" <input type="checkbox"/> 40" <input type="checkbox"/> 42" <input type="checkbox"/> 48"	In Water: <input type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> Fully In Sediment: <input type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> Half Full <input type="checkbox"/> Over Half <input type="checkbox"/> Fully

Observed Dry Weather Flow	<input type="checkbox"/> Yes	<input type="checkbox"/> No	(If No, Skip to Section 5)
Flow Description (If present)	<input type="checkbox"/> Trickle	<input type="checkbox"/> Moderate	<input type="checkbox"/> Substantial

Section 3: Quantitative Indicators for Flowing Outfalls: Field measurements? ☐ YES ☐ NO (If No, Skip to Section 4)

Estimated Discharge Rate				
A: Width of Flow	B: Approx. Avg. Depth	A x B = C: Area	Length of flow/ Time = D	C x D = E. Est. Flow Rate
PARAMETER	RESULT (UNIT)	Equip. Used	ACTION LEVEL	ACTION NEEDED
Temperature	°F		Nontidal waters >90°F	<input type="checkbox"/> Yes <input type="checkbox"/> No
pH	Unitless		< 6.0 or > 9.0	<input type="checkbox"/> Yes <input type="checkbox"/> No
Conductivity	mS/cm		> 0.40 mS/cm	<input type="checkbox"/> Yes <input type="checkbox"/> No
Ammonia	ppm		> 3 mg N/L	<input type="checkbox"/> Yes <input type="checkbox"/> No
Chlorine	ppm		>17 ug/L	<input type="checkbox"/> Yes <input type="checkbox"/> No

Section 4: Physical Indicators for Flowing Outfalls OnlyAre Physical Indicators Present in the flow? ☐ Yes ☐ No *(If No, Skip to Section 5)*

PHYSICAL INDICATOR	FLOW INDICATOR DESCRIPTION	FLOW INDICATOR RELATIVE SEVERITY INDEX (1-3)		
Odor	<input type="checkbox"/> Sewage <input type="checkbox"/> Rancid <input type="checkbox"/> Petroleum <input type="checkbox"/> Sulfide/Rotten Egg	<input type="checkbox"/> 1 – Faint	<input type="checkbox"/> 2 – Easily detected	<input type="checkbox"/> 3 – Noticeable from a distance
Color	<input type="checkbox"/> Clear <input type="checkbox"/> Brown <input type="checkbox"/> Gray <input type="checkbox"/> Yellow <input type="checkbox"/> Green <input type="checkbox"/> Orange <input type="checkbox"/> Red <input type="checkbox"/> White/Cloudy	<input type="checkbox"/> 1 – Faint	<input type="checkbox"/> 2 – Clearly visible	<input type="checkbox"/> 3 – Clearly visible in outfall flow
Surface/Floatables	<input type="checkbox"/> Sewage (Toilet Paper, etc.) <input type="checkbox"/> Suds <input type="checkbox"/> Petroleum / Oil Sheen <input type="checkbox"/> Other	<input type="checkbox"/> 1 – Few/slight; origin not obvious	<input type="checkbox"/> 2 – Some; indication of origin	<input type="checkbox"/> 3 – Some; origin clear /obvious

Section 5: Physical Indicators for Both Flowing and Non-Flowing OutfallsAre physical indicators that are not related to flow present? ☐ Yes ☐ No *(If No, Skip to Section 6)*

INDICATOR	DESCRIPTION	INDICATOR	DESCRIPTION
Outfall Damage	<input type="checkbox"/> Spalling, Cracking or Chipping <input type="checkbox"/> Corrosion	Pipe benthic growth	<input type="checkbox"/> Brown <input type="checkbox"/> Orange <input type="checkbox"/> Green <input type="checkbox"/> Black
Deposits/Stains	<input type="checkbox"/> Oily <input type="checkbox"/> Flow Line <input type="checkbox"/> Paint		

Section 6: Overall Outfall Illicit Discharge Characterization
☐ None ☐ Unlikely ☐ Potential (presence of two or more indicators) ☐ Suspect (one or more indicators with a severity of 3) ☐ Obvious
Section 7: Follow Up Needed? ☐ Yes ☐ No

1. Return for In-depth sampling?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
2. Return to Re-inspect for Flow?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
3. Grab sample collected?	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, Sample ID:
4. If yes, collected from:	<input type="checkbox"/> Flow <input type="checkbox"/> Pool	

Section 8: Comments

Appendix B - Field Screening Equipment List

- _____ Field Map(s)
- _____ Digital Camera
- _____ Cell phone or radio
- _____ Emergency contact list
- _____ Clipboard and pencil or water proof pens
- _____ Field Screening Sheets
- _____ First Aid Kit
- _____ Flash Light
- _____ Surgical Gloves
- _____ Waders and/or Snake proof boots
- _____ Safety Vest
- _____ Insect repellent
- _____ Machete/clippers (where needed)
- _____ Sanitary wipes
- _____ Backpack
- _____ Clear sample bottles
- _____ Test strips
- _____ YSI Meter
- _____ Safety goggles
- _____ Dipper

If laboratory sample is taken:

- _____ Cooler with ice
- _____ Permanent marker
- _____ Labeling tape
- _____ One liter plastic sampling bottles or bottles provided by laboratory for samples
- _____ Chain of custody sheet

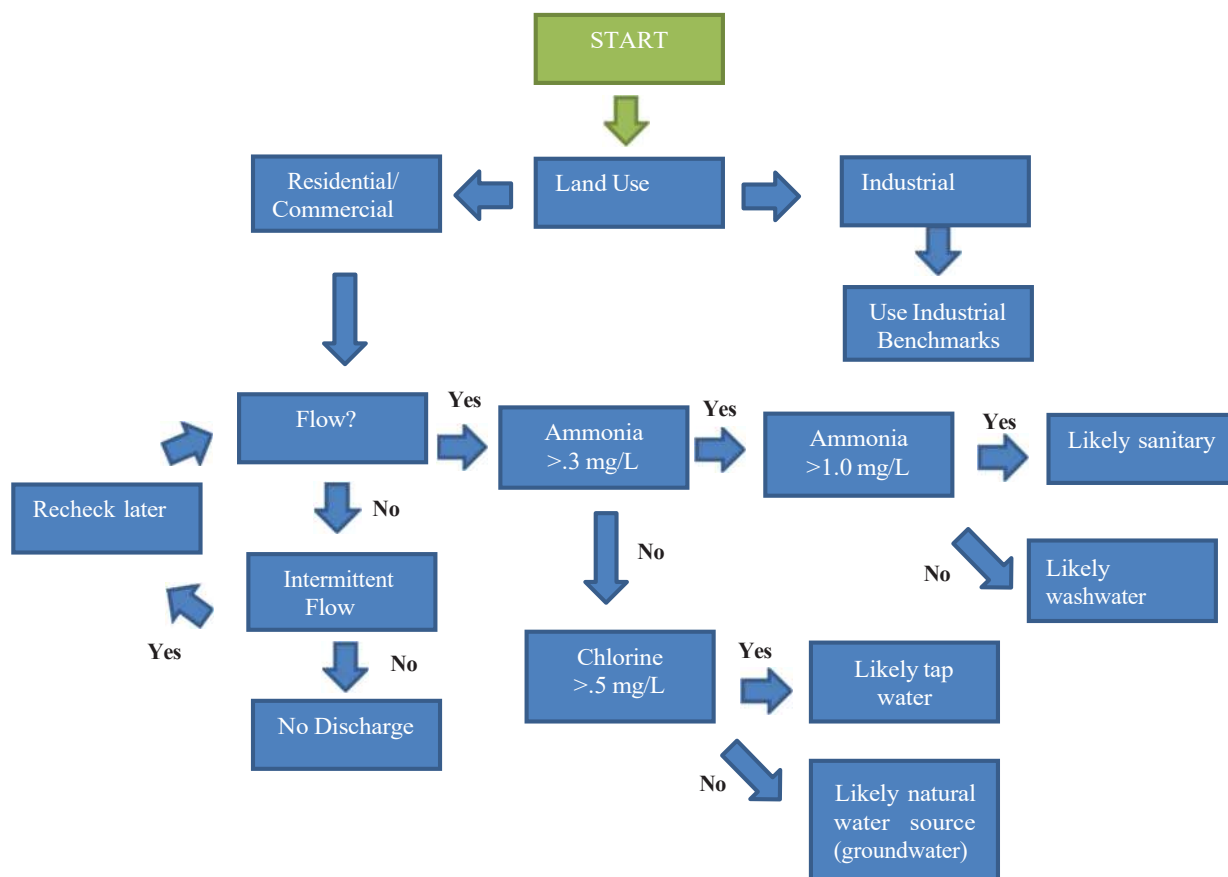
Appendix C - Field Screening Action Levels

Dissolved Oxygen:	< 4.0 mg/L ***
pH:	< 6.0 or > 9.0 ***
Temperature:	Nontidal waters >32°C***
Conductivity	> 400 uS/cm *
Ammonia	> 3 mg N/L***
Chlorine	>17 ug/L***

* No Federal EPA or State DEQ standard.

*** See 9VAC25-260-50

Appendix D - Flow Chart Method



Appendix E - Industrial Benchmarks

Indicator Parameter	Benchmark Concentration
Ammonia	> 50 mg/L
Color	> 500 units
Conductivity	>2,000 $\mu\text{S}/\text{cm}$
Hardness	> 2,000 mg/L as CaCO_3
pH	<5

Appendix F - Contract Lab Sampling Procedures

Lab Sample Collection

1. Indicator samples are stored in a polyethylene plastic sample bottle that is opaque or clear unless otherwise directed by the contracting laboratory.
2. During sample collection, wear surgical gloves. Wash hands when sampling is complete.
3. Use a dipper or bailer for sample collection; make sure not to disturb any sediments or benthic growth in the pipe or conveyance system as the sample is taken.
4. Rinse all sampling bottles, dippers, and bailers used for sample collection three times with sample water before collecting the sample to be analyzed.
5. Fill sample bottle to top without touching inside of bottle lid or rim.
6. Add any necessary preservatives at the time of sample collection.
7. Label the bottle immediately.
8. Store samples at 4°C (40°F). Keep samples on ice in a cooler if necessary.
9. Return samples to the contracting laboratory within 24 hours, or time required for appropriate sample.
10. Complete the chain of custody as required by the contracting laboratory.

Appendix G - Sanitary Sewer Overflow Reporting Procedure

TITLE	Sanitary Sewer Overflow Response Plan
PROCEDURE #	TES-Maint-2012-08

SECTION 1: PURPOSE

- 1.1 The purpose of the City of Alexandria Sanitary Sewer Overflow Response Plan (SORP) standard operating procedure is to minimize the impact of sanitary sewer overflows (SSO's) to the public and the environment. The City of Alexandria will ensure that sanitary sewer overflows are responded to in a timely manner to expedite the necessary steps to relieve the overflow. Relieving the sewage blockage and spill containment is the City's highest priority, taking in to consideration public health concerns. This response plan will be the guideline for the standard operating procedures in the event of a sanitary sewer overflow. The response plan will be reviewed periodically to ensure that all corrective measures are being taken and to determine whether periodic staff training (including refresher and/or new employee training) may be warranted.
- 1.2 The plan includes the following elements:
 - a. Section 2: Response to Notification of Spills: The City of Alexandria has adopted service call/overflow response procedures requiring immediate response to minimize or eliminate an overflow.
 - b. Section 3: Initial Spill Response: This section includes standard operating procedures that ensure the notification of first responders during normal business hours and after business hours, spill assessment and volume estimation for notification and reporting purposes.
 - c. Section 4: Service Restoration & Containment: Procedures to ensure containment, termination, maximum recovery and cleanup of spilled sewage.
 - d. Section 5: Notification: Standard practices the City uses to secure the area surrounding a spill, post warning signs as necessary and provide notification to affected City departments/divisions, other impacted agencies and the public.
 - e. Section 6: Recordkeeping and Reporting: Practices, including procedures that link field records to the City's maintenance management system, and procedures for reporting spills, as required, to appropriate regulatory agencies.

SECTION 2: RESPONSE TO NOTIFICATION OF SPILL

- 2.1 The City of Alexandria has adopted service call/emergency response procedures and after-hours processes for calls requiring immediate response to minimize or eliminate an overflow (See Attachments). The City provides (or contracts with an emergency response contractor that provides) all necessary spill response supplies. These supplies are available for use at any time. The SOP is to aid staff in prompt and responsible SSO response.

- 2.2 When a notification of an SSO is received, it should be clearly communicated who will respond, the estimated time of arrival, and what areas will need to be accessed. The information provided by the caller should be verified before dispatching a field crew. This includes verifying the address and nearest cross street and making sure it is part of the City's conveyance system. If not, provide the caller with the phone number of the responsible agency and follow up by calling the agency and providing the details of the call.

Public Observation

- 2.3 Public observation is the most common way that the City is notified of blockages and spills. Contact information for reporting sewer spills and backups are in the phone book, City website and in many pieces of literature provided by the City. The main telephone number is (703) 746-4488; this line includes an option for 24-hour call response.
- 2.4 When a report of a sewer spill or backup is made during normal business hours, City call center staff receives the call, takes the information from the caller, and completes a Cityworks service request. For emergency sewer backups, spills or blockages, the call center staff verbally communicates (does not leave a voicemail) appropriate information to the Sewers Superintendent or designee along with any information collected from other field reports. The Superintendent then notifies the City's Sewer Inspector and sewer response team, which responds to the incident as soon as possible.

Staff Observation

- 2.5 City staff and contractors perform periodic maintenance work on its sewer system facilities. Any problems noted with the sewer system facilities are reported to the Superintendent who, in turn, responds to emergency situations.

SECTION 3: INITIAL SPILL RESPONSE

- 3.1 All sewer system calls require a response to the reported location of the event in an attempt to minimize or eliminate an overflow. The first responder (Sewer Inspector during normal business hours or City Standby staff during after-hours) must respond to the reporting party or site of the problem and initiate response activities within 60 minutes after initial reporting of the spill to the City. If a responder cannot be at the spill location within 60 minutes after the spill, then the responder must notify the Sewers Superintendent who will dispatch other available staff or emergency contractors.
- 3.2 The first responder should determine appropriate response measures based on the circumstances and information provided by the caller (e.g. weather and traffic conditions, small backup vs. sewage flowing on the ground, etc.). If additional help is needed, contact other employees, contractors, and/or equipment suppliers. Based on available information, the first responder should determine if a combination sewer cleaning truck and/or a spill response vehicle is needed.
- 3.3 Upon arrival at the site, the first responder should:

- Note arrival time at spill site.
- Verify the existence of a sewer system spill or backup.
- Field verify the address and nearest cross street, making sure it is part of the City's sewer/conveyance system.
- Identify and clearly assess the affected area and extent of spill. If the spill is small (i.e. less than 50 gallons) an eyeball estimate may be made. If the spill appears large (i.e. greater than 50 gallons), staff should work with a Sewer Inspector or Sewer Superintendent to measure the volume. The shape, dimensions, and the depth of the contained wastewater are needed. The shape and dimensions are used to calculate the area of the spills and the depth is used to calculate the volume. In the event of a significant spill, the City Engineering Department or Office of Environmental Quality may be required to compute the spill volume using the duration or flowrate methods.
 - *To determine the volume of a large spill (i.e. larger than 50 gallons) refer to the following process:*
 - Step 1 Sketch the shape of the contained sewage (see figure above).
 - Step 2 Measure or pace off the dimensions.
 - Step 3 Measure the depth at several locations and select an average.
 - Step 4 Convert the dimensions, including depth, to feet.
 - Step 5 Calculate the area in square feet using the following formulas: Rectangle: Area = length (feet) x width (feet); Circle: Area = diameter (feet) x diameter (feet) x 0.785 or Triangle: Area = base (feet) x height (feet) x 0.5
 - Step 6 Multiply the area (square feet) times the depth (in feet) to obtain the volume in cubic feet.
 - Step 7 Multiply the volume in cubic feet by 7.5 to convert it to gallons.
- Comply with all safety precautions (traffic, confined space, etc).
- Contact caller, if time permits.
- Notify the Sewer Superintendent and Maintenance Division Chief if:
 - The spill appears to be large, in a sensitive area, or there is doubt regarding the extent, impact, or how to proceed; or
 - Additional help is needed for line cleaning or repair, containment, recovery, lab analysis, and/or site cleanup
- Begin completion of the Form 0- SSO Overflow Reporting Form

SECTION 4: SERVICE RESTORATION AND CONTAINMENT

Initial Assessment

- 4.1 Upon arrival at the location of a spill into a house or a building, the first responder should evaluate and determine if the spill was caused by a blockage in the lateral or in a City-owned sewer main, caused either by a backup in the sewer main line or nearby operations and maintenance activities.
- If a blockage is found in a property owner's lateral, it should be clearly communicated that it is not the City's responsibility to work on a private lateral.
 - If a backup in the main line is found to have caused the SSO in a house or building, the first responder should relieve the blockage in the main line and provide the resident with information on claims.

Service Restoration

- 4.2 The first responder should attempt to remove the blockage from the system and restore flow to the area. Using the appropriate cleaning tools, the field crew should set up downstream of the blockage and flush/hydroclean the sewer upstream from a clear manhole. The flows should be observed to ensure that the blockage does not recur downstream.
- 4.3 If the blockage is not relieved within the first few attempts (20 minutes), it is crucial that bypass procedures are followed immediately:
- 4.3.1 Locate the nearest downstream manhole that can accept the additional flow.
- 4.3.2 Set up a 3-inch pump for smaller collection lines, and the 6-inch pump for larger transmission lines, this should be used as a guideline, be advised that larger pumps may be needed. The pump discharge hose should be secured or placed far enough into the manhole that it will not come out during pumping. The pump and pump hose should be protected from traffic by barricades. If additional pumps are needed, they shall be rented from: Flippo Construction Company, 703.370.8778.

Containment & Clean Up

- 4.4 The first responder should attempt to contain as much of the spilled sewage as possible using the following steps:
- Determine the immediate destination of the overflowing sewage
 - Plug storm drains using available equipment and materials to contain the spill, wherever appropriate. If spilled sewage has made contact with the storm drainage system, attempt to contain the spilled sewage by plugging downstream storm drainage facilities
 - Arrange for removal of spilled sewage or debris from storm drainage system through use of vacuum truck and/or bypass pumping
 - Contain/direct the spilled sewage using dike/dam or sandbags

- Pump around the blockage/pipe failure/pump station or vacuum flow from upstream of the blockage and dispose of downstream of the blockage to prevent further overflow.

SSOs on Private Properties

4.5 When an SSO occurs inside of a house or building and is due to a City line backup, the first responder should instruct the property owner should be instructed to follow these guidelines:

- Keep all family members and pets away from the affected area.
- Place towels, rags, blankets, etc. between areas that have been affected and areas that have not been affected.
- Do not remove any contaminated items.
- Turn off the HVAC system.
- Move any uncontaminated property away from the overflow area.

The homeowner is responsible for clearing any blockage in the home's plumbing system or private lateral and for any resulting flood damage to the structure. The homeowner is also responsible for damage that happens because a lateral was not properly installed. Spills inside houses or buildings should be cleaned up by a professional cleaning company. Contact information for professional cleaning companies can be found in the "Water Damage Restoration" section of the Yellow Pages.

If the sewage backup is located inside a building or on private property and the backup was caused by a blockage in the public sewer main, the City may be responsible for cleanup and restoration. If this is the case, the City may arrange for a water damage restoration company. Claims by homeowners, if applicable, should be submitted based on information in Section 5.4 of this document.

SSOs on External/Hard Surfaced Areas

4.6 When an SSO occurs in an external location and is due to a City main, staff will make every effort to restore the environment to the condition that existed before the SSO occurred by using the procedures outlined below.

- Collect all signs of sewage solids and sewage-related material either by hand, vacuum or with the use of rakes and brooms and discharge it back into the sanitary sewer system.
- Take reasonable steps to contain and vacuum up the wastewater.
- Disinfect all areas that were contaminated from the overflow using the disinfectant solution of household bleach diluted 10:1 with water. Apply minimal amounts of the disinfectant solution using a hand sprayer. Document the volume and application method of disinfectant that was employed.
- Allow area to dry. Repeat the process if additional cleaning is required.

SSOs on External/Landscaped and Unimproved Natural Vegetation

4.7 When an SSO occurs in an external location such as a natural area and is due to a City main, staff will make every effort to restore the environment to the condition that existed before the SSO occurred by using the procedures outlined below.

- Collect all signs of sewage solids and sewage-related material either by hand, vacuum or with the use of rakes and brooms and discharge it back into the sanitary sewer system.
- Allow the area to dry. Repeat the process if additional cleaning is required.
- Recover any sewage within storm drains, channels, curb, gutters, and culverts.
- Clear surrounding area of paper, solids, and any other signs of a SSO.
- City forces will replace vegetation, sidewalks, asphalt, fencing or any other items that were damaged as a result of the SSO or the crews working to restore service.

Clean Up and Disinfection

4.8 Clean up and disinfection procedures should be implemented to reduce the potential for human health issues and adverse environmental impacts that are associated with an SSO event. The procedures described are for dry weather conditions and should be modified as required for wet weather conditions. Where clean-up is beyond the capabilities of City staff, a cleanup contractor will be used.

SECTION 5: NOTIFICATION

SSOs that do not Reach Public Waters

5.1 For spills that are contained and do not release unrecovered sewage into a storm drain, stream or a surface water body, notification to the public shall be accomplished through the use of signs at the location of the spill. The signs shall be left in place for a term of five business days.

- 5.1.1 City T&ES staff, Maintenance Division Chief (15t) or Sewer Superintendent (2"), shall notify the City Fire Department's Environmental Investigations Unit (EIU) emergency notification email list of all SSOs in order to provide notification to public safety and Office of Environmental Quality staff. All notices to the EIU shall reference the location of the SSO, the date and time discharge was discovered, volume, action being taken, whether it has reached the storm system and/or surface waters, and the appropriate Cityworks service request number.

Spills that Reach Public Waters - City OEQ Requirements

5.2 The Deputy Director of the T&ES Office of Environmental Quality (or designee) shall be notified if an SSO has reached the storm sewer system and/or a surface water. OEQ staff will determine if further investigation of the discharge site and potentially affected areas is required. OEQ will assist in verifying the extent of the contamination in the field. OEQ will be responsible for reporting to the state as required (see Section 6.3). Information in

the required reports will be largely based on Form 0 - SSO Overflow Reporting Form referenced in Section 3.3, Cityworks, and/or discussions with knowledgeable staff.

The City of Alexandria Health Department has the authority to close and re-open water bodies for public water contact. The water bodies affected are determined by the following parameters and best professional judgment:

- The volume of sewage discharged;
- Parameters affecting flow of sewage to the water bodies;
- Direction of current;
- Tides;
- Past experience in the area; and/or
- Any other pertinent information.

Point of Contact

- 5.3 Working with the Office of Communications and Public Information, and the T&ES Public Information Officer, the T&ES Maintenance Division Chief shall be responsible for coordinating public notification, if necessary, for SSOs not reaching waters of the state; and the Deputy Director of T&ES, Office of Environmental Quality (or designee), in coordination with T&ES Maintenance Staff, shall be responsible for public notification, if necessary, for SSOs that may be reasonably expected to reach surface waters.
- 5.4 If the SSO has occurred in a building or residential property and is attributable to a blockage in a City main, the responder or the City Sewer Inspector shall:
- Gather information and fill out a Sewer Backup Summary Report.
 - Notify the Maintenance Division Chief of the incident.
 - Wait for restoration firm to arrive (if required).
 - Forward incident reports and related documents to Maintenance Division Chief.
 - For potential claims, contact the City's office of Risk Management and provide contact information to the resident.

SECTION 6: RECORDKEEPING & REPORTING

Internal SSO Documentation

- 6.1 The first responder will complete a Cityworks work order and a Field Report/Daily Sheet form. The first responder will follow the procedures and complete the Sewer Backup Summary Report if an SSO has occurred in a residence or building. The Maintenance Division Chief will prepare a file for each individual SSO. The file should include the following information:
- Initial service call information with a completed Cityworks service request
 - City of Alexandria service request call field report/daily sheet form

- Copies of the City of Alexandria service request and work order forms, which should reference a volume estimate within the notes
- Closed-Circuit Television (CCTV) inspection (this is optional for SSOs that are not blockage related)
- Water quality sampling and test results, if applicable

External SSO Documentation

6.2 The City maintains SSO records for five years from the date of the SSO. All records shall be made available for review upon request. Records shall be retained for all SSOs, including but not limited to the following when applicable:

- Copy of Cityworks service requests and work orders;
- All original recordings for continuous monitoring instrumentation;
- Service call records and complaint logs of calls received by the City;
- SSO calls and SSO records;
- Steps that have been and will be taken to prevent the SSO from recurring and a schedule to implement those steps;
- Work orders, work completed, and any other maintenance records from the previous five years which are associated with responses and investigations of system problems related to SSOs;
- A list and description of complaints from customers or others from the previous five years; and
- Documentation of performance and implementation measures for the previous five years.

Reports to the State for Unauthorized Discharges

6.3 Discharges of sewage from an SSO that may reasonably be expected to enter surface waters shall be reported to the Virginia Department of Environmental Quality (VDEQ) immediately upon discovery of the discharge, but in no case later than within 24 hours after discovery. OEQ will utilize VDEQ's Pollution Response Program (PREP) online reporting to accomplish the 24 hour reporting. A written report of the unauthorized discharge shall be submitted by OEQ to VDEQ and the Virginia Department of Conservation and Recreation (DCR) within five days of the discovery of the discharge. OEQ will make the 24 hour notice and be responsible for final delivery of the five-day report. The written report shall contain the following, as noted on Form 0:

1. A description of the nature and location of the discharge;
2. The cause of the discharge;
3. The date on which the discharge occurred;
4. The length of time that the discharge continued;

5. The volume of the discharge;
6. If the discharge is continuing, how long it is expected to continue;
7. If the discharge is continuing, what the expected total volume of the discharge will be; and
8. Any steps planned or taken to reduce, eliminate and prevent a recurrence of the present discharge or any future discharges not authorized by this permit.

[illegible]

Appendix I - Civil Penalties Notice of Violation



NOTICE OF VIOLATION AND ORDER TO CORRECT

YOU ARE CHARGED WITH VIOLATING
THE CODE OF THE CITY OF ALEXANDRIA, VIRGINIA

Date of Violation _____ Time AM/PM _____

Location of Violation: _____

Description of Violation: _____

Violation _____ Section _____

☐ Illegal Dumping Sec. 11-13-2

☐ Unlawful accumulation or storage of waste
Sec. 11-13-3

☐ Failure to keep property clean from waste
Sec. 11-13-4

☐ Failure to remove materials from vehicle accident
Sec. 11-13-5

☐ Other _____

Order To Correct

You are hereby ordered to correct the violation:

☐ Immediately

☐ Within _____ days

Type of Notice and Civil Penalty:

_____ Warning (No Penalty)

_____ 1st Violation (\$100)

_____ 2nd Violation (\$250)

_____ 3rd or subsequent violation within 24
months (\$500)

NOTICE SERVED TO:

Name (Last) _____ (First) _____ (Middle) _____

PROPERTY OWNER: _____ Yes _____ No _____ NA

OPERATOR /DRIVER: _____ Yes _____ No _____ NA

Company Name (if applicable) _____ Position _____

Home/ Business Address _____

City / County / Town _____ State _____ Zip Code _____

License / Permit Number _____ Type _____ State _____

IMPORTANT INFORMATION FOR VIOLATOR

UNLESS THE WARNING ONLY (NO PENALTY) LINE IS CHECKED, YOU ARE REQUIRED TO RESPOND TO THIS NOTICE OF VIOLATION WITHIN 15 DAYS OF THE "DATE OF NOTICE" WRITTEN IN THE UPPER RIGHT CORNER OF THIS NOTICE OF VIOLATION. FAILURE TO RESPOND WILL RESULT IN THE FILING OF CIVIL LAWSUIT IN COURT TO ENFORCE THE PENALTY IMPOSED FOR THE VIOLATION DESCRIBED IN THIS NOTICE.

FAILURE TO CORRECT THE VIOLATION WITHIN THE STATED TIME MAY RESULT IN THE ISSUANCE OF A CRIMINAL WARRANT OR SUMMONS.

ON THE BACK OF THE VIOLATORS COPY YOU WILL FIND INSTRUCTIONS TELLING YOU HOW TO RESPOND TO THIS NOTICE OF VIOLATION.

Ticket No. _____

CERTIFICATION OF ISSUING AGENT

DATE OF NOTICE: _____

I HEREBY CERTIFY that I am an employee of the City of Alexandria or the Commonwealth of Virginia. That I personally observed or witnessed the violation noted above, and that on the Date of Notice, a copy of this Notice of Violation and Order to Correct was

☐ hand delivered to _____

_____ (Name);

☐ mailed to _____

_____ (Address);

☐ posted at the location of the violation.

Signature _____

Print Name _____ Title _____

_____ Violator's Copy

_____ Department of Finance copy (Box 12)

_____ City Attorney's office copy (Box 5)

_____ T&ES copy

I ACKNOWLEDGE RECEIPT
OF THIS NOTICE OF VIOLATION

Signature _____ Date _____

How to Respond to this Notice of Violation

If the "Civil Penalty" line on the front of this Notice of Violation contains a dollar figure, a civil penalty has been imposed. In that case, you must, within 15 days of the "Date of Notice" shown on the front of this Notice, take the steps listed in either Part A or Part B, below:

PART A

Pay penalty and waive your right to a hearing:

- In the "Certification" section check either "Admit Violation" or "No Contest", and sign on the "Signature" line.

By checking "Admit Violation", you agree that the violation listed on the front of this Notice occurred at the date, time and place stated. You agree, further, to abate the violation as required by state law.

By checking "No Contest", you decline to challenge the violation although you do not agree that the violation occurred.

- Payment by check:** Make out a personal check or obtain a money order, certified check or cashier's check, payable to "City of Alexandria", in the amount stated on the "Civil Penalty" line on the front of this Notice. On the front of the check or money order, print the Notice number (found in the upper right corner on the front of this Notice.)

Send by mail or hand-deliver the check or money order, together with this completed Notice, to the Treasury Office, City Hall, Room 1510, 301 King Street, Alexandria, VA 22314. Office hours are weekdays, 8 a.m. to 5 p.m.

- Payment by cash:** Hand-deliver the amount stated on the "Civil Penalty" line on the front of this Notice, together with this completed Notice, to the Treasury Office, City Hall, Room 1510, 301 King Street, Alexandria, VA 22314. Office hours are weekdays, 8 a.m. to 5 p.m. Do not send cash through the mail.

PART B

To contest penalty and obtain a court hearing at which you may present evidence showing that the violation noted on the front of this Notice did not take place:

- In the "Certification" section, below, check the "Contest Violation" line.
- Mail or hand-deliver this notice to the Office of the City Attorney, City Hall, Room 1300, 301 King Street, Alexandria, VA 22314. Office hours are weekdays, 8 a.m. to 5 p.m.

After the City Attorney's receipt of the Notice, a date will be set for trial in the Alexandria General District Court. You will be notified of the trial date.

CERTIFICATION

You must complete and sign this certification:

☐ Admit Violation

☐ No contest

☐ Contest violation

Name (print) _____

Street Address _____

City/county _____ State _____ Zip _____

Signature _____

Date _____

MS4 Outfalls
and Points of
Discharge

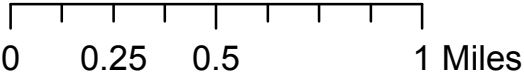
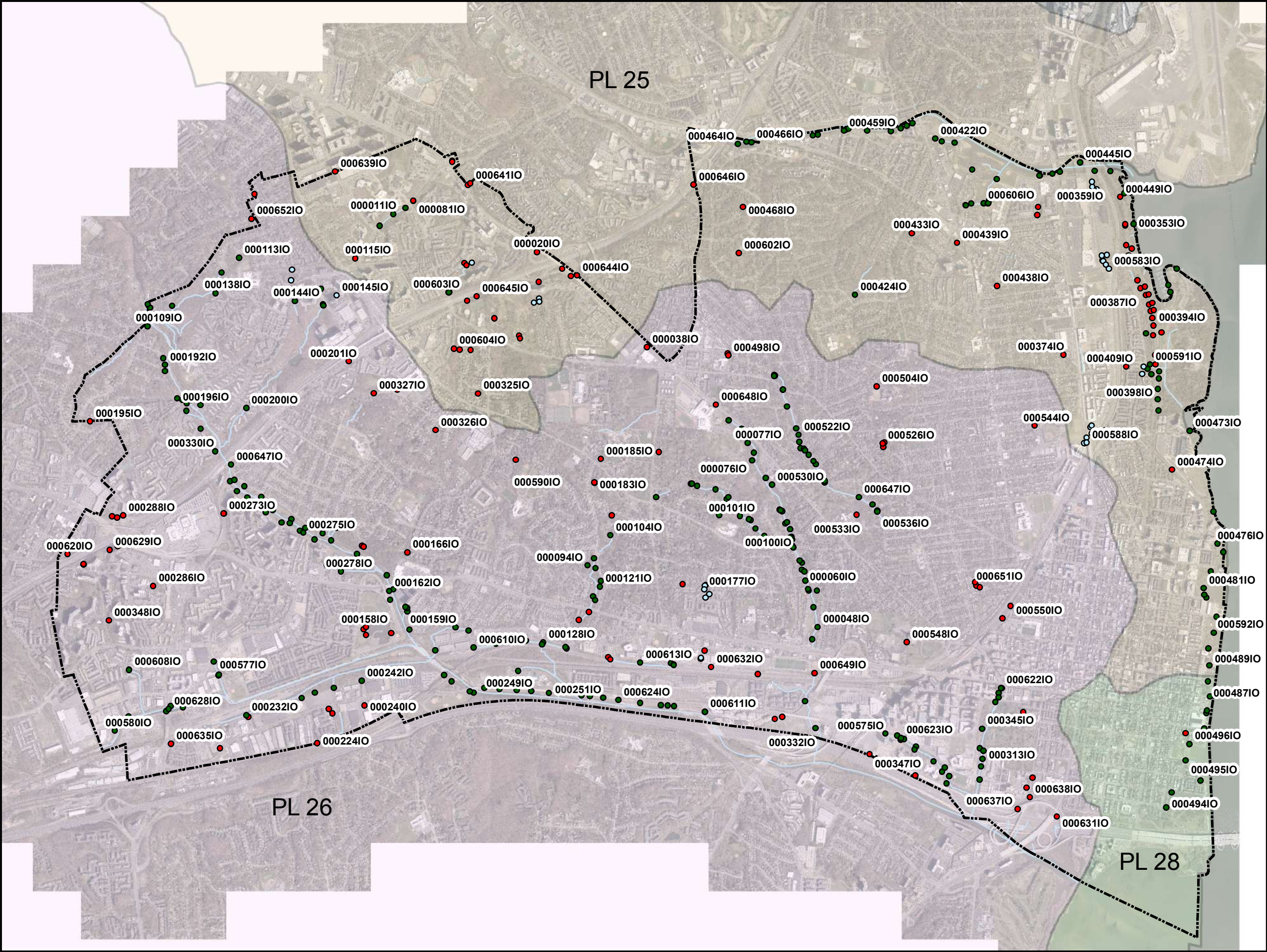
Legend

Outfall Types

- Outfall
- Outfall - Pond
- Point of Discharge
- City Boundary Line

HUC

- PL25
- PL26
- PL28



City of Alexandria
Outfall and Point of Discharge Table

Outfall ID	Estimated MS4 Acreage Served (acres)	Receiving Water	Ultimate Receiving Water	Ultimate Receiving Water Impairment	TMDLs	Type	HUC	Latitude Decimal Degrees	Longitude Decimal Degrees
000001IO	7.90	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11886440.46	6984163.82
000002IO	14.09	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11887433.77	6985111.699
000003IO	7.70	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11886723.66	6983909.517
000004IO	6.85	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11886768.19	6983959.464
000005IO	9.26	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11886527.7	6983494.552
000008IO	5.16	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11885959.42	6984253.376
000010IO	28.90	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11884893.22	6983957.149
000015IO	266.25	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11886772.62	6985948.308
000016IO	11.07	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11887114.73	6985732.021
000017IO	6.37	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11887237.89	6985607.025
000041IO	31.82	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888852.69	6981534.963
000042IO	0.61	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888839.71	6981576.72
000043IO	3.33	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888978.05	6981101.434
000044IO	22.58	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11889063.01	6981533.091
000045IO	6.38	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888946.51	6980279.499
000048IO	26.41	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11889082.33	6980591.082
000050IO	13.73	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888159.24	6983592.744
000051IO	6.29	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888369.04	6983123.82
000052IO	2.40	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888399.7	6982932.266
000053IO	0.81	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888415.94	6982864.731
000054IO	0.99	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888419.47	6982706.854
000055IO	21.06	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888460.54	6982655.803
000056IO	17.95	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888447.75	6982658.441
000057IO	2.42	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888681.1	6982256.677
000058IO	2.67	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888674.7	6982076.896
000059IO	4.63	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888760.68	6981795.462
000060IO	4.82	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888738.67	6982030.953
000061IO	1.12	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888613.22	6982314.863
000062IO	3.23	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888098.71	6983638.702
000063IO	0.22	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888118.97	6983622.493
000064IO	4.07	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888245.47	6983276.601
000065IO	1.34	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888285.14	6983309.497
000067IO	1.87	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888375.89	6982913.114
000068IO	3.29	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11887349.24	6983366.923
000069IO	0.74	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11887298.84	6983388.581
000070IO	2.71	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11887704.72	6982949.739
000074IO	83.60	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11885800.97	6984307.115
000075IO	0.06	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11885834.11	6984309.427
000076IO	4.20	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11887379.89	6984905.205
000077IO	4.44	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11887269.74	6985371.613
000100IO	3.27	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11887473.68	6983140.415
000101IO	2.47	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11887067.13	6983467.829
000105IO	3.80	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11871772.65	6988871.466
000106IO	2.40	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11872351.47	6988913.388
000107IO	0.87	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11871868.81	6988632.407

City of Alexandria
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Outfall ID	Estimated MS4 Acreage Served (acres)	Receiving Water	Ultimate Receiving Water	Ultimate Receiving Water Impairment	TMDLs	Type	HUC	Latitude Decimal Degrees	Longitude Decimal Degrees
000108IO	0.77	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11871717.05	6988957.849
000109IO	159.57	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11871709.92	6988392.875
000111IO	8.37	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11872121.4	6987563.654
000112IO	16.55	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11873633.7	6989781.374
000116IO	24.22	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall - Pond	PL26	11875459.07	6989850.611
000137IO	2.90	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall - Pond	PL26	11875428.37	6989580.595
000138IO	55.09	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11873477.22	6989249.213
000139IO	13.28	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall - Pond	PL26	11876210.96	6989363.584
000140IO	37.40	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11876260.94	6988957.362
000141IO	9.10	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11876271.96	6988924.012
000144IO	39.84	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11875529	6989042.071
000145IO	23.84	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall - Pond	PL26	11876612.34	6989189.499
000148IO	2.94	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11878443.82	6980994.703
000149IO	174.71	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11878439.43	6981085.436
000150IO	1.58	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11878394.06	6981111.526
000160IO	11.11	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11878082.06	6981564.146
000167IO	19.58	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11877911.78	6981936.063
000168IO	6.11	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11877136.98	6982486.439
000187IO	57.70	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11872480.58	6986519.899
000188IO	0.17	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11872719.14	6986432.001
000189IO	69.20	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11872727.84	6986390.825
000190IO	0.33	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11872609.86	6986480.859
000191IO	19.25	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11872162.41	6987222.227
000192IO	5.80	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11872157.94	6987385.018
000193IO	13.47	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11872820.91	6986465.417
000194IO	5.57	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11872716.75	6986195.981
000196IO	28.38	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11873082.39	6986343.762
000199IO	24.17	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11874431.35	6986442.873
000205IO	3.16	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11874958.15	6983625.44
000206IO	18.32	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11874658.4	6983959.895
000207IO	40.42	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11873856.13	6984375.101
000208IO	1.68	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11873960.35	6984405.523
000209IO	15.57	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11874220.58	6984243.16
000210IO	3.01	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11874028.17	6984111.987
000211IO	56.33	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11874299.01	6983950.406
000261IO	26.31	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11875441.23	6983386.159
000262IO	139.89	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11875796.74	6983158.759
000263IO	10.13	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11876249.98	6983015.281
000264IO	119.42	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11876474.07	6982840.734
000266IO	31.26	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11876489.67	6983233.711
000267IO	0.29	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11876482.58	6983243.472
000268IO	85.06	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11876603.31	6983160.824
000269IO	43.84	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11875185.9	6983294.572
000270IO	8.91	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11875394.33	6983279.187
000271IO	7.97	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11874773.85	6983567.035

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Outfall ID	Estimated MS4 Acreage Served (acres)	Receiving Water	Ultimate Receiving Water	Ultimate Receiving Water Impairment	TMDLs	Type	HUC	Latitude Decimal Degrees	Longitude Decimal Degrees
000274IO	1.36	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11875664.7	6983084.295
000275IO	1.14	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11875749.91	6983031.874
000276IO	6.01	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11876040.87	6982862.205
000277IO	17.27	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11876358.23	6982198.8
000278IO	3.31	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11876731.02	6982030.494
000299IO	1.62	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11892314.2	6976838.147
000300IO	3.36	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11892091.22	6977100.812
000301IO	2.82	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11892488.42	6976728.197
000302IO	10.66	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11892373.97	6976944.812
000303IO	0.24	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11891237.48	6977672.186
000305IO	0.36	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11891328.29	6977688.155
000306IO	26.82	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11891627.92	6977488.735
000307IO	3.54	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11891596.3	6977417.922
000308IO	2.87	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11893291.47	6977448.84
000309IO	2.99	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11893279.27	6976636.308
000311IO	1.62	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11893358.07	6977170.991
000312IO	0.84	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11893321.63	6976970.877
000313IO	9.38	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11893377.67	6977385.415
000314IO	3.14	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11893216.82	6976125.102
000315IO	1.01	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11892427.5	6976535.047
000329IO	14.08	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11873089.95	6985731.367
000330IO	55.21	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11873471.42	6985145.152
000332IO	4.09	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11889021.66	6977964.611
000333IO	2.90	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888756.38	6978667.449
000339IO	37.88	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11893835.8	6979007.152
000340IO	1.41	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11893771.36	6978878.931
000341IO	10.25	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11893770.71	6978765.68
000342IO	25.08	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11893687.46	6978645.541
000343IO	1.26	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11891144.8	6977778.141
000345IO	4.74	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11893347.93	6977952.632
000477IO	23.84	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11899425.95	6980856.343
000499IO	119.75	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11887957.9	6987122.845
000500IO	13.08	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11887977.39	6987119.421
000501IO	0.02	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11887985.29	6987106.255
000503IO	0.16	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11887961.33	6987104.763
000509IO	0.07	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888189.54	6986745.918
000510IO	14.54	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888289.4	6986308.817
000511IO	6.78	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888524.98	6985738.758
000512IO	1.76	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888635.96	6985228.64
000513IO	4.14	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888607.65	6985390.952
000514IO and 000516IO	1.94	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888733.03	6985216.088
000517IO	1.80	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888852.75	6985058.527
000518IO	13.55	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11889036.06	6984809.284
000519IO	3.38	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11889194.24	6984492.096

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000520IO	2.29	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11889264.36	6984339.698
000521IO	10.49	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888973.7	6984889.746
000522IO	3.85	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888592.34	6985576.612
000527IO	35.68	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11889265.48	6984379.21
000528IO	4.07	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11890503.11	6983766.34
000529IO	4.09	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11887734.92	6984458.919
000530IO	6.09	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11887900.99	6984281.077
000535IO	2.15	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11890630.67	6983613.107
000536IO	1.78	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11890625.82	6983589.708
000575IO	65.70	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11890841.65	6977825.425
000153IO	0.33	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11878002.88	6981297.641
000154IO	2.46	Backlick Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall - Pond	PL26	11878024.15	6980434.469
000155IO	2.50	Backlick Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall - Pond	PL26	11877378.05	6980380.58
000156IO	83.46	Backlick Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall - Pond	PL26	11877308.78	6980532.431
000158IO	45.60	Backlick Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall - Pond	PL26	11877375.12	6980585.74
000162IO	49.51	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11877978.71	6981527.501
000213IO	13.67	Backlick Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11873099.89	6978734.989
000214IO	1.19	Backlick Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11873553.67	6979339.892
000216IO	36.85	Backlick Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11871219.53	6978269.913
000218IO	0.65	Backlick Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11872192.49	6978410.296
000219IO	0.42	Backlick Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11872310.74	6978543.623
000220IO	1.82	Backlick Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11872625.8	6978511.084
000279IO	21.82	Backlick Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11873428.97	6979692.276
000608IO and 000609IO	216.50	Backlick Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11871233.5	6979481.27
000580IO	5.41	Backlick Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11870862.82	6977900.473
000146IO	143.67	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11880028.61	6980493.867
000147IO	11.38	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11878503.95	6980523.88
000159IO	24.73	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11879694.56	6980577.07
000098IO	77.58	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall - Pond	PL26	11886181.22	6981682.23
000099IO	4.21	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall - Pond	PL26	11886160.13	6981666.553
000151IO	2.58	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11879169.15	6979988.369
000171IO	1.13	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall - Pond	PL26	11886177.99	6981349.272
000175IO	5.45	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11885280.29	6979647.181
000177IO	9.62	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall - Pond	PL26	11886138.29	6981566.832
000222IO	119.14	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11875007.37	6978513.511
000223IO	5.29	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11875712.95	6978751.43
000225IO	28.59	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11876049.89	6978885.445
000230IO	221.93	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11876542.26	6979011.289
000232IO	21.18	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11874274.07	6978307.225
000233IO	15.75	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11877981.82	6979339.378
000234IO	0.42	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11880444.26	6979011.491
000235IO	11.25	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11880161.03	6978883.289
000236IO	3.12	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11880066.59	6978921.541
000237IO	7.83	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11879597.06	6979186.565

City of Alexandria
Outfall and Point of Discharge Table

Outfall ID	Estimated MS4 Acreage Served (acres)	Receiving Water	Ultimate Receiving Water	Ultimate Receiving Water Impairment	TMDLs	Type	HUC	Latitude Decimal Degrees	Longitude Decimal Degrees
000239IO	22.06	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11879399.17	6979351.053
000242IO	78.63	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11877266.2	6979195.948
000243IO	0.65	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11880835.6	6978979.844
000244IO	0.57	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11881283.49	6978950.336
000245IO	14.93	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall - Pond	PL26	11881322.96	6979451.111
000247IO	1.62	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11883173.19	6978796.949
000248IO	3.92	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11882964.55	6978815.446
000249IO	1.19	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11881661.07	6978924.296
000250IO	1.70	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11882117.72	6978880.28
000251IO	6.19	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11883525.38	6978752.362
000257IO	2.59	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11885199.34	6978557.125
000258IO	22.16	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11885013.64	6978565.314
000259IO	4.07	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11884485.44	6978625.494
000260IO	0.84	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11885358.9	6978545.929
000611IO and 000612IO	206.89	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11886156.54	6978395.62
000614IO and 000615IO	22.16	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11885351.2	6979617.37
000613IO	50.79	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11884484.87	6979664.457
000023IO	21.09	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall - Pond	PL25	11881862.88	6989104.991
000024IO	1.83	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall - Pond	PL25	11881871.58	6989023.44
000025IO	27.84	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall - Pond	PL25	11881734.63	6988996.356
000294IO	39.13	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11879517.26	6989272.799
000295IO and 000603IO	171.04	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11879527.29	6989274.32
000414IO	0.63	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11892303.12	6993182.401
000415IO	7.10	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11892632.15	6993149.696
000416IO	12.84	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11893091.67	6992445.754
000417IO	130.16	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11891391.27	6993589.596
000418IO	1.76	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11891536.69	6993657.921
000419IO	1.03	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11891232.3	6993525.851
000420IO	1.69	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11890977.69	6993440.809
000422IO	44.28	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11892133.87	6993252.545
000423IO	1.32	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11893066.17	6991568.178
000424IO	49.26	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11890056.31	6989201.547
000426IO	14.24	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11893722.17	6992206.379
000427IO	1.94	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11893389.3	6991573.821
000428IO	4.81	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11893386.94	6991574.315
000429IO, 000605IO, 000606IO	283.12	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11893493.05	6991573.139
000430IO	0.78	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11893527.94	6991655.21
000431IO and 000432IO	175.23	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11892922.94	6991532.446
000450IO	9.19	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11895169.35	6992340.963
000451IO	6.05	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11895361.1	6992393.396

City of Alexandria
Outfall and Point of Discharge Table

Outfall ID	Estimated MS4 Acreage Served (acres)	Receiving Water	Ultimate Receiving Water	Ultimate Receiving Water Impairment	TMDLs	Type	HUC	Latitude Decimal Degrees	Longitude Decimal Degrees
000452IO and 000600IO	19.11	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11894838.04	6992290.594
000454IO	127.67	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11887681.57	6993316.229
000456IO	55.74	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11890367.89	6993456.194
000457IO	0.13	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11889812.16	6993494.613
000458IO	0.62	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11889878.84	6993519.764
000459IO	1.91	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11889767.66	6993458.942
000460IO	6.74	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11889087.66	6993356.607
000461IO	1.74	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11888131.58	6993375.136
000462IO	1.06	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11888229.8	6993334.763
000463IO	19.80	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11888959.42	6993335.478
000464IO	1.25	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11887016.52	6993114.02
000465IO	58.18	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11887236.44	6993171.464
000466IO	0.74	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11887363.62	6993154.696
000079IO	0.23	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11878392.77	6991456.818
000011IO	10.80	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11878084.23	6991300.581
000084IO	39.42	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11877732.58	6990995.936
000087IO	28.12	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall	PL25	11877733.56	6990992.406
000353IO	6.05	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11897269.55	6991045.02
000361IO	214.12	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11896259.78	6992413.289
000379IO	1.88	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11898226.43	6989274.819
000381IO	2.88	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11898173.26	6989458.104
000382IO	1.76	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11898387.87	6989880.871
000396IO	1.16	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11897918.7	6986205.557
000397IO	2.50	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11897899.31	6986492.831
000398IO	1.44	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11897905	6986765.268
000402IO	0.36	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11897936.5	6987212.757
000403IO	0.51	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11897929.62	6987038.286
000404IO	6.95	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11897735.5	6987146.48
000405IO	50.89	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11897635.48	6987281.737
000406IO	7.82	Potomac River	Potomac River	Yes	PCBs	Outfall - Pond	PL28	11897538.98	6987335.751
000407IO	49.56	Potomac River	Potomac River	Yes	PCBs	Outfall - Pond	PL28	11897493.34	6987153.774
000447IO	0.95	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11896671.66	6992411.516
000448IO	0.11	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11897034.41	6991838.966
000469IO	7.78	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11899598.7	6982537.477
000470IO	8.51	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11899274.57	6982030.579
000471IO	16.87	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11899346.02	6983582.765
000472IO	4.54	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11898724.86	6985681.776
000473IO	0.14	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11898729.15	6985674.047
000475IO	0.53	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11899632.92	6982943.543
000476IO	1.29	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11899447.45	6982756.021
000478IO	1.21	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11899164.11	6981353.557
000479IO	9.59	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11899211.91	6980033.524
000480IO	4.59	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11899106.9	6981429.171
000481IO	3.76	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11899090.24	6981596.498

City of Alexandria
Outfall and Point of Discharge Table

Outfall ID	Estimated MS4 Acreage Served (acres)	Receiving Water	Ultimate Receiving Water	Ultimate Receiving Water Impairment	TMDLs	Type	HUC	Latitude Decimal Degrees	Longitude Decimal Degrees
000482IO	1.18	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11899118.54	6977767.156
000483IO	6.03	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11899107	6977958.021
000484IO	6.55	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11899161.83	6978365.66
000485IO	0.21	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11899176.78	6978428.621
000486IO	5.43	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11899253.3	6978787.148
000487IO	19.40	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11899201.25	6979183.219
000489IO	8.91	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11899232.88	6979594.487
000491IO	7.57	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11899003.88	6976613.722
000493IO	1.49	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11898260.33	6976296.936
000494IO	2.18	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11898120.95	6975913.388
000495IO	18.56	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11898622.46	6977129.506
000495IO and 000496IO	6.00	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11898722.45	6977560.075
000092IO	96.39	Strawberry Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11883287.15	6982366.915
000093IO	7.97	Strawberry Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11883326.8	6982117.109
000094IO	17.66	Strawberry Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11883116.46	6982186.014
000095IO	2.77	Strawberry Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11883467.54	6981784.938
000104IO	39.49	Strawberry Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11883709.61	6982971.088
000119IO	56.24	Strawberry Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11882579.12	6980036.325
000120IO	3.64	Strawberry Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11882545.18	6980074.069
000124IO	2.60	Strawberry Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11883256.09	6981387.195
000127IO	5.10	Strawberry Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11883313.69	6981285.708
000128IO	1.17	Strawberry Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11881967.95	6980192.612
000130IO	7.41	Strawberry Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11881517.46	6980244.8
000133IO	9.67	Strawberry Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11880744.71	6980158.563
000134IO	23.41	Strawberry Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11881196.01	6980229.609
000135IO	8.73	Strawberry Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11881936.87	6980148.008
000610IO	5.28	Strawberry Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11880163.71	6980062.784
000586IO	1.44	Potomac River	Potomac River	Yes	PCBs	Outfall - Pond	PL28	11895991.98	6985357.602
000588IO	30.32	Potomac River	Potomac River	Yes	PCBs	Outfall - Pond	PL28	11896057.16	6985376.432
000589IO	51.55	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11897592.62	6988200.249
000591IO	19.51	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11897701.93	6987397.715
000592IO	5.97	Potomac River	Potomac River	Yes	PCBs	Outfall	PL28	11899348.09	6980443.038
000121IO	13.49	Strawberry Run				Outfall	PL26	11883394.31	6981652.8
000621IO and 000622IO	1291.70	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11893852.18	6979004.593
000624IO	11.33	Cameron Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11883917.66	6978699.662
000628IO	94.19	Backlick Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11872259.35	6978466.72
000642IO	61.75	Four Mile Run	Four Mile Run Tidal	Yes	E. Coli	Outfall - Pond	PL25	11880117.33	6990035.114
000647IO	80.76	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11873876.92	6984802.006
000647IO	80.76	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11890149.55	6983954.071
000660IO	2.20	Holmes Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11873868.37	6984516.587
000661IO	52.89	Backlick Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11873534	6979431.994
000662IO	7.93	Backlick Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11873518.87	6979455.317
000668IO	5.46	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11889255.88	6981334.995

City of Alexandria
Outfall and Point of Discharge Table

Outfall ID	Estimated MS4 Acreage Served (acres)	Receiving Water	Ultimate Receiving Water	Ultimate Receiving Water Impairment	TMDLs	Type	HUC	Latitude Decimal Degrees	Longitude Decimal Degrees
000668IO	5.46	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888200.33	6986790.098
000669IO	53.44	Hooffs Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11891191.4	6977728.452
000670IO	5.31	Taylor Run	Hunting Creek/Cameron Run/Holmes Run	Yes	E. Coli	Outfall	PL26	11888943.74	6979086.277



City of Alexandria

Department of Transportation and Environmental Services
Office of Environmental Quality
301 King Street
City Hall, Room 3000
Alexandria, VA 22314
www.alexandriava.gov/Environment

July 15, 2009

Gayle England
Stormwater Specialist
Department of Environmental Services
Arlington County, Virginia

DELIVERED VIA EMAIL: Gengland@arlingtonva.us

Subject: Notice of Potentially Interconnected Municipal Separate Storm Sewer System (MS4)

Attention: MS4 Permit Manager

The City of Alexandria operates as a Phase II MS4 community with coverage under the Virginia Stormwater Management Program (VSMP) General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (No. VAR 040057).

Pursuant to Section II.B.3.g of this permit, the City must "Notify, in writing, any downstream regulated MS4 to which the small regulated MS4 is physically interconnected of the small regulated MS4's connection to that system." This letter is to notify you of the potential for interconnections between the City's MS4 and the permitted stormwater system operated by Arlington County. Currently, we have not identified any points where the City's MS4 discharges stormwater into Arlington's regulated MS4; however, it is likely that interconnections exist.

As mentioned in our previous email correspondences and pursuant to Section II.B.3.b, the City is currently working on a mapping effort that will verify the "location of all known outfalls ...including those physically interconnected to a regulated MS4..." City GIS Staff will be contacting you very soon to share information in order to identify and map any interconnections that may exist between our regulated stormwater systems. The City is scheduled to provide this map with its Annual Report due no later than October 1, 2010 to DCR.

Best Regards,

A handwritten signature in black ink, appearing to read "Jesse E. Maines", is written over a faint, large circular watermark of the City of Alexandria seal.

Jesse E. Maines
Water Quality Compliance Specialist
703-746-4071
Jesse.maines@alexandriava.gov

Cc: Mary Beth Fletcher, GIS Mapping Center Bureau Chief, mfletcher@arlingtonva.us



City of Alexandria

Department of Transportation and Environmental Services
Office of Environmental Quality
301 King Street
City Hall, Room 3000
Alexandria, VA 22314
www.alexandriava.gov/Environment

July 15, 2009

LIII (ALSO: MAY NEED TO SEND TO NOVA COLLEGE)
Stormwater Specialist
Department of Environmental Services
Arlington County, Virginia

DELIVERED VIA EMAIL:

Subject: Notice of Potentially Interconnected Municipal Separate Storm Sewer System (MS4)

Attention: MS4 Permit Manager

The City of Alexandria operates as a Phase II MS4 community with coverage under the Virginia Stormwater Management Program (VSMP) General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (No. VAR 040057).

Pursuant to Section II.B.3.g of this permit, the City must "Notify, in writing, any downstream regulated MS4 to which the small regulated MS4 is physically interconnected of the small regulated MS4's connection to that system." This letter is to notify you of the potential for interconnections between the City's MS4 and the permitted stormwater system operated by Arlington County. Currently, we have not identified any points where the City's MS4 discharges stormwater into Arlington's regulated MS4; however, it is likely that interconnections exist.

As mentioned in our previous email correspondences and pursuant to Section II.B.3.b, the City is currently working on a mapping effort that will verify the "location of all known outfalls ...including those physically interconnected to a regulated MS4..." City GIS Staff will be contacting you very soon to share information in order to identify and map any interconnections that may exist between our regulated stormwater systems. The City is scheduled to provide this map with its Annual Report due no later than October 1, 2010 to DCR.

Best Regards,

A handwritten signature in black ink, appearing to read "Jesse E. Maines", is written over a faint, large circular watermark of the City of Alexandria seal.

Jesse E. Maines
Water Quality Compliance Specialist
703-746-4071
Jesse.maines@alexandriava.gov

Cc: Mary Beth Fletcher, GIS Mapping Center Bureau Chief, mfletcher@arlingtonva.us



City of Alexandria

Department of Transportation and Environmental Services
Office of Environmental Quality
301 King Street
City Hall, Room 3000
Alexandria, VA 22314
www.alexandriava.gov/Environment

July 15, 2009

Roy T. Mills
Location and Design Division
State Stormwater Program Administrator
Virginia Department of Transportation

DELIVERED VIA EMAIL: Roy.Mills@VDOT.Virginia.gov

Subject: Notice of Potentially Interconnected Municipal Separate Storm Sewer System (MS4)

Attention: MS4 Permit Manager

The City of Alexandria operates as a Phase II MS4 community with coverage under the Virginia Stormwater Management Program (VSMP) General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (No. VAR 040057).

Pursuant to Section II.B.3.g of this permit, the City must "Notify, in writing, any downstream regulated MS4 to which the small regulated MS4 is physically interconnected of the small regulated MS4's connection to that system." This letter is to notify you of the potential for interconnections between the City's MS4 and the permitted stormwater system operated by the Virginia Department of Transportation (VDOT). Currently, we have not identified any points where the City's MS4 discharges stormwater into VDOT's regulated MS4; however, it is likely that interconnections exist.

As mentioned in my July 15, 2010 email and pursuant to Section II.B.3.b, the City is currently working on a mapping effort that will verify the "location of all known outfalls ...including those physically interconnected to a regulated MS4..." We would like to work together and share information so that each party may have adequate information to identify any interconnections that may exist between our regulated stormwater systems. The City is scheduled to provide this map with its Annual Report due no later than October 1, 2010 to DCR.

Please contact me at your earliest convenience to work together on the mapping effort.

Best Regards,

A handwritten signature in black ink, appearing to read "Jesse E. Maines", is written over a faint, circular watermark of the City of Alexandria seal.

Jesse E. Maines
Water Quality Compliance Specialist
703-746-4071
Jesse.maines@alexandriava.gov

Cc: Morris Z. Walton via email – Morris.Walton@VDOT.Virginia.gov



City of Alexandria

Department of Transportation and Environmental Services
Stormwater Management Division
2900-B Business Center Drive
Alexandria, VA 22314

May 24, 2018

Brenda Wasler
Environmental Protection Specialist
National Park Service
George Washington Memorial Parkway
700 George Washington Memorial Parkway
McLean, VA 22101

DELIVERED VIA EMAIL: brenda_wasler@nps.gov

Subject: Notice of Interconnected Municipal Separate Storm Sewer System (MS4)

Attention: MS4 Permit Manager

The City of Alexandria operates as a Phase II MS4 community with coverage under the Virginia Stormwater Management Program (VSMP) General VPDES Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (No. VAR 040057).

Pursuant to Section II.B.3.a of this permit, the City shall "notify in writing the downstream MS4 of any known physical interconnection." This letter is to notify you of the interconnection between the City's MS4 and the permitted stormwater system operated by the National Park Service, George Washington Memorial Parkway.

Thank you for providing your MS4 boundaries in April 2018. We confirmed that the City does operate outfalls that discharge into Jones Point Park in the southeast portion of the City and into the area east of the George Washington Memorial Parkway in the northeast portion of the City. We will review and update the City's MS4 boundaries as needed to ensure consistency between the data sets. After this is completed, the City's boundaries will be sent for your reference.

Sincerely,

A handwritten signature in black ink, appearing to read "Jesse E. Maines", is written over a faint, circular watermark of the City of Alexandria seal.

Jesse E. Maines
Division Chief
Transportation and Environmental Services
Stormwater Management Division
Jesse.maines@alexandriava.gov

Cc: Hannah Dean via email – Hannah_Dean@nps.gov

City of Alexandria
Municipal Separate Storm Sewer System (MS4) Program Plan

Appendix D - MCM #4: Construction Site Runoff Control

City of Alexandria

*301 King St., Room 2400
Alexandria, VA 22314*



Docket - Final

Wednesday, June 10, 2015

6:00 PM

Council Chambers

City Council Legislative Meeting

1 Calling the Roll.**2 Closed Meeting.**

[14-4156](#) 6:00 P.M. to 7:00 P.M. - Consideration of Convening a Closed Meeting for Consultation with Legal Counsel for Legal Advice Regarding the Investment of Public Funds Where Bargaining is Involved and to Discuss the Performance and Salaries of Public Officers.

Attachments: [14-4156_exec session motion](#)

3 Moment of Silence and Pledge of Allegiance.**4 Reading and Acting Upon the Minutes of the Following Meetings of City Council:**

[14-4132](#) The Regular Meeting Minutes of May 12, 2015;
The Public Hearing Meeting Minutes of May 16, 2015;
The Special Meeting Minutes of May 20, 2015; and
The Regular Meeting Minutes of May 26, 2015.

Attachments: [14-4132_May 12, 2015 minutes](#)
[14-4132_May 16, 2015 minutes](#)
[14-4132_May 20, 2015 minutes](#)
[14-4132_May 26, 2015 minutes.rtf](#)

PROCLAMATIONS

5 [14-4054](#) Presentation of the Donation of \$80,000 by RunningBrooke for Funding of Improvements to Hume Springs Park and Playground.

6 [14-4131](#) Presentation of a Proclamation Declaring June 19-28, 2015 as Warrior Games Family Appreciation Week in the City of Alexandria.

Attachments: [14-4131_Proclamation](#)

7 [14-4195](#) Presentation of a Proclamation Declaring November 13-22, 2015 as Virginia Cider Week.

Attachments: [14-4195_Proclamation](#)

ORAL REPORTS FROM CITY COUNCIL ON BOARDS, COMMISSIONS AND COMMITTEES

* **Report on Washington Metropolitan Area Transit Authority (Mayor Euille)**

* **Report on Audit Committee (Councilman Wilson and Councilman Smedberg)**

*** Virginia Municipal League Legislative Committee (Councilman Chapman)**

REPORTS AND RECOMMENDATIONS OF THE CITY MANAGER (five min.)

CONSENT CALENDAR (8-22)

(Resignations and Uncontested Appointments)

- 8** [14-4161](#) Receipt of the Following Resignations from Members of Boards, Commissions and Committees:

(a) Alexandria Redevelopment and Housing Authority
Kara Dinowitz

(b) Board of Zoning Appeals
Mark Allen

(c) Commission on Aging
Annmarie Pittman
Bernard Kellom, Jr

(d) Commission on Persons with Disabilities
Nyrisha Beckman

(e) Social Services Advisory Board
Julie Missimore

Attachments: [14-4161 Resignations](#)

- 9** [14-4162](#) Uncontested Appointments to Boards, Commissions and Committees:

(a) Affordable Housing Advisory Committee
1 Builder or Developer of Residential Property

(b) Alexandria-Caen Sister City Committee
1 Citizen Member

(c) Alexandria Marketing Committee
1 Member with Experience or Expertise in the Following Areas:
Marketing/Communications, Advertising Agency/Public Relations, Media Buyer, Graphic Design/Production, and/or Media Relations/Media Outlet

(d) Beauregard Design Advisory Committee
3 Citizen Members

(e) Beautification Commission

1 Citizen Member

(f) Board of Architectural Review - Parker-Gray District

1 Citizen Member

1 Architect Member

(g) Commission on Employment

1 Business Representative From Among Recognized Area Businesses
Including Minority-owned and Small Businesses

(h) Emergency Medical Services Council

1 Operational Medical Director Representative

(i) Local Emergency Planning Committee

1 Representative of Broadcast and Print Media

(j) Real Estate Assessments Review Board

1 Citizen Member

(k) Towing Advisory Board

1 Citizen Member

(l) Visit Alexandria Board of Governors

2 Hotel Owner/Manager, Restaurant Owner/Manager, Trade or
Professional Association Executive, or Retail Owner/Manager
Representative

1 Retail Owner/Manager Representative

(m) Waterfront Commission

1 Citizen Representative From Park Planning District I

Attachments: [14-4162 Uncontested Board Appointments](#)

(Reports and Recommendations of the City Manager)

- 10** [14-3154](#) Consideration of the Monthly Financial Report for the Period Ending April 30, 2015.
Attachments: [14-3154 Apr 15 Monthly Financial Report](#)
- 11** [14-4084](#) Consideration of the Submission of a Non-Competitive Grant Application to the Virginia Department of Environmental Quality Litter Prevention and Recycling Program for Funding of the Adopt-a-Park Litter Control

Program.

Attachments: [14-4084 Attachment 1](#)

[14-4084 Litter grant FY 2016 Attachment 2.docx](#)

[14-4084 Attachment 3](#)

- 12 [14-4088](#) Consideration of the Appointment to the Post-Employment Benefits Trust Board.

(Ordinances for Introduction)

- 13 [14-4120](#) Introduction and First Reading. Consideration. Passage on First Reading of an Ordinance to Amend and Reordain Article B (Fire Prevention), Chapter 2 (Fire Protection and Prevention), Title 4 (Public Safety) of the Code of the City of Alexandria, Virginia, 1981, as Amended.

Attachments: [14-4120 Reference Guide](#)

[14-4120 Ordinance](#)

[14-4120 Docket Cover Sheet](#)

- 14 [14-4003](#) Introduction and First Reading. Consideration. Passage on First Reading of an Ordinance Authorizing Amendments to Section 9-13 of the City Code - Towing and Storage of Motor Vehicles.

Attachments: [14-4003 Attachment 1 Ordinance Cover Towing and Storage of Motor Vehicles](#)

[14-4003 Attachment 2 Ordinance.docx.docx](#)

- 15 [14-4025](#) Introduction and First Reading. Consideration. Passage on First Reading of an Ordinance to Amend the City Code to Accomplish Changes to the Public Health Advisory Commission's Membership.

Attachments: [14-4025 Public Health Composition Change Cover](#)

[14-4025 Public Health Commission Composition Change ORD](#)

- 16 [14-4032](#) Introduction and First Reading. Consideration. Passage on First Reading of an Ordinance to Amend and Reordain Title 5 (Transportation and Environmental Services), Chapter 8 (Parking and Traffic Regulations) of the Code of the City of Alexandria, Virginia, 1981, as Amended.

Attachments: [14-4032 Attachment 1 Ordinance Cover.docx](#)

[14-4032 Attachment 2 Ordinance Parking Meter Revised.docx](#)

- 17 [14-4055](#) Introduction and First Reading. Consideration. Passage on First Reading of an Ordinance to Amend and Reordain Chapter 4 (Erosion and Sediment Control) of Title 5 (Transportation and Environmental Services), of the Code of the City of Alexandria, Virginia, 1981, as Amended.

Attachments: [14-4055 Attachment 1 Ordinance Cover Erosion and Sediment Control.docx](#)

[14-4055 Attachment 2 Ordinance Erosion and Sediment Control.docx](#)

- 18 [14-4070](#) Introduction and First Reading. Consideration. Passage on First Reading of an Ordinance Authorizing the Owners of the Property Located at 4825 Maury Lane to Maintain an Encroachment for Pervious Pavers, Fencing and Pillars at that Location.
Attachments: [14-4070 Information sheet](#)
 [14-4070 Ordinance](#)
 [14-4070 Attachment 1](#)
- 19 [14-3668](#) Introduction and First Reading. Consideration. Passage on First Reading of an Ordinance on Changes to the Name and Composition of the Affordable Housing Advisory Committee.
Attachments: [14-3668 Ordinance Cover.docx](#)
 [14-3668 Ordinance](#)
- 20 [14-4113](#) Introduction and First Reading. Consideration. Passage on First Reading of an Ordinance to Amend the City Code to Conform with the Virginia Public Procurement Act (VPPA) with Regard to Definitions, Performance and Payment Bonds, Alternate Forms of Security, Competitive Sealed Bidding, Contract Formation and Methods of Source Selection, Public Notice, Contracting for Professional Services by Competitive Negotiations, Competitive Negotiation, Job Order Contracting, and Contract Formation and Methods of Source Selection.
Attachments: [14-4113 Ordinance Cover](#)
 [14-4113 Proposed Ordinance](#)
- 21 [14-3852](#) Introduction and First Reading. Consideration. Passage on First Reading of a Supplemental Appropriation Ordinance for the Support of the City Government for FY 2015.
Attachments: [14-3852 Cover Sheet](#)
 [14-3852 Supp App Ordinance](#)
 [14-3852 Att 3 - June 2015 grant attachment](#)
- 22 [14-3854](#) Introduction and First Reading. Consideration. Passage on First Reading of an Ordinance to Make Appropriations for the Support of the City Government for Fiscal Year 2016.
Attachments: [14-3854 Attch 1. Appropriation Cover and Ordinance](#)
 [14-3854 Table 1 - 2016 Appropriation Ordinance Final Expenditures by Fund](#)
 [14-3854 Table II - 2016 Sources of Revenue](#)

END OF CONSENT CALENDAR

CONTESTED APPOINTMENTS

- 23 [14-4163](#) Board of Architectural Review - Old and Historic District
2 Citizen Members
Attachments: [14-4163_BAR Old and Historic.docx](#)
- 24 [14-4164](#) Budget and Fiscal Affairs Advisory Committee
2 Citizen Members
Attachments: [14-4164_BFAAC.docx](#)
- 25 [14-4165](#) Community Criminal Justice Board
1 Representative of Local Education to be Nominated by the
Superintendent of Schools
Attachments: [14-4165_Community Criminal Justice Board.docx](#)

REPORTS AND RECOMMENDATIONS OF THE CITY MANAGER FOR DISCUSSION (60 min.)

- 26 [14-3977](#) Consideration of an Amendment to the City Council Approved 2003
Windmill Hill Park Concept Plan to Include a Living Shoreline Design
Concept.
Attachments: [14-3977_Windmill Hill Park Attachment 1.pdf](#)
 [14-3977_Windmill Hill Park Living Shoreline Plan](#)
 [14-3977_CityCouncilPresentation.pdf](#)

ORAL REPORTS AND ORAL PRESENTATIONS BY MEMBERS OF CITY COUNCIL

ORAL REPORT FROM THE CITY MANAGER

- 27 [14-4158](#) Presentation of Report on Crime Reduction and Focus on Quality of Life
with Municipalities in El Salvador.
Attachments: [14-4158_El Salvador Presentation](#)

ORDINANCES AND RESOLUTIONS

- 28 [14-4145](#) Consideration of a Resolution Establishing an Ad Hoc Fort Ward
Management Plan Implementation Monitoring Group. [ROLL-CALL
VOTE]
Attachments: [14-4145_Fort Ward Management Plan Implementation Monitoring Group Resol](#)
- 29 [14-4114](#) Introduction and First Reading. Consideration. Passage on Final Reading
of an Ordinance to Amend the City Code to Amend and Reordain Section
11-11-5 of Article A (General Provisions) and Add Section 11-11-143 of
Article I (Exemptions and Alternate Provisions to the Aquatic Health
Ordinance) of Chapter 11 (Swimming Pools, Spa Pools and Health Clubs)
of Title 11 (Health, Environmental and Sanitary Regulations) of the City

of Alexandria Code. (Lifeguard and Pool Operator Exemption Ordinance.)

Attachments: [14-4114 Ordinance Cover Lifeguards and Operator Exemption Ordinance Cove](#)
[14-4114 Ordinance Lifeguard and Operator Exemption Ordinance](#)
[14-4114 Health Department Memo to Council - Lifeguard Exemption - 2015-05-](#)

OTHER

30 [14-4122](#) Consideration of City Council Schedule.

Attachments: [14-4122 Council Schedule for June 2015](#)
[14-4122 Proposed Council Schedule July 2015 - June 2016](#)

Closed Meeting Continued (if needed)

31 [14-4157](#) Consideration of Convening a Closed Meeting for Consultation with Legal Counsel for Legal Advice Regarding the Investment of Public Funds Where Bargaining is Involved and to Discuss the Performance and Salaries of Public Officers.

Attachments: [14-4157 exec session motion](#)

* * * * *

PUBLIC NOTICE:

The Audit Subcommittee will meet on Monday, June 8, 2015 at 6:00 p.m. in the City Council Work Room at City Hall.

* * * * *

*The Cablecast schedule of Government meetings on Channel 70 can be found here:
<http://apps.alexandriava.gov/Calendar/AltDisplay/VideoList.aspx>*

This docket is subject to change.

* * * * *

Full-text copies of ordinances, resolutions, and agenda items are available in the Office of the City Clerk and Clerk of the Council. Meeting materials are also available on-line at alexandriava.gov/council.

* * * * *

Individuals with disabilities who require assistance or special arrangements to participate in the City Council meeting may call the City Clerk and Clerk of Council's Office at 703-746-4550 (TTY/TDD 838-5056). We request that you provide a 48-hour notice so that the proper arrangements may be made.

City Council meetings are closed-captioned for the hearing impaired.

* * * * *

Attachment 1

Introduction and first reading:
Public hearing:
Second reading and enactment:

INFORMATION ON PROPOSED ORDINANCE

Title

AN ORDINANCE to amend and reordain Chapter 4 (EROSION AND SEDIMENT CONTROL) of Title 5 (TRANSPORTATION AND ENVIRONMENTAL SERVICES), of the Code of the City of Alexandria, Virginia, 1981, as amended.

Summary

In July 2013 the administration of the Virginia Stormwater Management Program and the Erosion and Sediment Control program was transferred from the Virginia Department of Conservation and Recreation (DCR) to the Virginia Department of Environmental Quality (DEQ). This transfer required a renumbering of state law and code. To more closely align the City code with the revised State code, staff is proposing minor editorial revisions to Title 5, Chapter 4 of the Code of Alexandria.

Sponsor

N/A

Staff

Mark Jinks, City Manager
Emily Baker, Acting Deputy City Manager
Yon Lambert, Director, T&ES
William J. Skrabak, Deputy Director, Infrastructure/Environmental Quality, T&ES
Lalit Sharma, Division Chief, Sanitary Sewer/Stormwater Infrastructure, T&ES
Jesse E. Maines, Watershed Management Planner, Sewer/Stormwater Infrastructure, T&ES

Authority

§2.04(c), Alexandria City Charter

Estimated Costs of Implementation

None

Attachments in Addition to Proposed Ordinance and its Attachments (if any)

None

ORDINANCE NO. _____

AN ORDINANCE to amend and reordain Chapter 4 (EROSION AND SEDIMENT CONTROL) of Title 5 (TRANSPORTATION AND ENVIRONMENTAL SERVICES), of the Code of the City of Alexandria, Virginia, 1981, as amended.

THE CITY COUNCIL OF ALEXANDRIA HEREBY ORDAINS:

Section 1. That Chapter 4 of Title 5 of the Code of the City of Alexandria, Virginia, 1981, as amended, be, and the same hereby is, amended and reordained to read as follows:

(New language is underscored; deleted material is ~~stricken~~)

CHAPTER 4 - Erosion and Sediment Control

Sec. 5-4-1 Definitions.

As used in this chapter, and pursuant to 9VAC25-840, the following terms shall have the meanings set forth below, unless the context requires a different meaning:

(a) "Agreement in lieu of a plan" means a contract between the city and the owner which specifies conservation measures which must be implemented in the construction or modification of a single-family residence; this contract may be executed by the Director in lieu of an erosion and sediment control plan.

(b) "Alexandria Water Quality Volume" means the volume equal to the first one-half inch of runoff multiplied by the impervious surface of the land development project. This is separate and in addition to the state stormwater management water quality requirement.

~~(c)~~ (b) "Applicant shall mean any person submitting an erosion and sediment control plan or an agreement in lieu of a plan for approval or requesting the issuance of a permit, when required, authorizing land-disturbing activities to commence.

(d) "Certified inspector" means an employee or agent of the city who (i) holds a certificate of competence from the Soil and Water Conservation Board in the area of project inspection or (ii) is enrolled in the Board's training program for project inspection and successfully completes such program within one year after enrollment.

(e) "Certified plan reviewer" means an employee or agent of a VESCP authority who (i) holds a certificate of competence from the Board in the area of plan review, (ii) is

44 enrolled in the Board's training program for plan review and successfully completes
45 such program within one year after enrollment, or (iii) is licensed as a professional
46 engineer, architect, landscape architect, land surveyor pursuant to Article 1 (§ 54.1-
47 400 et seq.) of Chapter 4 of Title 54.1, or professional soil scientist as defined in §
48 54.1-2200.
49

50 (f) "Certified program administrator" means an employee or agent of a VESCP authority
51 who (i) holds a certificate of competence from the Board in the area of program
52 administration or (ii) is enrolled in the Board's training program for program
53 administration and successfully completes such program within one year after
54 enrollment.
55

56 ~~(d)~~(g) "Director" shall mean ~~the~~ the director of transportation and environmental services,
57 his designee or his duly authorized agent.
58

59 ~~(e)~~(h) "Erosion and sediment control plan," "conservation plan" or "plan," shall mean a
60 document containing material for the conservation of soil and water resources of an
61 unit or group of units of land. It may include appropriate maps, an appropriate soil
62 and water plan, inventory and management information with needed interpretations,
63 and a record of decisions contributing to conservation treatments. The plan shall
64 contain all major conservation decisions to assure that the entire unit or units of land
65 will be so treated to achieve the conservation objectives.
66

67 ~~(e)~~(i) "Erosion impact source area" shall mean an area of land not associated with current
68 land- disturbing activity but subject to persistent erosion resulting in the delivery of
69 sediment onto neighboring properties or into state waters. This definition shall not
70 apply to any lot or parcel of land of 10,000 square feet or less used for residential
71 purposes or to shorelines where the erosion results from wave action or other coastal
72 processes.
73

74 ~~(f)~~(j) "Land-disturbing activity" for the purposes of this chapter shall mean any land
75 change which may result in soil erosion from water or wind and the movement of
76 sediments into state waters or onto lands in the commonwealth, including, but not
77 limited to, clearing, grading, excavating, transporting and filling of land.
78

79 ~~(g)~~(k) "Natural channel design concepts" means the utilization of engineering analysis
80 and fluvial geomorphic processes to create, rehabilitate, restore, or stabilize an open
81 conveyance system for the purpose of creating or recreating a stream that conveys its
82 bankfull storm event within its banks and allows larger flows to access its bankfull
83 bench and its floodplain.
84

~~(h)~~(l) "Owner" shall mean the owner or owners of the freehold of the premises or of a lesser estate therein, a mortgagee or vendee in possession, an assignee of rents, a receiver, an executor, a trustee, a lessee or another person, firm or corporation in control of a property.

~~(i)~~(m) "Peak flow rate" means the maximum instantaneous flow from a given storm condition at a particular location.

~~(j)~~(n) "Permittee" shall mean the person to whom the permit authorizing land-disturbing activities is issued or the person who certifies that the approved erosion and sediment control plan will be followed.

~~(k)~~(o) "Person" for the purposes of this chapter shall mean any individual, partnership, firm, association, joint venture, public or private corporation, trust, estate, commission, board, public or private institution, utility, cooperative, county, city, town, or other political subdivision of the commonwealth, interstate body, or other legal entity.

~~(l)~~(p) "Plan-approving authority" shall mean the department of transportation and environmental services which shall be responsible for determining the adequacy of a plan submitted for land-disturbing activities on ~~an~~ unit or group of units of lands and for approving plans.

~~(m)~~(q) "Runoff volume" means the volume of water that runs off the land development project from a prescribed storm event.

~~(n)~~(r) "State waters" shall mean all waters on the surface and or wholly or partially underground that is within or bordering the commonwealth or that is within the jurisdiction of the commonwealth.

~~(o)~~ "Water Quality Volume" means the volume equal to the first one half inch of runoff multiplied by the impervious surface of the land development project.

(Intervening sections are unchanged.)

Sec. 5-4-3.1 Same—erosion impact source area.

Notwithstanding any contrary provision of this chapter, it shall be unlawful for any property owner to fail, neglect or refuse to implement an erosion and sediment control conservation plan, approved by the director, and within such reasonable time as the director shall specify, for any land designated by the director as an erosion impact source area.

130
131 Sec. 5-4-3.2 Wetlands mitigation banks.
132

133 In accordance with the procedure set forth by § 62.1-44.15-51 ~~10.1-563~~(E) of the Code of
134 Virginia which is herein incorporated, any person engaging in the creation and operation
135 of wetland mitigation banks in multiple jurisdictions, which have been approved and are
136 operated in accordance with applicable federal and state guidance, laws, or regulations
137 for the establishment, use, and operation of mitigation banks, pursuant to a permit issued
138 by the Department of Environmental Quality, the Marine Resources Commission, or the
139 U.S. Army Corps of Engineers, may, at the option of that person, file general erosion and
140 sediment control specification for wetland mitigation banks annually with the Virginia
141 Soil and Water Conservation Board (Board) for review and approval consistent with
142 guidelines established by the Board.
143

144 (Intervening section is unchanged.)
145

146 Sec. 5-4-5 Exceptions.
147

148 The provisions of this chapter shall not apply to any construction, reconstruction, repair
149 or alteration of any building or structure when no land is disturbed and no trees, shrubs,
150 grass or vegetation is destroyed or removed, nor to any of the following:
151

152 (Intervening sections are unchanged.)
153

- 154 (1) Shore erosion control projects on tidal waters when the projects are approved by local
155 wetlands boards, the Marine Resources Commission and/or the U.S. Army Corps of
156 Engineers and located on tidal waters and within nonvegetated or vegetated wetlands
157 as defined in Title 28.2 of the Code of Virginia. However, any associated land that is
158 disturbed outside of this exempted area shall remain subject to the article and the
159 regulations adopted pursuant thereto.
160

161 (Intervening sections are unchanged.)
162
163

164 Sec. 5-4-6 Permits not to be issued without approved erosion and sedimentation control plan
165 when plan required by chapter.
166

- 167 (a) No permit shall be issued to construct, erect, or alter any building or structure on any
168 land within the city until a plan has been submitted and approved in accordance with
169 the provisions of this chapter and the applicant has certified in writing that the plan
170 will be followed. The person responsible for carrying out the plan shall provide the
171 name of an individual holding a certificate of competence to the program authority, as
172 provided by § 62.1-44.15:52 ~~10.1-561~~, who will be in charge of and responsible for
173 carrying out the land disturbing activity. However, any plan-approving authority may
174 waive the certificate of competence requirement for an agreement in lieu of a plan for
175 construction of a single family residence. If a violation occurs during the land-

disturbing activity, then the person responsible for carrying out the agreement in lieu of a plan shall correct the violation and provide the name of an individual holding a certificate of competence, as provided by § 62.1-44.15:52 ~~40.1-564~~. Failure to provide the name of an individual holding a certificate of competence prior to engaging in land-disturbing activities may result in revocation of the approval of the plan and the person responsible for carrying out the plan shall be subject to the penalties provided in this article.

(Subsequent section is unchanged.)

Sec. 5-4-7 Minimum criteria; city handbook.

- a) The director shall administer and enforce the provisions of this chapter.
- b) This chapter, the erosion and sediment control regulations of the Department of Environmental Quality Conservation and Recreation Division of Soil and Water Conservation (VR 625-02-00) effective March 22, 1995, [9 VAC 25-8404 VAC 50-30-10 et seq.], and the "Virginia Erosion and Sediment Control Handbook, Third Edition, 1992, which are incorporated herein by reference, shall be an integral part of the city's erosion and sediment control program and shall comprise the city's "Erosion and Sediment Control Handbook." The text of these regulations is on file in the office of the director.
- c) In addition to the minimum requirements for controlling erosion and sedimentation for land-disturbing activities which are contained in ~~VR 625-02-00 '4 [4 VAC 50-30-409 VAC25-840~~, the following additional minimum requirements shall apply:

(Subsequent sections are unchanged.)

(4) The following additional stormwater management criteria shall apply:

A stormwater management plan consistent with the requirements of Section 13-109(F) in Article XIII of the Alexandria Zoning Ordinance (the Environmental Management Ordinance and the Virginia Stormwater Management Program (VSMP) regulations shall apply. For plans approved on and after July 1, 2014, the flow rate capacity and velocity requirements of this section shall be satisfied by compliance with water quantity requirements in the Stormwater Management Act (§ 62.1-44.15:24 et seq.) and attendant regulations, unless such land-disturbing activities are in accordance with the grandfathering provisions of the VSMP regulations.

- a. ~~A stormwater management plan shall be developed so that, from the site, the postdevelopment peak runoff rate from a two-year and a 10-year storm, considered individually, shall not exceed their respective predevelopment rates. The predevelopment and postdevelopment peak runoff rates must be verified by engineering calculations. Within the Four Mile Run Watershed, postdevelopment peak runoff during a 100-year frequency storm shall not increase the peak runoff of the Four Mile Run Flood Control Channel as required by the city's contract with the United States Army Corp of Engineers.~~
- b. ~~b. 1. Concentrated stormwater runoff leaving a development site must be discharged directly into an adequate channel. If there is no adequate channel one must be constructed to convey stormwater to the nearest adequate channel. Newly constructed channels and conduits carrying a flow of 1,000 or more cubic feet per second shall be designed for a 100-year storm frequency and newly constructed channels and conduits carrying a flow of less than 1,000 cubic feet per second shall be designed for a 10-year storm frequency.~~
- e. ~~2.~~
- d. ~~An "adequate channel" shall be defined as a natural or man-made channel or pipe which is capable of conveying the runoff from a two-year storm or a 10-year storm, considered individually, without overtopping its banks or eroding after development of the site in question. A receiving channel may also be considered adequate at any point where the total contributing drainage area is at least 100 times greater than the drainage area of the development site in question or, where it can be shown that the peak rate of runoff from the site for a two-year and a 10-year storm, considered individually, will not be increased after development.~~
- e. ~~3.~~
- f. ~~In accordance with, § 10.1-561 of the Code of Virginia, stream restoration and relocation projects that incorporate natural channel design concepts are not man-made channels and shall be exempt from any flow rate capacity and velocity requirements for natural or man-made channels.~~
- g. ~~4.~~
- h. ~~In accordance with § 10.1-561 of the Code of Virginia, any land-disturbing activity that provides for stormwater management intended to address any flow rate capacity and velocity requirements for natural or manmade channels shall satisfy the flow rate capacity and velocity requirements for natural or manmade channels if the practices are designed to (i) detain the water quality volume and to release it over 48 hours; (ii) detain and release over a 24-hour period the expected rainfall resulting from the one-year, 24-hour storm; and (iii) reduce the allowable peak flow rate resulting from the 1.5, 2, and 10-year, 24-hour storms to a level that is less than or equal~~

261 to the peak flow rate from the site assuming it was a good forested
262 condition, achieved through multiplication of the forested peak flow rate
263 by a reduction factor that is equal to the runoff volume from the site when
264 it was in a good forested condition divided by the runoff volume from the
265 site in its proposed condition, and shall be exempt from any flow rate
266 capacity and velocity requirements for natural or manmade channels.

267
268 (Subsequent sections are unchanged.)
269

- 270 (5) Runoff rate and channel adequacy must be verified with engineering
271 calculations to the satisfaction of the director.
272
- 273 (6) All channel improvements or modifications must comply with all applicable
274 laws and regulations.
275
- 276 (7) If the applicant chooses an option which includes stormwater detention, the
277 applicant must provide the city with a plan for maintenance of the detention
278 facilities. The plan shall set forth the maintenance requirements of the facility
279 and the party responsible for performing the maintenance. The responsible
280 party may be an individual, organization or the city, whichever has consented
281 to carry out the maintenance. If the designated maintenance responsibility is
282 with an individual or organization other than the city, a maintenance
283 agreement should be executed between the responsible party and the city.
284
- 285 ~~(e) The owner or developer may continue to discharge stormwater that has not~~
286 ~~been concentrated (sheet flow) onto lower lying property if:~~
287 ~~1. the peak flow rate for a 10-year frequency storm after development does~~
288 ~~not exceed the predevelopment peak flow rate;~~
289 ~~2. the increase in total volumes of runoff caused by the development will~~
290 ~~not have an adverse impact on the lower lying property; and~~
291 ~~3. there will be no exacerbation of existing drainage problems on the lower~~
292 ~~lying or other downhill property.~~
293
- 294 ~~(5)(8) Stabilization of waterways and outlets. All on-site stormwater conveyance~~
295 ~~channels shall be designed and constructed to withstand the expected velocity~~
296 ~~of flow from a 10-year frequency storm without erosion. Stabilization~~
297 ~~adequate to prevent erosion must also be provided at the outlets of all pipes~~
298 ~~and paved channels. Energy dissipators shall be installed as required by the~~
299 ~~director.~~
300
- 301 ~~(6)(9) Working in or crossing watercourses. Construction vehicles should be kept~~
302 ~~out of watercourses to the extent possible. Where in-channel work is~~
303 ~~necessary, precautions must be taken to stabilize the work area during~~

construction to minimize erosion. The channel (including bed and banks) must always be re-stabilized immediately after in-channel work is completed.

~~(7)~~(10) Underground utility lines shall be installed in accordance with the following standard in addition to other applicable criteria: no more than 100 feet of trench are to be opened at one time.

~~(8)~~(11) Maintenance. All temporary and permanent erosion and sediment control practices must be maintained and repaired as specified in ~~VR 625-02-00 § 69VAC25-840-60.4 VAC 50-30-60~~.

~~(9)~~(12) Submission of an Erosion and Sediment Control Plan to the city is a grant of unlimited right of entry to the property to officials or agents of the city for the purposes of determining adequacy of the proposed plan and inspection of land-disturbing activities for compliance with the approved plan.

(d) The "Virginia Erosion and Sediment Control Handbook, Third Edition, 1992" and the tree planting and preservation regulations authorized by § 11-410(CC)(1) of the Zoning Ordinance of the City of Alexandria, and known as the city's Landscape Guidelines, shall be used by any applicant making a submittal under this chapter and by the director in his or her review and consideration of the adequacy of landscaping elements included in any erosion and sediment control plan submitted.

Sec. 5-4-8 Erosion and sediment control plans.

- a) Applications for approved erosion and sediment control plans shall be submitted to and filed with the director as part of the plan of development pursuant to the requirements in Article XIII of the Alexandria Zoning Ordinance, on forms prepared by the city, prior to the time any work subject to this chapter is begun on land. Fees for reviewing erosion and sediment control plans, ~~grading~~plot plans and performing field inspections for all new structures, exterior alteration, plumbing, electrical, or mechanical building permits where more than 2,500 square feet are disturbed shall be required, the fee to be determined by the ~~D~~director of Transportation and Environmental Services. Five copies of an erosion and sediment control plan or ~~grading~~plot plan must accompany any application, parts of which shall also be on forms prepared by the city. Upon receipt of an application and plans, the director shall consider the plan in light of the provisions of this chapter, and Virginia Erosion and Sediment Control Law and attendant regulations, and promptly approve the plan, disapprove the plan or approve the plan with modifications, noting thereon any changes that will be required. The director shall promptly notify the applicant of his or her decision on a plan. Any approved plan shall be issued, dated, and bear the manual signature of the director ~~of the department of transportation and environmental services or his or her deputy~~ or appropriate designee prior to the commencement of land-disturbing activities.

350 (Subsequent sections are unchanged.)

351

352

353 Section 2. That this ordinance shall become effective upon the date and at the time of its

354 final passage.

355

356

WILLIAM D. EUILLE

357

Mayor

358

359 Introduction:

360 First Reading:

361 Publication:

362 Public Hearing:

363 Second Reading:

364 Final Passage:

365



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

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www.deq.virginia.gov

Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

December 22, 2014

(804) 698-4000
1-800-592-5482

Rashad M. Young, City Manager
City of Alexandria
301 King Street, Room 3500
Alexandria, Virginia 22314

Dear Mr. Young:

In accordance with §62.1-44.15:27 G of the Virginia Stormwater Management Act (Act), Department of Environmental Quality (DEQ) has completed the review of the City of Alexandria's final Virginia Stormwater Management Program (VSMP) application package submitted on November 4, 2014. Based on this review, DEQ has determined that the City of Alexandria's VSMP is consistent with the Act, the VSMP regulation and the General VPDES Permit for Discharges of Stormwater from Construction Activities.

In light of this determination, DEQ approves the City of Alexandria's VSMP and the City is authorized to operate a VSMP as of July 1, 2014. Please note that this approval is based on the content of the application package. Any changes made to the documents in the package after the approval date, including changes to the adopted ordinance, may necessitate DEQ evaluation as part of its compliance review of your approved VSMP.

Thank you for your cooperation in developing a VSMP. We look forward to continuing to assist the City with the implementation of its VSMP.

Sincerely,

A handwritten signature in black ink, appearing to read "David K. Paylor", written over a horizontal line.

David K. Paylor

cc: Melanie Davenport, Director, Water Division
Frederick Cunningham, Director, Office of Water Permits
Joan Salvati, Manager, Local Government Stormwater Programs

ARTICLE XIII. - ENVIRONMENTAL MANAGEMENT

Sec. 13-100. - General findings.

The Chesapeake Bay is one of the most productive estuaries in the world, providing substantial economic and social benefits to the people of the Commonwealth of Virginia. Healthy state and local economies are integrally related to and dependent upon the health of the Chesapeake Bay. The general welfare of the people of the Commonwealth depends upon the health of the Bay.

The waters of the Chesapeake Bay and its tributaries, including the Potomac River and Alexandria's local streams, have been degraded significantly by point source and nonpoint source pollution, which threatens public health and safety and the general welfare.

13-101 - Purpose.

- (A) It is the policy of the City of Alexandria, Virginia to protect the quality of water in the Chesapeake Bay and its tributaries and, to that end, to require all land uses and land development in the city to:
 - (1) Safeguard the waters of the commonwealth from pollution;
 - (2) Prevent any increase in pollution of state waters;
 - (3) Reduce existing pollution of state waters; and
 - (4) Promote water resource conservation.
- (B) To fulfill this policy, this Article XIII is adopted to minimize potential pollution from stormwater runoff, minimize potential erosion and sedimentation, reduce the introduction of harmful nutrients and toxins into state waters, maximize rainwater infiltration while protecting groundwater, and ensure the long-term performance of the measures employed to accomplish the statutory purpose.
- (C) The provisions of this chapter shall be deemed severable, and the invalidity or unenforceability of any individual provision or section hereof shall not affect the validity and enforceability of the remaining provisions of the chapter.

13-102 - Authority.

This Article XIII is issued under the authority of Section 62.1-44.15:73 of the Code of Virginia (the Chesapeake Bay Preservation Act), 62.1-44.15:24 et seq. of the Code of Virginia (the Virginia Stormwater Management Act) and attendant regulations as adopted by the Virginia State Water Control Board. Code of Virginia Section 62.1-44.15:27 specifically requires the City to adopt a Virginia Stormwater Management Program. Authority to protect water quality is also provided by Section 15.2-2283 of the Code of Virginia.

13-103 - Definitions.

The following words and terms used in this Article XIII have the following meanings, unless the context clearly indicates otherwise.

- (A) *Administrator*. The person responsible for the administration of this Article XIII, which in the city shall be the director of T&ES or his/her designee.
- (B) *Alexandria water quality volume default*. The volume equal to the first 0.5 inch of runoff multiplied by the total impervious area of the site as defined herein.
- (C) *Applicant*. A person who has submitted, or plans to submit, a plan of development or an exception request to the city or a person seeking approval from the city for any activity that is regulated under this article.
- (D) *Best management practice (BMP)*. Schedules of activities, prohibitions of practices, maintenance procedures, and other management practices, including both structural and nonstructural practices, to prevent or reduce the pollution of surface water and groundwater systems from the impacts of land-disturbing activities.
- (E) *Buffer area*. An area of natural or established vegetation managed to protect other components of a resource protection area and state waters from significant degradation due to land disturbances. To effectively perform this function, the buffer area will achieve a 75 percent reduction of sediments and a 40 percent reduction of nutrients. A 100-foot wide buffer area shall be considered to meet this standard.

- (F) *Chesapeake Bay Preservation Act land-disturbing activity*. A land-disturbing activity including clearing, grading, or excavating in a land disturbance equal or greater than 2,500 square feet and less than one acre in all areas of the city designated as regulations adopted pursuant to the Chesapeake Bay Preservation Act, Code of Virginia, § 62.1-44.15:67 et seq.
- (G) *Clean Water Act* or *CWA* means the federal Clean Water Act (33 U.S.C § 1251 et seq.), formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972, Public Law 92-500, as amended by Public Law 95-217, Public Law 95-576, Public Law 96-483, and Public Law 97-117, or any subsequent revisions thereto.
- (H) *Common plan of development or sale*. A contiguous area where separate and distinct construction activities may be taking place at different times on different schedules.
- (I) *Control measure*. Any best management practice or stormwater management facility, or other method used to minimize the discharge of pollutants to state waters.
- (J) *Department (DEQ)*. The Virginia Department of Environmental Quality.
- (K) *Development*. Land disturbance and the resulting landform associated with the construction or substantial alteration of residential, commercial, industrial, institutional, recreational, transportation, or utility facilities or structures or the clearing of land for non-agricultural or non-silvicultural purposes.
- (L) *Director of T&ES/Director of P&Z*. Director of T&ES means the director of transportation and environmental services of the City of Alexandria. Director of P&Z means the director of planning and zoning of the City of Alexandria.
- (M) *Floodway*. All lands as defined in subsection 6-303(K) of this ordinance.
- (N) *General permit*. The state permit titled General Virginia Pollutant Discharge Elimination System (VPDES) Permit for Discharges of Stormwater from Construction Activities found in 9VAC25-880 et seq.) of the Virginia Stormwater Management Regulations authorizing a category of discharges under the federal Clean Water Act and the Virginia Stormwater Management Act within a geographical area of the Commonwealth of Virginia.
- (O) *Highly erodible soils*. Soils (excluding vegetation) with an erodibility index (EI) from sheet and rill erosion equal to or greater than eight. The erodibility index for any soil is defined as the product of the formula $RKLS/T$, where K is the soil susceptibility to water erosion in the surface layer; R is the rainfall and runoff; LS is the combined effects of slope length and steepness; and T is the soil loss tolerance.
- (P) *Highly permeable soils*. Soils with a given potential to transmit water through the soil profile. Highly permeable soils are identified as any soil having a permeability equal to or greater than six inches of water movement per hour in any part of the soil profile to a depth of 72 inches (permeability groups "rapid" and "very rapid"), as found in the "National Soil Survey Handbook" of November 1996 in the "Field Office Technical Guide" of the U.S. Dept. of Agriculture Natural Resources Conservation Service.
- (Q) *Impervious cover*. A surface composed of any material that significantly impedes or prevents natural infiltration of water into the soil. Impervious surfaces include, but are not limited to: roofs, buildings, streets, parking areas, and any concrete, asphalt, or compacted gravel surface.
- (R) *Intermittent stream*. Any natural or engineered channel (measured from top of bank) with flowing water during certain times of the year, when groundwater provides for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow. Acceptable methodologies for establishing the presence of an intermittent stream will be provided by the director of T&ES pursuant to subsection 13-104(C).
- (S) *Isolated wetlands of minimal ecological value*. Those wetlands, as defined in 9VAC25-210-10, that:
 - (i) Do not have a surface water connection to other state waters;
 - (ii) Are less than one-tenth of an acre in size;
 - (iii) Are not located in a Federal Emergency Management Agency designated 100-year floodplain;
 - (iv) Are not identified by the Virginia Natural Heritage Program as a rare or state significant natural community;
 - (v) Are not forested; and
 - (vi) Do not contain listed federal or state threatened or endangered species.

- (T) *Land disturbance or land-disturbing activity*. A manmade change to the land surface that potentially changes its runoff characteristics including clearing, grading, filling, or excavation.
- (U) *Layout*. A conceptual drawing sufficient to provide for the specified stormwater management facilities required at the time of approval.
- (V) *Minor modification*. An amendment to an existing general permit before its expiration not requiring extensive review and evaluation including, but not limited to, changes in EPA promulgated test protocols, increasing monitoring frequency requirements, changes in sampling locations, and changes to compliance dates within the overall compliance schedules. A minor general permit modification or amendment does not substantially alter general permit conditions, substantially increase or decrease the amount of surface water impacts, increase the size of the operation, or reduce the capacity of the facility to protect human health or the environment.
- (W) *Natural channel*. A nontidal waterway that is part of the natural topography and is generally characterized as being irregular in cross section with a meandering course.
- (X) *Nonpoint source pollution*. Contamination from diffuse sources that is not regulated as point source pollution under Section 402 of the Clean Water Act.
- (Y) *Nontidal wetlands*. Those wetlands, other than tidal wetlands, that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, as defined by the U.S. Environmental Protection Agency pursuant to Section 404 of the Federal Clean Water Act, in 33 CFR 328.3b.
- (Z) *Operator*. The owner or operator of any facility or activity subject to regulation under this Article XIII.
- (AA) *Permittee*. The person to whom a state permit is issued, including any owner or operator whose construction site is covered under a state construction general permit.
- (BB) *Person*. Any individual, corporation, partnership, association, municipality, commission, or political subdivision, of a state, governmental body, including federal, state, or local entity as applicable, any interstate body or any other legal entity.
- (CC) *Pre-development*. The land use that exists at the time that plans for the development are submitted to the city. Where phased development or plan approval occurs (preliminary grading, roads and utilities, etc.), the land use at the time the first item is submitted shall establish pre-development conditions.
- (DD) *Post-development*. Conditions that reasonably may be expected or anticipated to exist after completion of the development activity on a specific site or tract of land.
- (EE) *Public road*. For the purpose of this Article XIII, public road means a publicly owned road designed and constructed in accordance with water quality protection criteria at least as stringent as requirements applicable to the Virginia Department of Transportation, including regulations promulgated pursuant to (i) the Erosion and Sediment Control Law (Section 64.1-44.15:51 et seq. of the Code of Virginia) and (ii) the Virginia Stormwater Management Act (Section 64.1-44.15:24 et seq. of the Code of Virginia). This definition includes those roads where the Virginia Department of Transportation exercises direct supervision over the design or construction activities, or both, and cases where roads are constructed or maintained, or both, by the City of Alexandria.
- (FF) *Redevelopment*. The process of developing land that is or has been previously developed.
- (GG) *Regulations*. The Virginia Stormwater Management Program (VSMP) Permit Regulations, 9VAC-25-870, as amended.
- (HH) *Restored stormwater conveyance system*. A stormwater conveyance system that has been designed and constructed using natural channel design concepts. Restored stormwater conveyance systems include the main channel and the flood-prone area adjacent to the main channel.
- (II) *Resource management area (RMA)*. A Chesapeake Bay Preservation Area overlay designation as further defined in section 13-105(C).
- (JJ) *Resource protection area (RPA)*. A Chesapeake Bay Preservation Area overlay designation as further defined in section 13-105(B).
- (KK) *Shoreline*. Land contiguous to a body of water.
- (LL) *Site*. The land or water area where any facility or land-disturbing activity is physically located or conducted, including

adjacent land used or preserved in connection with the facility or land-disturbing activity. Areas channelward of mean low water in tidal Virginia shall not be considered part of a site. The following shall be used for determining water quality and water quantity requirements in sections 13-109(E) and (F): For projects disturbing less than 50 percent of the tax parcel, (or if multiple parcels are involved, the land subject to the application), the disturbed area shall constitute the site; for projects disturbing greater than or equal to 50 percent of the tax parcel (or if multiple parcels are involved, the land subject to the application), the entire tax parcel shall constitute the site.

- (MM) *State* . The Commonwealth of Virginia.
- (NN) *State permit* . An approval to conduct a land-disturbing activity issued by the Virginia State Water Control Board in the form of a state stormwater individual permit or coverage issued under a state general permit or an approval issued by the Virginia State Water Control Board for stormwater discharges from an MS4. Under these state permits, the state imposes and enforces requirements pursuant to the federal Clean Water Act, the Virginia Stormwater Management Act, and their attendant regulations.
- (OO) *State Water Control Law* . Chapter 3.1 (62.1-44.2 et seq.) of Title 62.1 of the Code of Virginia.
- (PP) *State waters*. All waters on the surface or in the ground, wholly or partially within or bordering the commonwealth or within its jurisdiction, including wetlands.
- (QQ) *Stormwater* . Precipitation that is discharged across the land surface or through conveyances to one or more waterways and that may include stormwater runoff, snow melt runoff, and surface runoff and drainage.
- (RR) *Stormwater management facility*. A device that controls stormwater runoff and changes the characteristics of that runoff including, but not limited to, the quantity and quality, the period of release or the velocity of flow.
- (SS) *Stormwater management plan* . A document or documents containing material describing methods for complying with the requirements of section 13-114 of this article.
- (TT) *Stormwater pollution prevention plan (SWPPP)* . A document that is prepared in accordance with section 13-113 of this article and good engineering practices and that identifies potential sources of pollutants that may reasonably be expected to affect the quality of stormwater discharges from the construction site, and otherwise meet the requirements of this article. In addition the document shall identify and require the implementation of control measures, and shall include, but not be limited to the inclusion of, or the incorporation by reference of, an approved erosion and sediment control plan, and a pollution prevention plan.
- (UU) *Subdivision*. Means the same as defined in section 2-197.2 of the Alexandria Zoning Ordinance.
- (VV) *Substantial alteration*. Expansion or modification of a building or development that would result in land disturbance exceeding an area of 2,500 square feet in the resource management area only.
- (WW) *Tidal shore*. Land contiguous to a tidal body of water between the mean low water level and the mean high water level.
- (XX) *Tidal wetlands*. Vegetated and nonvegetated wetlands as defined in Section 28.2-1300 of the Code of Virginia.
- (YY) *Top of Bank*. To the extent applicable, top of bank shall be determined on prevailing professional standards and the best professional judgment of the director.
- (ZZ) *Total maximum daily load (TMDL)* . The sum of the individual wasteload allocations for point sources, load allocations for nonpoint sources, natural background loading, and a margin of safety. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure. The TMDL process provides for point versus nonpoint source trade-offs.
- (AAA) *Use*. Any activity on the land other than development, including, but not limited to agriculture, horticulture, and silviculture.
- (BBB) *Virginia Stormwater Management Act* . Article 2.3 (§ 62.1-44.15:24 et seq.) of Chapter 3.1 of Title 62.1 of the Code of Virginia.
- (CCC) *Virginia Stormwater BMP Clearinghouse website* . A website that contains detailed design standards and specifications for control measures that may be used in Virginia to comply with the requirements of the Virginia Stormwater Management Act and regulations.
- (DDD) *Virginia Stormwater Management Program (VSMP)* . A program approved by the Virginia State Water Control Board that has been established by a locality to manage the quality and quantity of runoff resulting from land-disturbing

activities and shall include such items as local ordinances, rules, permits, requirements, annual standards and specifications, policies and guidelines, technical materials, and requirements for plan review, inspection and enforcement, where authorized in this article, and evaluation consistent with the requirements of this article and associated regulations.

- (EEE) *VSMP authority*. An authority approved by the Virginia State Water Control Board to operate a VSMP. For the purposes of this article, the city is the VSMP authority.
- (FFF) *VSMP authority permit*. An approval to conduct a land-disturbing activity issued by the city for the initiation of a land-disturbing activity after evidence of general permit coverage has been provided where applicable. In the City of Alexandria a VSMP authority permit is not a separate permit. Rather, the issuance of a building, land use, or other land development permit is contingent on a proposed land-disturbing activity meeting all VSMP authority permit requirements in 9VAC-25-870 and the requirements of this article.
- (GGG) *Water body with perennial flow*. A body of water that flows in a natural or engineered channel year-round during a year of normal precipitation. This includes, but is not limited to streams, estuaries, and tidal embayments and may include drainage ditches or channels constructed in wetlands or from former natural drainage ways that convey perennial flow. Lakes and ponds, through which a perennial stream flows, are a part of the perennial stream. Generally, the water table is located above the streambed for most of the year and groundwater is the primary source for stream flow. The width of the perennial stream extends from top-of-bank to top-of-bank of the channel or to the limits of the normal water level for a pond or lake when there is no definable top-of-bank. Acceptable methodologies for establishing the presence of a water body with perennial flow will be provided by the director of T&ES pursuant to subsection 13-104(C).
- (HHH) *Water-dependent facility*. A development of land that cannot exist outside of the resource protection area and must be located on the shoreline by reason of the intrinsic nature of its operation. These facilities include, but are not limited to:
 - (i) Ports;
 - (ii) The intake and outfall structures of power plants, water treatment plants, sewage treatment plants, and storm sewers;
 - (iii) Marinas and other boat docking facilities;
 - (iv) Beaches and other public water-oriented recreation areas; and
 - (v) Fisheries or other marine resources facilities.
- (III) *Watershed*. The total drainage area contributing runoff to a single point.
- (JJJ) *Wetlands*. Tidal and nontidal wetlands.

13-104 - Administration.

- (A) *Responsibility for administration*. The director of T&ES, or his/her designee, is charged with responsibility for the administration of this Article XIII.
- (B) *Duties and authority*. In the administration of this Article XIII the duties and authority of the director of T&ES shall include, without limitation:
 - (1) Receiving applications for plan of development approval;
 - (2) Reviewing applications to determine if they contain all information required and necessary for a determination of their merit;
 - (3) Reviewing applications to determine their compliance with the provisions and intent of this Article XIII and their merit;
 - (4) Docketing items for hearing before the planning commission and conferring with the city manager to schedule public hearings before the city council as necessary on applications;
 - (5) Preparing a staff report for each application;
 - (6) Interpreting the provisions of this Article XIII to ensure that its intent is carried out.

- (C) *Rules, regulations, and procedures.* The director of T&ES shall promulgate rules, regulations, and procedures for the adm enforcement of this Article XIII and shall promulgate rules, regulations, and procedures for the processing of applications review, comment, and recommendations on each application by the department of transportation and environmental sei manager shall promulgate rules and procedures for review by other departments of applications, where such review is de necessary or desirable and such procedures may include the establishment of a development review committee compos departments of the city whose expertise is necessary or desirable in the review of applications. All such rules, regulations shall be transmitted to the city council at the time of issuance.
- (D) *Establishment of fees.* The director of T&ES shall by general rule approved by city council establish a schedule of fees required for each application under this Article XIII to be paid at the time an application is submitted The schedule of fees shall include those authorized by 9VAC25-870-700 et seq. The schedule of fees is set per approved council docket.
- (E) *Responsibility for enforcement.* The director of T&ES shall have the authority and the responsibility of section 11-200 and section 13-126 to ensure that all buildings and structures and the use of all land complies with the provisions of this Article XIII.
- (F) The director of T&ES shall review, approve, disapprove, or approve with modifications or conditions or both the following elements of the plan of development:
 - (1) The environmental site assessment, required pursuant to section 13-112.
 - (2) The stormwater management plan, required pursuant to section 13-114 and approved in accordance with section 13-115.
 - (3) The erosion and sediment control plan required pursuant to section 5-4-1.
 - (4) The water quality impact assessment, if required, pursuant to section 13-117.
 - (5) Compliance of the plan of development with section 13-106 through section 13-110.
- (G) The director of T&ES shall have the authority and the responsibility to enforce the requirement that a permittee must develop, implement, and keep at the site for inspection a stormwater pollution prevention plan that meets the requirements set forth in section 13-113 and a pollution prevention plan that meets the requirements set forth in section 13-116.
- (H) Review and decision on applications for exceptions shall be as provided in section 13-119.
- (I) Review and decision on applications for modifications to noncomplying land uses and structures shall be as provided in section 13-122.
- (J) Review and decision on applications for exemptions shall be as provided in section 13-123.
- (K) Review and decision on the remaining elements of the plan of development shall be as provided in the regulations of this ordinance and the City Code applicable to each such element.

13-105 - Designation of Chesapeake Bay Preservation Area Overlay District.

- (A) All land within the corporate limits of the city is designated as a Chesapeake Bay Preservation Area (CBPA). The CBPA is divided into resource protection areas and resource management areas. The regulations set forth in this Article XIII shall apply as an overlay district, and shall supersede any zoning, land use, or land development regulation of the City Code that is inconsistent with the provisions of this Article XIII.
- (B) Resource protection areas (RPAs) consist of sensitive land that has either an intrinsic water quality value due to the ecological and biological processes such land performs or that is sensitive to uses or activities such that the use results in significant degradation to the quality of state waters. In their natural condition, these lands provide for the removal, reduction, or assimilation of nonpoint source pollution entering the bay and its tributaries. An area of land that includes any one of the following land types shall be considered to be within the RPA:
 - (1) Tidal wetlands;
 - (2) Tidal shores;
 - (3) Nontidal wetlands connected by surface flow and contiguous to tidal wetlands or water bodies with perennial flow;
 - (4) A buffer area of 100 feet (measured from top of bank) located adjacent to and landward of the components listed

in subsections (1) through (3) above and along both sides of any water body with perennial flow. The full buffer area shall be designated as the landward component of the RPA notwithstanding the presence of permitted uses, encroachments, and vegetation clearing in compliance with this Article XIII.

- (C) Resource management areas (RMAs) include land that, if improperly used or developed, has a potential for causing significant water quality degradation or for diminishing the functional value of the RPA. Therefore, all lands in the city, not included in the RPA, shall constitute the RMA since all such land drains through natural or manmade conveyances to the Potomac River and Chesapeake Bay.

13-106 - Establishment of CBPA boundaries.

- (A) Chesapeake Bay Preservation Area boundaries are established by text, as provided in section 13-105. The city shall publish and update in a manner established by the director of T&ES pursuant to section 13-104(C) a general map depicting the location of identified CBPA features. However, in all cases it is the burden of the applicant to identify CBPA features and to delineate the appropriate RPA boundaries in accordance with the development review process required pursuant to section 13-111, or if no development review process is required, then through the environmental site assessment pursuant to section 13-112.
- (B) Any property owner wishing to change the depiction of an RPA feature on the general map may conduct an environmental site assessment in section 13-112 and submit it to the director of T&ES. The director of T&ES may accept, modify, or reject the RPA delineation based on the evidence presented by the property owner and in consideration of all other available information.
- (C) In the event that a site-specific RPA boundary delineation is contested by an applicant or property owner, the applicant or property owner may request a meeting with the director of T&ES to review the decision. Requests for the meeting shall be made no more than 30 calendar days after notification of a modification or rejection of a proposed RPA delineation. The director of T&ES will preside over the meeting of the involved parties and reconsider the decision. The meeting participants will be notified by the director of T&ES within 30 calendar days after the meeting of the result of the reconsideration.

13-107 - Development, redevelopment, and uses permitted in RPAs.

The following criteria shall apply in RPAs unless the development, redevelopment, use, or land-disturbing activity is exempted under section 13-123 or granted an exception pursuant to section 13-119. All development, redevelopment, and uses within the RPA must comply with the performance criteria provided in section 13-109.

- (A) The following are permitted within the RPA provided they do not require development, redevelopment, structures, grading, fill, draining, or dredging:
- (1) Conservation or preservation of soil, water, vegetation, fish, shellfish, and other wildlife;
 - (2) Passive recreational activities, including but not limited to fishing, bird watching, hiking, boating, horseback riding, swimming, and canoeing; and
 - (3) Educational activities and scientific research.
- (B) The following are permitted within the RPA if approved by the director of T&ES. A water quality impact assessment may be required by the director of T&ES in accordance with section 13-117 if the project is located within an environmentally sensitive area, or is of sufficient scale to affect water quality.
- (1) Repair and maintenance of existing piers, walkways, observation decks, wildlife management shelters, boathouses, and other similar water-related structures provided that there is no increase in structure footprint and that any required excavating and filling results in a land-disturbing activity of 2,500 square feet or less;
 - (2) Boardwalks, trails, and pathways;
 - (3) Historic preservation and archeological activities; and
 - (4) Repair and maintenance of existing flood control and stormwater management facilities.
- (C) The following, if permitted in the underlying zone, are allowed within the RPA if approved by the director of T&ES and provided that a water quality impact assessment is performed and accepted by the director of T&ES as complete in

accordance with section 13-117.

- (1) A new or expanded water-dependent facility may be allowed provided that the following criteria are met:
 - (a) It does not conflict with the city master plan;
 - (b) Any non-water-dependent component is located outside of the RPA; and
 - (c) Access to the water-dependent facility is provided with the minimum disturbance necessary, and where practical, a single point of access is provided.
 - (2) Redevelopment may be allowed provided that the following criteria are met:
 - (a) There is no increase in impervious surface cover;
 - (b) There is no further encroachment within the RPA; and
 - (c) The proposed redevelopment is consistent with the city master plan.
 - (3) Public flood control and stormwater management facilities that drain or treat water from multiple development projects or from a significant portion of a watershed, may be allowed provided that:
 - (a) The director of T&ES has conclusively established that the location of the facility within the RPA is the optimum location;
 - (b) The size of the facility is the minimum necessary for flood control or stormwater quality treatment, or both;
 - (c) All applicable permits for construction in state or federal waters must be obtained from the appropriate state and federal agencies, such as the Army Corps of Engineers, the Virginia Department of Environmental Quality, and the Virginia Marine Resources Commission; and
 - (d) The facility is consistent with a city stormwater management program approved by the Virginia State Water Control Board.
 - (4) Stream restoration projects and shoreline erosion control and stabilization projects, including the removal of trees and woody vegetation, employment of necessary restoration, control, and stabilization techniques, and establishment of appropriate vegetation, may be allowed in accordance with the best available technical advice and applicable permit conditions or requirements if approved by the city arborist.
- (D) In order to maintain the functional value of the RPA buffer area, existing vegetation may be removed if approved by the director of T&ES and only to provide for reasonable sight lines, access paths, general woodlot management, and best management practices to prevent upland erosion and concentrated flows of stormwater, as follows:
- (1) Trees may be pruned or removed as necessary to provide for sight lines and vistas, provided that where removed, they shall be replaced with other vegetation that is equally effective in retarding runoff, preventing erosion, and filtering nonpoint source pollution from runoff. Replacement vegetation shall require the approval of the director of T&ES, in consultation with the department of recreation, parks, and cultural activities and the department of planning and zoning.
 - (2) Any path shall be constructed and surfaced so as to effectively control erosion.
 - (3) Dead, diseased, or dying trees or shrubbery and noxious weeds (such as Johnson grass, kudzu, and multiflora rose) may be removed and thinning of trees may be conducted. The director of T&ES may approve a long term management plan for a specific RPA that complies with professionally recognized management practices.
- (E) The following encroachments, if permitted in the underlying zone, are allowed to the RPA buffer area if approved by the director of T&ES and provided that a water quality impact assessment is performed and accepted by the director of T&ES as complete in accordance with section 13-117.
- (1) When the application of the buffer area would result in the loss of a buildable area on a lot or parcel recorded prior to October 1, 1989, encroachments into the buffer area may be approved by the director of T&ES in accordance with the following criteria:
 - (a) Encroachments into the buffer area shall be the minimum necessary to achieve a reasonable buildable area for a principal structure and necessary utilities;
 - (b) Where practicable, a vegetated area that will maximize water quality protection, mitigate the effects of the buffer encroachment, and is equal to the area of encroachment into the buffer area shall be established

elsewhere on the lot; and

- (c) The encroachment may not extend into the seaward 50 feet of the buffer area.
- (2) When the application of the buffer area would result in the loss of buildable area on a lot or parcel recorded between October 1, 1989 and March 1, 2002, encroachments into the buffer area may be approved by the director of T&ES in accordance with the following criteria:
 - (a) The lot or parcel was created as a result of a legal process conducted in conformity with the city's subdivision regulations;
 - (b) Any conditions or mitigation measures imposed through previously approved exceptions must be met;
 - (c) If a stormwater BMP was previously required, the BMP shall be evaluated to determine if it continues to function effectively, and, if necessary, the BMP shall be reestablished or repaired and maintained as required; and
 - (d) The criteria in (1) above of this section shall be met.

13-108 - Development and uses permitted in RMAs.

Development, redevelopment, and uses authorized by the underlying zone are permitted in the RMA provided such activity is carried out in accordance with all applicable criteria in this Article XIII. The director of T&ES may, due to the unique characteristics of a site or the intensity of the proposed development, redevelopment, or use require a water quality impact assessment as provided in subsections 13-117(C) and (D).

13-109 - General performance requirements for CBPAs.

The director of T&ES shall approve development, redevelopment, uses, or land-disturbing activities in the CBPA only if it is found that the activity is in compliance with this Article XIII and that the applicant has demonstrated, by a preponderance of the evidence, that the proposed development, redevelopment, use, or land-disturbing activity meets or exceeds the following standards.

- (A) No more land shall be disturbed than is necessary to provide for the proposed use, development, or redevelopment.
- (B) Indigenous vegetation shall be preserved to the maximum extent practicable consistent with the use, development, or redevelopment proposed.
- (C) Development or redevelopment shall minimize impervious cover consistent with the proposed use or development.
- (D) The proposed development or redevelopment shall comply with section 5-4-1 et seq. of the City Code (erosion and sediment control).
- (E) All development, redevelopment, and uses disturbing greater than 2,500 square feet shall meet the following storm water quality management performance requirements. For purposes of this section, the following shall be used to define the site area for determining water quality requirements: for projects disturbing less than 50 percent of the tax parcel (or if multiple parcels are involved, the land subject to the application), the disturbed area shall be used as the site area; for projects disturbing greater than or equal to 50 percent of the tax parcel (or if multiple parcels are involved, the land subject to the application), the entire tax parcel shall be used as the site area.
 - (1) The entire water quality volume from the site shall be treated. When the development, redevelopment, or use constitutes disturbing only a small portion of a tax map parcel greater than five acres in size, the director of T&ES may establish criteria for allowing the parcel to be divided into sub-basins.
 - (2) Single-family residences separately built and disturbing less than one acre and not part of a larger common plan of development or sale, including additions or modifications to existing single-family detached residential structures are exempt from subsections (4) and (5) below. The Alexandria water quality volume default requirement in subsection (6) still applies.
 - (3) In order to protect the quality of state waters located within the City of Alexandria and to control the discharge of stormwater pollutants from regulated activities, the following minimum design criteria and statewide standards for stormwater management, per 9VAC25-870-63 shall be applied.
 - (4) New development. The total phosphorus load of new development projects shall not exceed 0.41 pounds per

acre per year, as calculated pursuant to this section.

- (5) Development of prior developed lands:
 - (a) For land-disturbing activities disturbing greater than or equal to one acre that results in no net increase in impervious cover from the pre-development condition, the total phosphorus load shall be reduced at least 20 percent below the pre-development total phosphorus load.
 - (b) For regulated land-disturbing activities disturbing less than one acre that results in no net increase in impervious cover from the pre-development condition, the total phosphorus load shall be reduced at least ten percent below the predevelopment total phosphorus load.
 - (c) For land-disturbing activities that result in a net increase in impervious cover over the pre-development conditions, the design criteria for new development shall be applied to the increased impervious area. Depending on the area of disturbance, the criteria of subsections (a) or (b) above shall be applied to the remainder of the site.
 - (d) In lieu of subsection (c), the total phosphorus load of a linear development project as defined in 9VAC25-870-10 occurring on prior developed lands shall be reduced 20 percent below the predevelopment total phosphorus load.
 - (e) The total phosphorus load shall not be required to be reduced below the applicable standard for new development unless standards applied by other parts of this article require a more stringent standard.
- (6) For new development and development on prior developed lands in subsections (4) and (5) above, the entire Alexandria water quality volume default from the site shall be treated, or the requirements must be met consistent with section 13-110.
- (7) Compliance with subsections (4) and (5) above shall be determined using the runoff reduction method and through the use of stormwater BMPs established in 9VAC25-870-65 or found at the Virginia BMP Clearinghouse website, except as may be limited in accordance with policies established by the director of T&ES in accordance with subsection 13-104(C).
- (8) Compliance with subsections (4) and (5) may be achieved by the applicant in accordance with off-site compliance options in 9VAC25-870-69 under the following circumstances:
 - (a) Less than five acres of land will be disturbed;
 - (b) The post-construction phosphorus control requirement is less than ten pounds per year; or
 - (c) At least 75 percent of the required phosphorus nutrient reductions are achieved on-site. If at least 75 percent of the require phosphorus nutrient reductions cannot be met on-site, and the operator can demonstrate to the satisfaction of the director of T&ES that (i) alternative site designs have been considered that may accommodate on-site best management practices, (ii) on-site best management practices have been considered in alternative site designs to the maximum extent practicable, (iii) appropriate on-site best management practices will be implemented, and (iv) full compliance with post-development nonpoint nutrient runoff compliance requirements cannot practicably be met on-site, then the required phosphorus nutrient reductions may be achieved, in whole or in part, through the use of off-site compliance options.
- (9) When the requirements of subsections (4) and (5) have otherwise been met, the requirement to treat the entire Alexandria water quality volume default in subsection (6) may be achieved in accordance with alternative stormwater management equivalency options presented in section 13-110.
- (10) Notwithstanding those exemptions granted under section 13-123, all such land-disturbing activities shall be subject to the design storm and hydrologic methods set out in 9VAC25-870-72, linear development controls in 9VAC25-870-76, and criteria associated with stormwater impoundment structures in 9VAC25-870-85.
- (11) Notwithstanding the above requirements, any site with (a) an intermittent stream contained within an existing natural channel, or (b) a non-tidal wetland that does not meet the criteria for designation as a resource protection area in section 13-105(B), must meet the following additional water quality performance criteria:
 - (a) Measures must be taken to protect these features from direct stormwater runoff from impervious surfaces and to preserve their water quality functions.

- (b) A 50-foot wide vegetated area preserved where present, or established where not present, on the outward edge considered a sufficient BMP to meet this standard if the vegetated area is designed to prevent erosion and sedimentation.
 - (c) The BMP requirement in (b) above may alternatively be met through the use of a smaller vegetated area in combination with equivalent on-site stormwater treatment and/or equivalent off-site options presented in section 13-110 if approved by the director of T&ES.
 - (d) Development, redevelopment, uses, and land-disturbing activities allowed in the vegetated area shall be the same as those allowed in RPAs as described in section 13-107. Delineation of the vegetated area shall be accomplished in the manner prescribed in section 13-106.
 - (e) The director of T&ES may waive the requirements of (b) above if the non-tidal wetland is demonstrated to the director of T&ES's satisfaction that it qualifies as an isolated wetland of minimal ecological value defined in section 13-103(K).
- (F) All development and redevelopment shall meet the following channel protection and flood protection requirements. Compliance with this section satisfies the stormwater management requirements of section 5-4-7(c)(4) of the City Code (erosion and sediment control):
- (1) Channel protection. Concentrated stormwater flow shall be released into a stormwater conveyance system and shall meet the criteria of this section, where applicable, from the point of discharge to a point within the limits of analysis in subsection (d).
 - (a) *Manmade stormwater conveyance systems.* When stormwater from a development is discharged to a manmade stormwater conveyance system, following the land-disturbing activity, either:
 - (i) The manmade stormwater conveyance shall convey the post-development peak flow rate from the two-year 24-hour storm event without causing erosion of the system. Detention of stormwater or downstream improvements may be incorporated into the land-disturbing activity to meet this criterion, at the discretion of the director; or
 - (ii) The peak discharge requirements for concentrated stormwater flow to natural stormwater conveyance systems in subsection (c) shall be met.
 - (b) *Restored stormwater conveyance systems.* When stormwater from a development is discharged to a restored stormwater conveyance system that has been restored using natural design concepts, following the land-disturbing activity, either:
 - (i) The development shall be consistent, in combination with other stormwater runoff, with the design parameters of the restored stormwater conveyance system that is functioning in accordance with the design objectives; or
 - (ii) The peak discharge requirements for concentrated stormwater flow to natural stormwater conveyance systems in subsection (c) shall be met.
 - (c) *Natural stormwater conveyance systems.* When stormwater from a development is discharged to a natural stormwater conveyance system the maximum peak flow rate from the one-year 24-hour storm following the land-disturbing activity shall be calculated either:
 - (i) In accordance with the following methodology:

$$Q_{\text{Developed}} \leq \text{I.F.} * (Q_{\text{Pre-developed}} * RV_{\text{Pre-developed}}) / RV_{\text{Developed}}$$

Under no condition shall $Q_{\text{Developed}}$ be greater than $Q_{\text{Pre-developed}}$ nor shall $Q_{\text{Developed}}$ be required to be less than that calculated in the equation $(Q_{\text{Forest}} * RV_{\text{Forest}}) / RV_{\text{Developed}}$; where

I.F. (Improvement Factor) equals 0.8 for sites > 1 acre or 0.9 for sites ≤ 1 acre.

$Q_{\text{Developed}}$ = The allowable peak flow rate of runoff from the developed site.

$RV_{\text{Developed}}$ = The volume of runoff from the site in the developed condition.

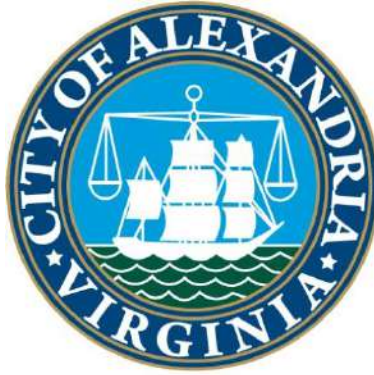
$Q_{\text{Pre-developed}}$ = The peak flow rate of runoff from the site in the pre-developed condition.

$RV_{Pre-developed}$ = The volume of runoff from the site in pre-developed condition.

Q_{Forest} = The peak flow rate of runoff from the site in a forested condition.

RV_{Forest} = The volume of runoff from the site in a forested condition.

- (d) *Limits of analysis.* Unless subsection (c) is utilized to show compliance with the channel protection criteria, stormwater conveyance systems shall be analyzed for compliance with channel protection criteria to a point where either:
- (i) Based on land area, the site's contributing drainage area is less than or equal to 1.0 percent of the total watershed area; or
 - (ii) Based on peak flow rate, the site's peak flow rate from the one-year 24-hour storm is less than or equal to 1.0 percent of the existing peak flow rate for the one-year 24-hour storm event prior to implementation of any stormwater quantity control measures.
- (2) Flood protection. Concentrated stormwater flow shall be released into a stormwater conveyance system and shall meet one of the following criteria as demonstrated by the use of acceptable hydrologic and hydraulic methodologies:
- (a) Concentrated stormwater flow to stormwater conveyance systems that currently do not experience localized flooding during the ten-year 24-hour storm event:
 - (i) The point of discharge releases stormwater into a stormwater conveyance system that, following the land-disturbing activity, confines the post-development peak flow rate from the ten-year 24-hour storm event within the stormwater conveyance system; and
 - (ii) Unless waived under (iv), the post-development peak flow rate for the ten-year 24-hour storm event shall be less than the predevelopment peak flow rate from the ten-year 24-hour storm event.
 - (iii) Detention of stormwater or downstream improvements may be incorporated into the approved land-disturbing activity to meet (i) and (ii), at the discretion of the director of T&ES.
 - (iv) A waiver of the detention requirements and/or the downstream stormwater limits of analysis in subsection (2)(c) may be granted by the director based on factors including but not limited to the project's location in the watershed.
 - (b) Concentrated stormwater flow to stormwater conveyance systems that currently experience localized flooding during the ten-year 24-hour storm event: The point of discharge either:
 - (i) Confines the post-development peak flow rate from the ten-year 24-hour storm event within the stormwater conveyance system to avoid the localized flooding. Additional detention of stormwater or downstream improvements may be incorporated into the approved land-disturbing activity to meet this criterion, at the discretion of the director; or
 - (ii) Releases a post-development peak flow rate for the ten-year 24-hour storm event that is less than the pre-development peak flow rate from the ten-year 24-hour storm event.
 - (iii) A waiver of the detention requirement may be granted by the director of T&ES based on factors including but not limited to the amount of stormwater runoff generated, the severity of flooding issues in the watershed and/or the lack of adequacy of the existing conveyance system.
 - (c) Limits of analysis. Stormwater conveyance systems shall be analyzed for compliance with flood protection criteria to a point where:
 - (i) The site's contributing drainage area is less than or equal to 1.0 percent of the total watershed area draining to a point of analysis in the downstream stormwater conveyance system;
 - (ii) Based on peak flow rate, the site's peak flow rate from the ten-year 24-hour storm even is less than or equal to 1.0 percent to the existing peak flow rate from the ten-year 24-hour storm event prior to the implementation of any stormwater quantity control measures; or,
 - (iii) The stormwater conveyance system enters a mapped floodplain or other flood-prone area adopted in



City of Alexandria, Virginia

**Policies and Procedures for Construction Site Runoff Control
Inspections**

06/05/2014

Updated 3/8/2019

Eco-CITY  ALEXANDRIA

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Purpose

The purpose of this document is to provide policies and procedures for the inspection of construction sites for stormwater runoff control.

Construction sites will be inspected for compliance with erosion and sedimentation control and for compliance with the site's VPDES Stormwater Construction General Permit as applicable.

Legal Authority

Commonwealth of Virginia

Legal Authority to enforce stormwater runoff controls on construction sites is granted to the City by the Code of Virginia. Specifically, authority is granted by the Stormwater Management Act, Title 62.1, Chapter 3.1, Article 2.3 of the Code of Virginia; the Virginia Stormwater Management Program (VSMP) Regulation, Chapter 870 of the Virginia Administrative Code; and by chapter 880 the General VPDES Permit for Discharges of Stormwater From Construction Activities, Chapter 880 of the Virginia Administrative Code.

City of Alexandria

The City of Alexandria Erosion and Sedimentation Control Ordinance is located in Title 5 Chapter 4 of the Alexandria, Virginia code of Ordinances.

The Environmental Management Ordinance, Article XIII of the City of Alexandria Zoning Ordinance contains those provisions of the City Code related to the VPDES Construction General Permit.

City Procedures for Erosion and Sedimentation Control Inspections

Inspection Schedule

All permitted projects will be inspected as follows:

- A. During or immediately following initial installation of erosion and sediment controls;
- B. At least once in every two week period;
- C. Within 48 hours following any runoff producing storm event; and
- D. At the completion of the project prior to the release of any performance bonds.

Inspection Procedure

City inspections will be performed according to the following procedures:

1. Inspections will be performed to inspect for compliance with the approved erosion and sedimentation control plan. City staff will attempt to inform the construction site operator and/or permittee prior to the inspection.
2. Inspections will be documented on the inspection forms found in appendix 1 of this document.
3. After the inspection has been completed, a hard copy of the documentation will be saved along with any pictures.
4. After an inspection, a report will be generated for the permittee.
5. For those sites failing inspection, a notice to comply and a copy of the inspection report will be sent to the permittee. This notice can be hand delivered or sent to the permittee by certified mail. The notice to comply will specify the measures needed to bring the site into compliance with the approved erosion and sedimentation control plan and the timeframe allowed for compliance. The notice to comply can be found in Appendix 1 of this document.
6. The time allowed for compliance will be determined by the inspector and will be based on the severity of the violation. No timeframe to comply will exceed 30 days.
7. After the timeframe to complete the required measures has expired, the City inspector will reinspect the site for compliance with the notice to comply.
8. All enforcement action notification will follow the procedures outlined in this document.

Documentation

The inspection records shall include at a minimum:

1. The date of inspection,
2. The result of the inspection,
3. Any deficiencies,
4. The timeframe allowed for compliance with any noted deficiencies.

All records must be kept on file for a minimum of five years.

Enforcement of Erosion and Sedimentation Control Violations

In cases where noncompliance is causing or is imminent danger of causing harmful erosion of lands or sediment deposition in the waters of the commonwealth, drainage system discharging to such waters, or lower lying property or where land disturbing activities have commenced without an approved plan, a stop work order may be issued whether or not the permittee has been issued a notice to comply.

For all other violations, enforcement action for failure to comply with an approved erosion and sedimentation control plan or for performing land disturbing activities without an approved plan will follow these steps:

1. After a notice to comply has been issued, the inspector will reinspect the site for compliance with the notice to comply.
2. If the site fails to meet all of the measures outlined in the notice to comply, the inspector may issue a written stop work order.
3. The permittee will be given a timeframe to complete the measures needed to bring the site into compliance with the notice to comply and the approved sedimentation and erosion control plan. The timeframe allowed will be determined by the inspector and will be based upon the severity of the violation.
4. During the time period the stop work order is active, no construction or other work on the site can take place other than corrective measures.
5. Once the time allowed to bring the site into compliance has expired, the site may be referred to the Director of Transportation and Environmental Services, his or her designee; the City Attorney's Office; or both.
6. The City may then execute a letter of intent to use the performance security for site correction and/or refer the project to the City Attorney's Office to issue a Notice of Violation with associated civil penalties. A letter of intent can be found in appendix 2 of this document. A notice of violation can be found in appendix 3 of this document.
 - a. Letter of Intent. If referred to the Director of Transportation and Environmental Services, the director will send the permittee a letter of intent to utilize the performance bond or cash escrow to apply the corrective measures to the site. The letter will specify a timeframe for compliance. If no action is taken in the time specified, the Director shall have the deficiencies corrected charge to and pay for all related expenses from the performance bond or escrow account. If the cost of correction exceeds the amount of the held security, the Director may collect the difference from the permittee.
 - b. Penalties for noncompliance. Any person who violates these regulations shall be subject to a civil penalty. Each day the violation continues shall constitute a separate offense.
 - i. First time offenders shall be subject to a civil penalty not to exceed five hundred dollars (\$500.00) per day of continuing violation.
 - ii. Each subsequent violation for the same section or provision shall be subject to a civil penalty not to exceed one thousand dollars (\$1000.00) per day of continuing violation.

- iii. No civil penalty arising from the same operative set of facts shall give rise to levying of a civil penalty more than once in any 10 day period or exceeding a total of \$3,000.

City Procedures for VPDES Stormwater Construction General Permit Inspections

Inspection Schedule

All permitted projects will be inspected as follows:

- A. Periodically, and/or
- B. In response to complaints.

Inspection Procedure

City inspections will be performed according to the following procedures:

1. Inspections will be performed to inspect for compliance with the approved erosion and sedimentation control plan and Stormwater Pollution Prevention Plan (SWPPP). City staff will attempt to inform the construction site operator and/or permittee prior to the inspection.
2. Inspections will be documented on the inspection forms found in appendix 1 of this document.
3. After the inspection has been completed, a hard copy of the documentation will be saved along with any pictures.
4. After an inspection, a report will be generated for the permittee.
5. For those sites failing inspection, a notice to comply and a copy of the inspection report will be sent to the permittee. This notice can be hand delivered or sent to the permittee by certified mail. The notice to comply will specify the measures needed to bring the site into compliance with the approved VPDES Stormwater Construction General Permit and the timeframe allowed for compliance.
6. The time allowed for compliance will be determined by the inspector and will be based on the severity of the violation. No timeframe to comply will exceed 30 days.
7. After the timeframe to complete the required measures has expired, the City inspector will reinspect the site for compliance with the notice to comply.
8. All further enforcement action notification will follow the procedures outlined in this document.

Documentation

The inspection records shall include at a minimum:

1. The date of inspection,
2. The result of the inspection,
3. Any deficiencies,
4. The timeframe allowed for compliance with any noted deficiencies.

All records must be kept on file for a minimum of five years.

Enforcement of VPDES Stormwater Construction General Permit Violations

In cases where noncompliance is grossly affecting or presents an imminent and substantial danger of causing harmful erosion of lands or sediment deposition in waters within the watersheds of the Commonwealth or otherwise substantially impacting water quality, the Director of T&ES may issue, without advance notice or hearing, an emergency order directing such person to cease immediately all land-disturbing activities on the site.

For all other violations, enforcement action for failure to comply with an approved VPDES Construction General Permit or for performing land disturbing activities without an approved permit will follow these steps:

1. After a notice to comply has been issued, the inspector will reinspect the site for compliance with the notice to comply.
2. If the site fails to meet all of the measures outlined in the notice to comply, the inspector may issue a written stop work order. A stop work order can be found in appendix 1 of this document.
3. The permittee will be given a timeframe to complete the measures needed to bring the site into compliance with the notice to comply and the approved VPDES Construction General Permit. The timeframe allowed will be determined by the inspector and will be based upon the severity of the violation.
4. During the time period the stop work order is active, no construction or other work on the site can take place other than corrective measures.
5. Once the time allowed to bring the site into compliance has expired, a notice of violation may be issued and the site referred to the City Attorney's Office. A notice of violation can be found in appendix 4 of this document.
6. Any violation of the VPDES Construction General Permit or failure to operate without a permit is subject to a civil penalty not to exceed \$32,500 per day per violation with each day of violation as a separate offense. The City Attorney's Office will pursue collection of the civil penalty through prosecution in the appropriate court.

Appendix 1-Inspection Form, Notice to Comply, and Stop Work Order

REASON FOR INSPECTION

- ☐ PERIODIC
☐ BIWEEKLY
☐ RAINFALL EVENT



Transportation and Environmental Services
 Development and Right of Way
 301 King St. Room 4130
 Alexandria, VA 22314
 703-746-4090

CONSTRUCTION GENERAL PERMIT INSPECTION REPORT

Date: _____ CGP Number: _____

Project name: _____

Location: _____

Inspector name: _____ Weather conditions: _____

Date of last precipitation: _____ Precipitation Amount: _____ (data from Reagan National Airport)

STAGE OF CONSTRUCTION

- ☐ Pre-construction conference
☐ Final Grading
☐ Other: _____
- ☐ Rough Grading
☐ Final Stabilization
- ☐ Building Construction
☐ Notice of Termination

Enforcement/Follow-up Action:

- ☐ Notice to comply ☐ Stop work order ☐ Re-inspection ☐ N/A

ESC AND SWM CONTROL MEASURES

Properly Installed and Operational			Type of BMP or Activity	Location and Corrective Action Required	Date to complete
Yes	No	N/A			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	MS1-Temporary or permanent stabilization of exposed areas		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	MS2-Stabilization of stockpiles		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	MS3-Adequate stabilization using vegetative cover		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	MS4-Installation and maintenance of perimeter sediment control		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	MS5-Stabilization of earthen structures		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	MS6-Installation of sediment basins and/or sediment traps		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	MS7-Stabilization of slopes		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	MS8-No concentrated runoff from slopes		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	MS9- Protection from slope water seepage		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	MS10-Adequate catch basin installation		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	MS11-Channel lining/outlet protection for stormwater conveyance channels		

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	MS12-Measures used to minimize impacts for in-stream construction		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	MS13-Non-erodible material for temporary stream crossings		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	MS14-Applicable regulations for working in a watercourse have been met		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	MS15-Re-stabilization of in-stream construction		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	MS16-Underground utilities installed in accordance with applicable standards		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	MS17-Construction entrance/exit and prevention of offsite tracking		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	MS18-All temporary ESC controls removed when required		

POLLUTION PREVENTION MEASURES

BMP Implemented			Type of BMP or Activity	Corrective Action Required	Date to complete
Yes	No	N/A			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Vehicle and equipment fueling, cleaning, storage, and maintenance areas free of spills, leaks, or deleterious material		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Concrete washout clearly marked, being used, and emptied as required		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sensitive areas (RPAs, streams, mature trees) protected with barriers, flags, or similar		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Additional measures to address a TMDL		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Materials with potential to impact stormwater stored under cover		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BMPs effective to prevent discharges from washout/cleanout of stucco, paint, form release oils, curing compounds or construction material		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Covered dumpsters for trash and litter		

STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

On site and available			SWPPP Element	Corrective Action Required	Date to complete
Yes	No	N/A			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Notice of permit coverage posted at site entrance		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Notice of the location of the SWPPP, contact, and information for public access posted at site entrance		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SWPPP onsite, up to date, and modifications documented		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Copy of signed registration statement		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Copy of notice of coverage letter and copy of CGP		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Name, phone number, and qualifications of qualified professional		

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Approved ESC plan on site		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Approved SWM plan on site		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pollution prevention plan with pollution generating activities map		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	List of contractors and sub-contractors		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Record of land disturbing activities		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Record of corrective actions		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Self-inspections performed every 4 days or 5 days and after a qualifying rain event		

STORMWATER MANAGEMENT FACILITY

Under construction			Construction Complete			Type of facility	Type of work being performed
Yes	No	N/A	Yes	No	N/A		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Verbal/Written notification given to:

Inspector signature:

ADDITIONAL INFORMATION (Attach additional pages if needed)

Appendix 2-Letter of Intent

DATE

Owner Name

Owner Address

RE: Failure to comply with the approved erosion and sedimentation control plan

Site

Certified Mail #

LETTER OF INTENT

Dear NAME:

On DATE, the above reference site was issued a Notice to Comply from the City of Alexandria Office of Construction and Inspection for failure to comply with the site's approved erosion and sedimentation control plan. A stop work order was issued on DATE giving you X number of days to bring the site into compliance with the approved plan. As of today, the site remains out of compliance with the approved plan.

You have X days from the date of this letter to either bring the site into compliance or submit in writing a request for an extension. If the site is not brought into compliance or given an approved extension of time by DATE, the City will utilize your performance bond or cash escrow to apply the necessary corrective measures to the site. If the cost of correction exceeds the amount of the held security, the City may collect the difference from the permittee. Failure to complete corrective measures may also result in the issuance of a Notice of Violation and associated penalties of up to \$1000 per day per violation.

Section 5-4 of the City of Alexandria Code of Ordinances requires applicable development to operate under an approved erosion and sedimentation control plan and to remain in compliance with that plan. Specifically, Sec. 5-4-4 of the City Code states:

- a) It shall be unlawful for any person to construct, erect or alter any building or structure for which an approved erosion and sedimentation control plan is required by this chapter, except in accordance with the approved plan.
- b) It shall be unlawful for any person to clear, grade, excavate, fill, remove topsoil from or change the contour of any land in the city for which an approved erosion and sedimentation control plan is required by this chapter except in accordance with the approved plan.
- c) It shall be unlawful for any person to remove or destroy trees, shrubs, grass, weeds, vegetation, ground cover or other plant life on any land in the city for which an approved erosion and sedimentation control plan is required by this chapter except in accordance with the approved plan.

The following observations were made during the inspection and require compliance measures:

- Comments
-

Your time and cooperation are greatly appreciated and will help to achieve our goal of protecting our streams, rivers and the Chesapeake Bay. Please contact **NAME** in Development and Right of Way Services at **PHONE**, via email at **EMAIL**, if you have any questions, need additional information, or to submit the above requested information.

Thank you for your time and cooperation with regard to this matter.

Sincerely,

Deputy Director, Development and Right of Way Services

CC: , Inspector
 , VSMP Administrator
 , Deputy Director, Infrastructure and Environmental Quality
 , Director, Transportation and Environmental Services

Appendix 3-Erosion and Sedimentation Notice of Violation

DATE

Owner Name

Owner Address

RE: Failure to comply with the approved erosion and sedimentation control plan
Site

NOTICE OF VIOLATION

Dear NAME:

On DATE, the above reference site was issued a Notice to Comply from the City of Alexandria Office of Construction and Inspection for failure to comply with the site's approved erosion and sedimentation control plan. A stop work order was issued on DATE giving you X number of days to bring the site into compliance with the approved plan. As of today, the site remains out of compliance with the approved plan.

Due to failure to respond to multiple notices by the City and/or to bring the site into compliance with the approved sedimentation and erosion control plan, you are hereby served a **NOTICE OF VIOLATION for violation of the City Code of Alexandria Title 5, Chapter 4-Erosion and Sedimentation Control.**

Section 5-4 of the City of Alexandria Code of Ordinances requires applicable development to operate under an approved erosion and sedimentation control plan and to remain in compliance with that plan. Specifically, Sec. 5-4-4 of the City Code states:

- a) It shall be unlawful for any person to construct, erect or alter any building or structure for which an approved erosion and sedimentation control plan is required by this chapter, except in accordance with the approved plan.
- b) It shall be unlawful for any person to clear, grade, excavate, fill, remove topsoil from or change the contour of any land in the city for which an approved erosion and sedimentation control plan is required by this chapter except in accordance with the approved plan.
- c) It shall be unlawful for any person to remove or destroy trees, shrubs, grass, weeds, vegetation, ground cover or other plant life on any land in the city for which an approved erosion and sedimentation control plan is required by this chapter except in accordance with the approved plan.

You will be assessed a civil penalty of \$500 per day per violation beginning DATE until the corrective actions below are completed.

The following items are required to bring your site into compliance:

- Comments

This office will pursue collection of the civil penalty through prosecution in the appropriate court. Additionally, the city may perform the necessary corrections and bill the property owner.

Your time and cooperation are greatly appreciated and will help to achieve our goal of protecting our streams, rivers and the Chesapeake Bay. Please contact **NAME** in Development and Right of Way Services directly at **PHONE** or via email at [email](#), if you have any questions about the corrective measures. Please contact me with any questions about the scope and nature of the impending legal proceedings.

Please let me know if you have any questions.

Yours very truly,

Deputy City Attorney

CC: , Inspector
 , VSMP Administrator
 , Deputy Director, Infrastructure and Environmental Quality
 , Deputy Director, Development and Right of Way
 , Director, Transportation and Environmental Services

Appendix 4-VPDES Stormwater Construction General Permit Notice of Violation

DATE

Owner Name

Owner Address

RE: Failure to comply with the approved erosion and sedimentation control plan

Site

NOTICE OF VIOLATION

Dear NAME:

On DATE, the above reference site was issued a Notice to Comply from the City of Alexandria Office of Construction and Inspection for failure to comply with the site's approved VPDES Construction General Permit. A stop work order was issued on DATE giving you X number of days to bring the site into compliance with the approved plan. As of today, the site remains out of compliance with the approved plan.

Due to failure to respond to multiple notices by the City and/or to bring the site into compliance with the approved plan, you are hereby served a **NOTICE OF VIOLATION for violation of the City of Alexandria Zoning Ordinance, Article XIII-Environmental Management.**

Section 13-111 of the Ordinance requires applicable development to operate under an approved VPDES permit, an approved stormwater management plan, an approved erosion and sedimentation control plan and an approved stormwater pollution prevention plan and to remain in compliance with those plans. Specifically, Section 13-126 of the City Code states:

Any person who violates any provision of this article or who fails, neglects, or refuses to comply with any order of the director of T&ES, shall be subject to a civil penalty not to exceed \$32,500.00 for each violation within the discretion of the court. Each day of violation of each requirement shall constitute a separate offense.

(a) Violations for which a penalty may be imposed under this subsection shall include but not be limited to the following:

- i. No state permit registration;
- ii. No SWPPP;
- iii. Incomplete SWPPP;
- iv. SWPPP not available for review;
- v. No approved erosion and sediment control plan;
- vi. Failure to install stormwater BMPs or erosion and sediment controls;
- vii. Stormwater BMPs or erosion and sediment controls improperly installed or maintained;

- viii. Operational deficiencies;
- ix. Failure to conduct required inspections;
- x. Incomplete, improper, or missed inspections; and
- xi. Discharges not in compliance with the requirements of 4FAC50-60-1170 of the general permit.

You will be assessed a civil penalty of \$500 per day per violation beginning DATE until the corrective actions below are completed.

The following items are required to bring your site into compliance:

- Comments

This office will pursue collection of the civil penalty through prosecution in the appropriate court. Additionally, the city may perform the necessary corrections and bill the property owner.

Your time and cooperation are greatly appreciated and will help to achieve our goal of protecting our streams, rivers and the Chesapeake Bay. Please contact NAME in Development and Right of Way Services directly at PHONE or via email at email if you have any questions about the corrective measures. Please contact me with any questions about the scope and nature of the impending legal proceedings.

Please let me know if you have any questions.

Yours very truly,

Deputy City Attorney

CC: , Inspector
 , VSMP Administrator
 , Deputy Director, Infrastructure and Environmental Quality
 , Deputy Director, Development and Right of Way
 , Director, Transportation and Environmental Services



DEVELOPMENT PRELIMINARY SITE PLAN CHECKLIST

Department of Planning and Zoning, 301 King Street, Room 2100
Alexandria, Virginia 22314 Phone: (703) 746-4666

DSUP/DSP # _____

Project Name (different from project address): _____

Project Address: _____

Applicant's Name: _____

Submission Deadline: Plan submissions received before 3:00 pm will be processed and routed to reviewers the same day. Plan submissions received after 3:00 pm will be processed and routed the next business day. **Submit to the Planning and Zoning Office to avoid processing delays.**

The following materials are required for a complete development preliminary plan submission:

_____ Completed and Signed Development Special Use Permit or Development Site Plan Application

_____ Completed and Signed Preliminary Plan Checklist (this form)

_____ Filing Fee (DSUP and DSP). Please see the fee schedule [here](#).

_____ Site Plans for Completeness Review of Preliminary Plan (First Submission) 16 sets.

_____ 13 rolled sets in black & white

_____ 3 rolled sets in color labeled "color sets"

_____ 17 copies of application, site plan checklist, & response to City comments letter

_____ Site Plans After Completeness Review of Preliminary Plan (Second Submission) 17 sets.

_____ 14 rolled sets in black & white

_____ 3 rolled sets in color labeled "color sets"

_____ 21 copies of application, site plan checklist, & response to City comments letter

Note: Thirteen half-sized sets of the preliminary plan will be requested once the proposal is scheduled for a Planning Commission hearing.

_____ **Electronic Copy.** For each submission, provide an electronic copy of all submitted documents on a CD disk or thumb drive in .pdf format. Please submit the PDF of the site plan as one single file (do not break out the individual pages).

_____ **Signature of professional certifying that the submission meets all requirements:**

I, _____ (print name), hereby certify that the drawings and other materials that accompany this checklist have met the requirements of the checklist, and the accompanying electronic copy is an exact duplicate of the hard copy submission.

Signature _____ Date _____

General Process Information:

Preliminary site plans will be reviewed for completeness by City staff. Completeness review comments will be returned to the applicant in approximately 3 weeks from submission listing additional information required for the application to be deemed complete.

The applicant must revise the site plan to address all comments of the completeness review and resubmit to Planning and Zoning. This submission must include a total of 21 full-sized folded copies, each with a letter responding to each of the completeness comments and the specific location of the additions or corrections made to the plan. These plans are routed and reviewed to verify completeness. **If the plans are still not complete, the review of them will be suspended and the applicant will be notified of the information that is required.**

When the plan/application is deemed complete, a confirmation letter or e-mail will be sent to the applicant. Within 5 working days of receipt of the confirmation the applicant shall install a notice of the proposed development at the site. When an application is complete, it will receive technical review by City agencies. Three (3) weeks prior to the scheduled hearing date the applicant shall submit a sample materials board and/or color rendering.

FORMAT REQUIREMENTS FOR EACH SHEET:

- _____ Print size of 24" x 36"
- _____ Scale of no less than 1" : 40' with scale identified on each sheet – 1" : 20 or 1" : 30 preferred **Note: 1":25 is not an acceptable scale**
- _____ City approval signature block in same place (lower right corner) on each sheet (see attachment for configuration and size of block)
- _____ North point shown consistently in the same direction on all plan sheets with reference to source of meridian. North arrow pointing down is not acceptable
- _____ Property lines with course and distance for each
- _____ Name, address, signature and registration number of professional(s) preparing the plan on each sheet – all plans to be sealed by the appropriate professional
- _____ Legend of symbols, patterns, and abbreviations used
- _____ Date the plan was prepared/last revised

COVER SHEET:

- _____ Name, address, telephone and email address of the developer and of the owner(s) of record
- _____ A narrative description of the project
- _____ Location map with the site shown in relation to the nearest intersection of two or more streets, and Parcel Number (includes tax reference number)
- _____ Sheet Index
- _____ Key to plan sheets if more than one sheet is needed to show the whole site
- _____ Total area included in the site plan, total area of tax parcel, total existing and proposed impervious area on the tax parcel, and total area that will be disturbed during construction (all expressed in square feet and acres)
- _____ A list of all special use permits, site plan approvals and zoning modifications or waivers being requested
- _____ A list of all existing special use permits, site plans and proffers that apply to all or part of the site
- _____ Building Code analysis

ZONING TABULATIONS (May be included on cover where sufficient space exists)- *For each element, list zoning ordinance requirement and number proposed on preliminary plan:*

***Note: If the proposed development includes multiple lots, the zoning tabulation information must be provided for each individual lot unless all the lots will be consolidated in conjunction with the proposal.**

- _____ Zoning of the site (zoning proffers, if applicable)
- _____ Existing uses on the site
- _____ Proposed uses on the site
- _____ Lot area minimum required by zone district
- _____ Lot area (required and proposed)
- _____ Number of dwelling units (list by number of bedrooms for multifamily)
- _____ Units per acre for residential
- _____ Gross square feet (GSF) of building area*, total and listed by use, (with area devoted to parking included and listed separately)
- _____ Net square feet (NSF) or Floor Area, total and listed by use
- _____ Floor-area-ratios existing and proposed
- _____ Open space (required and proposed)
- _____ Open space total proposed and broken down by ground level space and usable space

- _____ proposed.
- _____ Average finish grade for each building
- _____ Height of each building above average finish grade
- _____ Building setbacks (required and proposed) for each building
- _____ Frontage with required and proposed listed separately
- _____ Parking spaces (listed by compact, standard, handicapped size and total) required and proposed
- _____ Parking spaces (listed by location of parking i.e. above grade and/or below grade)
- _____ Loading spaces (required and proposed)
- _____ Existing and proposed trip generation

***Note: The gross square footage of a building or buildings on a lot or tract of land (whether “main” or “accessory”) is the sum of all gross horizontal areas under a roof or roofs. These areas shall be measured from the exterior faces of walls and from eaves of all roofs where they extend beyond the wall line, or from the center line of party walls.**

The net square footage OR Floor Area of a building or buildings on a lot or tract of land (whether “main” or “accessory”) is the sum of all gross horizontal areas under a roof or roofs. These areas shall be measured from the exterior faces of walls and from the eaves of all roofs where they extend beyond the wall line or from the centerline of party walls and shall include all space with headroom of seven feet six inches or more, whether or not provided with a finished floor or ceiling. Excluded shall be elevator and stair bulkheads, accessory water tanks, cooling towers and similar construction not susceptible to storage or occupancy. Basements and subbasements shall be excluded from the floor area ratio computations, but for the purpose of computing off street parking requirements that portion of such areas as are occupied by permitted uses shall be subject to the provisions of Article VIII. (special restrictions apply in Eisenhower East and Landmark – Van Dorn)

CONTEXTUAL PLAN:

- _____ Show the proposed project site(s) and adjacent areas affected by the project
 - _____ Proposed project site appropriately labeled
 - _____ Display a minimum of a quarter (1/4) mile in radius of proposed project
 - _____ Existing property lines, buildings, streets, metro, transit stops and routes, and major thoroughfares, if any, appropriately labeled

MAP OF EXISTING SITE CONDITIONS - *Show location, dimensions, size, height, and elevations of:*

- _____ Sidewalks, streets and their names (show full width, curblines and centerlines), alleys, existing easements (include emergency vehicle easements), covenants and reservations
- _____ Show the full right-of-way width of all adjoining streets and include all information for both sides
- _____ Roadway and lane widths and uses (right turn, left turn, etc.)
- _____ Traffic and pedestrian controls including signs, markings and signals
- _____ Existing transit/bus stops with route number identification adjacent to the property
- _____ On-street parking locations and individual spaces when designated
- _____ Driveways, entrances, exits, parking areas; show vehicle parking spaces by type (standard, compact and accessible) and indicate the number in each bay and total count. Dimensions shall exclude any obstructions such as columns or light poles
- _____ Building setbacks, highway setback lines and zone transition lines
- _____ Existing buildings and structures; show footprint and indicate height
- _____ Property lines, including adjoining property lines; show course and distance of each site boundary line
- _____ For adjoining properties, show current zoning and names and addresses of owners

- (show zoning district boundary lines if multiple districts exist on the site or adjacent parcels)
- _____ Transformers, valves, and other surface features of utility systems
 - _____ Storm and sanitary sewer systems, water mains, and other buried utilities; indicate size of lines and direction of flow for storm and sanitary lines; identify owner of each system
 - _____ Fire hydrants and fire department connections
 - _____ Major trees (6" or more in caliper) and shrubs (3' or more in height), located and identified by species, including street trees on public right-of-ways along property frontage. Also, locate and identify trees on adjacent properties with canopies that extend over the site. Identify species, size and locations of trees on opposite sides of fronting streets.
 - _____ Recreation areas, swimming pools and bike and walking trails on abutting streets or public access easements
 - _____ Watercourses, bodies of water, wetlands and limits of flood plains
 - _____ Resource Protection Areas (RPAs) as defined in Article XIII of the Zoning Ordinance
 - _____ Lighting on public rights-of-way adjacent to the site
 - _____ Significant site features
 - _____ Topography shown with 2' contours on the subject property and on adjacent parcels for sufficient distance to indicate the relationship of the site to off-site terrain
 - _____ Slopes, terraces and retaining walls, including elevations of level areas and tops and bottoms of walls and exterior stairways and ramps
 - _____ Indicate the following on the plan- underground storage tanks; areas located within 1,000 feet of a former sanitary landfill, dump or disposal area; areas with the potential of generating combustible gases.
 - _____ Location of buildings listed on the Alexandria List of 100-Year Old Buildings that occur on the site or on adjacent parcels
 - _____ A statement indicating whether or not the Site has areas of Marine Clay
 - _____ Indicate areas on plan and provide a statement describing any known or expected contamination or brief narrative of due diligence completed (site history) if none is expected

PRELIMINARY SITE PLAN - *Include existing features to be retained and show location, dimension, size, height and elevation of proposed:*

- _____ Boundaries of zoning districts on the site and adjoining sites
- _____ Sidewalks, streets, alleys with widths labeled, and elevations
- _____ Show the full width and centerlines of all adjoining streets
- _____ Existing and modified lane widths and uses (right turn, left turn, etc.)
- _____ Existing and proposed traffic controls including signs, markings and signals
- _____ Sidewalks, bike and walking trails on sites and on abutting streets or public property/easements, with widths of each
- _____ Bicycle parking spaces provided per City Standards
- _____ Bicycle and pedestrian paths per the Transportation Master Plan and 1998 *Bicycle Transportation and Multi-Use Trail Master Plan*, including existing and proposed routes
- _____ Direction of traffic and volumes at all site entrances, exits and intersections
- _____ Sight distance per AASHTO at all driveways and street intersections
- _____ Curb radii at intersections and driveway entrances for public and private streets and alleys, and within parking lots; note AASHTO turning radii
- _____ Existing and proposed on-street parking locations and individual spaces when required
- _____ Driveways, entrances, exits, parking areas; show parking spaces by type (standard, compact and handicap) and indicate the number in each bay and the total count
- _____ Locations of underground parking and indicate the footprint of related subsurface structures
- _____ Garage layouts with columns shown and drive aisle and parking spaces dimensioned. Parking space widths and lengths do not include the column width. The use of "typical"

- _____ may be used provided it dimensions all types of spaces/aisles and is used in enough places that the review can be performed accurately.
- _____ Vehicle turning movements for any parking lot or garage, entrances and drive aisles, accessible spaces with AASHTO standard vehicle
- _____ Vehicle turning movements for loading zones with the largest vehicle that will access the site
- _____ Slope of entrance ramp
- _____ Locations of building entrances and exits
- _____ Building setbacks, highway setback lines, zone transition lines and vision clearances
- _____ Provide sections demonstrating compliance with the Section 6-403
- _____ Show any transition zone setback, if applicable
- _____ Easements, covenants and reservations including emergency vehicle easements (EVE) (existing and proposed)
- _____ Property lines; show course and distance of each site boundary line
- _____ Yard dimensions for setback requirements
- _____ Buildings and structures, including optional decks and other projections such as canopies, bay projections, roof overhangs; or maximum building envelope (where approved as envelope) showing outside dimensions, including height, and first floor elevations
- _____ Stoops, steps and staircases (with elevations)
- _____ Distances between buildings and adjoining property lines
- _____ Storage space for solid waste and recyclable material containers with trash truck turning movements and pick up locations
- _____ Storm and sanitary sewer systems, including lateral lines, water mains and service lines, with size, direction of flow and owners indicated in plan view for both existing and proposed
- _____ Gas mains and service lines; with size of line and owner of line indicated
- _____ Fire hydrants, water mains and service lines; with size of line and owner of line indicated
- _____ Electric, telephone, cable and all other utilities on the property; identify owners
- _____ Transformers, ground level mechanical units, switchboxes, cable boxes, poles, telephone pedestals, and other surface features of utility systems and elevations
- _____ Existing and proposed light poles and fixtures on-site and on adjoining rights-of-way
- _____ Existing and proposed bus stop(s) and bus stop amenities
- _____ Recreation areas, swimming pools. (Discharge from swimming pools shall be shown connected to the sanitary sewer in plan view.)
- _____ Watercourses, bodies of water, wetlands and limits of flood plains
- _____ Resource Protection Areas (RPAs) as defined in Article XIII of the Zoning Ordinance and developable area
- _____ Significant site features
- _____ Limits of Disturbance
- _____ Proposed grading shown with 2' contours on the subject property and on adjacent parcels for sufficient distance to indicate the relationship of the site to off-site terrain
- _____ Slopes, terraces and retaining walls, including elevations of level areas and tops and bottoms of walls and exterior stairways and ramps
- _____ Identify all potential future deck locations

LANDSCAPE PLAN - *(Proposed landscape plan must comply with the " City of Alexandria Landscape Guidelines, 2007" published by the Department of Recreation, Parks and Cultural Activities, City of Alexandria)*
http://alexandriava.gov/uploadedFiles/recreation/info/040907_land_guidelines.pdf

- _____ Buildings, and other structures and all building entrances
- _____ Streets, driveways, sidewalks, trails, intersections and all paved areas
- _____ Utilities and utility easements, existing and proposed
- _____ Locations of off-site and on-site lighting, including street lighting

- _____ Existing vegetation to be removed; include locations, size and species of all trees 6" or greater in caliper
- _____ Street trees and natural vegetation to be retained; include locations, approximate driplines, size and species of all trees 6" or greater in caliper
- _____ Details of protection structures to be used for existing trees to be preserved
- _____ Proposed street tree species, locations, and planting details
- _____ Indicate the distances between street trees
- _____ Location and dimensions of areas to be landscaped (including within public right-of-ways), specifying the location, names, caliper, and size of proposed individual trees, shrubs, and ground cover plants (indicate initial and final height for trees and shrubs, initial width for shrubs, and initial spread for groundcover plants)
- _____ Tabulation of required, existing and proposed crown coverage (**Do not include street trees.**)
- _____ Show existing and proposed trails, roadways and sidewalks
- _____ Plans shall be sealed by a Certified/Registered Landscape Architect.

OPEN SPACE PLAN:

- _____ Open space areas graphically showing the square footage and type (ground level or rooftop)

LIGHTING PLAN/SIGNAGE PLAN:

- _____ Building and structures
- _____ Location of all existing and proposed lights, including street lights and building lights.
- _____ Type of fixture
- _____ Show the locations and height of proposed signs and provide information needed to assess compliance with the sign ordinance and applicable special guidelines.

GIS - DIMENSION PLAN - *Include existing features to be retained and show location, dimension, size, height and elevation of:*

- _____ Sidewalks, streets, alleys, driveways and parking lots; (edge of pavement or top of curb)
- _____ Show the full right-of-way width and centerlines of all adjoining streets
- _____ Buildings and structures, showing outside dimensions, including height
- _____ Property lines
- _____ Stoops, steps and staircases
- _____ Locations of building entrances; identification of primary building entrance, secondary entrances and any mock entrances if applicable
- _____ 3 x y coordinate pairs in state plane coordinates (NAD 83) conforming to 50 scale (1:600/1"=50') National Map Accuracy Standards.

***Note: The Dimension Plan is used to update the City of Alexandria's Geographic Information System and therefore should contain only the information specified above. Additionally, Alexandria GIS does not meet the threshold for accuracy, as listed for the coordinate data above and is therefore not suitable as source for obtaining this coordinate information.**

ELEVATIONS AND SECTIONS:

- _____ Scaled architectural elevations of each building face, with materials labeled
- _____ Scaled elevations showing landscaping plan or screening treatment along public rights-of-way
- _____ Scaled sections through buildings
- _____ Scaled sections showing grade changes in relationship to buildings and/or retaining walls
- _____ Scaled sections showing average finished grade line and scaled heights, including penthouses
- _____ A detailed graphic showing floor area analysis indicating areas that have been deducted for purposes of the FAR calculation. If the FAR deductions exceed 20% of the overall

_____ building's square footage, written justification shall be submitted.
_____ Scaled floor plans

ENVIRONMENTAL QUALITY AND QUANTITY PLAN - Plans for collecting and depositing stormwater, including approximate pipe sizes, structures and stormwater quality facility best management practices (BMPs):

- _____ Pre- and post-development, 1, 2 and 10 year stormwater computations as appropriate
- _____ Drainage area map delineating area contributing stormwater onto the project
- _____ Narrative describing how the project will comply with the stormwater quantity and quality requirements in Article XIII of the Zoning Ordinance, to include the Alexandria Water Quality Volume Default.
- _____ Soil types (Hydrologic Soil Group A, B, C or D as defined by NRCS) and location thereof. Group D soils must be used for stormwater worksheets and computations unless a geotechnical investigation is provided that documents otherwise.
- _____ Virginia Runoff Reduction Method (VRRM) worksheets must be completed to document compliance with water quality requirements in Sec. 13-109(E) (4) and (5).
- _____ Layout of stormwater facility BMPs providing the location and type of facility(ies) being proposed.
- _____ Use the VRRM in computing Channel Protection and Flood Protection Requirements.
- _____ Drainage area map with scale and north arrow indicating the area draining to the selected water quality BMPs
- _____ City standard Alexandria water quality volume default BMP data blocks (2)
- _____ Geographic coordinates of the BMP(s) (NAD88)
- _____ If an operator intends to address the water quality phosphorus requirements established in 9VAC25-870-63 and found in Sec. 13-109(E) (4) or (5) through purchasing offsite credits, where applicable, then a letter of availability from the offsite credit provider shall be included that documents the phosphorus and associated nitrogen credits are in place and achieving the required reduction.
- _____ Preliminary calculations of sanitary flow generated from the site
- _____ Narrative describing how the project will comply with the requirements of Memo to Industry 02-07 titled *New Sanitary Sewer Connection and Adequate Outfall Analysis*
- _____ Environmental Site Assessment Notes per Sec. 13-112 Environmental Management Ordinance

When subdivision of land is involved, include a PRELIMINARY SUBDIVISION PLAT - (Refer to Section 11-1700 of the Alexandria Zoning Ordinance for additional requirements.)

- _____ Plat size shall not exceed 24" x 36"
- _____ Scale no less than 100' to 1"
- _____ Subdivision name
- _____ Name, address of owner of record and the applicant
- _____ Name, address, certificate number and seal of the surveyor or engineer
- _____ Gross area in acres and total number of buildings, lots or sites involved
- _____ Date, scale and north point with reference to source of meridian
- _____ Zoning of the property
- _____ A form or space, not less than two and one-quarter by three and one-half inches, on which approval by the commission may be shown
- _____ Lot lines with the dimensions of the length and width of the lots
- _____ In the case of resubdivisions, all lot lines or lot numbers that are proposed to go out of existence by reason of the resubdivision shall be shown by dotted lines and numbers
- _____ Location of the property immediately adjoining the proposed subdivision and the names and addresses of all its owners
- _____ Location and width of all proposed streets, alleys and public areas and their dimensions
- _____ Points of connection with the city sewer system

- _____ Location of all easements, reservations, and highway setbacks, as established by section 7-1006 of the zoning ordinance
- _____ The width and name of adjacent existing streets, alleys, easements, public utilities, and railroads shown graphically
- _____ Limits of floodplains and resource protection areas (RPAs)
- _____ The location of metal monuments not less than one inch in diameter and 24 inches in length shown thus: O, and located in the ground at each intersection of streets and alleys with plat boundary lines, and at all points on street, alley, and boundary lines where there is a corner, change in direction, or curvature.
- _____ Any deed restrictions shall be recorded with this plat, if applicable.
- _____ A surveyor's or engineer's seal and certificate of survey in the following form, which may be modified to accommodate title information:

"I hereby certify that I have carefully surveyed the property delineated by this plat, and that it is correct to the best of my knowledge and belief; that this is a subdivision of part (or all) of the land conveyed by _____ to _____ by deed dated _____ and recorded among the land records of _____ in Deed Book _____ at page _____ and is within those boundaries; and that all required monuments have been installed where indicated; except those that will be installed at a later date but before completion of the project.

"Certified Surveyor or Engineer"

- _____ A curve table shall be placed on the final plat containing the following for all curvilinear boundaries and street centerlines; delta, radius, arc, tangent, chord and chord bearing. All distances shall be shown to the nearest one-hundredth of a foot; angles or bearings to the nearest ten seconds.

ADDITIONAL STUDIES – IF REQUIRED

WATER QUALITY ASSESSMENT (in case of RPA encroachment)

- _____ See Article XIII of the Zoning Ordinance for specific requirements

ARCHAEOLOGICAL ASSESSMENT

- _____ Documentary Study and initial Archaeological Evaluation completed and submitted by Alexandria Archaeology
- _____ Appropriate archaeology comments on all site plan sheets involving ground disturbance
- _____ Locations and themes for historical interpretive elements and markers on plan, if applicable.

BUILDING MASSING STUDY

- _____ A physical model showing the mass and scale of the proposed buildings relative to surrounding buildings. This should be a scaled three-dimensional representation of the proposed building mass (including building articulation) in the context of surrounding buildings. Digital models and/or photomontage may be substituted for physical models if deemed acceptable by the Director of Planning & Zoning.

TRANSPORTATION STUDIES

- _____ Submit multimodal Transportation Study and TMP or Memo.
- _____ Submit Parking Study
- _____ Submit other studies as required (queuing study, signal warrant analysis, etc.)

AFFORDABLE HOUSING PLAN

- _____ A statement of intended voluntary contribution to the City's Housing Trust Fund or, in the case of a residential project, a voluntary Affordable Housing plan that specifies the

number of affordable on-site units, by unit type, or a statement explaining why the developer is unable to include the on-site units, along with the developer's proposed voluntary contribution to the Housing Trust Fund

- _____ It is the City's policy that a voluntary contribution for affordable housing be made on all new development. The payment should be paid to the City prior to issuance of certificate of occupancy in the case of commercial development or rental housing, and paid at sale to end user in the case of for-sale housing. In lieu of this contribution, a developer may submit an Affordable Housing Plan to the Office of Housing proposing another means of meeting the affordable housing requirement.
<http://alexandriava.gov/housing/info/default.aspx?id=6628>

Design Guidelines

Guidelines Link – The design guidelines below can be found on the City's website at:

<http://alexandriava.gov/planning/info/default.aspx?id=14676>

If the project is located in the following areas, provide information necessary to assess compliance with the appropriate design and/or streetscape guidelines.

- _____ Along Mount Vernon Avenue - *Mount Vernon Avenue Design Guidelines*
_____ Old Town North Small Area Plan - *Old Town North Design Guidelines*
_____ Old and Historic Alexandria District - *Alexandria Historic District Design Guidelines*.
_____ Parker Gray Historic District - *Alexandria Historic District Design Guidelines*.
_____ If involving a site which occupied by a building on the *Buildings over 100 Years Old Outside the Historic Districts* list - *Alexandria Historic District Design Guidelines*.
_____ Along Washington Street - *Washington Street Standards and Guidelines*, the *Old Town North Urban Design Guidelines* and the *Alexandria Historic District Design Guidelines*.
_____ Carlyle CDD – *Carlyle Design Guidelines* and the *Carlyle Streetscape Design Guidelines*.
_____ Potomac Yard/Potomac Greens Small Area Plan - *Potomac Yard Urban Design Guidelines*.
_____ Beauregard Small Area Plan – *Beauregard Urban Design Standards and Guidelines*
_____ Four Mile Run – *Four Mile Run Design Guidelines*
_____ Oakville Triangle – *Oakville Design Guidelines*

All projects Transportation and Environmental Services – Memos to the Industry -

<http://alexandriava.gov/tes/info/default.aspx?id=3522>

ADDITIONAL APPLICATIONS WHICH MAY BE REQUIRED FOR CERTAIN DEVELOPMENT PROPOSALS

Generally, all applications related to the same development proposal are required to be processed concurrently. There is a separate fee for each of these applications. See current fee schedule. Check those which are submitted with this application.

- _____ **Master Plan and/or Rezoning.** Required when the proposal requires different zoning or a change to the City's Master Plan. See sections 11-800 and 11-900 of the Zoning Ordinance.
- _____ **Transportation Management Plan Special Use Permit.** Required for any project containing 50,000 sq.ft. or more of commercial space, 40,000 sq.ft. or more of retail space, 150,000 sq.ft. or more of industrial space or 250 or more residential units. See section 11-700 of the Zoning Ordinance.
- _____ **Vacation.** Required when a portion of the public right-of-way is proposed to be acquired and utilized in the development.
- _____ **Encroachment.** Required when portions of the building (including stoops, steps, awnings, etc.) or planters, etc. project into the public right-of-way.

- _____ **Coordinated Development District (CDD) Concept Plan.** Required on tracts zoned CDD, in order to proceed with development under the CDD zoning. See section 5-600 of the Zoning Ordinance.
- _____ SUP for parking reductions and signs
- _____ SUP for specific uses
- _____ **Board of Architectural Review Approvals.** Required when the project is within one of the City's two historic districts. See chapter 10 of the Zoning Ordinance. ***Note this is a separate review process.**

Revised:

7/26/2013 – RAL
12/9/2013 – JXB
12/3/2014 - DXR
2/25/2015 -DXR
3/25/2015 – SMA
1/18/2016 – JEM
4/6/2016 - KMJ



DEVELOPMENT FINAL PLAN CHECKLIST

Department of Planning and Zoning
Development Division, City Hall
301 King Street, Room 2100
Alexandria, Virginia 22314
Phone: (703) 746- 4666

Project Name: _____

Project Location (Address): _____

Tax Map References: _____

Applicant Name: _____

Applicant Address: _____

Applicant E-mail Address: _____

The following materials are required for a complete Final Site Plan (DSUP/DSP) submission:

_____ **Filing Fee.** Please see fee schedule [here](#).

_____ **Completed and signed ESI checklist**

_____ **ESI fee for Transportation & Environmental Services Review**, if applicable

G Check here to specify non-ESI member, with no ESI review required

_____ **Response Letter.** A response letter must be provided with the initial final site plan submission which provides a response to **EACH** recommendation, code requirement, and finding contained in the Preliminary DSP or DSUP staff report, and for subsequent final submissions, which responds to **EACH** staff comment on the prior final review. Responses must include a reference to the plan sheet where change has been made. The Response Letter must also include a detailed description of and justification for any changes made to the plan which are not a result of a specific approval condition or staff comment.

_____ **Final Site Plans.** Fourteen sets of Final Site Plan drawings (rolled) shall be provided. Lesser numbers may be required after the first submission; check with the Development Team Leader. The last submission will require three sets of prints, one set of mylars. **NOTE: When second and subsequent final site plans are submitted all sets shall be marked in red where the changes to the plans have been made in response to review comments.**

_____ **Electronic Copy.** For each submission, provide a CD with PDF files of the entire site plan. Please submit as few PDF files as possible with clearly defined file names. (ex. Sheet C1 – C10 or Sheet C1 Title Sheet, Sheet C2 Notes, etc.)

Payment Rc'd:	____/____/____
	date amt initials
Payment Verified	____/____/____
	date amt initials

All Final Site Plans and application materials shall be submitted to the Department of Planning and Zoning at the above address. Plans will not be distributed for review to other departments until a

Final DSUP and DSP Checklist:

complete submission, with all items, is filed. Submission of any materials to departments other than Planning & Zoning may result in a processing delay, as review dates are determined by routing from Planning & Zoning.

I certify that I am responsible for the preparation of the final site plans being submitted and that the plans are consistent with all prior approvals granted by the City except as may be called out in the Response Letter accompanying this final site plan submission. I further certify that I have filled out the attached check list and confirmed that all required information has been provided.

Signature of Engineer/Architect/Surveyor

Date of Submission

Final DSUP and DSP Checklist:

FINAL SITE PLAN DRAWINGS SUBMISSION FORMAT/REQUIREMENTS:

Note: The following sheets and information are required for every submission. Additional sheets and information should be provided where necessary to demonstrate compliance with City requirements or conditions of approval.

REQUIREMENTS FOR EACH SHEET

- _____ Print size shall not exceed 24" x 36" and all sheets shall be the same size
- _____ Scale no less than 40' to 1" (20' or 30' to 1" preferred), with scale identified on each sheet
- _____ City approval signature block in same place (lower right corner) on each sheet (see attachment for configuration and size of block)
- _____ Date, scale and north point with reference to source of meridian
- _____ Name, address, signature and registration number of professional preparing the plan on each sheet
- _____ Date the plan was prepared on each sheet

COVER SHEET

- _____ Name and address of the developer and of the owner(s) of record
- _____ A narrative description of the proposed development
- _____ Location map with the site shown in relation to the nearest intersection of two or more streets
- _____ Index to plan sheets
- _____ Key to plan sheets if more than one sheet is needed to show the whole site
- _____ Total area included in the site plan, total area of tax parcel, total existing and proposed impervious area on the tax parcel, and total area that will be disturbed during construction (all expressed in square feet and acres)
- _____ A list of all special use permits and zoning modifications or waivers **approved** with the preliminary plan
- _____ Notes
 - _____ Noise
 - _____ ESA Statement (amend accordingly)
 - _____ Wells
 - _____ Contaminated Lands
 - _____ E&S
- _____ Table of all symbols and abbreviations utilized in the plan set.

ZONING TABULATIONS (May be provided on cover where sufficient space exists)

For each element, list zoning ordinance requirement, number approved on preliminary plan and number proposed on final plan, if different.

****Note:** If the proposed development includes multiple lots, the zoning tabulation information must be provided for each individual lot unless all the lots will be consolidated in conjunction with the proposal.**

- _____ Zoning of the site
- _____ Existing uses on the site
- _____ Proposed uses for the site
- _____ Lot area (and minimum lot area under zoning, if applicable)
- _____ Number of dwelling units (list by number of bedrooms for multifamily)

Final DSUP and DSP Checklist:

- _____ Units per acre for residential
- _____ Gross square feet (GSF) of building area*, total and listed by use (with parking listed separately)
- _____ Net square feet (NSF) of floor area, total and listed by use
- _____ Floor-area-ratio (existing if applicable, and proposed listed separately and combined)
- _____ Open space, with ground level open space listed separately from other open space
- _____ Average finished grade of each building
- _____ Height of each building
- _____ Yards; required and proposed listed separately
- _____ Frontage; required and proposed listed separately
- _____ Parking spaces (listed by compact, standard, and handicapped sizes and total)
- _____ Parking spaces (listed by location i.e. above ground and/or below ground)
- _____ Loading spaces
- _____ Existing and proposed trip generation

***Note:** The gross square footage of a building or buildings on a lot or tract of land (whether “main” or “accessory”) is the sum of all gross horizontal areas under a roof or roofs. These areas shall be measured from the exterior faces of walls and from eaves of all roofs where they extend beyond the wall line, or from the center line of party walls. Parking garages, other than garages attached to, or on the same lot with, individual residences and designated for use by a single household, are excluded from the gross square footage calculation.

DSP/DSUP CONDITIONS WITH PLANNING COMMISSION & CITY COUNCIL ACTIONS

(Place this information on a separate sheet of the submission following the cover sheet)

- _____ Copy of the approved DSUP/DSP conditions, with action, from the staff report for the project
- _____ Copy of the City Department Comments containing Code Requirements from the staff report.

EXISTING CONDITIONS PLAN

- _____ Same sheet as required in preliminary site plan (with corrections, if any required by approval)

FINAL SITE PLAN

Include existing features to be retained and show location, dimension, size, height and elevation of:

- _____ Boundaries of zoning districts on the site
- _____ Sidewalks, streets, alleys with widths labeled, and elevations
- _____ Show the full right-of-way width and centerlines of all adjoining streets
- _____ Existing and modified lane widths and uses (right turn, left turn, etc.)
- _____ Traffic controls including signs, markings and signals on a separate sheet if necessary (see Traffic Signal Plan, below)
- _____ Maintenance of traffic plan
- _____ Existing and proposed on-street parking locations and individual spaces when required
- _____ Direction of traffic and volumes at all site entrances, exits and intersections
- _____ Sight distance per AASHTO at all driveways and street intersections; horizontal and vertical
- _____ Easements, covenants and reservations including emergency vehicle easements (EVE)
- _____ Building restriction lines, highway setback lines, zone transition lines, vision clearances
- _____ Property lines; show course and distance of each site boundary line
- _____ Dimensions of front, side and rear yards
- _____ Buildings and structures, including optional decks and other projections such as canopies, roof overhangs; or maximum building envelope (where approved as envelope) showing outside dimensions, including height, and first floor elevations
- _____ Stoops, steps and staircases

Final DSUP and DSP Checklist:

- _____ Locations of building entrances and exits
- _____ Sump pump and roof drain outfalls
- _____ Locations of underground parking and the extent of related subsurface structures
- _____ Dimensions of all on-site parking spaces indicating type (standard, compact or handicapped)
- _____ Storm and sanitary sewer systems, including lateral lines, water mains and service lines, with size and owner of line indicated; indicate direction of flow; profiles; calculations for storm and sanitary
- _____ Gas mains and service lines; with size of line and owner of line indicated
- _____ Fire hydrants, water mains and service lines; with size of line and owner of line indicated
- _____ Electric, telephone, cable and all other utilities on the property; identify owners
- _____ Transformers, switchboxes, cable boxes, telephone pedestals, and other surface features of utility systems
- _____ Light poles and fixtures on-site and on adjoining rights-of-way
- _____ Driveways, entrances, exits, parking areas; show parking spaces by type (standard, compact and handicap) and indicate the number in each bay and the total count
- _____ Curb radii at intersections and driveway entrances for public and private streets and alleys, and within parking lots
- _____ Sidewalks, bike and walking trails on sites and on abutting streets or public property/easements
- _____ Recreation areas, swimming pools
- _____ Watercourses, bodies of water, wetlands and limits of flood plains
- _____ Resource Protection Areas as defined in Article XIII of the Zoning Ordinance
- _____ Soil boring data and test reports for sites containing marine clay or fill, and when the Director of Transportation and Environmental Services requires
- _____ Significant geological features
- _____ Proposed grading shown with 2' contours on the subject property and on adjacent parcels for sufficient distance to indicate the relationship of the site to off-site terrain
- _____ Slopes, terraces and retaining walls, including elevations of level areas and tops and bottoms of walls and exterior stairways and ramps
- _____ Indicate elevations at the base of all utility structures other than individual poles, such as fire hydrants and transformers
- _____ Provide rim elevation and invert elevations of all piping at manholes
- _____ Elevations of streets and alleys
- _____ Total area that will be disturbed during construction (expressed in square feet, acres, and delineated accordingly)
- _____ Roadway alignment data

LANDSCAPE PLAN

(See "Landscape Guidelines" published by the Department of Planning and Zoning, City of Alexandria.)

- _____ Buildings, streets, driveways, paved areas and other structures
- _____ Utilities and Utility easements
- _____ Locations of off and on site lighting including street lighting
- _____ Street trees and natural vegetation to be retained; include locations, size and species.
- _____ Proposed tree protection locations and details
- _____ Proposed trees and landscaping, including within public right-of-ways
- _____ Location and dimensions of areas to be landscaped (including within public right-of-ways), specifying the location, names, species, caliper, and size of proposed individual trees, shrubs, and ground cover plants (indicate initial height for trees and shrubs, initial width for shrubs, and initial spread for groundcover plants)
- _____ Tabulation of required, existing and proposed crown coverage

Final DSUP and DSP Checklist:

- _____ Tree and shrub planting details
- _____ Landscape planters on underground parking
- _____ Total area that will be disturbed during construction (expressed in square feet, acres, and delineated accordingly)
- _____ The following notes:
 - _____ All materials' specifications shall be in accordance with the industry standard for grading plant material-The American Standard for Nursery Stock (ANSI Z60.1).
 - _____ Maintenance of all trees and landscape materials shall conform to accepted industry standards set forth by the Landscape Contractors Association, American Society of Landscape Architects, the International Society of Arboriculture, and the American National Standards Institute.

LIGHTING PLAN

- _____ Buildings and structures
- _____ Location of all existing and proposed lights, including street lights and building lights.
- _____ Type of fixture
- _____ Mounting height
- _____ Strength of fixture in lumens or watts
- _____ Manufacturers' specifications for fixtures
- _____ Photometric calculations (point lighting plan) accounting for proposed street trees

EROSION AND SEDIMENT CONTROL PLANS

- _____ Erosion and Sediment (E&S) Control Plan Sheets showing:
 - _____ Two-phase plan for sediment and erosion control
 - _____ Narrative phasing plan including demolition and sequence of construction activities
 - _____ All appropriate details of erosion and sediment control measures (must meet Virginia Erosion and Sedimentation Control Handbook (VESCH) standards)
 - _____ Sources of water for construction entrance washdown
 - _____ Grading for drains and traps for construction entrance runoff
 - _____ Phase 1 drainage area map indicating existing conditions drainage area, runoff coefficients and peak discharges for 2- and 10-year storms
 - _____ Phase 2 drainage area map indicating drainage areas to selected BMPs, runoff coefficients and peak discharges for 2- and 10-year storms
 - _____ Show and list appropriate control measures defined for each drainage area
 - _____ Total area that will be disturbed during construction (expressed in square feet, acres, and delineated accordingly)
 - _____ Identify areas having different ground covering materials (i.e. concrete, asphalt, gravel, turf, crushed stone, etc.)
 - _____ Delineate any wetlands or Resource Protection Areas (RPA)
 - _____ Legend for line types (must be in accordance with VESCH)
 - _____ Grading for sediment traps and basins
 - _____ Tabulate drainage area, wet volume, dry volume, and clean-out volume for traps and basins with respective elevations
 - _____ Temporary and permanent seeding mixtures
- _____ Erosion and Sediment Control Narrative to include:
 - _____ Adjacent properties
 - _____ Critical areas
 - _____ Soils description
 - _____ BMP strategies

Final DSUP and DSP Checklist:

- _____ Maintenance practices to be employed
- _____ Phasing
- _____ Standard notes
- _____ Stockpiling procedures
- _____ Contaminated soils
- _____ Calculations for:
 - _____ Traps
 - _____ Basins
 - _____ Dewatering structures
 - _____ Culvert protection
 - _____ Culvert sizing
- _____ Block for Certified Responsible Land Disturber
- _____ References to any needed VPDES permit and indication that a copy will be filed with the City
- _____ References to any needed POTW permit and indication that a copy will be filed with the City
- _____ Geotechnical information

STORMWATER MANAGEMENT/BMP SHEETS

(See Article XIII of the Zoning Ordinance for guidance on water quality calculations)

- _____ Water Quality Impact Assessment
 - _____ Location and description of RPA components
 - _____ Location and nature of RPA encroachment
 - _____ Type and location of proposed BMP, with supporting calculations
- In addition, where a MAJOR assessment is required:
 - _____ Hydrogeological element
 - _____ Landscape plan supplement
 - _____ Ecological impact analysis
- _____ Stormwater Management Sheets
 - _____ Outfalls located and determined to be adequate for proposed discharge
 - _____ Pre and post development calculations
 - _____ Drainage divides off-site identified and delineated
 - _____ Drainage divides on-site identified and delineated
 - _____ Show flow routing to detention
 - _____ Calculate HGL and depict on profiles showing 2 feet of freeboard
 - _____ Computation and display of inlet flow
 - _____ Show full flow calculations
 - _____ Demonstrate that velocities are no less than 2 FPS and no more than 20 FPS
 - _____ Use N-values $>36"=0.015$ & $\leq 36" 0.013$
 - _____ Show erosive velocity at outfalls
 - _____ BMP Sheets
 - _____ Water Quality Volume (WQV) computation (in cubic feet and acre-feet)
- _____ Drainage area map with scale and north arrow indicating the area draining to the selected water quality BMPs
- _____ Water Quality Worksheets A or B and C
- _____ City standard water quality BMP data blocks (2)
- _____ BMP detail including WQV default elevation
- _____ Surface appurtenance casting detail

Final DSUP and DSP Checklist:

- _____ Signage detail for surface BMP
- _____ Standard BMP notes
- _____ Waiver approval letters

SIGNING AND MARKING PLANS

- _____ Street layout, including curb lines or edge of pavement, sidewalks, handicap ramp locations
- _____ Existing pavement markings, noting markings to be eradicated
- _____ Proposed new pavement markings, including pattern, width and color
- _____ Dimensions of proposed lane widths, and parking lanes and spaces
- _____ Pavement marking materials specifications, including type and thickness
- _____ Existing signs to be retained, removed or relocated
- _____ Proposed new traffic signs, including locations, MUTCD sign codes where applicable, and special legends
- _____ Sign schedule including sign code, size, legend, sheeting and sign blank specifications, special installation requirements

TRAFFIC SIGNAL PLAN

- _____ Intersection layout showing poles, mast arms, signal head, detector and controller locations and specifications
- _____ Intersection lane use and markings
- _____ Vehicular and pedestrian signal head configurations
- _____ Signal phasing and sequence charts and initial timing plans
- _____ Location of power connection
- _____ Cable and conduit layout, sizes and specifications
- _____ Wiring size and specifications
- _____ Interconnect details
- _____ Specifications for poles, mast arms and pole foundations; pole foundation designs sealed by registered engineer

FIRE SAFETY PLAN

(See 'Water and Fire Requirements For Site Plans and New Construction' prepared and published by the City of Alexandria Fire/EMS Department.)

- _____ Building foot prints, driveways, parking areas.
- _____ Building entrances and exits
- _____ Use group classification and type of construction (defined by USBC).
- _____ Existing and proposed water main location and size
- _____ Existing and proposed fire hydrant locations
- _____ Available water pressure and flow capability, static pressure, residual pressure, flow in GPM
- _____ Fire flow calculations in accordance with city standards that are prepared by a licensed engineer that determine the required fire flow for the project. Verification that the existing and/or proposed infrastructure is capable of providing the required fire flow shall be provided..
- _____ Type of fire suppression or detection system to be provided (e.g. sprinklers, standpipes, smoke or heat detectors).
- _____ Location and size of underground fire lines
- _____ Location of fire department siamese connection (typically, street front of building)
- _____ Height of building in feet and stories
- _____ Identification of fire walls, tenant separations, etc.
- _____ Topographical map relating grade and elevation to fire department connections.
- _____ Location of all Emergency Vehicle Easements and of EVE signs outlining the EVE

Final DSUP and DSP Checklist:

- _____ Emergency vehicle turnaround space for drive aisles in excess of 100 feet.
- _____ Fire ladder truck access to the front and rear of all buildings in excess of 50 feet in height.

DIMENSION PLAN

(The Dimension Plan is to be submitted with the first and second submission as a separate sheet. A paper copy of the dimension plan is to be submitted at the time of the mylar submission.)

Include existing features to be retained and show location, dimension, size, height and elevation of:

- _____ Sidewalks, streets, alleys, driveways and parking lots; (edge of pavement or top of curb)
- _____ Show the full right-of-way width and centerlines of all adjoining streets
- _____ Buildings and structures, showing outside dimensions, including height
- _____ Property lines
- _____ Stoops, steps and staircases
- _____ Locations of building entrances; identification of primary building entrance if applicable
- _____ 3 x,y coordinate pairs in state plane coordinates (NAD 83) conforming to 50 scale (1:600/1"=50') National Map Accuracy Standards.
- _____ Fire Hydrants

Note: The Dimension Plan is used to update the City of Alexandria's Geographic Information System and therefore should contain only the information specified above. Additionally, Alexandria GIS does not meet the threshold for accuracy, as listed for the coordinate data above and is therefore not suitable as source for obtaining this coordinate information.

DETAILS

(Details may be incorporated into relevant sheets if sufficient space is available.)

- _____ Fences and walls, retaining walls
- _____ Street typical sections
- _____ Pavement sections
- _____ Curbs
- _____ Driveway aprons
- _____ Handicap ramps
- _____ Location and dimension of all handicapped parking spaces
- _____ Sidewalks and plaza sections/details
- _____ Signs
- _____ Trash receptacles
- _____ Two benchmarks

THE FOLLOWING SHEETS ARE NOT REQUIRED TO BE PROVIDED IN EVERY SET. INSTEAD, 3 COPIES OF EACH SHEET MAY BE PROVIDED SEPARATELY.

OPEN SPACE EXHIBIT

(The purpose of this sheet is to demonstrate to staff which areas were counted toward open space.)

- _____ parcels
- _____ streets, alleys, driveways, all other areas of paving
- _____ buildings and entrances
- _____ areas counted as open space, shaded and dimensioned with areas counted as usable open space identified
- _____ tabulations of areas counted as open space and usable open space

ARCHITECTURAL ELEVATIONS

- _____ Elevations of each building face, to scale and with dimensions
- _____ Label all building materials

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Revised 5/13/05kmj

1/14/05kmj

9/29/03kmj

8/18/04kmj

4/27/06 kmj

12/14/09 kmj

2/27/12 ral

7/26/13 ral

12/9/2013 jxb

Final DSUP and DSP Checklist:

GRADING PLAN CHECK LIST SUBMISSION REQUIREMENTS:

Per City of Alexandria Code Section 5-6-224 (d)

Note: The following sheets and information are required for every submission. Additional sheets and information should be provided where necessary to demonstrate compliance with City requirements or conditions of approval. Provide a cd of all submission documents, \$500 submission fee, applicable VSMP fee (see VSMP fee schedule-[LINK](#)), and a VSMP application if required with the first submission.

The Check List shall be completed and submitted with first submission of the plans. Failure to comply may result in the plan being deemed incomplete and unacceptable for review.

Property Address: _____

Engineer: _____

Engineer Phone # and Email: _____

Owner/Applicant (do not duplicate Engineer information): _____

Owner/Applicant Contact Phone # and Email: _____

THE UNDERSIGNED HEREBY agrees to allow the City to post an informational notice placard on the subject property for a total of 30 days.

APPLICANT OR AUTHORIZED AGENT:

Name _____

Signature _____

REQUIREMENTS FOR EACH SHEET

- _____ Scale no less than 30' to 1" with scale identified on each sheet
- _____ City grading plan approval signature block in same place (lower right corner) on each sheet
- _____ Date, scale and north arrow with reference to source of meridian
- _____ Name, address, email, signature and registration number of professional preparing the plan on each sheet (original signature required for mylar submission)
- _____ Date the plan was prepared on each sheet/ Date of latest revision
- _____ Name, address, email, and phone number of the developer/builder and/or the owner(s) of record
- _____ Table of standard symbols per common engineering practice and abbreviations utilized in the plan set

ADDITIONAL REQUIREMENTS

- _____ Location map on cover sheet with the site shown in relation to the nearest intersection of two or more streets, parcel number of property (includes the tax reference number)
- _____ A narrative description of the proposed development
- _____ Index to plan sheets

- _____ Total area included in the site plan, total area of tax parcel, total existing and proposed impervious area on the tax parcel, and total area that will be disturbed during construction (all expressed in square feet and acres). The disturbed area will be calculated as described in Memo to the Industry 02-08 on Grading Plan Requirements and Waiver Provisions ([LINK](#))
- _____ If applicable, a list of all special use permits, subdivisions, variances, certificate of appropriateness, special exception, waivers, etc., **approved** for the Grading Plan (i.e. Curb cut approval)
- _____ Copy of Curb cut approval (if required) shown on plan
- _____ City Standard Notes (*amend as applicable- available from Development Coordinator and online under T&ES Memos to Industry- [LINK](#)*)

GRADING PLAN

Show location, dimensions, size, height and elevation of the following along with the existing features to be retained:

- _____ Sidewalks, streets, alleys with widths labeled, and elevations
- _____ Vision clearances (on corner lots)
- _____ Property lines; show course and distance of each site boundary line
- _____ Setback dimensions of front, side and rear yards
- _____ Buildings and structures, including optional decks and other projections such as canopies, roof overhangs
- _____ Stoops, steps and staircases
- _____ Locations of building entrances and exits
- _____ Sump pump and roof drain outfalls [*per the requirements of Memo to Industry 05-14- [LINK](#)*]
- _____ Existing and proposed storm and sanitary sewer systems, including lateral lines in plan and profile.
- _____ Existing and proposed gas mains and service lines in plan view
- _____ Show all utilities on one plan sheet
- _____ Provide profiles for any utility crossings, denoting horizontal and vertical clearances
- _____ Light poles and fixtures on-site and on adjoining rights-of-way
- _____ Driveways, entrances, exits, parking areas; show parking spaces by type (standard, compact and handicap) and indicate the number in each bay and the total count
- _____ Dimensions of new curb cut (if provided) at property line
- _____ Sidewalks, bike and walking trails on site and on abutting streets or public property/easements
- _____ If applicable, recreation areas, swimming pools, etc.
- _____ Watercourses, bodies of water, wetlands and limits of flood plains
- _____ Depict any Resource Protection Areas as defined in Article XIII of the Zoning Ordinance and delineate their appropriate buffer width
- _____ To any wetland or RPA add a note stating that “RPA buffer shall be vegetated with native riparian species and remain undisturbed. RPA is limited to water dependent facilities or redevelopment.”
- _____ Significant geological features and soil types (Hydrologic Soil Group A, B, C or D as defined by NRCS)
- _____ Proposed grading shown with 2' contours on the subject property and on adjacent parcels for sufficient distance to indicate the relationship of the site to off-site terrain. The Director of Transportation and Environmental Services (T&ES), at his discretion, may ask to show the contours at a lesser interval than 2', if required, to understand the pattern of micro drainage from the site and/or the adjacent properties.

- _____ Two benchmarks
- _____ Slopes, terraces and retaining walls, including elevations of level areas and tops and bottoms of walls and exterior stairways and ramps
- _____ Indicate elevations at the base of all utility structures other than individual poles, such as fire hydrants and transformers
- _____ Provide rim elevation and invert elevations of all piping at manholes
- _____ Elevations of streets and alleys
- _____ If an operator intends to meet the requirements established in 9VAC25-870-63 or 9VAC25-870-66 through the use of off-site compliance options, where applicable, then a letter of availability from the off-site provider must be included
- _____ Fee and fee form (Par XIII of Chapter 9VAC25-870)
- _____ A description of any additional control measures necessary to address a TMDL pursuant to subsection E of 9VAC25-870-54
- _____ Standard pollution prevention notes and any other management of site specific pollutants over and above those covered in the notes.

ZONING REQUIREMENTS (Provided on cover sheet)

For each element, list zoning ordinance requirement, number approved on preliminary plan and number proposed on final plan, if different.

- _____ Zoning of the site
- _____ Existing use on the site
- _____ Proposed use for the site
- _____ Existing and required lot area
- _____ Depict building restriction line
- _____ Preliminary gross square feet (GSF) of existing and new building area (attach P&Z floor area calculations sheet). Note FAR review as a Preliminary Review
- _____ Preliminary net square feet (NSF) of existing and new building area (attach P&Z floor area calculations sheet). Note FAR review as a Preliminary Review
- _____ Floor-area-ratio (existing and proposed)
- _____ Open space (existing and proposed)
- _____ Average finished grade of structure for existing and new construction
- _____ Height of structure from existing and average finished grade
- _____ Yards (front, side and rear) required and proposed
- _____ Parking space(s), if applicable listed by total number, size of space and type (compact, standard, and handicapped)
- _____ % of crown coverage existing and proposed (based on P&Z Landscape Guidelines)

****Note: ** If the proposed development includes multiple lots, the zoning tabulation information must be provided for each individual lot unless all the lots will be consolidated in conjunction with the proposal.**

EROSION AND SEDIMENT CONTROL PLANS (When required)

- _____ Delineate the total area that will be disturbed during construction and show it on the plan.
Calculate the total disturbed area as described in the Memorandum to the Industry on Grading Plan Requirements and Waiver Provisions ([LINK](#)) in square feet and acres and show it on the plan. If the total disturbed area is more than 2,500 square feet then the proposed improvements shall be designed to complete the requirements of Article XIII of the Zoning Ordinance of the City of Alexandria.
- _____ Narrative phasing plan including demolition and sequence of construction activities
- _____ All appropriate details of erosion and sediment control measures [must meet Virginia Erosion and Sedimentation Control Handbook (VESCH) standards]
- _____ Sources of water for construction entrance wash down
- _____ Grading for drains and traps for construction entrance runoff
- _____ Show and list appropriate control measures defined for each drainage area
- _____ Identify areas having different ground covering materials (i.e. concrete, asphalt, gravel, turf, crushed stone, etc.)
- _____ Delineate any wetlands or Resource Protection Areas (RPA)
- _____ Legend for line types (must be in accordance with VESCH)
- _____ Temporary and permanent seeding mixtures
- _____ Erosion and Sediment Control Narrative per requirements outlined in Memo 02-09 ([LINK](#))
- _____ BMP strategies (projects with 2,500 SF of disturbed area including construction staging and storage.)
- _____ BMP Narrative
- _____ Delineation and description of areas with contaminated soils
- _____ Erosion & Sediment Control Notes (*amend as applicable- available from Development Coordinator and online under T&ES Memos to Industry- [LINK](#)*)

STORMWATER MANAGEMENT (QUALITY AND QUANTITY) and BMP SHEETS (When Required)

(See Article XIII of the Zoning Ordinance for guidance on water quality calculations and quantity requirements)

- _____ Location and description of RPA components
- _____ Location and nature of RPA encroachment
- _____ Water Quality Impact Assessment, if applicable
- _____ Type and location of proposed BMP (including geographic coordinates- NAD88), with supporting calculations
- _____ Pre and post development runoff calculations for 2 and 10 year storms
- _____ Stormwater Narrative
- _____ Stormwater Outfall Narrative
- _____ Stormwater Outfall Analysis
- _____ Stormwater Detention Facility Design
- _____ Pre and Post-development drainage divides off-site/on-site identified and delineated
- _____ Water Quality Volume (WQV) computation (in cubic feet and acre-feet)
- _____ Drainage area map with hatched areas indicating the impervious area draining to selected water quality BMPs
- _____ Virginia Runoff Reduction Method (VRRM) worksheets
- _____ City standard water quality BMP data blocks (2) (Project Description and Miscellaneous Blocks)

- _____ Signage detail for surface BMP
- _____ Water Quality Improvement Fund request, if applicable, shall be included on the first final plan with original hard copy included. Once the request is approved then both the request and approval letters must be included on the plan of subsequent submissions and/or Mylar.
- _____ BMP and associated structure details including planting plans if applicable.
- _____ BMP Sign details
- _____ BMP table with a separate listing for each individual BMP that includes the name of the practice, total area treated (acres), pervious area treated (acres), impervious area treated (acres), phosphorous removal efficiency (percentage), phosphorous removed by the practice (lbs), and geographic coordinates in decimal degree format. (SWM)
- When required, BMP and/or Detention Maintenance Agreement must be recorded prior to plan release

EXISTING AND PROPOSED VEGETATION

(Refer to included example plan exhibit)

- _____ Required notes for tree preservation and protection, and proposed plantings per the City's Landscape Guidelines
- _____ Inventory, identification, and location(s) of existing trees on-site and within 15 feet of the property line (as applicable) as outlined in the City's Landscape Guidelines.
- _____ Identify existing trees that are to be saved as "TBS" and existing trees that are to be removed as "TBR" (as applicable).
- _____ Location of tree protection fencing per the City's Landscape Guidelines for all trees to be saved.
- _____ Notifications to neighbors per the City's Landscape Guidelines of potential impacts to trees located within 15 feet of the property line on adjacent (as applicable).
- _____ Tree protection details per the City's Landscape Guidelines (as applicable).
- _____ Locations of proposed vegetation.
- _____ A proposed planting schedule indicating species, specifications, quantities, and crown coverage allowance.
- _____ Crown coverage calculations including existing, removed, required, and proposed crown coverage.

City of Alexandria
Municipal Separate Storm Sewer System (MS4) Program Plan
Appendix E – MCM #5: Post-Construction Stormwater Management

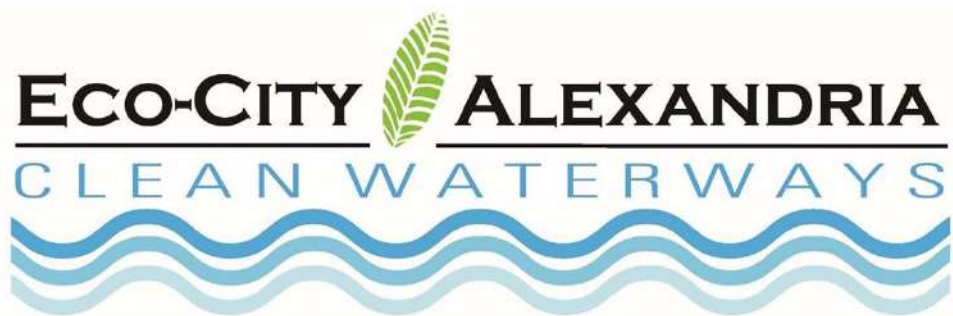


City of Alexandria, Virginia

**Policies and Procedures for Post-Construction BMP
Inspection and Maintenance**

6/5/2014

Updated 4/28/2019



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A. Purpose

The purpose of this document is to provide policies and procedures for the long-term maintenance of Stormwater Best Management Practices (BMPs).

Public BMPs owned and operated by the City of Alexandria will be maintained by the City. Annual Inspections will be performed for all publicly owned and operated BMPs.

Privately owned BMPs will be the responsibility of the property owner or other entity named in the recorded BMP Operation and Maintenance Agreement. City staff will inspect all privately owned BMP facilities other than those that treat stormwater from an individual residential lot at least once during every 5-year Municipal Separate Storm Sewer System (MS4) permit cycle.

B. Public Stormwater BMP Inspections and Maintenance

1. Maintenance Schedule and Guidelines

Public BMPs will be maintained according to the BMP maintenance schedule and guideline specific to each BMP found in Appendix 1 of this document.

2. Inspections

Inspections will be performed on an annual basis. After completion, the results of each inspection and any associated pictures will be entered into the City's database.

3. Follow up

When any BMPs require maintenance, the required maintenance tasks will be addressed as soon as practicable. Any work performed, inspections, and inspection pictures will be documented in the City's database.

C. Private Stormwater BMP Maintenance Regulations

City of Alexandria, Virginia

Stormwater BMP Maintenance Regulations

Effective: July 1, 2014

Updated: April 28, 2019

1. Authority

The following regulations for stormwater Best Management Practice (BMP) maintenance have been adopted as permitted by the Zoning Ordinance of the City of Alexandria section 13-104(C).

These regulations supplement the Zoning ordinance of the City of Alexandria relating to the regulation of stormwater BMP maintenance.

2. BMP Regulations

It is the responsibility of the owner of any stormwater BMP facility as described in the Environmental Management Ordinance to provide adequate maintenance and proper functioning of the system. All BMPs must operate in good working condition and in accordance with the approved design and specifications. Maintenance shall be performed in accordance with the requirements set forth in:

1. The BMP maintenance agreement and;
2. The BMP maintenance schedule and guideline, or in cases where no BMP maintenance schedule and guideline is recorded, in accordance with the maintenance requirements as set forth in the original design.

3. Inspections and Maintenance Records

The owner of any BMP shall keep on file all inspection and maintenance records for the facility. The records shall include at a minimum:

1. The date of inspection or maintenance,
2. The result of the inspection,
3. The type of maintenance performed, if required, and,
4. The signature of the owner of the facility or the individual acting on the owner's behalf.

All records must be kept on file for a minimum of five years and be available for submission to the City upon request.

4. City Inspections

Inspections by the City may be conducted or established on any reasonable basis, including but not limited to: routine inspections; random inspections; inspections based upon complaints or other notice of possible violations; and joint inspections with other agencies inspecting under environmental or safety laws. Inspections may include, but are not limited to: reviewing maintenance and repair records; sampling discharges, surface water, groundwater, and material or water in BMPs; and evaluating the condition of BMPs.

5. Notification of Enforcement Action

If inadequate maintenance is observed by the City, the City shall notify, in writing, the property owner or other person violating these regulations. The notification shall indicate the nature of the violation, contain the address or other description of the site upon which the violation is occurring, order the necessary action to correct the violation, and give a deadline for correcting the violation. Notification will follow the procedure below:

1. The first Letter of Notification shall require the owner to contact the City with a maintenance plan within 30 days and shall allow 90 days for the owner to perform the required BMP maintenance actions.
2. If an adequate response is not received within 30 days following the Letter of Notification, a Letter of Corrective Action will be issued requiring the owner to contact the City with a maintenance plan and to perform the required BMP maintenance within 60 days.
3. If an adequate response is not received within 30 days following the Letter of Corrective Action, a Notice of Noncompliance will be issued requiring the owner to contact the City with a maintenance plan and to perform the required BMP maintenance within 30 days.
4. If an adequate response is not received within 30 days following the Notice of Noncompliance, a Notice of Violation with associated civil penalties will be issued by the City Attorney's Office.

6. Extension of time

A person who receives an enforcement letter, or the owner of the land on which the violation occurs, may submit to the Director or T&ES or his or her designee a written request for an extension of time for correction of the violation. On determining that the request includes enough information to show that the violation cannot be corrected within the specified time limit for reasons beyond the control of the person requesting the extension, the City may extend the time limit as is reasonably necessary to allow timely correction of the violation.

7. Penalties for noncompliance

Any person who violates these regulations shall be subject to a civil penalty. Each day the violation continues shall constitute a separate offense.

1. First time offenders shall be subject to a civil penalty not to exceed five hundred (\$500.00) per day of continuing violation.
2. Repeat violators shall be subject to a civil penalty not to exceed one thousand dollars (\$1000.00) per day of continuing violation.

The City Attorney's Office will pursue collection of the civil penalty through prosecution in the appropriate court. Additionally, the city may perform the necessary corrections and bill the property owner.

D. Procedures for the Inspection of Private Stormwater BMPs

1. Inspection Procedure

All privately owned stormwater BMPs not serving single family residential properties will be inspected a minimum of once during every MS4 permit cycle.

Inspections will be performed according to the following procedures:

1. Prior to inspection, a pre-inspection notification letter will be sent to the property owner and/or contact on file for each BMP. A copy of the pre-inspection notification letter can be found in Appendix 3 of this document.
2. Inspections will be documented on the inspection forms found in Appendix 2 of this document.
3. After the inspection has been completed, documentation of the inspection, including any pictures will be saved in the City's database.
4. After inspection, a post inspection letter will be sent to the property owner and/or contact on file for each BMP with the results of the inspection. If required, the letter will state any maintenance items needed to bring the BMP into compliance with its maintenance requirements. Post-inspection notification letters can be found in Appendix 4 of this document.
5. All enforcement action notification will follow the procedures outlined in the City's Stormwater BMP Maintenance Regulations. All enforcement action letters can be found in Appendix 5 of this document.

2. Documentation

All inspection forms, pre- and post- inspection letters, and applicable enforcement letters will be documented in the City's database after completion of each inspection. Documentation will be kept on file with the City for a minimum of 5 years.

E. Single Family Residential BMP Inspections and Maintenance

It is the responsibility of the owner of any stormwater BMP facility that treats stormwater from an individual residential lot to provide adequate maintenance and proper functioning of the system. All BMPs must operate in good working condition and in accordance with the approved design and specifications.

1. Inspections and Maintenance Records

The owner of any BMP shall keep on file all inspection and maintenance records for the facility. The records shall include at a minimum:

1. The date of inspection or maintenance,
2. The result of the inspection,
3. The type of maintenance performed, if required, and,
4. The signature of the owner of the facility or the individual acting on the owner's behalf.

All records must be kept on file for a minimum of five years and be available for submission to the City upon request.

2. City Outreach and Inspections

As an alternative to required maintenance agreements, the City will perform homeowner outreach targeted to the maintenance of single family residential BMPs. City Staff will mail out annual fact sheets and/or maintenance reminders targeted to the owner of each BMP.

Inspections by the City may be conducted or established on any reasonable basis, including but not limited to: routine inspections; random inspections; inspections based upon complaints or other notice of possible violations; and joint inspections with other agencies inspecting under environmental or safety laws. Inspections may include, but are not limited to: reviewing maintenance and repair records; sampling discharges, surface water, groundwater, and material or water in BMPs; and evaluating the condition of BMPs.

Appendix 1-BMP Maintenance Schedule and Guidelines

Appendix 1-BMP Maintenance Schedule and Guidelines

Bioretention Area Maintenance Schedule and Guidelines

First Year Maintenance Guidelines

Successful establishment of bioretention areas requires that the following tasks be undertaken in the first year following installation:

- Initial inspections. For the first 6 months following construction, the bioretention area should be inspected at least twice after storm events that exceed 1/2 inch of rainfall.
- Spot reseeding. Inspect for bare or eroding areas in the contributing drainage area or around the bioretention area, and make sure they are immediately stabilized with grass cover.
- Watering. Watering is needed once a week during the first 2 months, and then as needed during first growing season (April-October), depending on rainfall.
- Remove and replace dead plants.

Routine Maintenance Guidelines

Bioretention areas must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be documented and addressed as soon as practicable.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Inspect for and remove excess sediment	Annually
Mow grass filter strips and bioretention turf cover	At least four times per year
Weed and rake mulch	Twice during the growing season
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Re-mulch to maintain a three-inch layer	Annually
Prune trees and shrubs	Annually
Inspect for clogging or ponding water in the filter bed	Annually
Remove invasive plants	As needed
Replace dead or damaged plant material	As needed
Repair broken pipes	As needed
Remove sediment in pretreatment cells and inflows	Every 2-3 years
Replace the mulch layer	Every 3 years

Appendix 1-BMP Maintenance Schedule and Guidelines

Constructed Wetlands Maintenance Schedule and Guidelines

First Year Maintenance Guidelines

Successful establishment of constructed wetland areas requires that the following tasks be undertaken in the first year:

- Initial Inspections. During the first 6 months following construction, the site should be inspected at least twice after storm events that exceed 1/2 inch of rainfall.
- Spot Reseeding. Inspect for bare or eroding areas in the contributing drainage area or around the wetland buffer, and make sure they are immediately stabilized with grass cover.
- Watering. Trees planted in the buffer and on wetland islands and peninsulas need watering during the first growing season. In general, consider watering every three days for first month, and then weekly during the first growing season (April - October), depending on rainfall.
- Reinforcement Plantings. Remove and replace any dead or dying plantings.

Routine Maintenance Guidelines

Constructed wetlands must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be documented and addressed as soon as practicable.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Check for and remove nuisance animals and burrows	Annually
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Forebay inspection and cleanout	Annually-remove sediment when forebay reaches 50% capacity or every 5 years
Inspect the orifice and repair any clogging	Annually
Inspect and exercise all mechanical devices	Annually
Inspect for and repair any structural damage and leaks	Annually
Inspect inlets and outlets and repair any clogging and damage	Annually
Remove woody vegetation on or near embankments, forebays, spillways, and outlets	Annually
Check sediment accumulation in the permanent pool	Annually, dredge if necessary
Harvest overgrown vegetation to guide wetland maturation	As needed
Replace displaced rip rap	As needed
Remove invasive plants	As needed
Replace dead or damaged plant material	As needed
Repair broken pipes	As needed

Appendix 1-BMP Maintenance Schedule and Guidelines

Dry Swale Maintenance Schedule and Guidelines

Routine Maintenance Guidelines

Swales must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be documented and addressed as soon as practicable.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Remove any invasive vegetation or weeds	As needed
Mow grass to a height of 4"-9"	As needed to maintain correct height
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Replace any dead or dying plantings	Annually
Remove accumulated sand or sediment	Annually
Inspect check dams and repair any erosion or blockage	Annually
Inspect underdrains and repair any clogging or damage	Annually
Inspect inflow and outlets and repair any clogging or damage	Annually

Appendix 1-BMP Maintenance Schedule and Guidelines

Dry Detention Basin Maintenance Schedule and Guidelines

First Year Maintenance Guidelines

Successful establishment of dry detention basins requires that the following tasks be undertaken in the first year following installation:

- Immediately after the dry extended detention basin is established, the vegetation will be watered twice weekly if needed until the plants become established (commonly six weeks).
- No portion of the dry extended detention pond will be fertilized after the first initial fertilization to establish the vegetation.
- The vegetation in and around the basin will be maintained at a height of approximately six inches.

Routine Maintenance Guidelines

Dry detention basins must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be documented and addressed as soon as practicable.

Routine Maintenance Tasks	Frequency
Remove debris and trash	As needed
Outlet/inlet inspection and cleanout	Annually
Bank mowing and inspection/stabilization of eroded areas	As needed to maintain 4"-9" height
Forebay inspection and cleanout	Annually -remove sediment every 7 years or when sediment volume exceeds 50% of storage volume
Check pond depth	Annually-remove sediment as needed
Remove woody vegetation along embankment	Annually
Inspect for and repair structural damage	Annually
Inspect, exercise, and repair all mechanical devices	Annually
Repair broken pipes	As needed
Replace riprap that has been choked with sediment	As needed

Appendix 1-BMP Maintenance Schedule and Guidelines

Extended Detention (ED) Pond Maintenance Schedule and Guidelines

First Year Maintenance Guidelines

ED Ponds are prone clogging at the ED low-flow orifice. Ideally, the orifice should be inspected at least twice a year after initial construction.

Routine Maintenance Guidelines

ED Ponds must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be documented and addressed as soon as practicable.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Check for and remove nuisance animals and burrows	Annually
Mow area around facility	Twice per year at a minimum
Forebay inspection and cleanout	Annually-remove sediment when 50% capacity reached or every 7 years
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Inspect the orifice and repair any clogging or damage	Annually
Inspect and exercise all mechanical devices	Annually
Inspect for and repair any structural damage and leaks	Annually
Inspect inlets and outlets and repair any clogging or damage	Annually
Remove woody vegetation on or near embankments, forebays, spillways, and outlets	Annually
Check sediment accumulation in the permanent pool	Annually, dredge if necessary
Replace displaced rip rap	As needed
Remove invasive plants	As needed
Replace dead or damaged plant material	As needed
Repair broken pipes	As needed

Appendix 1-BMP Maintenance Schedule and Guidelines

Grass Channel Maintenance Schedule and Guidelines

Routine Maintenance Guidelines

Grass channels must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be documented and addressed as soon as practicable.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Mow grass to height of 4"-9"	As need to maintain correct height
Remove excess sediment accumulation	Annually
Inspect for and repair any clogging	Annually
Inspect check dams and repair any erosion or blockages	Annually
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Remove invasive plants	As needed
Replace dead or damaged plant material	As needed

Appendix 1-BMP Maintenance Schedule and Guidelines

Infiltration Practice Maintenance Schedule and Guidelines

Routine Maintenance Guidelines

Infiltration practices must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be documented and addressed as soon as practicable

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check for and repair eroded areas	Annually
Check for and remove nuisance animals and burrows	Annually
Mow grass to a height of 4"-9"	As needed to maintain correct height
Inspect for and remove excess sediment	Annually
Inspect facility for clogging and repair	Annually
Remove woody vegetation from facility	As needed
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Inspect for and repair any structural damage	Annually
Inspect for and repair any clogged outlets or inlets	Annually
Replace clogged pea gravel, topsoil, and filter fabric	As needed
Remove invasive plants	As needed
Replace dead or damaged plant material	As needed
Repair broken pipes	As needed

Appendix 1-BMP Maintenance Schedule and Guidelines

Permeable Pavement Maintenance Schedule and Guidelines

Routine Maintenance Guidelines

Permeable pavement must be inspected to ensure that it operates in good working condition and in accordance with the approved design and specifications. Items in need of repair must be documented and addressed as soon as practicable.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Inspect for and remove excess sediment	Annually
Inspect facility for clogging and repair any clogging and improper drainage	Annually
Inspect for and repair any structural damage	Annually
Inspect for repair any clogged or damaged inlets and outlets	Annually

Appendix 1-BMP Maintenance Schedule and Guidelines

Proprietary BMP Maintenance Schedule and Guidelines

Routine Maintenance Guidelines

Proprietary systems must be maintained in good working condition and in accordance with the approved design and specifications. All proprietary systems should be inspected and maintained according to the manufacturer's recommendations.

A copy of the manufacturer's recommended inspection and maintenance schedule must be attached to the BMP Maintenance Agreement.

Appendix 1-BMP Maintenance Schedule and Guidelines

Rainwater Harvesting Maintenance Schedule and Guidelines

Routine Maintenance Guidelines

Rainwater harvesting systems must be inspected to ensure they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be documented and addressed as soon as practicable.

All rainwater harvesting system components should be inspected by the responsible party twice per year. A comprehensive inspection by a qualified third-party inspector should occur every third year.

Routine Maintenance Tasks	Frequency
Remove leaves and debris from gutters and downspouts	Semi-annually
Remove any algae growth	Semi-annually
Inspect and clean prescreening devices and first flush diverters	Quarterly
Inspect and clean storage tank lids	Annually
Inspect for and repair any clogging	Annually
Inspect and repair mosquito screens	Annually
Inspect tank and remove sediment build up	Every 3 years
Clear overhanging vegetation and trees over roof	Every 3 years
Check integrity of backflow preventer	Every 3 years
Inspect structural integrity of tank, pump, pipe, and electrical system and repair any damage	Every 3 years
Replace damaged or defective system components	As needed

Appendix 1-BMP Maintenance Schedule and Guidelines

Rooftop Disconnection BMP Maintenance Schedule and Guidelines

Routine Maintenance Guidelines

Rooftop disconnections must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be documented and addressed as soon as practicable.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Inspect for downspout disconnection	Annually
Inspect for and remove any sediment accumulation	Annually
Check that pervious areas receiving flow have not been disturbed or converted	Annually

Appendix 1-BMP Maintenance Schedule and Guidelines

Sand Filter Maintenance Schedule and Guidelines

First Year Maintenance Guidelines

Proper functioning of the sand filter requires that the following tasks be undertaken in the first year:

- Initial Inspections. During the first 6 months following construction, the site should be inspected at least twice after storm events that exceed 1/2 inch of rainfall.

Routine Maintenance Guidelines

Sand filters must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be documented and addressed as soon as practicable.

Routine Maintenance Tasks	Frequency
Remove trash and debris	Annually, or more often if needed
Inspect sedimentation chamber or forebay, cleanout when sediment accumulation exceeds design level	Annually
Inspect for standing water or ponding for more than 48 hours after a storm	Annually
Inspect and exercise all mechanical devices and repair if needed	Annually
Inspect for and repair any structural damage and leaks	Annually
For filters that hold water, check for water at normal pool	Annually
Inspect for and repair any clogging	Annually
Cleanout wet sedimentation chambers	Every 2-3 years or when over ½ full
Remove sediments from dry sedimentation chamber	Every 2-3 years

Appendix 1-BMP Maintenance Schedule and Guidelines

Sheet Flow to Vegetated Filter Areas and Conserved Open Space Maintenance Schedule and Guidelines

Routine Maintenance Guidelines

These practices must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be documented and addressed as soon as practicable.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Mow grass filter strips to prevent woody growth	Semi-annually
Inspect for and remove sediment accumulation	Annually
Inspect level spreader for diffuse flow and repair any channeling	Annually
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Remove invasive plants	As needed
Replace dead or damaged plant material	As needed

Soil Compost Amendment Maintenance Schedule and Guidelines

First Year Maintenance Guidelines

In order to ensure the success of soil compost amendments, the following tasks must be undertaken in the first year following soil restoration:

- Initial inspections. For the first six months following the incorporation of soil amendments, the site should be inspected at least once after each storm event that exceeds 1/2-inch of rainfall.
- Spot Reseeding. Check for bare or eroding areas in the contributing drainage area or around the soil restoration area and make sure they are immediately stabilized with grass cover.
- Fertilization. Depending on the amended soils test, a one-time, spot fertilization may be needed in the fall after the first growing season to increase plant vigor.
- Watering. Water once every three days for the first month, and then weekly during the first year (April-October), depending on rainfall.

Routine Maintenance Guidelines

Soil compost amendments must be maintained in good working condition and in accordance with the approved design and specifications. There are no major on-going maintenance needs associated with compost amendments.

Appendix 1-BMP Maintenance Schedule and Guidelines

Urban Bioretention Area Maintenance Schedule and Guidelines

First Year Maintenance Guidelines

Successful establishment of bioretention areas requires that the following tasks be undertaken in the first year following installation:

- Initial inspections. For the first 6 months following construction, the bioretention area should be inspected at least twice after storm events that exceed 1/2 inch of rainfall.
- Spot reseeding. Inspect for bare or eroding areas in the contributing drainage area or around the bioretention area, and make sure they are immediately stabilized with grass cover.
- Watering. Watering is needed once a week during the first 2 months, and then as needed during first growing season (April-October), depending on rainfall.
- Remove and replace dead plants.

Routine Maintenance Guidelines

Bioretention areas must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be documented and addressed as soon as practicable.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Inspect for and remove excess sediment	Annually
Weed mulch	Twice during the growing season
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Re-mulch to maintain a three-inch layer	Annually
Prune trees and shrubs	Annually
Inspect for clogging or ponding water in the filter bed	Annually
Remove invasive plants	As needed
Replace dead or damaged plant material	As needed
Repair broken pipes	As needed
Replace the mulch layer	Every 3 years

Vegetated Roof Maintenance Schedule and Guidelines

First Year Maintenance Guidelines

Successful establishment of vegetated roofs require that the following tasks be undertaken during the first year following construction:

- Initial inspections. The roof should be inspected monthly during the vegetation establishment period, and then every six months thereafter to assess the state of vegetative cover and to look for leaks, drainage problems and other functional or structural concerns

Routine Maintenance Guidelines

Vegetated roofs must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be documented and addressed as soon as practicable.

The use of herbicides, insecticides, fungicides, and fertilizers should be avoided, since their presence could hasten degradation of the waterproof membrane. Also, power-washing and other exterior maintenance operations should be avoided so that cleaning agents and other chemicals do not harm the vegetated roof plant communities.

Routine Maintenance Tasks	Frequency
Remove trash and debris	Semi-annually
Inspect waterproof membrane for leaks or cracks and repair any damage	Semi-annually
Remove invasive plants	Semi-annually
Inspect and remove overgrowth and debris from roof drains, scuppers and gutters	Semi-annually
Inspect plant composition for consistency with approved plans and correct any deficiencies	Semi-annually
Replace any dead or dying plants	Semi-annually
Remove excess debris, fallen leaves, and overgrowth	Semi-annually
Check and repair areas of erosion	Semi-annually
Water to promote plant growth and survival	As needed

Wet Pond Maintenance Schedule and Guidelines

First Year Maintenance Guidelines

Successful establishment of wet ponds requires that the following tasks be undertaken during the first year following construction.

- Initial inspections. For the first six months following construction, the site should be inspected at least twice after storm events that exceed a 1/2-inch of rainfall.
- Aquatic Benches. Remove and replace dead or dying plants.
- Spot Reseeding. Inspect for eroding areas in the contributing drainage area or around the pond buffer, and make sure they are immediately stabilized with grass cover.
- Watering. Trees planted in the pond buffer need to be watered during the first growing season. In general, consider watering every 3 days for first month, and then weekly during the remainder of the first growing season (April - October), depending on rainfall.

Routine Maintenance Guidelines

Wet Ponds must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be documented and addressed as soon as practicable.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Check for and remove nuisance animals and burrows	Annually
Mow area around facility	Twice per year at a minimum
Forebay inspection and cleanout	Annually-remove sediment when forebay reaches 50% capacity or every 7 years
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Inspect and repair any clogging or damage to the orifice	Annually
Inspect and exercise all mechanical devices	Annually
Inspect for and repair structural damage and leaks	Annually
Inspect and repair any damaged or clogged inlets and outlets	Annually
Remove woody vegetation on or near embankments, forebays, spillways, and outlets	Annually
Check sediment accumulation in the permanent pool	Annually, dredge if necessary
Replace displaced rip rap	As needed
Remove invasive plants	As needed
Replace dead or damaged plant material	As needed
Repair broken pipes	As needed

Appendix 1-BMP Maintenance Schedule and Guidelines

Wet Swale Maintenance Schedule and Guidelines

Routine Maintenance Guidelines

Swales must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be documented and addressed as soon as practicable.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Remove any invasive vegetation	As needed
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Replace any dead or dying plantings	Annually
Remove accumulated sand or sediment	Annually
Inspect for and repair any eroded or blocked check dams	Annually
Inspect for and remove any clogging at inflow and outlets	Annually

Appendix 2-Inspection Forms

Appendix 2-Inspection Forms



City of Alexandria, Virginia BMP Inspection-Bioretention

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Satisfactory (Y/N)	N/A	Comments
Contributing Drainage Area			
Vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Pre-treatment			
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Inlet			
Inlet stability	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash, debris, or sediment	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Inflow blocked by vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Side slopes			
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Sediment accumulation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Nuisance animals	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Vegetation			

Appendix 2-Inspection Forms

Plant composition consistent with approved plans	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Invasive species	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Dead or dying plants	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
75-90% cover (mulch/turf)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Mulch 2"-3" deep	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Grass is more than 6"-10"	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Filter media			
Compacted or inconsistent with plan design	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Mulch condition	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Evidence of oil, grease, chemicals or fertilizer	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash, debris, or sediment	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Clogging	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Underdrain			
Water conveyance	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Standing water present	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Planters (if applicable)			
Water drains within 3-4 hours	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Structural deficiencies	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Outlet			
Trash, debris, or obstructions	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Sediment	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Evidence of erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Obstructions	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Condition of grates	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Observation well present and capped	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Overall			
Adequate facility access	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Mosquito proliferation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Encroachments	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	

Appendix 2-Inspection Forms

Inspection Comments

Appendix 2-Inspection Forms



City of Alexandria, Virginia BMP Inspection-Constructed Wetlands

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Satisfactory (Y/N)	N/A	Comments
Contributing Drainage Area			
Vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Pre-treatment			
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Forebay less than 50% filled	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Clogging	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Adequate vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Inlet			
Inlet stability	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash, debris, or sediment	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Evidence of erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Woody growth	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Nuisance animals	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Vegetation			

Appendix 2-Inspection Forms

Plant composition consistent with approved plans	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Invasive species	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Overgrown grass around facility	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Dead or dying plants	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Wetland Cells and pools			
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Nuisance animals	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Sediment accumulation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Adequately maintaining permanent pool	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Riser and principal spillway			
Structural damage	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Valves operational	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Seepage into conduit	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Clogging	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash rack is clear of debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Obstruction of orifice	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Sediment accumulation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Dam/Embankment			
Cracking, bulging, or sliding	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Soft spots, seepage, or sink holes	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Nuisance animals	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Woody vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Emergency Spillway			
Woody growth	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash, debris, or sediment	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Soft spots, seepage, or sink holes	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Riprap failure	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Obstruction	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Outlet			

Appendix 2-Inspection Forms

Woody growth	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash, debris, or obstructions	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Sediment accumulation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Rip rap failure	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Pipe condition	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Endwall/headwall condition	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Overall			
Adequate facility access	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Mosquito proliferation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Encroachments on pond	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	

Inspection Comments

Appendix 2-Inspection Forms



City of Alexandria, Virginia BMP Inspection-Dry Swale

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Satisfactory (Y/N)	N/A	Comments
Contributing Drainage Area			
Vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Pre-treatment			
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Clogging	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Inlet /swale sides and base			
Inlet stability	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash, debris, or sediment	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Check dams			
Dam functions properly	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash/debris build up behind dam	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Vegetation			

Appendix 2-Inspection Forms

Plant composition consistent with approved plans	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Invasive species	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Dead or dying plants	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Grass height is 4"-9"	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Underdrain			
Water conveyance	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Standing water present	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Outlet			
Trash, debris, or obstructions	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Sediment build up	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Overall			
Adequate facility access	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Mosquito proliferation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Encroachments	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	

Inspection Comments

Appendix 2-Inspection Forms



City of Alexandria, Virginia BMP Inspection-Extended Detention Pond

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Satisfactory (Y/N)	N/A	Comments
Contributing Drainage Area			
Vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Pre-treatment			
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Forebay less than 50% filled	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Clogging	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Inlet			
Inlet stable	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash, debris, or sediment	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Woody growth	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Nuisance animals	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Vegetation			
Plant composition consistent with approved plans	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Invasive species	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	

Appendix 2-Inspection Forms

Grass overgrown around facility	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Dead or dying plants	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Permanent pool/Side slopes			
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Nuisance animals	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Sediment	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Permanent pool maintained	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Riser and principal spillway			
Structural damage	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Valves are operational	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Seepage into conduit	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Evidence of clogging	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash rack clear of debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Obstruction of orifice	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Excessive sediment	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Dam/Embankment			
Cracking, bulging, or sliding	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Soft spots, seepage, or sink holes	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Nuisance animals	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Woody vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Emergency Spillway			
Woody growth	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash, debris, or sediment	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Soft spots, seepage, or sink holes	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Riprap failure	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Obstruction	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Outlet			
Woody growth	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash, debris, or obstructions	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Sediment accumulation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Rip rap failure	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Pipe condition	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Endwall/headwall condition	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	

Appendix 2-Inspection Forms

Overall			
Adequate facility access	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Mosquito proliferation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Encroachments on pond	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	

Inspection Comments

Appendix 2-Inspection Forms



City of Alexandria, Virginia BMP Inspection-Grass Channel

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Satisfactory (Y/N)	N/A	Comments
Contributing Drainage Area			
Vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Pre-treatment			
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Clogging	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Inlet			
Inlet is stable	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash, debris, or sediment	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Check dams			
Proper function of dam	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash/debris build up behind dam	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Vegetation			

Appendix 2-Inspection Forms

Plant composition consistent with approved plans	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Invasive species	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Dead or dying plants	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Grass height is not 4"-9"	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Side slopes			
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Channel Bottom			
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Soil compaction	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Outlet			
Trash, debris, or obstructions	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Sediment build up	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Outlet stable	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Overall			
Adequate facility access	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Mosquito proliferation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Encroachments	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	

Inspection Comments	

Appendix 2-Inspection Forms



City of Alexandria, Virginia BMP Inspection-Hydrodynamic

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Satisfactory (Y/N)	N/A	Comments
Contributing Drainage Area			
Vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Debris Clean Out			
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Clogging	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Structural Components			
Deterioration	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Grates	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Spalling or Cracking	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Sediment Deposition			
Inlets and Outlets	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Sediment build-up below manufacturer's limit	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Overall			
Evidence of flow bypassing	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Odors	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Facility access	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Mosquito			

Appendix 2-Inspection Forms

Encroachments			
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Inspection Comments

Appendix 2-Inspection Forms



City of Alexandria, Virginia BMP Inspection-Infiltration Practice

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Satisfactory (Y/N)	N/A	Comments
Contributing Drainage Area			
Vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Pre-treatment			
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Clogging	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Inlet			
Inlet is stable	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash, debris, or sediment	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Inflow blocked by vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Embankment/Side slopes			
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Sediment build up	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Nuisance animals	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Vegetation			

Appendix 2-Inspection Forms

Plant composition consistent with approved plans	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trees in the facility	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Grass height is more than 4"-9"	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Facility drainage			
Compacted or inconsistent with plan design	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Excessive trash and debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Drawdown 3 days after a ½ inch storm.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Excessive trash, debris, or sediment	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Evidence of erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Evidence of clogging	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Structural			
Spalling or cracking	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Grates condition	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Structural deterioration	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Outlet			
Trash, debris, or obstructions	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Sediment accumulation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Obstructions	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Grates condition	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Observation well present and capped	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Overall			
Adequate facility access	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Mosquito proliferation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Encroachments	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	

Inspection Comments

Appendix 2-Inspection Forms



City of Alexandria, Virginia BMP Inspection-Permeable Pavement

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Satisfactory (Y/N)	N/A	Comments
Contributing Drainage Area			
Vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Pre-treatment/Inlets			
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Clogging	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Pavement Surface			
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Loose material stored on pavement surface	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Sediment accumulation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Pavement stained, clogged or ponded	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Structural Integrity			
Slumping, cracking, spalling or broken pavers	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Observation wells			
Present and capped	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	

Appendix 2-Inspection Forms

Outlet			
Trash, debris, or obstructions	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Sediment build up	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Pipe condition	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Overall			
Adequate facility access	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Mosquito proliferation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Encroachments	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	

Inspection Comments	

Appendix 2-Inspection Forms



City of Alexandria, Virginia BMP Inspection-Rainwater Harvesting

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Satisfactory (Y/N)	N/A	Comments
Overall			
Leaking	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Structural damage evident	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Electric system is functioning	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Sediment accumulation is less than 5% of design volume	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Overhanging trees/vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Captured roof area			
Excessive trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Gutter system			
Clogging	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Runoff reaching the system	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Algae growth	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Sediment accumulation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Mosquitos in system	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Screens and filters			

Appendix 2-Inspection Forms

Debris or sediment present	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Pump			
Pump operational	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Prescreening/first flush			
Trash/debris or obstructions	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Overflow pipe			
Excessive erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Pipe condition	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Encroachments	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	

Inspection Comments

Appendix 2-Inspection Forms



City of Alexandria, Virginia BMP Inspection-Rooftop Disconnection

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Satisfactory (Y/N)	N/A	Comments
Piping, gutters, and drains			
Downspouts remain disconnected	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Runoff is entering pervious area	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Downstream treatment			
Treatment practice in place	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Ponding at point of disconnection	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Adequate facility access	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Mosquito proliferation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Encroachments	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	

Appendix 2-Inspection Forms

Inspection Comments

Appendix 2-Inspection Forms



City of Alexandria, Virginia BMP Inspection-Sand Filter

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

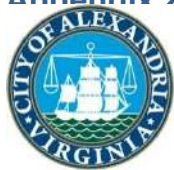
Parameter	Satisfactory (Y/N)	N/A	Comments
Contributing Drainage Area			
Vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Inlet			
Inlet stability	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash, debris, or sediment	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Oil and grease entry minimized	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Sedimentation Chambers			
Sediment level below recommended cleanout	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Water level at normal pool	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash and debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Filter media			
Clogging	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	

Appendix 2-Inspection Forms

Media condition acceptable	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Water retention			
Water at normal pool	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Leakage	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Structural components			
Structural deterioration	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Grates and manholes condition	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Spalling or cracking	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Outlet			
Structural deterioration	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash, debris, or sediment	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Obstruction	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Pump			
Conduits intact	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash, debris, or obstructions	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Panel box marked	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Pump failure	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Overall			
Adequate facility access	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Mosquito proliferation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Encroachments	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Noticeable odors	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	

Inspection Comments	

Appendix 2-Inspection Forms



City of Alexandria, Virginia

BMP Inspection-Sheet flow to vegetated areas

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Satisfactory (Y/N)	N/A	Comments
Contributing Drainage Area			
Vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Inlet			
Inlet is stable	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash, debris, or sediment	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Channel			
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Accumulation of trash/debris at top of filter area	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Vegetation			
Plant composition consistent with approved plans	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Invasive species	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Dead or dying plants	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Gravel diaphragm			
In place and functioning	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	

Appendix 2-Inspection Forms

Level spreader			
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Concentrated flow	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Outlet			
Trash, debris, or obstructions	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Sediment accumulation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Outlet stable	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Overall			
Adequate facility access	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Mosquito proliferation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Encroachments	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	

Inspection Comments

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Satisfactory (Y/N)	N/A	Comments
Overall			
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Excessive fertilizer/chemical use	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	

Inspection Comments

Appendix 2-Inspection Forms



City of Alexandria, Virginia

BMP Inspection-Proprietary Filter Device

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Satisfactory (Y/N)	N/A	Comments
Contributing Drainage Area			
Vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Inlet			
Inlet is stable	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash, debris, or sediment	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Pretreatment Chambers			
Sediment level in chamber	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Filter media			
Clogging	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Sediment in chamber	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Sediment on cartridges	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Water retention			
Water holding chambers at normal pool	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Leakage	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	

Appendix 2-Inspection Forms

Structural components			
Structural deterioration	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Grates and manholes condition	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Spalling or cracking	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Outlet/ Spillway			
Structural deterioration	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash, debris, or sediment	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Obstruction	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Pump			
Conduits intact	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash, debris, or obstructions	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Panel box marked	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Pump failure	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Overall			
Adequate facility access	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Mosquito proliferation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Encroachments	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Noticeable odors	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	

Inspection Comments

Appendix 2-Inspection Forms



City of Alexandria, Virginia BMP Inspection-Vegetated Roof

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Satisfactory (Y/N)	N/A	Comments
Vegetation			
Plant composition consistent with approved plans	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Dead or dying plants	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Plants are choking on excess vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Invasive vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Overgrown grass	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Drought conditions	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Pest infestations	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Structural components			
Waterproof membrane is not leaking or cracked	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Drainage layer and inlet			
Clogging	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Inlet condition	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Soil substrate			
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Clogging	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	

Appendix 2-Inspection Forms

Overall			
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Mosquito proliferation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Damage/vandalism	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	

Inspection Comments

Appendix 2-Inspection Forms



City of Alexandria, Virginia BMP Inspection-Wet Pond

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Satisfactory (Y/N)	N/A	Comments
Contributing Drainage Area			
Vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Pre-treatment			
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Forebay less than 50% filled	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Clogging	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Adequate vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Inlet			
Inlet stability	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash, debris, or sediment	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Evidence of erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Woody growth	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Nuisance animals	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Vegetation			

Appendix 2-Inspection Forms

Plant composition consistent with approved plans	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Invasive species	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Overgrown grass around facility	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Dead or dying plants	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Permanent pool/Side slopes			
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Nuisance animals	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Sediment accumulation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Adequately maintaining permanent pool	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Riser and principal spillway			
Structural damage	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Valves operational	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Seepage into conduit	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Clogging	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash rack is clear of debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Obstruction of orifice	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Sediment accumulation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Dam/Embankment			
Cracking, bulging, or sliding	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Soft spots, seepage, or sink holes	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Nuisance animals	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Woody vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Emergency Spillway			
Woody growth	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash, debris, or sediment	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Soft spots, seepage, or sink holes	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Riprap failure	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Obstruction	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	

Appendix 2-Inspection Forms

Outlet			
Woody growth	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash, debris, or obstructions	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Sediment accumulation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Rip rap failure	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Pipe condition	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Endwall/headwall condition	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Overall			
Adequate facility access	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Mosquito proliferation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Encroachments on pond	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	

Inspection Comments	

Appendix 2-Inspection Forms



City of Alexandria, Virginia BMP Inspection-Wet Swale

Project Name:
Location:
Project #:
BMP Type:
BMP Info:

Inspection Date:	Inspection Time:
Primary Inspector:	Time since last precipitation:
Secondary Inspector:	Amount of last precipitation:

Flow condition:
Structural condition:
Overall condition:

Parameter	Satisfactory (Y/N)	N/A	Comments
Contributing Drainage Area			
Vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Pre-treatment			
Trash or debris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Clogging	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Vegetation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Inlet			
Inlet stability	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Trash, debris, or sediment	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Check dams			
Proper function of dam	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Accumulation of trash/debris behind dam	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Vegetation			

Appendix 2-Inspection Forms

Plant composition consistent with approved plans	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Invasive species	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Dead or dying plants	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Outlet			
Trash, debris, or obstructions	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Sediment accumulation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Overall			
Adequate facility access	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Mosquito proliferation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	
Encroachments	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	

Inspection Comments	

Appendix 3-Pre-Inspection Notification Letter



City of Alexandria, Virginia

Department of Transportation & Environmental Services
Stormwater Management Division
2900-B Business Center Drive
Alexandria, VA 22314
www.alexandriava.gov

DATE

«Owner_Name»

«OWNER_ADDRESS»

«Owner_City», «Owner_State» «Owner_Zip»

RE: STORMWATER BEST MANAGEMENT PRACTICE (BMP) FACILITY INSPECTION

«Plan_Name», «BMP_Address», «BMP_City», «BMP_State» «BMP_Zip»

(Project #«BMP_ID» – «BMP_Type_Full»)

Dear Facility Owner:

As part of the City's stormwater program, staff will be visiting the above-referenced project to inspect the stormwater Best Management Practice (BMP) facility within the next few weeks. This inspection ensures proper maintenance activities are being performed and that the BMP is functioning according to design. The City performs maintenance inspections of stormwater BMPs to meet regulatory requirements as well as practice good environmental stewardship. It is the responsibility of the owner to ensure proper maintenance and functioning of the BMP that serves their property.

Examples of stormwater BMPs include ponds, bioretention areas, sand filters, hydrodynamic devices, and vegetated buffer strips, to name a few. These BMPs improve the quality of stormwater runoff from a developed site by reducing pollutants such as sediment, oil, litter, and excess nutrients that enter our local streams and waterways, such as Four Mile Run, Cameron Run, Holmes Run, the Potomac River and Chesapeake Bay.

As required by the Virginia Stormwater Management Act and Chesapeake Bay Preservation Act, the Environmental Management Ordinance (Article XIII of the Alexandria Zoning Ordinance) establishes the City's stormwater management program and sets forth the owner's inspection and maintenance requirements and the City's quality assurance inspections. Additionally, under the Virginia Stormwater Management Program permit regulations (9VAC25-870), the Virginia Department of Environmental Quality (DEQ) requires the City to control pollution to the maximum extent practicable and to ensure that BMPs are being maintained and function properly.

City Code Section 13-109(G) states that all stormwater BMPs must be adequately maintained by their owners. This is also outlined in the BMP maintenance agreement executed between the site developer/owner and the City to ensure proper functioning and regular maintenance for the life of the

facility. This agreement is on file in our office and conveys to successive landowners with the property deed.

City staff will inspect the above referenced facility in the next few weeks. If you would like to be present for the inspection, it can be scheduled when you can be onsite to discuss any issues and answer any questions you may have about the facility. Please contact me by phone at 703-746-4071 or by email to schedule the inspection or to discuss this further.

A post-inspection letter will be sent following the inspection. In instances where inadequate maintenance is observed or the facility is malfunctioning, this letter will list maintenance requirements and will specify a period of time to correct the deficiencies. Documentation of maintenance must be provided to this office and will be kept on file. **Failure to complete required maintenance activities may result in a notice of violation and assessment of civil penalties.**

Our records show that you are the owner – or may act on behalf of the owner – of the facility. However, if you are not the appropriate contact for the facility, please let me know or forward this letter to the appropriate person or organization.

Your time and cooperation are greatly appreciated and working together will help to achieve our goal of protecting our streams, the Potomac River, and the Chesapeake Bay. Please feel free to contact me if you have any questions or need any additional information. Please reference the project # located at the top of this letter in your correspondence.

Sincerely,

Water Quality Compliance Specialist
City of Alexandria, VA

Appendix 4-Post-Inspection Letters

Post inspection Letter-No maintenance required



City of Alexandria, Virginia

Department of Transportation & Environmental Services
Stormwater Management Division
2900-B Business Center Drive
Alexandria, VA 22314
www.alexandriava.gov

DATE

«Owner_Name»

«Owner_Address»

«Owner_City», «Owner_State» «Owner_Zip»

RE: POST INSPECTION – STORMWATER BEST MANAGEMENT PRACTICE (BMP) FACILITIES

«Plan_Name», «BMP_Address», «BMP_City», «BMP_State» «BMP_Zip»

(Project #«BMP_ID» – «BMP_Type_Full» & BMP)

Dear Facilities Owner:

The City performed an inspection of the above-referenced stormwater Best Management Practice (BMP) facility on **DATE**. This letter is sent to inform you of the inspection findings and any required maintenance activities that must be performed.

As part of the City's stormwater program, staff inspects stormwater Best Management Practice (BMP) facilities to ensure proper maintenance activities are being performed and that the BMP is functioning according to design. The City performs maintenance inspections of stormwater BMPs to meet regulatory requirements as well as practice good environmental stewardship.

As required by the Virginia Stormwater Management Act and Chesapeake Bay Preservation Act, the Environmental Management Ordinance (Article XIII of the Alexandria Zoning Ordinance) establishes the City's stormwater management program and sets forth the owner's inspection and maintenance requirements and the City's quality assurance inspections. Additionally, under the Virginia Stormwater Management Program permit regulations (9VAC25-870), the Virginia Department of Environmental Quality (DEQ) requires the City to control pollution to the maximum extent practicable and to ensure that BMPs are being maintained and function properly.

City Code Section 13-109(G) states that all stormwater BMPs must be adequately maintained by their owners. This is also outlined in the BMP maintenance agreement executed between the site developer/owner and the City to ensure proper functioning and regular maintenance for the life of the facility. This agreement is on file in our office, runs with the land as part of the recorded deed and is thus binding on subsequent landowners.

The following observations were made during the inspection:

Plan number and Name

- Comments

No action is necessary at this time. Please continue routine inspection and maintenance of the facility to ensure it functions as designed.

Your time and cooperation are greatly appreciated and will help to achieve our goal of protecting our streams, rivers and the Chesapeake Bay. Please contact me directly at 703-746-4071 or via email at xxx@alexandriava.gov if you have any questions, need additional information.

Thank you for your time and cooperation with regard to this matter.

Sincerely,

Water Quality Compliance Specialist

Post-Inspection Letter-Maintenance Required



City of Alexandria, Virginia
Department of Transportation & Environmental Services
Stormwater Management Division
2900-B Business Center Drive
Alexandria, VA 22314
www.alexandriava.gov

DATE

«Owner_Name»

«Owner_Address»

«Owner_City», «Owner_State» «Owner_Zip»

RE: POST INSPECTION – STORMWATER BEST MANAGEMENT PRACTICE (BMP) FACILITIES

«Plan_Name», «BMP_Address», «BMP_City», «BMP_State» «BMP_Zip»

(Project #«BMP_ID» – «BMP_Type_Full» & BMP)

Dear Facilities Owner:

The City performed an inspection of the above-referenced stormwater Best Management Practice (BMP) facility on **DATE**. This letter is sent to inform you of the inspection findings and required maintenance activities that must be performed. Documentation of maintenance must be received by this office within the timeframe provided below to avoid a notice of violation for noncompliance.

Section 13-109 of the Environmental Management Ordinance (Article XIII of the Alexandria Zoning Ordinance) requires the City of Alexandria to perform maintenance inspections of stormwater BMPs and ensure their proper function. Additionally, under Virginia Stormwater Management Program permit regulations (9VAC 25-870), the Virginia Department of Environmental Quality (DEQ) requires the City to ensure adequate long-term operation and maintenance of these BMPs by requiring the owner to develop a recorded inspection and maintenance schedule.

City ordinance {13-109(G)} states that all stormwater BMPs must be adequately maintained by the property owners. This is also outlined in the BMP maintenance agreement executed between the owner (or site developer) and the City to ensure proper functioning and regular maintenance for the life of the facility. This agreement is on file in our office, runs with the land as part of the recorded deed and is thus binding on subsequent landowners.

The following observations were made during the inspection and require maintenance:

Plan number and Name

- Comments

Immediate maintenance is required to restore proper functioning of the facility. Please perform maintenance of the facility and provide the below requested information.

Provide the following:

- Within **30 days** from the date of this letter provide a written plan identifying applicable maintenance / corrective actions that will be taken. The plan may be submitted by mail or email.
- Perform maintenance / corrective actions within **90 days** of the date of this letter. Provide documentation of the work performed to this office. Documentation may be submitted by mail or email.

Please reference the Project # in your correspondence as listed at the beginning of this letter.

Your time and cooperation are greatly appreciated and will help to achieve our goal of protecting our streams, rivers and the Chesapeake Bay. Please contact me directly at 703-746-4071 or via email at xxx@alexandriava.gov if you have any questions, need additional information, or to submit the above requested information.

Thank you for your time and cooperation with regard to this matter.

Sincerely,

Water Quality Compliance Specialist

Appendix 5-Enforcement Letters

Notice of corrective action required



City of Alexandria, Virginia

Department of Transportation & Environmental Services
Stormwater Management Division
2900-B Business Center Drive
Alexandria, VA 22314
www.alexandriava.gov

DATE

«Owner_Name»

«Owner_Address»

«Owner_City», «Owner_State» «Owner_Zip»

RE: STORMWATER BEST MANAGEMENT PRACTICE (BMP) FACILITY MAINTENANCE
«Plan_Name», «BMP_Address», «BMP_City», «BMP_State» «BMP_Zip»

Certified Mail #

NOTICE OF CORRECTIVE ACTION REQUIRED

Dear Facility Owner:

On **DATE**, a certified letter from the City of Alexandria was sent notifying you that the stormwater Best Management Practice (BMP) on the above-referenced property required maintenance and was out of compliance with the City's Environmental Management ordinance. The prior notification letter required you to contact the city within 30 days with a plan for maintenance and to perform all required maintenance within 90 days. As of today, the City has not received an adequate response to this letter.

Documentation of maintenance must be received by this office within the timeframe provided below to avoid a notice of violation for noncompliance and the associated penalty fees.

Section 13-109 of the Environmental Management Ordinance (Article XIII of the Alexandria Zoning Ordinance) requires the City of Alexandria to perform maintenance inspections of stormwater BMPs and ensure their proper function. Additionally, under Virginia Stormwater Management Program permit regulations (9VAC 25-870), the Virginia Department of Environmental Quality (DEQ) requires the City to ensure adequate long-term operation and maintenance of these BMPs by requiring the owner to develop a recorded inspection and maintenance schedule.

City Code Section 13-109(G) states that all stormwater BMPs must be adequately maintained by the property owners. This is also outlined in the BMP maintenance agreement executed between the owner (or site developer) and the City to ensure proper functioning and regular maintenance for the life of the

facility. This agreement is on file in our office, runs with the land as part of the recorded deed and is thus binding on subsequent landowners.

The following observations were made during the inspection and require maintenance:

Plan name and Number

- Comments

Immediate maintenance is required to restore proper functioning of the facility. Perform maintenance of the facility and provide the below requested information.

Provide the following:

- Within **30 days** from the date of this letter provide a written plan identifying applicable maintenance / corrective actions that will be taken. The plan may be submitted by mail or email.
- Perform maintenance / corrective actions within **60 days** of the date of this letter. Provide documentation of the work performed to this office. Documentation may be submitted by mail or email.

Please reference the Project # in your correspondence as listed at the beginning of this letter.

Failure to provide the required information and/or perform the required BMP maintenance in the timeframe allowed may result in a notice of violation which carries penalties of up to \$32,500 per day per violation until the required maintenance has been completed.

Your time and cooperation are greatly appreciated and will help to achieve our goal of protecting our streams, rivers and the Chesapeake Bay. Please contact me directly at 703-746-4071 or via email at xxx@alexandriava.gov if you have any questions, need additional information, or to submit the above requested information.

Thank you for your time and cooperation with regard to this matter.

Sincerely,

Water Quality Compliance Specialist

Notice of noncompliance



City of Alexandria, Virginia
Department of Transportation & Environmental Services
Stormwater Management Division
2900-B Business Center Drive
Alexandria, VA 22314
www.alexandriava.gov

DATE

«Owner_Name»

«Owner_Address»

«Owner_City», «Owner_State» «Owner_Zip»

RE: STORMWATER BEST MANAGEMENT PRACTICE (BMP) FACILITY MAINTENANCE
«Plan_Name», «BMP_Address», «BMP_City», «BMP_State» «BMP_Zip»

Certified Mail #

NOTICE OF NONCOMPLIANCE

Dear Facility Owner:

On **DATE**, a certified letter from the City of Alexandria was sent notifying you that the stormwater Best Management Practice (BMP) on the above-referenced property required maintenance and was out of compliance with the City's Environmental Management Ordinance. A second notice of corrective action was sent on **DATE**. The prior notification letter required you to contact the city within 30 days with a plan for maintenance and to perform all required maintenance within 60 days. As of today, the City has not received an adequate response to this letter.

You have 30 days from the date of this letter to either repair the BMPs or submit in writing a request for an extension. Failure to repair the BMPs or submit in writing for an extension shall result in the issuance of a NOTICE OF VIOLATION. Each notice of violation for failure to maintain a stormwater BMP may result in the assessment of a civil penalty of up to \$32,500 per day per violation until corrective action is completed.

Section 13-109 of the Environmental Management Ordinance (Article XIII of the Alexandria Zoning Ordinance) requires the City of Alexandria to perform maintenance inspections of stormwater BMPs and ensure their proper function. Additionally, under Virginia Stormwater Management Program permit regulations (9VAC 25-870), the Department of Environmental Quality (DEQ) requires the City to ensure adequate long-term operation and maintenance of these BMPs by requiring the owner to develop a recorded inspection and maintenance schedule.

City Code Section 13-109(G) states that all stormwater BMPs must be adequately maintained by the property owners. This is also outlined in the BMP maintenance agreement executed between the owner (or site developer) and the City to ensure proper functioning and regular maintenance for the life of the facility. This agreement is on file in our office, runs with the land as part of the recorded deed and is thus binding on subsequent landowners.

The following observations were made during the inspection and require maintenance:

Plan Number and Name

- Comments

Immediate maintenance is required to restore proper functioning of the facility.

Your time and cooperation are greatly appreciated and will help to achieve our goal of protecting our streams, rivers and the Chesapeake Bay. Please contact **NAME** in the Stormwater Management Division directly at 703-746-4071, via email if you have any questions, need additional information, or to submit the above requested information.

Thank you for your time and cooperation with regard to this matter.

Sincerely,

Division Chief
TES/Stormwater Management Division

CC: , Water Quality Compliance Specialist
 , Watershed Management Planner
 , Deputy Director of Transportation and Environmental Services
 , Director of Transportation and Environmental Services
 , Deputy City Attorney

Notice of Violation



City of Alexandria, Virginia
Department of Transportation & Environmental Services
Stormwater Management Division
2900-B Business Center Drive
Alexandria, VA 22314
www.alexandriava.gov

DATE

«Owner_Name»

«Owner_Address»

«Owner_City», «Owner_State» «Owner_Zip»

RE: STORMWATER BEST MANAGEMENT PRACTICE (BMP) FACILITY MAINTENANCE
«Plan_Name», «BMP_Address», «BMP_City», «BMP_State» «BMP_Zip»

NOTICE OF VIOLATION

Dear Facility Owner:

On **DATE**, a certified letter from the City of Alexandria was sent notifying you that the stormwater Best Management Practice (BMP) on the above-referenced property required maintenance and was out of compliance with the City's Environmental Management ordinance. A second notice of corrective action was sent on **DATE**. A final notice of noncompliance was sent on **DATE**.

Due to failure to respond to multiple notices by the City and/or to repair the above-reference BMP, you are hereby served a **NOTICE OF VIOLATION for failure to maintain a BMP and violation of the City's Environmental Management Ordinance**. City Code Section 13-109(G) states that all stormwater BMPs must be adequately maintained by their owners. This is also set forth in the BMP maintenance agreement executed between the site developer and the City to ensure proper functioning and regular maintenance for the life of the facility. This agreement is on file in our office, runs with the land as part of the recorded deed and is thus binding on subsequent landowners.

You will be assessed a civil penalty of \$500 per day per violation beginning **DATE until the corrective actions below are completed.**

The following maintenance items are required to bring your BMP into compliance:

Plan Number and Name

- Comments

This office will pursue collection of the civil penalty through prosecution in the appropriate court. Additionally, the city may perform the necessary corrections and bill the property owner.

Your time and cooperation are greatly appreciated and will help to achieve our goal of protecting our streams, rivers and the Chesapeake Bay. Please contact **NAME** in Stormwater Management Division directly at 703-746-4071 or via email at [email](#) if you have any questions about the BMP corrective measures. Please contact me with any questions about the scope and nature of the impending legal proceedings.

Please let me know if you have any questions.

Yours very truly,

Deputy City Attorney

CC: , Water Quality Compliance Specialist
 , Watershed Management Planner
 , Deputy Director of Transportation and Environmental Services
 , Director of Transportation and Environmental Services



STANDARD MAINTENANCE AND MONITORING AGREEMENT STORMWATER BMP FACILITIES MAINTENANCE / MONITORING AGREEMENT

THIS AGREEMENT, made and entered into this _____ day of _____, 20____, by and between, _____ hereinafter called the "Landowner", and the City of Alexandria, Virginia (the "City");

WITNESSTH:

WHEREAS, the Landowner is the owner of certain real property described as tax map # _____, block # _____, parcels # _____ as acquired by deed in the land records of the City of Alexandria, Virginia, Deed book _____ Page # _____ (Instrument # _____,) hereinafter called the "Property".

WHEREAS, the Landowner is proceeding to build on and develop the property; and

WHEREAS, _____, hereinafter called the "Plan", which is expressly made a part hereof, as approved or to be approved by the City, provides for detention on-site treatment of stormwater within the confines of the property; and

WHEREAS, the City and the Landowner, its successors and assigns agree that the health, safety and welfare of the residents of the City of Alexandria, Virginia, require that on-site stormwater management/Best Management Practices (BMP) facilities be constructed and maintained on the property; and

WHEREAS, the City requires that on-site stormwater management/BMP facilities as shown on the Plan be constructed and adequately maintained by the Landowner, its successors and assigns.

NOW, THEREFORE, in consideration of the foregoing premises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

1. The on-site stormwater management/BMP facilities shall be constructed by the Landowner, its successors and assigns, in accordance with the plans and specifications identified in the plans.
2. The Landowner, its successors and assigns, shall maintain the stormwater management/BMP facilities in good working conditions, acceptable to the City, so that they are performing their design functions.
3. The Landowner, its successors and assigns, hereby grant permission to the City, its authorized agents and employees, to enter upon the property and to inspect the stormwater management/BMP facilities whenever the City deems necessary. The purpose of the inspection is to assure safe and proper functioning of the facilities. The inspection shall cover the entire

facility including, berms, inlet and outlet structures, vegetation, infiltration media, pond areas, access roads, etc. When deficiencies are noted, the City shall notify the Landowner, its successors and assigns, and provide information the inspection findings and evaluations.

4. In the event the Landowner, its successors and assigns, fail to maintain the stormwater management/BMP facilities in good working condition acceptable to the City, the City may enter upon the Property and take whatever steps it deems necessary to maintain said stormwater management/BMP facilities and to charge the costs of the repairs to the Landowner, its successors and assigns. This provision shall not be construed to allow the City of Alexandria to erect any structure of a permanent nature on the land of the Landowner, outside of an easement belonging to the City. It is expressly understood and agreed that the City is under no obligation to maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the City.

5. The Landowner, its successors and assigns, will perform maintenance in accordance with the maintenance schedule for the stormwater management/BMP facilities including sediment removal as outlined on the approved plans and the following specific requirements:

Maintenance of the following Best Management Practice(s):

shall conform to the approved plan's maintenance requirements, requirements contained in Chapter 2 of the Alexandria Supplement to the Northern Virginia BMP Handbook, the Northern Virginia Regional Commission guidebook Maintaining Stormwater Systems: A Guidebook for Private Owners and Operator in Northern Virginia, and/or specific maintenance requirements established by the manufacturer as approved by the Director of Transportation and Environmental Services (T&ES) prior to the release of the Final Site Plan. Specific manufacturer maintenance requirements for the BMP will be submitted to the City of Alexandria, T&ES.

6. In the event the City, pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials and the like on account of the Landowner's or its successors' and assigns' failure to perform such work, the Landowner, its successors and assigns, shall reimburse the City, upon demand, within 30 days of receipt thereof for all costs incurred by the City hereunder. If not paid within such 30-day period, the City shall have a lien against the property in the amount of such costs, plus interest at the Judgment Rate, and may enforce it in the same manner a lien for real property taxes may be enforced.

7. The Landowner, its successors and assigns, shall indemnify and hold harmless the City and its agents and employees for any and all damages, accidents, casualties, occurrences or claims which might arise or be asserted against the City for the construction, presence, existence or maintenance of the stormwater management/BMP facilities by the Landowner, its successors and assigns.

8. In the event a claim is asserted against the City, its agents or employees, the City shall promptly notify the Landowners, their successors and assigns, and they shall defend, at their own expense, any suit based on such claim. If any judgment or claim against the City, its agents or employees shall be allowed, the Landowner, its successors and assigns shall pay all costs and expenses in connection therewith.

9. The Landowner, its successors and assigns, hereby grants permission to the city, its authorized agents, employees, guests, and consultants to enter upon the property to install, operate and maintain equipment to monitor the flow characteristics and pollutant content of the influent and effluent, and at intermediate points in the facility. The Landowner further agrees to design and construct the facility to provide access for monitoring as outlined in Chapter 2 of the Alexandria Supplement to the Northern Virginia BMP Handbook and/or in the manufacturer manual for the BMP.

10. The Landowner, its successors and assigns, hereby grants permission to the City, its authorized agents, employees and guests to enter upon the property whenever the City deems necessary, with a ten day advance notice, to conduct tours of the stormwater management/BMP facilities. The purpose of such tours is to expand the base of knowledge in the stormwater management/BMP field amongst planners, engineers, scientists and other interested parties.

11. This Agreement shall be recorded among the land records of the City of Alexandria, Virginia, and shall constitute a covenant running with the land/or equitable servitude, and shall be binding on the Landowner, its administrators, executors, assigns, heirs and other successors in interest.

WITNESS the following signatures and seals:

Landowner Signature

Print or Type Name

Title

ATTEST:

COMMONWEALTH OF _____

CITY OF _____

I, _____, a Notary Public in and for the City and Commonwealth aforesaid, whose commission expires on the ____ day of _____, 20__, do hereby certify that _____, whose name(s) is/are signed to the foregoing Agreement bearing date of the _____ day of _____, 20__, has acknowledged the same before me in my said City and State.

GIVEN UNDER MY HAND THIS _____ day of _____, 20__.

NOTARY PUBLIC

WITNESS the following signatures and seals.

Director, Department of T&ES or Designee

Print or Type Name

ATTEST:

COMMONWEALTH OF _____
CITY OF _____

I, _____, a Notary Public in the City of Alexandria
and for the Commonwealth of Virginia, whose commission expires on the _____ day of
_____, 20 __, do hereby certify that _____, representative for
the City of Alexandria, whose name is signed to the foregoing Agreement bearing the
date of the _____ day of _____, 20 __, has acknowledged the same before me in the
City and Commonwealth aforesaid.

GIVEN UNDER MY HAND THIS _____ day of _____, 20 ____.

NOTARY PUBLIC



INSTRUCTIONS FOR PREPARING: STANDARD MAINTENANCE AND MONITORING AGREEMENT STORMWATER BMP FACILITIES MAINTENANCE / MONITORING AGREEMENT

The following instructions are provided to help the applicant properly complete steps associated with this agreement.

- Day, date and Landowner are self-explanatory and must be provided
- Description of property should be provided in full, in the spaces provided
- **Project Name**
- **Project Number** as assigned by the City of Alexandria
- Specify the **Number**, and then the **Specific Type** of stormwater quality BMP facility. If different BMPs are employed for the same project, provide type and number of each being constructed.
- Execute and notarize the document in the spaces provided.
- T&ES staff will also execute and notarize the document.

*This document must be executed and recorded with the Land Records Division of the Alexandria Circuit Court. **The applicant must submit proof (i.e. Receipt) that this agreement has been recorded prior to release of site plan.***

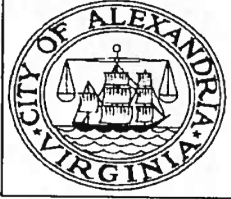
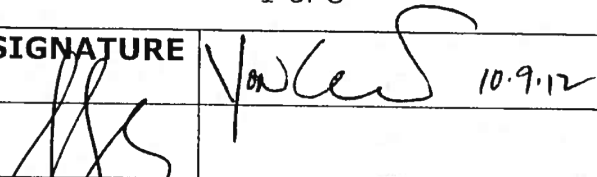
The following shall be completed by the applicant prior to release of the Performance Bond (if applicable)

- The applicant must submit a written certification by a Registered Engineer or Licensed Surveyor that the BMP(s) have been constructed and installed as designed and in accordance with the Final Site Plan.
- Submit a certification by a qualified professional, to the satisfaction of the Director of T&ES, that any existing stormwater management facilities and associated conveyance systems adjacent to the project were not adversely affected by construction operations and that they are functioning.
- A copy of the BMP Operation and Maintenance Manual shall be submitted to the Division of Environmental Quality via written or digital media. A copy of the executed maintenance service contract made with a qualified private contractor shall be included in the Manual.

City of Alexandria
Municipal Separate Storm Sewer System (MS4) Program Plan
Appendix F – MCM #6: Pollution Prevention and Good Housekeeping

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	TITLE		Sanitary Sewer Overflow Response Plan	
	Procedure #		TES-Maint-2012-08	
	Revision	JFD	Date	20-September-2012
	Page		1 of 8	
ORIGINATOR Name / Title	Yon Lambert / Deputy Director, Operations	SIGNATURE	 10.9.12	
APPROVED BY Name / Title	Richard J. Baier / Director, T&ES			

SECTION 1: PURPOSE

- 1.1 The purpose of the City of Alexandria Sanitary Sewer Overflow Response Plan (SORP) standard operating procedure is to minimize the impact of sanitary sewer overflows (SSO's) to the public and the environment. The City of Alexandria will ensure that sanitary sewer overflows are responded to in a timely manner to expedite the necessary steps to relieve the overflow. Relieving the sewage blockage and spill containment is the City's highest priority, taking in to consideration public health concerns. This response plan will be the guideline for the standard operating procedures in the event of a sanitary sewer overflow. The response plan will be reviewed periodically to ensure that all corrective measures are being taken and to determine whether periodic staff training (including refresher and/or new employee training) may be warranted.
- 1.2 The plan includes the following elements:
- Section 2: Response to Notification of Spills: The City of Alexandria has adopted service call/overflow response procedures requiring immediate response to minimize or eliminate an overflow.
 - Section 3: Initial Spill Response: This section includes standard operating procedures that ensure the notification of first responders during normal business hours and after business hours, spill assessment and volume estimation for notification and reporting purposes.
 - Section 4: Service Restoration & Containment: Procedures to ensure containment, termination, maximum recovery and cleanup of spilled sewage.
 - Section 5: Notification: Standard practices the City uses to secure the area surrounding a spill, post warning signs as necessary and provide notification to affected City departments/divisions, other impacted agencies and the public.
 - Section 6: Recordkeeping and Reporting: Practices, including procedures that link field records to the City's maintenance management system, and procedures for reporting spills, as required, to appropriate regulatory agencies.

SECTION 2: RESPONSE TO NOTIFICATION OF SPILL

- 2.1 The City of Alexandria has adopted service call/emergency response procedures and after-hours processes for calls requiring immediate response to minimize or eliminate an overflow (See Attachments). The City provides (or contracts with an emergency response contractor that provides) all necessary spill response supplies. These supplies are available for use at any time. The SOP is to aid staff in prompt and responsible SSO response.

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- 2.2 When a notification of an SSO is received, it should be clearly communicated who will respond, the estimated time of arrival, and what areas will need to be accessed. The information provided by the caller should be verified before dispatching a field crew. This includes verifying the address and nearest cross street and making sure it is part of the City's conveyance system. If not, provide the caller with the phone number of the responsible agency and follow up by calling the agency and providing the details of the call.

Public Observation

- 2.3 Public observation is the most common way that the City is notified of blockages and spills. Contact information for reporting sewer spills and backups are in the phone book, City website and in many pieces of literature provided by the City. The main telephone number is (703) 746-4488; this line includes an option for 24-hour call response.
- 2.4 When a report of a sewer spill or backup is made during normal business hours, City call center staff receives the call, takes the information from the caller, and completes a Cityworks service request. For emergency sewer backups, spills or blockages, the call center staff verbally communicates (does not leave a voicemail) appropriate information to the Sewers Superintendent or designee along with any information collected from other field reports. The Superintendent then notifies the City's Sewer Inspector and sewer response team, which responds to the incident as soon as possible.

Staff Observation

- 2.5 City staff and contractors perform periodic maintenance work on its sewer system facilities. Any problems noted with the sewer system facilities are reported to the Superintendent who, in turn, responds to emergency situations.

SECTION 3: INITIAL SPILL RESPONSE

- 3.1 All sewer system calls require a response to the reported location of the event in an attempt to minimize or eliminate an overflow. The first responder (Sewer Inspector during normal business hours or City Standby staff during after-hours) must respond to the reporting party or site of the problem and initiate response activities within 60 minutes after initial reporting of the spill to the City. If a responder cannot be at the spill location within 60 minutes after the spill, then the responder must notify the Sewers Superintendent who will dispatch other available staff or emergency contractors.
- 3.2 The first responder should determine appropriate response measures based on the circumstances and information provided by the caller (e.g. weather and traffic conditions, small backup vs. sewage flowing on the ground, etc.). If additional help is needed, contact other employees, contractors, and/or equipment suppliers. Based on available information, the first responder should determine if a combination sewer cleaning truck and/or a spill response vehicle is needed.

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3.3 Upon arrival at the site, the first responder should:

- Note arrival time at spill site.
- Verify the existence of a sewer system spill or backup.
- Field verify the address and nearest cross street, making sure it is part of the City's sewer/conveyance system.
- Identify and clearly assess the affected area and extent of spill. If the spill is small (i.e. less than 50 gallons) an eyeball estimate may be made. If the spill appears large (i.e. greater than 50 gallons), staff should work with a Sewer Inspector or Sewer Superintendent to measure the volume. The shape, dimensions, and the depth of the contained wastewater are needed. The shape and dimensions are used to calculate the area of the spills and the depth is used to calculate the volume. In the event of a significant spill, the City Engineering Department or Office of Environmental Quality may be required to compute the spill volume using the duration or flowrate methods.
 - *To determine the volume of a large spill (i.e. larger than 50 gallons) refer to the following process:*
 - Step 1 Sketch the shape of the contained sewage (see figure above).
 - Step 2 Measure or pace off the dimensions.
 - Step 3 Measure the depth at several locations and select an average.
 - Step 4 Convert the dimensions, including depth, to feet.
 - Step 5 Calculate the area in square feet using the following formulas: Rectangle: Area = length (feet) x width (feet); Circle: Area = diameter (feet) x diameter (feet) x 0.785 or Triangle: Area = base (feet) x height (feet) x 0.5
 - Step 6 Multiply the area (square feet) times the depth (in feet) to obtain the volume in cubic feet.
 - Step 7 Multiply the volume in cubic feet by 7.5 to convert it to gallons.
- Comply with all safety precautions (traffic, confined space, etc).
- Contact caller, if time permits.
- Notify the Sewer Superintendent and Maintenance Division Chief if:
 - The spill appears to be large, in a sensitive area, or there is doubt regarding the extent, impact, or how to proceed; or
 - Additional help is needed for line cleaning or repair, containment, recovery, lab analysis, and/or site cleanup
- Begin completion of the Form O- SSO Overflow Reporting Form

SECTION 4: SERVICE RESTORATION AND CONTAINMENT

Initial Assessment

- 4.1 Upon arrival at the location of a spill into a house or a building, the first responder should evaluate and determine if the spill was caused by a blockage in the lateral or in a City-owned sewer main, caused either by a backup in the sewer main line or nearby operations and maintenance activities.
- If a blockage is found in a property owner's lateral, it should be clearly communicated that it is not the City's responsibility to work on a private lateral.

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- If a backup in the main line is found to have caused the SSO in a house or building, the first responder should relieve the blockage in the main line and provide the resident with information on claims.

Service Restoration

4.2 The first responder should attempt to remove the blockage from the system and restore flow to the area. Using the appropriate cleaning tools, the field crew should set up downstream of the blockage and flush/hydroclean the sewer upstream from a clear manhole. The flows should be observed to ensure that the blockage does not recur downstream.

4.3 If the blockage is not relieved within the first few attempts (20 minutes), it is crucial that bypass procedures are followed immediately:

4.3.1 Locate the nearest downstream manhole that can accept the additional flow.

4.3.2 Set up a 3-inch pump for smaller collection lines, and the 6-inch pump for larger transmission lines, this should be used as a guideline, be advised that larger pumps may be needed. The pump discharge hose should be secured or placed far enough into the manhole that it will not come out during pumping. The pump and pump hose should be protected from traffic by barricades. If additional pumps are needed, they shall be rented from:

Flippo Construction Company, 703-370-8778

Containment & Clean Up

4.4 The first responder should attempt to contain as much of the spilled sewage as possible using the following steps:

- Determine the immediate destination of the overflowing sewage
- Plug storm drains using available equipment and materials to contain the spill, wherever appropriate. If spilled sewage has made contact with the storm drainage system, attempt to contain the spilled sewage by plugging downstream storm drainage facilities
 - Arrange for removal of spilled sewage or debris from storm drainage system through use of vacuum truck and/or bypass pumping
- Contain/direct the spilled sewage using dike/dam or sandbags
- Pump around the blockage/pipe failure/pump station or vacuum flow from upstream of the blockage and dispose of downstream of the blockage to prevent further overflow.

SSOs on Private Properties

4.5 When an SSO occurs inside of a house or building and is due to a City line backup, the first responder should instruct the property owner should be instructed to follow these guidelines:

- Keep all family members and pets away from the affected area.
- Place towels, rags, blankets, etc. between areas that have been affected and areas that have not been affected.
- Do not remove any contaminated items.
- Turn off the HVAC system.

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- Move any uncontaminated property away from the overflow area.

The homeowner is responsible for clearing any blockage in the home's plumbing system or private lateral and for any resulting flood damage to the structure. The homeowner is also responsible for damage that happens because a lateral was not properly installed. Spills inside houses or buildings should be cleaned up by a professional cleaning company. Contact information for professional cleaning companies can be found in the "Water Damage Restoration" section of the Yellow Pages.

If the sewage backup is located inside a building or on private property and the backup was caused by a blockage in the public sewer main, the City may be responsible for cleanup and restoration. If this is the case, the City may arrange for a water damage restoration company. Claims by homeowners, if applicable, should be submitted based on information in Section 5.4 of this document.

SSOs on External/Hard Surfaced Areas

- 4.6 When an SSO occurs in an external location and is due to a City main, staff will make every effort to restore the environment to the condition that existed before the SSO occurred by using the procedures outlined below.
- Collect all signs of sewage solids and sewage-related material either by hand, vacuum or with the use of rakes and brooms and discharge it back into the sanitary sewer system.
 - Take reasonable steps to contain and vacuum up the wastewater.
 - Disinfect all areas that were contaminated from the overflow using the disinfectant solution of household bleach diluted 10:1 with water. Apply minimal amounts of the disinfectant solution using a hand sprayer. Document the volume and application method of disinfectant that was employed.
 - Allow area to dry. Repeat the process if additional cleaning is required.

SSOs on External/Landscaped and Unimproved Natural Vegetation

- 4.7 When an SSO occurs in an external location such as a natural area and is due to a City main, staff will make every effort to restore the environment to the condition that existed before the SSO occurred by using the procedures outlined below
- Collect all signs of sewage solids and sewage-related material either by hand, vacuum or with the use of rakes and brooms and discharge it back into the sanitary sewer system.
 - Allow the area to dry. Repeat the process if additional cleaning is required.
 - Recover any sewage within storm drains, channels, curb, gutters, and culverts.
 - Clear surrounding area of paper, solids, and any other signs of a SSO.
 - City forces will replace vegetation, sidewalks, asphalt, fencing or any other items that were damaged as a result of the SSO or the crews working to restore service.

Clean Up and Disinfection

- 4.8 Clean up and disinfection procedures should be implemented to reduce the potential for human health issues and adverse environmental impacts that are associated with an SSO event. The procedures described are for dry weather conditions and should be

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modified as required for wet weather conditions. Where clean-up is beyond the capabilities of City staff, a cleanup contractor will be used.

SECTION 5: NOTIFICATION

SSOs that do not Reach Public Waters

5.1 For spills that are contained and do not release unrecovered sewage into a storm drain, stream or a surface water body, notification to the public shall be accomplished through the use of signs at the location of the spill. The signs shall be left in place for a term of five business days.

5.1.1 City T&ES staff, Maintenance Division Chief (1st) or Sewer Superintendent (2nd), shall notify the City Fire Department's Environmental Investigations Unit (EIU) emergency notification email list of all SSOs in order to provide notification to public safety and Office of Environmental Quality staff. All notices to the EIU shall reference the location of the SSO, the date and time discharge was discovered, volume, action being taken, whether it has reached the storm system and/or surface waters, and the appropriate Cityworks service request number.

Spills that Reach Public Waters – City OEQ Requirements

5.2 The Deputy Director of the T&ES Office of Environmental Quality (or designee) shall be notified if an SSO has reached the storm sewer system and/or a surface water. OEQ staff will determine if further investigation of the discharge site and potentially affected areas is required. OEQ will assist in verifying the extent of the contamination in the field. OEQ will be responsible for reporting to the state as required (see Section 6.3). Information in the required reports will be largely based on Form O - SSO Overflow Reporting Form referenced in Section 3.3, Cityworks, and/or discussions with knowledgeable staff.

The City of Alexandria Health Department has the authority to close and re-open water bodies for public water contact. The water bodies affected are determined by the following parameters and best professional judgment:

- The volume of sewage discharged;
- Parameters affecting flow of sewage to the water bodies;
- Direction of current;
- Tides;
- Past experience in the area; and/or
- Any other pertinent information.

Point of Contact

5.3 Working with the Office of Communications and Public Information, and the T&ES Public Information Officer, the T&ES Maintenance Division Chief shall be responsible for coordinating public notification, if necessary, for SSOs not reaching waters of the state; and the Deputy Director of T&ES, Office of Environmental Quality (or designee), in coordination with T&ES Maintenance Staff, shall be responsible for public notification, if necessary, for SSOs that may be reasonably expected to reach surface waters.

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- 5.4 If the SSO has occurred in a building or residential property and is attributable to a blockage in a City main, the responder or the City Sewer Inspector shall:
- Gather information and fill out a Sewer Backup Summary Report.
 - Notify the Maintenance Division Chief of the incident.
 - Wait for restoration firm to arrive (if required).
 - Forward incident reports and related documents to Maintenance Division Chief.
 - For potential claims, contact the City's office of Risk Management and provide contact information to the resident.

SECTION 6: RECORDKEEPING & REPORTING

Internal SSO Documentation

- 6.1 The first responder will complete a Cityworks work order and a Field Report/Daily Sheet form. The first responder will follow the procedures and complete the Sewer Backup Summary Report if an SSO has occurred in a residence or building.

The Maintenance Division Chief will prepare a file for each individual SSO. The file should include the following information:

- Initial service call information with a completed Cityworks service request
- City of Alexandria service request call field report/daily sheet form
- Copies of the City of Alexandria service request and work order forms, which should reference a volume estimate within the notes
- Closed-Circuit Television (CCTV) inspection (this is optional for SSOs that are not blockage related)
- Water quality sampling and test results, if applicable

External SSO Documentation

- 6.2 The City maintains SSO records for five years from the date of the SSO. All records shall be made available for review upon request. Records shall be retained for all SSOs, including but not limited to the following when applicable:
- Copy of Cityworks service requests and work orders;
 - All original recordings for continuous monitoring instrumentation;
 - Service call records and complaint logs of calls received by the City;
 - SSO calls and SSO records;
 - Steps that have been and will be taken to prevent the SSO from recurring and a schedule to implement those steps;
 - Work orders, work completed, and any other maintenance records from the previous five years which are associated with responses and investigations of system problems related to SSOs;
 - A list and description of complaints from customers or others from the previous five years; and
 - Documentation of performance and implementation measures for the previous five years.

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Reports to the State for Unauthorized Discharges

- 6.3 Discharges of sewage from an SSO that may reasonably be expected to enter surface waters shall be reported to the Virginia Department of Environmental Quality (VDEQ) immediately upon discovery of the discharge, but in no case later than within 24 hours after discovery. OEQ will utilize VDEQ's Pollution Response Program (PREP) online reporting to accomplish the 24 hour reporting. A written report of the unauthorized discharge shall be submitted by OEQ to VDEQ and the Virginia Department of Conservation and Recreation (DCR) within five days of the discovery of the discharge. OEQ will make the 24 hour notice and be responsible for final delivery of the five-day report. The written report shall contain the following, as noted on Form O:
1. A description of the nature and location of the discharge;
 2. The cause of the discharge;
 3. The date on which the discharge occurred;
 4. The length of time that the discharge continued;
 5. The volume of the discharge;
 6. If the discharge is continuing, how long it is expected to continue;
 7. If the discharge is continuing, what the expected total volume of the discharge will be; and
 8. Any steps planned or taken to reduce, eliminate and prevent a recurrence of the present discharge or any future discharges not authorized by this permit.

SECTION 7: DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA

FORM O

SSO Overflow Reporting Form

City of Alexandria, Virginia
Department of Transportation & Environmental Services

1. Date and time staff became aware that a SSO occurred:

2. Location:

3. Date and Time Operations Staff reported to T&ES, ENG and DEQ:

4. Name of Person Making Report Under No. 3:

5. Date and Time Staff Reported Overflow to City Health Department:

6. Name of Person Making Report Under No. 5:

7. Estimated Date/Time Overflow Started:

8. Estimated Date/Time Overflow Ended:

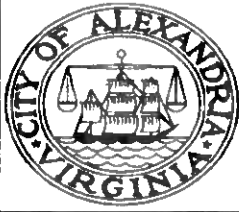
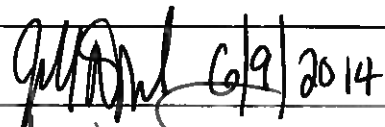

9. Estimated Volume (gallons) of SSO:

Corrective Action Taken: Please describe:

10. Was SSO Monitored Until It Was Eliminated (Yes / No):

If No.10 is No, Explain:

Name and Title of Person(s) Making Report:

	TITLE	Brick Sidewalk Maintenance	
	Procedure #	TES-2013-04	
	Revision		Date
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ORIGINATOR Name / Title	Jeff DuVal / Division Chief, Maintenance	SIGNATURE	 6/9/2014
APPROVED BY Name / Title	Yon Lambert / Deputy Director, T&ES Operations		 6.9.14

OVERVIEW:

The City of Alexandria, Transportation and Environmental Services (T&ES), Maintenance Division provides maintenance and repairs for all City sewers, streets, sidewalks and fire hydrants; maintains stream beds, weirs and stream banks; maintains drainage tunnels, box culverts and storm water pollution removal facilities; maintains bridges; and conducts snow removal and flood control operations. The Maintenance Division coordinates with other City agencies and other divisions within T&ES to respond to weather and hurricanes, and assists in both emergency management and clean-up following these events.

The Standard Operation Procedures (SOP) is a guide for Maintenance Division. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 The Brick Sidewalk Maintenance Team serves to repair and maintain brick sidewalk infrastructure in the City of Alexandria public Right of Way (ROW).

- Provides immediate Traffic Control to ensure roadway and pedestrian safety
- Conducts assessments and inspections of brick sidewalk infrastructure
- Determines and implements appropriate response
- Repairs and maintains brick sidewalk infrastructure

1.2 The Brick Sidewalk Maintenance Team Operations include the following elements:

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of each Team Member assigned to Brick Maintenance.
- b. Section 3: Service Request Process: Identifies the process by which Cityworks Service Requests are processed to Brick Sidewalk Maintenance Team.
- c. Section 4: Equipment List: Personal Protective Equipment (PPE), Traffic Control Devices (TCD), and Tools, all of which are mandatory equipment, have been listed.
- d. Section 5: Brick Sidewalk Maintenance Operation: Captures the efforts with standard procedure for responding to brick sidewalk maintenance.

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- e. Section 6: Brick Sidewalk Maintenance Reporting: Contains information required in creating/closing a Cityworks Work Order upon completion of repairs.
- f. Section 7: Reference Materials
- g. Section 8: Document Changes

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 Brick Sidewalk Maintenance Team roles and responsibilities have been identified below:

- **Supervisor** is responsible for processing the maintenance request from Cityworks and verifying the information is accurate; reviews work of staff engaged in brick repair and maintenance; maintain written and computerized records of repairs. The Assistant Superintendent is responsible for inspection of completed work and closing working orders in Cityworks.
- **Repair Team** is responsible for reporting service levels to Supervisor; coordinate with Supervisor to establish maintenance and repair goals; perform field observation to ensure compliance with department policies, practices, and City ordinances.

SECTION 3: SERVICE REQUEST PROCESS

3.1 Cityworks Work Management system is used to process services requested by customers within the City. Customers and Staff may submit requests by phone, online, or the social networking sites.

3.2 When a notification of services is received, it must first be reviewed by the Superintendents / Assistant Superintendents to verify the need for repair or maintenance on the request. This is accomplished by visiting the location, locating the problem or incident, and identifying the solution.

3.3 Once it has been determined the service request / incident location warrants repair, the Supervisor and Repair Team will be sure to take precautions and reasonable measures to render the location safe. At this point the Superintendent / Assistant Superintendents will create a work order and repair work can begin.

SECTION 4: EQUIPMENT LIST

4.1 Brick Sidewalk Maintenance Team equipment list has been identified below:

- **Personal Protective Equipment (PPE):**
 - Safety Vest
 - Hard Hats
 - Government Issued Work Boots
 - Gloves
 - Protective Eyewear
 - Protective Hearing Equipment
 - Hand Sanitizer
- **Identification and Security**
 - Complete City Issued Uniform
 - Government Issue Identification (ID) Badge

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- **Traffic Control Devices:**
 - Minimum of six (6) Orange Cones
 - Minimum of two (2) Flashlights
 - Flags
 - Sidewalk Close Signs
- **Tools**
 - Maps (Sewer and City)
 - Pick
 - Shovel
 - Broom
 - Utility Contacts
 - Emergency Fire and Police Contacts
 - City Risk Management Handouts
 - Utility Truck
 - Gravel
 - Stone Dust
 - Brick or Pavers
 - Leveling Tool
 - Rubber Mallet

SECTION 5: BRICK MAINTENANCE OPERATION

5.1 Brick Sidewalk Maintenance requests are processed during normal business hours and assemble out of 2900 Business Center Driver (BCD). When a Brick Sidewalk request is processed, the following is expected:

- Supervisor is responsible for operating the Utility Truck
- Operator/Support is responsible for operating the Crew Cab (or other vehicle as needed)
- Perform pre-trip equipment check
- The Team must report safely to the work location
- Upon arrival to the work location, team must create safe work zone
- Establish signs displaying that the sidewalk is closed so that sidewalk is not damaged by pedestrians or bicyclists travelling on sidewalk
- To begin laying the walkway
 - Level the ground appropriately for the walkway
 - While the walkway should be level, the ground should slope gently outward from the brick walkway to act as a runoff for rain and snow
 - Layer 4 inches of gravel inside the walkway bed and tamp it down. Be sure that the gravel is spread evenly
 - Fill the brick walkway bed with approximately 1 inch of masonry sand. This will act as a binding agent for the bricks once watered and allowed to dry
 - Tamp and level the stone dust. Check the walkway every few feet with a level to be certain that the proper height and curve is being maintained

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- Begin laying the bricks
 - Lay the bricks in the proper pattern over the masonry sand. Use a rubber mallet to tamp each brick down after it has been placed
 - Cover the bricks with another layer of masonry sand after laying all of your bricks or pavers
 - Sweep the masonry sand into all the cracks and in between each brick. Be sure to sweep stone dust along the brick edges with a soft broom
- Seal and secure the bricks with the masonry sand by watering the brick walkway thoroughly. The masonry sand will become hard upon drying and hold the bricks in place
 - Once sidewalk is completed, establish signs to prevent pedestrians from using sidewalk until masonry sand has been given adequate time to dry
 - When sidewalk has dried, remove signage and return sidewalk to operational status

SECTION 6: BRICK SIDEWALK MAINTENANCE TEAM REPORTING

Brick Sidewalk Maintenance Team Report

6.1 Once the Brick Sidewalk Maintenance Team returns to BCD upon completion of the tasks, the Team Supervisor must report the details and efforts of the response in a Cityworks Work Order.

Items to be entered into Cityworks:

- Employee Name
- Department
- Job Title
- Supervisor
- Date
- Hours Worked
- Work site location
- Equipment/Vehicle
- Materials Used
- Assessment
- Unit Accomplished (indicate distance)
- Unit of Measure/Codes and Descriptions (indicate standard of measurement)
- Comments (may be used to indicate additional information for reporting)
- Attach Before and After Pictures (if applicable)
- Save all changes
- Close work order

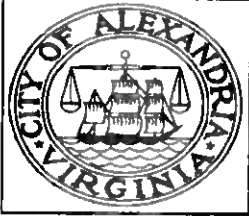
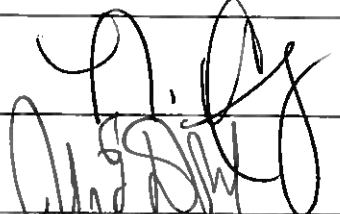
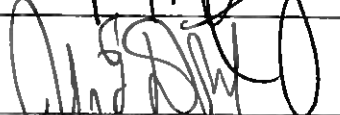
SECTION 7: REFERENCE

- City Website – Memo to Industry Standard for Brick Pavers (<http://alexandriava.gov/tes/info/default.aspx?id=3522>)
- Safety and Personal Protective Equipment Specifications (S:\SAFETY Programs\Personal Protective Equipment\PPE Matrix by DIVISIONS\MAINTENANCE)

TITLE	Brick Sidewalk Maintenance	Procedure #	TES-2013-04
		Page 5 of 5	

SECTION 8: DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA

	TITLE	Brine System and Application: Pollution Prevention Measures		
	Procedure #	TES-2013-11		
	Revision		Date	
	Page	1 of 2		
ORIGINATOR Name / Title	Nikeya Cunningham / Program Analyst, Public Works Services	SIGNATURE		
APPROVED BY Name / Title	Jeffrey DuVal / Deputy Director, T&ES Operations	6.26.15		

OVERVIEW:

The City of Alexandria, Transportation and Environmental Services (T&ES), Public Works Services Division (PWS) provides maintenance and repairs for all City sewers, streets, sidewalks and fire hydrants; maintains stream beds, weirs and stream banks; maintains drainage tunnels, box culverts and storm water pollution removal facilities; maintains bridges; and conducts snow removal and flood control operations. The Public Works Services Division (PWS) coordinates with other City agencies and other divisions within T&ES to respond during weather events, and assists in both emergency management and clean-up following these events.

The Standard Operation Procedures (SOP) is a guide for the PWS Division. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 The Snow Pretreatment Operator Team serves in pretreatment of roadways when conditions warrant application in response to an impending snow event in the City of Alexandria. Pretreatment helps to minimize the formation of snow and ice in order to keep roadways clear and safe for motorist and pedestrian travel. This task is completed by:

SECTION 2: EQUIPMENT LIST

2.1 Pretreatment equipment is identified below:

- **Personal Protective Equipment (PPE): Refer to PPE Matrix**
 - Safety Vest
 - Government Issued Work Boots
 - Gloves
 - Protective Eyewear (ANSI Z87 with side shields)
 - Protective Hearing Equipment (HPD with minimum 20 dB NRR)
 - Hand Sanitizer
- **Identification and Security**
 - Complete City Issued Uniform
 - Government Issue Identification (ID) Badge

TITLE	Brine System and Application: Pollution Prevention Measures	Procedure #	TES-2013-11
		Page 2 of 2	

- **Tools**

- Snow Zone Maps
- Emergency Fire and Police Contacts
- City Risk Management Handouts
- Radio

- **Vehicles**

- Utility Vehicle (F-450 with snowplow and spreader)

- **Deicing Materials**

- Brine
- Sand

SECTION 3: PRETREATMENT PROCEDURE

3.1 Pretreating important roadways prior to an impending snow event that warrants application is vital to snow removal operations. Pretreatment minimizes the accumulation of hard snow, but more importantly, minimizes the bond between the snow and the roadway, assisting in plowing efforts. Additionally, pretreatment helps to minimize refreezing of slush on road surfaces.

Procedures for applying deicing materials are as follows:
(PROCEDURES WILL BE FULLY DEVELOPED AT A LATER TIME)

SECTION 4: POLLUTION PREVENTION MEASURES

4.1 Pollution prevention procedures must be followed to minimize or prevent impacts to the Municipal Separate Storm Sewer System (MS4) from pretreatment operations. Deicing agents must not contain urea or other forms of nitrogen or phosphorus to parking lots, roadways, sidewalks, or other paved surfaces.

Sand/Aggregate Storage and Loading

- Ensure that sand/aggregate is stored under the designated shelter
- When loading, take care to not overload
- Sweep the area frequently to prevent buildup and runoff of material

Brine Storage and Loading

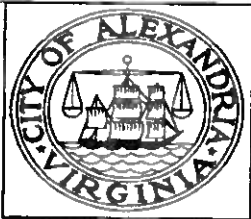
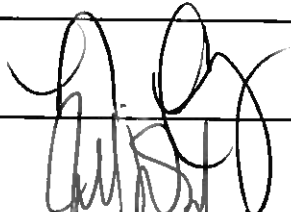

- Store brine in designated containers, with secure covers/lids
- Ensure that plumbing and delivery equipment are not leaking and in proper working order
- Ensure emergency shutoff in working order
- Ensure inlet protection is readily available to block off inlet in case of accidental release
- Use the lowest concentration that remains effective

Application

- Use designated amounts on roadway surfaces

Equipment Cleanup

- Recover wash water generated from equipment cleaning

	TITLE		Bus Shelter and Bike Rack Installation and Maintenance	
	Procedure #		TES-PWS-2015-28	
	Revision		Date	
	Page		1 of 4	
ORIGINATOR Name / Title	Nikeya Cunningham / Program Analyst, Public Works Services		SIGNATURE	
APPROVED BY Name / Title	Jeffrey DuVal / Deputy Director, T&ES Operations		6.30.15	

OVERVIEW:

The City of Alexandria, Transportation and Environmental Services (T&ES), Public Works Services Division (PWS) provides maintenance and repairs for all City sewers, streets, sidewalks and fire hydrants; maintains stream beds, weirs and stream banks; maintains drainage tunnels, box culverts and storm water pollution removal facilities; maintains bridges; and conducts snow removal and flood control operations. The Public Works Services Division (PWS) coordinates with other City agencies and other divisions within T&ES to respond to weather and hurricanes, and assists in both emergency management and clean-up following these events.

The Standard Operation Procedures (SOP) is a guide for the PWS Division. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 In accordance with Section II.B.6.a of the 2013-2018 MS4 Permit, the City developed written policies and standard operating procedures to address the daily practices that will minimize or prevent pollutant discharges from daily operations and municipal facilities.

1.2 The Team Operations include the following elements:

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of each unit contributing to the Standby Response effort. Lists of potential response calls and efforts.
- b. Section 3: Service Request Process: Identifies the process by which Cityworks Service Requests are processed to Team.
- c. Section 4: Equipment List: Personal Protective Equipment (PPE) and Tools, all of which are mandatory have been listed.
- d. Section 5: Operation: Captures the efforts with standard procedure for responding to bus shelter and bike rack installation and maintenance.
- e. Section 6: Reporting: Contains information required in creating/closing a Cityworks Work Order
- f. Section 7: Reference Material
- g. Section 8: Document Changes

TITLE	Bus Shelter and Bike Rack Installation and Maintenance	Procedure #	TES-PWS-2015-28
		Page 2 of 4	

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 Bus Shelter and Bike Rack Installation and Maintenance roles and responsibilities have been identified below:

- **Supervisor** is responsible for processing the maintenance request from Cityworks and verifying the information is accurate; reviews work of staff engaged in repair and maintenance; maintains written and computerized records of repairs. The Assistant Superintendent is responsible for inspecting completed work, updating and closing work orders in Cityworks.
- **Repair Team** is responsible for reporting service levels to Supervisor; coordinate with Supervisor to establish maintenance and repair goals; perform field observation to ensure compliance with department policies, practices, and City ordinances.

SECTION 3: SERVICE REQUEST PROCESS

3.1 Cityworks Work Management system is used to process services requested by customers within the City. Customers and Staff may submit requests by phone, online, or the social networking sites.

3.2 When a notification of services is received, it must first be reviewed by the Superintendents / Assistant Superintendents to verify the need for repair or maintenance on the request. This is accomplished by visiting the location, locating the problem or incident, and identifying the solution.

3.3 Once it has been determined the service request / incident location warrants repair, the Supervisor and Repair Team will be sure to take precautions and reasonable measures to render the location safe. At this point the Superintendent / Assistant Superintendents will create a work order and repair work can begin.

SECTION 4: EQUIPMENT LIST

3.1 Equipment list has been identified below:

- **Personal Protective Equipment (PPE):**
 - Safety Vest
 - Hard Hats
 - Government Issued Work Boots
 - Gloves
 - Protective Eyewear
 - Protective Hearing Equipment
 - Hand Sanitizer
- **Identification and Security**
 - Complete City Issued Uniform
 - Government Issue Identification (ID) Badge
- **Tools**
 - Maps (Sewer and City)
 - Pick

TITLE	Bus Shelter and Bike Rack Installation and Maintenance	Procedure #	TES-PWS-2015-28
		Page 3 of 4	

- Shovel
- Broom
- Utility Contacts
- Emergency Fire and Police Contacts
- City Risk Management Handouts

SECTION 5: OPERATION

4.1 The Team requests are processed during normal business hours at 2900 Business Center Drive (BCD). When a ticket is processed, the following is expected: (PROCEDURES WILL BE FULLY DEVELOPED AT A LATER TIME)

- Prevent disturbance of, or introduction of, polluted runoff to storm drain system. Use temporary sediment control measures, such as a silt fence or sock, as necessary.
- Stabilize any exposed ground, dirt, or soil.
- Use only the amount of repair material needed.
- Pick up litter and debris around the site prior to any repair activities.
- Avoid tracking mud and dust from work activities. Clean any tracked mud or dust using dry methods, such as sweeping.

SECTION 6: TEAM REPORTING

Team Report

5.1 Once the Team returns to BCD upon completion of the tasks, the Team Supervisor must report the details and efforts of the response in a Cityworks Work Order.

Items to be entered into Cityworks:

- Employee Name
- Department
- Job Title
- Supervisor
- Date
- Hours Worked
- Work site location
- Assessment
- Unit Accomplished (indicate distance)
- Unit of Measure/Codes and Descriptions (indicate standard of measurement)
- Comments (may be used to indicate additional information for reporting)
- Save all changes
- Close work order

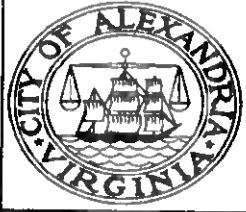
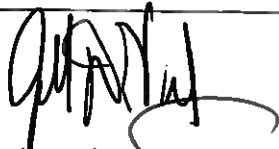
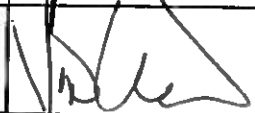
SECTION 7: REFERENCE

7.1 Safety and Personal Protective Equipment Specifications (S:\SAFETY Programs\Personal Protective Equipment\PPE Matrix by DIVISIONS\MAINTENANCE)

TITLE	Bus Shelter and Bike Rack Installation and Maintenance	Procedure #	TES-PWS-2015-28
		Page 4 of 4	

SECTION 8: DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA

	TITLE		Concrete Sidewalk Maintenance	
	Procedure #		TES-2013-09	
	Revision		Date	
	Page		1 of 6	
ORIGINATOR Name / Title	Jeff DuVal / Division Chief, Public Works Services		SIGNATURE	
APPROVED BY Name / Title	Yon Lambert / Deputy Director, T&ES Operations			

OVERVIEW:

The City of Alexandria, Transportation and Environmental Services (T&ES), Public Works Services Division provides maintenance and repairs for all City sewers, streets, sidewalks and fire hydrants; maintains stream beds, weirs and stream banks; maintains drainage tunnels, box culverts and storm water pollution removal facilities; maintains bridges; and conducts snow removal and flood control operations. The Public Works Services Division coordinates with other City agencies and other divisions within T&ES to respond to weather and hurricanes, and assists in both emergency management and clean-up following these events.

The Standard Operation Procedures (SOP) is a guide for Public Works Services Division. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 The Concrete Sidewalk Maintenance Team serves to repair and maintain concrete sidewalk infrastructure in the City of Alexandria public Right of Way (ROW).

- Provides immediate Traffic Control to ensure roadway and pedestrian safety
- Conducts assessments and inspections of concrete sidewalk infrastructure
- Determines and implements appropriate response
- Repairs and maintains concrete sidewalk infrastructure

1.2 The Concrete Sidewalk Maintenance Team Operations include the following elements:

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of each Team Member assigned to Concrete Maintenance.
- b. Section 3: Service Request Process: Identifies the process by which Cityworks Service Requests are processed to the Concrete Maintenance Team.

TITLE	Concrete Sidewalk Maintenance	Procedure #	TES-2013-09
			Page 2 of 6

- c. Section 4: Equipment List: Personal Protective Equipment (PPE), Traffic Control Devices (TCD), and Tools, all of which are mandatory maintenance crew equipment, have been listed.
- d. Section 5: Concrete Sidewalk Installation Operation: Captures the efforts with standard procedure for responding to concrete sidewalk maintenance.
- e. Section 6: Concrete Sidewalk Installation Reporting: Contains information required in creating/closing a Cityworks Work Order upon completion of repairs.
- f. Section 7: Reference Material
- g. Section 8: Document Changes

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 Concrete Sidewalk Maintenance Team roles and responsibilities have been identified below:

- **Assistant Superintendent** is responsible for inspecting completed work, and updating and closing work orders in Cityworks.
- **Supervisor** is responsible for processing the maintenance ticket and verifying accurate information through Cityworks; reviews work of staff engaged in concrete sidewalk repair; maintains written and computerized records of repairs.
- **Repair Team** is responsible for reporting service levels to Supervisor; coordinating with Supervisor to establish maintenance and repair goals; performing field observations to ensure compliance with departmental policies, practices, and City ordinances.
- **Concrete Inspector** is responsible for identifying large area sidewalk projects; coordinating with the Superintendent to establish high volume requests areas; and monitoring contractor repair and costs to ensure compliance with departmental policies, practices, and City ordinances.

SECTION 3: SERVICE REQUEST PROCESS

3.1 Cityworks Work Management system is used to process services requested by customers within the City. Customers and Staff may submit requests by phone, online, or the social networking sites.

3.2 When a notification of services is received, it must first be reviewed by the Superintendents / Assistant Superintendents to verify the need for repair or maintenance on the request. This is accomplished by visiting the location, locating the problem or incident, and identifying the solution.

3.3 Once it has been determined the service request / incident location warrants repair, the Supervisor and Repair Team will be sure to take precautions and reasonable measures to render the location safe. At this point the Superintendent / Assistant Superintendents will create a work order and repair work can begin.

SECTION 4: EQUIPMENT LIST

3.1 Concrete Sidewalk Installation Team Equipment list has been identified below:

- **Personal Protective Equipment (PPE): Refer to PPE Matrix**
 - Safety Vest

TITLE	Concrete Sidewalk Maintenance	Procedure #	TES-2013-09
		Page 3 of 6	

- Hard Hats
- Government Issued Work Boots
- Gloves
- Protective Eyewear
- Protective Hearing Equipment
- Hand Sanitizer
- **Identification and Security**
 - Complete Uniform
 - Government Issue Identification (ID) Badge
- **Traffic Control Devices:**
 - Minimum of six (6) Orange Cones
 - Minimum of two (2) Flashlights
 - Flags
 - Sidewalk Repair Signs
- **Tools**
 - Maps (Sewer and City)
 - Pick
 - Shovel
 - Broom
 - Utility Contacts
 - Emergency Fire and Police Contacts
 - City Risk Management Handouts
 - Air Compressor
 - Jackhammer
 - Wheelbarrow
 - Utility Truck
 - Concrete truck

SECTION 5: CONCRETE SIDEWALK INSTALLATION OPERATION

4.1 Concrete Sidewalk Installation tickets are processed during normal business hours. Concrete Sidewalk Installation teams assemble out of 2900 Business Center Drive (BCD). When a Concrete Sidewalk Installation ticket is processed:

- **Preparation**
 - Work crew will arrive to the work site safely and immediately establish a safe work zone.
 - Establish signs stating that the sidewalk is closed and establish proper roadway signs to create buffer if needed
 - Store dry and wet materials under cover, away from drainage areas.
 - If existing sidewalk is being replaced.
 - Remove any damaged concrete that may need to be replaced
 - Use jackhammers or backhoe to break concrete into small chunks
 - Use wheelbarrows and tools to remove the broken chunks of concrete into a dump truck or other vehicle
 - Prepare and compact sub-base.

TITLE	Concrete Sidewalk Maintenance	Procedure #	TES-2013-09
		Page 4 of 6	

- Dig the sub-base to the proper depth for the entire length of the sidewalk that is to be replaced
 - Pour the sub-base material evenly across the section of sidewalk to be replaced
 - Using a compacting tool, compact the section of sub-base so that it is level for the length of the sidewalk
 - Using a leveling tool, check that the sub-base maintains the standard depth for each section of sidewalk
- Set forms and place any reinforcing steel that may be required.
 - Set the forms along the edges of the sidewalk with no gaps between the form and the sub-base so that the concrete mix maintains the same height and does not flow out under either side
- Measure to determine how much concrete will be needed.
 - Include formula for determining how much concrete is needed and what measurements must be taken. The typical formula would be: length x width x depth divided by 27. This will equal the cubic yards needed for measure and repair.
- Locate or construct approved concrete washout facility.
- Installation Process
 - Install inlet protection as needed.
 - Inlet protection will be needed if the sidewalk will be installed directly on top of storm water inlets
 - Moisten sub-base just prior to placing new concrete. This helps keep the soil from wicking the moisture out of the concrete into the ground.
 - Place new concrete in forms.
 - Pour concrete to the center of the form at a slow rate, so that the concrete is able to spread across the form properly and is not at risk of overflowing
 - Scrape off surface.
 - Scrape off excess concrete into the adjacent form, as to not waste excess concrete and to keep the sidewalk level
 - Level the surface to remove any obstructions before the concrete settles and will make repairs more costly and time consuming
 - Let concrete obtain its initial set.
 - Apply appropriate surface finish.
 - Remove forms when concrete will not slump.
 - This is typically about 24 hours after pour, but will be longer if weather is excessively humid, less if it is very hot and dry
- Site Cleanup
 - Sweep cement and concrete dust from grinding activities and load into a truck with a dump bed. Sweep all dirt and debris from the street and gutter and load it into utility vehicle.
 - Transport all waste and debris from job site to an appropriate waste disposal facility (aggregate yard) identified by the Superintendent.

TITLE	Concrete Sidewalk Maintenance	Procedure #	TES-2013-09
		Page 5 of 6	

- Once work area is cleared of all tools, debris and excess materials, open the sidewalk for pedestrian traffic.
- Return to Business Center Drive and complete work order form.
- Equipment Specific Cleaning
 - Perform washout of concrete trucks and equipment in designated areas only. Clear out any excess concrete mix from vehicle and make vehicle ready for next shift.

SECTION 6: CONCRETE SIDEWALK MAINTENANCE TEAM REPORTING

Concrete Sidewalk Maintenance Team Report

6.1 Once the Concrete Sidewalk Maintenance Team returns to BCD upon completion of the tasks, the Team Supervisor must report the details and efforts of the response in a Cityworks Work Order.

Items to be entered into Cityworks:

- Employee Name
- Department
- Job Title
- Supervisor
- Date
- Hours Worked
- Work site location
- Equipment/Vehicle
- Materials Used
- Assessment
- Unit Accomplished (indicate distance)
- Unit of Measure/Codes and Descriptions (indicate standard of measurement)
- Comments (may be used to indicate additional information for reporting)
- Attach Before and After Pictures (if applicable)
- Save all changes
- Close work order

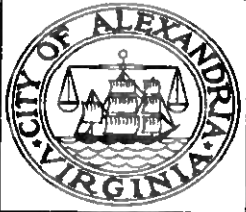
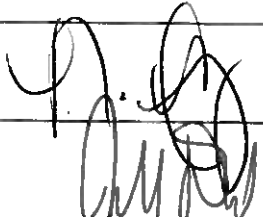

SECTION 7: REFERENCE

- Safety and Personal Protective Equipment Specifications (S:\SAFETY Programs\Personal Protective Equipment\PPE Matrix by DIVISIONS\MAINTENANCE)

REV Level	Purpose of Change	Changes	Date of Previous Revision

TITLE	Concrete Sidewalk Maintenance	Procedure #	TES-2013-09
		Page 6 of 6	

Initial	New	None	NA

	TITLE		Crack Sealing, Strip Patching, and Paving/Patching/Concrete Construction Maintenance	
	Procedure #		TES-PWS-2015-27	
	Revision		Date	
	Page		1 of 4	
ORIGINATOR Name / Title	Nikeya Cunningham / Program Analyst, Public Works Services		SIGNATURE	
APPROVED BY Name / Title	Jeffrey DuVal / Deputy Director, T&ES Operations		6-30-15	

OVERVIEW:

The City of Alexandria, Transportation and Environmental Services (T&ES), Public Works Services Division (PWS) provides maintenance and repairs for all City sewers, streets, sidewalks and fire hydrants; maintains stream beds, weirs and stream banks; maintains drainage tunnels, box culverts and storm water pollution removal facilities; maintains bridges; and conducts snow removal and flood control operations. The Public Works Services Division (PWS) coordinates with other City agencies and other divisions within T&ES to respond to weather and hurricanes, and assists in both emergency management and clean-up following these events.

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SECTION 1: PURPOSE

1.1 In accordance with Section II.B.6.a of the 2013-2018 MS4 Permit, the City developed written policies and standard operating procedures to address the daily practices that will minimize or prevent pollutant discharges from daily operations and municipal facilities.

1.2 The Team Operations include the following elements:

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of each unit contributing to the Standby Response effort. Lists of potential response calls and efforts.
- b. Section 3: Service Request Process: Identifies the process by which Cityworks Service Requests are processed to Team.
- c. Section 4: Equipment List: Personal Protective Equipment (PPE) and Tools, all of which are mandatory have been listed.
- d. Section 5: Operation: Captures the efforts with standard procedure for responding to crack sealing, strip patching, paving/patching construction maintenance, and concrete inspection/construction maintenance.

TITLE	Crack Sealing, Strip Patching, and Paving/Patching/Concrete Construction Maintenance	Procedure #	TES-PWS-2015-27
		Page 2 of 4	

- e. Section 6: Reporting: Contains information required in creating/closing a Cityworks Work Order
- f. Section 7: Reference Material
- g. Section 8: Document Changes

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 Crack Sealing, Strip Patching, and Paving/Patching/Concrete Construction Maintenance roles and responsibilities have been identified below:

- **Supervisor** is responsible for processing the maintenance request from Cityworks and verifying the information is accurate; reviews work of staff engaged in repair and maintenance; maintains written and computerized records of repairs. The Assistant Superintendent is responsible for inspecting completed work, updating and closing work orders in Cityworks.
- **Repair Team** is responsible for reporting service levels to Supervisor; coordinate with Supervisor to establish maintenance and repair goals; perform field observation to ensure compliance with department policies, practices, and City ordinances.

SECTION 3: SERVICE REQUEST PROCESS

3.1 Cityworks Work Management system is used to process services requested by customers within the City. Customers and Staff may submit requests by phone, online, or the social networking sites.

3.2 When a notification of services is received, it must first be reviewed by the Superintendents / Assistant Superintendents to verify the need for repair or maintenance on the request. This is accomplished by visiting the location, locating the problem or incident, and identifying the solution.

3.3 Once it has been determined the service request / incident location warrants repair, the Supervisor and Repair Team will be sure to take precautions and reasonable measures to render the location safe. At this point the Superintendent / Assistant Superintendents will create a work order and repair work can begin.

SECTION 4: EQUIPMENT LIST

3.1 Equipment list has been identified below:

- **Personal Protective Equipment (PPE):**
 - Safety Vest
 - Hard Hats
 - Government Issued Work Boots
 - Gloves
 - Protective Eyewear
 - Protective Hearing Equipment
 - Hand Sanitizer

TITLE	Crack Sealing, Strip Patching, and Paving/Patching/Concrete Construction Maintenance	Procedure #	TES-PWS-2015-27
		Page 3 of 4	

- **Identification and Security**
 - Complete City Issued Uniform
 - Government Issue Identification (ID) Badge
- **Tools**
 - Maps (Sewer and City)
 - Pick
 - Shovel
 - Broom
 - Utility Contacts
 - Emergency Fire and Police Contacts
 - City Risk Management Handouts

SECTION 5: OPERATION

4.1 The Team requests are processed during normal business hours at 2900 Business Center Drive (BCD). When a ticket is processed, the following is expected: (PROCEDURES WILL BE FULLY DEVELOPED AT A LATER TIME)

- Prevent disturbance of, or introduction of, polluted runoff to storm drain system. Use temporary sediment control measures, such as a silt fence or sock, as necessary.
- Stabilize any exposed ground, dirt, or soil.
- Use only the amount of repair material needed.
- Pick up litter and debris around the site prior to any repair activities.
- Avoid tracking mud and dust from work activities. Clean any tracked mud or dust using dry methods, such as sweeping.

SECTION 6: TEAM REPORTING

Team Report

5.1 Once the Team returns to BCD upon completion of the tasks, the Team Supervisor must report the details and efforts of the response in a Cityworks Work Order.

Items to be entered into Cityworks:

- Employee Name
- Department
- Job Title
- Supervisor
- Date
- Hours Worked
- Work site location
- Assessment
- Unit Accomplished (indicate distance)
- Unit of Measure/Codes and Descriptions (indicate standard of measurement)

TITLE	Crack Sealing, Strip Patching, and Paving/Patching/Concrete Construction Maintenance	Procedure #	TES-PWS-2015-27
		Page 4 of 4	

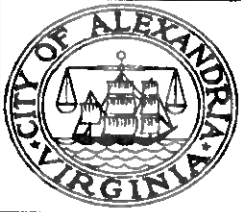
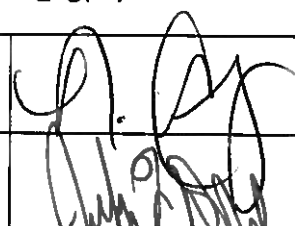
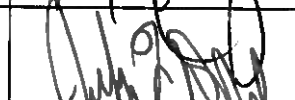
- Comments (may be used to indicate additional information for reporting)
- Save all changes
- Close work order

SECTION 7: REFERENCE

7.1 Safety and Personal Protective Equipment Specifications (S:\SAFETY Programs\Personal Protective Equipment\PPE Matrix by DIVISIONS\MAINTENANCE)

SECTION 8: DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA

	TITLE		Dewatering	
	Procedure #		TES-PWS-2015-26	
	Revision		Date	
	Page		1 of 4	
ORIGINATOR Name / Title	Nikeya Cunningham / Program Analyst, Public Works Services		SIGNATURE	
APPROVED BY Name / Title	Jeffrey DuVal / Deputy Director, T&ES Operations		6.26.15	

OVERVIEW:

The City of Alexandria, Transportation and Environmental Services (T&ES), Public Works Services Division (PWS) provides maintenance and repairs for all City sewers, streets, sidewalks and fire hydrants; maintains stream beds, weirs and stream banks; maintains drainage tunnels, box culverts and storm water pollution removal facilities; maintains bridges; and conducts snow removal and flood control operations. The Public Works Services Division (PWS) coordinates with other City agencies and other divisions within T&ES to respond to weather and hurricanes, and assists in both emergency management and clean-up following these events.

The Standard Operation Procedures (SOP) is a guide for the PWS Division. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 In accordance with Section II.B.6.a of the 2013-2018 MS4 Permit, the City developed written policies and standard operating procedures to address the daily practices that will minimize or prevent pollutant discharges from daily operations and municipal facilities.

1.2 The Team Operations include the following elements:

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of each unit contributing to the Standby Response effort. Lists of potential response calls and efforts.
- b. Section 3: Service Request Process: Identifies the process by which Cityworks Service Requests are processed to Team.
- c. Section 4: Equipment List: Personal Protective Equipment (PPE) and Tools, all of which are mandatory have been listed.
- d. Section 5: Operation: Captures the efforts with standard procedure for responding to dewatering.
- e. Section 6: Reporting: Contains information required in creating/closing a Cityworks Work Order
- f. Section 7: Reference Material
- g. Section 8: Document Changes

TITLE	Dewatering	Procedure #	TES-PWS-2015-26
		Page 2 of 4	

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 Dewatering Operations roles and responsibilities have been identified below:

- **Supervisor** is responsible for processing the maintenance request from Cityworks and verifying the information is accurate; reviews work of staff engaged in repair and maintenance; maintains written and computerized records of repairs. The Assistant Superintendent is responsible for inspecting completed work, updating and closing work orders in Cityworks.
- **Repair Team** is responsible for reporting service levels to Supervisor; coordinate with Supervisor to establish maintenance and repair goals; perform field observation to ensure compliance with department policies, practices, and City ordinances.

SECTION 3: SERVICE REQUEST PROCESS

3.1 Cityworks Work Management system is used to process services requested by customers within the City. Customers and Staff may submit requests by phone, online, or the social networking sites.

3.2 When a notification of services is received, it must first be reviewed by the Superintendents / Assistant Superintendents to verify the need for repair or maintenance on the request. This is accomplished by visiting the location, locating the problem or incident, and identifying the solution.

3.3 Once it has been determined the service request / incident location warrants repair, the Supervisor and Repair Team will be sure to take precautions and reasonable measures to render the location safe. At this point the Superintendent / Assistant Superintendents will create a work order and repair work can begin.

SECTION 4: EQUIPMENT LIST

3.1 Equipment list has been identified below:

- **Personal Protective Equipment (PPE):**
 - Safety Vest
 - Hard Hats
 - Government Issued Work Boots
 - Gloves
 - Protective Eyewear
 - Protective Hearing Equipment
 - Hand Sanitizer
- **Identification and Security**
 - Complete City Issued Uniform
 - Government Issue Identification (ID) Badge
- **Tools**
 - Maps (Sewer and City)
 - Pick
 - Shovel
 - Broom
 - Utility Contacts

TITLE	Dewatering	Procedure #	TES-PWS-2015-26
		Page 3 of 4	

- Emergency Fire and Police Contacts
- City Risk Management Handouts

SECTION 5: OPERATION

4.1 The Team requests are processed during normal business hours at 2900 Business Center Drive (BCD). When a ticket is processed, the following is expected:

- All dewatering discharges into the storm drain system should be filtered or treated to ensure there is no sediment or other contaminants. To remove sediment from dewatering discharges, either filter the discharge or use a settling container.
- Some dewatering operations may require a separate VPDES permit. If so, follow all procedures, requirements, and recommendations in the permit.
- If the project has a stormwater pollution prevention plan (SWPPP), follow all procedures, requirements, and recommendations in the plan.
- Monitor and analyze dewatering discharges daily for appropriate pH and turbidity.
- Use temporary sediment control measures, such as a silt sock, around storm drains located near dewatering activities.

SECTION 6: TEAM REPORTING

Team Report

5.1 Once the Team returns to BCD upon completion of the tasks, the Team Supervisor must report the details and efforts of the response in a Cityworks Work Order.

Items to be entered into Cityworks:

- Employee Name
- Department
- Job Title
- Supervisor
- Date
- Hours Worked
- Work site location
- Assessment
- Unit Accomplished (indicate distance)
- Unit of Measure/Codes and Descriptions (indicate standard of measurement)
- Comments (may be used to indicate additional information for reporting)
- Save all changes
- Close work order


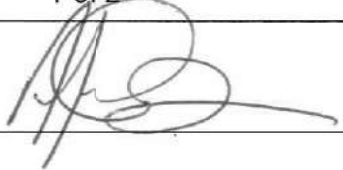
SECTION 7: REFERENCE

7.1 Safety and Personal Protective Equipment Specifications (S:\SAFETY Programs\Personal Protective Equipment\PPE Matrix by DIVISIONS\MAINTENANCE)

TITLE	Dewatering	Procedure #	TES-PWS-2015-26
		Page 4 of 4	

SECTION 8: DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA

	Standard Operating Procedures (SOP)				
	TITLE		Fleet and Vehicle Maintenance		
	Purpose		Stormwater Pollution Prevention		
	Revision	Initial	Date	June 4, 2015	
	Page		1 of 2		
SOP Administrator: Name / Title	Alfred Coleman / Deputy Director, Administration		SIGNATURE		
Location of SOP:	3550 Wheeler Avenue, Alexandria, VA				

I. Purpose

The Fleet Services Division within the Department of General Services is responsible for maintaining the City's vehicles, specialty, and major construction equipment. The City has approximately 900 units in its fleet, which includes police cruisers, pickup trucks, sedans, SUVs, dump trucks, hybrid fuel vehicles, construction equipment, refuse trucks, and street sweepers. Fleet Services performs maintenance and repairs on these City-owned units at the fleet maintenance facility located at 3550 Wheeler Avenue. This SOP provides pollution prevention and good housekeeping written procedures for daily activities related to Fleet and Vehicle Maintenance to address the applicable Municipal Separate Storm Sewer System (MS4) General Permit requirement in Section II B. 6 a.

II. Roles and Responsibilities

The Fleet Services Division Team roles and responsibilities have been identified below:

- **Supervisor** is responsible for ensuring that this SOP is followed.
- **Team** is responsible for following the SOP.

III. Process

- Conduct maintenance work indoors to the greatest extent possible.
- When maintenance work is conducted outdoors, use an impervious surface and protect storm drains from spills and leaks.
- Clean up any spills or leaks promptly using dry methods, such as adsorbent pads or sweeping.
- Do not clean any vehicles or equipment, including lawn care equipment, near a storm drain. Use designated wash racks that drain to sanitary sewers to wash vehicles and equipment.
- Clean grass from lawn care equipment using dry methods, such as brooms, preferably on grassed surfaces. If lawn care equipment is cleaned on impervious surfaces, clean-up all materials using dry methods, such as sweeping.
- Use drip pans for vehicles that are stored outside.
- Do not leave drip pans outside during rain. Properly dispose of any liquid that collects in drip pans. Do not dispose of liquid in storm drains.
- Never leave vehicles/equipment unattended while fueling.

TITLE	Fleet and Vehicle Maintenance SOP	Purpose	Stormwater Pollution Prevention
		Page 2 of 2	

IV. Training and Documentation


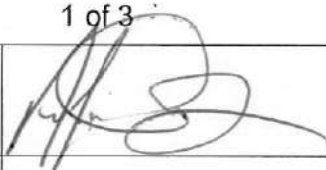
- **Training**
 - The MS4 permit requires that employees are trained in stormwater pollution prevention and good housekeeping, and how to recognize and report illicit discharges.
- **Documentation**
 - Maintain a record of all employees trained and training topics.
 - Maintain documentation of maintenance and inspection activity.

V. References

- Pollution Prevention/Good Housekeeping for Municipal Operations: Standard Operating Procedures for Erie County Department of Environment and Planning Division of Environmental Compliance Services
(\\Tes01\DeptFiles\Testenvqlty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\StwtrPPGH SOP.pdf)
- Fleet and Vehicle Maintenance Standard Operating Procedure for City of Boulder, Colorado
(\\Tes01\DeptFiles\Testenvqlty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\fleetvehicle_maint_sops.pdf)
- Street Maintenance Standard Operating Procedure for Storm Water Control for Municipality of Anchorage Watershed Management Program
(\\Tes01\DeptFiles\Testenvqlty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\App E1 St Maint SOPs for SW Control.pdf)

VI. Record of Changes

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	N/A

	Standard Operating Procedures (SOP)				
	TITLE		Fleet and Vehicle Washing		
	Purpose		Stormwater Pollution Prevention		
	Revision	Initial	Date	June 4, 2015	
	Page		1 of 3		
SOP Administrator: Name / Title	Alfred Coleman / Deputy Director, Administration		SIGNATURE		
Location of SOP:	3550 Wheeler Avenue, Alexandria, VA				

I. Purpose

The Fleet Services Division within the Department of General Services is responsible for maintaining the City's vehicles, specialty, and major construction equipment. The City has approximately 900 units in its fleet, which includes police cruisers, pickup trucks, vans, sedans, dump trucks, hybrid fuel vehicles, construction equipment, refuse trucks, and street sweepers. Fleet Services performs maintenance and repairs on these City-owned units at the fleet maintenance facility located at 3550 Wheeler Avenue. This SOP provides stormwater pollution prevention procedures relating to fleet and vehicle washing. The City's Municipal Separate Storm Sewer System (MS4) permit issued by the Virginia Department of Environmental Quality (DEQ) prohibits the discharge of vehicle and equipment wash water to the storm sewer system. In accordance with Section II.B.6.a of the 2013-2018 MS4 Permit, the City developed written policies and standard operating procedures to address the daily practices that will minimize or prevent pollutant discharges from daily operations and municipal facilities.

II. Roles and Responsibilities

The Fleet Services Division Team roles and responsibilities have been identified below:

- **Supervisor** is responsible for ensuring that this SOP is followed.
- **Team** is responsible for following the SOP.

III. Process

- Wash water is prohibited from entering the storm sewer system.
- Do not clean or wash vehicles or equipment, including lawn care equipment, near a storm drain. If washing vehicles outdoors, use designated wash racks that drain to sanitary sewers to wash vehicles and equipment or use a system that contains wash water and properly dispose of it.
- Minimize soap and water use when washing vehicles.
- Clean grass from lawn care equipment using dry methods, such as brooms, preferably on grassed surfaces. If lawn care equipment is cleaned using brooms on impervious surfaces, clean-up all materials using dry methods, such as sweeping.
- Keep vehicles and other equipment clean, and do not allow a build-up of oil or grease.

Vehicles and equipment may be cleaned using one of the following methods that prevent wash water from entering the storm sewer system:

TITLE	Fleet and Vehicle Washing SOP	Purpose	Stormwater Pollution Prevention
		Page 2 of 3	

- **Washrack**
 - When using the dedicated washrack at 133 Quaker Lane, ensure that the grate inlet at the washrack is draining to the sanitary sewer by engaging the valve that switches from the storm sewer to the sanitary sewer.
 - When done using the washrack, ensure the valve to the sanitary sewer has been disengaged and that the drain is now draining to the storm sewer.
- **Contain / Capture Wash Water**
 - When using a system that contains all wash water, such as blocking storm drains or using a wash kit, absorbent boom, or berm, collect and dispose of all wash water in the sanitary sewer.
 - Follow the manufacturers' directions for all proprietary systems and kits that capture wash water ("Read the Label").
 - Do not dispose of any wash water in the storm sewer or on grassed areas.
 - Clean wash equipment on grassed surfaces or in areas that drain directly to the sanitary sewer.
- **Car Wash Vendor**
 - Wash City-owned vehicles at the commercial car wash facility under contract with the City.

IV. Training and Documentation

- **Training**
 - The MS4 permit requires that employees are trained in stormwater pollution prevention and good housekeeping, and how to recognize and report illicit discharges.
- **Documentation**
 - Maintain a record of all employees trained and training topics.

V. References

- Standard Operating Procedures for Weber County Storm Water Coalition
(\\Tes01\DeptFiles\Tes\envglty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\SOPs Weber County.pdf)
- Street Maintenance Standard Operating Procedure for Storm Water Control for Municipality of Anchorage Watershed Management Program
(\\Tes01\DeptFiles\Tes\envglty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\App E1 St Maint SOPs for SW Control.pdf)
- Vehicle Wash Compliance for City of Alexandria Fire Department
(\\Tes01\DeptFiles\Tes\envglty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Fire Dept\GO 13-030 Vehicle Wash Compliance 8-7-13.pdf)

TITLE	Fleet and Vehicle Washing SOP	Purpose	Stormwater Pollution Prevention
		Page 3 of 3	

- Vehicle Wash Compliance Certification Form for Prohibition of Municipal Vehicle Washwater Discharge to Storm Drain System, City of Alexandria
(\\Tes01\DeptFiles\Tes\envq\ty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Vehicle Wash Compliance Certification Form Final 07.01.2013.docx)

VI. Record of Changes

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	N/A



Alexandria Fire Department

General Order		
Subject:	Stormwater Pollution Prevention	GO # 15-003
Approved:	Dwayne Bonnette, Assistant Chief	Date: 6/30/2015

1.0 BACKGROUND

- 1.1 Discharges into waterways from storm sewer systems are regulated under the Virginia Stormwater Management Act, the Virginia Stormwater Management Program (VSMP), and the Clean Water Act. The Virginia Department of Environmental Quality (VDEQ) issues and regulates these discharges throughout the State by issuing Municipal Separate Storm Sewer System (MS4) permits to local and municipal jurisdictions with compliance requirements. Failure of local and municipal governments to comply with the terms of their permits will result in fines from VDEQ and/or the Environmental Protection Agency (EPA).
- 1.2 The provisions of the MS4 permit require local and municipal governments to develop, maintain and enforce a program that includes six control areas, including detection and elimination of illicit discharges; controlling construction stormwater runoff; post-construction stormwater management; and pollution prevention and good housekeeping policies for government processes and employees.
- 1.3 The City's permit explicitly requires the city to "Prevent the discharge of municipal vehicle wash water into the Municipal Separate Storm Sewer System (MS4) by July 2013." Vehicle wash discharge contains metals and asbestos from brake dust, grease and oils from the vehicle, and other pollutants that become attached to the vehicle from road grime. Stormwater filter systems that have been installed at some Fire Department facilities only filter sediment, they do not filter oils, metals, and other pollutants from the water.

2.0 PURPOSE

- 2.1** This policy establishes pollution prevention and good housekeeping practices to support the City's compliance of the MS4 permit.

3.0 APPLICABILITY

- 3.1** This policy applies to all Fire Department employees.

4.0 DEFINITIONS

- 4.1 Vehicle Wash:** any fixed or mobile facility where the manual, automatic, or self-service exterior washing of vehicles is conducted. It includes, but is not limited to, automobiles, trucks, motor homes, buses, motorcycles, ambulances, fire trucks, tractor trailers, and other devices that convey passengers or goods on streets or highways (9VAC25-194-10)
- 4.2 Heavy Duty Vehicle:** larger apparatus, such as engines, trucks, rescue squads, medic units, and other large specialty vehicles.
- 4.3 Light Duty Vehicle:** cars, pickup trucks, and sport utility vehicles.
- 4.4 Nonpoint Source Pollution:** pollution caused by rainfall, snowmelt, and other water sources that carry natural and man-made pollutants. These pollutants include: oils, grease, toxic chemicals and metals, soap and cleaning chemicals, fertilizers, insecticides, pesticides, sediment, etc.
- 4.5 Vehicle Wash Containment System:** A deployable system that is placed around a vehicle to collect all vehicle wash water. The wash water is collected and disposed of through the sanitary sewer system.
- 4.6 Sanitary Sewer System:** Any drain that discharges into the sewer system that is used to dispose of sewage.

5.0 POLICY

- 5.1** During non-emergency operations, all personnel will take necessary measures to prevent Nonpoint Source Pollution runoff from entering the storm water system.
- 5.2** Heavy Duty Vehicles will be rinsed or washed inside a fire station's apparatus bay with a floor drain that discharges to the sanitary sewer system. If the fire station does not have a floor drain that discharges to the sanitary sewer, or the drain is inoperative, a Vehicle Wash Containment System will be deployed to contain and properly dispose of the vehicle wash water.
- 5.3** Light Duty Vehicles will utilize the current City contracted car wash vendor.
- 5.4** Fuel dispensing stations will be provided with spill containment supplies and emergency pump shut-offs. All spills will be treated immediately. The hazardous materials team will be called for any spill greater than the local resources are capable of handling.
- 5.5** Vehicles and equipment must be attended during active fueling.

6.0 RESPONSIBILITIES

- 6.1** All personnel are responsible for ensuring their non-emergency work does not result in Nonpoint Source Pollution.
- 6.2** Station Managers are responsible for establishing specific housekeeping and vehicle wash procedures for their facility.

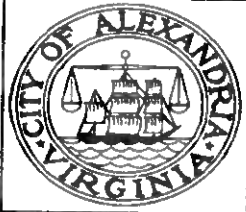
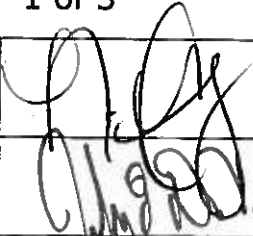
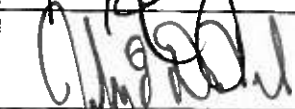
7.0 PROCEDURE

- 7.1** Vehicle maintenance and repair will be conducted indoors to the greatest extent possible.
- 7.2** When vehicle maintenance or repair is performed outdoors, use an impervious surface and protect storm drains from spills and leaks. Vehicle maintenance and repair will not be performed during a rain event.

- 7.3** Clean up spills and leaks promptly using dry methods, such as absorbent pads, loose absorbent and sweeping.
- 7.4** Do not wash equipment, including lawn care equipment, on any impervious surface that leads to the storm drain system.
- 7.5** Remove grass from lawn care equipment using dry methods, such as a broom, preferably while on grassed surfaces.
- 7.6** Use oil drip pans underneath the motor area of Heavy Apparatus Vehicles that are stored indoors and outdoors. Properly dispose of all liquids, oils, and grease collected in drip pans. The pans shall be cleaned in a manner that prevents Nonpoint Source Pollution.
- 7.7** Vehicles washed at fire stations will only be washed using biodegradable soap.
- 7.8** Vehicles washed using a Vehicle Wash Containment System must deploy the system prior to use of any water or soap products. Any wash water collected must be disposed of through the Sanitary Sewer System.

8.0 CANCELLATIONS

- 8.1** This policy cancels Standard Operating Procedure #13-030, Vehicle Wash Compliance issued on August 8, 2013.

	TITLE		Hydrant Inspection and Maintenance	
	Procedure #		TES-PWS-2013-12	
	Revision		Date	
	Page		1 of 3	
ORIGINATOR Name / Title	Nikeya Cunningham / Program Analyst, Public Works Services		SIGNATURE	
APPROVED BY Name / Title	Jeffrey DuVal / Deputy Director, T&ES Operations		6.26.15	

OVERVIEW:

The City of Alexandria, Transportation and Environmental Services (T&ES), Public Works Services Division (PWS) provides maintenance and repairs for all City sewers, streets, sidewalks and fire hydrants; maintains stream beds, weirs and stream banks; maintains drainage tunnels, box culverts and storm water pollution removal facilities; maintains bridges; and conducts snow removal and flood control operations. The Public Works Services Division (PWS) coordinates with other City agencies and other divisions within T&ES to respond to weather and hurricanes, and assists in both emergency management and clean-up following these events.

The Standard Operation Procedures (SOP) is a guide for the PWS Division. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 In accordance with Section II.B.6.a of the 2013-2018 MS4 Permit, the City developed written policies and standard operating procedures to address the daily practices that will minimize or prevent pollutant discharges from daily operations and municipal facilities.

1.2 The Team Operations include the following elements:

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of each unit contributing to the Standby Response effort. Lists of potential response calls and efforts.
- b. Section 3: Service Request Process: Identifies the process by which Cityworks Service Requests are processed to Team.
- c. Section 4: Equipment List: Personal Protective Equipment (PPE) and Tools, all of which are mandatory have been listed.
- d. Section 5: Operation: Captures the efforts with standard procedure for responding to hydrant inspection and maintenance.
- e. Section 6: Reporting: Contains information required in creating/closing a Cityworks Work Order
- f. Section 7: Reference Material
- g. Section 8: Document Changes

ITILE	Hydrant Inspection and Maintenance	Procedure #	TES-PWS-2013-12
		Page 2 of 3	

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 Hydrant Inspection and Maintenance roles and responsibilities have been identified below:

- **Supervisor** is responsible for processing the maintenance request from Cityworks and verifying the information is accurate; reviews work of staff engaged in repair and maintenance; maintains written and computerized records of repairs. The Assistant Superintendent is responsible for inspecting completed work, updating and closing work orders in Cityworks.
- **Repair Team** is responsible for reporting service levels to Supervisor; coordinate with Supervisor to establish maintenance and repair goals; perform field observation to ensure compliance with department policies, practices, and City ordinances.

SECTION 3: SERVICE REQUEST PROCESS

3.1 Cityworks Work Management system is used to process services requested by customers within the City. Customers and Staff may submit requests by phone, online, or the social networking sites.

3.2 When a notification of services is received, it must first be reviewed by the Superintendents / Assistant Superintendents to verify the need for repair or maintenance on the request. This is accomplished by visiting the location, locating the problem or incident, and identifying the solution.

3.3 Once it has been determined the service request / incident location warrants repair, the Supervisor and Repair Team will be sure to take precautions and reasonable measures to render the location safe. At this point the Superintendent / Assistant Superintendents will create a work order and repair work can begin.

SECTION 4: EQUIPMENT LIST

3.1 Equipment list has been identified below:

- **Personal Protective Equipment (PPE):**
 - Safety Vest
 - Hard Hats
 - Government Issued Work Boots
 - Gloves
 - Protective Eyewear
 - Protective Hearing Equipment
 - Hand Sanitizer
- **Identification and Security**
 - Complete City Issued Uniform
 - Government Issue Identification (ID) Badge
- **Tools**
 - Maps (Sewer and City)
 - Pick
 - Shovel
 - Broom
 - Utility Contacts
 - Emergency Fire and Police Contacts
 - City Risk Management Handouts

ITLE	Hydrant Inspection and Maintenance	Procedure #	TES-PWS-2013-12
		Page 3 of 3	

SECTION 5: HYDRANT OPERATION AND INSPECTION

4.1 The Team requests are processed during normal business hours at 2900 Business Center Drive (BCD). When a ticket is processed, the following is expected: (PROCEDURES WILL BE FULLY DEVELOPED AT A LATER TIME)

- Pick up litter and debris around the site prior to any inspection and maintenance activities.
- Use temporary sediment control measures, such as a silt sock, around storm drains located near hydrant inspection and maintenance activities.

SECTION 6: TEAM REPORTING

Team Report

5.1 Once the Team returns to BCD upon completion of the tasks, the Team Supervisor must report the details and efforts of the response in a Cityworks Work Order.

Items to be entered into Cityworks:

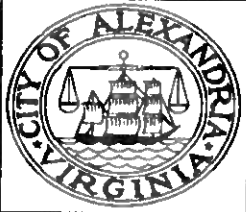
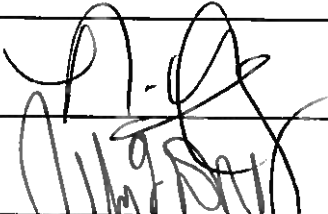

- Employee Name
- Department
- Job Title
- Supervisor
- Date
- Hours Worked
- Work site location
- Assessment
- Unit Accomplished (indicate distance)
- Unit of Measure/Codes and Descriptions (indicate standard of measurement)
- Comments (may be used to indicate additional information for reporting)
- Save all changes
- Close work order

SECTION 7: REFERENCE

7.1 Safety and Personal Protective Equipment Specifications (S:\SAFETY Programs\Personal Protective Equipment\PPE Matrix by DIVISIONS\MAINTENANCE)

SECTION 8: DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA

	TITLE		Jet Truck Operations	
	Procedure #		TES-PWS-2013-06	
	Revision		Date	
	Page		1 of 4	
ORIGINATOR Name / Title	Nikeya Cunningham / Program Analyst, Public Works Services	SIGNATURE		
APPROVED BY Name / Title	Jeffrey DuVal / Deputy Director, T&ES Operations	6.26.15		

OVERVIEW:

The City of Alexandria, Transportation and Environmental Services (T&ES), Public Works Services Division (PWS) provides maintenance and repairs for all City sewers, streets, sidewalks and fire hydrants; maintains stream beds, weirs and stream banks; maintains drainage tunnels, box culverts and storm water pollution removal facilities; maintains bridges; and conducts snow removal and flood control operations. The Public Works Services Division (PWS) coordinates with other City agencies and other divisions within T&ES to respond during weather events, and assists in both emergency management and clean-up following these events.

The Standard Operation Procedures (SOP) is a guide for the PWS Division. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 The Jet Truck Crew serves to clean sewer infrastructure that is owned by the City of Alexandria.

- Provides immediate Traffic Control to ensure roadway and pedestrian safety
- Determines and implements appropriate response
- Cleans and clears sewer infrastructure

1.2 The Jet Truck Crew operations include the following elements:

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of each unit contributing to the Standby Response effort. Lists of potential response calls and efforts.
- b. Section 3: Equipment List: Personal Protective Equipment (PPE), Traffic Control Devices (TCD), and Tools, all of which are mandatory Jet Truck equipment have been listed.
- c. Section 4: Service Request Process: Identifies the process by which Cityworks Service Requests are processed to the Jet Truck Team.
- d. Section 5: Jet Truck Operation: Captures the response efforts with standard procedure for each ticket response.
- e. Section 6: Jet Truck Reporting: Contains information to report to Cityworks after response to tickets.
- f. Section 7: Reference Materials
- g. Section 8: Document Changes

TITLE	Jet Truck Operations	Procedure #	TES-PWS-2013-06
		Page 2 of 4	

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 Jet Truck Crew roles and responsibilities have been identified below:

- **Supervisor** is responsible for processing maintenance ticket and verifying accurate information from Cityworks, as well as operating the Jet Truck.
- **Operator/Support** is responsible for assisting with Traffic Control Devices and other equipment.

SECTION 3: EQUIPMENT LIST

3.1 Jet Truck Cleaning Team equipment list has been identified below:

- **Personal Protective Equipment (PPE):**
 - Complete Uniform
 - Safety Vest
 - Hard Hats
 - Government Issued Work Boots
 - Gloves
 - Protective Eyewear
 - Protective Hearing Equipment
 - Government Issue Identification (ID) Badge
 - Hand Sanitizer
- **Traffic Control Devices:**
 - Minimum of six (6) Orange Cones
 - Minimum of two (2) Flashlights
 - Flags
- **Tools**
 - Maps (Sewer and City)
 - Pick
 - Shovel
 - Broom
 - Utility Contacts
 - Emergency Fire and Police Contacts
 - City Risk Management Handouts
 - Jet Truck
 - Manhole Tool
 - 4328 CCTV (if needed)

SECTION 4: SERVICE REQUEST PROCESS

4.1 Cityworks Work Management system is used to process services requested by customers within the City. Customers and Staff may submit requests by phone, online, or the social networking sites.

4.2 When a notification of services is received, it must first be reviewed by the Superintendents / Assistant Superintendents to verify the need for repair or maintenance on the request. This is accomplished by visiting the location, locating the problem or incident, and identifying the solution.

4.3 Once it has been determined the service request / incident location warrants repair, the Supervisor and Repair Team will be sure to take precautions and

TITLE	Jet Truck Operations	Procedure #	TES-PWS-2013-06
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reasonable measures to render the location safe. At this point the Superintendent / Assistant Superintendents will create a work order and repair work can begin.

SECTION 5: JET TRUCK OPERATION

5.1 The Jet Truck Operation Team is responsible for meeting during normal working hours at 2900 Business Center Drive (BCD) and cleaning assigned sewer infrastructure in the City of Alexandria. When the Jet Truck Cleaning Team processes a sewer maintenance ticket, the following is expected:

- Supervisor is responsible for operating the Jet Truck
- Operator/Support is responsible for operating the Crew Cab (or other vehicle as needed)
- Perform pre-trip equipment check
 - Check quantity of water in tank, fill if necessary.
 - Start truck and extend the hose reel in order to open hood
 - Finish under the hood components of pre-trip check
- The Team must report safely to the work location
- Upon arrival on location, set truck close to manhole and have laborer guide truck into final position. Team must then create safe work zone.
 - Create work zone with cones
 - Open manhole lid and check the direction of water flow
 - Send the nozzle up-stream
 - When cleaning storm sewers, place a bladder downstream to collect water, sediment, and debris. This ensures that excess sediment is not released into the receiving water.
- Prepare by
 - Attaching the correct nozzle to the hose, then adjust hose reel over manhole
 - Lower hose into hole and set footage counter on the hose reel when hose enters pipe
 - Slide tiger tail into hole to prevent chaffing
- Begin pumping by
 - Switching the rodder pump on
 - Switching the engine RPM on
 - Adjusting the engine RPM to achieve 1,000 psi
 - Send the Support to next manhole to watch for the hose
 - Operator of truck must know when hose enters manhole
 - Document footage
- Finish by
 - Reel in hose while maintaining pressure of 1000 psi
 - Watching the water at bottom of manhole for debris
 - When hose nozzle is almost back at the start manhole, reduce RPM and shut off rodder pump switch
 - Remove tiger tail and rest of hose
 - If cutter is needed to cut roots, utilize 4328 CCTV to place cutter exactly on the root
 - Use dry methods, such as sweeping, to clean up any sediment around the work site.
- Upon return to BCD

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- Check water level at end of shift, tank must be topped off for stand-by crew
- Clean filters if scheduled, replace if needed
- Store Jet Truck inside 133 Quaker Lane building if temperature is close to freezing (overnight temperature is expected to be below 40 degrees Fahrenheit)

SECTION 6: JET TRUCK CLEANING TEAM REPORTING

Jet Truck Cleaning Team Report

6.1 Once the Jet Truck Cleaning Team returns to 2900 Business Center Drive, the Team supervisor must report the details of the response on the Jet Truck Cleaning Form. The Team supervisor will then record the details into Cityworks.

Items to be completed on Jet Truck Cleaning Report:


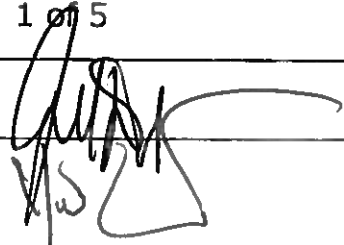
- Employee Name
- Department
- Job Title
- Supervisor
- Date
- Hours Worked
- Work site location
- Equipment/ Vehicle
- Materials Used
- Assessment
- Responsibility
- Description (indicate materials used)
- Measurement (indicate amount of materials used)
- Comments (may be used to indicate additional information for reporting)
- Attach Before and After Pictures (if applicable)

SECTION 7: REFERENCE

- Safety and Personal Protective Equipment Specifications (S:\SAFETY Programs\Personal Protective Equipment\PPE Matrix by DIVISIONS\MAINTENANCE)

SECTION 8: DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA

	TITLE		Pothole Patch Maintenance	
	Procedure #		TES-2013-05	
	Revision		Date	
	Page		1 of 5	
ORIGINATOR Name / Title	Jeff DuVal / Division Chief, Maintenance		SIGNATURE	
APPROVED BY Name / Title	Yon Lambert / Deputy Director, T&ES Operations			

OVERVIEW:

The City of Alexandria, Transportation and Environmental Services (T&ES), Maintenance Division provides maintenance and repairs for all City sewers, streets, sidewalks and fire hydrants; maintains stream beds, weirs and stream banks; maintains drainage tunnels, box culverts and storm water pollution removal facilities; maintains bridges; and conducts snow removal and flood control operations. The Maintenance Division coordinates with other City agencies and other divisions within T&ES to respond to weather and hurricanes, and assists in both emergency management and clean-up following these events.

The Standard Operation Procedures (SOP) is a guide for Maintenance Division. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 The Pothole Patch Repair Team serves to repair potholes in roadways that have been determined to pose a safety risk to motorists and pedestrians, or that compromise the integrity of roadway infrastructure in the City of Alexandria public Right of Way (ROW).

- Provides immediate Traffic Control to ensure roadway and pedestrian safety
- Determines and implements appropriate response
- Repairs / fills in pothole in roadway

1.2 The Pothole Patching Team Operations include the following elements:

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of each unit contributing to the Standby Response effort. Lists of potential response calls and efforts.
- b. Section 3: Service Request Process: Identifies the process by which Cityworks Service Requests are processed to Pothole Patching Maintenance Team.
- c. Section 4: Equipment List: Personal Protective Equipment (PPE), Traffic Control Devices (TCD), and Tools, all of which are mandatory pothole patching equipment have been listed.
- d. Section 5: Pothole Repair Operation: Captures the efforts with standard procedure for responding to pothole patching maintenance.

TITLE	Pothole Patch Maintenance [DRAFT]	Procedure #	TES-2013-05
		Page 2 of 5	

- e. Section 6: Pothole Repair Maintenance Reporting: Contains information required in creating/closing a Cityworks Work Order
- f. Section 7: Reference Material
- g. Section 8: Document Changes

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 Pothole Repair Operations roles and responsibilities have been identified below:

- **Supervisor** is responsible processing the maintenance request from Cityworks and verifying the information is accurate; reviews work of staff engaged in pothole patch repair and maintenance; maintain written and computerized records of repairs. The Assistant Superintendent is responsible for inspecting completed work, updating and closing work orders in Cityworks.
- **Repair Team** is responsible for reporting service levels to Supervisor; coordinate with Supervisor to establish maintenance and repair goals; perform field observation to ensure compliance with department policies, practices, and City ordinances.

SECTION 3: SERVICE REQUEST PROCESS

3.1 Cityworks Work Management system is used to process services requested by customers within the City. Customers and Staff may submit requests by phone, online, or the social networking sites.

3.2 When a notification of services is received, it must first be reviewed by the Superintendents / Assistant Superintendents to verify the need for repair or maintenance on the request. This is accomplished by visiting the location, locating the problem or incident, and identifying the solution.

3.3 Once it has been determined the service request / incident location warrants repair, the Supervisor and Repair Team will be sure to take precautions and reasonable measures to render the location safe. At this point the Superintendent / Assistant Superintendents will create a work order and repair work can begin.

SECTION 4: EQUIPMENT LIST

3.1 Pothole Repair Team Equipment list has been identified below:

- **Personal Protective Equipment (PPE):**
 - Safety Vest
 - Hard Hats
 - Government Issued Work Boots
 - Gloves
 - Protective Eyewear
 - Protective Hearing Equipment
 - Hand Sanitizer
- **Identification and Security**
 - Complete City Issued Uniform
 - Government Issue Identification (ID) Badge

TITLE	Pothole Patch Maintenance [DRAFT]	Procedure #	TES-2013-05
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- **Traffic Control Devices:**
 - Minimum of six (6) Orange Cones
 - Directional Signs
 - Minimum of two (2) Flashlights
 - Information signs
 - Arrow boards
 - Flags

- **Tools**
 - Maps (Sewer and City)
 - Pick
 - Shovel
 - Broom
 - Utility Contacts
 - Emergency Fire and Police Contacts
 - City Risk Management Handouts
 - UPM / Cold Patch Mix
 - Tamping tool
 - Buzz saw
 - Jackhammer
 - Air compressor

SECTION 5: POTHOLE REPAIR OPERATION

4.1 The Pothole Repair Team requests are processed during normal business hours at 2900 Business Center Drive (BCD). When a Pothole Repair ticket is processed, the following is expected:

- Operator/Support is responsible for operating the Crew Cab (or other vehicle as needed)
- Immediately set up Traffic Control Devices
- Assess the location
- Determine and implement appropriate response by following Pothole and Pavement Rating System. The Pothole and Pavement Rating System is used to determine whether a pothole patch is necessary, as well as which method of repair to use, if a repair is required. Potholes and pavement defects are classified by the Superintendent, who uses the following factors to determine repair priority: size, depth, location in the street, potential for damage to vehicles and injuries to residents. Work order priority levels can be modified in Cityworks to track response efforts.
 - Priority 1 poses a significant and imminent threat to vehicular and pedestrian traffic, including personal safety and damage to property. This level of repair requires a minimum of 5 business days, weather permitting.
 - Priority 2 poses a moderate threat to vehicular and pedestrian traffic, including personal safety and damage to property. This level of repair requires a minimum of 7-10 business days, weather permitting.

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- Priority 3 poses a minimal threat to vehicular and pedestrian traffic, including personal safety and damage to property. This level of repair requires a minimum of 7-10 business days, weather permitting.
- The Supervisor will determine the appropriate Technique to use to patch potholes
 - Cold Mix Patching Technique (Non-summer months / cold weather)
 - Clean the pothole of any loose debris and standing water
 - Install cold mix to pothole and tamp material into pothole so it is even with the existing surface of the road.
 - If using Aquaphalt Material, place material in hole and level with a rake or shovel. Ensure that the material stands above the existing surface to allow for compaction. If the depth of the area to be patched is greater than 2.5 inches, place material in two layers. Soak material evenly with water; 1 quart of water per container is recommended. Excess water will not damage the material. Compact to a smooth finish with a hand-tamper or roller.



- Hot Mix Patching Technique (Summer months)
 - Saw cut the pothole with saw or square cut the pothole with a jackhammer if the street is in good or fair condition. Cutting and squaring potholes is only done on an as needed basis. If the street is in poor condition remove loose debris, apply tack to pothole and fill with hot mix and tamp material into pothole so it is even with the existing surface of the road.
 - Spray hole with tack oil
 - Place hot mix in pothole in 2-3 inch layers
 - Compact hot mix material into hole with tamping device until material is level with road surface
- Clean work site of loose debris and return to operational status

TITLE	Pothole Patch Maintenance [DRAFT]	Procedure #	TES-2013-05
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SECTION 6: POTHOLE PATCH REPAIR TEAM REPORTING

Pothole Patch Repair Team Report

5.1 Once the Pothole Patch Repair Team returns to BCD upon completion of the tasks, the Team Supervisor must report the details and efforts of the response in a Cityworks Work Order.

Items to be entered into Cityworks:

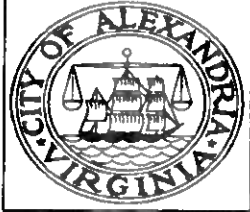
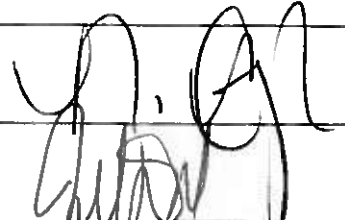

- Employee Name
- Department
- Job Title
- Supervisor
- Date
- Hours Worked
- Work site location
- Assessment
- Unit Accomplished (indicate distance)
- Unit of Measure/Codes and Descriptions (indicate standard of measurement)
- Comments (may be used to indicate additional information for reporting)
- Save all changes
- Close work order

SECTION 7: REFERENCE

7.1 Personal Protective Equipment Specifications and Vendors
(S:\SAFETY Programs\Personal Protective Equipment\PPE Matrix by DIVISIONS\MAINTENANCE)

SECTION 8: DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA

	TITLE		Snow Operations CDL/Non-CDL Operators	
	Procedure #		TES-2013-11	
	Revision		Date	
	Page		1 of 7	
ORIGINATOR Name / Title	Nikeya Cunningham / Program Analyst, Public Works Services		SIGNATURE	
APPROVED BY Name / Title	Jeffrey DuVal / Deputy Director, T&ES Operations		6.30.15	

OVERVIEW:

The City of Alexandria, Transportation and Environmental Services (T&ES), Public Works Services (PWS) Division provides maintenance and repairs for all City sewers, streets, sidewalks and fire hydrants; maintains stream beds, weirs and stream banks; maintains drainage tunnels, box culverts and storm water pollution removal facilities; maintains bridges; and conducts snow removal and flood control operations. The Public Works Services Division (PWS) coordinates with other City agencies and other divisions within T&ES to respond to weather and hurricanes, and assists in both emergency management and clean-up following these events.

The Standard Operation Procedures (SOP) is a guide for the PWS Division. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 The Snow Response Operator Team serves in snow response efforts in the City of Alexandria to keep roadways clear and safe for motorist and pedestrian travel. This task is completed by:

- Coordinating efforts with partnering agencies and forecasters in order to calculate a successful snow response effort
- Responding when a snow emergency is put into effect
- Pretreat city streets with brine when conditions warrant application
- Maintain vehicles in a safe operating capacity for the duration of a snow event
- Apply Deicing and Snow Treatment material to roads during a snow event
- Clear Snow Emergency Routes and Zones identified by the City

1.2 The Snow Response Operator Team includes the following elements:

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of the Snow Response Operator Team during a snow event.
- b. Section 3: Equipment List: Personal Protective Equipment (PPE), Traffic Control Devices (TCD), and Tools, all of which are mandatory equipment, have been listed.

TITLE	Snow Operations CDL/Non-CDL Operators	Procedure #	TES-2013-11
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- c. Section 4: Snow Response Operator Team Operation: Captures the efforts with standard procedure for responding during a snow event.
- d. Section 5: Snow Response Operator Team Plow Procedures: Encompasses procedures for effective snow plow operation.
- e. Section 6: Snow Response Operator Team Report: Contains information to be reported at the end of a snow shift.
- f. Section 7: Reference Materials
- g. Section 8: Document Changes

1.3 The Brine System and Application for Pretreatment of Roadways will be covered under a separate SOP. (Note that deicing agents must not contain urea or other forms of nitrogen or phosphorus.)

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 Snow Response Operator Team roles and responsibilities have been identified below:

- **CDL Driver** is responsible for safely driving vehicles that require a valid Commercial Driver's License.
- **Operator** is responsible for clearing road and applying deicing and snow treatment material using small utility based vehicles such as Ford F-450 utility body trucks.

SECTION 3: EQUIPMENT LIST

3.1 Snow Response Operator Team equipment list has been identified below:

- **Personal Protective Equipment (PPE): Refer to PPE Matrix**
 - Safety Vest
 - Government Issued Work Boots
 - Gloves
 - Protective Eyewear (ANSI Z87 with side shields)
 - Protective Hearing Equipment (HPD with minimum 20 dB NRR)
 - Hand Sanitizer
- **Identification and Security**
 - Complete City Issued Uniform
 - Government Issue Identification (ID) Badge
- **Tools**
 - Snow Zone Maps
 - Pick
 - Shovel
 - Broom
 - Emergency Fire and Police Contacts
 - City Risk Management Handouts
 - Radio
 - Salt/Deicing Material
- **Vehicles**
 - 10-wheel dump truck

TITLE	Snow Operations CDL/Non-CDL Operators	Procedure #	TES-2013-11
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- 6-wheel dump truck
- Utility Vehicle (F-450 with snowplow and spreader)
- Loader

SECTION 4: SNOW RESPONSE OPERATOR TEAM OPERATION

4.1 Snow Response Team Laborer responses occur when forecasters believe that there is a sufficient probability of a snow emergency occurring, regardless of time or day of week.

When a Snow Event is activated, the following is expected:

- The Team must report safely to the muster room
- Upon arrival, the Team will receive
 - Weather briefing
 - Equipment assignment
 - Special instructions as needed
- Team Member will inspect vehicles
 - CDL drivers are to complete a CDL vehicle inspection form
 - Non-CDL drivers are to complete Vehicle Check Sheet, then assist CDL drivers with CDL vehicle inspection if needed
 - Wash or clean out frozen loads from conveyor belts or salt spreaders
- Before leaving yard
 - Enter data for the starting mileage and hour meter for each vehicle
 - Check vehicle for operational condition, to include lights, fuel and leaks; and use drip pans for leaking equipment or vehicles
 - Give white copy of vehicle check sheet to Supervisor
 - Conduct radio check with Supervisor
 - Attach any relevant documents to clipboard so they do not become a distraction during the snow shift
- Radio procedures
 - Perform Radio Check with Supervisor upon leaving
 - Snow Command will provide weather updates on the hour or more frequently if needed
 - Call in only two (2) routes at a time to reduce the confusion with Snow Command
 - Be sure to report to Snow Command at least once an hour. Failure to do so will be reported to the Supervisor or Office Assistant for follow-up
 - Keep radio channels clear of irrelevant discussions. The possibility may arise where drivers encounter an emergency situation and radio channels need to be kept clear in the event that this happens
 - If you encounter an emergency, announce over radio "I have an emergency." When this is heard over the radio, all other operators must cease communications so the Operator with an emergency can speak clearly with Command.
- Safety procedures while on roadways

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- Follow proper winter driving techniques: Drive slow, keep a safe distance between vehicles, avoid situations where you may have to use large driver inputs (i.e. sudden braking or hard turns)
- Be aware of where the snow you plow is going, as to avoid damage to people and property
- Always exercise caution
- If you need to use the phone, pull over to the side and use the proper radio code (10/7 or 10/8)
- NO TEXTING WHILE DRIVING. If you are involved in an accident while texting or using the phone, you can be held liable
- If you become stuck
 - Remain calm and declare to Command that you have an emergency
 - Describe to your Supervisor what your situation is
 - Turn your vehicle lights off and put your 4-way flashers on
 - Do not dig the tires in and try to get out, this will make the situation worse
 - Keep the plow down in order to help prevent vehicle from tipping
- If you encounter a stranded motorist
 - Check if they need assistance. If they do, inform command.
 - Command will be able to dispatch the proper help to the motorist.
 - Do not attempt to get the vehicle unstuck, and do not allow the motorist to ride in your vehicle with you
- At the end of the shift
 - Clear out truck cabin for next operator
 - Inform Supervisor of any equipment problems / concerns
 - Retrieve and complete Salt Usage check sheet from Supervisor to track all salt loaded during shift

SECTION 5: SNOW RESPONSE PLOW PROCEDURE

5.1 During a Snow Event, safe and effective removal of snow is vital in snow operations. Below is a detailed outline of procedures for snow removal.

Procedures for clearing streets are as follows:

- When plowing city streets, single lane and multi-lane
 - Begin clearing the center first and work your way towards the curb
 - Be cautious of parked cars and other objects obstructing the roadway even on snow emergency routes
 - Be cautious of where the snow you are plowing is going and that it does not endanger anyone or cause damage and injury
- Roads with medians and turn lanes
 - Begin in center, feel for the curb then back away slightly
 - Follow the median
 - Plow the turn lane on your first pass. If there is a backup truck, have the backup plow address the turn lanes
 - Lay extra salt in the turn lane
- Roads with 'suicide lanes' or optional-left turn lanes

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- As a standard, begin in the outside and work your way out while plowing
 - Lay extra salt in the center lanes
 - Be mindful that you are in a turn lane, oncoming traffic might not understand what you are doing and attempt to turn in front of you
- Multi-lane road with head wall
 - Start plowing from the head wall to the Berm
 - Keep in mind of the similarity of plowing from the center of the road first
 - If this is not executed properly, snow might create a ramp which would allow a vehicle sliding to jump over the wall and into oncoming traffic
- Intersections
 - Start with a center lane
 - Be cautious of medians
 - Lay extra salt before and after intersection
- Hills
 - Proceed with caution, these are areas with very low traction
 - Gear the transmission down
 - Apply salt heavily
 - Call Supervisor if help is needed
- Curves
 - Pay close attention to speed
 - Be aware of the berm and overhanging tree limbs
 - If you cannot see around the corner, drive as if there is a car in the other lane and proceed with caution
- Heavy traffic roads
 - Be sure to put salt down before rush hour so the heavy flow of traffic can spread the salt application across the roadway
 - Be cautious of sudden stops
 - Keep your plow down at all times, even when heading back to depot
- Obstructions
 - Examples of common obstructions can be mailboxes, telephone poles, and other equipment that is typically found close to the road
 - Make note of pedestrian islands and others obstructions close to the roadway when you are making dry runs so that you will become familiar with the locations during an active snow event
 - If you damage public or private property, record the address and give this information to your supervisor
- Bridges
 - Know the clearance for your truck, including the light bar on the top of the truck
 - When plowing on bridges that have no traffic below, angle the plow toward the berm. Feel for the curb to contact with the side of the plow, then back away slightly
 - When plowing on bridges that have traffic below, do not angle the plow towards the berm. Straight blade the snow off the bridge deck.

TITLE	Snow Operations CDL/Non-CDL Operators	Procedure #	TES-2013-11
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Once the bridge deck is complete, angle your blade back towards the berm and continue plowing.

- **Night Plowing**
 - Because of the lower temperatures, the salt will not be as effective as it would be during the day. However, you must keep applying salt so as the temperatures warms during the day it will begin to melt the snow.
 - Use this opportunity to access areas that would otherwise be congested with traffic during the day
- **Snow Glare**
 - When plowing during the day, lower your visors to help deflect sun light
 - Keep windshield clean and wiper fluid reservoir full
 - Wear sun glasses if needed
- **Ice**
 - In icy conditions, or when you suspect that black ice is present:
 - Do not slam on brakes
 - Do not make sudden changes in speed or direction
 - Ease off the accelerator and steer into the direction that you are skidding. This will help to keep the vehicle stable when attempting to regain traction
 - Ice storms can be especially hazardous. They have the capability of downing power lines and branches
 - If a low power line or branch falls on your truck, contact the Snow Command immediately for action steps
- **Low Visibility**
 - Keep your light on low beams. If you turn your high beams on, it is possible that you will temporarily blind other drivers
 - Reduce your speed to increase your reaction time
- **Piling and Storage of Snow**
 - Avoid plowing, pushing, blowing or storing excess snow and street debris in front of storm drain inlets
 - Do not dispose of snow in wetlands, storm water BMPs, ditches with open water, or on top of storm drains
 - Store snow on gravel or grass where snow can melt and infiltrate
- **Salt / Deicing Materials**
 - Applied following plowing operations during prolonged snow events.
 - Take precaution to avoid overloading the application equipment and vehicles.

SECTION 6: SNOW RESPONSE OPERATOR TEAM REPORT

6.1 Once the Snow Response Operator Team returns to 2900 Business Center Drive upon completion of assigned tasks, the details of their shift and salt usage check must be reported. The details of their shift will be entered into Cityworks upon the return to BCD.

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Items to be completed on Snow Emergency Operator Report Form:

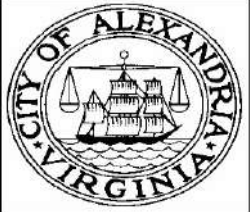

- Employee Name
- Department
- Job Title
- Supervisor
- Date
- Hours Worked
- Equipment/Vehicle
- Materials Used
- Measurement (indicate amount of materials used)
- Comments (may be used to indicate additional information for reporting)

SECTION 7: REFERENCE

- Safety and Personal Protective Equipment Specifications (S:\SAFETY Programs\Personal Protective Equipment\PPE Matrix by DIVISIONS\MAINTENANCE)
- Master Snow Plow (S:\maint\FILES\SNOW REMOVAL)

SECTION 8: DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA

	Standard Operating Procedures (SOP)			
	TITLE		Bulk Material Storage	
	Purpose		Stormwater Pollution Prevention	
	Revision	Initial	Date	June 4, 2015
	Page		1 of 3	
SOP Administrator: Name / Title	James Nichols / Division Chief, Park Operations & Maintenance	SIGNATURE		
Location of SOP:	2900 Business Center Drive, Alexandria, VA			

OVERVIEW:

The City of Alexandria, Recreation, Parks and Cultural Activities (RPCA) Department, Park Operations, manages the City's numerous parks, natural areas, facilities and equipment, medians and rights-of-way, and the grounds of many public buildings. Park Operations includes three Divisions:

- Natural Resources – Urban Forestry (street trees), Environmental Education (Buddie Ford Nature Center), and Natural Lands Management (invasive plant mgt.)
- Park Maintenance – Maintenance of all City Parks (grounds maintenance, ball fields, restrooms, pavilions, trails, open spaces areas)
- Facility and Operation Support – Equipment and vehicle maintenance, irrigation systems, fixed assets, and Horticulture

Park Operations also responds to weather emergencies, including snow and ice control at Metro stations, schools, recreation centers, and many of the City's walkways and overpasses.

The Standard Operation Procedures (SOP) is a guide for RPCA and Park Operations. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. The City's Municipal Separate Storm Sewer System (MS4) permit issued by the Virginia Department of Environmental Quality (DEQ) requires the development and implementation of this SOP. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 In accordance with Section II.B.6.a of the 2013-2018 MS4 Permit, the City developed written policies and standard operating procedures to address the daily practices that will minimize or prevent pollutant discharges from daily operations and municipal facilities. This SOP focuses on the proper storage procedures for bulk materials.

1.2 The Bulk Material Storage SOP includes the following elements:

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of each Team Member assigned to Bulk Material Storage.

TITLE	Bulk Material Storage SOP	Purpose	Stormwater Pollution Prevention
		Page 2 of 3	

- b. Section 3: Bulk Material Storage: Identifies the appropriate process for Sand, Salt, Dirt, or Gravel, and Liquid Storage.
- c. Section 4: Training and Documentation: Contains guidelines for employee Training and Record Keeping and Documentation.
- d. Section 5: Reference Materials
- e. Section 6: Record of Document Changes

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 Bulk Material Storage Team roles and responsibilities have been identified below:

- **Supervisor** is responsible for ensuring that this SOP is followed.
- **Team** is responsible for following the SOP.

SECTION 3: BULK MATERIAL STORAGE

- **Sand, Salt, Dirt, or Gravel**
 - Store piles under a roof, inside a building, or covered with a tarp.
 - Store piles on a flat, impervious surface.
 - Contain stormwater run-on and runoff with barriers or berms.
 - Clean-up "track out" using dry cleaning methods, such as brooms.
 - Never dispose of wash water from sand/salt trucks into storm drains.
- **Liquid**
 - Provide secondary containment for all above-ground storage tanks (ASTs). Secondary containment can include double-walled tanks, or impervious containment outside of the tank that can contain the entire contents of the largest tank plus an additional 4 inches of rainfall.
 - Properly dispose of liquid that is drained from secondary containment for ASTs.
 - Have a spill kit available in case of a spill, leak, or accidental discharge. Immediately clean all spills, leaks, or accidental discharges.

SECTION 4: TRAINING AND DOCUMENTATION

- **Training**
 - The MS4 permit requires that employees are trained in stormwater pollution prevention and good housekeeping, and how to recognize and report illicit discharges.
 - Employees who handle bulk materials should be trained on the safest way to store the materials.
- **Record Keeping and Documentation**
 - Maintain a record of all employees trained and training topics.
 - Maintain an inventory of bulk materials storage amounts and locations.

SECTION 5: REFERENCES

- Operation and Maintenance Plan for Port of Skagit, Washington
[\(\\Tes01\DeptFiles\Tes\envqlty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for](#)

TITLE	Bulk Material Storage SOP	Purpose	Stormwater Pollution Prevention
		Page 3 of 3	

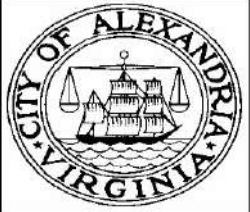

Daily Operations\Resources\

PortofSkagitOPERATIONmMAINTENANCEplanupdated.pdf)

- Guidelines and Standard Operating Procedures: Illicit Discharge Detention and Elimination and Pollution Prevention/Good Housekeeping for Stormwater Phase II Communities in New Hampshire
(\\Tes01\DeptFiles\Tes\envqlty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\NH IDDE SOP.pdf)

SECTION 6: RECORD OF DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	N/A

	Standard Operating Procedures (SOP)			
	TITLE		Equipment Maintenance	
	Purpose		Stormwater Pollution Prevention	
	Revision	Initial	Date	June 4, 2015
	Page		1 of 3	
SOP Administrator: Name / Title	James Nichols / Division Chief, Park Operations & Maintenance		SIGNATURE	
Location of SOP:	2900 Business Center Drive, Alexandria, VA			

I. Purpose

The City of Alexandria, Recreation, Parks and Cultural Activities (RPCA) Department, Park Operations, manages the City's numerous parks, natural areas, facilities and equipment, medians and rights-of-way, and the grounds of many public buildings. Park Operations includes three Divisions:

- Natural Resources – Urban Forestry (street trees), Environmental Education (Buddie Ford Nature Center), and Natural Lands Management (invasive plant mgt.)
- Park Maintenance – Maintenance of all City Parks (grounds maintenance, ball fields, restrooms, pavilions, trails)
- Facility and Operation Support – Equipment and vehicle maintenance, irrigation systems, fixed assets, and Horticulture

Park Operations also responds to weather emergencies, including snow and ice control at Metro stations, schools, recreation centers, and many of the City's walkways and overpasses.

This SOP provides pollution prevention and good housekeeping written procedures for daily activities related to Fleet and Vehicle Maintenance to address the applicable Municipal Separate Storm Sewer System (MS4) General Permit requirement in Section II B. 6 a.

II. Roles and Responsibilities

The Equipment Maintenance Team roles and responsibilities have been identified below:

- **Supervisor** is responsible for ensuring that this SOP is followed.
- **Team** is responsible for following the SOP.

III. Process

- Conduct maintenance work indoors to the greatest extent possible.
- When maintenance work is conducted outdoors, use an impervious surface and protect storm drains from spills and leaks.
- Clean up any spills or leaks promptly using dry methods, such as adsorbent pads or sweeping.
- Do not clean any vehicles or equipment, including lawn care equipment, near a storm drain. Use designated wash racks that drain to sanitary sewers to wash vehicles and equipment.

TITLE	Equipment Maintenance SOP	Purpose	Stormwater Pollution Prevention
			Page 2 of 3

- Clean grass from lawn care equipment using dry methods, such as brooms, preferably on grassed surfaces. If lawn care equipment is cleaned on impervious surfaces, clean-up all materials using dry methods, such as sweeping.
- Use drip pans for vehicles that are stored outside.
- Do not leave drip pans outside during rain. Properly dispose of any liquid that collects in drip pans. Do not dispose of liquid in storm drains.
- Never leave vehicles/equipment unattended while fueling.

IV. Training and Documentation

- **Training**
 - The MS4 permit requires that employees are trained in stormwater pollution prevention and good housekeeping, and how to recognize and report illicit discharges.
- **Documentation**
 - Maintain a record of all employees trained and training topics.
 - Maintain documentation of maintenance and inspection activity.

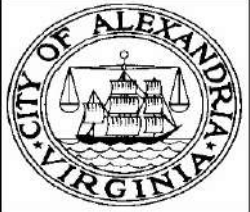

V. References

- Pollution Prevention/Good Housekeeping for Municipal Operations: Standard Operating Procedures for Erie County Department of Environment and Planning Division of Environmental Compliance Services
(\\Tes01\DeptFiles\Tes\envqlty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\StwtrPPGH SOP.pdf)
- Fleet and Vehicle Maintenance Standard Operating Procedure for City of Boulder, Colorado
(\\Tes01\DeptFiles\Tes\envqlty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\fleetvehicle maint sops.pdf)
- Street Maintenance Standard Operating Procedure for Storm Water Control for Municipality of Anchorage Watershed Management Program
(\\Tes01\DeptFiles\Tes\envqlty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\App E1 St Maint SOPs for SW Control.pdf)

TITLE	Equipment Maintenance SOP	Purpose	Stormwater Pollution Prevention
		Page 3 of 3	

VI. Record of Changes

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	N/A

	Standard Operating Procedures (SOP)			
	TITLE		Fleet and Vehicle Washing	
	Purpose		Stormwater Pollution Prevention	
	Revision		Initial	Date
				June 4, 2015
Page		1 of 3		
SOP Administrator: Name / Title		James Nichols / Division Chief, Park Operations & Maintenance		SIGNATURE 
Location of SOP:		2900 Business Center Drive, Alexandria, VA		

OVERVIEW:

The City of Alexandria, Recreation, Parks and Cultural Activities (RPCA) Department, Park Operations, manages the City's numerous parks, natural areas, facilities and equipment, medians and rights-of-way, and the grounds of many public buildings. Park Operations includes three Divisions:

- Natural Resources – Urban Forestry (street trees), Environmental Education (Buddie Ford Nature Center), and Natural Lands Management (invasive plant mgt.)
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- Facility and Operation Support – Equipment and vehicle maintenance, irrigation systems, fixed assets, and Horticulture

Park Operations also responds to weather emergencies, including snow and ice control at Metro stations, schools, recreation centers, and many of the City's walkways and overpasses.

The Standard Operation Procedures (SOP) is a guide for RPCA and Park Operations. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. The City's Municipal Separate Storm Sewer System (MS4) permit issued by the Virginia Department of Environmental Quality (DEQ) requires the development and implementation of this SOP. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 In accordance with Section II.B.6.a of the 2013-2018 MS4 Permit, the City developed written policies and standard operating procedures to address the daily practices that will minimize or prevent pollutant discharges from daily operations and municipal facilities. This SOP focuses on the proper washing procedures for fleet and vehicle washing.

1.2 The Fleet and Vehicle Washing SOP includes the following elements:

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of each Team Member assigned to Fleet and Vehicle Washing.

TITLE	Fleet and Vehicle Washing SOP	Purpose	Stormwater Pollution Prevention
		Page 2 of 3	

- b. Section 3: Fleet and Vehicle Washing: Identifies the appropriate process for fleet and vehicle washing.
- c. Section 4: Training and Documentation: Contains guidelines for employee Training and Record Keeping and Documentation.
- d. Section 5: Reference Materials
- e. Section 6: Record of Document Changes

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 The Fleet and Vehicle Washing Team roles and responsibilities have been identified below:

- **Supervisor** is responsible for ensuring that this SOP is followed.
- **Team** is responsible for following the SOP.

SECTION 3: FLEET AND VEHICLE WASHING

- Wash water is prohibited from entering the storm sewer system.
- Do not clean or wash vehicles or equipment, including lawn care equipment, near a storm drain. If washing vehicles outdoors, use designated wash racks that drain to sanitary sewers to wash vehicles and equipment or use a system that contains wash water and properly dispose of it.
- Minimize soap and water use when washing vehicles.
- Clean grass from lawn care equipment using dry methods, such as brooms, preferably on grassed surfaces. If lawn care equipment is cleaned using brooms on impervious surfaces, clean-up all materials using dry methods, such as sweeping.
- Keep vehicles and other equipment clean, and do not allow a build-up of oil or grease.

Vehicles and equipment may be cleaned used one of the following methods that prevent wash water from entering the storm sewer system:

- **Washrack**
 - When using the dedicated washrack at 133 Quaker Lane, ensure that the grate inlet at the washrack is draining to the sanitary sewer by engaging valve that switches from the storm sewer to the sanitary sewer.
 - When done using the washrack, ensure the valve to the sanitary sewer has been disengaged and that the drain is now draining to the storm sewer.
- **Contain / Capture Wash Water**
 - When using a system that contains all wash water, such as blocking storm drains or using a wash kit, adsorbent boom, or berm, collect and dispose of all wash water in the sanitary sewer.
 - Follow the manufacturers' directions for all proprietary systems and kits that capture wash water ("Read the Label").
 - Do not dispose of any wash water in the storm sewer or on grassed areas.

TITLE	Fleet and Vehicle Washing SOP	Purpose	Stormwater Pollution Prevention
		Page 3 of 3	

- Clean wash equipment on grassed surfaces or in areas that drain directly to the sanitary sewer.
- **Car Wash Vendor**
 - Wash vehicles at the commercial car wash facility under contract with the City.

SECTION 4: TRAINING AND DOCUMENTATION

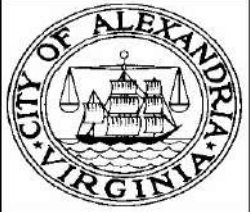

- **Training**
 - The MS4 permit requires that employees are trained in stormwater pollution prevention and good housekeeping, and how to recognize and report illicit discharges.
- **Record Keeping and Documentation**
 - Maintain a record of all employees trained and training topics.
 - Maintain an inventory of fleet vehicles.

SECTION 5: REFERENCES

- Standard Operating Procedures for Weber County Storm Water Coalition ([\\Tes01\DeptFiles\Tes\envqlty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\SOPs Weber County.pdf](#))
- Street Maintenance Standard Operating Procedure for Storm Water Control for Municipality of Anchorage Watershed Management Program ([\\Tes01\DeptFiles\Tes\envqlty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\App E1 St Maint SOPs for SW Control.pdf](#))
- Vehicle Wash Compliance for City of Alexandria Fire Department ([\\Tes01\DeptFiles\Tes\envqlty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Fire Dept\GO 13-030 Vehicle Wash Compliance 8-7-13.pdf](#))
Vehicle Wash Compliance Certification Form for Prohibition of Municipal Vehicle Washwater Discharge to Storm Drain System, City of Alexandria ([\\Tes01\DeptFiles\Tes\envqlty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Vehicle Wash Compliance Certification Form Final 07.01.2013.docx](#))

SECTION 6: RECORD OF DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA

	Standard Operating Procedures (SOP)			
	TITLE		Garbage Storage	
	Purpose		Stormwater Pollution Prevention	
	Revision	Initial	Date	June 4, 2015
	Page		1 of 3	
SOP Administrator: Name / Title	James Nichols / Division Chief, Park Operations & Maintenance	SIGNATURE		
Location of SOP:	2900 Business Center Drive, Alexandria, VA			

OVERVIEW:

The City of Alexandria, Recreation, Parks and Cultural Activities (RPCA) Department, Park Operations, manages the City's numerous parks, natural areas, facilities and equipment, medians and rights-of-way, and the grounds of many public buildings. Park Operations includes three Divisions:

- Natural Resources – Urban Forestry (street trees), Environmental Education (Buddie Ford Nature Center), and Natural Lands Management (invasive plant mgt.)
- Park Maintenance – Maintenance of all City Parks (grounds maintenance, ball fields, restrooms, pavilions, trails)
- Facility and Operation Support – Equipment and vehicle maintenance, irrigation systems, fixed assets, and Horticulture

Park Operations also responds to weather emergencies, including snow and ice control at Metro stations, schools, recreation centers, and many of the City's walkways and overpasses.

The Standard Operation Procedures (SOP) is a guide for RPCA and Park Operations. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. The City's Municipal Separate Storm Sewer System (MS4) permit issued by the Virginia Department of Environmental Quality (DEQ) requires the development and implementation of this SOP. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 In accordance with Section II.B.6.a of the 2013-2018 MS4 Permit, the City developed written policies and standard operating procedures to address the daily practices that will minimize or prevent pollutant discharges from daily operations and municipal facilities. This SOP focuses on the proper storage procedures for garbage.

1.2 The Bulk Material Storage SOP includes the following elements:

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of each Team Member assigned to Garbage Storage.

TITLE	Garbage Storage SOP	Purpose	Stormwater Pollution Prevention
		Page 2 of 3	

- b. Section 3: Garbage Storage: Identifies the appropriate process for Garbage Storage.
- c. Section 4: Training and Documentation: Contains guidelines for employee Training and Record Keeping and Documentation.
- d. Section 5: Reference Materials
- e. Section 6: Record of Document Changes

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 Garbage Storage Team roles and responsibilities have been identified below:

- **Supervisor** is responsible for ensuring that this SOP is followed.
- **Team** is responsible for following the SOP.

SECTION 3: GARBAGE STORAGE

- Cover dumpsters located outside.
- Place dumpsters and trash cans on a flat, impervious surface that does not drain directly to a storm drain.
- Locate dumpsters and trash cans in convenient, easily observable areas.
- Regularly inspect trash cans and dumpsters for leaks. Repair immediately if any are found.
- Never dispose of wash water from dumpsters or trash cans into storm drains.
- Do not put hazardous materials or oils in dumpsters or trash cans.

SECTION 4: TRAINING AND DOCUMENTATION

- **Training**
 - The MS4 permit requires that employees are trained in stormwater pollution prevention and good housekeeping, and how to recognize and report illicit discharges.
- **Record Keeping and Documentation**
 - Maintain a record of all employees trained and training topics.

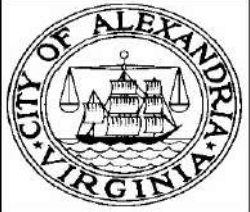

SECTION 5: REFERENCES

- Operation and Maintenance Plan for Port of Skagit, Washington
(\\Tes01\DeptFiles\Tes\envqlty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\PortofSkagitOPERATIONmAINTENANCEplanupdated.pdf)
- Guidelines and Standard Operating Procedures: Illicit Discharge Detention and Elimination and Pollution Prevention/Good Housekeeping for Stormwater Phase II Communities in New Hampshire
(\\Tes01\DeptFiles\Tes\envqlty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\NH IDDE SOP.pdf)

TITLE	Garbage Storage SOP	Purpose	Stormwater Pollution Prevention
		Page 3 of 3	

SECTION 6: RECORD OF DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA

	Standard Operating Procedures (SOP)				
	TITLE		Pesticide, Herbicide, and Fertilizer Application		
	Purpose		Stormwater Pollution Prevention		
	Revision	Initial	Date	June 4, 2015	
	Page		1 of 4		
SOP Administrator: Name / Title	James Nichols / Division Chief, Park Operations & Maintenance		SIGNATURE		
Location of SOP:	2900 Business Center Drive, Alexandria, VA				

OVERVIEW:

The City of Alexandria, Recreation, Parks and Cultural Activities (RPCA) Department, Park Operations, manages the City's numerous parks, natural areas, facilities and equipment, medians and rights-of-way, and the grounds of many public buildings. Park Operations includes three Divisions:

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Park Operations also responds to weather emergencies, including snow and ice control at Metro stations, schools, recreation centers, and many of the City's walkways and overpasses.

The Standard Operation Procedures (SOP) is a guide for RPCA and Park Operations. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. The City's Municipal Separate Storm Sewer System (MS4) permit issued by the Virginia Department of Environmental Quality (DEQ) requires the development and implementation of this SOP. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 In accordance with Section II.B.6.a of the 2013-2018 MS4 Permit, the City developed written policies and standard operating procedures to address the daily practices that will minimize or prevent pollutant discharges from daily operations and municipal facilities. This SOP focuses on the proper handling, mixing, application, clean-up, and storage procedures for pesticides, herbicides, and fertilizers (landscape chemicals).

1.2 The Pesticide, Herbicide, and Fertilizer Application SOP include the following elements:

TITLE	Pesticide, Herbicide, and Fertilizer Application SOP	Purpose	Stormwater Pollution Prevention
		Page 2 of 4	

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of each Team Member assigned to Pesticide, Herbicide, and Fertilizer Application.
- b. Section 3: Preparation: Identifies the appropriate preparation for Pesticide, Herbicide, and Fertilizer Application.
- c. Section 4: Equipment List: Includes a list of mandatory equipment that is needed for Personal Protective Equipment (PPE), Identification and Security, and Tools.
- d. Section 5: Process: Identifies the appropriate process for Pesticide, Herbicide, and Fertilizer Application.
- e. Section 6: Training and Documentation: Contains guidelines for employee Training and Record Keeping and Documentation.
- f. Section 7: Reference Materials
- g. Section 8: Record of Document Changes

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 Pesticide, Herbicide, and Fertilizer Application Team roles and responsibilities have been identified below:

- **Supervisor** is responsible for ensuring that this SOP is followed.
- **Team** is responsible for following the SOP.

SECTION 3: PREPARATION

- Always follow the manufacturers' recommendations for use of pesticide, herbicide, and fertilizer ("Read the Label").
- Fertilizer applications must be based on recommendations in the Nutrient Management Plan if applicable, and/or Virginia Nutrient Management Standards and Criteria (latest) to avoid economic costs and environmental impacts associated with excess fertilizer use.
- Use herbicides and pesticides only if there is an actual pest problem.
- Do not apply pesticides, herbicides, or fertilizers if rain is expected within a 24-hour period.
- Only apply pesticides, herbicides, or fertilizers if wind speeds are low (less than 5 mph).
- Have a spill kit available in case of a spill.

SECTION 4: EQUIPMENT LIST

4.1 equipment list has been identified below:

- **Personal Protective Equipment (PPE):**
 - Safety Vest
 - Government Issued Work Boots
 - Rubber gloves
 - Protective Eyewear
 - Hand Sanitizer
- **Identification and Security**
 - Government Issue Identification (ID) Badge
- **Tools**

TITLE	Pesticide, Herbicide, and Fertilizer Application SOP	Purpose	Stormwater Pollution Prevention
		Page 3 of 4	

- ANSI approved sprayers
- Plastic pallets and pails for secondary containment
- Spill kit
- Absorbent pads
- Broom
- Dust pan
- Manufacturers' instructions for use and disposal of materials
- MSDS sheets for all chemicals
- Emergency Fire and Police Contacts
- City Risk Management Handouts

SECTION 5: PROCESS

When pesticide, herbicide, and/or fertilizer are applied the following is expected:

- **Mixing**
 - Always follow the manufacturers' recommendations for mixing of pesticide, herbicide, and fertilizer ("Read the Label").
 - Do not mix, prepare, transfer, or pour landscape chemicals outdoors or near or in storm drains. Use a protected area with impervious secondary containment, preferably indoors, to mix, prepare, transfer, and pour landscape chemicals.
- **Application**
 - Always follow the manufacturers' recommendations for application of pesticide, herbicide, and fertilizer ("Read the Label").
 - Only apply the recommended amounts of the landscape chemicals.
 - Do not overspray the landscape chemicals onto an impervious surface, such as a sidewalk or driveway.
 - Do not apply landscape chemicals to frozen ground.
 - Do not overwater areas recently treated with landscape chemicals to minimize the amount of runoff into storm drains.
- **Clean-Up**
 - Always follow the manufacturers' recommendations for clean-up and disposal of pesticide, herbicide, and fertilizer ("Read the Label").
 - Clean up any spills or leaks promptly using dry methods, such as sweeping.
 - Triple rinse pesticide and herbicide containers and use the rinse water as product or as dilution for the next batch.
 - Recycle or dispose of all spent or excess landscape chemicals properly and promptly.
 - Dispose of any excess, unused, expired, or waste pesticide, herbicide, and/or fertilizer as hazardous waste.
 - Keep application equipment clean; do not allow a buildup of chemicals.
 -
- **Storage**
 - Always follow the manufacturers' recommendations for storage of pesticide, herbicide, and fertilizer ("Read the Label").

TITLE	Pesticide, Herbicide, and Fertilizer Application SOP	Purpose	Stormwater Pollution Prevention
		Page 4 of 4	

- All pesticide and herbicide storage should be kept to a minimum. Any pesticides that are stored should be stored in secured area, preferably indoors so that spills and leaks will not contact soils.
- All containers must be clearly and correctly labeled.

SECTION 6: TRAINING AND DOCUMENTATION

• Training

- The MS4 permit requires that employees are trained in stormwater pollution prevention and good housekeeping, and how to recognize and report illicit discharges.
- Employees who handle pesticides should be trained on the safest way to mix, apply, store, and handle the chemicals.

• Record Keeping and Documentation

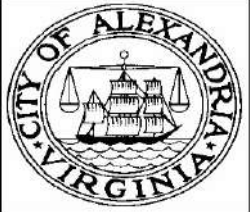

- Maintain a record of all employees trained and training topics.
- Maintain an inventory of pesticide, herbicide, and/or fertilizer application activities.
- Maintain an inventory of pesticide, herbicide, and/or fertilizer expiration dates.

SECTION 7: REFERENCES

- Fertilizer, Herbicide, and Pesticide Application Standard Operating Procedure for City of Westminster, Colorado
(\\Tes01\DeptFiles\Tes\envqlty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\fertilizer application Westminster.pdf)
- Fertilizer, Herbicide, and Pesticide Application Standard Operating Procedure for City of Boulder, Colorado
(\\Tes01\DeptFiles\Tes\envqlty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\01638 BoulderColoradoChemical.pdf)
- Chemical Application Pesticides, Herbicides, Fertilizers (Parks and Recreation) Standard Operating Procedure for Sandy City, Utah
(\\Tes01\DeptFiles\Tes\envqlty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\SOPs Storm Water 2011.pdf)

SECTION 8: RECORD OF DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA

	Standard Operating Procedures (SOP)			
	TITLE		Snow Operations	
	Purpose		Stormwater Pollution Prevention	
	Revision	Initial	Date	June 4, 2015
	Page		1 of 3	
SOP Administrator: Name / Title	James Nichols / Division Chief, Park Operations & Maintenance	SIGNATURE		
Location of SOP:	2900 Business Center Drive, Alexandria, VA			

OVERVIEW:

The City of Alexandria, Recreation, Parks and Cultural Activities (RPCA) Department, Park Operations, manages the City's numerous parks, natural areas, facilities and equipment, medians and rights-of-way, and the grounds of many public buildings. Park Operations includes three Divisions:

- Natural Resources – Urban Forestry (street trees), Environmental Education (Buddie Ford Nature Center), and Natural Lands Management (invasive plant mgt.)
- Park Maintenance – Maintenance of all City Parks (grounds maintenance, ball fields, restrooms, pavilions, trails)
- Facility and Operation Support – Equipment and vehicle maintenance, irrigation systems, fixed assets, and Horticulture

Park Operations also responds to weather emergencies, including snow and ice control at Metro stations, schools, recreation centers, and many of the City's walkways and overpasses.

The Standard Operation Procedures (SOP) is a guide for RPCA and Park Operations. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. The City's Municipal Separate Storm Sewer System (MS4) permit issued by the Virginia Department of Environmental Quality (DEQ) requires the development and implementation of this SOP. Where a standard operation procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 In accordance with Section II.B.6.a of the 2013-2018 MS4 Permit, the City developed written policies and standard operating procedures to address the daily practices that will minimize or prevent pollutant discharges from daily operations and municipal facilities. This SOP focuses on pollution prevention and good housekeeping procedures associated with snow removal.

1.2 The Snow Operations SOP includes the following elements:

- a. Section 2: Roles and Responsibilities: Provides clear and concise direction on the roles and responsibilities of each team member during snow operations.

TITLE	Snow Operations SOP	Purpose	Stormwater Pollution Prevention
		Page 2 of 3	

- b. Section 3: Snow Operations: Identifies the appropriate process for pollution prevention and good housekeeping for snow operations.
- c. Section 4: Training and Documentation: Contains guidelines for employee Training and Record Keeping and Documentation.
- d. Section 5: Reference Materials
- e. Section 6: Document Changes

SECTION 2: ROLES AND RESPONSIBILITIES

2.1 Snow Response Operator Team roles and responsibilities have been identified below:

- **Supervisor** is responsible for ensuring that this SOP is followed.
- **Team** is responsible for following the SOP.

SECTION 3: SNOW OPERATIONS

- Inspect vehicles and equipment
 - Check vehicle for operational condition, to include lights, fuel and leaks; and use drip pans for leaking equipment or vehicles
- Piling and Storage of Snow
 - Avoid plowing, pushing, blowing or storing excess snow and street debris in front of storm drain inlets
 - Do not dispose of snow in wetlands, stormwater BMPs, ditches with open water, or on top of storm drains
 - Store snow on gravel or grass where snow can melt and infiltrate
- Salt / Deicing Materials
 - Take precaution to avoid overloading the application equipment and vehicles

SECTION 4: TRAINING AND DOCUMENTATION

- **Training**
 - The MS4 permit requires that employees are trained in stormwater pollution prevention and good housekeeping, and how to recognize and report illicit discharges.
- **Record Keeping and Documentation**
 - Maintain a record of all employees trained and training topics.

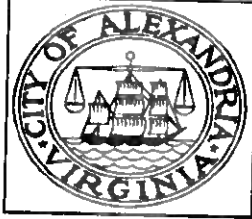
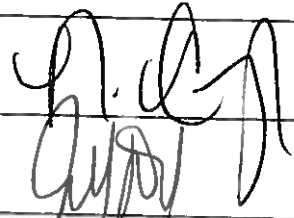
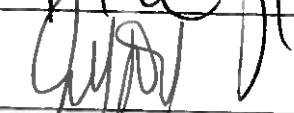
SECTION 7: REFERENCE

- Safety and Personal Protective Equipment Specifications (S:\SAFETY Programs\Personal Protective Equipment\PPE Matrix by DIVISIONS\MAINTENANCE)
- Master Snow Plow (S:\maint\FILES\SNOW REMOVAL)

TITLE	Snow Operations SOP	Purpose	Stormwater Pollution Prevention
		Page 3 of 3	

SECTION 8: DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA

	TITLE	Vehicle and Equipment Washing (Resource Recovery)		
	Procedure #	TES-RR-2015-22		
	Revision		Date	
	Page	1 of 5		
ORIGINATOR Name / Title	Nikeya Cunningham / Program Analyst, Public Works Services	SIGNATURE		
APPROVED BY Name / Title	Jeffrey DuVal / Deputy Director, T&ES Operations	6.30.15		

OVERVIEW:

The City of Alexandria, Transportation and Environmental Services (T&ES), Resource Recovery (RR) Division is responsible for refuse and recycling collection, street sweeping, and curbside recycling programs. The Resource Recovery (RR) Division provides comprehensive, cost-effective solid waste management to residents and businesses in an environmentally sound manner, while incorporating state-of-the-art methods and technology, and educating the public on responsible resource management. The RR Division coordinates with other City agencies and other divisions within T&ES to respond during weather events and assists in both emergency management and clean-up following these events.

The Standard Operation Procedures (SOP) is a guide for the RR Division. The SOP outlines the rules and processes to be followed for administrative functions, field work, and the enforcement of regulations. Where a standard operating procedure is not applicable or does not exist, a Team Member should ask for guidance from his/her Supervisor or the Division Chief.

SECTION 1: PURPOSE

1.1 The purpose of this procedure is to provide operational best management practices (BMPs) to control pollutant discharges by promoting a conscious effort when washing City vehicles and equipment to reduce the amount of sediment, antifreeze, heavy metals, oil and other materials that may runoff from the wash rack. Uncontrolled washing activities have a potential to produce a high concentration of pollutants in runoff wash water to the storm water system. These procedures are critical steps that must be included in every vehicle washing activity at the 133 South Quaker Lane wash rack.

1.2 Vehicle and Equipment Washing include the following elements:

- a. Section 2: Equipment List: Personal Protective Equipment (PPE) and mandatory equipment have been listed.
- b. Section 4: Refuse Container Management Process: Captures the efforts and description with standard procedure for vehicle and equipment washing.
- c. Section 5: Pollution Prevention
- d. Section 6: Training and Documentation
- e. Section 7: Reference Materials
- f. Section 8: Document Changes

TITLE	Vehicle and Equipment Washing (Refuse Recovery)	Procedure#	TES-2015-22
		Page 2 of 5	

SECTION 3: EQUIPMENT LIST

3.1 The Vehicle and Equipment Washing equipment list has been identified below:

- **Personal Protective Equipment (PPE):**
 - Safety Vest
 - Work Boots
 - Protective Eyewear (ANSI Z87 with side shields)
- **Vehicle Washing Equipment:**
 - Biodegradable/ Phosphate free Detergents
 - Pump Sprayer
 - Vehicle Wash Brush
 - Automotive Degreaser
 - City Vehicle Wash Rack
- **Identification and Security:**
 - Complete City Issued Uniform
 - Government Issue Identification (ID) Badge

SECTION 4: VEHICLE AND EQUIPMENT WASHING PROCESS

4.1 State and Federal regulations require local ordinances to prohibit unauthorized discharges to the storm drainage system and local water ways. One of the most common "prohibited discharges" is wastewater from commercial vehicle washing. The City of Alexandria takes every precautionary measure to ensure no runoff enters the storm drainage systems.

4.2 All vehicles and equipment must be washed in a designated area, located in the rear of 133 S. Quaker Lane. Vehicle washing is conducted twice a month on bi-weekly Mondays (weather permitting). To begin the process, the Superintendent of the Public Works Services (PWS) Sewer Section, must be notified in order to change the sewer drain from *storm* to *sanitary* prior to vehicle washing.

- **Vehicle/Equipment Prewash**
 - Using the pre-wash degreasing agent, starting with the lower portion working upwards, mist the degreaser onto the vehicle. Allow the product to dwell on the vehicle (usually 30 seconds – 5 minutes) as it works to break up and loosen any contaminants from the vehicle.
 - Choose a wash media (sponge or mitt) to use and soak it in clean water for a few seconds. Working in small areas, wipe the area you are degreasing with the wash media, using as little pressure as possible. Be sure to repeat these steps until each area of the vehicle has been agitated with the wash media and water.
- **Interior Trim**
 - Empty vehicle of all debris, trash and recyclables and take out any floor mats and lay them aside.

TITLE	Vehicle and Equipment Washing (Refuse Recovery)	Procedure#	TES-2015-22
			Page 3 of 5

- Vacuum the floorboards, under the seats, around the pedals, the upholstery, rear deck, and top of the dashboard. Be sure to use any brush attachments and crevice tools available to get between and beside seats.
- Spray vinyl cleaner onto a cloth and wipe methodically over the vinyl surfaces in the vehicle and buff the surfaces with a clean, soft cloth.
- Spray window cleaner on a cloth or paper towel and methodically clean the windows.
- Traditional Power Wash Cleaning
 - Pour roughly an ounce (or as directed on the bottle) of shampoo into the pump sprayer. Spray the bucket with water to generate some lather and suds.
 - Take the vehicle wash brush, starting from the top of your vehicle, gently guide your brush across a section of the vehicle, using little to no added pressure. Be sure to repeat these steps until your entire vehicle has been washed.
 - All vehicles are to be air dried after wash. After wash is complete, the sewer drain must then be switched back to storm from sanitary.
- Cleaning Truck Hopper
 - Lock Out/Tag Out – *Lockout* is the isolation of energy from any system (a machine, equipment, or process) which physically locks the system in a safe mode. *Tagout* is a labelling process that is always used when lockout is required. The process of tagging out a system involves attaching or using an indicator that includes information on why the lockout is needed.
 - At this time the hopper is now ready to be cleaned. Follow the steps for *Vehicle/Equipment Prewash* followed by steps for *Traditional Power Wash Cleaning*.
- Wash Rack Clean-up
 - Once all vehicles have been washed thoroughly, all debris must be removed and the area is then power washed to remove all sediments.

SECTION 5: POLLUTION PREVENTION MEASURES

5.1 In accordance with Section II.B.6.a of the 2013-2018 MS4 Permit, the City developed written policies and standard operating procedures to address the daily practices that will minimize or prevent pollutant discharges from daily operations and municipal facilities.

- Wash water is prohibited from entering the storm sewer system.
- Do not clean or wash vehicles or equipment, including lawn care equipment, near a storm drain. If washing vehicles outdoors, use designated wash racks that drain to sanitary sewers to wash vehicles and equipment or use a system that contains wash water and properly dispose of it.
- Use biodegradable, phosphate free soap when washing vehicles.
- Minimize soap and water use when washing vehicles.

TITLE	Vehicle and Equipment Washing (Refuse Recovery)	Procedure#	TES-2015-22
		Page 4 of 5	

- Clean grass from lawn care equipment using dry methods, such as brooms, preferably on grassed surfaces. If lawn care equipment is cleaned using brooms on impervious surfaces, clean-up all materials using dry methods, such as sweeping.
- Keep vehicles and other equipment clean, and do not allow a build-up of oil or grease.

5.2 Vehicles and equipment may be cleaned using one of the following methods that prevent wash water from entering the storm sewer system:

- **Washrack**
 - When using the dedicated washrack at 133 Quaker Lane, ensure that the grate inlet at the washrack is draining to the sanitary sewer by engaging valve that switches from the storm sewer to the sanitary sewer.
 - When done using the washrack, ensure the valve to the sanitary sewer has been disengaged and that the drain is now draining to the storm sewer.
- **Contain / Capture Wash Water**
 - When using a system that contains all wash water, such as blocking storm drains or using a wash kit, adsorbent boom, or berm, collect and dispose of all wash water in the sanitary sewer.
 - Follow the manufacturers' directions for all proprietary systems and kits that capture wash water ("Read the Label").
 - Do not dispose of any wash water in the storm sewer or on grassed areas.
 - Clean wash equipment on grassed surfaces or in areas that drain directly to the sanitary sewer.
- **Car Wash Vendor**
 - Wash vehicles at the commercial car wash facility under contract with the City.

SECTION 6: TRAINING AND DOCUMENTATION

Training

- The MS4 permit requires that employees are trained in stormwater pollution prevention and good housekeeping, and how to recognize and report illicit discharges.

Documentation

- Maintain a record of all employees trained and training topics.

TITLE	Vehicle and Equipment Washing (Refuse Recovery)	Procedure#	TES-2015-22
		Page 5 of 5	

SECTION 6: REFERENCE

- Standard Operating Procedures for Weber County Storm Water Coalition (\\Tes01\DeptFiles\Tes\envqlty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\SOPs Weber County.pdf)
- Street Maintenance Standard Operating Procedure for Storm Water Control for Municipality of Anchorage Watershed Management Program (\\Tes01\DeptFiles\Tes\envqlty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Resources\App E1 St Maint SOPs for SW Control.pdf)
- Vehicle Wash Compliance for City of Alexandria Fire Department (\\Tes01\DeptFiles\Tes\envqlty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Fire Dept\GO 13-030 Vehicle Wash Compliance 8-7-13.pdf)
- Vehicle Wash Compliance Certification Form for Prohibition of Municipal Vehicle Washwater Discharge to Storm Drain System, City of Alexandria (\\Tes01\DeptFiles\Tes\envqlty\Stormwater\MS4 Permit\2013-2018 MS4 Permit Cycle\Program Plan Update FY15\PY2 Program Plan Updates\SOPs for Daily Operations\Vehicle Wash Compliance Certification Form Final 07.01.2013.docx)
- Safety and Personal Protective Equipment Specifications (S:\SAFETY Programs\Personal Protective Equipment\PPE Matrix by DIVISIONS\MAINTENANCE)

SECTION 7: DOCUMENT CHANGES

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	NA



Environmental
Sustainability
Management
System

City of Alexandria - RPCA

Verification	Originator	Revised	Approved	Issued
Initials Date	RHS 04/4/2014	RHS 03/12/2015	Core Team 03/13/2015	RPCA 03/16/2015

RPCA Standard Operating Procedures (SOP) for Invasive Species Control and Herbicide Use in the City of Alexandria

Description

This work shall consist of activities to control or eradicate invasive vegetation within a given project area. All project areas and work sites must be pre-approved by RPCA, Natural Resources Division.

Control areas typically include upland forested areas, woodland edges, tidal wetlands, emergent fringe wetlands, rip-rap side slopes, trails, medians, right-of-ways, and other sites. These efforts include the application of approved herbicides and may include hand extraction in combination with the herbicide application throughout the duration of the contract.

All work shall be performed in accordance with this specification, specific plans, and as directed by Natural Resources Division. Invasive vegetation control shall only include those species designated by Natural Resources Division.

Materials

All herbicides shall be EPA registered chemicals, including those that are approved for use in or adjacent to waterways where applicable, to control and prevent re-growth of undesirable vegetation. All herbicides proposed for use require prior approval by Natural Resources Division. Contractors shall select herbicides appropriate to the species being managed and shall submit the selection(s) to Natural Resources Division for written approval prior to the use of such chemicals. Manufacturer's specification sheets (labels) for herbicide, wetting agent, basal oil, and dyes shall also be submitted to Natural Resources Division. Also, a colorant shall be added to the herbicide in order to easily identify plants that have been treated.

In addition, where foliar application of a glyphosate herbicide is indicated, we require that Roundup or other glyphosate products formulated with reportedly environmentally damaging surfactants not be used,

but rather a 53.8% non-surfactant glyphosate herbicide (in the form of its isopropylamine salt), such as Rodeo, AquaNeat, Accord Concentrate, Foresters Non Selective, or comparable product, that is mixed with an environmentally safe surfactant such as Agri-Dex.

Procedures

Herbicide application is strictly regulated, and the Contractor must ensure that all regulations are followed. Application equipment, personal protective equipment, and application rates of the herbicide shall be in conformance with manufacturer's recommendations as shown on the product label and in accordance with federal and state pesticide application laws.

In addition, all tanks, backpack sprayers, hand sprayers, and containers holding herbicides shall have the contents visibly and legibly written and displayed on the container (product or trade name and active ingredients and percent).

- 1) **Pre-Application Meeting:** A pre-application meeting shall be scheduled prior to commencement of invasive plant control operations. Meeting shall include Natural Resource Division staff.
- 2) **Qualifications of Herbicide Operator:** The Contractor shall submit qualifications of key personnel who will be performing and/or supervising work on site, including a copy of the herbicide applicator's license. Only certified pesticide technicians and applicators are authorized to apply herbicides on City lands (except those in training under the direct supervision of certified applicators on-site).
- 3) **Notification:** The Contractor shall notify Natural Resources Division at least 48 hours prior to all herbicide applications.
- 4) **Flagging:** The areas planned for treatment shall be clearly flagged in the field and reviewed by Natural Resources Division Staff prior to commencement of treatment activities. The Contractor shall be prepared to discuss invasive species control and native plant preservation methodologies during this field review.
- 5) **Timing of Herbicide Application:** Herbicide applications shall only be applied during appropriate periods of the growing season, typically between May and October, or as approved by Natural Resources Division. Herbicide application shall only be conducted during appropriate weather conditions as indicated on the product label. The herbicide shall not be applied when it is raining or if rain is forecasted within 24 hours of the planned application. The wind speed cannot be greater than 10 mph at the time of application.
- 6) **Application Method:** Herbicide application shall be selective low volume treatments with a backpack sprayer, truck mounted spray rig with low volume pump and spray gun, squirt bottle, injection gun, paint brush, or other methods, as approved by Natural Resources Division. Broadcast

high volume applications will not be permitted, except in certain, pre-approved situations. The herbicide shall be applied with approved spraying apparatus directly to the target plant. Extreme caution shall be used when spraying adjacent to off-target, non-invasive vegetation or directly adjacent to any waterways/wetlands. Overspray of herbicide onto non-target plants shall be avoided to the greatest extent possible. The Contractor shall be responsible for any act of negligence in applying and handling of the herbicide on the project.

Operating motorized vehicles along any natural area trails, except for rare emergency situations, is prohibited, unless pre-approved by Natural Resources Division. This is highly damaging to fragile soils, vegetation, and wildlife, and creates an active disturbance mechanism for the spread of non-native invasive species.


Digging woody plants from wooded and riparian sites is not allowed, except in special, pre-approved cases, because it creates soil disturbance and causes an increase of non-native invasive species, damages native vegetation, de-stabilizes slopes and stream banks, and causes erosion. Instead, it is advised to saw down the targeted vegetation and immediately treat the fresh cut with the appropriate herbicide.

- 7) **Pre-Application Invasive Plant Eradication:** The Contractor shall conduct a field walk of the project area to identify the location and density of the invasive plant species to be managed. Once the Contractor has identified these areas and approved the locations and methods to be used, he will manage the invasive plants as here described.
- 8) **Upland slopes with dense stands of invasive plants:** Reduce growth layers and damage leaves with a string trimmer to improve herbicide uptake. Thoroughly wet all leaves with approved herbicides. Cut large stems or trunks and apply approved herbicides to cut surfaces immediately (within seconds) using a spray bottle or paint brush.
- 9) **Wetland fringe areas and upland slopes with individual plants or small patches of invasive plants:** Utilize spot treatment methods while being sure to minimize over spray onto surrounding desirable plants. Cut large stems and apply approved herbicides to cut surfaces immediately using a spray bottle or paint brush.
- 10) **Post-Application Invasive Plant Eradication:** Some contracts are negotiated to have the Contractor responsible for post-application management of invasive plants for a designated period of time after the completion of first-phase applications.
- 11) **Upland slopes:** Identify and flag individual plants and areas dominated by invasive plants. Spot treat individual invasive plants while being sure to minimize over spray onto surrounding desirable plants. Cut large stems and apply approved herbicides to cut surfaces immediately using a spray bottle or paint brush.

- 12) **Created wetland vegetation fringe along the stream:** Identify and flag individual plants and areas dominated by invasive plants. Spot treat individual invasive plants while being sure to minimize over spray onto surrounding desirable plants.
- 13) **Herbicide Handling:** The Contractor shall store, transport, and handle the herbicide in accordance with the manufacturer's recommendations. Materials shall be stored in the original container at a secured location. Any spills or leaks must be cleaned up immediately.
- 14) **Site Cleanup:** During the execution of invasive vegetation control measures, all areas shall be kept neat and clean and free of trash and debris. Final cleanup shall be the responsibility of the Contractor and shall consist of the removal of all trash and materials incidental to the project to an approved off-site disposal location.
- 15) **Replacement of Native Plants Damaged:** The Contractor shall be responsible for replacing (or suitable in-kind restitution) of any native plant material that is killed or damaged through any act of negligence by the Contractor in applying and handling of the herbicide on the project.
- 16) **Final Inspection:** The Contractor shall be responsible for correcting all deficiencies within seven (7) calendar days of inspection. Natural Resources Division and the Contractor shall perform a final inspection and any corrective actions at the close-out of the contract.

Measurement and Payment

The Invasive Species Control will be measured and paid for at the contract unit price of square yards of surface area of herbicide applied. Hand extraction prior to or following herbicide application will be considered part of the contract unit. Any additional work required to ensure invasive vegetation control during the duration of the contract, including hand pulling, will be measured on a per square yard basis. This work will only be undertaken as approved or directed by RPCA/Natural Resources Division, and price and payment will constitute full compensation for furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work.

	Standard Operating Procedures (SOP)			
	Title	Water Disposal from Dewatering Activities During Utility Construction and Maintenance Activities		
	Purpose	Pollution prevention		
	Revision	Initial	Date	September 29, 2020
	Page 1 of 2			
SOP Administrator: Name/Title	Mark Gundersen, Division Chief of Public Works Services	SIGNATURE		
Location of SOP:	2900-B Business Center Drive, Alexandria, VA 22314			

- 1) **Objective:** This Standard Operating Procedure (SOP) specifies responsibilities and procedures for water disposal from dewatering activities performed by City of Alexandria, VA, Transportation and Environmental Services (TES) Public Works Services (PWS). The scope of this procedure is to address the disposal of water pumped during maintenance or construction operations where that water could be discarded outdoors or directly to stormwater conveyances. This includes but is not limited to the dewatering of BMP Vaults and other Storm Structures by the City of Alexandria.
- 2) **Responsibilities:** TES PWS is responsible for publicly owned utilities (fire hydrants, storm sewer and sanitary sewer) maintenance activities in the City.
- 3) **Compliance / Regulations:** The following regulations are to follow the current Federal, Virginia Department of Environmental Quality (DEQ) and the City of Alexandria regulations.
- 4) **Best Management Practices:** These practices apply for dewatering and excavation of Tunnels, BMP Vaults, and other Storm Structures. This policy excludes any work for other than work directly performed by TES PWS.

BMP and Storm Structures

- Visually inspect the water to be removed. Water in excavations usually results from groundwater infiltration or rainfall. Determine if there are visible pollutants and/or contaminants in the water to be pumped and the potential sources of those pollutants on site.
- The following steps shall be taken based on the material found:
 - **Organic material, pollutants and/or contaminants** are found within the structure, a specialized contractor shall be contacted to remove the material prior to further actions. Further investigation and actions may be required by the City on proper removal and disposal.
 - **No sediment within the water** (clear water), which has been the result from rainwater or groundwater. Dewatering can be completed by either pumping the water into a vegetated area and/or pumped and hauled to an existing storm sewer for disposal.

Title	Water Disposal from Dewatering Activities During Utility Construction and Maintenance Activities	Purpose	Pollution Prevention
		Page 2 of 2	

- **Sediment within the water** is observed, TES PWS shall place erosion and sediment and control around existing storm structures downstream (current version of the DEQ Erosion and Sediment Control Handbook, or approved alternate). Water will be pumped using a submersible pump and discharged overland to the erosion and sediment control structure.

Care is to be taken to prevent sediment from being discharged. As much sediment shall be removed by mechanical means and removed to an off-site site for further dewatering and disposal.

When the operation is completed, the erosion and sediment control downstream devices shall be removed and disposed of.



- TES PWS will not be liable for third party discharges. Any discharge from a third party will be responsible for the maintenance, disposal of all material, and all costs involved.

5) Authority:

1. The TES PWS responsible staff member onsite has the authority to make changes onsite per changing site conditions. The staff member shall take necessary precautions to reduce and/or eliminate the discharge of sediment and other material from entering the environment.
2. The TES PWS responsible staff member has the authority to stop operations if there is an environmental and/or life safety risk that poses immediate danger.
3. The TES PWS responsible staff member has no authority of a Contractor's work and/or actions.
4. The TES PWS responsible staff member has no authority over other work performed by the City staff and/or departments.

6) Record of Changes

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	N/A

	Standard Operating Procedures (SOP)			
	Title	Disposal of Landscape Organic Waste		
	Purpose	Prevent landscape organic waste from entering the storm sewer system		
	Revision	Initial	Date	September 9, 2020
	Page	1 of 2		
SOP Administrator: Name/Title	Bob Williams, Division Chief, Park Operations & Natural Resources	SIGNATURE		
Location of SOP:	2900-B Business Center Drive, Alexandria, VA 22314			

- 1) **Objective:** This Standard Operating Procedure (SOP) provides an overview of landscape organic waste disposal best practices with the goal of preventing waste from entering the storm drain inlet and the storm sewer system. The Department of Recreation, Parks & Cultural Activities (RPCA) at the City of Alexandria, VA, provides landscape maintenance services across the City.
- 2) **Responsibilities:** RPCA and its contractors are responsible for landscape organic waste disposal to minimize potential stormwater impacts.
- 3) **Procedures**
 - a. All vegetation shall be maintained in such a way as keeps stormwater conveyances including drains, clear and free of vegetative debris.
 - b. Any organic, plant or soil wastes generated as a result of landscape maintenance, including but not limited to leaves, soil cores, grass clippings, or other debris shall be handled in an environmentally responsible manner to reduce likelihood of this material entering stormwater conveyances or local streams.
 - i. Grass Clippings: Grass clippings shall be collected or blown back on to grassed areas. In no cases shall grass clippings be blown onto pavement, where they can then be washed down a storm drain.
 - ii. Soil Cores: Soil cores shall be collected for proper disposal or shall remain on grassed areas so that any soil runoff remains on the landscaped areas.
 - iii. Leaves: Leaves shall be picked from storm drains up as promptly as practical to keep storm drains clear from obstruction, which could cause damaging flooding, and keep leaves from entering the storm sewer system. In the event leaves cannot be picked up in a timely manner, they should be blown back onto vegetated surfaces. Fall leaf program includes the mulching of leaves and leaving this material on vegetative surfaces.
 - iv. Sticks, limbs, or whole vegetation: Limbs, sticks, or other vegetative debris generated either as a result of maintenance activities or from natural causes should be cleaned up immediately upon generation or discovery. If vegetative debris cannot be removed from a site in a timely manner, it should be moved to a vegetated area where it cannot block stormwater conveyances or storm drains. Not intended for entire park areas.

Title	Disposal of Landscape Organic Waste	Purpose	Prevent landscape organic waste from entering the storm sewer system
Page 2 of 2			

- 4) **Proper Disposal:** Coordinate with Transportation & Environmental Services for disposal at the Leaf Mulch Facility as appropriate or COVANTA if not appropriate for the Leaf Mulch Facility.
- 5) **Dissemination and Training:** Park Operations will conduct a minimum of two times per year discussion on stormwater, including a spring session. Also included with on-boarding new staff. For contractors, this language will be included in the ITB. However, RPCA is not responsible for contractor training.

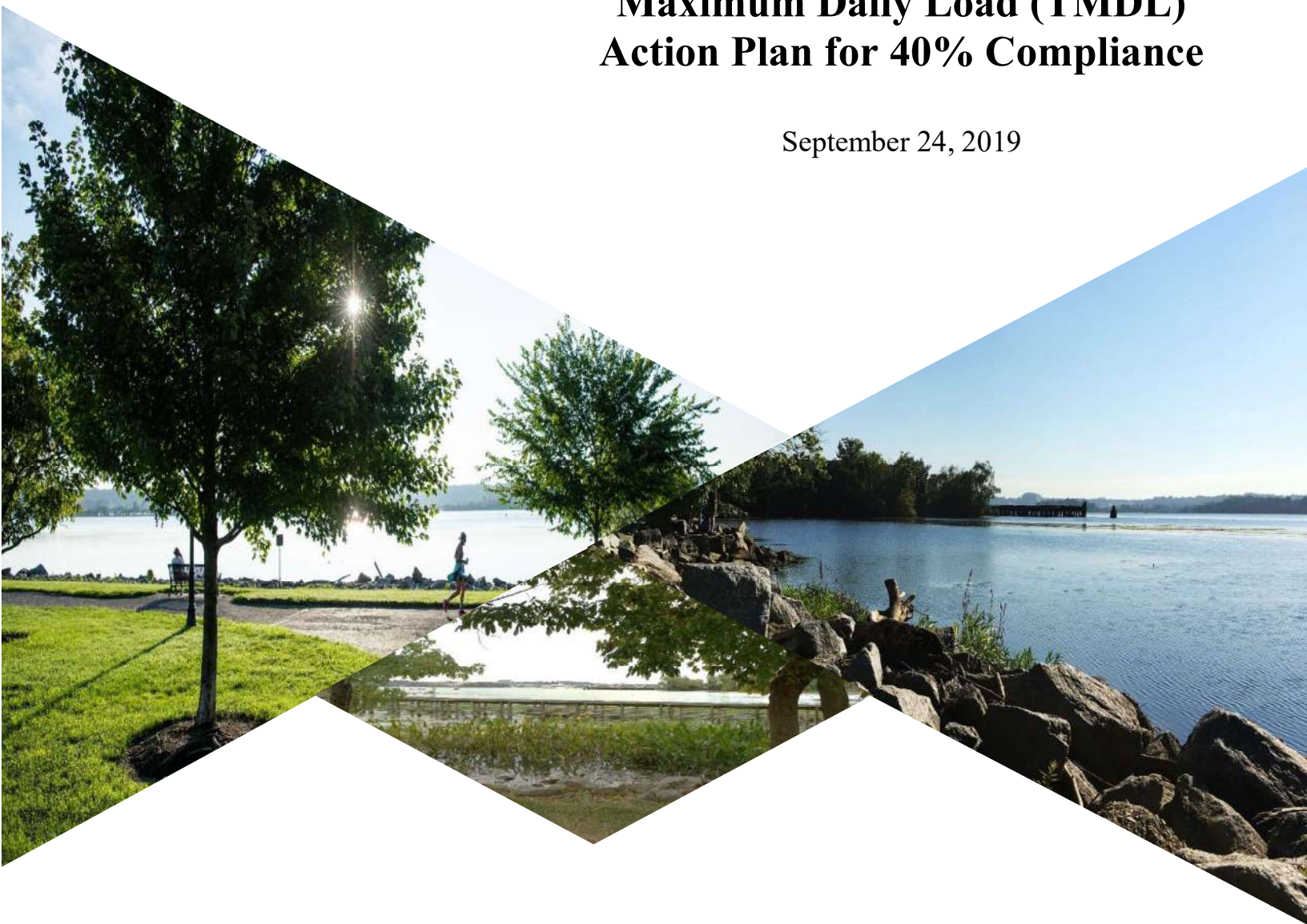
6) **Record of Changes**

REV Level	Purpose of Change	Changes	Date of Previous Revision
Initial	New	None	N/A

City of Alexandria
Municipal Separate Storm Sewer System (MS4) Program Plan
Appendix G – Phase II Chesapeake Bay TMDL Action Plan

Phase 2 Chesapeake Bay Total Maximum Daily Load (TMDL) Action Plan for 40% Compliance

September 24, 2019



**For compliance with 9VAC25-890 et. seq., “General VPDES Permit
for Discharges of Stormwater from Small Municipal Separate
Storm Sewer Systems, Permit No. VAR040057**



City of Alexandria, Virginia

Prepared by:

City of Alexandria, Virginia
Department of Transportation and Environmental Services
Stormwater Management Division



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City of Alexandria, Virginia

Phase 2 Chesapeake Bay TMDL Action Plan for 40% Compliance

September 24, 2019

Executive Summary

The purpose of this Phase 2 Chesapeake Bay Total Maximum Daily Load (TMDL) Action Plan is to comply with Part II A “Chesapeake Bay TMDL special condition” of the 2018 – 2023 General Virginia Pollution Discharge Elimination System (VPDES) Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4), No. VAR040057 issued to the City of Alexandria (City) on November 1, 2018. The City’s Phase 1 Chesapeake Bay TMDL Action Plan documenting the City’s proposed strategies to achieve 44%, 39% and 39% of the City’s total nitrogen, total phosphorus, and total suspended solids (sediment) goals, respectively, by June 30, 2018, was approved by the Virginia Department of Environmental Quality (DEQ) on January 12, 2016.

This Phase 2 Action Plan has been developed to document that sufficient measures have been implemented to meet the 5% compliance targets identified in the 2013-2018 permit and to demonstrate the City’s ability to comply with the required additional 35% reductions for existing sources as of June 30, 2009, increased loads from 2009-2019 New Sources, and increased loads from Grandfathered projects (9VAC25-870-48). The focus of the Action Plan is to provide the means and methods and a general level of effort that will be needed for the City to meet the 40% cumulative Chesapeake Bay TMDL reduction targets in the MS4 permit for phosphorus, nitrogen, and sediment developed by the United States Environmental Protection Agency (EPA) in December 2010. Consistent with the approach in the Phase 1 Action Plan, the City’s Phase 2 planned internal goals includes progress to achieve reductions prior to the required permit end dates in order to lessen the burden during the third permit cycle (July 2023 to June 2028).

During the Phase 1 Action Plan, the following tasks were completed and/or documented:

- Delineation of the MS4 service area including the breakdown of pervious and impervious area;
- Calculation of the pollutant baseline loads for MS4 service area;
- Calculation of the increased pollutant loads from redevelopment projects during July 1, 2009 to June 30, 2014 where an average land cover condition greater than 16% impervious cover was used;
- Calculation of pollutant loads from Grandfathered projects that are required to be offset prior to project completion;
- Mean and methods to meet the Phase 1 target pollutant load reductions;
- Calculation of the total pollutant reductions required for Phase 1; and

- Calculation of the pollutant reductions associated with the proposed strategies and corresponding costs.

The Phase 2 Action Plan builds on the previous work completed in the Phase 1 Action Plan. However, as required in the permit, the Phase 2 Action Plan addresses pollutant reductions of 40% of the L2 scoping run in addition to the offsets required from July 1, 2009 to June 30, 2019 redevelopment projects and grandfathered projects. Table E1 provides a summary of the required pollutant load reductions during the second permit cycle.

Table E1 – Summary of Required Reductions for Existing Sources

Pollutant	40% Cumulative L2 Reduction (lbs/yr)	2009-2019 New Sources Offsets	Grandfathered Offsets (lbs/yr)	Total Phase 2 Reductions¹
TN	3,038.8	13.0	-30.6	3,021.3
TP	401.8	2.3	-8.7	395.4
TSS	344,775	1911	-3,676	343,010

¹ Total reductions to be addressed by the end of the second permit cycle.

The City has an “all of the above” strategy, which is an iterative, adaptive approach that considers a range of potential strategies based on extant conditions, which enables the City to ramp up planning and design to increase the likelihood of success in achieving the reduction goals required in the third MS4 permit cycle.

Means and methods to meet the target pollutant load reduction are described in Section 8 and include the following:

- Credits for January 1, 2006 to July 1, 2009 stormwater BMPs
- Credit for post July 1, 2009 stormwater BMPs
- Projected Redevelopment
- New Regional Facilities and Retrofits
- Retrofits on City Properties
- Retrofits of City Rights-of-Way
- Street Sweeping and Catch Basin Cleaning
- Tree Planting
- Urban Stream Restoration
- Public-Private Partnerships (P3s)
- Urban Nutrient Management
- Land Use Change
- Forest Buffers
- Nutrient Trading
- Bi-Lateral Trading

In addition to the strategies listed above, two specific projects have been identified to meet the required reductions for the Phase 2 permit cycle. The Lake Cook Retrofit project was substantially complete in September 2018; therefore, it was moved from the end of the Phase 1 permit cycle to the Phase 2 cycle.

The Ben Brenman Pond Retrofit is currently under construction and includes modifying an existing wet pond to meet the Virginia BMP Clearinghouse guidance for a Level 2 wet pond and increasing the acreage draining to the pond. This will allow the City to take credit for the variation in the pollutant removal. Note that progress is also being made on the Lucky Run, Strawberry Run and Taylor Run urban stream restoration projects which will potentially restore approximately 3,600 linear feet of stream. However, these stream restoration projects are included in the Action Plan for reference purposes only since the *Recommendations of the Expert Panel to Define Removal Rates for Individual Stream Restoration Projects* that contains the pollutant removal computation methodologies accepted by the Chesapeake Program to address Bay TMDL has been revised numerous times and is slated for further revisions and approval. Yet, the Phase 2 reductions will be met through the projects listed in Table E2, which includes associated pollutant reductions and estimated costs.

Table E2: Phase 2 Estimated Pollutant Reductions and Costs

Reduction Strategy	TN (lbs/yr)	TP (lbs/yr)	TSS (lbs/yr)	Estimated Cost¹
Lake Cook Retrofit	1,587	163.3	131,334	\$4.5M
Ben Brenman Pond Retrofit	946.4	151.3	87,734	\$3.75M
Total	2,533.4	314.6	219,068	\$8.25M

¹Includes funds from SLAF grants

Table E3 summarizes the expected progress at the end of the Phase 2 permit cycle once the above potential strategies have been implemented. Based on progress made in the first cycle and strategies to be implemented in the second permit cycle, the City will far exceed the 40% pollutant reduction requirement and will have substantial progress towards meeting the 100% reduction goal. This is consistent with the City's internal goal to exceed the mandated targets to smooth the ascent of the ramp up towards the third permit cycle's 100% cumulative reductions.

Table E3: Phase 2 Expected Progress

Pollutant of Concern	City Phase 1 Reductions (lb/yr)	City Phase 2 Planned Reductions (lb/yr)	L2 Total Required Reductions (lb/yr)	Percent of L2 Total Required Reductions Met
TN	2,689.8	2,533.4	7,597.0	69%
TP	402.4	314.6	1,004.4	71%
TSS	361,990	219,068	861,937	67%

Introduction

The purpose of this Phase 2 Chesapeake Bay Total Maximum Daily Load (TMDL) Action Plan is to comply with Part II A “Chesapeake Bay TMDL special condition” of the 2018 – 2023 General Virginia Pollution Discharge Elimination System (VPDES) Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4), No. VAR040057 issued to the City of Alexandria (City) on November 1, 2018. The City’s initial Draft Action Plan was submitted with the MS4 Permit registration statement in May 2018. The City’s Phase 1 Chesapeake Bay TMDL Action Plan documenting the City’s strategies to achieve 44%, 39% and 39% of the City’s total nitrogen, total phosphorus, and total suspended solids (sediment) goals, respectively, by June 30, 2018, was approved by the Virginia Department of Environmental Quality (DEQ) on January 12, 2016 and exceeded the required 5% reductions.

This Phase 2 Action Plan has been developed to document that sufficient measures have been implemented to meet the compliance targets identified in the 2013-2018 MS4 permit and to demonstrate the City’s ability to comply with the required additional 35% reductions for existing sources as of June 30, 2009, increased loads from 2009-2019 New Sources, and increased loads from Grandfathered projects (9VAC25-870-48) pursuant to the requirements of the 2018 – 2023 MS4 General Permit. The Action Plan includes the requisite planning items found in the 2018-2023 Permit Part II A and was developed according to the procedures provided in the Virginia Department of Environmental Quality (DEQ) Guidance Memo No. 15-2005 dated May 18, 2015 (Phase 1 Guidance). In a letter dated May 2, 2018, regarding the reissuance of VPDES General Permit No. VAR040057, it was stated that the Action Plan guidance is currently being updated and that the most current guidance document is still Guidance Memo No. 15-2005.

The focus of the Action Plan is to provide the means and methods and a general level of effort that will be needed for the City to meet the 40% Chesapeake Bay TMDL reduction targets in the MS4 permit for phosphorus, nitrogen, and sediment developed by the United States Environmental Protection Agency (EPA) in December 2010. Consistent with the approach in the Phase 1 Action Plan, the City’s Phase 2 planned internal goals include progress to achieve permit targets prior to the required end dates in order to lessen the burden during the third permit cycle.

The TMDL contains aggregate wasteload allocations (WLAs) for regulated stormwater and no specific WLAs for the City’s MS4. The Virginia Chesapeake Bay TMDL Phase I Watershed Implementation Plan (WIP I) submitted to EPA on November 29, 2010 contains general requirements for permittees. The Phase II WIP (WIP II) that was submitted to EPA on March 20, 2012 builds on the WIP I as the state’s primary planning tool to establish strategies, targets, and expectations for different sectors; including urban stormwater for local governments. The Phase II WIP requires the implementation of urban stormwater controls to meet specific nutrient and sediment reductions – Level 2 (L2) scoping implementation – to address the TMDL. The Draft Phase III WIP (WIP III) submitted April 5, 2019 includes new state initiatives as well as existing federal, state and local programs, and local area planning goals for unregulated areas provided by the planning district commissions and soil and water conservation districts and augmented by DEQ. The WIPs identify the use of state-issued stormwater permits as the tool for compliance by requiring target reductions for the TMDL.

The MS4 general permit reissued by DEQ and effective July 1, 2013 contained special conditions which required the implementation of strategies to meet 5% reductions of the overall L2 scoping for nitrogen, phosphorus and sediment, along with offsets for new sources and grandfathered projects. This 5% goal (Phase I) was to be implemented no later than June 30, 2018. The 2018-2023 MS4 general permit, effective November 1, 2018, requires implementation of strategies to meet an additional 35% of the L2 scoping run for a total reduction at the end of the permit term of 40% of L2.

The following excerpt from the WIP II provides more information on the L2 scoping:

The Commonwealth will utilize MS4 permits to assure BMP implementation on existing developed lands to achieve nutrient and sediment reductions equivalent to Level 2 (L2) scoping run reductions by 2025 for state and local MS4 operators. Level 2 implementation equates to an average reduction of 9 percent of nitrogen loads, 16 percent of phosphorus loads and 20% of sediment loads from impervious regulated acres and 6 percent of nitrogen loads, 7.25 percent of phosphorus loads and 8.75 percent sediment loads beyond 2009 progress loads and beyond urban nutrient management reductions for pervious regulated acreage.

According to the WIP II, WIP III, and MS4 general permit, the City will have three full MS4 permit cycles to implement the required L2 scoping reductions (Phase 1: 2013-2018; Phase 2: 2018-2023; and Phase 3: 2023-2028). During the first cycle (Phase 1), the City was required to implement practices sufficient to achieve 5% of the reduction targets. During the second cycle (Phase 2), the City will need to implement additional practices sufficient to achieve 35% reductions for a total of 40%. Finally, the remaining 60% for the total reduction target must be achieved by 2028 (Phase 3). Pursuant to the permit, this Action Plan is required to address the additional 35%, or Phase 2, reductions required during the permit term. While the WIP II and WIP III contain a range of strategies applicable to urban land uses, the City can only be required to implement strategies that are enforceable through the MS4 permit based on the City's regulated land contained in the MS4 service area as defined.

The technical and fiscal challenges of meeting the Chesapeake Bay TMDL as required in the MS4 general permit will be significant. Since the development of the TMDL and WIPs, the City engaged internal and external support to assist in an analysis to meet the reduction requirements and to develop a better overall understanding of the potential cost and feasibility of different combinations of stormwater best management practices (BMPs). The Action Plan builds on the previous technical and planning-level work, to include the previous action plan, and refines previous analysis of the potential strategies discussed by the City's internal stakeholders – the Water Quality Steering Committee and Water Quality Work Group – and external stakeholders to meet the MS4 general permit target reductions.

The “means and methods” or reduction strategies discussed require significant resources. While this report focuses on potential strategies to meet the 40% reduction goals that must be implemented by June 30, 2023, reduction requirements are even higher for the third and final permit cycle. Therefore, like the first permit cycle, the City has set an internal goal for the second permit cycle that extends beyond the required 40% target, to achieve the escalating total reductions in the required timeframe towards meeting the overall total. Concrete strategies to achieve the 40% are presented, with the flexibility to choose from a menu of options as contingency measures and/or to begin addressing the future requirements. The City's “all of the above”

strategy is an iterative, adaptive approach that considers a range of potential strategies based on extant conditions, which enables the City to ramp up planning and design to increase the likelihood of success in achieving the reduction goals required in the third MS4 permit cycle.

Following development of the Bay TMDL and during the development of the WIPs, the City engaged in the process of planning and analyses of potential strategies, including the implementation of structural stormwater quality best management practices (BMPs), towards meeting the target pollutant reductions. The first official planning-level exercise began in fall 2011 with the first draft of the “Chesapeake Bay TMDL Analysis and Options” in February 2012 and the final draft in August of 2012. This planning effort focused first on the overall requirements by examining potential strategies, identifying potential gaps, and order of magnitude costs to implement the reductions. The City’s Phase 1 Action Plan – approved by DEQ on January 12, 2016 – outlined means and methods to not only meet the required 5% reduction targets but to make substantial progress in meeting the Phase 2 reduction targets.

This Phase 2 Action Plan builds upon the means and methods found in the Phase 1 Action Plan and refines the City’s efforts to date. This plan focuses on meeting the 40% requirements in the 2018-2023 MS4 Permit. The Phase 2 Action Plan:

1. Documents the progress made during the first permit cycle including updated calculations based on final project data;
2. Provides general information regarding the City’s process for the L2 required reductions; and
3. Outlines potential strategies that may be implemented in the 2018-2023 permit cycle.

This Action Plan includes the following sections:

- Current Program and Legal Authority
- Delineation of the MS4 Service Area
- Existing Source Loads and Calculating Target Reductions
- Increased Loads from 2009 – 2019 New Sources
- Increased Loads from Grandfathered Projects
- Estimated Future Grandfathered Projects
- Phase 1 Action Plan and Progress
- Means and Methods to Meet Target Reductions
- Estimated Cost of Implementation

1. Current Program and Legal Authority

The City takes pride in being a waterfront community on the Potomac River – the nation’s river – and understands the integral part that our water resources play in our economy, our environment and the social well-being of our community. Being a waterfront community in the Chesapeake Bay, the City has long enacted local environmental ordinances to protect our water resources. In 1992, the City incorporated requirements of the Chesapeake Bay Act for protection of land in the watershed and stormwater quality into local ordinance through Article XIII of the Zoning Ordinance – the Environmental Management Ordinance. During the process of adopting Bay Act requirements, the City took a more conservative route and chose to be more protective by implementing 100’ Resource Protection Area (RPA) requirements in

the City, and designating all other non-RPA land acreage as Resource Management Areas (RMAs). The City exceeded the Bay Act requirements by implementing a 50' buffer requirement for natural intermittent streams and isolated wetlands. In addition to meeting the minimum water quality requirements for development and redevelopment, the City adopted a more stringent requirement to provide stormwater treatment for the first ½" of runoff from all onsite impervious surfaces, known as the water quality volume default, which provides reductions beyond those mandated. More recently, the City adopted amendments to the Environmental Management Ordinance that incorporate the Virginia Stormwater Management Program (VSMP) regulations, while retaining the more stringent water quality volume default requirements and 50' buffer application, and currently operates the VSMP locally.

The City was initially issued an MS4 general permit in 2003 to regulate stormwater discharges. Successive five-year permits have been reissued, with the City currently regulated under the 2018 – 2023 permit. Since the Phase 1 Action Plan, there have not been any new or modified legal authorities that have been implemented to meet the City's Chesapeake Bay required pollutant reductions.

2. Delineation of the MS4 Service Area

The City's MS4 general permit is the regulatory mechanism used to require implementation of stormwater quality BMPs or other strategies necessary to meet the Chesapeake Bay TMDL. The permit requires the City to define the size and extent of the MS4 service area, to include the existing impervious and pervious area within the service area – the regulated area. Areas of the City that sheet flow directly to waters of the state, or otherwise drain to waters of the state through means other than a regulated outfall, are not considered part of the MS4 service area – the unregulated area. Properties within the jurisdictional boundary that are regulated under a separate VPDES stormwater permit, forested areas, wetlands, and open waters are also not considered part of the MS4 service area.

As part of the Phase 1 Action Plan, areas were distinguished between regulated and unregulated land areas to define the MS4 service area. To perform this analysis, the City utilized local ArcGIS data and tools, a review of other state stormwater permits under the VPDES program, and discussions with regulating agencies. A digital elevation model (DEM) for the entire City was built using two-foot contour data. Storm sewer pipes, represented as lines, were burned into the DEM. MS4 outfall locations, stored as points in ArcGIS, were treated as small watershed outlets and the ArcGIS Desktop Hydrology toolset was utilized to generate small watersheds draining to each MS4 outfall. These small watersheds were manually reviewed and edited for greater accuracy. Finally, the breakdown of impervious and pervious area was determined by clipping the impervious surface cover to the MS4 service area, with the assumption that all non-impervious areas were pervious.

The above approach coupled with GIS impervious surface data rendered a delineation of impervious versus pervious areas within the regulated and unregulated areas. Unregulated areas include land with direct drainage to surface waters with no connection to the MS4, stream corridors, and areas covered under separate MS4 or VPDES industrial stormwater permits. The exclusion of these categories from the MS4 regulated area was initially confirmed by the Virginia Department of Conservation and Recreation (DCR) during their previous administration of the MS4 program. Additional confirmation of this approach is provided in the Phase 1 Guidance and current 2013-2018 MS4 general permit. Federal lands not covered under a separate stormwater permit were not simply excluded, but were categorized as

regulated or unregulated based on this above approach. The Combined Sewer System (CSS) in the Old Town area is covered under a separate non-stormwater related VPDES permit and is considered independently of the MS4 in the Chesapeake Bay TMDL.

Lands associated with separate individual or general MS4 or industrial stormwater permits were removed from the Alexandria MS4 service area totals and are listed in Table 1.

Table 1 – Permit Holders Excluded from MS4 Service Area

Permit Holder	Permit
National Park Service: George Washington Parkway & Jones Point Park	MS4
Northern Virginia Community College	MS4
VDOT	MS4
United Parcel Service - Alexandria	Industrial
US Postal Service - Alexandria Vehicle Maintenance Facility	Industrial
Covanta Alexandria Arlington Incorporated	Industrial
WMATA - Alexandria Metro Rail Yard	Industrial
Virginia Paving Company Alexandria Plant	Industrial
Alexandria Renew Enterprises Wastewater Treatment Plant	Industrial
NS Thoroughbred Bulk Terminal Alexandria	Industrial

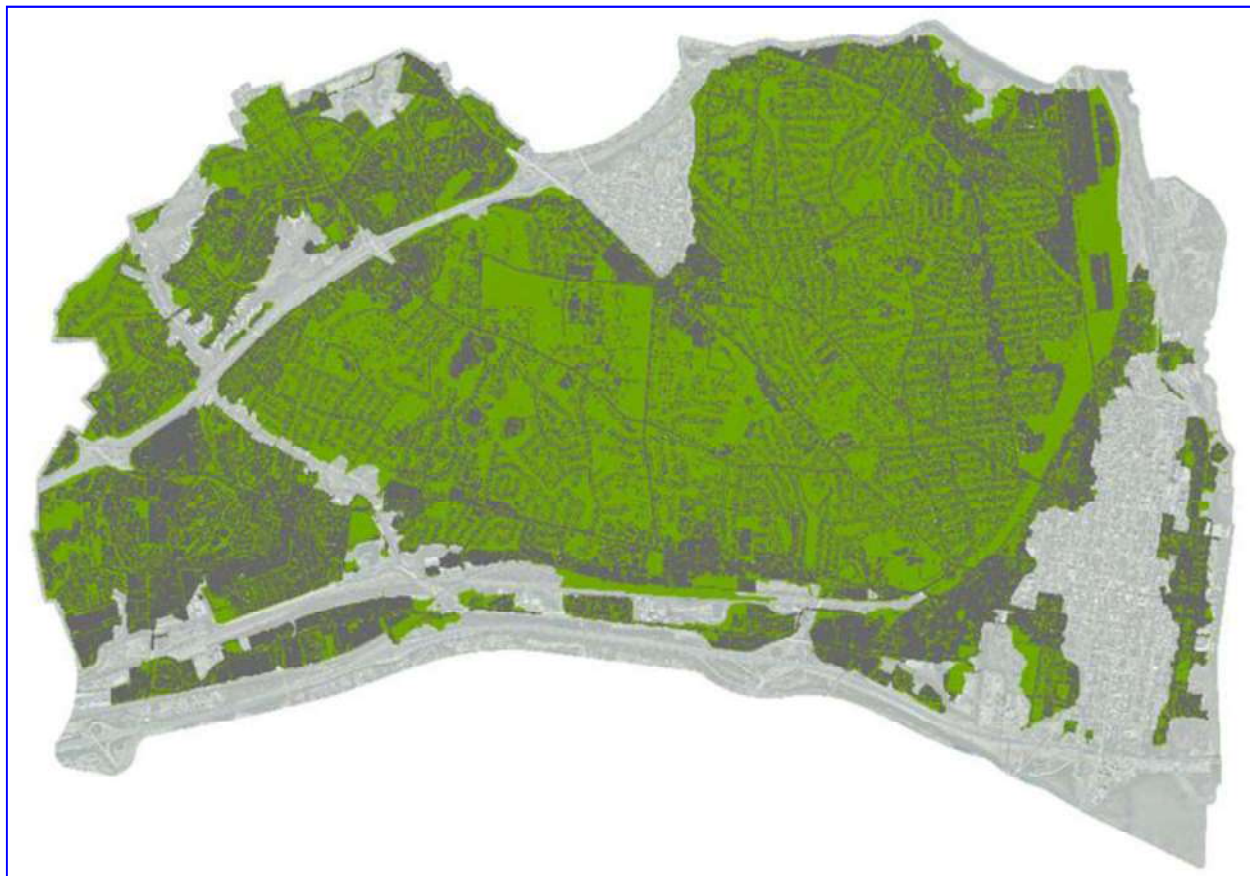
Based on the above analysis, the estimated land areas draining to the Alexandria MS4 service area, non-Alexandria MS4, and CSS is presented in Table 2. Figure 1 shows the size and extent of the delineated pervious and impervious land uses for the MS4 service area in green.

Table 2 – Alexandria MS4, Non-Alexandria MS4, and CSS Land Area¹

Land Area	Impervious (ac)	Pervious (ac)	Totals (ac)
Alexandria MS4 Service Area (regulated)	3417.24	3991.57	7408.81
CSS (regulated)	398.75	177.85	576.6
Non-Alexandria MS4 (unregulated)	452.17	1387.68	1839.85

1. Approximate acreage in Old Town – the historic portion of the City.

Figure 1 – Regulated City of Alexandria MS4 (in Green)



3. Existing Loads and 40% Compliance Reductions

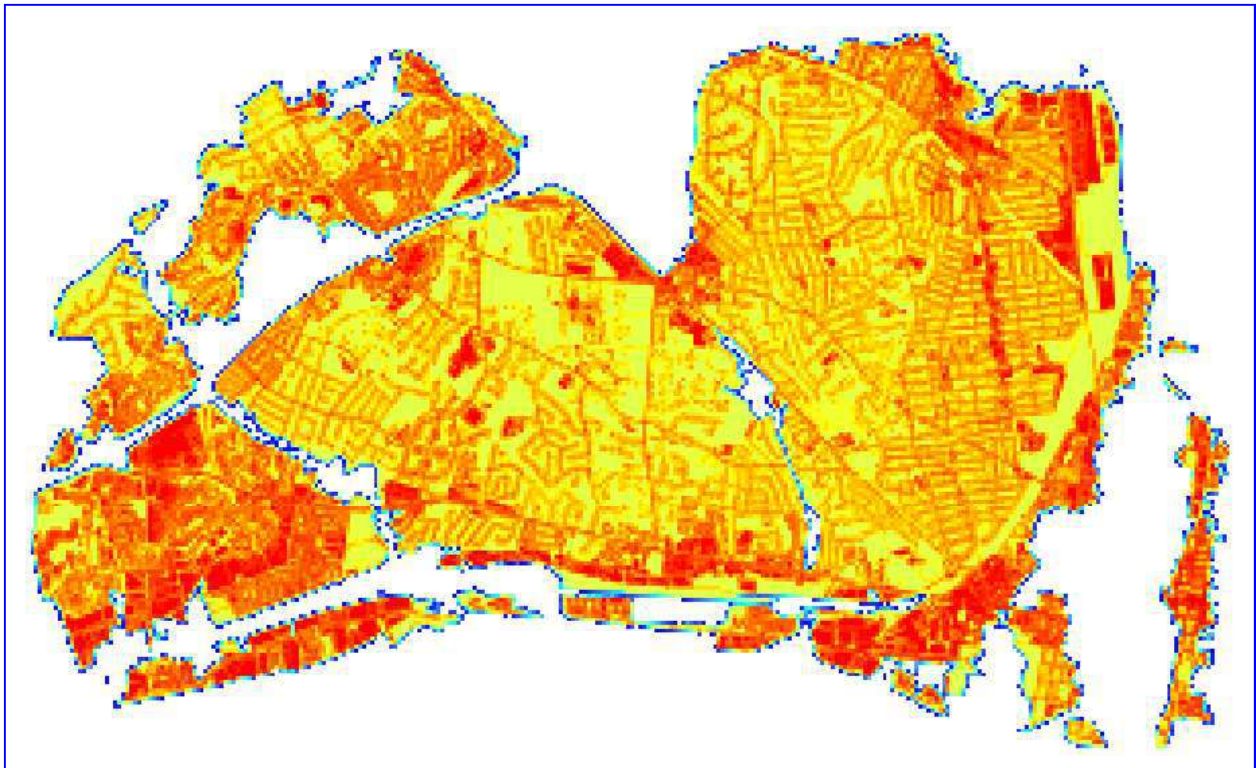
Baseline loads for nitrogen, phosphorus, and sediment were established using the City's impervious surface GIS data that represent the best available data for total existing acres served by the MS4 as of June 30, 2009, along with loading rate data for each pollutant of concern found in Table 2b (Potomac River Basin) of the 2013-2018 MS4 general permit. In working with our consultant, AMEC Environment and Infrastructure, ALERT (AMEC Loading Estimation and Reduction Tool) was used to calculate total loads from the MS4 service area and generate spatial data to help visualize areas of higher and lower loading rates.

Total loads from existing impervious and pervious sources are presented below in Table 3. Figure 2 is a "heat map" that presents existing nitrogen loads in a graphic format that was generated using ALERT. Existing loads for phosphorus and sediment will generally show similar intensity differentials.

Table 3 – Existing Source Loading Rates for Nitrogen, Phosphorus, and Sediment

Subsource	Pollutant of Concern	Est. MS4 Service Area (ac)	Loading Rates (lbs./ac)	Load per Land Cover (lbs.)	Total Exiting Load (lbs.)
Regulated Impervious	Nitrogen	3417.24	16.86	57,614.67	97,809.78
Regulated Pervious		3991.57	10.07	40,195.11	
Regulated Impervious	Phosphorus	3417.24	1.62	5,535.93	7,172.47
Regulated Pervious		3991.57	0.41	1,636.54	
Regulated Impervious	Total Suspended Solids	3417.24	1,171.32	4,002,681.56	4,704,399.56
Regulated Pervious		3991.57	175.8	701,718.01	

Figure 2 – Graphic Representation of Existing Nitrogen Loads



The Phase I WIP and MS4 General Permit special conditions state that MS4 permittees will need to meet L2 scoping reduction requirements for existing sources. During the first MS4 permit cycle (2013-2018), the L2 reduction requirements were 5% while during the second cycle, 35% reductions are required, for a total of 40%. This report focuses on these 40%, or Phase II, reductions; however, potential strategies considered may achieve reductions beyond the 40%, given the need to comply with increasing reduction requirements in the final permit cycle (remaining 60%). The L2 reductions for total nitrogen (TN), total

phosphorus (TP), and total suspended solids (TSS) applied to the regulated MS4 service area are presented in Table 4.

Table 4 – Level 2 Reduction Requirements

Land Cover Type	Required Reduction		
	TN	TP	TSS
Regulated Impervious	9.00%	16.00%	20.00%
Regulated Pervious	6.00%	7.25%	8.75%

Table 5 presents the total required reductions through all three permit cycles. The total loads were calculated using 2018-2023 MS4 general permit Table 3b loading rates for the Potomac River Basin and the impervious and pervious areas within the MS4 service area. Estimated total required reductions were calculated using the total L2 scoping requirements in the Phase I WIP (Table 4 above). These represent the estimated 100% target reductions to be met by the end of the third MS4 general permit cycle.

Table 5 – Existing Source Loads and Total L2 Pollutant Reductions¹

Land Cover Type	Pollutant	Total Existing Loads (lbs)	Estimated Total Required Reductions (lbs/yr)
Regulated Impervious	TN	97,809.78	7,597.03
Regulated Pervious			
Regulated Impervious	TP	7,172.47	1,004.40
Regulated Pervious			
Regulated Impervious	TSS	4,704,399.56	861,936.64
Regulated Pervious			

1. Approximate L2 scoping total reductions.

Table 6a presents the final estimated pollutant reductions broken out by MS4 general permit cycle based strictly on meeting 5%, 35%, and 60% (or total) of the L2 scoping requirements.

Table 6a – Estimated Pollutant Reductions Broken Out by MS4 Permit Cycle¹

Permit Cycle	TN (lbs/yr)	TP (lbs/yr)	TSS (lbs/yr)
First MS4 Cycle Target (5%)	379.85	50.21	43,096.83
Second MS4 Cycle Target (35%)	2,658.96	351.54	301,677.82
Third MS4 Cycle Target (60%)	4,558.22	602.64	517,161.98
TOTAL REDUCTION (100%)	7,597.03	1,004.40	861,936.64

1. These estimates are based on percentages of the L2 requirements.

The 2018-2023 MS4 General Permit requires the City to use permit Table 3b for the Potomac River Basin to determine the 40% reductions required by the end of the permit cycle. For reference purposes, the 5% reduction requirements associated with the first permit cycle were TN = 379.9 lbs/ac; TP = 50.2 lbs/ac;

and TSS = 43,097 lbs/ac. The second permit cycle 40% reductions can be seen in Table 6b. It should be noted that for the City, the 2010 Census urbanized area did not change from the 2000 Census urbanized area.

Table 6b: Second Permit Cycle Pollutant Reductions Calculated per the MS4 Permit¹

Permit Table 3b Calculation Sheet for Estimating Existing Source Loads and Reduction Requirement for the Potomac River Basin								
		A	B	C	D	E	F	G
Pollutant	Subsource	Loading rate (lbs/ac/yr)¹	Existing developed lands as of 6/30/09 served by the MS4 within the 2010 CUA (acres)²	Load (lbs/yr)³	Percentage of MS4 required Chesapeake Bay total L2 loading reduction	Percentage of L2 required reduction by 3/30/2023	40% cumulative reduction required by 6/30/2023 (lbs/yr)⁴	Sum of 40% cumulative reduction (lbs/yr)⁵
Nitrogen	Regulated urban impervious	16.86	3417.24	57,614.7	9%	40%	2,074.1	3,038.8
	Regulated urban pervious	10.07	3991.57	40,195.1	6%	40%	964.7	
Phosphorus	Regulated urban impervious	1.62	3417.24	5,535.9	16%	40%	354.3	401.8
	Regulated urban pervious	0.41	3991.57	1,636.5	7%	40%	47.5	
Total suspended solids	Regulated urban impervious	1171.32	3417.24	4,002,682	20%	40%	320,215	344,775
	Regulated urban pervious	175.8	3991.57	701,718	9%	40%	24,560	

¹ Edge of stream loading rate based on Chesapeake Bay Watershed Model Progress Run 5.3.2

²To determine the exiting developed acres required in Column B, permittees should first determine the extent of their regulated service area based on the 2010 Census Urbanized Area (CUA). Next permittees will need to delineate the lands within the 2010 CUA served by the MS4 as pervious or impervious as of the baseline date of June 30, 2009.

³Column C = Column A x Column B

⁴Column F = Column C x (Column D /100) x (Column E /100)

⁵Column G = The sum of the subsourse cumulative reduction required by 6/30/23 (lbs/yr) as calculated in Column F.

4. Increased Loads from 2009 – 2019 New Sources

The City first adopted the Chesapeake Bay Act requirements into local ordinance in 1992. This included land protection and water quality requirements being adopted locally. The Bay Act required that post-construction stormwater quality requirements be calculated based on an average land cover condition.

While localities were required to adopt the new stormwater quality requirements, they were given the option of setting the average land cover condition at 16% impervious – the calculated average for the Bay watershed – or using the existing average impervious area for a local watershed. Using the average impervious land cover condition existing in the City at that time was the most feasible alternative for urbanized communities like the City. Requiring development to go back to 16% impervious cover would be overly restrictive given the existing urbanized conditions. Consistent with the Act, the City adopted a local average land cover condition of 41% impervious for post-construction stormwater quality design and required development to meet these criteria. This represented the existing condition, so that new development and redevelopment projects could not increase the pollutant load above this average. However, in addition to meeting the Bay Act stormwater requirements the City went a step further and adopted the more stringent “water quality volume default” requirements for development and redevelopment projects to also treat the first ½” depth of stormwater runoff over the site’s entire impervious surface – or first flush – for post-construction stormwater design. This more stringent requirement reduced pollution beyond the 41% impervious land cover condition. The City has amended Article XIII of the Zoning Ordinance (the Environmental Management Ordinance) effective July 1, 2014 to incorporate the water quality technical criteria in the Virginia Stormwater Management Regulations (9VAC25-870). The 2018-2023 MS4 General Permit Part II.A.4 requires the City to offset increased loads from new sources initiating construction between July 1, 2009 and June 30, 2019 that disturb one acre or greater and result in a total phosphorous load greater than 0.45 lb/ac/yr. With the implementation of the July 1, 2014 stormwater regulations and the Virginia Runoff Reduction Method, the target total phosphorous loading after construction is 0.41 lb/ac/yr or less, which is more conservative than the 0.45 lb/ac/yr requirement. Therefore, there have been no increased loads from new sources initiating construction between July 1, 2014 to June 30, 2019. Please note that the majority of land-disturbing activities in the City do not reach the one acre or greater threshold.

The increased loads from projects that initiated construction between July 1, 2009 to June 30, 2014 were calculated for the Phase 1 Action Plan. The City used the aggregate approach discussed in the Phase 1 Guidance to determine the increased loads from projects disturbing greater than one. Loading rates in permit Table 3b were used to calculate the existing (pre-site) and resultant (post-site) loads for changes in impervious and pervious area as a result of these projects. The estimated full offset was calculated by subtracting the pre-site from the post-site loadings. Since 40% reductions need to be addressed during this phase, the current required offsets were calculated as 40% of the total. Table 7 provides net change in pollutant load, required reduction for this permit cycle, and total required offset. Detailed supporting calculations for the net load change was submitted with the Phase 1 Action Plan. It should be noted that credits from BMPs installed as part of the July 1, 2009 to June 30, 2014 projects are included in the Post-2009 BMPs in Section 9.2 and are not reflected in Table 7.

Table 7 – Increased Loads and Pollutant Reductions 2009-2019 New Sources

Pollutant	Net Load Change (lbs/yr)*	Required Reduction during second permit cycle	Additional Red. Req'd. by the end of second permit cycle (lbs/yr)
Nitrogen	32.6	40%	13.0
Phosphorus	5.8	40%	2.3
Total Suspended Solids	4,778	40%	1911

**Reductions for BMPs related to development and/or redevelopment projects during this time are included in the July 1, 2009 to June 30, 2014 BMP Credits.*

5. Increased Loads from Grandfathered Projects

The Virginia Stormwater Management Regulations (9VAC25-870-48) provide the opportunity for qualifying development and redevelopment projects to calculate post-construction stormwater quality requirements in accordance with the old water quality technical criteria in place in the City prior to the implementation of the new state stormwater requirements effective July 1, 2014. However, 2013-2018 MS4 general permit Section I.C.2.a.(8) required the City to offset increased loads from grandfathered projects disturbing one acre or greater that initiate construction after July 1, 2014.

As discussed in the previous section, the City implemented the Chesapeake Bay Act stormwater quality requirements utilizing an average land cover condition of 41% impervious. Additionally, the City continues to retain the more stringent requirement for projects to treat the first ½” of runoff associated with impervious surfaces – the water quality volume default. The permit requires that the City to offset the difference between the existing impervious condition of the project and the final impervious condition when applying the 41% land cover condition requirement. The City maintains a BMP database in a Microsoft Access format. Required BMP information and additional pertinent information is added to the database during the plan and construction record drawings review and approval processes. Projects where post-construction stormwater quality requirements were calculated using the old technical criteria and have not commenced construction, but are fairly certain to initiate construction during this MS4 permit term, are labeled in the database as “planned.” Increased loads associated with planned projects disturbing equal to or greater than one acre must be offset by the City prior to completion of the grandfathered project. Given that the permit and Phase 1 Guidance do not provide details regarding what constitutes completion, this plan assumes that approval of as-built plans and certification by a professional engineer that the stormwater management BMP is functioning properly is a reasonable measure of completion for each project.

Appendix II of the Phase 1 Guidance was followed to calculate the offsets. The simple method was used to determine the loading rate from the existing pre-site impervious cover. The simple method was also used to determine the loading rate from the final or post-site impervious cover condition. The pre-site loading rate (lb/ac/yr) was subtracted from the post site loading rate (lb/ac/yr), and the difference was multiplied by the post site area (ac) to yield the increased load (lb/yr). As instructed in the 2018-2023 MS4 Permit, Table 4 was used to develop the equivalent pollutant loads for nitrogen and total suspended solids. These are the loads that must be offset prior to applying the credit received for BMPs implemented for these projects. The credits for installed BMPs were calculated according to Part III of the Phase 1 Guidance using the Chesapeake Bay Program BMP efficiencies in Table V.C.1.

These Grandfathered projects generate minimal offsets, due in large part to the existing impervious cover of the site and the City's more stringent requirements to treat the water quality volume default. Considering the most aggressive scenario that all the projects are completed before October 31, 2023, the minimal loads requiring offsetting would be in place through other strategies such as credit generated from 2006-2009 BMPs or Post-2009 BMPs discussed in Section 9. For the Phase 1 Action Plan, the City identified 14 projects implementing 25 BMPs to meet the old water quality technical criteria and the more stringent Alexandria water quality volume default. For this update, the City reviewed the list of these grandfathered projects and potential grandfathered projects for Phase 2 and updated and refined the project list and corresponding pollutant calculations. There have only been two grandfathered projects that have been constructed thus far. As often seen with development projects, many were aborted due to funding issues or other complications and others lost grandfathering status. Summary calculations are presented in Table 8.

Table 8 – Summary of Remaining Offset Loads from Grandfathered Projects

	TN (lbs/yr)	TP (lbs/yr)	TSS (lbs/yr)
Offset Loads to Reduce	20.4	3.0	1,390
Loads Removed by BMPs*	51.0	11.6	5,066
Total Load Remaining**	-30.6	-8.7	-3,676

**These BMP reductions are not included in Post-2009 BMP credits.*

***Negative values indicate net pollutant credit.*

6. Estimated Future Grandfathered Projects

Estimated future grandfathered projects may disturb greater than one acre and qualify as future grandfathered in accordance with 9VAC25-870-48. These projects have been approved or have an obligation of funding prior to July 1, 2012 but have not received coverage under the VPDES Construction General Permit prior to July 1, 2019. It is uncertain if or when these projects may initiate construction as they all have been delayed or on hold for a significant period. The City documents 6 projects associated with 47 acres are considered as grandfathered and have yet to begin construction. It is likely that many of these projects will never be constructed, but the City will maintain a list of these projects until the grandfathering status expires in 2024. The list of future grandfathered projects is provided in Appendix A.

7. Summary of Required Reductions

The 2018-2023 MS4 general permit contains special conditions requiring the implementation of strategies to meet 40% reductions of the overall L2 scoping for nitrogen, phosphorus and sediment, along with offsets for new sources and grandfathered projects. This 40% goal (Phase 2) is to be implemented no later than the end of the permit cycle.

Table 9 presents a summary of the required total reductions for each pollutant of concern (POC), 2009-2019 offsets, grandfathered projects, and 40% required reductions.

Table 9 – Summary of Required Reductions for Existing Sources

Pollutant	40% cumulative L2 reduction (lbs/yr)	2009-2019 New Sources Offsets	Grandfathered Offsets (lbs/yr)	Total Phase 2 Reductions¹
TN	3,038.8	13.0	-30.6	3,021.3
TP	401.8	2.3	-8.7	395.4
TSS	344,775	1911	-3,676	343,010

¹ Total reductions to be addressed by the end of the second permit cycle.

8. Means and Methods to Meet Target Reductions

The BMP strategies discussed in this Action Plan are part of the City’s “means and methods” to meet target pollutant reductions. While the WIP II and Draft WIP III contain a range of strategies applicable to urban land uses, the City can only be required to implement strategies that are enforceable through the MS4 permit based on the City’s regulated land contained in the MS4 service area. This Action Plan is only required to focus specifically on means and methods to meet the 40% reduction goals that must be implemented by the end of the permit cycle.

The City has used an iterative approach in continually refining the list of potential pollutant reduction strategies through a series of planning level exercises to address meeting the TMDL target reductions. In addition to this Phase 2 Action Plan, this includes the following documents:

1. Chesapeake Bay TMDL Analysis and Options - Final Draft August 2012
2. The City’s February 1, 2012 response to the Virginia Department of Conservation and Recreation (DCR) “local letter” - November 9, 2011
3. Draft Chesapeake Bay TMDL Phase 1 (5%) Action Plan - June 26, 2014
4. Feasibility Study for Retrofit of Existing Ponds and Construction of New Stormwater Management Ponds” – Final December 2014
5. Final Chesapeake Bay TMDL Phase 1 (5%) Action Plan with updated attachments – February 2016

The City will employ a wide variety of means and methods to meet the required target pollutant for reductions total nitrogen, total phosphorus and total suspended solids. This includes reductions to meet pollution related to:

1. Existing Sources
2. New Sources
3. Increased Loads from 2009 – 2019 New Sources
4. Increased Loads from Grandfathered Projects.

The Phase 1 Guidance stipulates BMPs implemented for credit should be in the Virginia Stormwater BMP Clearinghouse or be approved by the Chesapeake Bay Program. The City is using a menu of means and methods that fit this stipulation to meet the reduction requirements for each of the categories listed above. This type of adaptive management approach is an iterative “all of the above” strategy to identify likely

candidate projects for implementation. This approach puts the greatest number of strategies on the table, and allows the City to consider any and all of the strategies based on conditions present at the time.

The means and methods in this Action Plan represent the synthesis of analysis and options reports, planning-level exercises, feasibility studies, and historical staff knowledge regarding project needs. In considering an iterative approach that employs adaptive management principles and retains maximum flexibility in choosing the appropriate means and methods, the City has identified numerous potential strategies to reach target reduction goals. A mix of the following strategies will be implemented, where practicable, to address the reductions due by the end of the Phase 2 permit cycle; while additionally working towards meeting anticipated reductions required for the final permit cycle.

Projected redevelopment requiring the implementation of stormwater management BMPs meeting the new technical criteria for projects initiating construction after July 1, 2014 can be credited towards reductions and reported as credits following implementation. Structural BMPs such as retrofitting existing facilities and implementing new facilities to retrofit existing impervious areas are included in the means and methods to meet reductions.

Focus on Green Infrastructure

The City recognizes that Green Infrastructure (GI) can reduce stormwater runoff volumes, peak flow, and pollutant loads. As such, GI practices is the first option in selecting BMPs to retrofit existing impervious areas. Retrofits of City properties or rights-of-way will be considered using GI approaches, including but limited to, urban bioretention, bio-swales, permeable pavers, and vegetated green roofs. The City also requires development and redevelopment projects to implement GI practices through small area planning (Old Town North Small Area Plan, Eisenhower West Small Area Plan, etc.) and through the January 2018 release of a Memorandum to Industry requiring all new development and redevelopment to use non-proprietary surface BMPs approved by the Virginia Stormwater BMP Clearinghouse (Clearinghouse) to treat a minimum of 65% of the TP removal required by the VSMP regulations incorporated into the City's zoning ordinance. The memo also prohibits MTDs from being used on single-family detached residential projects. To further the feasibility and understanding of implementing GI broadly as a city-wide approach, the City plans to conduct a GI study in 2020 and will incorporate applicable elements into the next Action Plan.

The City's "all of the above" approach is focused on strategies that are complete, under construction, or in the design phase are listed below. However, other strategies not listed below may also be implemented.

- ***Redevelopment.*** Stormwater quality BMPs implemented to meet the new VSMP regulations, as adopted into the City's Environmental Management Ordinance effective July 1, 2014 and the City's more stringent ordinance. Note that new development also must comply with the more stringent water quality volume default and treat at least 65% of the TP removal requirement through non-proprietary surface BMPs.
- ***New Regional Facilities and Retrofits.*** Installing new facilities to treat stormwater and retrofitting existing facilities originally installed with the primary purpose of addressing stormwater quantity to enhance their ability to improve water quality.
- ***Retrofits on City Properties.*** Retrofitting City-owned properties that are currently undertreated or not treated by stormwater quality BMPs and overtreating redevelopment.

- ***Right-of-Way Retrofits.*** Retrofitting public streets, especially in coordination with Capital Improvement Program (CIP) road projects where implementation is deemed feasible.
- ***Street Sweeping and Catch Basin Cleaning.*** Removing nutrients and sediment from roadways by mechanical means before pollutants may be transported offsite in stormwater flows.
- ***Tree Planting.*** Planting trees on developed land to increase tree canopy but not to mimic forest-like conditions or to plant trees within a contiguous area.
- ***Urban Stream Restoration.*** Restoration using natural channel design methods of urban streams.
- ***Public Private Partnerships (P3).*** May consist of (1) Informal arrangement for implementation of regional facilities during the development process that provide for treatment of impervious area beyond the required site area, in exchange for other onsite consideration as well as treating offsite stormwater; or (2) Agreement between the City and a private owner to construct a BMP on private property.

The following additional strategies may be pursued by the City to address the targeted reductions; however, these are currently not part of the core strategies anticipated for Phase 2 but may be investigated during this phase.

- ***Urban Nutrient Management.*** Pollutant reductions from nutrient management plans implemented beyond those required by law or statute.
- ***Land Use Change.*** Credit for converted lands to a land use with a lower associated pollutant load.
- ***Forest Buffers.*** Implementing buffers and enhancing RPAs to protect local waterways and receive pollutant reduction credits.
- ***Nutrient Trading.*** Purchasing pollutant credits through the expanded nutrient credit exchange.
- ***Bi-Lateral Trading.*** Applying credits generated through the implementation of combined sewer overflow and wet-weather treatment controls implemented by Alexandria Renew Enterprises to address the City's VPDES Combined Sewer System (CSS) permit required bacteria reductions to address MS4 requirements.

Acknowledging the significantly higher reduction requirements for the 2018-2023 and 2023-2028 permit cycles, the City set an internal planning goal for the first permit cycle that extended beyond the 5% target to approximately 15-20% of the anticipated total reductions. Similarly, the City has set an internal goal for the second permit cycle that extends beyond the required 40% target. The City's adaptive management approach allows the City to realize efficiencies through maximization of benefits and minimize of cost and external impacts. The mix of potential strategies presented above are discussed in further detail in the following sections.

8.1 Projected Redevelopment

Redevelopment over time is a significant opportunity for the City to achieve pollutant reductions, since corresponding pollutant reductions will be credited towards Bay TMDL targeted reductions. The City is almost completely built out and was done so largely prior to stormwater quality regulations adopted in 1992. The Virginia Stormwater Management Regulations, implemented by the City on July 1, 2014 through the updated Environmental Management Ordinance, require that all redevelopment greater than or equal to one acre must achieve a 20% reduction in phosphorus from existing site conditions. Redevelopment less than an acre must reduce phosphorus 10% from existing conditions. New development and redevelopment that is subject to the new stormwater management regulations will have to meet nitrogen, phosphorus and sediment loading rates associated with pervious area, or a 0.41 lbs/ac/yr TP loading rate. This equates to no net increase and is therefore considered neutral with respect to loads. However, in addition to the state water quality standards, the City has retained the more stringent requirement of treating the first ½" of runoff associated with all the impervious area of the site – the water quality volume default. This more stringent requirement will continue to translate to increased reductions beyond the state minimum water quality requirements for both development and redevelopment projects.

While future redevelopment projects will provide nutrient and sediment credits, given the highly speculative nature of potential credits generated from projected development from now until 2023, there is no guarantee that these projects will occur to be credited towards the 40% reductions required at the end of the second permit cycle. For this reason, credits associated with projected redevelopment are not presented here. However, the City will include reductions from development and redevelopment projects in the required reporting on progress towards achieving the overall targets.

8.2 New Regional Facilities and Retrofits

Several existing and potential stormwater pond sites were considered to evaluate planning-level retrofit feasibility for new or enhanced water quality benefits. The viability of retrofitting existing regional ponds and potential construction of new stormwater management ponds was addressed through a multi-year *"Feasibility Study for Retrofit of Existing Ponds and Construction of New Stormwater Management Ponds"* that was finalized December 2014. That report represents a refinement from the previous planning-level exercise for large regional projects, and provides more specificity based on the City's Water Quality Steering Committee and Water Quality Work Group internal stakeholder discussions about viability and potential for these projects to go forward. Some barriers to implementation included minimal water quality benefits and site-specific restraints which included lack of available area, ownership and competing interests, among others. The potential strategy involves the retrofit of existing water quantity-only facilities (detention ponds) to provide water quality benefits by, enhancing the pollutant removal of an existing pond, or increasing the amount of treated impervious area draining to the facility.

For regional facilities that provide no effective water quality benefit, the improved stormwater treatment would provide a removal efficiency and the entire associated pollutant reduction will be credited. For existing regional BMPs that are enhanced to provide an extra water quality benefit, the increased pollutant reductions will be credited. In the Phase 1 Action Plan, potential regional facilities were identified for retrofits. Two of these projects, Lake Cook and Eisenhower Block 19 Pond, are

complete and are further described in Section 8. Construction of one additional project, Ben Brenman Pond (previously referred to as Cameron Station Pond), expects to be completed in winter 2019/2020 and further details are below.

Ben Brenman Pond (referred to as Cameron Station Pond in the Phase 1 Action Plan)

This City-owned and maintained facility drains approximately 255 acres of urban land with an impervious percentage of 62%. The pond is in Ben Brenman Park and is in the Backlick Run watershed. Design plans improving the pond to meet the Level 2 Wet Pond criteria were finalized in November 2017. Improvements include increased pond and forebay volume, multiple cells, aquatic benches, wetland areas, aerators, and diversion of an additional 35 acres that was previously untreated. It is anticipated that construction of the project will be complete in winter 2019/2020.

The project received a SLAF 50% matching grant in December 2014. Table 10 presents the estimation of pollutant removal and the approximate total CIP cost. For the Ben Brenman Pond Retrofit Pollutant Removal Calculations Technical Memorandum dated August 17, 2017 documenting the procedures for computing these pollutant removals, see Appendix B. The pollutant removals have been refined since they were reported for reference purposes in the Phase 1 Action Plan.

Table 10: Ben Brenman Pond Retrofit – Anticipated Pollutant Reductions

Total Acres Treated	Impervious Acres Treated	TN Removed (lbs/yr)	TP Removed (lbs/yr)	TSS Removed (lbs/yr)	Approx. Cost¹
290.1	179.1	946.4	151.3	87,734	\$3.75M

1. Opportunity costs for alternate uses of the land are considered inconsequential given the current use and therefore not factored into the costs.

8.3 Retrofits on City Property

This strategy involves retrofits on City properties to treat existing impervious areas that are not currently treated by stormwater quality BMPs and overtreating when redevelopment occurs. Even prior to the Bay TMDL reduction requirements, the City actively sought opportunities to retrofit existing impervious areas on City properties to provide water quality benefits for local streams, the Potomac River, and the Chesapeake Bay. A number of these retrofits were implemented prior to June 30, 2009 and cannot be credited towards the current reduction targets. However, the City continues to look for opportunities to retrofit City properties. Treatment of these previously untreated areas are strictly retrofits and generate credits towards meeting the required reductions. During earlier planning exercises, the City refined a list of existing properties as candidates for BMP retrofits. This list of potential projects was based on the following criteria:

- 1) Greater than 1 acre of untreated impervious area; and
- 2) No planned redevelopment for the property in the near term.

For planning purposes, the list of potential City properties was assumed to be retrofitted with an average type of technology for the range of BMPs that may be installed to generate pollutant

reductions. For planning purposes, it is assumed that approximately 50% of existing untreated impervious area could be treated by retrofits. Also, for planning and discussion purposes, a range of technologies was assumed for implementation. Pollutant removal efficiencies for this range of technologies were derived by averaging the efficiencies for several types of BMPs that would be likely candidates for this application on City properties: Filtering Practices, Bioretention, Dry Swale and Grass Channel. The resulting average efficiencies assigned to this range of technologies is: 30% TN, 50% TP, and 60% TSS. These were used to generate possible pollutant reductions for this range of technologies that may be implemented. The identification of specific practices can then be refined during subsequent onsite planning and design when the project becomes feasible. Final retrofits implemented and the associated removal efficiencies will determine the reductions achieved.

The City is currently evaluating conducting a green infrastructure on City properties projects that would build on the analyses already completed. The study would assess, evaluate, and rank potential project sites for implementation of green infrastructure. Section 9 includes a list of completed retrofits on City properties and corresponding pollutant removals.

8.4 Retrofits of City Rights-of-Way

City right-of-way retrofits is a potential strategy for treating smaller areas with each practice, but collectively may net large areas of impervious surface cover being treated. This approach has the benefit of using public property, which avoids the cost of land acquisition. These retrofits treat public spaces such as public streets and medians. Retrofits may include low impact development (LID) such as bioretention for the medians and sidewalks, inlet tree box filters or various manufactured BMPs such as hydrodynamic or filters to treat roadways. These retrofits tend to treat relatively small areas due to size constraints and gradient changes. As a result, a large number of facilities are required to achieve meaningful reductions. Considering median retrofits in conjunction with inlet retrofits generally provides for the treatment of a greater contiguous area.

The City has identified possible medians and nearby stormwater inlets as retrofit candidates. Potential medians considered as likely candidates for retrofit were wide enough to accommodate the typical dimensions of a bioretention facility. Inlets considered were located in the vicinity of the potential median projects. The location of utilities and mature street trees were not considered and must be taken into consideration when performing more in-depth onsite investigations.

Pursuant to the City's memo to industry No. 04-2014 issued on June 1, 2014 entitled 'Treatment of Roadway Runoff Associated with Development Projects', projects are required to install BMPs to treat runoff from any new public roadways created as a consequence of development or redevelopment. This requirement serves to treat new roadways. For existing roadways within a project limits or adjacent to a project are often treated by the developer to comply with the City's more stringent water quality requirement in Sec. 13-110 of the Alexandria zoning ordinance that development and redevelopment projects must treat the first ½" of runoff from all impervious surfaces within the project by installing BMPs. If drainage patterns make this impractical, the project may treat adjacent existing roadways to meet this local more stringent requirement. Because of these requirements, new roadways associated with development and adjacent roadways are often treated during development and

redevelopment. Additionally, based on input provided by a convened stakeholder group comprised of staff and the development community, the City's memo to industry No. 01-18 requires that at least 65% of the state's phosphorus reduction requirements be met through implementation of green infrastructure practices.

For planning purposes, acres treated and the impervious acres treated may vary since it may not be practical that the entire median area can be directed to a BMP and treated. Average efficiencies assigned to this range of technologies is: 30% TN, 50% TP, and 60% TSS. These efficiencies consider a range of technologies that may be implemented. The identification of specific practices and the target locations will be further refined during subsequent onsite planning and design. The most advantageous time to implement such practices is during planned transportation improvements. The City continues to look for ways to implement these types of retrofits through coordination with other departments and divisions during the internal planning and review process for CIP transportation projects. Implementation of retrofit practices will determine the actual pollutant loads removed to be reported.

8.5 Street Sweeping and Catch Basin Cleaning

Street sweeping is an effective strategy of removing nutrient and sediment loads prior to them being transported in stormwater runoff. The Chesapeake Bay BMP Expert Panel approved this credit in March 2011; however, the Final Recommendations of the Expert Panel to Define Removal Rates for Street and Storm Drain Cleaning Practices was issued in May 2016 and revised the credit methods. According to the 2016 Expert Panel Report, the pollutant credits is dependent on the frequency that the sweeping occurs and the type of technology that is used (advanced sweeping technology or mechanical broom technology). The City is currently administering a street sweeping program with both advanced sweeping technology (AST) equipment and mechanical broom technology (MBT) equipment. Staff is working to develop a tracking mechanisms to determine the frequency that the MS4 is cleaned by ASTs and MBTs.

The same expert panel report also outlines how to define pollutant removal rates for storm drain cleaning. To perform the calculation, the mass of the matter captured and the composition of the material (sediment or organic) is required. Similar to street sweeping, the City is currently administering a catch basin cleaning program and staff is working to develop a means to determine the mass of the material removed from the MS4 catch basins and the percentage of sediment versus organic material. The City would like to reserve the right to determine the composition (sediment and organic matter) of a few representative samples and then apply this percentage to the material removed across the entire City.

8.6 Tree Planting

The Final Recommendation of the Expert Panel to Define BMP Effectiveness for Urban Tree Canopy Expansion was approved in September 2016. This report includes two different implementation options for determining pollutant credits.

- Urban Tree Canopy Expansion BMP – Tree plantings on developed land (impervious or turfgrass) that result in an increase in tree canopy but are not intended to result in forest-like

conditions. The pollutant reduction associated with the tree is dependent on the underlying land use.

- Urban Forest Planting BMP – Trees planted in a contiguous area with the intent of establishing a forest or similar ecosystem processes and function.

The City currently has a tree planting program and property owner can receive a tree planting credit as part of the Stormwater Utility. At some point during the Phase 2 permit cycle, the City plans to track the number of trees planted and compute the corresponding pollutant removals using the expert panel guidance for the Urban Tree Canopy Expansion BMP.

8.7 Urban Stream Restoration

The Recommendations of the Expert Panel to Define Removal Rates for Individual Stream Restoration Projects (Expert Panel Report) contains the pollutant removal computation methodologies accepted by the Chesapeake Program to address Bay TMDL reductions enforced through the City's MS4 permit. The Expert Panel Report has been revised numerous times and is slated for further revisions and approval. Because of this, the pollutant removal computation methodologies in the current version of the expert panel report may change prior to the completion of the Lucky Run, Strawberry Run, and Taylor Run projects, and therefore affect the anticipated pollutant removal rates projected for these projects that are currently in the design phase. Given that the required pollutant removals for this Phase 2 Action Plan are being achieved without inclusion of these projects that are currently in various stages of design, these projects are not included in the anticipated Phase 2 reductions to meet a cumulative 40%.

The Four Mile Run Stream Restoration project was substantially completed in the summer of 2016 and brought online in the PY4 reporting period. Additional details can be found in Section 8 and a memorandum documenting the associated pollutant removal credits was submitted with the Phase 1 Action Plan.

Lucky Run Stream Restoration

The City received a SLAF grant in May 2017 for the Lucky Run Stream Restoration project which involves restoring 950 linear feet of stream. The project is bounded by residential developments to the north and east, West Braddock Road to the west, and by Interstate 395 to the south. Lucky Run eventually outfalls to Four Mile Run, which ultimately outfalls to the Potomac River, and then the Chesapeake Bay. Approximately, 224 acres of highly urban land drain to Lucky Run. The restoration will reestablish a stable pattern and profile in the stream as well as addressing areas of severe erosion near a sanitary line and nature trail. Currently, construction is anticipated to be completed in late summer/early fall of 2020 and by the end of the Phase 2 permit cycle. Table 11 presents the pollutant removals for the project based on the 2014 Stream Restoration Expert Panel Report using protocols 1 and 2. The City is currently considering performing a post construction BANCS assessment to determine if increased pollutant removal efficiencies are more representative of the post construction condition.

Strawberry Run and Taylor Run Stream Restoration

In 2018, the City completed a study to assess, evaluate, and rank five potential stream restoration projects using a decision matrix with a comprehensive list of criteria to prioritize the projects. The two top ranking projects were segments along Strawberry Run (900 feet) and Taylor Run (1800

feet). These projects will mitigate channel and bank erosion, preventing sediment and phosphorous associated with that erosion from being delivered downstream from an actively incising urban stream. The City applied for and was awarded SLAF grants for these two projects. Table 11 presents the approximate pollutant removals using protocol 1.

Table 11: Urban Stream Restoration – Anticipated Pollutant Reductions

Project	TN Removed (lbs/yr)	TP Removed (lbs/yr)	TSS Removed (lbs/yr)	Approx. Cost
Lucky Run	658	257	489,818	\$1.7M
Strawberry Run	745	343	118,347	\$1.6M
Taylor Run	641	295	34,303	\$4.5M

8.8 Public-Private Partnerships

The use of public-private partnerships (P3) can optimize all available technical and financial resources to reduce the cost burden borne by the City. These partnerships are often used as a means to provide more cost effective financial strategy to build and manage public infrastructure that can carry huge financial obligations. Examples include toll roads, military housing, and wastewater and recycling services. Historically, wastewater has been the leader in this arena related to water quality. Today, governments at all levels are considering public-private partnerships to address fiscal challenges related to the construction, operation, and maintenance of infrastructure, expansion of services, and repair of aging infrastructure. However, stormwater retrofits to meet the Bay TMDL has provided a new set of financial concerns.

Municipalities are considering this approach to help reduce costs and risks related to retrofits. Prince George's County, Maryland is pioneering this P3 effort in the region to address Bay TMDL requirements. The County has established an innovative P3 pilot program to help fund projects to retrofit of about 8,000 acres of existing impervious surfaces at an estimated cost of \$1.2B. The private partners will get paid from stormwater utility fees collected by the County that are based on impervious area, while the County may reduce its costs of the retrofit program by 40%.

While the P3 for stormwater retrofits and infrastructure is modeled on past approaches, a related but somewhat different approach being promoted by EPA through their Green Infrastructure initiative is Community Based Public-Private Partnerships (CBP3s). While a CBP3 uses many of the same financial and procurement arrangements as a traditional P3, there are differences as well. The nature of the contract, wider range of retrofit opportunities and the flexibility of the adaptive management approach are a few of the key differences. The biggest difference is the optimization of equity and the focus on the community inherent in the approach. In a CBP3, conditions must be appropriate for the community and the contractor so that both receive equitable benefits for all actions and gains from efficiencies. (EPA Region 3, April 2015)

The Prince George's P3 pilot program and the CBP3 may prove to be the most efficient and equitable models for localities trying to meet the overwhelming cost of the retrofits required by the Bay TMDL. This program is complicated and processes are still being defined; however, these P3 and CBP3

strategies are being considered to help achieve reductions required in Phases II and III. The City will continue to monitor the effectiveness of Prince George's P3 program and stay abreast of other cases that may materialize.

Until further consideration provides for information on the suitability of a P3 or CBP3 approach, the City has taken a less formal collaborative approach. Negotiations between the City and developers may produce reduction credits beyond those required in local ordinance. This strategy may include the implementation of regional facilities during the development process that provide for treatment of impervious area beyond the required site area in exchange for other onsite considerations as well as treating offsite water. Credits generated under this strategy would be negotiated during construction and be the property of the City. Based on desktop analyses and current conditions, it was concluded that private parcels with greater than five acres of untreated impervious area could be potential candidates for the program. This threshold was chosen because the level of effort would outpace the return on investment for parcels with smaller untreated areas. Projects which had a significant possibility of being developed between 2015 and 2028 were identified. The City may enter into discussions with these properties to determine if over treatment of the site is a possibility.

8.9 Urban Nutrient Management

According to Section II.B.6.c of the MS4 general permit, the City is required to develop and implement nutrient management plans (NMPs) for lands owned and operated by the City which receive nutrients and are greater than one contiguous acre. The Commonwealth has also implemented the ban of use phosphorus-containing fertilizers during routine applications. The City does not receive pollutant reduction credits for reductions required by Virginia statute or law. However, the City can receive pollution reduction credits for the development and implementation of NMPs for unregulated lands outside the MS4 service area, on public lands less than one contiguous acre, and on private lands, other than golf courses, where nutrients are applied. (Expert Panel, March 2013)

The City has developed all necessary NMPs according to the MS4 permit and continues to update and implement them. Following the Phase 1 Guidance and the Expert Panel report, the City is considering the feasibility for the implementation of NMPs on unregulated lands, private lands, and City lands receiving nutrients that are less than one contiguous acre. The option for residential condominiums to develop NMPs has been included as a method to receive stormwater utility fee credit. The City can receive pollution reduction credit for these non-MS4 permit required NMPs. If additional NMPs are developed, they will be included in the City's annual report.

8.10 Land Use Change

As part of the "all of the above" approach, the City will look for opportunities to receive credit for land use change conversions and apply the appropriate credit per Appendix V.G of the Guidance. This may include converting impervious to forest, impervious to grass, impervious to pervious, pervious to forest, or pervious to grass. Upon completion of a land use change BMP, the City will use the Table V.G.1 Land Use Change Conversion Efficiency table found in the Phase 1 Guidance to calculate the reductions. Pollutant reductions credited will be reported in the annual report for the appropriate period.

8.11 Forest Buffers

This BMP is another tool in the “all of the above” approach and similar to the previous BMP. The City will look for opportunities to protect local waterways and create credits by implementing forest buffer BMPs and/or providing enhancements to existing RPAs. Focus will be placed on identifying areas on City properties. Credits will be calculated using the efficiencies found in Table V.H.1 of the Phase 1 Guidance and will be reported with the appropriate annual report.

8.12 Nutrient Trading

The Commonwealth of Virginia allows urban stormwater to be included in the sectors that may trade nutrient credits to meet reduction requirements. The City has identified nutrient trading as a potential strategy to meet target reductions. Nutrient credits to meet overall stormwater reductions must be kept in perpetuity to meet final goals. However, wastewater dischargers currently use the program to trade credits annually. This annual trading can also be a valuable tool to assist localities in complying with their MS4 permits while working to implement the required reductions.

Likewise, urban stormwater pollutant reduction practices functioning beyond the pollutant reductions required in each MS4 permit cycle generate credits in advance of permitted requirements. These credits should be available for “annual” trading in the expanded nutrient credit exchange. For instance, if the City exceeds the 40% pollutant reduction requirements for 2023, these credits should be available for the City to trade in 2023 to other permittees that may need more time to reach the required June 30, 2023 pollutant reductions. The pollutant credits would be purchased by another MS4 permittee until the City is required to use the credits per the MS4 general permit. This approach protects water quality by incentivizing early implementation of urban stormwater reduction practices and helping to ensure that the largest number of MS4 permittees are in compliance. This expansion of the program would complement the current nutrient trading program allows for annual trading, and provide sediment credits for trading.

8.13 Bi-Lateral Trading

A Combined Sewer System (CSS) exists in the older historic district of the City and includes four combined sewer outfalls. The Bay TMDL assigns a wasteload allocation (WLA) to these four combined sewer overflow (CSO) outfalls (CSO 001 at Oronoco Bay, CSO 002 at Hunting Creek, and CSOs 003 and CSO 004 at Hooffs Run) for nutrients and sediment. Additionally, the Hunting Creek Bacteria TMDL assigns a WLA to three (CSO 002, CSO 003, and CSO 004) of the four CSO outfalls and requires substantial reductions that are enforced through CSO legislation enacted in 2017 (2017 CSO Law). The Virginia General Assembly enacted the 2017 CSO Law on April 26, 2017, which requires the implementation of CSO controls to address the Hunting Creek Bacteria TMDL and reduction of overflows at CSO 001 to meet the EPA CSO Control Policy Presumption Approach by July 1, 2025.

In response to the 2017 CSO Law, the City and Alexandria Renew Enterprises (AlexRenew) developed a revised LTCPU to comply with the CSO reduction requirements and compliance deadline. AlexRenew owns and operates the Water Resource Recovery Facility (WRRF) which provides sanitary and combined sewage treatment services to the City of Alexandria and parts of Fairfax County. The LTCPU, now branded as “RiverRenew” proposes the construction of new sewer

infrastructure to meet CSO control requirements, which includes storage and conveyance tunnels strategically coupled with AlexRenew's WRRF, to maximize the volume of CSO flow receiving treatment. The LTCPU was approved by City Council in April 2018 and subsequently by DEQ in June 2018. The controls implemented as the result of the LTCPU will achieve substantial nitrogen, phosphorus and sediment reductions and are on schedule to be constructed by July 1, 2025 per the 2017 CSO Law.

AlexRenew and the City of Alexandria are working together to leverage the WRRF to achieve CSO control requirements by the legislative deadline and have made significant progress towards meeting this overall water quality goal. On June 6, 2018, City Council approved the Outfall Transfer Agreement between the City of Alexandria, Virginia and the City of Alexandria Sanitation Authority Concerning Wet Weather Wastewater Storage and Conveyance Facilities (Outfall Transfer Agreement). The Outfall Transfer Agreement makes AlexRenew responsible for the financing, design, construction, operation and maintenance, and permitting of the CSO outfalls to comply with the 2017 CSO Law. Additionally, the Outfall Transfer Agreement outlined "Secondary Benefits" following the implementation of CSO controls with respect to the Chesapeake Bay TMDL.

As of July 1 2018, the City has transferred ownership of these outfalls to Alexandria Renew Enterprises (AlexRenew), who is now the VPDES permit holder for the outfalls. Section 15 of the Outfall Transfer Agreement states that AlexRenew will apply the Bay TMDL CSO WLAs that are in effect for nitrogen, phosphorus and sediment to any CSO overflows and to combined sewer flows that are measured, captured, and treated through AlexRenew's WRRF once CSO controls are constructed and functional. If after this analysis, allocation of nitrogen, phosphorus, and sediment remains unapplied, such credits will be calculated using AlexRenew's actual previous year annual reported nitrogen, phosphorus and sediment performance and traded to the City for its use. As such, the City may use these credits towards meeting the Bay TMDL pollutant reductions in the MS4 permit.

The LTCPU estimated capital costs are \$370 - \$555M, while infrastructure investments for compliance with the MS4 permit are estimated at \$100 - \$200M. Note that the same ratepayers in the City are being asked to fund the LTCPU capital costs to mitigate the CSO discharges as well as the MS4 capital costs to mitigate stormwater discharges. By integrating these two water quality efforts to help identify efficiencies in how to best prioritize capital investments and facilitate the use of sustainable and comprehensive solutions, the City can minimize the overall additive cost to the City ratepayers, which bear sanitary sewer costs to implement the LTCPU as well as funding for the Stormwater Utility fee that was adopted to fund costly stormwater infrastructure retrofits to meet MS4 permit requirements and the Bay TMDL. Therefore, this bi-lateral trading approach will provide water quality benefits to the City's local streams, the Potomac River and the Chesapeake Bay through maximizing the economic benefits to the City's rate payers through the most cost-effective approach (EPA Memo, June 2012).

9. Phase 1 Permit Cycle Progress

The following sections discuss the progress that the City has made in meeting the L2 Scoping Target Reductions. Each project or group of BMPs below was initially presented in the City's Phase 1 Action Plan and is complete or is expected to be substantially completed by the end of the 2017-2018 permit year. Section 9.9 summarizes the pollutant reductions for the Phase 1 permit cycle.

9.1 Credits for 2006 – 2009 Unreported Stormwater BMPs

Structural stormwater BMPs implemented prior to January 1, 2006 are included in the calibration and baseline conditions of the Bay Model and are not available for credit towards reductions. The credits for structural BMPs implemented on or after January 1, 2006 and prior to July 1, 2009 were approved by DEQ in the Phase 1 Chesapeake Bay Action Plan. These historical BMPs were submitted by September 1, 2015 as part of the “Historical Data Clean-up” and so that they could be incorporated into the Phase 6 Chesapeake Bay Model. The Phase 1 Guidance stated that if the data submitted prior to September 1, 2015, the permittee would receive credit toward target pollutant reductions.

The City BMP database was queried for BMPs installed during this timeframe. Pollutant loads associated with the impervious and pervious area draining to project BMPs were calculated using the Potomac River Basin loading rates from 2013-2018 Table 2b. Removal efficiencies for the BMPs were assigned using the Chesapeake Bay Program Efficiencies found in Guidance Table V.C.2. A full list of BMPs per project with all pertinent data and calculations was submitted with the Phase 1 Action Plan. The summary of the 2006 – 2009 BMP reductions for nitrogen, phosphorus and sediment are presented in Table 12.

Table 12: Reductions Achieved for 2006 – 2009 BMPs

Number of Projects	Total Number of BMPs	TN Removed (lbs/yr)	TP Removed (lbs/yr)	TSS Removed (lbs/yr)	Approx. City Cost ¹
40	62	1,305.1	158.0	150,452	\$0

1. Developer bears installation and long-term operation and maintenance costs for private facilities.

9.2 Credits for Post-2009 Stormwater BMPs

The City maintains a current digital inventory of stormwater management BMPs that are required as part of the development process or that have been implemented as retrofits on City properties. This database was used to identify and gather data on BMPs for projects initiating construction on or after July 1, 2009, which qualify for water quality treatment credit according to Part III 3 of the Guidance. In addition to the Chesapeake Bay ordinance water quality requirements, the City implemented the water quality volume default requirement for development and redevelopment during this time period. BMPs installed prior to January 1, 2006 are included in the baseline existing conditions in the Bay Model and not given credit towards treatment. (Credit for BMPs installed on or after January 1, 2006 and before July 1, 2009 are discussed in Section 8.1.) An analysis was conducted to determine the total load reductions achieved by post-June 30, 2009 BMPs within the MS4 service area.

The BMP database was used to determine the acres treated per type of BMP installed after the 2009 baseline. Pollutant loads for impervious and pervious areas draining to each BMP were calculated using the Potomac River Basin loading rates. Specific BMP types and associated pollutant removal efficiencies were based on the Chesapeake Bay Program Efficiencies and Retrofit Curves data, as applicable.

Two separate calculation tables were developed:

- Table 13 with pollutant reductions associated with BMPs installed between 2009 and June 30, 2014; and

- Table 14 with pollutant reductions associated with BMPs installed between July 1, 2014 and June 30, 2018.

The differentiation was made due to the implementation of the updated VSMP regulations on July 1, 2014 and the need to compare these reductions to the increased loads from the 2009 to June 30, 2014 redevelopment projects (Section 4). The full calculation tables with the pollutant removals for the BMPs installed during these time periods can be found in the Appendix C.

Please note that there was a summation error in the pollutant reduction table for the July 1, 2009 to June 30, 2014 BMPs (Attachment 1B) which was submitted to DEQ on December 14, 2015 and the values found in Table 13 have been updated.

Table 13: Reductions Achieved for July 1, 2009 - June 30, 2014 BMPs

Total Acres Treated	Impervious Acres Treated	TN Removed (lbs/yr)	TP Removed (lbs/yr)	TSS Removed (lbs/yr)	Approx. City Cost ¹
230.7	165.2	610.9	117.9	125,640	\$0

¹Developer bears the cost of installation and long-term operation and maintenance for private facilities.

Table 14: Reductions Achieved for July 1, 2014 – June 30, 2019 BMPs

Total Acres Treated	Impervious Acres Treated	TN Removed (lbs/yr)	TP Removed (lbs/yr)	TSS Removed (lbs/yr)	Approx. City Cost ¹
130.28	102.78	263.4	36.7	34,583	\$0

¹Developer bears the cost of installation and long-term operation and maintenance for private facilities.

9.3 Lake Cook, Regional Facility

Funding for the feasibility and design of Lake Cook were included in the City's FY2013 CIP. This existing fishing pond was identified in early planning-level exercises initiated in late 2011 as a retrofit candidate, included in the City's Response to DCR's November 2011 Information Request, and was considered in a subsequent feasibility study initiated in March 2013. Lake Cook is an existing facility that is currently used as a fishing pond that provides water quantity only (detention). Lake Cook is being retrofitted to provide enhanced pollutant removal or to increase the capture volume and level of treatment. In December 2013, the City received a Stormwater Local Assistance Fund (SLAF) 50% matching grant from DEQ to help fund the conversions of Lake Cook from a recreational fishing lake to a stormwater management BMP. Lake Cook drains approximately 390 acres of urban land, with approximately 127 acres of the drainage area being impervious. The lake's primary use is recreational and it is regularly stocked with fish by the Virginia Department of Game and Inland Fisheries.

A Technical Memorandum providing the approach of the planned retrofit, the calculated pollutant removal efficiencies, and the associated pollutant removal credits was submitted and approved with the Phase 1 Action Plan.

Note that the project wasn't substantially complete until September 2018, so the associated reductions are not included in Table 20 but are included in Table 21 with the Phase 2 pollutant reductions. Table

15 provides a summary of acres treated, pollutant reductions, and costs for this retrofit project. The total cost of the project was \$4.5M.

Table 15: Lake Cook Retrofit - Pollutant Reductions

Total Acres Treated	Impervious Acres Treated	TN Removed (lbs/yr)	TP Removed (lbs/yr)	TSS Removed (lbs/yr)	Approx. City Cost ¹
390.3	127.5	1587.0	163.3	131,334	\$4.5M

¹Value includes funds from a SLAF grant. Operation and maintenance is projected at \$103,000 annually beginning in FY 2019 with a three percent annual inflation factor included each year thereafter.

9.4 Eisenhower Pond 19, Regional Facility

This regional facility was constructed by the private developer of the property; however, the impervious area treated was negotiated by City staff to be greater than that required during the development review process. Any pollutant reductions beyond those required are credited towards the City's Bay TMDL reduction requirements. Since this practice goes well beyond the reductions required for development and redevelopment, this pond is not included in the previous section as a "Credit for Post-2009 BMPs". The pond assumes efficiencies based on the stormwater retrofit curves/equations and the runoff depth treated per impervious acre. The efficiency values of 35.0% TP; 22.2% for TN and 44.5% for TSS were subsequently derived. Table 16 presents the pollutant removal data for this regional facility. The Eisenhower Block 19 Pond was brought online in June 2015.

Table 16: Eisenhower Block 19 Pond – Pollutant Reductions

Total Acres Treated	Impervious Acres Treated	TN Removed (lbs/yr)	TP Removed (lbs/yr)	TSS Removed (lbs/yr)	Approx. City Cost ¹
67.1	53.7	166.8	39.2	23,644	\$0

¹Developer bears the cost of installation and long-term operation and maintenance. Opportunity costs for alternate uses of the land are considered inconsequential given the current use and therefore not factored into the costs.

9.5 Retrofits on City Properties

The City has completed several BMP retrofit projects on City properties. Table 17 presents the retrofits that have been implemented on City properties after June 30, 2009 and the related pollutant reductions.

Table 17: Retrofits on City Property – Pollutant Reductions

Project	Total Treated (ac)	Impervious Treated (ac)	TN Removed (lbs/yr)	TP Removed (lbs/yr)	TSS Removed (lbs/yr)	Approximate Total City Cost ²
Fire Station #206	0.55	0.55	2.66	0.40	515.38	\$252,240
Burke Library BMP#1	0.53	0.51	2.52	0.38	480.71	\$71,686 ¹
Burke Library BMP#2	0.78	0.41	2.66	0.37	299.91	\$71,686 ¹
Charles Barrett Elementary BMP#1	0.73	0.62	3.31	0.47	596.45	\$252,240 ¹
Charles Barrett Elementary BMP#2	1.62	1.38	6.42	1.05	912.24	\$252,240 ¹
Totals			17.6	2.7	2,805	\$900,092

1. The total cost was evenly divided, however actual costs varied for each.

2. Average operational costs based on published studies of such facilities with enhanced amenities and visibility are estimated at \$25,000 annually beginning in FY 2019, with a three percent annual inflation factor included each year thereafter.

9.6 Four Mile Run, Urban Stream Restoration

Following years of design, public outreach and inter-jurisdictional collaboration, the Four Mile Run Stream Restoration began construction in May 2015 and substantial completion in the Summer of 2016. The project involved a tidal wetland restoration that the City assessed using Protocol 3 – Credit for Floodplain Reconnection Volume. The protocol provides mass sediment and nutrient reduction credit since the project will provide a reconnection of the Four Mile Run main stream channel to the floodplain over a wide range of storm events. The approach and the determination of pollutant removal credits is discussed in the Technical Memorandum submitted with the Phase 1 Action Plan. Please note that although the memo references an older version of the expert panel report, staff has reviewed the memo against the most recent expert panel report and deemed that the approach remains valid and the calculated credits are consistent with the latest expert panel recommendations. Table 18 presents the reductions for each pollutant of concern and the approximate project cost. This project was brought online in July 2016.

Table 18: Four Mile Run Stream Restoration - Pollutant Reductions

TN (lbs/yr)	TP (lbs/yr)	TSS (lbs/yr)	Approximate City Cost ¹
194.8	40.0	14,914	\$1.8M

¹Estimate from the total costs of multiple projects in one package; construction only.

9.7 Windmill Hill Living Shoreline

Construction of the living shoreline at Windmill Hill park was substantially complete in June 2018. This project was not documented during the Phase 1 Action Plan because it was not known at the time that the scope of the project would include the installation of a natural living shoreline and the Expert Panel Report for Shoreline Management Projects had not obtained final approval. The project was initiated because of a failing bulkhead along the Potomac River at Windmill Hill Park. Several options for replacement were studied with the most cost effective and beneficial being the installation of a living shoreline. Pollutant removal calculations can be found in Table 19.

Table 19: Windmill Hill Living Shoreline Pollutant Reductions

TN (lbs/yr)	TP (lbs/yr)	TSS (lbs/yr)	Approximate City Cost¹
131.3	8.0	9,951	\$3.6M

¹Total cost of project; construction only.

9.8 Phase 1 Action Plan

The Phase 1 Action Plan was approved by DEQ on January 12, 2016. Correspondence between the City and DEQ along with the Action Plan approval letter can be found in Appendix D. The following list documents the updates and additions to the anticipated Phase 1 reductions documented in the Phase 1 Action Plan:

1. The as-built conditions for Pond 19 produces pollutant reductions slightly less than the values submitted (differences of TN = -2.1 lb/yr; TP = -3.5 lb/yr; TSS = -275.3 lb/yr).
2. A summation error was discovered in the pollutant reduction table for the July 1, 2009 to June 30, 2014 BMP table. The updated values are significantly higher than what was submitted (differences of TN = 500.6 lb/yr; TP = 103.0 lb/yr; TSS = 108,589 lb/yr).
3. The inclusion of the reductions associated with the BMPs installed from July 1, 2014 to June 30, 2018 (differences of TN = 263.4 lb/yr; TP = 36.7 lb/yr; TSS = 34,583 lb/yr).
4. The list of grandfathered projects which began construction was updated and refined. There were several projects that did not move forward or were updated to use the Virginia Runoff Reduction methodology (differences of TN = -722.6 lb/yr; TP = -85.2 lb/yr; TSS = -25,798 lb/yr).
5. The pollutant reductions associated with Windmill Hill Shoreline Restoration were added (TN = 131.3 lb/yr; TP = 8.0 lb/yr; TSS = 9,951 lb/yr).
6. The pollutant reduction associated with Lake Cook Retrofit were removed and are included with the Phase 2 pollutant reductions since the project was substantially complete in September 2018. (TN = 1,587 lb/yr; TP = 163.3 lb/yr; TSS = 131,344 lb/yr).

9.9 Phase 1 Reductions

The following table summarizes the pollutant reductions related to the projects which have been completed, fully or substantially, by the end of the 2017-2018 permit year.

Table 20: Phase 1 Permit Cycle Pollutant Reductions

Project or BMPs	TN Removed (lbs/yr)	TP Removed (lbs/yr)	TSS Removed (lbs/yr)	Approximate City Cost ¹
2006-2009 BMPs	1305.1	158.0	150,452	\$0
2009-2014 BMPs ²	610.9	117.9	125,640	\$0
2014-2018 BMPs ³	263.4	36.7	34,583	\$0
Eisenhower Pond 19 ⁴	166.8	39.2	23,644	\$0
Retrofits on City Properties	17.6	2.7	2,805	\$900,000
Four Mile Run Restoration	194.8	40.0	14,914	\$1.8M
Windmill Hill Living Shoreline ³	131.3	8.0	9,951	\$3.6M
TOTAL PHASE 1	2,689.8	402.4	361,990	\$6.3M

¹Developer bears installation and long-term operation and maintenance costs for private facilities.

²Calculation error discovered in Phase 1 Action Plan (values have been increased by TN = 500.6 lb/yr; TP = 103.0 lb/yr; TSS = 108,589 lb/yr as compared to the Phase 1 Action Plan)

³Was not included in Phase 1 Action Plan

⁴Values have changed from the Phase 1 Action Plan based on the as-built survey

10. Anticipated Phase 2 Reductions and Corresponding Costs

The cost for credits for BMPs implemented during development and redevelopment are borne by the developer. But much of the cost to implement the strategies outlined in this study will largely fall to the City. While small amounts of grant funding may be available from state and federal agencies, Virginia has acknowledged that the planning, implementation, operation, and maintenance of BMPs “will be costly and likely borne by local government.” (Virginia Senate Finance Committee, November 2011)

Order of magnitude costs were developed in previous planning-level exercises to estimate the total cost of 100% compliance with the target loads in order to determine the impact on the CIP budget over the short and long terms. Cost assumptions were based on best engineering practices, local assumptions, discussions with regional partners, and a draft report researching the costs of various BMPs (King and Hagen, 2011) prepared for the Maryland Department of Environment. The analyses employed during the previous planning level exercise identified specific possible retrofit strategies that may be implemented based on assumptions about the type of retrofit most likely to be implemented for each specific strategy, and limitations associated with each strategy. A range of technologies were assumed applicable and an average removal efficiency and unit cost per acre treated were derived for each strategy. For instance, most Retrofits of City Rights-of-Way would likely involve manufactured BMPs (such as tree box filters) or similar structures with an average removal efficiency of approximately 45% at a unit cost of approximately \$112,000 per acre treated. This and other assumptions for other types of strategies, along with the assumed long-term operations and maintenance costs, may or may not hold true. With regard to those strategies needed to fill the pollutant reduction gap (that is, those generic strategies needed to reach reduction targets after implementation of the specific strategies addressed in this report) no assumptions were made regarding whether these would be sited on public or private land. As a result, cost estimates do not include the cost of purchasing land or easements – which could be considerable.

The approximate cost to implement the potential means and methods to meet the total nitrogen, phosphorus and sediment reductions through FY2023 may range as high as \$50M and depends of the type and mix of technologies implemented, whereas total compliance may reach as high as \$100M. Table 5 presents the means and methods, the pounds of each pollutant of concern, percentage of the total L2 scoping targets and the estimated costs.

To meet these increased costs, the City has adopted a Stormwater Utility Fee on May 4, 2017 with the Fiscal Year 2018 budget to provide a dedicated source to fund the City's Stormwater Management Program. The fee funds stormwater management, to include federal and state mandates to clean up the Chesapeake Bay, more equitably than through real estate taxes by shifting stormwater management costs to residential and nonresidential property owners with greater impact on stormwater runoff. The fee was effective January 1, 2018 and the first bill was mailed on in May 2018. The fee is billed twice a year with the City's real estate billing.

Table 21 presents a summary of potential Phase 2 strategies and their potential pollutant reductions in pounds per year for the two projects that the City plans to install during the next permit cycle. Additional strategies may also be evaluated for implementation.

The anticipated pollutant reductions associated with the Ben Brenman Pond Retrofit have increased based on additional details regarding the design and routing additional untreated area to the pond. Note that this pond retrofit was included in the Phase 1 Action Plan for reference purposes only and the pollutant removals were not incorporated into the total pollutant removals documented in the Phase 1 Action Plan. The associated pollutant calculations can be found in the Ben Brenman Technical Memorandum found in Appendix B.

Table 21: Phase 2 Estimated Pollutant Reductions and Costs

Reduction Strategy	TN (lbs/yr)	TP (lbs/yr)	TSS (lbs/yr)	Estimated City Cost¹
Lake Cook Retrofit	1,587	163.3	131,334	\$4.5M
Ben Brenman Pond Retrofit	946.4	151.3	87,734	\$3.75M
Total	2,533.4	314.6	219,068	\$8.25M

¹Includes funds from SLAF grants

²Projects are in the design phase and part of the City's internal goal to achieve permit targets prior to the required end dates

Table 22 presents a summary of the expected progress at the end of the Phase 2 permit cycle once the potential strategies have been implemented. Based on progress made in the first cycle and strategies to be implanted in the second permit cycle, the City will far exceed the 40% pollutant reduction requirement and will have substantial progress to meeting the 100% reduction goals.

Table 22: Phase 2 Expected Progress

Pollutant of Concern	City Phase 1 Reductions (lb/yr)	City Phase 2 Planned Reductions (lb/yr)	L2 Total Required Reductions (lb/yr)	Percent of L2 Total Required Reductions Met
TN	2,689.8	2,533.4	7,597.0	69%
TP	402.4	314.6	1,004.4	71%
TSS	361,990	219,068	861,937	67%

11. Public Comment

The 2018-2023 MS4 General Permit states that the permittee must provide an opportunity for public comment on the additional BMPs proposed in the Phase 2 Action Plan to meet the reductions not previously approved by DEQ in the Phase 1 Action Plan for no less than 15 days. The Phase 2 Chesapeake Bay TMDL Action Plan was put on the City's website on July 16, 2019 for public review and comment. The comment period remained open until August 15, 2019 or for 30 calendar days. An eNews announcement was sent out on July 18, 2019 inviting public comment on the Draft Action Plan. In addition, notices were published in both the Alexandria Gazette and Alexandria Times on July 19th and July 25th, respectfully. No public meetings were held; however, the Action Plan was presented to the City's Environmental Policy Commission on September 23, 2019.

The City received 1 comment, which is summarized below:

1. AlexRenew proposed various updates to the text for Section 8.13 Bilateral Trading.

Based on these comments, the City made the following update to the Phase 2 Action Plan:

2. Updated Section 8.13 Bilateral Trading to incorporate the updated text from AlexRenew.

12. References

1. Community Based Public-Private Partnerships (CBP3s) and Alternative Market-Based Tools for Integrating Green Stormwater Infrastructure; EPA Region 3; Water Protection Division, April 2015
2. Chesapeake Stormwater Network Technical Bulletin No. 9, Stormwater Nutrient Accounting.
3. Guidance Memo No. 15-2005, Virginia Department of Environmental Quality, May 18, 2015
4. Recommendations of the Expert Panel to Define Removal Rates for Urban Stormwater Retrofit Projects, January 2015
5. Recommendation of the Expert Panel to Define Removal Rates for Urban Nutrient Management, March 2013
6. Recommendation of the Expert Panel to Define Removal Rates for Individual Stream Restoration Projects, September 2014
7. Recommendation of the Expert Panel to Define Removal Rates for Shoreline Management Projects, July 2015
8. Recommendations of the Expert Panel to Define Removal Rates for Street and Storm Drain Cleaning Practices, May 2016
9. Recommendations of the Expert Panel to Define BMP Effectiveness for Urban Tree Canopy Expansion, September 2016
10. June 5, 2012 Memo from EPA Regional Administrators to Acting Assistant Administrator for the Office of Water, Integrated Municipal Stormwater and Wastewater Planning Approach Framework

Appendix A

Future Grandfathered Projects

Future Grandfathered Projects		
Project Name	Address	Approx. Project Site Area (ac)
Potomac Yard Landbay G - Block D (Institute for Defense Analyses at Potomac Yard)	DSP2012-00008	19.08
Carlyle Plaza Two (Amendments)	DSP2013-00025	6.92
Hoffman Properties Blocks 11 and 12	DSP2016-00012 (DSUP2013-00008)	4.27
Carlyle Plaza One	DSP2006-00003	1.39
Mark Center Plaza 1A Building 5	DSP2007-00027	7.24
Eisenhower Block 20	DSP2015-00008 (DSUP2007-00017)	2.81
	Total	41.71

Appendix B

Ben Brenman Technical Memorandum



City of Alexandria, Virginia

TECHNICAL MEMORANDUM

DATE: August 21, 2017

SUBJECT: Ben Brenman Pond Retrofit Pollutant Removal Calculations

PREPARED BY: City of Alexandria and URS

Purpose

The City of Alexandria has been proactive in its approach to meeting the Chesapeake Bay Total Maximum Daily Load (TMDL) reductions specified in its Municipal Separate Storm Sewer System (MS4) permit. The City identified retrofitting its existing stormwater ponds as a first step towards meeting its required Chesapeake Bay TMDL reductions. A study commissioned by the City in August 2012 identified several wet ponds as candidates for water quality improvement retrofits. In December 2014, the City received a Stormwater Local Assistance Fund (SLAF) grant from the Virginia Department of Environmental Quality (VA DEQ) to help fund retrofitting Ben Brenman Pond to meet the design criteria for a Virginia Best Management Practice (BMP) Clearinghouse Level 2 Wet Pond.

The purpose of this technical memorandum is to describe the proposed retrofits to Ben Brenman Pond and to summarize the water quality benefits in terms of pounds of nitrogen, phosphorus, and total suspended solids.

Background

Ben Brenman Pond, also referred to as Cameron Station Pond, is located in Ben Brenman Park and was originally constructed in the late 1990s as a stormwater management facility for the adjacent Cameron Station residential development. The pond receives drainage from approximately 255 acres of urban land in the City and is located in the Backlick Run watershed. Backlick Run is a tributary to Holmes Run which flows into Cameron Run and then the Potomac River. Approximately 179 acres (62 percent) of the drainage area for Ben Brenman Pond is impervious. The pond has a surface area of approximately 6.1 acres. In addition to serving as a stormwater management facility, the pond is a popular amenity to the Cameron Station residents, and Ben Brenman Park is heavily used by the local residents.

Proposed Retrofits

Improvement to the existing Ben Brenman Pond will involve adding or retrofitting water quality features in order for the pond to meeting the Level 2 Wet Pond criteria as outlined in *Virginia DEQ Stormwater Design Specification No. 14 – Wet Pond, Version 1.9, dated March 1, 2011*.

Also, the retrofitted pond will provide water quality treatment for previously untreated stormwater in the Backlick Run watershed. Low flows from adjacent storm sewer systems will be diverted to the pond, which will provide water quality treatment for an additional 35 acres of regulated urban pervious and impervious land. The following sections provide detailed descriptions of the proposed retrofits.

Pond and Forebay Treatment Volume

A treatment volume of 24.5 acre-feet is required to meet Level 2 design criteria for the proposed 290 acres (after diversion of the additional 35 acres) being routed to the pond. As outlined in the Virginia DEQ Stormwater Design Specification for Wet Ponds, this treatment volume may consist of the volume entirely below the normal pool elevation, or a combination of the volume associated with extended detention above the normal pool elevation and the volume below the normal pool elevation. Currently, Ben Brenman Pond has a storage volume of approximately 23.8 acre-feet. After the pond is retrofitted, the treatment volume will increase to approximately 27 acre-feet.

Multiple Cell Design

Storage in the pond is currently provided within two cells: a sediment forebay and the larger main pond. Since the entire treatment volume will be contained below the normal pool elevation, the pond must have at least 3 internal cells to meet the Level 2 design criteria. The proposed design includes dividing the main pond cell into two cells using a weir structure across the narrowest portion of the pond.

Sediment Forebay

The sediment forebay is located on the west side of the pond and is separated from the main pond by an earthen berm. The design plans for the pond show a storage volume of 1.7 acre-feet for the forebay, which is approximately 0.5 acre-feet smaller than what the VA DEQ Stormwater Design Specification require for a Level 1 Wet Pond. Bathymetry conducted in Fall of 2012 indicates that a significant amount of sediment has accumulated in the forebay and the volume has been reduced to approximately 1.1 acre-feet. The proposed retrofit will dredge the existing forebay area to its original constructed volume and increase its volume to 3.7 acre-feet by shifting the location of the earthen weir further into the main pond. The volume of 3.7 acre-feet is consistent with the necessary volume for a sediment forebay of a Level 2 Wet Pond draining 290 acres. The retrofitted forebay will have a surface area of approximately 0.7 acres and account for 11% of the retrofitted pond's surface area.

Aquatic Benches

The existing pond does not include aquatic benches and the as-built plans confirmed that benches were not included in the original construction. The VA DEQ Stormwater Design Specification requires aquatic benches for a Level 2 Wet Pond and, as part of the retrofit, they will be constructed around the perimeter of the pond. The aquatic benches will be 5 feet wide around the perimeter of the sediment forebay and 10 feet wide around the perimeter of the two internal pond cells. They will also serve as a safety feature in the event of someone or something falls into the pond.

Wetlands

The VA DEQ Stormwater Design Specification for Wet Ponds specify that wetlands make up more than 10 percent of the pond area. Based on the *High Marsh Zone* definition found in *Virginia DEQ Stormwater Design Specification No. 13 – Constructed Wetlands*, those portions of the aquatic benches that are within 6 inches (above or below) the normal pool elevation will be considered wetland areas for the purpose of meeting this requirement. The proposed aquatic benches will provide approximately 0.4 acres of wetlands around the perimeter of the pond. In addition, floating wetlands will be added to the pond to meet the remaining 10 percent requirement. Together, the floating wetlands and aquatic bench wetlands will be equal to or greater than the 0.61 acres in size, given the pond surface area of approximately 6.1 acres.

Aerators

The existing pond contains two types of aerators. Originally, the pond was equipped with five aerators that pumped surface water in the form of fountains. Since the pond's construction, the City's park service added additional underwater aerators closer to the bottom of the pond. There is no plan to alter the existing aerators, and they will continue to remain in the pond.

Upflow Filter

Additional water quality improvements are provided by an existing upflow filter consisting of aggregate media. Although, it is not a requirement for a Level 1 or 2 design, the upflow filter will remain in the pond, and will not be altered as part of the retrofit design.

The City has noted improved water quality downstream from Ben Brenman Pond that has not been observed downstream from other City-owned retention ponds. This is believed to be at least partially attributed to the upflow filter. A similar upflow filter was added to the retrofit design for nearby Lake Cook, which the City is also retrofitting to help comply with its required Chesapeake Bay TMDL reductions.

Pollutant Calculations

The following sections describe the methodologies and procedures used to compute the existing conditions and proposed retrofit conditions pollutant removals for Ben Brenman Pond. The procedures and methodologies found in Guidance Memo No. 15-2005 (GM15-2005), also referred to as the Chesapeake Bay TMDL Action Plan Guidance, were used in the pollutant calculations.

Existing Conditions

Ben Brenman Pond currently treats 255 acres of urban land due to the existing drainage infrastructure. Since the initial/existing pond was not build to meet the VA Stormwater BMP Clearinghouse standards, the existing pollutant removal rates for Ben Brenman Pond were calculated based on the Chesapeake Bay Program (CBP) established efficiencies for Wet Ponds and Wetlands provided in Table V.C.1 Chesapeake Bay

Program BMPs, Established Efficiencies of GM15-2005.

Table V.C.1 – Chesapeake Bay Program BMPs, Established Efficiencies

Chesapeake Bay Program BMPs	TN	TP	TSS
Wet Ponds and Wetlands	20%	45%	60%

Due to the existing forebay being substantially undersized and the lack of aquatic benches, a downward modification to the Chesapeake Bay Program efficiencies was used. Example V.D.2 in GM15-2005 provides an example of this same approach.

<i>Design Deficiency</i>	<i>Downward Modification</i>
Undersized Forebay	10%
No Aquatic Benches	10%
TOTAL	20%

After incorporating the downward modifications, the resultant adjusted pollutant removal efficiencies were as follows:

Table 1: Ben Brenman Pond Existing Conditions Pollutant Load Reduction Efficiencies

Pollutant	CBP Efficiency	Downward Modification	Adjusted Efficiency
TN	20%	20%	16%
TP	45%	20%	36%
TSS	60%	20%	48%

The Potomac River Basin 2009 edge of stream loading rates (lbs/acre/yr) can be found in the table below and in Table 2 b of GM15-2005.

Table 2: Potomac River Basin Pollutant Loadings

Pollutant	Land Use	Loading
Nitrogen	Reg Urb Imp	16.86
	Reg Urb Per	10.07
	Forest	5.29
Phosphorus	Reg Urb Imp	1.62
	Reg Urb Per	0.41
	Forest	0.13
Total Suspended Solids	Reg Urb Imp	1171.32
	Reg Urb Per	175.8
	Forest	79.91

It should be noted that the forest loading rate was not used in the calculations because no land within the pond's contributing drainage area was considered to be forested. There are areas of tree cover within the drainage area; however, the Chesapeake Bay Phase 6 TMDL Model categorizes these areas as Tree Canopy over Turf Grass or trees within 30' to 80' of non-road impervious surfaces where the understory is assumed to be turf grass or otherwise altered through compaction, removal of surface organic material, and/or

fertilization. Subsequently, the forest loading rates were not used in the existing condition or proposed retrofitted condition pollutant calculations.

Using the loadings and efficiencies determined above, the total nitrogen, total phosphorus, and total suspended solids removed by the existing pond were computed as shown below.

Table 3: Ben Brenman Pond Existing Conditions Pollutant Load Reductions

Area Treated (ac)	Impervious Treated (ac)	TN Load (lb/yr)	TP Load (lb/yr)	TSS Load (lb/yr)	TN Removed (lb/yr)	TP Removed (lb/yr)	TSS Removed (lb/yr)
255.11	144.1	3547.40	278.96	188,303	567.58	100.42	90,385.33

Proposed Retrofitted Conditions

The retrofitted pond will be designed to treat runoff from the 255 acres of urban land currently draining to it, as well as previously untreated runoff from an additional 35 acres of urban land that will be diverted to the pond.

After retrofitting, the pond will meet the Level 2 design criteria and will be eligible to receive the corresponding pollutant load reductions as presented in Table V.A.1 Virginia Stormwater BMP Clearinghouse BMPs, Established Efficiencies of GM15-2005. The Level 2 Wet Pond efficiencies for TN are 40% (30% in the coastal plain terrain) and for TP are 75% (65% in the coastal plain terrain). Some physiographic maps indicate that the majority of the City of Alexandria falls within the coastal plain region; however, a closer examination of the terrain and other determining characteristics suggests that the west side of the City more closely resembles the piedmont physiographic region. This includes the area where Ben Brenman Pond is located. As a result, the higher efficiencies associated with the non-coastal plain region are used to calculate the pollutant removals for the proposed retrofitted pond.

Table V.A.1 - Virginia Stormwater BMP Clearinghouse BMPs, Established Efficiencies

Practice Number	Practice	TN	TP
14	Wet Pond 1	30% (20%) ²	50% (45%) ²
	Wet Pond 2	40% (30%) ²	75% (65%) ²

²Lower nutrient removal in parentheses apply to wet ponds in coastal plain terrain

Since there are no established efficiencies for TSS in the Virginia Stormwater BMP Clearinghouse, Appendix V.A of GM15-2005 states that permittees should use the retrofit curves developed by the Bay Program or the CBP Established Efficiencies. Using the treatment volume of the proposed retrofitted pond (27 acre-feet) and the impervious area treated (179.1 acres), a treated runoff depth of 1.81 inches was computed. Using the equations for the retrofit curves, a TSS efficiency value of 77.7% was calculated.

Table 4: Ben Brenman Pond Proposed Conditions Pollutant Load Efficiencies

TN Efficiency	TP Efficiency	TSS Efficiency
40%	75%	77.7%

Using the loadings and efficiencies determined above, the total nitrogen, total phosphorus, and total suspended solids removed by the proposed retrofitted Level 2 pond were computed as shown below.

Table 5: Ben Brenman Pond Proposed Conditions Pollutant Load Reductions

Area Treated (ac)	Impervious Treated (ac)	TN Load (lb/yr)	TP Load (lb/yr)	TSS Load (lb/yr)	TN Removed (lb/yr)	TP Removed (lb/yr)	TSS Removed (lb/yr)
290.11	179.1	3785.05	335.66	229,299	1,514.02	251.74	178,119.26

Incremental Difference in Pollutant Removals

According to GM15-2005, permittees will calculate the credit associated with BMP enhancement, conversion, and restoration using an incremental rate.

The difference between the pollutant loads currently being removed by the existing pond and the loads which will be removed by the proposed retrofitted pond will be equal to the amount that can be associated with the project. Using the existing and proposed pollutant removals, the following values are the pollutant removals associated with the retrofit project and can be applied toward the City's required Chesapeake Bay TMDL pollutant load reductions.

Table 6: Ben Brenman Pond Incremental Pollutant Load Reductions (Credits)

TN Removed (lb/yr)	TP Removed (lb/yr)	TSS Removed (lb/yr)
946.44	151.32	87,733.93

Appendix C

July 1, 2009 to June 30, 2014 BMP Calculation Table

July 1, 2014 to June 30, 2018 BMP Calculation Table

	Chesapeake Bay Program BMP Type	BMP Name (Full)	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency*	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	Efficiency
	Bioretention A/B soils, no underdrain	Green Roof	1/14/2010	0.182	0.182	0.29	3.07	213	85%	80%	90%	0.25	2.45	191.86	Chesapeake Program
	Vegetated Open Channels C/D soils, no underdrain	Grass Swale	5/20/2011	0.48	0.08	0.29	5.38	164	10%	10%	50%	0.03	0.54	82.01	Chesapeake Program
	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	6/11/2011	1.6	0.4	1.14	18.83	679	20%	13%	50%	0.23	2.40	339.74	VA BMP Category I
	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	10/22/2012	0.28	0.25	0.42	4.52	298	20%	13%	50%	0.08	0.57	149.05	VA BMP Category I
	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	10/22/2012	0.35	0.31	0.52	5.63	370	20%	13%	50%	0.10	0.72	185.07	VA BMP Category I
	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	10/22/2012	1.4	0.54	1.23	17.76	784	20%	13%	50%	0.25	2.26	391.85	VA BMP Category I
	Filtering Practices	StormFilter™ Stormwater Treatment System	6/22/2012	1.39	1.1	1.90	21.47	1,339	45%	29%	80%	0.86	6.15	1071.55	VA BMP Category I
	Bioretention A/B soils, no underdrain	Green Roof	6/22/2012	0.259	0.259	0.42	4.37	303	85%	80%	90%	0.36	3.49	273.03	Chesapeake Program
	Vegetated Open Channels C/D soils, no underdrain	Vegetated Filter Strip	2/1/2010	1.65	0.11	0.81	17.36	400	10%	10%	50%	0.08	1.74	199.79	Chesapeake Program
	Vegetated Open Channels C/D soils, no underdrain	Vegetated Filter Strip	2/1/2010	1.85	0.56	1.44	22.43	883	10%	10%	50%	0.14	2.24	441.36	Chesapeake Program
	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	2/1/2010	0.114	0.114	0.18	1.92	134	20%	10%	55%	0.04	0.19	73.44	Chesapeake Program
	Dry Detention Ponds and Hydrodynamic Structures	Dry Detention Pond	2/1/2010	0.68	0.14	0.45	7.80	259	10%	5%	10%	0.04	0.39	25.89	Chesapeake Program
	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	10/15/2012	1.83	0.56	1.43	22.23	879	20%	13%	50%	0.29	2.83	439.60	VA BMP Category I
	Filtering Practices	StormFilter™ Stormwater Treatment System	11/12/2009	1.4	0.96	1.74	20.62	1,202	45%	29%	80%	0.78	5.91	961.46	VA BMP Category I
	Filtering Practices	StormFilter™ Stormwater Treatment System	11/3/2010	1.84	1.4	2.45	28.03	1,717	45%	29%	80%	1.10	8.03	1373.76	VA BMP Category I
	Filtering Practices	StormFilter™ Stormwater Treatment System	11/3/2010	0.54	0.5	0.83	8.83	593	45%	29%	80%	0.37	2.53	474.15	VA BMP Category I
	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	10/18/2010	0.44	0.34	0.59	6.74	416	20%	13%	50%	0.12	0.86	207.91	VA BMP Category I
	Bioretention C/D soils, underdrain	Tree Box Filter	10/18/2010	0.13	0.11	0.19	2.06	132	45%	25%	55%	0.08	0.51	72.80	Chesapeake Program
	Bioretention C/D soils, underdrain	Tree Box Filter	10/18/2010	0.17	0.15	0.25	2.73	179	45%	25%	55%	0.11	0.68	98.57	Chesapeake Program
	600 ft of Stream Restoration - DSP 2007-0018	Stream Restoration	1/31/2012	2.7	0.9	2.20	33.30	1,371				40.80	45.00	26928.00	Chesapeake Program
	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	1/31/2012	0.104	0.104	0.17	1.75	122	20%	10%	55%	0.03	0.18	67.00	Chesapeake Program
	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	10/22/2009	0.83	0.76	1.26	13.52	903	20%	13%	50%	0.25	1.72	451.25	VA BMP Category I
	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	10/22/2009	0.26	0.24	0.40	4.25	285	20%	13%	50%	0.08	0.54	142.32	VA BMP Category I
	Filtering Practices	StormFilter™ Stormwater Treatment System	10/19/2012	0.62	0.54	0.91	9.91	647	45%	29%	80%	0.41	2.84	517.26	VA BMP Category I
	Filtering Practices	StormFilter™ Stormwater Treatment System	10/19/2012	0.85	0.6	1.07	12.63	747	45%	29%	80%	0.48	3.62	597.39	VA BMP Category I

	Chesapeake Bay Program BMP Type	BMP Name (Full)	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency*	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	Efficiency
	Filtering Practices	StormFilter™ Stormwater Treatment System	10/19/2012	0.54	0.39	0.69	8.09	483	45%	29%	80%	0.31	2.32	386.55	VA BMP C I
	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	12/28/2009	1.46	1.17	2.01	22.65	1,421	20%	13%	50%	0.40	2.88	710.71	VA BMP C I
	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	12/4/2013	0.66	0.56	0.95	10.45	674	20%	13%	50%	0.19	1.33	336.76	VA BMP C I
	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	9/17/2009	0.9	0.7	1.22	13.82	855	20%	13%	50%	0.24	1.76	427.54	VA BMP C I
	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	1/31/2013	2.66	2.3	3.87	42.40	2,757	20%	13%	50%	0.77	5.40	1378.66	VA BMP C I
	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	1/31/2013	3.01	2.61	4.39	48.03	3,127	20%	13%	50%	0.88	6.11	1563.73	VA BMP C I
	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	1/31/2013	2.8	2.16	3.76	42.86	2,643	20%	13%	50%	0.75	5.45	1321.28	VA BMP C I
	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	1/31/2013	5.07	4.03	6.96	78.42	4,903	20%	13%	50%	1.39	9.98	2451.63	VA BMP C I
	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	1/31/2013	2.49	2.2	3.68	40.01	2,628	20%	13%	50%	0.74	5.09	1313.94	VA BMP C I
	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	1/31/2013	9	7.06	12.23	138.57	8,611	20%	13%	50%	2.45	17.63	4305.29	VA BMP C I
	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	1/31/2013	8.19	6.18	10.84	124.44	7,592	20%	13%	50%	2.17	15.84	3796.06	VA BMP C I
	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	1/31/2013	3.22	2.75	4.65	51.10	3,304	20%	13%	50%	0.93	6.50	1651.88	VA BMP C I
	Filtering Practices	StormFilter™ Stormwater Treatment System	12/16/2010	1.214	1.164	1.91	20.13	1,372	45%	29%	80%	0.86	5.77	1097.77	VA BMP C I
	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	8/18/2009	0.69	0.62	1.03	11.16	739	20%	13%	50%	0.21	1.42	369.26	VA BMP C I
	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	8/18/2009	2.41	2.28	3.75	39.75	2,693	20%	13%	50%	0.75	5.06	1346.73	VA BMP C I
	Dry Detention Ponds and Hydrodynamic Structures	StormTech® Isolator™ Row Stormwater Management System	7/8/2013	0.24	0.22	0.36	3.91	261	10%	5%	10%	0.04	0.20	26.12	Chesa Pr
	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	12/11/2009	0.738	0.463	0.86	10.58	591	20%	13%	50%	0.17	1.35	295.33	VA BMP C I
	Bioretention A/B soils, no underdrain	Green Roof	12/11/2009	0.244	0.244	0.40	4.11	286	85%	80%	90%	0.34	3.29	257.22	Chesa Pr
	Dry Detention Ponds and Hydrodynamic Structures	Dry Detention Pond	12/1/2009	6.49	5.15	8.89	100.32	6,268	10%	5%	10%	0.89	5.02	626.79	Chesa Pr
	Filtering Practices	Flow Thru Planter Box	12/1/2009	0.46	0.46	0.75	7.76	539	60%	40%	80%	0.45	3.10	431.05	Chesa Pr
	Filtering Practices	Flow Thru Planter Box	12/1/2009	0.3	0.3	0.49	5.06	351	60%	40%	80%	0.29	2.02	281.12	Chesa Pr
	Filtering Practices	Flow Thru Planter Box	12/1/2009	0.35	0.35	0.57	5.90	410	60%	40%	80%	0.34	2.36	327.97	Chesa Pr
	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	9/11/2010	1.19	1	1.70	18.77	1,205	20%	13%	50%	0.34	2.39	602.36	VA BMP C I
	Filtering Practices	StormFilter™ Stormwater Treatment System	9/11/2010	0.285	0.224	0.39	4.39	273	45%	29%	80%	0.17	1.26	218.48	VA BMP C I
	Filtering Practices	StormFilter™ Stormwater Treatment System	9/11/2010	0.315	0.248	0.43	4.86	302	45%	29%	80%	0.19	1.39	241.81	VA BMP C I

	Chesapeake Bay Program BMP Type	BMP Name (Full)	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency*	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	Efficiency
	Filtering Practices	StormFilter™ Stormwater Treatment System	9/11/2010	0.197	0.155	0.27	3.04	189	45%	29%	80%	0.12	0.87	151.15	VA BMP C I
	Filtering Practices	StormFilter™ Stormwater Treatment System	9/11/2010	0.226	0.178	0.31	3.48	217	45%	29%	80%	0.14	1.00	173.55	VA BMP C I
	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	3/22/2013	0.587	0.587	0.95	9.90	688	20%	13%	50%	0.19	1.26	343.78	VA BMP C I
T 01	Bioretention C/D soils, underdrain	Bioretention Filter	11/29/2012	0.062	0.002	0.03	0.64	13	45%	25%	55%	0.01	0.16	7.09	Chesa Pr
T 02	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	11/29/2012	0.35	0.35	0.57	5.90	410	20%	13%	50%	0.11	0.75	204.98	VA BMP C I
	Filtering Practices	Delaware Sand Filter	6/3/2013	0.859	0.45	0.90	11.71	599	60%	40%	80%	0.54	4.68	479.20	Chesa Pr
	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	12/23/2009	0.884	0.401	0.85	11.62	555	20%	13%	50%	0.17	1.48	277.31	VA BMP C I
	Filtering Practices	StormFilter™ Stormwater Treatment System	6/15/2011	0.115	0.0955	0.16	1.81	115	45%	29%	80%	0.07	0.52	92.23	VA BMP C I
	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	6/15/2011	0.0164	0.0164	0.03	0.28	19	20%	10%	55%	0.01	0.03	10.57	Chesa Pr
	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	6/11/2010	1.81	1.4	2.44	27.73	1,712	20%	13%	50%	0.49	3.53	855.96	VA BMP C I
	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	6/24/2012	2.21	1.59	2.83	33.05	1,971	20%	13%	50%	0.57	4.21	985.70	VA BMP C I
	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	6/24/2012	7.37	5.56	9.75	111.97	6,831	20%	13%	50%	1.95	14.25	3415.37	VA BMP C I
T 01	Filtering Practices	StormFilter™ Stormwater Treatment System	4/19/2012	0.09	0.09	0.15	1.52	105	45%	29%	80%	0.07	0.43	84.34	VA BMP C I
	Filtering Practices	StormFilter™ Stormwater Treatment System	4/11/2011	0.433	0.433	0.70	7.30	507	45%	29%	80%	0.32	2.09	405.75	VA BMP C I
	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	4/11/2011	0.069	0.069	0.11	1.16	81	20%	10%	55%	0.02	0.12	44.45	Chesa Pr
	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	4/11/2011	0.026	0.026	0.04	0.44	30	20%	10%	55%	0.01	0.04	16.75	Chesa Pr
T 01	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	12/28/2009	0.741	0.6726	1.12	12.03	800	20%	13%	50%	0.22	1.53	399.93	VA BMP C I
T 02		Oil / Grit Separator	12/28/2009	0.1	0.1	0.16	1.69	117							Chesa Pr
	Filtering Practices	Sand Filter	6/19/2012	0.244	0.148	0.28	3.46	190	60%	40%	80%	0.17	1.38	152.19	Chesa Pr
	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	7/19/2013	0.79	0.44	0.86	10.94	577	20%	13%	50%	0.17	1.39	288.46	VA BMP C I
	Vegetated Open Channels C/D soils, no underdrain	Vegetated Filter Strip	7/10/2013	1.44	0.12	0.74	15.32	373	10%	10%	50%	0.07	1.53	186.31	Chesa Pr
	Bioretention C/D soils, underdrain	Bioretention Filter	7/10/2013	1.27	0.54	1.17	16.46	761	45%	25%	55%	0.53	4.11	418.47	Chesa Pr
	Bioretention C/D soils, underdrain	Bioretention Filter	7/10/2013	1.16	0.86	1.52	17.52	1,060	45%	25%	55%	0.68	4.38	583.04	Chesa Pr
	Bioretention C/D soils, underdrain	Bioretention Filter	7/10/2013	1.26	0.75	1.42	17.78	968	45%	25%	55%	0.64	4.45	532.48	Chesa Pr

	Chesapeake Bay Program BMP Type	BMP Name (Full)	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency*	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	Efficiency
	Bioretention C/D soils, underdrain	Bioretention Filter	7/10/2013	0.95	0.68	1.21	14.18	844	45%	25%	55%	0.55	3.55	464.18	Chesapeake Program
	Bioretention C/D soils, underdrain	Bioretention Filter	7/10/2013	0.25	0.15	0.28	3.54	193	45%	25%	55%	0.13	0.88	106.30	Chesapeake Program
	Already included in aggregate method for determining increase in impervious areas	Cistern	7/10/2013	0	0	0.00	0.00	0							Chesapeake Program
	Dry Detention Ponds and Hydrodynamic Structures	Vortechs® Stormwater Treatment System	11/27/2012	0.67	0.5624	0.96	10.57	678	20%	13%	50%	0.19	1.34	338.83	VA BMP C Program
	Dry Detention Ponds and Hydrodynamic Structures	Vortechs® Stormwater Treatment System	11/27/2012	0.44	0.2827	0.52	6.35	359	20%	13%	50%	0.10	0.81	179.39	VA BMP C Program
	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	11/27/2012	0.73	0.6996	1.15	12.10	825	20%	13%	50%	0.23	1.54	412.40	VA BMP C Program
	Dry Detention Ponds and Hydrodynamic Structures	Vortechs® Stormwater Treatment System	3/27/2010	0.73	0.68	1.12	11.97	805	20%	13%	50%	0.22	1.52	402.64	VA BMP C Program
	Dry Detention Ponds and Hydrodynamic Structures	Vortechs® Stormwater Treatment System	3/27/2010	1.1	1.1	1.78	18.55	1,288	20%	13%	50%	0.36	2.36	644.23	VA BMP C Program
	Dry Detention Ponds and Hydrodynamic Structures	Vortechs® Stormwater Treatment System	3/27/2010	1.1	1.1	1.78	18.55	1,288	20%	13%	50%	0.36	2.36	644.23	VA BMP C Program
	Filtering Practices	StormFilter™ Stormwater Treatment System	3/27/2010	0.61	0.56	0.93	9.95	665	45%	29%	80%	0.42	2.85	531.78	VA BMP C Program
	Filtering Practices	BayFilter™ Stormwater Filtration System	12/8/2010	1.86	1.49	2.57	28.85	1,810	50%	32%	80%	1.28	9.18	1448.25	VA BMP C Program
	Bioretention C/D soils, underdrain	Tree Box Filter	6/29/2011	0.41	0.38	0.63	6.71	450	45%	25%	55%	0.28	1.68	247.71	Chesapeake Program
	Bioretention C/D soils, underdrain	Tree Box Filter	6/29/2011	0.58	0.395	0.72	8.52	495	45%	25%	55%	0.32	2.13	272.36	Chesapeake Program
	Bioretention C/D soils, underdrain	Tree Box Filter	6/29/2011	0.58	0.395	0.72	8.52	495	45%	25%	55%	0.32	2.13	272.36	Chesapeake Program
T 01	Permeable Pavement w/Sand, Veg. C/D soils, underdrain	Permeable Pavement	2/27/2010	0.077	0.077	0.12	1.30	90	20%	20%	55%	0.02	0.26	49.61	Chesapeake Program
T 02	Dry Detention Ponds and Hydrodynamic Structures	Dry Detention Pond	2/27/2010	0.82	0.08	0.43	8.80	224	10%	5%	10%	0.04	0.44	22.38	Chesapeake Program
	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	5/9/2011	9.195	4.667	9.42	124.28	6,263	20%	13%	50%	1.88	15.82	3131.29	VA BMP C Program
	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	4/3/2012	2.46	2.38	3.89	40.93	2,802	20%	13%	50%	0.78	5.21	1400.90	VA BMP C Program
	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	4/3/2012	2.45	2.23	3.70	39.81	2,651	20%	13%	50%	0.74	5.07	1325.36	VA BMP C Program
	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	9/29/2012	2.89	2.13	3.76	43.57	2,629	20%	13%	50%	0.75	5.54	1314.26	VA BMP C Program
	Already included in aggregate method for determining increase in impervious areas	Cistern	9/29/2012	0.33	0.33	0.53	5.56	387							Chesapeake Program
	Bioretention A/B soils, no underdrain	Green Roof	9/29/2012	0.33	0.33	0.53	5.56	387	85%	80%	90%	0.45	4.45	347.88	Chesapeake Program
	Filtering Practices	Flow Thru Planter Box	9/15/2011	0.057	0.057	0.09	0.96	67	60%	40%	80%	0.06	0.38	53.41	Chesapeake Program

	Chesapeake Bay Program BMP Type	BMP Name (Full)	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency*	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	Efficiency
	Filtering Practices	Flow Thru Planter Box	9/15/2011	0.056	0.056	0.09	0.94	66	60%	40%	80%	0.05	0.38	52.48	Chesapeake Bay Program
	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	10/26/2012	1.5	0.841	1.63	20.82	1,101	20%	13%	50%	0.33	2.65	550.47	VA BMP Catalog
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.1691	0.1691	0.27	2.85	198	60%	40%	80%	0.16	1.14	158.46	Chesapeake Bay Program
	Bioretention A/B soils, no underdrain	Green Roof	8/11/2011	0.15	0.15	0.24	2.53	176	85%	80%	90%	0.21	2.02	158.13	Chesapeake Bay Program
	Bioretention A/B soils, no underdrain	Green Roof	8/11/2011	0.0146	0.0146	0.02	0.25	17	85%	80%	90%	0.02	0.20	15.39	Chesapeake Bay Program
	Vegetated Open Channels C/D soils, no underdrain	Vegetated Buffer	7/8/2012	0.26	0.26	0.42	4.38	305	10%	10%	50%	0.04	0.44	152.27	Chesapeake Bay Program
D 01	Bioretention C/D soils, underdrain	Tree Box Filter	4/19/2010	0.068	0.066	0.11	1.13	78	45%	25%	55%	0.05	0.28	42.71	Chesapeake Bay Program
D 02	Bioretention C/D soils, underdrain	Tree Box Filter	4/19/2010	0.069	0.067	0.11	1.15	79	45%	25%	55%	0.05	0.29	43.36	Chesapeake Bay Program
D 03	Bioretention C/D soils, underdrain	Tree Box Filter	4/19/2010	0.052	0.046	0.08	0.84	55	45%	25%	55%	0.03	0.21	30.21	Chesapeake Bay Program
D 04	Bioretention C/D soils, underdrain	Tree Box Filter	4/19/2010	0.052	0.046	0.08	0.84	55	45%	25%	55%	0.03	0.21	30.21	Chesapeake Bay Program
	Bioretention A/B soils, no underdrain	Green Roof	1/24/2012	0.0142	0.0142	0.02	0.24	17	85%	80%	90%	0.02	0.19	14.97	Chesapeake Bay Program
	Bioretention A/B soils, no underdrain	Green Roof	1/24/2012	0.0124	0.0124	0.02	0.21	15	85%	80%	90%	0.02	0.17	13.07	Chesapeake Bay Program
	Filtering Practices	BayFilter™ Stormwater Filtration System	10/31/2011	1.73	1.34	2.33	26.52	1,638	50%	32%	80%	1.17	8.44	1310.50	VA BMP Catalog
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0166	0.0166	0.03	0.28	19	60%	40%	80%	0.02	0.11	15.56	Chesapeake Bay Program
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0166	0.0166	0.03	0.28	19	60%	40%	80%	0.02	0.11	15.56	Chesapeake Bay Program
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0166	0.0166	0.03	0.28	19	60%	40%	80%	0.02	0.11	15.56	Chesapeake Bay Program
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0166	0.0166	0.03	0.28	19	60%	40%	80%	0.02	0.11	15.56	Chesapeake Bay Program
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0166	0.0166	0.03	0.28	19	60%	40%	80%	0.02	0.11	15.56	Chesapeake Bay Program
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0166	0.0166	0.03	0.28	19	60%	40%	80%	0.02	0.11	15.56	Chesapeake Bay Program
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0166	0.0166	0.03	0.28	19	60%	40%	80%	0.02	0.11	15.56	Chesapeake Bay Program
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0135	0.0135	0.02	0.23	16	60%	40%	80%	0.01	0.09	12.65	Chesapeake Bay Program
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0135	0.0135	0.02	0.23	16	60%	40%	80%	0.01	0.09	12.65	Chesapeake Bay Program
D 01	Bioretention C/D soils, underdrain	Bioretention Filter	10/9/2009	0.8829	0.1221	0.51	9.72	277	45%	25%	55%	0.23	2.43	152.22	Chesapeake Bay Program
D 02	Bioretention A/B soils, no underdrain	Green Roof	10/9/2009	0.0784	0.0784	0.13	1.32	92	85%	80%	90%	0.11	1.06	82.65	Chesapeake Bay Program
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0316	0.0316	0.05	0.53	37	60%	40%	80%	0.03	0.21	29.61	Chesapeake Bay Program
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0316	0.0316	0.05	0.53	37	60%	40%	80%	0.03	0.21	29.61	Chesapeake Bay Program

	Chesapeake Bay Program BMP Type	BMP Name (Full)	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency*	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	Efficiency
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0316	0.0316	0.05	0.53	37	60%	40%	80%	0.03	0.21	29.61	Chesapeake Bay Program
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0316	0.0316	0.05	0.53	37	60%	40%	80%	0.03	0.21	29.61	Chesapeake Bay Program
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0316	0.0316	0.05	0.53	37	60%	40%	80%	0.03	0.21	29.61	Chesapeake Bay Program
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
D 01	Bioretention C/D soils, underdrain	Bioretention Filter	7/30/2011	0.28	0.02	0.14	2.96	69	45%	25%	55%	0.06	0.74	38.02	Chesapeake Bay Program
D 01	Infiltration Practices w/o Sand, Veg.	Infiltration System	9/7/2011	0.26	0.26	0.42	4.38	305	85%	80%	95%	0.36	3.51	289.32	Chesapeake Bay Program
D 01	Filtering Practices	Flow Thru Planter Box	7/20/2011	0.063	0.063	0.10	1.06	74	60%	40%	80%	0.06	0.42	59.03	Chesapeake Bay Program
D 01	Filtering Practices	Flow Thru Planter Box	7/20/2011	0.035	0.035	0.06	0.59	41	60%	40%	80%	0.03	0.24	32.80	Chesapeake Bay Program
	Filtering Practices	StormFilter™ Stormwater Treatment System	11/19/2013	1.91	1.54	2.65	29.69	1,869	45%	29%	80%	1.19	8.51	1495.10	VA BMP Catalog
	Bioretention C/D soils, underdrain	Tree Box Filter	11/14/2012	0.479	0.435	0.72	7.78	517	45%	25%	55%	0.33	1.94	284.49	Chesapeake Bay Program
	Bioretention C/D soils, underdrain	Tree Box Filter	11/14/2012	0.718	0.635	1.06	11.54	758	45%	25%	55%	0.48	2.89	417.11	Chesapeake Bay Program
	Bioretention C/D soils, underdrain	Bioretention Filter	4/2/2014	0.141	0.07	0.14	1.90	94	45%	25%	55%	0.06	0.47	51.96	Chesapeake Bay Program
	Bioretention C/D soils, underdrain	Bioretention Filter	4/2/2014	0.643	0.439	0.79	9.46	550	45%	25%	55%	0.36	2.36	302.54	Chesapeake Bay Program
	Bioretention C/D soils, underdrain	Bioretention Filter	4/2/2014	0.277	0.213	0.37	4.24	261	45%	25%	55%	0.17	1.06	143.41	Chesapeake Bay Program
	Bioretention C/D soils, underdrain	Bioretention Filter	4/2/2014	0.125	0.096	0.17	1.91	118	45%	25%	55%	0.08	0.48	64.65	Chesapeake Bay Program
	Filtering Practices	D.C. Sand Filter	4/2/2014	0.8275	0.82	1.33	13.90	962	60%	40%	80%	0.80	5.56	769.44	Chesapeake Bay Program
	Filtering Practices	D.C. Sand Filter	4/2/2014	0.8275	0.82	1.33	13.90	962	60%	40%	80%	0.80	5.56	769.44	Chesapeake Bay Program

	Chesapeake Bay Program BMP Type	BMP Name (Full)	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency*	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	Efficiency
	Filtering Practices	Delaware Sand Filter	4/2/2014	0.211	0.198	0.33	3.47	234	60%	40%	80%	0.20	1.39	187.37	Chesapeake Program
D 01	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	5/9/2012	0.66	0.51	0.89	10.11	624	20%	13%	50%	0.18	1.29	311.87	VA BMP Category I
	Filtering Practices	StormFilter™ Stormwater Treatment System	5/12/2014	1.868	1.548	2.64	29.32	1,869	45%	29%	80%	1.19	8.40	1495.57	VA BMP Category I
D 01	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	9/6/2012	1.34	1.14	1.93	21.23	1,370	20%	13%	50%	0.39	2.70	685.23	VA BMP Category I
D 02	Bioretention C/D soils, underdrain	Tree Box Filter	9/6/2012	0.43	0.27	0.50	6.16	344	45%	25%	55%	0.23	1.54	189.41	Chesapeake Program
D 03	Filtering Practices	D.C. Sand Filter	9/6/2012	2.34	2.19	3.61	38.43	2,592	60%	40%	80%	2.17	15.37	2073.25	Chesapeake Program
D 04	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	9/6/2012	0.014	0.014	0.02	0.24	16	20%	10%	55%	0.00	0.02	9.02	Chesapeake Program
D 05	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	9/6/2012	0.014	0.014	0.02	0.24	16	20%	10%	55%	0.00	0.02	9.02	Chesapeake Program
D 01	Bioretention C/D soils, underdrain	Bioretention Filter	8/1/2012	0.7575	0.0851	0.41	8.21	218	45%	25%	55%	0.19	2.05	119.84	Chesapeake Program
D 02	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	8/1/2012	0.69	0.35	0.71	9.32	470	20%	13%	50%	0.14	1.19	234.87	VA BMP Category I
D 03	Filtering Practices	Flow Thru Planter Box	8/1/2012	0.0448	0.0448	0.07	0.76	52	60%	40%	80%	0.04	0.30	41.98	Chesapeake Program
D 04	Filtering Practices	Flow Thru Planter Box	8/1/2012	0.0052	0.0052	0.01	0.09	6	60%	40%	80%	0.01	0.04	4.87	Chesapeake Program
GRD	Bioretention C/D soils, underdrain	Tree Box Filter	11/25/2013	0.126	0.126	0.20	2.12	148	45%	25%	55%	0.09	0.53	81.17	Chesapeake Program
	Filtering Practices	Flow Thru Planter Box	2/7/2014	0.062	0.062	0.10	1.05	73	60%	40%	80%	0.06	0.42	58.10	Chesapeake Program
	Filtering Practices	Flow Thru Planter Box	2/7/2014	0.062	0.062	0.10	1.05	73	60%	40%	80%	0.06	0.42	58.10	Chesapeake Program
	Filtering Practices	Flow Thru Planter Box	2/7/2014	0.014	0.014	0.02	0.24	16	60%	40%	80%	0.01	0.09	13.12	Chesapeake Program
	Filtering Practices	Flow Thru Planter Box	2/7/2014	0.047	0.047	0.08	0.79	55	60%	40%	80%	0.05	0.32	44.04	Chesapeake Program
	Filtering Practices	Flow Thru Planter Box	2/7/2014	0.04	0.04	0.06	0.67	47	60%	40%	80%	0.04	0.27	37.48	Chesapeake Program
	Filtering Practices	Flow Thru Planter Box	2/7/2014	0.04	0.04	0.06	0.67	47	60%	40%	80%	0.04	0.27	37.48	Chesapeake Program
	Filtering Practices	StormFilter™ Stormwater Treatment System	2/7/2014	9.195	4.667	9.42	124.28	6,263	45%	29%	80%	4.24	35.61	5010.06	VA BMP Category I
	Bioretention C/D soils, underdrain	Tree Box Filter	5/2/2012	0.25	0.25	0.41	4.22	293	45%	25%	55%	0.18	1.05	161.06	Chesapeake Program
	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	7/25/2013	2.05	1.42	2.56	30.29	1,774	20%	13%	50%	0.51	3.85	887.01	VA BMP Category I
	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	7/25/2013	0.7	0.62	1.04	11.26	740	20%	13%	50%	0.21	1.43	370.14	VA BMP Category I
	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	7/25/2013	0.25	0.22	0.37	4.01	263	20%	13%	50%	0.07	0.51	131.48	VA BMP Category I
J 01	Bioretention C/D soils, underdrain	Bioretention Filter	12/15/2012	0.31	0.31	0.50	5.23	363	45%	25%	55%	0.23	1.31	199.71	Chesapeake Program

	Chesapeake Bay Program BMP Type	BMP Name (Full)	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency*	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	Efficien Chesa Pr
J 02	Vegetated Open Channels C/D soils, no underdrain	Vegetated Buffer	12/15/2012	0.46	0.46	0.75	7.76	539	10%	10%	50%	0.07	0.78	269.40	
Totals				230.73	165.19	294.48	3,445	205,012	Totals			117.86	610.86	125,640.17	

City of Alexandria July 1, 2014 - June 30, 2018 BMPs

BMP ID	Reporting PY	Chesapeake Bay Program BMP Type	BMP Name (Full)	Efficiency Method	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]
2012-0011 01	2014/2015	Infiltration Practices w/o Sand, Veg.	Infiltration System	Chesapeake Bay Program	9/1/2015	2.84	2.25	3.89	43.88	2,739	85%	80%	95%	3.30	35.10	2602.23
2012-0011 02	2014/2015	Infiltration Practices w/o Sand, Veg.	Infiltration System	Chesapeake Bay Program	9/1/2015	0.83	0.66	1.14	12.84	803	85%	80%	95%	0.97	10.27	762.81
2012-0011 03	2014/2015	Bioretention C/D soils, underdrain	Bioretention Filter	Chesapeake Bay Program	9/1/2015	0.85	0.48	0.93	11.82	627	45%	25%	55%	0.42	2.95	345.00
2012-0011 04	2014/2015	Already included in aggregate method for determining increase in impervious areas	Cistern		9/1/2015	2.1	1.73	2.95	32.89	2,091						
2012-0011 05	2014/2015	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	VA BMP Clearinghouse - MTD	9/1/2015	2.1	1.73	2.95	32.89	2,091	20%	13%	50%	0.59	4.19	1045.71
2012-0011 06	2014/2015	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	VA BMP Clearinghouse - MTD	9/1/2015	0.38	0.32	0.54	6.00	385	20%	13%	50%	0.11	0.76	192.69
2010-0023 01	2014/2015	Filtering Practices	StormFilter™ Stormwater Treatment System	VA BMP Clearinghouse - MTD	1/2/2015	0.8539	0.8539	1.38	14.40	1,000	45%	29%	80%	0.62	4.12	800.15
2004-0005 01	2014/2015	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	VA BMP Clearinghouse - MTD	1/21/2015	2.13	0.9	1.96	27.56	1,270	20%	13%	50%	0.39	3.51	635.21
2004-0005 02	2014/2015	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	VA BMP Clearinghouse - MTD	1/21/2015	1.4	0.56	1.25	17.90	804	20%	13%	50%	0.25	2.28	401.81
2010-0028 01	2014/2015	Filtering Practices	Dry Vault Sand Filter	Chesapeake Bay Program	1/28/2015	2.23	2.2	3.58	37.39	2,582	60%	40%	80%	2.15	14.96	2065.74
2014-0101 01	2014/2015	Bioretention C/D soils, underdrain	Tree Box Filter	Chesapeake Bay Program	7/7/2014	0.17	0.11	0.20	2.46	139	45%	25%	55%	0.09	0.61	76.67
2014-0101 02	2014/2015	Bioretention C/D soils, underdrain	Tree Box Filter	Chesapeake Bay Program	7/7/2014	0.16	0.12	0.21	2.43	148	45%	25%	55%	0.09	0.61	81.17
2014-0101 03	2014/2015	Bioretention C/D soils, underdrain	Tree Box Filter	Chesapeake Bay Program	7/7/2014	0.16	0.08	0.16	2.15	108	45%	25%	55%	0.07	0.54	59.27
2014-0101 04	2014/2015	Bioretention C/D soils, underdrain	Tree Box Filter	Chesapeake Bay Program	7/7/2014	0.18	0.12	0.22	2.63	151	45%	25%	55%	0.10	0.66	83.11
2014-0101 05	2014/2015	Bioretention C/D soils, underdrain	Tree Box Filter	Chesapeake Bay Program	7/7/2014	0.19	0.11	0.21	2.66	143	45%	25%	55%	0.09	0.67	78.60
2014-0101 06	2014/2015	Bioretention C/D soils, underdrain	Tree Box Filter	Chesapeake Bay Program	7/7/2014	0.15	0.13	0.22	2.39	156	45%	25%	55%	0.10	0.60	85.68
2014-0101 07	2014/2015	Bioretention C/D soils, underdrain	Tree Box Filter	Chesapeake Bay Program	7/7/2014	0.18	0.14	0.24	2.76	171	45%	25%	55%	0.11	0.69	94.06
2012-0001 01	2014/2015	Filtering Practices	StormFilter™ Stormwater Treatment System	VA BMP Clearinghouse - MTD	9/19/2014	1.555	1.269	2.17	24.28	1,537	45%	29%	80%	0.98	6.95	1229.35
2011-0022 01	2014/2015	Filtering Practices	StormFilter™ Stormwater Treatment System	VA BMP Clearinghouse - MTD	9/19/2014	1.868	1.548	2.64	29.32	1,869	45%	29%	80%	1.19	8.40	1495.57
2003-0007 01	2014/2015	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	VA BMP Clearinghouse - MTD	2/19/2015	1.6	0.4	1.14	18.83	679	20%	13%	50%	0.23	2.40	339.74
2010-0012	2015/2016	Wet Ponds and Wetlands	Wet Pond	Chesapeake Bay Program	6/30/2015	18.84	15.1	26.00	292.25	18,344	45%	20%	60%	11.70	58.45	11006.65
2011-0030 01	2015/2016	Filtering Practices	StormFilter™ Stormwater Treatment System	VA BMP Clearinghouse - MTD	8/3/2015	3.94	3.58	5.95	63.98	4,257	45%	29%	80%	2.68	18.33	3405.29
2012-0010	2015/2016	Dry Detention Ponds & Hydrodynamic Structures	CDS® Stormwater Treatment System	VA BMP Clearinghouse - MTD	2/24/2016	1.56	1.56	2.53	26.30	1,827	20%	13%	50%	0.51	3.35	913.63
2012-0022 01	2015/2016	Filtering Practices	StormFilter™ Stormwater Treatment System	VA BMP Clearinghouse - MTD	7/27/2015	1.48	0.79	1.56	20.27	1,047	45%	29%	80%	0.70	5.81	837.32
2012-0028	2015/2016	Wet Pond	Wet Pond	Chesapeake Bay Program	6/30/2015	67.1	53.68	92.46	1040.18	65,236						
2013-0005 01	2015/2016	Filtering Practices	StormFilter™ Stormwater Treatment System	VA BMP Clearinghouse - MTD	8/3/2015	0.83	0.73	1.22	13.31	873	45%	29%	80%	0.55	3.81	698.11
2013-0010 01	2015/2016	Dry Detention Ponds & Hydrodynamic Structures	CDS® Stormwater Treatment System	VA BMP Clearinghouse - MTD	6/14/2016	0.2	0.16	0.28	3.10	194	20%	13%	50%	0.06	0.39	97.22

City of Alexandria July 1, 2014 - June 30, 2018 BMPs

BMP ID	Reporting PY	Chesapeake Bay Program BMP Type	BMP Name (Full)	Efficiency Method	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]
2011-0014 01	2016/2017	Dry Detention Ponds & Hydrodynamic Structures	StormChamber Stormwater Treatment System	VA BMP Clearinghouse - MTD	8/8/2016											
2011-0014 02	2016/2017	Filtering Practices	Flow Thru Planter Box	Chesapeake Bay Program	8/8/2016	0.0091	0.0091	0.01	0.15	11	60%	40%	80%	0.01	0.06	8.53
2011-0014 03	2016/2017	Filtering Practices	Flow Thru Planter Box	Chesapeake Bay Program	8/8/2016	0.0091	0.0091	0.01	0.15	11	60%	40%	80%	0.01	0.06	8.53
2011-0014 04	2016/2017	Filtering Practices	Flow Thru Planter Box	Chesapeake Bay Program	8/8/2016	0.0091	0.0091	0.01	0.15	11	60%	40%	80%	0.01	0.06	8.53
2011-0014 05	2016/2017	Filtering Practices	Flow Thru Planter Box	Chesapeake Bay Program	8/8/2016	0.0091	0.0091	0.01	0.15	11	60%	40%	80%	0.01	0.06	8.53
2011-0014 06	2016/2017	Filtering Practices	Flow Thru Planter Box	Chesapeake Bay Program	8/8/2016	0.0091	0.0091	0.01	0.15	11	60%	40%	80%	0.01	0.06	8.53
2011-0014 07	2016/2017	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	Chesapeake Bay Program	8/8/2016	0.012	0.012	0.02	0.20	14	20%	10%	55%	0.00	0.02	7.73
2011-0014 08	2016/2017	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	Chesapeake Bay Program	8/8/2016	0.01	0.01	0.02	0.17	12	20%	10%	55%	0.00	0.02	6.44
2011-0028 01	2016/2017	Filtering Practices	StormFilter™ Stormwater Treatment System	VA BMP Clearinghouse - MTD	10/24/2016	0.55	0.44	0.76	8.53	535	45%	29%	80%	0.34	2.44	427.78
2012-0030 01	2016/2017	Dry Detention Ponds & Hydrodynamic Structures	CDS® Stormwater Treatment System	VA BMP Clearinghouse - MTD	11/8/2016	0.56	0.5	0.83	9.03	596	20%	13%	50%	0.17	1.15	298.10
2013-0019 02	2016/2017	Filtering Practices	StormFilter™ Stormwater Treatment System	VA BMP Clearinghouse - MTD	10/20/2016	1.09	0.58	1.15	14.91	769	45%	29%	80%	0.52	4.27	615.22
2016-0102 01 DPI	2016/2017	Bioretention C/D soils, underdrain	Bioretention Filter	Chesapeake Bay Program	12/2/2016	0.63	0.46	0.81	9.47	569	45%	25%	55%	0.37	2.37	312.78
2016-0103 01 DPI	2016/2017	Stream Restoration Urban	Stream Restoration FP Reconnection	NA	7/2/2016											
2017-0101 01 DPI	2016/2017	Bioretention C/D soils, underdrain	Bioretention Filter	Chesapeake Bay Program	4/18/2017	0.5	0.1	0.33	5.71	187	45%	25%	55%	0.15	1.43	103.10
2017-0102 01 DPI	2016/2017	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	Chesapeake Bay Program	8/12/2016	0.05	0.05	0.08	0.84	59	20%	10%	55%	0.02	0.08	32.21
2014-0004 02	2017/2018		CDS® Stormwater Treatment System	VA BMP Clearinghouse - MTD	4/20/2018	2.08	1.78	3.01	33.03	2,138	20%	13%	50%	0.60	4.20	1068.84
2014-0011 01	2017/2018		Bioretention 2	VA BMP Clearinghouse	3/7/2018	0.11	0.06	0.12	1.52	79	90%	90%	0%	0.11	1.36	0.00
2014-0011 02	2017/2018		Bioretention 2	VA BMP Clearinghouse	3/7/2018	0.44	0.10	0.30	5.11	177	90%	90%	0%	0.27	4.60	0.00
2014-0011 03	2017/2018		Bioretention 1	VA BMP Clearinghouse	3/7/2018	0.04	0.04	0.07	0.71	49	55%	64%	0%	0.04	0.45	0.00
2014-0011 04	2017/2018		Bioretention 1	VA BMP Clearinghouse	3/7/2018	0.04	0.04	0.07	0.71	49	55%	64%	0%	0.04	0.45	0.00
2014-0011 05	2017/2018		Bioretention 1	VA BMP Clearinghouse	3/7/2018	0.04	0.04	0.07	0.71	49	55%	64%	0%	0.04	0.45	0.00
2014-0011 06	2017/2018		Bioretention 1	VA BMP Clearinghouse	3/7/2018	0.04	0.04	0.07	0.71	49	55%	64%	0%	0.04	0.45	0.00
2014-0011 07	2017/2018		Bioretention 1	VA BMP Clearinghouse	3/7/2018	0.04	0.04	0.07	0.71	49	55%	64%	0%	0.04	0.45	0.00
2014-0011 08	2017/2018		Bioretention 1	VA BMP Clearinghouse	3/7/2018	0.04	0.04	0.07	0.71	49	55%	64%	0%	0.04	0.45	0.00
2014-0011 09	2017/2018		Bioretention 1	VA BMP Clearinghouse	3/7/2018	0.04	0.04	0.07	0.71	49	55%	64%	0%	0.04	0.45	0.00
2014-0011 10	2017/2018		Bioretention 1	VA BMP Clearinghouse	3/7/2018	0.04	0.04	0.07	0.71	49	55%	64%	0%	0.04	0.45	0.00

City of Alexandria July 1, 2014 - June 30, 2018 BMPs

BMP ID	Reporting PY	Chesapeake Bay Program BMP Type	BMP Name (Full)	Efficiency Method	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]
2014-0011 11	2017/2018		Bioretention 1	VA BMP Clearinghouse	3/7/2018	0.04	0.04	0.07	0.71	49	55%	64%	0%	0.04	0.45	0.00
2014-0011 12	2017/2018		Permeable Pavement 1	VA BMP Clearinghouse	3/7/2018	0.01	0.01	0.02	0.17	12	59%	59%	0%	0.01	0.10	0.00
2014-0011 13	2017/2018		Permeable Pavement 1	VA BMP Clearinghouse	3/7/2018	0.01	0.01	0.02	0.17	12	59%	59%	0%	0.01	0.10	0.00
2014-0011 14	2017/2018		Permeable Pavement 1	VA BMP Clearinghouse	3/7/2018	0.01	0.01	0.02	0.17	12	59%	59%	0%	0.01	0.10	0.00
2014-0011 15	2017/2018		Permeable Pavement 1	VA BMP Clearinghouse	3/7/2018	0.05	0.05	0.07	0.76	53	59%	59%	0%	0.04	0.45	0.00
2014-0011 16	2017/2018		Permeable Pavement 1	VA BMP Clearinghouse	3/7/2018	0.05	0.05	0.07	0.76	53	59%	59%	0%	0.04	0.45	0.00
2014-0011 17	2017/2018		Permeable Pavement 1	VA BMP Clearinghouse	3/7/2018	0.05	0.05	0.08	0.84	59	59%	59%	0%	0.05	0.50	0.00
2014-0011 18	2017/2018		Permeable Pavement 1	VA BMP Clearinghouse	3/7/2018	0.05	0.05	0.08	0.84	59	59%	59%	0%	0.05	0.50	0.00
2014-0011 19	2017/2018		Permeable Pavement 1	VA BMP Clearinghouse	3/7/2018	0.05	0.05	0.08	0.84	59	59%	59%	0%	0.05	0.50	0.00
2014-0011 20	2017/2018		Bioretention 1	VA BMP Clearinghouse	3/7/2018	0.04	0.04	0.07	0.71	49	55%	64%	0%	0.04	0.45	0.00
2014-0011 21	2017/2018		Bioretention 1	VA BMP Clearinghouse	3/7/2018	0.04	0.04	0.07	0.71	49	55%	64%	0%	0.04	0.45	0.00
2014-0011 22	2017/2018		Bioretention 1	VA BMP Clearinghouse	3/7/2018	0.04	0.04	0.07	0.71	49	55%	64%	0%	0.04	0.45	0.00
2014-0026 02	2017/2018		Urban Bioretention	VA BMP Clearinghouse	5/11/2018	0.08	0.08	0.13	1.35	94	55%	64%	0%	0.07	0.86	0.00
2014-0046 01	2017/2018		Bioretention 2	VA BMP Clearinghouse	1/24/2018	0.27	0.22	0.38	4.21	266	90%	90%	0%	0.34	3.79	0.00
2014-0046 02	2017/2018		Bioretention 2	VA BMP Clearinghouse	1/24/2018	0.35	0.30	0.51	5.56	360	90%	90%	0%	0.46	5.01	0.00
2014-0046 03	2017/2018		JellyFish Filter	VA BMP Clearinghouse - MTD	1/24/2018	0.22	0.19	0.32	3.51	228	50%	32%	0%	0.16	1.12	0.00
2014-0046 04	2017/2018		JellyFish Filter	VA BMP Clearinghouse - MTD	1/24/2018	0.43	0.43	0.70	7.25	504	50%	32%	0%	0.35	2.31	0.00
2015-0002 02	2017/2018		CDS® Stormwater Treatment System	VA BMP Clearinghouse - MTD	5/10/2018	1.29	1.10	1.86	20.46	1,322	20%	13%	50%	0.37	2.60	660.93
2015-0005 02	2017/2018		JellyFish Filter	VA BMP Clearinghouse - MTD	9/18/2017	0.42	0.42	0.68	7.08	492	50%	32%	0%	0.34	2.25	0.00
2015-0020 01	2017/2018		StormFilter™ Stormwater Treatment System, Phosphosorb	VA BMP Clearinghouse - MTD	9/25/2017	2.34	1.85	3.20	36.13	2,253	50%	32%	0%	1.60	11.50	0.00
2015-0020 02	2017/2018		Urban Bioretention	VA BMP Clearinghouse	9/25/2017	0.41	0.30	0.53	6.17	371	55%	64%	0%	0.29	3.95	0.00
2016-0023 01	2017/2018		BayFilter™ Stormwater Filtration System	VA BMP Clearinghouse - MTD	10/17/2017	1.74	1.67	2.73	28.86	1,968	50%	32%	80%	1.37	9.19	1574.73
2018-0101 01 DPI	2017/2018	Already broken out an included in Phase 1 BMPs	Urban Shoreline Vegetated	Chesapeake Bay Program	6/30/2018											
Totals						130.28	102.78	177.78	2,009.80	125,224.88				36.68	263.36	34,583.31

Appendix D

DEQ Correspondence and Action Plan Approval

DEQ Additional Data Request 11/30/2015

City Response to Additional Data Request 12/14/2015

DEQ Provisionally Approval Letter and Data Request 12/29/2015

City Response to Provisionally Approved Letter 1/7/2016

DEQ Action Plan Approval Letter 1/12/2016

City Response to Approval Letter 2/11/2016

From: Brooks, Kelsey (DEQ) <Kelsey.Brooks@deq.virginia.gov>
Sent: Monday, November 30, 2015 11:43 AM
To: Jesse Maines
Subject: VAR040057 Chesapeake Bay TMDL Action Plan - Additional Info Required

Follow Up Flag: Flag for follow up
Flag Status: Flagged

Hello Jesse,

The Chesapeake Bay TMDL Action Plan for the City of Alexandria is currently under review. However, the following supplemental and/or clarifying information is necessary before the review of the Action Plan can be completed:

1. **Current Program and Legal Authority** – Please provide an affirmative statement that the permittee has sufficient legal authorities in place to meet the requirements of the TMDL.
2. **Service Area Delineation** – Please provide additional information on the method the permittee used to verify the forested acres that were excluded from the service area are greater than or equal to 900m² contiguous and are otherwise undeveloped.
3. **Gordon Recycling Limited Liability Corporation** – Our records indicate this facility is no longer active. The permittee should not exclude the lands draining from this site from its service area. Please revise the loading calculations appropriately.
4. **Historical BMPs** – Please provide the list of Historical BMPs that are being submitted for credit towards the TMDL. The list should include the following for each BMP:
 1. The date the BMP was installed
 2. The BMP type
 3. The method that was used to determine the BMP efficiency for each POC
 4. The BMP efficiency for each POC
 5. The reductions for each POC
5. **Lake Cook** – Please clarify if the lake is being expanded – it is unclear from the information provided how the lake is treating 15 acres in its present condition, but will treat 390 acres once it is upgraded.
6. **Eisenhower Pond 19** – The method the permittee used to determine the efficiencies used to determine the reductions for this pond is unclear from the information provided. Please provide the following information:
 1. The project's required reductions (total acres, percent impervious)
 2. The pond's total reductions
 3. The RD value that was used to determine the BMP's efficiencies
 4. The date the BMP was implemented.

In addition the TSS value provided in the description does not appear to match the value for TSS provided in Table 15. Please verify which value is correct.

7. **Cameron Station Pond** – Similarly to the Lake Cook project it is unclear to the Department why the pond is treating 94 acres prior to the ponds upgrade and 248.1 acres after the ponds upgrade if the facility's footprint is not increasing. Please provide additional information concerning the change in the pond's drainage area.
8. **Section 8.5** – Please provide the following information for each BMP summarized in Table 12:
 1. The date the BMP was installed
 2. The BMP type

3. The BMP efficiency for each POC

Please note the values in Table 12 do not appear to match the values in Table 15. Please verify which of the reported values are correct.

9. **Four Mile Run Stream Restoration** – Please note that it is not appropriate to apply the stream restoration protocols to streams that are tidally influenced. Based on the information provided in this section, it does not appear that the application of Protocol 3 is appropriate.
10. **Aggregate Method Applications** – Please note that the calculations the permittee provided in Table 7 do not appear to match the method provided in Guidance Memo 15-2005. The permittee should also take in to account the change in pervious acres when applying the aggregate accounting method. Please revise the provided calculations.
11. **Grandfathered Projects** – Please provide the list of grandfathered projects summarized in Table 8. Also, please provide the same information as requested in comment 3 for the BMPs that were included in Table 8.
12. **Public Comment Period** – This process should have been completed prior to the Action Plan submittal. If the permittee has posted the plan and solicited comments, please let us know. If not, this process should be undertaken as soon as possible.

Please provide the above information no later than **December 14, 2015**. If there is information in the Action Plan that explains these issues that has been overlooked, please let me know.

If you have any questions, please contact me at **804-698-4321** or kelsey.brooks@deq.virginia.gov.

Thank you,
Kelsey Brooks

MS4 Stormwater Specialist
Department of Environmental Quality
629 E Main St, Richmond, VA 23219
P: (804) 698-4321
E: kelsey.brooks@deq.virginia.gov



**DEPARTMENT OF TRANSPORTATION
AND ENVIRONMENTAL SERVICES**

**P.O. Box 178 - City Hall
Alexandria, Virginia 22313
703-746-4025
www.alexandriava.gov**

December 14, 2015

Via Email: kelsey.brooks@deq.virginia.gov

Kelsey Brooks
MS4 Stormwater Specialist
Department of Environmental Quality
629 E Main St, Richmond, VA 23219

RE: City of Alexandria Response to DEQ Additional Information Request: MS4 VAR040057
Chesapeake Bay TMDL 5% Action Plan

Ms. Brooks:

The City received the electronic correspondence entitled "VAR040057 Chesapeake Bay TMDL Action Plan – Additional Info Request" on November 30, 2015 in response to the City's June 30, 2015 "Chesapeake Bay TMDL Action Plan for 5% Compliance" submitted to the Virginia Department of Environmental Quality (DEQ) on October 1, 2015 in compliance with the MS4 permit. The responses below are provided to address the additional information and/or clarifications requested to aid in review of the submitted action plan and will be considered as an addendum to the action plan.

Your request is provided in italics below in its entirety, along with the City's responses in non-italics.

Hi Jesse,

The Chesapeake Bay TMDL Action Plan for the City of Alexandria is currently under review. However, the following supplemental and/or clarifying information is necessary before the review of the Action Plan can be completed:

1. ***Current Program and Legal Authority*** – Please provide an affirmative statement that the permittee has sufficient legal authorities in place to meet the requirements of the TMDL.

Response: Please note that Section 2 of the action plan contains detailed information illustrating the City's ability to meet the requirements of the TMDL. The City affirms that it has sufficient legal authorities in place to meet the requirements of the TMDL.

2. ***Service Area Delineation*** – Please provide additional information on the method the permittee used to verify the forested acres that were excluded from the service area are greater than or equal to 900m² contiguous and are otherwise undeveloped.

Response: The City took a conservative approach to forested acres in delineating the MS4 service area. Forested areas located in Resource Protection Areas that are undeveloped and/or greater than 900 square meters were excluded. Forested areas draining to a regulated outfall that are not associated with an undeveloped RPA were considered as pervious, regardless of size.

3. ***Gordon Recycling Limited Liability Corporation*** – *Our records indicate this facility is no longer active. The permittee should not exclude the lands draining from this site from its service area. Please revise the loading calculations appropriately.*

Response: This property was previously not included in the service area and loading calculations due to the active VPDES permit and that the property does not drain to the delineated service area. In the absence of an active permit, the property continues to be excluded from the service area and loading calculations since it is not within the delineated service area.

4. **Historical BMPs** – Please provide the list of Historical BMPs that are being submitted for credit towards the TMDL. The list should include the following for each BMP:
1. The date the BMP was installed
 2. The BMP type
 3. The method that was used to determine the BMP efficiency for each POC
 4. The BMP efficiency for each POC
 5. The reductions for each POC

Response: Historical BMP data was included in Appendix B of the Chesapeake Bay TMDL Action Plan dated June 30, 2015 that included #2 (VA Clearinghouse name), #4 (TP only) and #5 above. The table did not contain the date installed since it was given that the BMPs presented were indeed installed between January 1, 2006 and June 30, 2009. The table has been revised to include the requested information. 2006 – 2009 BMPs are presented here in Attachment 1A, and 2009 – 2014 BMP credits (see below for offsets) are presented in Attachment 1B

5. ***Lake Cook*** – *Please clarify if the lake is being expanded – it is unclear from the information provided how the lake is treating 15 acres in its present condition, but will treat 390 acres once it is upgraded.*

Response: Lake Cook is a fishing pond created prior to 1992 that was not built for water quality and quantity purposes and does not conform to any standard. As such, the pond provides no water quality benefit. The 15 acres assigned to the pond is associated with a water park that was constructed on City property. The Lake Cook Retrofit Project was awarded a Stormwater Local Assistance Fund (SLAF) grant in FY2014, and includes the installation of a sediment forebay, aquatic bench and capture volume to treat approximately 390 acres to the 1” water quality standard.

6. ***Eisenhower Pond 19*** – *The method the permittee used to determine the efficiencies used to determine the reductions for this pond is unclear from the information provided. Please provide the following information:*
1. *The project’s required reductions (total acres, percent impervious)*
 2. *The pond’s total reductions*
 3. *The RD value that was used to determine the BMP’s efficiencies*
 4. *The date the BMP was implemented.*

In addition the TSS value provided in the description does not appear to match the value for TSS provided in Table 15. Please verify which value is correct.

Response: This regional wet pond implemented in “Eisenhower Block 19” treats additional acreage than required to meet the project’s water quality requirements. The project is currently under construction (Site Plan DSP2012-00028) by a private developer and slated for completion Spring 2016, so the date of installation requested per #4 is not yet applicable. City staff negotiated with the developer to provide reductions beyond those required for the development project. The following provides project information:

- The RD value is 0.40” based on $RD = (1.81 \text{ ac-ft.})(12) / 53.68 \text{ Ia}$, using the Bay Curves for a Stormwater Treatment (ST) practice since this is a wet pond.
- Bay Curve efficiencies: TP = 38%, TN = 22.5%, TSS = 45%
- Pond drains a total of 67.1 acres (53.68 impervious acres)
- Project considered new development with 0% impervious existing and about 50% proposed. (see lines #3 and #4 below)
- Reductions required to meet the 16% land cover condition was calculated by subtracting #5 from #3.
- Total reductions in #2 minus the required reductions for the project #6 (old technical criteria requirements and offset to 16%) equals the additional credits in #7 beyond those required by the development and credited towards Bay TMDL reductions.

The following table provides the requested information summarized for Pond 19.

		Total Area (ac)	Ia (ac)	TP (lbs/yr)	TN (lbs/yr)	TSS (lbs/yr)
1.	Total Drainage Area	67.1	53.68	117.80	812.83	55272.12
2.	Total Reductions Provided (TP=38%, TN=22.5%, TSS=45%)			44.8	182.9	24,872.5
3.	Development Site Post Conditions	2.88	1.45	3.30	22.80	1550.11
4.	Existing Site Conditions	2.88	0	0.33	2.27	154.05
5.	16% Land Cover Condition	2.88	0.46	1.27	8.78	596.94
6.	Total Required Reductions to Meet 16% Land cover			2.03	14.02	953.17
7.	Additional Credits Reductions (#2 - #6)			42.7	168.9	23,919.3

7. **Cameron Station Pond** – Similarly to the Lake Cook project it is unclear to the Department why the pond is treating 94 acres prior to the ponds upgrade and 248.1 acres after the ponds upgrade if the facility’s footprint is not increasing. Please provide additional information concerning the change in the pond’s drainage area.

Response: The Cameron Station Pond was originally designed in the 1990's as a Level 1 pond to the ½" standard for the Cameron Station project, which drained approximately 100 acres from the project and an additional 119.4 acres draining to the pond, equaling a total of 219.4 acres draining to the pond in this configuration. The proposed retrofit will enhance the pond to a Level 2 design standard, which will include increasing the size of the forebay, create two cells, and enhance the aquatic bench. Additionally, the project includes diverting an additional 33ac to the pond for treatment.

As stated in the action plan, this project will not likely be constructed before June 30, 2018 and were not included in summarized strategies to comply with the 5% target reductions of the current MS4 permit cycle. The information in the action plan was based on an outdated approach. The table below presents current information on this retrofit.

Cameron Pond Specification (Note: Proposed conditions includes 33- acres of offsite area to be treated)	TP (lbs/yr)	TN (lbs/yr)	TSS (lbs/yr)
Existing Level I Wet Pond, collects 137.3 acres impervious and 82.1 acres turf (total 219 acres)	169	727	79,294.8
Proposed Level II Wet Pond, which will collect 160.9 acres impervious and 91.9 acres turf (total 252.8 acres)	296	1,129	138,833.2
Water Quality Treatment Achieved through this Retrofit (Proposed minus Existing Conditions)	127	402	59,588.4

8. **Section 8.5** – Please provide the following information for each BMP summarized in Table 12:
1. The date the BMP was installed
 2. The BMP type
 3. The BMP efficiency for each POC

Please note the values in Table 12 do not appear to match the values in Table 15. Please verify which of the reported values are correct.

Response: The Table in question is related to the Retrofits on City Property that have already been implemented towards the target reductions. The requested information is included in Attachment 2. The revised Table 15 is provided below.

9. **Four Mile Run Stream Restoration** – Please note that it is not appropriate to apply the stream restoration protocols to streams that are tidally influenced. Based on the information provided in this section, it does not appear that the application of Protocol 3 is appropriate.

Response: The Four Mile Run Stream Restoration is a floodplain reconnection project that closely aligns with the goals of the Expert Panel's protocol 3 for floodplain reconnection. This project meets all of the basic qualifying criteria and protocol-specific criteria set forth in the Expert Panel report. The tidal limit for Four Mile Run is approximately at the Mount Vernon Bridge, which is only about 500 feet upstream of this project. Because the primary goal of the project was floodplain reconnection and the project meets all of the basic and protocol specific qualifying conditions, we believe that protocol 3 does apply to this stream restoration project.

10. **Aggregate Method Applications** – Please note that the calculations the permittee provided in Table 7 do not appear to match the method provided in Guidance Memo 15-2005. The permittee should also take in to account the change in pervious acres when applying the aggregate accounting method. Please revise the provided calculations.

Response: The revised information is provided in Attachment 3.

11. **Grandfathered Projects** – Please provide the list of grandfathered projects summarized in Table 8. Also, please provide the same information as requested in comment 3 for the BMPs that were included in Table 8.

Response: The list of Grandfathered BMP Credits is proved in Attachment 4A and Grandfather Project Offsets is provided in Attachment 4B.

12. **Public Comment Period** – This process should have been completed prior to the Action Plan submittal. If the permittee has posted the plan and solicited comments, please let us know. If not, this process should be undertaken as soon as possible.

Response: The City provided for a public comment period on the draft Action Plan prior to finalizing on June 30, 2015. The below provides additional information on the process:

- A public notice was placed in the Alexandria Times/Gazette inviting the public to learn about and comment on the draft by attending the May 18, 2015 Environmental Policy Commission (EPC) Public Meeting.
- A presentation based on this draft will be provided during the May 18, 2015 EPC Public Meeting, inviting the EPC and members of the community to comment on the draft.
- Solicitation of public comment by posting the draft action plan on the City website with contact information for receipt of comment.
- Solicitation of public comment through posting in the June 5, 2015 City Manager's Report on the City's website online.
- Public comment period was picked up by AlexandriaNews.org (a very well-read online news source) and circulated on June 5, 2015 email alert and online posting.
- Finally, the Final action plan was placed on the City Council docket for September 8, 2015; where the recommendation to submit the June 30, 2015 action plan to DEQ was passed by consensus.

Please provide the above information no later than **December 14, 2015**. If there is information in the Action Plan that explains these issues that has been overlooked, please let me know.

Thanks for this opportunity to provide clarifying information for the action plan to facilitate your review. As presented in the action plan and here in this response to your request, the 5% goal of the action plan – including 2009-2014 offsets and grandfathered projects – is nearly achieved through credits from Post-2009 BMPs from redevelopment. Factoring in the reductions for 2006-2009 Historical BMPs exceeds the requirement by nearly 200%. Based on the above clarifications, the following table (revised from Table 15 in the action plan) summarizes the City's requirements and reductions:

Reduction Strategies	N (lbs)	100% Goal ²	P (lbs)	100% Goal ²	TSS (lbs/yr)	100% Goal ²
2006-2009 BMPs	1305.10	17.2	158.00	15.48	150,452.00	8.69
Post-2009 BMPs	110.24	1.5	14.88	4.44	17,051.59	4.59
Regional Facilities – Lake Cook	1586.97	20.9	163.25	15.79	131,334.00	15.2
Regional Facilities – Pond 19	168.90	2.2	42.70	1.52	23,919.30	1.35
Retrofits on City Property	17.57	0.2	2.67	1.48	2,804.69	0.12
Urban Stream Restoration – Four Mile Run	194.80	2.6	40.00	3.87	14,914.00	1.73
Total Proposed Reductions	3364.54	44.5	280.10	42.58	273,612.33	31.68
<i>Total Required Reductions (3 permit cycles)</i>	<i>7,597.00</i>	<i>100%</i>	<i>1,004.40</i>	<i>100%</i>	<i>861,936.64</i>	<i>100%</i>

1. Assumes all grandfathered projects to be offset this permit cycle.

2. 100% goal is based on L2 scoping.

Please note that the City will provide annual compliance reporting on the implementation of strategies to meet the City's Bay TMDL targets per the requirements of the MS4 general permit and DEQ's Guidance. Please feel free to contact me at jesse.maines@alexandriava.gov or 703-746-4643 should you have any additional questions.

Sincerely,



Jesse E. Maines, MPA, CPESC
Watershed Management Planner
Transportation and Environmental Services
Stormwater & Sanitary Infrastructure Division

Cc: William J. Skrabak, Deputy Director, T&ES Infrastructure and Environment
Lalit K. Sharma, PE, Division Chief, T&ES, Stormwater & Sanitary Infrastructure Division
Brian Rahal, PE, T&ES, S&SI, Stormwater Section Lead

Attachments: Attachment 1A – 2006-2009 Historical BMPs
Attachment 1B – 2009-2014 BMP credits
Attachment 2 – City Property Retrofits
Attachment 3 – Aggregate Accounting 2009-2014 Offsets
Attachment 4A – Grandfathered BMP Credits
Attachment 4B – Grandfathered Required Offsets

BMP ID	BMP Type	Chesapeake Bay Program BMP Type	BMP Name (Full)	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency*	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	Efficiency Method
1995-0019 01	D.C. Sand Filter	Filtering Practices	D.C. Sand Filter	4/13/2006	1.65	0.95	1.83	23.07	1,236	60%	40%	80%	1.10	9.23	988.65	Chesapeake Bay Program
1995-0019 02	D.C. Sand Filter	Filtering Practices	D.C. Sand Filter	4/13/2006	1.05	0.86	1.47	16.41	1,041	60%	40%	80%	0.88	6.57	832.59	Chesapeake Bay Program
1998-0015 01	Stormceptor® Stormwater Treatment System	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	1/3/2007	5.40	0.93	3.34	60.69	1,875	20%	13%	50%	0.67	7.72	937.58	VA BMP Clearinghouse-MTD
1998-0015 02	Vegetated Buffer	Vegetated Open Channels C/D soils, no underdrain	Vegetated Buffer	1/3/2007	0.95	0.05	0.45	9.91	217	10%	10%	50%	0.05	0.99	108.39	Chesapeake Bay Program
2000-0009 01	Bioretention Filter	Bioretention C/D soils, underdrain	Bioretention Filter	1/17/2007	2.11	1.69	2.91	32.71	2,051	45%	25%	55%	1.31	8.18	1128.26	Chesapeake Bay Program
2001-0003 01	Alexandria Compound Sand Filter	Filtering Practices	Alexandria Compound Sand Filter	7/11/2008	1.15	1.15	1.86	19.39	1,347	60%	40%	80%	1.12	7.76	1077.61	Chesapeake Bay Program
2001-0003 02	Alexandria Compound Sand Filter	Filtering Practices	Alexandria Compound Sand Filter	7/11/2008	1.20	1.20	1.94	20.23	1,406	60%	40%	80%	1.17	8.09	1124.47	Chesapeake Bay Program
2001-0014 01	StormFilter™ Stormwater Treatment System	Filtering Practices	StormFilter™ Stormwater Treatment System	5/22/2008	1.00	1.00	1.62	16.86	1,171	45%	29%	80%	0.73	4.83	937.06	VA BMP Clearinghouse-MTD
2001-0014 03	StormFilter™ Stormwater Treatment System	Filtering Practices	StormFilter™ Stormwater Treatment System	5/4/2007	1.11	0.78	1.40	16.49	970	45%	29%	80%	0.63	4.72	776.14	VA BMP Clearinghouse-MTD
2001-0014-A 01	Regional Wet Pond	Wet Ponds and Wetlands	Regional Wet Pond	5/28/2008	225.00	133.00	253.18	3168.82	171,959	45%	30%	60%	113.93	946.73	102758.87	Retrofit Curves
2002-0001 01	Stormceptor® Stormwater Treatment System	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	8/19/2008	1.05	0.83	1.43	16.21	1,011	20%	13%	50%	0.29	2.06	505.44	VA BMP Clearinghouse-MTD
2002-0022 01	StormFilter™ Stormwater Treatment System	Filtering Practices	StormFilter™ Stormwater Treatment System	6/27/2007	2.02	1.37	2.49	29.64	1,719	45%	29%	80%	1.12	8.49	1375.18	VA BMP Clearinghouse-MTD
2002-0048 01	Aqua-Swirl® Stormwater Hydrodynamic Separator	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	1/5/2009	1.06	0.42	0.94	13.49	599	20%	13%	50%	0.19	1.72	299.74	VA BMP Clearinghouse-MTD
2002-0048 02	Aqua-Swirl® Stormwater Hydrodynamic Separator	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	1/5/2009	1.24	0.67	1.31	17.00	880	20%	13%	50%	0.26	2.16	440.01	VA BMP Clearinghouse-MTD
2003-0010 01	Alexandria Compound Sand Filter	Filtering Practices	Alexandria Compound Sand Filter	3/4/2008	0.96	0.96	1.56	16.20	1,126	60%	40%	80%	0.93	6.48	900.51	Chesapeake Bay Program
2003-0016 01	StormFilter™ Stormwater Treatment System	Filtering Practices	StormFilter™ Stormwater Treatment System	9/19/2008	0.28	0.19	0.34	4.11	238	45%	29%	80%	0.16	1.18	190.70	VA BMP Clearinghouse-MTD
2003-0016 02	Green Roof	NOT APPLICABLE	Green Roof	9/25/2008	0.07	0.07	0.11	1.10	76	53%	45%	56%	0.06	0.49	42.64	Retrofit Curves
2003-0035 01	StormFilter™ Stormwater Treatment System	Filtering Practices	StormFilter™ Stormwater Treatment System	9/8/2006	1.56	0.99	1.84	22.43	1,260	45%	29%	80%	0.83	6.43	1007.85	VA BMP Clearinghouse-MTD
2003-0039 01	Dry Vault Sand Filter	Filtering Practices	Dry Vault Sand Filter	3/6/2006	0.81	0.81	1.31	13.66	949	60%	40%	80%	0.79	5.46	759.02	Chesapeake Bay Program
2003-0041 01	Alexandria Compound Sand Filter	Filtering Practices	Alexandria Compound Sand Filter	10/16/2006	1.32	1.22	2.01	21.55	1,443	60%	40%	80%	1.21	8.62	1154.09	Chesapeake Bay Program
2003-0042 01	Aqua-Swirl® Stormwater Hydrodynamic Separator	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	5/8/2009	1.20	0.12	0.64	12.90	330	20%	13%	50%	0.13	1.64	165.21	VA BMP Clearinghouse-MTD
2003-0042 02	Aqua-Swirl® Stormwater Hydrodynamic Separator	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	5/8/2009	0.13	0.13	0.21	2.19	152	20%	13%	50%	0.04	0.28	76.14	VA BMP Clearinghouse-MTD
2004-0014 01	StormFilter™ Stormwater Treatment System	Filtering Practices	StormFilter™ Stormwater Treatment System	9/12/2006	0.15	0.10	0.19	2.22	130	45%	29%	80%	0.08	0.64	103.92	VA BMP Clearinghouse-MTD
2004-0014 02	StormFilter™ Stormwater Treatment System	Filtering Practices	StormFilter™ Stormwater Treatment System	9/12/2006	0.28	0.16	0.31	3.90	208	45%	29%	80%	0.14	1.12	166.01	VA BMP Clearinghouse-MTD
2004-0019 01	D.C. Sand Filter	Filtering Practices	D.C. Sand Filter	8/9/2006	0.38	0.38	0.62	6.41	445	60%	40%	80%	0.37	2.56	356.08	Chesapeake Bay Program
2004-0020 01	Delaware Sand Filter	Filtering Practices	Delaware Sand Filter	1/16/2006	0.35	0.28	0.48	5.43	340	60%	40%	80%	0.29	2.17	272.22	Chesapeake Bay Program
2004-0021 01	Delaware Sand Filter	Filtering Practices	Delaware Sand Filter	1/16/2006	0.57	0.45	0.78	8.80	548	60%	40%	80%	0.47	3.52	438.55	Chesapeake Bay Program
2004-0022 01	D.C. Sand Filter	Filtering Practices	D.C. Sand Filter	1/16/2006	0.75	0.62	1.06	11.76	749	60%	40%	80%	0.63	4.70	599.26	Chesapeake Bay Program
2004-0025 01	D.C. Sand Filter	Filtering Practices	D.C. Sand Filter	4/13/2007	1.40	1.05	1.84	21.23	1,291	60%	40%	80%	1.11	8.49	1033.13	Chesapeake Bay Program
2004-0025 02	CDS® Stormwater Treatment System	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	4/13/2007	7.83	7.57	12.37	130.25	8,913	20%	13%	50%	2.47	16.57	4456.30	VA BMP Clearinghouse-MTD

BMP ID	BMP Type	Chesapeake Bay Program BMP Type	BMP Name (Full)	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency*	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	Efficiency Method
2004-0025 03	CDS® Stormwater Treatment System	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	4/13/2007	1.77	1.29	2.29	26.58	1,595	20%	13%	50%	0.46	3.38	797.69	VA BMP Clearinghouse-MTD
2004-0041 01	Aqua-Swirl® Stormwater Hydrodynamic Separator	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	8/8/2006	1.73	1.59	2.63	28.15	1,882	20%	13%	50%	0.53	3.58	941.16	VA BMP Clearinghouse-MTD
2005-0005 01	D.C. Sand Filter	Filtering Practices	D.C. Sand Filter	1/21/2008	2.99	2.82	4.64	49.26	3,333	60%	40%	80%	2.78	19.70	2666.41	Chesapeake Bay Program
2005-0011 01	StormFilter™ Stormwater Treatment System	Filtering Practices	StormFilter™ Stormwater Treatment System	10/10/2008	0.25	0.18	0.32	3.76	226	45%	29%	80%	0.15	1.08	180.90	VA BMP Clearinghouse-MTD
2005-0011 02	StormFilter™ Stormwater Treatment System	Filtering Practices	StormFilter™ Stormwater Treatment System	10/10/2008	0.44	0.42	0.69	7.29	497	45%	29%	80%	0.31	2.09	397.83	VA BMP Clearinghouse-MTD
2005-0015 01	Alexandria Compound Sand Filter	Filtering Practices	Alexandria Compound Sand Filter	2/23/2009	0.48	0.45	0.73	7.82	528	60%	40%	80%	0.44	3.13	422.15	Chesapeake Bay Program
2005-0019 PLT 01	Vegetated Filter Strip	Vegetated Open Channels C/D soils, no underdrain	Vegetated Filter Strip	8/30/2007	1.02	0.52	1.05	13.80	697	10%	10%	50%	0.10	1.38	348.49	Chesapeake Bay Program
2005-0019 PLT 02	Permeable Pavement	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	8/30/2007	0.01	0.01	0.01	0.15	11	20%	10%	55%	0.00	0.02	5.80	Chesapeake Bay Program
2005-0019 PLT 03	Permeable Pavement	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	8/30/2007	0.01	0.01	0.01	0.15	11	20%	10%	55%	0.00	0.02	5.80	Chesapeake Bay Program
2005-0020 01	D.C. Sand Filter	Filtering Practices	D.C. Sand Filter	1/21/2008	1.34	1.27	2.09	22.12	1,500	60%	40%	80%	1.25	8.85	1,200	Chesapeake Bay Program
2005-0028 01	Alexandria Compound Sand Filter	Filtering Practices	Alexandria Compound Sand Filter	2/23/2009	0.57	0.57	0.92	9.61	668	60%	40%	80%	0.55	3.84	534	Chesapeake Bay Program
2005-0810 BLD 01	Green Roof	NOT APPLICABLE	Green Roof	3/25/2006	0.15	0.15	0.24	2.53	176	53%	45%	56%	0.13	1.13	98	Retrofit Curves
2006-0009 PLT 01	Infiltration System	Infiltration Practices w/o Sand, Veg.	Infiltration System	5/12/2007	2.10	0.00	0.86	21.15	369	85%	80%	95%	0.73	16.92	351	Chesapeake Bay Program
2006-0009 PLT 02	Infiltration System	Infiltration Practices w/o Sand, Veg.	Infiltration System	5/12/2007	4.09	0.00	1.68	41.15	718	85%	80%	95%	1.42	32.92	682	Chesapeake Bay Program
2006-0018 PLT 01	StormFilter™ Stormwater Treatment System	Filtering Practices	StormFilter™ Stormwater Treatment System	10/17/2007	2.26	1.60	2.87	33.64	1,993	45%	29%	80%	1.29	9.64	1,595	VA BMP Clearinghouse-MTD
2006-0018 PLT 02	StormFilter™ Stormwater Treatment System	Filtering Practices	StormFilter™ Stormwater Treatment System	10/17/2007	10.18	10.18	16.49	171.63	11,924	45%	29%	80%	7.42	49.17	9,539	VA BMP Clearinghouse-MTD
2006-0018 PLT 03	Stream Buffer Restoration	Wetland Restoration: Coastal Plain Dissected Uplands Non-Tidal; Coastal Plain Dissected Uplands Tidal; Coastal Plain Lowlands Tidal; Coastal Plain Uplands Tidal; Coastal Plain Lowlands Non-Tidal; Coastal Plain Uplands Non-Tidal	Stream Buffer Restoration	10/17/2007	11.27	1.28	6.17	122.16	3,257	50%	25%	15%	3.09	30.54	489	Chesapeake Bay Program
2006-0036 PLT 01	Vortechs® Stormwater Treatment System	Dry Detention Ponds and Hydrodynamic Structures	Vortechs® Stormwater Treatment System	11/13/2008	0.68	0.34	0.70	9.21	463	20%	13%	50%	0.14	1.17	231	VA BMP Clearinghouse-MTD
2006-0101 01	Tree Box Filter	Bioretention C/D soils, underdrain	Tree Box Filter	1/26/2007	0.25	0.25	0.41	4.22	293	45%	25%	55%	0.18	1.05	161	Chesapeake Bay Program
2006-0101 02	Tree Box Filter	Bioretention C/D soils, underdrain	Tree Box Filter	1/26/2007	0.25	0.25	0.41	4.22	293	45%	25%	55%	0.18	1.05	161	Chesapeake Bay Program
2006-0101 03	Tree Box Filter	Bioretention C/D soils, underdrain	Tree Box Filter	1/26/2007	0.25	0.25	0.41	4.22	293	45%	25%	55%	0.18	1.05	161	Chesapeake Bay Program
2007-0004 PLT 01	Aqua-Swirl® Stormwater Hydrodynamic Separator	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	5/3/2008	0.59	0.59	0.95	9.91	689	20%	13%	50%	0.19	1.26	344	VA BMP Clearinghouse-MTD
2007-0004 PLT 02	Aqua-Swirl® Stormwater Hydrodynamic Separator	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	5/3/2008	0.67	0.67	1.09	11.30	785	20%	13%	50%	0.22	1.44	392	VA BMP Clearinghouse-MTD
2007-0004 PLT 03	Aqua-Swirl® Stormwater Hydrodynamic Separator	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	5/3/2008	0.52	0.46	0.77	8.35	548	20%	13%	50%	0.15	1.06	274	VA BMP Clearinghouse-MTD
2007-0010 PLT 01	Vegetated Filter Strip	Vegetated Open Channels C/D soils, no underdrain	Vegetated Filter Strip	8/8/2008	0.48	0.42	0.71	7.69	503	10%	10%	50%	0.07	0.77	251	Chesapeake Bay Program

BMP ID	BMP Type	Chesapeake Bay Program BMP Type	BMP Name (Full)	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency*	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	Efficiency Method
2007-0016 PLT 01	StormFilter™ Stormwater Treatment System	Filtering Practices	StormFilter™ Stormwater Treatment System	11/20/2008	2.13	1.71	2.94	33.06	2,077	45%	29%	80%	1.32	9.47	1,661	VA BMP Clearinghouse-MTD
2007-0101 01	Tree Box Filter	Bioretention C/D soils, underdrain	Tree Box Filter	8/16/2008	0.50	0.50	0.81	8.43	586	45%	25%	55%	0.36	2.11	322	Chesapeake Bay Program
2007-0101 02	Tree Box Filter	Bioretention C/D soils, underdrain	Tree Box Filter	8/16/2008	0.50	0.50	0.81	8.43	586	45%	25%	55%	0.36	2.11	322	Chesapeake Bay Program
2007-0102 01	Green Roof	NOT APPLICABLE	Green Roof	12/31/2007	0.01	0.01	0.01	0.13	9	53%	45%	56%	0.01	0.06	5	Retrofit Curves
2008-0018 PLT 01	StormFilter™ Stormwater Treatment System	Filtering Practices	StormFilter™ Stormwater Treatment System	2/12/2009	0.73	0.65	1.09	11.76	775	45%	29%	80%	0.49	3.37	620	VA BMP Clearinghouse-MTD
2008-0101 01	Tree Box Filter	Bioretention C/D soils, underdrain	Tree Box Filter	5/27/2009	0.26	0.20	0.35	3.98	245	45%	25%	55%	0.16	0.99	135	Chesapeake Bay Program
2008-0101 02	Tree Box Filter	Bioretention C/D soils, underdrain	Tree Box Filter	5/27/2009	0.30	0.21	0.38	4.45	262	45%	25%	55%	0.17	1.11	144	Chesapeake Bay Program
Totals					313	189	357.33	4,435	243,470				Totals	158.0	1,305.1	150,452

*TN Efficiency for the Manufactured Treatment Devices was estimated from the Retrofit Curves and the VA BMP Clearinghouse TP efficiency.

BMP ID	BMP Type	Chesapeake Bay Program BMP Type	BMP Name (Full)	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency*	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	Efficiency Method
1995-0021 01	Dry Detention Ponds & Hydrodynamic Structures	Dry Detention Ponds and Hydrodynamic Structures	Regional Dry Pond	8/19/2013	34.65	22.72	41.70	503.19	28,710	10%	5%	10%	4.17	25.16	2870.97	Chesapeake Bay Program
1998-0019 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	7/21/2009	1.84	1.66	2.76	29.80	1,976	20%	13%	50%	0.55	3.79	988.02	VA BMP Clearinghouse-MTD
1999-0018 01	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	3/16/2011	0.0263	0.0263	0.04	0.44	31	45%	25%	55%	0.02	0.11	16.94	Chesapeake Bay Program
2000-0028 01	Underground Sand Filter	Filtering Practices	Dry Vault Sand Filter	9/21/2009	3.392	2.942	4.95	54.13	3,525	60%	40%	80%	2.97	21.65	2820.11	Chesapeake Bay Program
2000-0028 02	Underground Sand Filter	Filtering Practices	Dry Vault Sand Filter	9/21/2009	5.813	4.842	8.24	91.41	5,842	60%	40%	80%	4.95	36.57	4673.79	Chesapeake Bay Program
2000-0028 03	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Vortechs® Stormwater Treatment System	9/21/2009	1.73	1.73	2.80	29.17	2,026	20%	13%	50%	0.56	3.71	1013.19	VA BMP Clearinghouse-MTD
2000-0028 04	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	9/21/2009	1.55	1.55	2.51	26.13	1,816	20%	13%	50%	0.50	3.33	907.77	VA BMP Clearinghouse-MTD
2001-0012 01	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	9/1/2009	0.8	0.2	0.57	9.41	340	45%	25%	55%	0.26	2.35	186.86	Chesapeake Bay Program
2001-0012 02	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	9/1/2009	0.2	0.06	0.15	2.42	95	45%	25%	55%	0.07	0.61	52.19	Chesapeake Bay Program
2001-0012 03	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	9/1/2009	0.399	0.1	0.28	4.70	170	45%	25%	55%	0.13	1.17	93.33	Chesapeake Bay Program
2001-0012 05	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	9/1/2009	0.517	0.172	0.42	6.37	262	45%	25%	55%	0.19	1.59	144.16	Chesapeake Bay Program
2001-0012 06	Vegetated Treatment Area, C/D soils, no underdrain	Vegetated Open Channels C/D soils, no underdrain	Vegetated Filter Strip	9/1/2009	0.3	0.06	0.20	3.43	112	10%	10%	50%	0.02	0.34	56.24	Chesapeake Bay Program
2001-0012 07	Vegetated Treatment Area, C/D soils, no underdrain	Vegetated Open Channels C/D soils, no underdrain	Vegetated Filter Strip	9/1/2009	0.5	0.06	0.28	5.44	148	10%	10%	50%	0.03	0.54	73.82	Chesapeake Bay Program
2001-0012 08	Vegetated Open Channels	Vegetated Open Channels C/D soils, no underdrain	Grass Swale	9/1/2009	0.2	0.09	0.19	2.63	125	10%	10%	50%	0.02	0.26	62.38	Chesapeake Bay Program
2001-0012 PLT 01	Vegetated Treatment Area, C/D soils, no underdrain	Vegetated Open Channels C/D soils, no underdrain	Vegetated Filter Strip	9/1/2009	0.36	0.16	0.34	4.71	223	10%	10%	50%	0.03	0.47	111.29	Chesapeake Bay Program
2002-0009 01	Underground Sand Filter	Filtering Practices	Alexandria Compound Sand Filter	4/8/2011	0.23	0.23	0.37	3.88	269	60%	40%	80%	0.22	1.55	215.52	Chesapeake Bay Program
2002-0044 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Downstream Defender® Stormwater Treatment Vortex Separator	1/14/2010	1.22	0.862	1.54	18.14	1,073	20%	13%	50%	0.31	2.31	536.31	VA BMP Clearinghouse-MTD
2002-0044 02	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Downstream Defender® Stormwater Treatment Vortex Separator	1/14/2010	1.19	0.889	1.56	18.02	1,094	20%	13%	50%	0.31	2.29	547.11	VA BMP Clearinghouse-MTD
2002-0044 03	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Downstream Defender® Stormwater Treatment Vortex Separator	1/14/2010	0.755	0.503	0.92	11.02	633	20%	13%	50%	0.18	1.40	316.74	VA BMP Clearinghouse-MTD
2002-0044 04	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Downstream Defender® Stormwater Treatment Vortex Separator	1/14/2010	1	0.573	1.10	13.96	746	20%	13%	50%	0.22	1.78	373.12	VA BMP Clearinghouse-MTD
2002-0044 05	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	1/14/2010	2.898	2.512	4.23	46.24	3,010	45%	29%	80%	1.90	13.25	2408.17	VA BMP Clearinghouse-MTD
2002-0044 06	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	1/14/2010	3.19	1.489	3.11	42.23	2,043	45%	25%	55%	1.40	10.56	1123.72	Chesapeake Bay Program
2002-0044 07	Reduction of Impervious Surface	Already included in aggregate method for determining increase in impervious areas	Cistern	1/14/2010	5.892	5.892	9.55	99.34	6,901							Chesapeake Bay Program
2002-0044 08	Bioretention, no underdrain, A/B soils	Bioretention A/B soils, no underdrain	Green Roof	1/14/2010	0.182	0.182	0.29	3.07	213	85%	80%	90%	0.25	2.45	191.86	Chesapeake Bay Program
2003-0006 01	Vegetated Open Channels	Vegetated Open Channels C/D soils, no underdrain	Grass Swale	5/20/2011	0.48	0.08	0.29	5.38	164	10%	10%	50%	0.03	0.54	82.01	Chesapeake Bay Program
2003-0007 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	6/11/2011	1.6	0.4	1.14	18.83	679	20%	13%	50%	0.23	2.40	339.74	VA BMP Clearinghouse-MTD
2003-0013 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	10/22/2012	0.28	0.25	0.42	4.52	298	20%	13%	50%	0.08	0.57	149.05	VA BMP Clearinghouse-MTD

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2003-0013 02	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	10/22/2012	0.35	0.31	0.52	5.63	370	20%	13%	50%	0.10	0.72	185.07	VA BMP Clearinghouse- MTD
2003-0013 03	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	10/22/2012	1.4	0.54	1.23	17.76	784	20%	13%	50%	0.25	2.26	391.85	VA BMP Clearinghouse- MTD
2003-0019 01	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	6/22/2012	1.39	1.1	1.90	21.47	1,339	45%	29%	80%	0.86	6.15	1071.55	VA BMP Clearinghouse- MTD
2003-0019 02	Bioretention, no underdrain, A/B soils	Bioretention A/B soils, no underdrain	Green Roof	6/22/2012	0.259	0.259	0.42	4.37	303	85%	80%	90%	0.36	3.49	273.03	Chesapeake Bay Program
2003-0030 01	Vegetated Treatment Area, C/D soils, no underdrain	Vegetated Open Channels C/D soils, no underdrain	Vegetated Filter Strip	2/1/2010	1.65	0.11	0.81	17.36	400	10%	10%	50%	0.08	1.74	199.79	Chesapeake Bay Program
2003-0030 02	Vegetated Treatment Area, C/D soils, no underdrain	Vegetated Open Channels C/D soils, no underdrain	Vegetated Filter Strip	2/1/2010	1.85	0.56	1.44	22.43	883	10%	10%	50%	0.14	2.24	441.36	Chesapeake Bay Program
2003-0030 03	Permeable Pavement w/o Sand, Veg. - C/D soils, underdrain	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	2/1/2010	0.114	0.114	0.18	1.92	134	20%	10%	55%	0.04	0.19	73.44	Chesapeake Bay Program
2003-0030 04	Dry Detention Ponds & Hydrodynamic Structures	Dry Detention Ponds and Hydrodynamic Structures	Dry Detention Pond	2/1/2010	0.68	0.14	0.45	7.80	259	10%	5%	10%	0.04	0.39	25.89	Chesapeake Bay Program
2003-0037 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	10/15/2012	1.83	0.56	1.43	22.23	879	20%	13%	50%	0.29	2.83	439.60	VA BMP Clearinghouse- MTD
2004-0010 01	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	11/12/2009	1.4	0.96	1.74	20.62	1,202	45%	29%	80%	0.78	5.91	961.46	VA BMP Clearinghouse- MTD
2004-0018 01	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	11/3/2010	1.84	1.4	2.45	28.03	1,717	45%	29%	80%	1.10	8.03	1373.76	VA BMP Clearinghouse- MTD
2004-0018 02	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	11/3/2010	0.54	0.5	0.83	8.83	593	45%	29%	80%	0.37	2.53	474.15	VA BMP Clearinghouse- MTD
2004-0032 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	10/18/2010	0.44	0.34	0.59	6.74	416	20%	13%	50%	0.12	0.86	207.91	VA BMP Clearinghouse- MTD
2004-0032 02	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	10/18/2010	0.13	0.11	0.19	2.06	132	45%	25%	55%	0.08	0.51	72.80	Chesapeake Bay Program
2004-0032 03	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	10/18/2010	0.17	0.15	0.25	2.73	179	45%	25%	55%	0.11	0.68	98.57	Chesapeake Bay Program
2004-0038 01	Urban stream restoration	600 ft of Stream Restoration - DSP 2007-0018	Stream Restoration	1/31/2012	2.7	0.9	2.20	33.30	1,371				40.80	45.00	26928.00	Chesapeake Bay Program
2004-0038 03	Permeable Pavement w/o Sand, Veg. - C/D soils, underdrain	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	1/31/2012	0.104	0.104	0.17	1.75	122	20%	10%	55%	0.03	0.18	67.00	Chesapeake Bay Program
2005-0003 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	10/22/2009	0.83	0.76	1.26	13.52	903	20%	13%	50%	0.25	1.72	451.25	VA BMP Clearinghouse- MTD
2005-0003 02	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	10/22/2009	0.26	0.24	0.40	4.25	285	20%	13%	50%	0.08	0.54	142.32	VA BMP Clearinghouse- MTD
2005-0013 01	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	10/19/2012	0.62	0.54	0.91	9.91	647	45%	29%	80%	0.41	2.84	517.26	VA BMP Clearinghouse- MTD
2005-0013 02	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	10/19/2012	0.85	0.6	1.07	12.63	747	45%	29%	80%	0.48	3.62	597.39	VA BMP Clearinghouse- MTD
2005-0013 03	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	10/19/2012	0.54	0.39	0.69	8.09	483	45%	29%	80%	0.31	2.32	386.55	VA BMP Clearinghouse- MTD
2005-0016 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	12/28/2009	1.46	1.17	2.01	22.65	1,421	20%	13%	50%	0.40	2.88	710.71	VA BMP Clearinghouse- MTD
2005-0018 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	12/4/2013	0.66	0.56	0.95	10.45	674	20%	13%	50%	0.19	1.33	336.76	VA BMP Clearinghouse- MTD
2005-0024 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	9/17/2009	0.9	0.7	1.22	13.82	855	20%	13%	50%	0.24	1.76	427.54	VA BMP Clearinghouse- MTD
2005-0038 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	1/31/2013	2.66	2.3	3.87	42.40	2,757	20%	13%	50%	0.77	5.40	1378.66	VA BMP Clearinghouse- MTD
2005-0038 02	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	1/31/2013	3.01	2.61	4.39	48.03	3,127	20%	13%	50%	0.88	6.11	1563.73	VA BMP Clearinghouse- MTD
2005-0038 03	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	1/31/2013	2.8	2.16	3.76	42.86	2,643	20%	13%	50%	0.75	5.45	1321.28	VA BMP Clearinghouse- MTD
2005-0038 04	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	1/31/2013	5.07	4.03	6.96	78.42	4,903	20%	13%	50%	1.39	9.98	2451.63	VA BMP Clearinghouse- MTD

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2005-0038 05	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	1/31/2013	2.49	2.2	3.68	40.01	2,628	20%	13%	50%	0.74	5.09	1313.94	VA BMP Clearinghouse-MTD
2005-0038 06	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	1/31/2013	9	7.06	12.23	138.57	8,611	20%	13%	50%	2.45	17.63	4305.29	VA BMP Clearinghouse-MTD
2005-0038 07	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	1/31/2013	8.19	6.18	10.84	124.44	7,592	20%	13%	50%	2.17	15.84	3796.06	VA BMP Clearinghouse-MTD
2005-0038 08	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	1/31/2013	3.22	2.75	4.65	51.10	3,304	20%	13%	50%	0.93	6.50	1651.88	VA BMP Clearinghouse-MTD
2005-0041 01	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	12/16/2010	1.214	1.164	1.91	20.13	1,372	45%	29%	80%	0.86	5.77	1097.77	VA BMP Clearinghouse-MTD
2006-0012 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	8/18/2009	0.69	0.62	1.03	11.16	739	20%	13%	50%	0.21	1.42	369.26	VA BMP Clearinghouse-MTD
2006-0012 02	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	8/18/2009	2.41	2.28	3.75	39.75	2,693	20%	13%	50%	0.75	5.06	1346.73	VA BMP Clearinghouse-MTD
2006-0019 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	StormTech® Isolator™ Row Stormwater Management System	7/8/2013	0.24	0.22	0.36	3.91	261	10%	5%	10%	0.04	0.20	26.12	Chesapeake Bay Program
2006-0023 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	12/11/2009	0.738	0.463	0.86	10.58	591	20%	13%	50%	0.17	1.35	295.33	VA BMP Clearinghouse-MTD
2006-0023 02	Bioretention, no underdrain, A/B soils	Bioretention A/B soils, no underdrain	Green Roof	12/11/2009	0.244	0.244	0.40	4.11	286	85%	80%	90%	0.34	3.29	257.22	Chesapeake Bay Program
2006-0025 01	Dry Detention Ponds & Hydrodynamic Structures	Dry Detention Ponds and Hydrodynamic Structures	Dry Detention Pond	12/1/2009	6.49	5.15	8.89	100.32	6,268	10%	5%	10%	0.89	5.02	626.79	Chesapeake Bay Program
2006-0025 02	Filtering Practices	Filtering Practices	Flow Thru Planter Box	12/1/2009	0.46	0.46	0.75	7.76	539	60%	40%	80%	0.45	3.10	431.05	Chesapeake Bay Program
2006-0025 03	Filtering Practices	Filtering Practices	Flow Thru Planter Box	12/1/2009	0.3	0.3	0.49	5.06	351	60%	40%	80%	0.29	2.02	281.12	Chesapeake Bay Program
2006-0025 04	Filtering Practices	Filtering Practices	Flow Thru Planter Box	12/1/2009	0.35	0.35	0.57	5.90	410	60%	40%	80%	0.34	2.36	327.97	Chesapeake Bay Program
2006-0030 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	9/11/2010	1.19	1	1.70	18.77	1,205	20%	13%	50%	0.34	2.39	602.36	VA BMP Clearinghouse-MTD
2006-0031 01	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	9/11/2010	0.285	0.224	0.39	4.39	273	45%	29%	80%	0.17	1.26	218.48	VA BMP Clearinghouse-MTD
2006-0031 02	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	9/11/2010	0.315	0.248	0.43	4.86	302	45%	29%	80%	0.19	1.39	241.81	VA BMP Clearinghouse-MTD
2006-0031 03	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	9/11/2010	0.197	0.155	0.27	3.04	189	45%	29%	80%	0.12	0.87	151.15	VA BMP Clearinghouse-MTD
2006-0031 04	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	9/11/2010	0.226	0.178	0.31	3.48	217	45%	29%	80%	0.14	1.00	173.55	VA BMP Clearinghouse-MTD
2006-0036 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	3/22/2013	0.587	0.587	0.95	9.90	688	20%	13%	50%	0.19	1.26	343.78	VA BMP Clearinghouse-MTD
2007-0003 PLT 01	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	11/29/2012	0.062	0.002	0.03	0.64	13	45%	25%	55%	0.01	0.16	7.09	Chesapeake Bay Program
2007-0003 PLT 02	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	11/29/2012	0.35	0.35	0.57	5.90	410	20%	13%	50%	0.11	0.75	204.98	VA BMP Clearinghouse-MTD
2007-0004 01	Underground Sand Filter	Filtering Practices	Delaware Sand Filter	6/3/2013	0.859	0.45	0.90	11.71	599	60%	40%	80%	0.54	4.68	479.20	Chesapeake Bay Program
2007-0008 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	12/23/2009	0.884	0.401	0.85	11.62	555	20%	13%	50%	0.17	1.48	277.31	VA BMP Clearinghouse-MTD
2007-0011 01	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	6/15/2011	0.115	0.0955	0.16	1.81	115	45%	29%	80%	0.07	0.52	92.23	VA BMP Clearinghouse-MTD
2007-0011 02	Permeable Pavement w/o Sand, Veg. - C/D soils, underdrain	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	6/15/2011	0.0164	0.0164	0.03	0.28	19	20%	10%	55%	0.01	0.03	10.57	Chesapeake Bay Program
2007-0013 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	6/11/2010	1.81	1.4	2.44	27.73	1,712	20%	13%	50%	0.49	3.53	855.96	VA BMP Clearinghouse-MTD
2007-0014 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	6/24/2012	2.21	1.59	2.83	33.05	1,971	20%	13%	50%	0.57	4.21	985.70	VA BMP Clearinghouse-MTD
2007-0014 02	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	6/24/2012	7.37	5.56	9.75	111.97	6,831	20%	13%	50%	1.95	14.25	3415.37	VA BMP Clearinghouse-MTD

BMP ID	BMP Type	Chesapeake Bay Program BMP Type	BMP Name (Full)	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency*	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	Efficiency Method
2007-0024 PLT 01	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	4/19/2012	0.09	0.09	0.15	1.52	105	45%	29%	80%	0.07	0.43	84.34	VA BMP Clearinghouse- MTD
2007-0025 01	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	4/11/2011	0.433	0.433	0.70	7.30	507	45%	29%	80%	0.32	2.09	405.75	VA BMP Clearinghouse- MTD
2007-0025 02	Permeable Pavement w/o Sand, Veg. - C/D soils, underdrain	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	4/11/2011	0.069	0.069	0.11	1.16	81	20%	10%	55%	0.02	0.12	44.45	Chesapeake Bay Program
2007-0025 03	Permeable Pavement w/o Sand, Veg. - C/D soils, underdrain	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	4/11/2011	0.026	0.026	0.04	0.44	30	20%	10%	55%	0.01	0.04	16.75	Chesapeake Bay Program
2007-0027 PLT 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	12/28/2009	0.741	0.6726	1.12	12.03	800	20%	13%	50%	0.22	1.53	399.93	VA BMP Clearinghouse- MTD
2007-0027 PLT 02	Water Quality Inlet		Oil / Grit Separator	12/28/2009	0.1	0.1	0.16	1.69	117							Chesapeake Bay Program
2007-0030 01	Underground Sand Filter	Filtering Practices	Sand Filter	6/19/2012	0.244	0.148	0.28	3.46	190	60%	40%	80%	0.17	1.38	152.19	Chesapeake Bay Program
2007-0031 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	7/19/2013	0.79	0.44	0.86	10.94	577	20%	13%	50%	0.17	1.39	288.46	VA BMP Clearinghouse- MTD
2007-0037 01	Vegetated Treatment Area, C/D soils, no underdrain	Vegetated Open Channels C/D soils, no underdrain	Vegetated Filter Strip	7/10/2013	1.44	0.12	0.74	15.32	373	10%	10%	50%	0.07	1.53	186.31	Chesapeake Bay Program
2007-0037 02	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	7/10/2013	1.27	0.54	1.17	16.46	761	45%	25%	55%	0.53	4.11	418.47	Chesapeake Bay Program
2007-0037 03	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	7/10/2013	1.16	0.86	1.52	17.52	1,060	45%	25%	55%	0.68	4.38	583.04	Chesapeake Bay Program
2007-0037 04	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	7/10/2013	1.26	0.75	1.42	17.78	968	45%	25%	55%	0.64	4.45	532.48	Chesapeake Bay Program
2007-0037 05	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	7/10/2013	0.95	0.68	1.21	14.18	844	45%	25%	55%	0.55	3.55	464.18	Chesapeake Bay Program
2007-0037 06	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	7/10/2013	0.25	0.15	0.28	3.54	193	45%	25%	55%	0.13	0.88	106.30	Chesapeake Bay Program
2007-0037 07	Reduction of Impervious Surface	Already included in aggregate method for determining increase in impervious areas	Cistern	7/10/2013	0	0	0.00	0.00	0							Chesapeake Bay Program
2008-0008 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Vortechs® Stormwater Treatment System	11/27/2012	0.67	0.5624	0.96	10.57	678	20%	13%	50%	0.19	1.34	338.83	VA BMP Clearinghouse- MTD
2008-0008 02	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Vortechs® Stormwater Treatment System	11/27/2012	0.44	0.2827	0.52	6.35	359	20%	13%	50%	0.10	0.81	179.39	VA BMP Clearinghouse- MTD
2008-0008 03	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	11/27/2012	0.73	0.6996	1.15	12.10	825	20%	13%	50%	0.23	1.54	412.40	VA BMP Clearinghouse- MTD
2008-0012 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Vortechs® Stormwater Treatment System	3/27/2010	0.73	0.68	1.12	11.97	805	20%	13%	50%	0.22	1.52	402.64	VA BMP Clearinghouse- MTD
2008-0012 02	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Vortechs® Stormwater Treatment System	3/27/2010	1.1	1.1	1.78	18.55	1,288	20%	13%	50%	0.36	2.36	644.23	VA BMP Clearinghouse- MTD
2008-0012 03	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Vortechs® Stormwater Treatment System	3/27/2010	1.1	1.1	1.78	18.55	1,288	20%	13%	50%	0.36	2.36	644.23	VA BMP Clearinghouse- MTD
2008-0012 04	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	3/27/2010	0.61	0.56	0.93	9.95	665	45%	29%	80%	0.42	2.85	531.78	VA BMP Clearinghouse- MTD
2008-0013 01	Filtering Practices - MTD	Filtering Practices	BayFilter™ Stormwater Filtration System	12/8/2010	1.86	1.49	2.57	28.85	1,810	50%	32%	80%	1.28	9.18	1448.25	VA BMP Clearinghouse- MTD
2008-0017 01	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	6/29/2011	0.41	0.38	0.63	6.71	450	45%	25%	55%	0.28	1.68	247.71	Chesapeake Bay Program
2008-0017 02	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	6/29/2011	0.58	0.395	0.72	8.52	495	45%	25%	55%	0.32	2.13	272.36	Chesapeake Bay Program
2008-0017 03	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	6/29/2011	0.58	0.395	0.72	8.52	495	45%	25%	55%	0.32	2.13	272.36	Chesapeake Bay Program
2008-0035 PLT 01	Permeable Pavement w/o Sand, Veg. - C/D soils, underdrain	Permeable Pavement w/Sand, Veg. C/D soils, underdrain	Permeable Pavement	2/27/2010	0.077	0.077	0.12	1.30	90	20%	20%	55%	0.02	0.26	49.61	Chesapeake Bay Program

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2008-0035 PLT 02	Dry Detention Ponds & Hydrodynamic Structures	Dry Detention Ponds and Hydrodynamic Structures	Dry Detention Pond	2/27/2010	0.82	0.08	0.43	8.80	224	10%	5%	10%	0.04	0.44	22.38	Chesapeake Bay Program
2008-0102 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	5/9/2011	9.195	4.667	9.42	124.28	6,263	20%	13%	50%	1.88	15.82	3131.29	VA BMP Clearinghouse-MTD
2009-0003 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	4/3/2012	2.46	2.38	3.89	40.93	2,802	20%	13%	50%	0.78	5.21	1400.90	VA BMP Clearinghouse-MTD
2009-0003 02	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	4/3/2012	2.45	2.23	3.70	39.81	2,651	20%	13%	50%	0.74	5.07	1325.36	VA BMP Clearinghouse-MTD
2009-0006 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	9/29/2012	2.89	2.13	3.76	43.57	2,629	20%	13%	50%	0.75	5.54	1314.26	VA BMP Clearinghouse-MTD
2009-0006 02	Reduction of Impervious Surface	Already included in aggregate method for determining increase in impervious areas	Cistern	9/29/2012	0.33	0.33	0.53	5.56	387							Chesapeake Bay Program
2009-0006 03	Bioretention, no underdrain, A/B soils	Bioretention A/B soils, no underdrain	Green Roof	9/29/2012	0.33	0.33	0.53	5.56	387	85%	80%	90%	0.45	4.45	347.88	Chesapeake Bay Program
2009-0008 01	Filtering Practices	Filtering Practices	Flow Thru Planter Box	9/15/2011	0.057	0.057	0.09	0.96	67	60%	40%	80%	0.06	0.38	53.41	Chesapeake Bay Program
2009-0008 02	Filtering Practices	Filtering Practices	Flow Thru Planter Box	9/15/2011	0.056	0.056	0.09	0.94	66	60%	40%	80%	0.05	0.38	52.48	Chesapeake Bay Program
2009-0009 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	10/26/2012	1.5	0.841	1.63	20.82	1,101	20%	13%	50%	0.33	2.65	550.47	VA BMP Clearinghouse-MTD
2009-0009 02	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.1691	0.1691	0.27	2.85	198	60%	40%	80%	0.16	1.14	158.46	Chesapeake Bay Program
2009-0009 04	Bioretention, no underdrain, A/B soils	Bioretention A/B soils, no underdrain	Green Roof	8/11/2011	0.15	0.15	0.24	2.53	176	85%	80%	90%	0.21	2.02	158.13	Chesapeake Bay Program
2009-0009 05	Bioretention, no underdrain, A/B soils	Bioretention A/B soils, no underdrain	Green Roof	8/11/2011	0.0146	0.0146	0.02	0.25	17	85%	80%	90%	0.02	0.20	15.39	Chesapeake Bay Program
2009-0013 01	Vegetated Treatment Area, C/D soils, no underdrain	Vegetated Open Channels C/D soils, no underdrain	Vegetated Buffer	7/8/2012	0.26	0.26	0.42	4.38	305	10%	10%	50%	0.04	0.44	152.27	Chesapeake Bay Program
2009-0014 GRD 01	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	4/19/2010	0.068	0.066	0.11	1.13	78	45%	25%	55%	0.05	0.28	42.71	Chesapeake Bay Program
2009-0014 GRD 02	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	4/19/2010	0.069	0.067	0.11	1.15	79	45%	25%	55%	0.05	0.29	43.36	Chesapeake Bay Program
2009-0014 GRD 03	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	4/19/2010	0.052	0.046	0.08	0.84	55	45%	25%	55%	0.03	0.21	30.21	Chesapeake Bay Program
2009-0014 GRD 04	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	4/19/2010	0.052	0.046	0.08	0.84	55	45%	25%	55%	0.03	0.21	30.21	Chesapeake Bay Program
2009-0101 01	Bioretention, no underdrain, A/B soils	Bioretention A/B soils, no underdrain	Green Roof	1/24/2012	0.0142	0.0142	0.02	0.24	17	85%	80%	90%	0.02	0.19	14.97	Chesapeake Bay Program
2009-0101 02	Bioretention, no underdrain, A/B soils	Bioretention A/B soils, no underdrain	Green Roof	1/24/2012	0.0124	0.0124	0.02	0.21	15	85%	80%	90%	0.02	0.17	13.07	Chesapeake Bay Program
2010-0001 01	Filtering Practices - MTD	Filtering Practices	BayFilter™ Stormwater Filtration System	10/31/2011	1.73	1.34	2.33	26.52	1,638	50%	32%	80%	1.17	8.44	1310.50	VA BMP Clearinghouse-MTD
2010-0005 01	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0166	0.0166	0.03	0.28	19	60%	40%	80%	0.02	0.11	15.56	Chesapeake Bay Program
2010-0005 02	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0166	0.0166	0.03	0.28	19	60%	40%	80%	0.02	0.11	15.56	Chesapeake Bay Program
2010-0005 03	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0166	0.0166	0.03	0.28	19	60%	40%	80%	0.02	0.11	15.56	Chesapeake Bay Program
2010-0005 04	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0166	0.0166	0.03	0.28	19	60%	40%	80%	0.02	0.11	15.56	Chesapeake Bay Program
2010-0005 05	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0166	0.0166	0.03	0.28	19	60%	40%	80%	0.02	0.11	15.56	Chesapeake Bay Program
2010-0005 06	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0166	0.0166	0.03	0.28	19	60%	40%	80%	0.02	0.11	15.56	Chesapeake Bay Program
2010-0005 07	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0166	0.0166	0.03	0.28	19	60%	40%	80%	0.02	0.11	15.56	Chesapeake Bay Program
2010-0005 08	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0135	0.0135	0.02	0.23	16	60%	40%	80%	0.01	0.09	12.65	Chesapeake Bay Program

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2010-0005 09	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0135	0.0135	0.02	0.23	16	60%	40%	80%	0.01	0.09	12.65	Chesapeake Bay Program
2010-0007 GRD 01	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	10/9/2009	0.8829	0.1221	0.51	9.72	277	45%	25%	55%	0.23	2.43	152.22	Chesapeake Bay Program
2010-0007 GRD 02	Bioretention, no underdrain, A/B soils	Bioretention A/B soils, no underdrain	Green Roof	10/9/2009	0.0784	0.0784	0.13	1.32	92	85%	80%	90%	0.11	1.06	82.65	Chesapeake Bay Program
2010-0009 01	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0316	0.0316	0.05	0.53	37	60%	40%	80%	0.03	0.21	29.61	Chesapeake Bay Program
2010-0009 02	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0316	0.0316	0.05	0.53	37	60%	40%	80%	0.03	0.21	29.61	Chesapeake Bay Program
2010-0009 03	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0316	0.0316	0.05	0.53	37	60%	40%	80%	0.03	0.21	29.61	Chesapeake Bay Program
2010-0009 04	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0316	0.0316	0.05	0.53	37	60%	40%	80%	0.03	0.21	29.61	Chesapeake Bay Program
2010-0009 05	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0316	0.0316	0.05	0.53	37	60%	40%	80%	0.03	0.21	29.61	Chesapeake Bay Program
2010-0010 01	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
2010-0010 02	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
2010-0010 03	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
2010-0010 04	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
2010-0010 05	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
2010-0010 06	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
2010-0010 07	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
2010-0010 08	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
2010-0010 09	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
2010-0010 10	Filtering Practices	Filtering Practices	Flow Thru Planter Box	10/26/2012	0.0299	0.0299	0.05	0.50	35	60%	40%	80%	0.03	0.20	28.02	Chesapeake Bay Program
2010-0018 GRD 01	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	7/30/2011	0.28	0.02	0.14	2.96	69	45%	25%	55%	0.06	0.74	38.02	Chesapeake Bay Program
2010-0021 GRD 01	Urban Infiltration Practices	Infiltration Practices w/o Sand, Veg.	Infiltration System	9/7/2011	0.26	0.26	0.42	4.38	305	85%	80%	95%	0.36	3.51	289.32	Chesapeake Bay Program
2010-0023 GRD 01	Filtering Practices	Filtering Practices	Flow Thru Planter Box	7/20/2011	0.063	0.063	0.10	1.06	74	60%	40%	80%	0.06	0.42	59.03	Chesapeake Bay Program
2010-0024 GRD 01	Filtering Practices	Filtering Practices	Flow Thru Planter Box	7/20/2011	0.035	0.035	0.06	0.59	41	60%	40%	80%	0.03	0.24	32.80	Chesapeake Bay Program
2011-0003 01	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	11/19/2013	1.91	1.54	2.65	29.69	1,869	45%	29%	80%	1.19	8.51	1495.10	VA BMP Clearinghouse MTD
2011-0008 01	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	11/14/2012	0.479	0.435	0.72	7.78	517	45%	25%	55%	0.33	1.94	284.49	Chesapeake Bay Program
2011-0008 02	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	11/14/2012	0.718	0.635	1.06	11.54	758	45%	25%	55%	0.48	2.89	417.11	Chesapeake Bay Program
2011-0015 01	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	4/2/2014	0.141	0.07	0.14	1.90	94	45%	25%	55%	0.06	0.47	51.96	Chesapeake Bay Program
2011-0015 02	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	4/2/2014	0.643	0.439	0.79	9.46	550	45%	25%	55%	0.36	2.36	302.54	Chesapeake Bay Program
2011-0015 03	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	4/2/2014	0.277	0.213	0.37	4.24	261	45%	25%	55%	0.17	1.06	143.41	Chesapeake Bay Program
2011-0015 04	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	4/2/2014	0.125	0.096	0.17	1.91	118	45%	25%	55%	0.08	0.48	64.65	Chesapeake Bay Program
2011-0015 05	Underground Sand Filter	Filtering Practices	D.C. Sand Filter	4/2/2014	0.8275	0.82	1.33	13.90	962	60%	40%	80%	0.80	5.56	769.44	Chesapeake Bay Program

BMP ID	BMP Type	Chesapeake Bay Program BMP Type	BMP Name (Full)	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency*	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	Efficiency Method
2011-0015 06	Underground Sand Filter	Filtering Practices	D.C. Sand Filter	4/2/2014	0.8275	0.82	1.33	13.90	962	60%	40%	80%	0.80	5.56	769.44	Chesapeake Bay Program
2011-0015 07	Underground Sand Filter	Filtering Practices	Delaware Sand Filter	4/2/2014	0.211	0.198	0.33	3.47	234	60%	40%	80%	0.20	1.39	187.37	Chesapeake Bay Program
2011-0020 GRD 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	Stormceptor® Stormwater Treatment System	5/9/2012	0.66	0.51	0.89	10.11	624	20%	13%	50%	0.18	1.29	311.87	VA BMP Clearinghouse- MTD
2011-0022 01	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	5/12/2014	1.868	1.548	2.64	29.32	1,869	45%	29%	80%	1.19	8.40	1495.57	VA BMP Clearinghouse- MTD
2011-0026 GRD 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	9/6/2012	1.34	1.14	1.93	21.23	1,370	20%	13%	50%	0.39	2.70	685.23	VA BMP Clearinghouse- MTD
2011-0026 GRD 02	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	9/6/2012	0.43	0.27	0.50	6.16	344	45%	25%	55%	0.23	1.54	189.41	Chesapeake Bay Program
2011-0026 GRD 03	Underground Sand Filter	Filtering Practices	D.C. Sand Filter	9/6/2012	2.34	2.19	3.61	38.43	2,592	60%	40%	80%	2.17	15.37	2073.25	Chesapeake Bay Program
2011-0026 GRD 04	Permeable Pavement w/o Sand, Veg. - C/D soils, underdrain	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	9/6/2012	0.014	0.014	0.02	0.24	16	20%	10%	55%	0.00	0.02	9.02	Chesapeake Bay Program
2011-0026 GRD 05	Permeable Pavement w/o Sand, Veg. - C/D soils, underdrain	Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	Permeable Pavement	9/6/2012	0.014	0.014	0.02	0.24	16	20%	10%	55%	0.00	0.02	9.02	Chesapeake Bay Program
2011-0032 GRD 01	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	8/1/2012	0.7575	0.0851	0.41	8.21	218	45%	25%	55%	0.19	2.05	119.84	Chesapeake Bay Program
2011-0032 GRD 02	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	CDS® Stormwater Treatment System	8/1/2012	0.69	0.35	0.71	9.32	470	20%	13%	50%	0.14	1.19	234.87	VA BMP Clearinghouse- MTD
2011-0032 GRD 03	Filtering Practices	Filtering Practices	Flow Thru Planter Box	8/1/2012	0.0448	0.0448	0.07	0.76	52	60%	40%	80%	0.04	0.30	41.98	Chesapeake Bay Program
2011-0032 GRD 04	Filtering Practices	Filtering Practices	Flow Thru Planter Box	8/1/2012	0.0052	0.0052	0.01	0.09	6	60%	40%	80%	0.01	0.04	4.87	Chesapeake Bay Program
2012-0013 01 GRD	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	11/25/2013	0.126	0.126	0.20	2.12	148	45%	25%	55%	0.09	0.53	81.17	Chesapeake Bay Program
2012-0034 01	Filtering Practices	Filtering Practices	Flow Thru Planter Box	2/7/2014	0.062	0.062	0.10	1.05	73	60%	40%	80%	0.06	0.42	58.10	Chesapeake Bay Program
2012-0034 02	Filtering Practices	Filtering Practices	Flow Thru Planter Box	2/7/2014	0.062	0.062	0.10	1.05	73	60%	40%	80%	0.06	0.42	58.10	Chesapeake Bay Program
2012-0034 03	Filtering Practices	Filtering Practices	Flow Thru Planter Box	2/7/2014	0.014	0.014	0.02	0.24	16	60%	40%	80%	0.01	0.09	13.12	Chesapeake Bay Program
2012-0034 04	Filtering Practices	Filtering Practices	Flow Thru Planter Box	2/7/2014	0.047	0.047	0.08	0.79	55	60%	40%	80%	0.05	0.32	44.04	Chesapeake Bay Program
2012-0034 05	Filtering Practices	Filtering Practices	Flow Thru Planter Box	2/7/2014	0.04	0.04	0.06	0.67	47	60%	40%	80%	0.04	0.27	37.48	Chesapeake Bay Program
2012-0034 06	Filtering Practices	Filtering Practices	Flow Thru Planter Box	2/7/2014	0.04	0.04	0.06	0.67	47	60%	40%	80%	0.04	0.27	37.48	Chesapeake Bay Program
2012-0034 07	Filtering Practices - MTD	Filtering Practices	StormFilter™ Stormwater Treatment System	2/7/2014	9.195	4.667	9.42	124.28	6,263	45%	29%	80%	4.24	35.61	5010.06	VA BMP Clearinghouse- MTD
2012-0101 01	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Tree Box Filter	5/2/2012	0.25	0.25	0.41	4.22	293	45%	25%	55%	0.18	1.05	161.06	Chesapeake Bay Program
2012-0102 01	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	7/25/2013	2.05	1.42	2.56	30.29	1,774	20%	13%	50%	0.51	3.85	887.01	VA BMP Clearinghouse- MTD
2012-0102 02	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	7/25/2013	0.7	0.62	1.04	11.26	740	20%	13%	50%	0.21	1.43	370.14	VA BMP Clearinghouse- MTD
2012-0102 03	Hydrodynamic Structures - MTD	Dry Detention Ponds and Hydrodynamic Structures	BaySeparator™ Stormwater Treatment System	7/25/2013	0.25	0.22	0.37	4.01	263	20%	13%	50%	0.07	0.51	131.48	VA BMP Clearinghouse- MTD
2012-0383 PRJ 01	Bioretention, underdrain, C/D soils	Bioretention C/D soils, underdrain	Bioretention Filter	12/15/2012	0.31	0.31	0.50	5.23	363	45%	25%	55%	0.23	1.31	199.71	Chesapeake Bay Program
2012-0383 PRJ 02	Vegetated Treatment Area, C/D soils, no underdrain	Vegetated Open Channels C/D soils, no underdrain	Vegetated Buffer	12/15/2012	0.46	0.46	0.75	7.76	539	10%	10%	50%	0.07	0.78	269.40	Chesapeake Bay Program
Totals					27.96	19.81	35.44	416	24,637	Totals			14.88	110.24	17,051.59	

*TN Efficiency for the Manufactured Treatment Devices was estimated from the Retrofit Curves and the VA BMP Clearinghouse TP efficiency.

Retrofits on City Property

Project	BMP ID	Chesapeake Bay Program BMP Type	BMP Name (Full)	Date Installed	Area Treated (ac)	Impervious Treated (ac)	TP LOAD [LB/YR]	TN LOAD [LB/YR]	TSS LOAD [LB/YR]	TP BMP Efficiency	TN BMP Efficiency*	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	Efficiency Method
Fire Station #206	2012-0103 01	Filtering Practices	StormFilter™ Stormwater Treatment System	5/20/2015	0.55	0.55	0.89	9.27	644	45%	29%	80%	0.40	2.66	515.38	VA BMP Clearinghouse MTD
Burke Library		Filtering Practices	StormFilter™ Stormwater Treatment System	5/1/2015	0.53	0.51	0.83	8.80	601	45%	29%	80%	0.38	2.52	480.71	VA BMP Clearinghouse MTD
Burke Library		Bioretention C/D soils, underdrain	Bioretention C/D soils, underdrain	5/1/2015	0.78	0.41	0.82	10.64	545	45%	25%	55%	0.37	2.66	299.91	Chesapeake Bay Program
Charles Barrett Elementary	2012-0104 01	Filtering Practices	StormFilter™ Stormwater Treatment System	5/20/2015	0.73	0.62	1.05	11.56	746	45%	29%	80%	0.47	3.31	596.45	VA BMP Clearinghouse MTD
Charles Barrett Elementary	2012-0104 03	Bioretention C/D soils, underdrain	Bioretention Filter	5/20/2015	1.62	1.38	2.33	25.68	1,659	45%	25%	55%	1.05	6.42	912.24	Chesapeake Bay Program
Totals					4.21	3.47	5.92	65.96	4,194.58	Totals			2.67	17.57	2,804.69	

*TN Efficiency for the Manufactured Treatment Devices was estimated from the Retrofit Curves and the VA BMP Clearinghouse TP efficiency.

Aggregate Accounting for Special Condition Requirement 7

POC Loads as of June 30, 2009 (Pre-Development)

Subsource	Pollutant	Total Existing Acres Served by MS4 as of 6/30/2009	2009 EOS Loading Rate (lbs/acre/yr)	Estimated Total POC Load as of 6/30/2009 (lbs/yr)
Regulated Impervious	Nitrogen	3,417.24	16.86	57,614.7
Regulated Pervious		3,991.57	10.07	40,195.1
Regulated Impervious	Phosphorus	3,417.24	1.62	5,535.9
Regulated Pervious		3,991.57	0.41	1,636.5
Regulated Impervious	Total Suspended Solids	3,417.24	1,171.32	4,002,682
Regulated Pervious		3,991.57	175.80	701,718

Post-Development Conditions July 1, 2014

Subsource	Pollutant	Total Existing Acres Served by MS4 as of 7/01/2014	2009 EOS Loading Rate (lbs/acre/yr)	Estimated Total POC Load as of 7/01/2014 (lbs/yr)
Regulated Impervious	Nitrogen	3,422.04	16.86	57,695.6
Regulated Pervious		3,986.77	10.07	40,146.8
Regulated Impervious	Phosphorus	3,422.04	1.62	5,543.7
Regulated Pervious		3,986.77	0.41	1,634.6
Regulated Impervious	Total Suspended Solids	3,422.04	1,171.32	4,008,304
Regulated Pervious		3,986.77	175.80	700,874

Total Load Change from "New Sources" between June 30, 2009 and July 1, 2014

Subsource	Pollutant	Estimated Total POC Loads as of 7/1/2014 (lbs/yr)	Estimated Total POC Load as of 6/30/2009 (lbs/yr)	Load Change (lbs/yr)	Total Load Change (lbs/yr)
Regulated Impervious	Nitrogen	57,695.6	57,614.7	80.9	32.6
Regulated Pervious		40,146.8	40,195.1	-48.3	
Regulated Impervious	Phosphorus	5,543.7	5,535.9	7.8	5.8
Regulated Pervious		1,634.6	1,636.5	-2.0	
Regulated Impervious	Total Suspended Solids	4,008,304	4,002,682	5,622	4,778
Regulated Pervious		700,874	701,718	-844	

Pollutant	Net Load Change (lbs/yr)*	Required Reduction during first permit cycle	Additional Red. Req'd. by the end of first permit cycle (lbs/yr)
Nitrogen	32.6	0.05	1.6
Phosphorus	5.8	0.05	0.3
Total Suspended Solids	4,778	0.05	239

*Reductions for BMPs related to development and/or redevelopment projects during this time are included in the July 1, 2009 to June 30, 2014 BMP Credits

Grandfathered Projects

Grandfathered Projects - BMP Reductions

Project	BMP ID	Chesapeake Bay Program BMP Type	BMP Name (Full)	Manufactured Treatment Device	Area Treated (ac)	Impervious Treated (ac)	TP Load [LB/YR]**	TN Load [LB/YR]**	TSS Load [LB/YR]**	TP BMP Efficiency	TN BMP Efficiency*	TSS BMP Efficiency	TP Removed [LB/YR]	TN Removed [LB/YR]	TSS Removed [LB/YR]	Efficiency Method
Partial Landbay I & Partial Landbay H Multi-Family	2011-0021 01	Filtering Practices	BayFilter™ Stormwater Filtration System	TRUE	0.695	0.21	1.27	8.80	598	50%	32%	80%	0.64	2.80	478.49	VA BMP Clearinghouse MTD
Lynn House - Proposed Addition	2003-0026 01	Filtering Practices	StormFilter™ Stormwater Treatment System	TRUE	1.16	0.69	1.02	7.07	481	45%	29%	80%	0.46	2.03	384.73	VA BMP Clearinghouse MTD
Lynn House - Proposed Addition	2003-0026 02	Hydrodynamic Structures	CDS® Stormwater Treatment System	TRUE	0.67	0.49	0.59	4.08	278	20%	13%	50%	0.12	0.52	138.88	VA BMP Clearinghouse MTD
Lynn House - Proposed Addition	2003-0026 03	Vegetated Open Channels C/D soils, no underdrain	Vegetated Filter Strip	FALSE	0.44	0.08	0.39	2.68	182	10%	10%	50%	0.04	0.27	91.21	Chesapeake Bay Program
Lynn House - Proposed Addition	2003-0026 04	Vegetated Open Channels C/D soils, no underdrain	Vegetated Filter Strip	FALSE	0.53	0.06	0.47	3.23	220	10%	10%	50%	0.05	0.32	109.86	Chesapeake Bay Program
Victory Center - Phase 1	2004-0037 01	Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	TRUE	4.49	3.44	7.72	53.28	3,623	20%	13%	50%	1.54	6.78	1811.60	VA BMP Clearinghouse MTD
5325 Polk Avenue	2005-0012 01	Hydrodynamic Structures	Downstream Defender® Stormwater Treatment Vortex Separator	TRUE	1.43	0.69	1.11	7.68	522	20%	13%	50%	0.22	0.98	260.99	VA BMP Clearinghouse MTD
Lindsay Lexus of Alexandria	2006-0006 01	Filtering Practices	StormFilter™ Stormwater Treatment System	TRUE	1.51	1.33	2.66	18.37	1,249	45%	29%	80%	1.20	5.26	999.43	VA BMP Clearinghouse MTD
Woodmont Park Apartments	2007-0003 01	Hydrodynamic Structures	Vortechs® Stormwater Treatment System	TRUE	0.91	0.91	1.07	7.38	502	20%	13%	50%	0.21	0.94	250.95	VA BMP Clearinghouse MTD
Woodmont Park Apartments	2007-0003 02	Hydrodynamic Structures	Vortechs® Stormwater Treatment System	TRUE	0.85	0.85	1.00	6.89	469	20%	13%	50%	0.20	0.88	234.40	VA BMP Clearinghouse MTD
Woodmont Park Apartments	2007-0003 03	Filtering Practices	StormFilter™ Stormwater Treatment System	TRUE	10.95	7.45	12.87	88.81	6,039	45%	29%	80%	5.79	25.44	4831.46	VA BMP Clearinghouse MTD
VEPCO - North Alexandria Electrical Substation	2007-0009 01	Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	TRUE	0.76	0.55	0.70	4.82	328	20%	13%	50%	0.14	0.61	163.99	VA BMP Clearinghouse MTD
Eisenhower East Small Area Plan (E.E.S.A.P.) - Block 20	2007-0017 01	Filtering Practices	Alexandria Compound Sand Filter	FALSE	0.96	0.82	1.38	9.51	647	60%	40%	80%	0.83	3.80	517.41	Chesapeake Bay Program
Eisenhower East Small Area Plan (E.E.S.A.P.) - Block 19	2007-0017 02	Filtering Practices	Alexandria Compound Sand Filter	FALSE	1.02	0.86	1.24	8.56	582	60%	40%	80%	0.74	3.42	465.45	Chesapeake Bay Program
Eisenhower East Small Area Plan (E.E.S.A.P.) - Block 19	2007-0017 03	Filtering Practices	Alexandria Compound Sand Filter	FALSE	1.86	1.55	2.26	15.60	1,061	60%	40%	80%	1.36	6.24	848.77	Chesapeake Bay Program
Hoffman Properties - Blocks 11 & 12	2009-0004 01	Filtering Practices	Dry Vault Sand Filter	FALSE	3.73	3.33	7.27	50.19	3,413	60%	40%	80%	4.36	20.07	2730.07	Chesapeake Bay Program
Hoffman Properties - Blocks 11 & 12	2009-0004 02	Bioretention C/D soils, underdrain	Bioretention Filter	FALSE	0.83	0.79	1.62	11.17	759	45%	25%	55%	0.73	2.79	417.65	Chesapeake Bay Program
Victory Center - Master Plan	2010-0011 01	Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	TRUE	4.43	3.83	7.22	49.83	3,388	20%	13%	50%	1.44	6.34	1694.08	VA BMP Clearinghouse MTD
Victory Center - Master Plan	2010-0011 02	Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	TRUE	1.03	0.88	1.68	11.58	788	20%	13%	50%	0.34	1.47	393.88	VA BMP Clearinghouse MTD
Victory Center - Master Plan	2010-0011 04	Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	TRUE	3.85	2.67	6.28	43.30	2,945	20%	13%	50%	1.26	5.51	1472.28	VA BMP Clearinghouse MTD
Victory Center - Master Plan	2010-0011 05	Hydrodynamic Structures	Aqua-Swirl® Stormwater Hydrodynamic Separator	TRUE	3.32	2.34	5.41	37.34	2,539	20%	13%	50%	1.08	4.75	1269.61	VA BMP Clearinghouse MTD
Potomac Yard Park (Pond P-2 Enlargement)	2010-0012 01	Wet Ponds and Wetlands	Wet Pond	FALSE	31.68	27.7	60.46	417.15	28,367	45%	20%	60%	27.21	83.43	17019.92	Chesapeake Bay Program
The Delaney	2011-0007 01	Filtering Practices	StormFilter™ Stormwater Treatment System	TRUE	1.3378	1.3378	2.16	14.92	1,014	45%	29%	80%	0.97	4.27	811.38	VA BMP Clearinghouse MTD
The Delaney	2011-0007 02	Bioretention C/D soils, underdrain	Tree Box Filter	FALSE	0.2826	0.2584	0.46	3.15	214	45%	25%	55%	0.21	0.79	117.84	Chesapeake Bay Program
Landmark Gateway - Phase 2	2013-0005 01	Filtering Practices	StormFilter™ Stormwater Treatment System	TRUE	0.83	0.73	1.33	9.21	626	45%	29%	80%	0.60	2.64	500.87	VA BMP Clearinghouse MTD
Totals					79.6	63.8	129.7	894.6	60,833.7	Totals			51.7	192.4	38,015.2	

*TN Efficiency for the Manufactured Treatment Devices was estimated from the Retrofit Curves and the VA BMP Clearinghouse TP efficiency.

**Simple Method was used

Grandfathered Projects

Grandfathered Projects - Offset Loads

Project	Project ID	Pre-Site Total Area (ac)	Pre-Site Impervious (ac)	Pre-Site Loading TP Rate (lb/ac/yr)	Post Site Total Area (ac)	Post Site Impervious (ac)	Post Site TP Loading Rate (lb/ac/yr)	TP LOAD to Offset [LB/YR]	TN Load to Offset [LB/YR]	TSS Load to Offset [LB/YR]
Partial Landbay I & Partial Landbay H Multi-Family	2011-0021	1.607	1.347	1.83	1.607	1.347	1.83	2.24	15.46	1,051
Lynn House - Proposed Addition	2003-0026	3.52	1.2	0.81	3.52	1.32	0.88	1.56	10.77	733
Victory Center - Phase 1	2004-0037	16.00	13.71	1.87	16	12.52	1.72	20.48	141.29	9,608
5325 Polk Avenue	2005-0012	2.38	0.15	0.24	2.38	0.77	0.78	0.80	5.55	377
Lindsay Lexus of Alexandria	2006-0006	1.63	1.52	2.03	1.63	1.31	1.76	2.16	14.88	1,012
Woodmont Park Apartments	2007-0003	17.69	8.06	1.05	17.69	9.15	1.18	13.01	89.77	6,105
VEPCO - North Alexandria Electrical Substation	2007-0009	1.63	0.4	0.62	1.63	0.64	0.92	0.78	5.40	367
Eisenhower East Small Area Plan (E.E.S.A.P.) - Block 20	2007-0017	2.81	1.96	1.55	2.81	1.81	1.44	2.80	19.31	1,313
Eisenhower East Small Area Plan (E.E.S.A.P.) - Block 19	2009-0004	2.85	0	0.11	2.85	1.53	1.22	2.21	15.25	1,037
Hoffman Properties - Blocks 11 & 12	2009-0004	4.27	3.79	1.94	4.27	3.82	1.95	6.45	44.49	3,025
Victory Center - Master Plan	2010-0011	16.00	13.71	1.87	16	11.82	1.63	19.04	131.38	8,934
Potomac Yard Park (Pond P-2 Enlargement)	2010-0012	31.68	13.31	0.98	31.68	27.7	1.91	46.52	320.97	21,826
The Delaney	2011-0007	2.33	2.24	2.09	2.33	1.7051	1.62	2.74	18.90	1,285
Landmark Gateway - Phase 2	2013-0005	6.32	5.99	2.06	6.32	4.6	1.61	7.38	50.92	3,463
Totals								128.2	884.4	60,137



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

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Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

December 29, 2015

Mark B. Jinks
City Manager
City of Alexandria
301 King St., Room 3500
Alexandria, VA 22314

Transmitted electronically: mark.jinks@alexandriava.gov

RE: Virginia Pollutant Discharge Elimination System (VPDES) MS4 Permit VAR040057, City of Alexandria, Chesapeake Bay TMDL Action Plan Approval

Dear Mr. Jinks:

The Department of Environmental Quality (DEQ) has reviewed the Chesapeake Bay TMDL Action Plan received on October 1, 2015 in accordance with Section I.C of the General VPDES Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4). Based on this review, DEQ has determined that the items included in the Chesapeake Bay TMDL Action Plan are consistent with the permit requirements; however, additional information is required. Additional information was received on December 14, 2015.

The Chesapeake Bay TMDL Action Plan is provisionally approved and is considered an enforceable part of the MS4 Program Plan. This provisional approval is conditioned upon DEQ's receipt and review of requested revisions to the Chesapeake Bay TMDL Action Plan as communicated by DEQ staff (attached). Please submit the required revisions by January 12, 2016. After review DEQ will provide the final approval of the Chesapeake Bay TMDL Action Plan.

Thank you for your cooperation through the TMDL Action Plan review and approval process. Please contact Kelsey Brooks at (804) 698-4321 or at kelsey.brooks@deq.virginia.gov if you have any questions.

Sincerely,

A handwritten signature in dark ink that reads "Allan Brockenbrough II".

Allan Brockenbrough II, P.E.
Manager, Office of VPDES Permits

Copies: File

Jesse Maines (Jesse.Maines@alexandriava.gov)

Bauer, Jaime (DEQ)

From: Brooks, Kelsey (DEQ)
Sent: Tuesday, December 29, 2015 1:33 PM
To: Jesse Maines
Subject: RE: VAR040057 Chesapeake Bay TMDL Action Plan - Additional Info Required

Hi Jesse,

Thank you for sending this additional information. We have a few follow up questions/comments:

1. As I mentioned in an email sent earlier today, the submission appears to be missing attachment 3. Please send that attachment.
2. We are unable to recreate the values in the summary table. If we add the reductions for each strategy provided in the table, we calculate the following values:

	TN (lbs/yr)	TP (lbs/yr)	TSS (lbs/yr)
Total Reductions	3383.58	421.5	340475.58

Please clarify whether the total proposed reductions provided in the addendum are correct or need to be updated.

If you have any questions, please let me know. Please provide this information no later than **January 12, 2016**.

Thank you,
Kelsey

From: Jesse Maines [mailto:Jesse.Maines@alexandriava.gov]
Sent: Monday, December 14, 2015 5:26 PM
To: Brooks, Kelsey (DEQ)
Cc: William Skrabak; Lalit Sharma; Brian Rahal; Joni Calmbacher; Jesse Maines
Subject: RE: VAR040057 Chesapeake Bay TMDL Action Plan - Additional Info Required

Kelsey,

Please find attached the City's response to the additional information request. Please feel free to call or email me if you have any additional questions. If I don't talk to you before, have a great holiday!

Thanks,

Jesse Maines, MPA
Watershed Management Planner
City of Alexandria
T&ES, Storm and Sanitary Infrastructure
703.746.4643 (direct)
571.414.8237 (mobile)

From: Brooks, Kelsey (DEQ) [mailto:Kelsey.Brooks@deg.virginia.gov]
Sent: Monday, November 30, 2015 11:43 AM
To: Jesse Maines
Subject: VAR040057 Chesapeake Bay TMDL Action Plan - Additional Info Required

Hello Jesse,

The Chesapeake Bay TMDL Action Plan for the City of Alexandria is currently under review. However, the following supplemental and/or clarifying information is necessary before the review of the Action Plan can be completed:

1. **Current Program and Legal Authority** – Please provide an affirmative statement that the permittee has sufficient legal authorities in place to meet the requirements of the TMDL.
2. **Service Area Delineation** – Please provide additional information on the method the permittee used to verify the forested acres that were excluded from the service area are greater than or equal to 900m² contiguous and are otherwise undeveloped.
3. **Gordon Recycling Limited Liability Corporation** – Our records indicate this facility is no longer active. The permittee should not exclude the lands draining from this site from its service area. Please revise the loading calculations appropriately.
4. **Historical BMPs** – Please provide the list of Historical BMPs that are being submitted for credit towards the TMDL. The list should include the following for each BMP:
 1. The date the BMP was installed
 2. The BMP type
 3. The method that was used to determine the BMP efficiency for each POC
 4. The BMP efficiency for each POC
 5. The reductions for each POC
5. **Lake Cook** – Please clarify if the lake is being expanded – it is unclear from the information provided how the lake is treating 15 acres in its present condition, but will treat 390 acres once it is upgraded.
6. **Eisenhower Pond 19** – The method the permittee used to determine the efficiencies used to determine the reductions for this pond is unclear from the information provided. Please provide the following information:
 1. The project's required reductions (total acres, percent impervious)
 2. The pond's total reductions
 3. The RD value that was used to determine the BMP's efficiencies
 4. The date the BMP was implemented.

In addition the TSS value provided in the description does not appear to match the value for TSS provided in Table 15. Please verify which value is correct.

7. **Cameron Station Pond** – Similarly to the Lake Cook project it is unclear to the Department why the pond is treating 94 acres prior to the ponds upgrade and 248.1 acres after the ponds upgrade if the facility's footprint is not increasing. Please provide additional information concerning the change in the pond's drainage area.
8. **Section 8.5** – Please provide the following information for each BMP summarized in Table 12:
 1. The date the BMP was installed
 2. The BMP type
 3. The BMP efficiency for each POC

Please note the values in Table 12 do not appear to match the values in Table 15. Please verify which of the reported values are correct.

9. **Four Mile Run Stream Restoration** – Please note that it is not appropriate to apply the stream restoration protocols to streams that are tidally influenced. Based on the information provided in this section, it does not appear that the application of Protocol 3 is appropriate.
10. **Aggregate Method Applications** – Please note that the calculations the permittee provided in Table 7 do not appear to match the method provided in Guidance Memo 15-2005. The permittee should also take in to account

the change in pervious acres when applying the aggregate accounting method. Please revise the provided calculations.

11. **Grandfathered Projects** – Please provide the list of grandfathered projects summarized in Table 8. Also, please provide the same information as requested in comment 3 for the BMPs that were included in Table 8.
12. **Public Comment Period** – This process should have been completed prior to the Action Plan submittal. If the permittee has posted the plan and solicited comments, please let us know. If not, this process should be undertaken as soon as possible.

Please provide the above information no later than **December 14, 2015**. If there is information in the Action Plan that explains these issues that has been overlooked, please let me know.

If you have any questions, please contact me at **804-698-4321** or kelsey.brooks@deq.virginia.gov.

Thank you,
Kelsey Brooks

MS4 Stormwater Specialist
Department of Environmental Quality
629 E Main St, Richmond, VA 23219
P: (804) 698-4321
E: kelsey.brooks@deq.virginia.gov



**DEPARTMENT OF TRANSPORTATION
AND ENVIRONMENTAL SERVICES**

**P.O. Box 178 - City Hall
Alexandria, Virginia 22313
703-746-4025
www.alexandriava.gov**

January 7, 2016

Via Email: kelsey.brooks@deq.virginia.gov

Kelsey Brooks
MS4 Stormwater Specialist
Department of Environmental Quality
629 E Main St, Richmond, VA 23219

RE: City of Alexandria Response to DEQ Additional Information Request: MS4 VAR040057
Chesapeake Bay TMDL 5% Action Plan

Ms. Brooks:

The City received an electronic letter regarding the “Virginia Pollutant Discharge Elimination System (VPDES) MS4 Permit VAR040057, City of Alexandria, Chesapeake Bay TMDL Action Plan Approval” dated December 29, 2015 and signed by Allan Brockenbrough II, P.E. This letter was in response to the City’s “Chesapeake Bay TMDL Action Plan for 5% Compliance” and the December 14, 2015 submittal of additional information based on a request from the Virginia Department of Environmental Quality (DEQ). The letter provided provisional approval of the City’s Chesapeake Bay TMDL Action Plan conditioned upon DEQ’s receipt and review of requested information, which is provided herein.

The responses below are provided to address the additional information and/or clarifications requested by DEQ staff in the December 29, 2015 provisional approval letter and will be considered as an addendum to the Action Plan. Your request is provided in italics below in its entirety, along with the City’s responses in non-italics. With this additional information and clarification, we look forward to receiving DEQ’s Final Approval of the Chesapeake Bay TMDL Action Plan.

Hi Jesse,

Thank you for sending this additional information. We have a few follow up questions/comments.

- 1. As I mentioned in an email I sent earlier today, the submission appear to be missing attachment 3. Please send the attachment.*

Response: Attachment 3 was inadvertently left off the previous response and is attached to this letter.

- 2. We are unable to recreate the values in the summary table. If we add the reductions for each strategy provided in the table, we calculate the following values:*

	TN (lbs/yr)	TP (lbs/yr)	TSS (lbs/yr)
Total Reductions	3383.58	421.5	340475.58

Please clarify whether the proposed reductions provided in the addendum are correct or need to be updated.

Response: The proposed reductions provided in the December 14, 2015 response letter needed to be updated. The table below has been updated and the values match the total proposed reductions you outlined above.

Reduction Strategies	N (lbs)	100% Goal²	P (lbs)	100% Goal²	TSS (lbs/yr)	100% Goal²
2006-2009 BMPs	1305.10	17.2	158.00	15.48	150,452.00	8.69
Post-2009 BMPs	110.24	1.5	14.88	4.44	17,051.59	4.59
Regional Facilities – Lake Cook	1586.97	20.9	163.25	15.79	131,334.00	15.2
Regional Facilities – Pond 19	168.90	2.2	42.70	1.52	23,919.30	1.35
Retrofits on City Property	17.57	0.2	2.67	1.48	2,804.69	0.12
Urban Stream Restoration – Four Mile Run	194.80	2.6	40.00	3.87	14,914.00	1.73
Total Proposed Reductions	3383.58	44.5	421.50	42.58	340,475.58	31.68
<i>Total Required Reductions (3 permit cycles)</i>	<i>7,597.00</i>	<i>100%</i>	<i>1,004.40</i>	<i>100%</i>	<i>861,936.64</i>	<i>100%</i>

1. Assumes all grandfathered projects to be offset this permit cycle.
2. 100% goal is based on L2 scoping.

As noted in our December 14, 2015 response letter, the City will provide annual compliance reporting on the implementation of strategies to meet the City's Bay TMDL targets per the requirements of the MS4 general permit and DEQ's Guidance.

Please feel free to contact me at jesse.maines@alexandriava.gov or 703-746-4643 should you have any additional questions.

Sincerely,



Jesse E. Maines, MPA, CPESC
Watershed Management Planner
Transportation and Environmental Services
Stormwater & Sanitary Infrastructure Division

Cc: William J. Skrabak, Deputy Director, T&ES Infrastructure and Environment
Lalit K. Sharma, PE, Division Chief, T&ES, Stormwater & Sanitary Infrastructure Division
Brian Rahal, PE, T&ES, S&SI, Stormwater Section Lead

Attachment: Attachment 3 – Aggregate Accounting 2009-2014 Offsets



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Street address: 629 East Main Street, Richmond, Virginia 23219

Mailing address: P.O. Box 1105, Richmond, Virginia 23218

www.deq.virginia.gov

Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

January 12, 2016

Mark B. Jinks
City Manager
City of Alexandria
301 King St.
Room 3500
Alexandria, VA 22314

Transmitted electronically: mark.jinks@alexandriava.gov

RE: Virginia Pollutant Discharge Elimination System (VPDES) MS4 Permit
VAR040057, City of Alexandria, Chesapeake Bay TMDL Action Plan Approval

Dear Mr. Jinks:

The Department of Environmental Quality (DEQ) has reviewed the Chesapeake Bay TMDL Action Plan received on October 1, 2015 in accordance with Section I.C of the General VPDES Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4). Additional information was received November 19, 2015 and January 7, 2016.

As submitted, the action plan will result in the following annual reduction of pollutants of concern in the Potomac River Basin:

Pollutant of Concern	Annual Load Reduction (lb/yr)	Percentage of L2 Reduction Achieved After Implementation	Percentage of New Source Reduction Achieved After Implementation
Total Nitrogen	3,383.58	44.44%	5%
Total Phosphorus	421.50	39.01%	5%
Total Suspended Solids	340,475.58	39.24%	5%

The Chesapeake Bay TMDL Action Plan is hereby approved and is an enforceable part of the MS4 Program Plan. The approved action plan is based on the 2000 Urbanized Area as designated by the U.S. Census Bureau; and reductions were calculated based on land use data from 2009. Please note that additional reductions may be required to address loads from expanded urbanized area as a result of the 2010 Census in accordance with Section II.C.5 of the MS4 General Permit.

Please note any modifications to the Chesapeake Bay TMDL Action Plan shall be made in accordance with the Program Plan Modification Section of the MS4 General Permit (Section II.F).

As provided by Rule 2A:2 of the Supreme Court of Virginia, you have thirty (30) days from the date you received this decision within which to appeal this decision by filing a notice of appeal in accordance with the Rules of the Supreme Court of Virginia with the Director, Virginia Department of Environmental Quality.

Please contact Kelsey Brooks at (804) 698-4321 or at kelsey.brooks@deq.virginia.gov if you have any questions.

Sincerely,

A handwritten signature in dark ink, reading "Allan Brockenbrough II". The signature is fluid and cursive, with a stylized "II" at the end.

Allan Brockenbrough II, P.E.
Manager, Office of VPDES Permits

Copies: File

Jesse Maines (Jesse.Maines@alexandriava.gov)



**DEPARTMENT OF TRANSPORTATION
AND ENVIRONMENTAL SERVICES**

**P.O. Box 178 - City Hall
Alexandria, Virginia 22313
703-746-4025
www.alexandriava.gov**

February 11, 2016

Via Email: kelsey.brooks@deq.virginia.gov

Kelsey Brooks
MS4 Stormwater Specialist
Department of Environmental Quality
629 E Main St, Richmond, VA 23219

RE: City of Alexandria Response to Calculation Table in DEQ Approval Letter: MS4 VAR040057
Chesapeake Bay TMDL 5% Action Plan

Ms. Brooks:

The City received an electronic letter regarding the “Virginia Pollutant Discharge Elimination System (VPDES) MS4 Permit VAR040057, City of Alexandria, Chesapeake Bay TMDL Action Plan Approval” dated January 12, 2016 and signed by Allan Brockenbrough II, P.E. This letter provided approval of the City’s “Chesapeake Bay TMDL Action Plan for 5% Compliance.”

We revisited the calculations related to the grandfathered projects and realized that the required pollutant reductions needed to be updated based on each project situation. The updated grandfathered calculations are attached. As a result, values for the “Percentage of L2 Reduction Achieved” also changed (see table below). This table follows the format and calculation methods that you previously provided.

Please keep in mind that the City’s requirement for projects to meet the Water Quality Volume Default (1/2” treatment over the site’s entire impervious surface) is a more stringent requirement beyond the application of the average land cover condition. Because of this, grandfathered projects achieved more reductions than would be expected if only the average land cover condition were applied.

Summary - Annual Reduction of Pollutants of Concern (lb/yr)

Pollutant of Concern	Total Reductions from BMPs	Special Condition 6 Req'd Reductions - Table 3b	Total Req'd Reductions - All Cycles	Special Condition 7 New Sources Reductions	Special Condition 8 Grandfathered Reductions	BMP Removal to Meet L2	Percent of L2 Achieved
Total Nitrogen	3,383.58	379.85	7,597.03	1.63	72.79	3,309.16	43.56%
Total Phosphorus	421.50	50.22	1,004.40	0.29	-12.61	433.81	43.19%
Total Suspended Solids	340,475.58	43,096.83	861,936.64	238.92	-19,327.02	359,563.68	41.72%

As noted in our January 8, 2016 response letter, the City will provide annual compliance reporting on the implementation of strategies to meet the City's Bay TMDL targets per the requirements of the MS4 general permit and DEQ's Guidance.

I agree that the best way to proceed is with a revised approval letter with an updated calculation table. Please feel free to contact Joni Calmbacher at joni.calmbacher@alexandriava.gov or 703-746-4174 should you have any additional questions.

Sincerely,

A handwritten signature in blue ink, appearing to read "Jesse E. Maines".

Jesse E. Maines, MPA, CPESC
Watershed Management Planner
Transportation and Environmental Services
Stormwater & Sanitary Infrastructure Division

Cc: William J. Skrabak, Deputy Director, T&ES Infrastructure and Environment
Lalit K. Sharma, PE, Division Chief, T&ES, Stormwater & Sanitary Infrastructure Division
Brian Rahal, PE, T&ES, S&SI, Stormwater Section Lead

Attachment: Updated Attachment 4b – Grandfathered Projects – Loads, BMP Reductions, and Net Loads

Grandfathered Projects

UPDATED Attachment 4B: Grandfathered Projects - Loads, BMP Reductions, and Net Loads

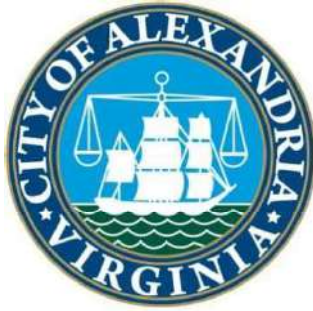
Project	Project ID	Pre-Site Total Area (ac)	Pre-Site Impervious (ac)	Pre-Site Loading TP Rate (lb/ac/yr)	Post Site Total Area (ac)	Post Site Impervious (ac)	Post Site TP Loading Rate (lb/ac/yr)	Existing % Impervious	Proposed % Impervious	Situation	TP Load to Offset [lb/yr]*	TN Load to Offset [lb/yr]*	TSS Load to Offset [lb/yr]*	TP Reduced by BMPs (lb/yr)	TN Reduced by BMPs (lb/yr)	TSS Reduced by BMPs (lb/yr)
Partial Landbay I & Partial Landbay H Multi-Family	2011-0021	1.607	1.347	1.83	1.607	1.347	1.83	84%	84%	SITUATION 3	0.29	2.03	138	0.64	2.80	478.49
Lynn House - Proposed Addition	2003-0026	3.52	1.2	0.81	3.52	1.32	0.88	34%	38%	SITUATION 1	0.25	1.70	116	0.67	3.14	724.68
Victory Center - Phase 1	2004-0037	16.00	13.71	1.87	16	12.52	1.72	86%	78%	SITUATION 3	0.55	3.82	260	1.54	6.78	1,811.60
5325 Polk Avenue	2005-0012	2.38	0.15	0.24	2.38	0.77	0.78	6%	32%	SITUATION 1	1.28	8.82	600	0.22	0.98	260.99
Lindsay Lexus of Alexandria	2006-0006	1.63	1.52	2.03	1.63	1.31	1.76	93%	80%	SITUATION 3	-0.10	-0.69	-47	1.20	5.26	999.43
Woodmont Park Apartments	2007-0003	17.69	8.06	1.05	17.69	9.15	1.18	46%	52%	SITUATION 3	3.89	26.86	1,827	6.21	27.26	5,316.81
VEPCO - North Alexandria Electrical Substation	2007-0009	1.63	0.4	0.62	1.63	0.64	0.92	25%	39%	SITUATION 1	0.49	3.40	231	0.14	0.61	163.99
Eisenhower East Small Area Plan (E.E.S.A.P.) - Block 20	2007-0017	2.81	1.96	1.55	2.81	1.81	1.44	70%	64%	SITUATION 3	0.13	0.87	59	0.83	3.80	517.41
Eisenhower East Small Area Plan (E.E.S.A.P.) - Block 19	2009-0004	2.85	0	0.11	2.85	1.53	1.22	0%	54%	SITUATION 2	2.21	15.25	1,037			
Hoffman Properties - Blocks 11 & 12	2009-0004	4.27	3.79	1.94	4.27	3.82	1.95	89%	89%	SITUATION 3	0.89	6.13	417	5.09	22.87	3,147.72
Victory Center - Master Plan	2010-0011	16.00	13.71	1.87	16	11.82	1.63	86%	74%	SITUATION 3	-0.88	-6.09	-414	4.12	18.08	4,829.86
Potomac Yard Park (Pond P-2 Enlargement)	2010-0012	31.68	13.31	0.98	31.68	27.7	1.91	42%	87%	SITUATION 3	30.19	208.31	14,165	27.21	83.43	17,019.92
The Delaney	2011-0007	2.33	2.24	2.09	2.33	1.7051	1.62	96%	73%	SITUATION 3	-0.61	-4.22	-287	1.18	5.06	929.22
Landmark Gateway - Phase 2	2013-0005	6.32	5.99	2.06	6.32	4.6	1.61	95%	73%	SITUATION 3	-1.55	-10.70	-728	0.60	2.64	500.87
Totals											37.0	255.5	17,374	49.6	182.7	36,701

Grandfathered Net Loads	-12.6	72.8	-19,327.0
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*Negative values indicate a pollutant credit

City of Alexandria
Municipal Separate Storm Sewer System (MS4) Program Plan

Appendix H – Local TMDL Action Plans



City of Alexandria, Virginia

**Bacteria
Total Maximum Daily Load (TMDL)
Action Plan**

**For compliance with 9VAC25-890, General VPDES Permit for Discharges
of Stormwater from Small Municipal Separate Storm Sewer Systems,
Permit No. VAR040057**

**June 17, 2015
Revised November 20, 2015
Revised June 30, 2016
Revised April 15, 2020**

Prepared by:

City of Alexandria, Virginia
Department of Transportation and Environmental Services
Stormwater Management Division

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1. Introduction

The General Virginia Pollutant Discharge Elimination System (VPDES) Permit for Discharges of Stormwater from Municipal Separate Storm Sewer Systems (MS4) No. VAR040057 was issued to the City of Alexandria (City) from the Virginia Department of Environmental Quality (VDEQ) effective November 1, 2018 (2018 MS4 permit). This permit contains special conditions for local total maximum daily loads (TMDL) under Part II, TMDL Special Conditions, Section B, Local TMDL Special Condition. This section of the permit requires the City to update any previously approved local TMDL action plans for TMDLs approved by the U.S. Environmental Protection Agency (EPA) prior to July 1, 2013, no later than 18-months after the permit effective date. This action plan was first developed and submitted by the City in 2015 in response to the Special Conditions included in the City's General VPDES MS4 Permit, effective July 1, 2013 (2013 MS4 permit). The 2013 MS4 permit included the requirement for the City to develop action plans to address TMDLs where a wasteload allocation (WLA) has been assigned to the MS4. This action plan was most recently updated June 30, 2016 and is found as an appendix to the most recent *MS4 Program Plan* (2019). This action plan identifies best management practices, measurable goals and milestones, and evaluation measures; assesses all significant sources; and includes a method to assess effectiveness of the plan in reducing the WLA pollutant. In accordance with Table 1 in the 2013 MS4 permit, the City was required to develop this *Bacteria TMDL Action Plan* no later than June 30, 2015, for TMDLs approved by the State Water Control Board (SWCB) or EPA prior to July 2008 and no later than June 30, 2016, for TMDLs approved between July 2008 and June 2013. This action plan was developed initially based on the requirements in the 2013 MS4 permit, as well as the local TMDL Guidance memo dated issued by VDEQ in 2015. The *Non-Tidal Four Mile Run Action Plan* submitted to VDEQ in 2015 was updated to include all of the current bacteria TMDLs within the City to create a comprehensive *Bacteria TMDL Action Plan*.

2. Background

This action plan updates the previously approved local TMDL action plan. The bacteria TMDLs addressed in this action plan are identified in Table 1.

Table 1. City of Alexandria's Approved Bacteria TMDLs

Approved Bacteria TMDLs
<p><i>Fecal Coliform TMDL Development for Four Mile Run, Virginia (Non-Tidal)</i></p> <ul style="list-style-type: none"> • Bacteria – fecal coliform • First listed – 1998 • EPA approval – 5/31/2002 • SWCB approval – 6/17/2004
<p><i>Bacteria TMDL for the Tidal Four Mile Run Watershed</i></p> <ul style="list-style-type: none"> • Bacteria – <i>E. coli</i> • First listed – 1996 • EPA approval – 6/14/2010 • SWCB approval – 9/30/2010
<p><i>Bacteria TMDLs for the Hunting Creek, Cameron Run, and Holmes Run Watersheds</i></p> <ul style="list-style-type: none"> • Bacteria – <i>E. coli</i> • First listed – 1998, 2006, 2004 (respectively) • EPA approval – 11/10/2010 • SWCB approval – 8/4/2011

VDEQ initially listed the Four Mile Run watershed as impaired on the Commonwealth's *Final 1998 305(b)/303(d) Water Quality Assessment Integrated Report*. Four Mile Run is a direct tributary of the Potomac River and is identified as Virginia River Segment VAN-A12R. The non-tidal portion of Four Mile Run associated with the City starts at the western border with Arlington County and extends to approximately the Mount Vernon Avenue Bridge across Four Mile Run. The *Fecal Coliform TMDL Development for Four Mile Run, Virginia* (NVRC, 2002), addresses a fecal coliform impairment and includes approximately 17.0 square miles of the watershed that was approved by the SWCB on June 17, 2004. According to Section 5.2 of the TMDL document, "there are no WLAs for fecal coliform bacteria in the non-tidal portion of the Four Mile Run watershed." In developing the *Bacteria TMDL Action Plan* to meet the requirements in the 2013 MS4 permit, the City took a proactive approach to protecting local water quality and included the non-tidal portion of Four Mile Run despite a WLA not being assigned to the City.

The impaired tidal portion of Four Mile Run associated with the City starts at approximately the Mount Vernon Avenue Bridge and continues east to the confluence with the Potomac River. The corresponding TMDL document for this section of stream is entitled *Bacteria TMDL for the Tidal Four Mile Run Watershed* (ICPRB, 2010) and was approved by the SWCB on September 30, 2010. The TMDL report provides an aggregate WLA for the City.

Hunting Creek, Cameron Run, and Holmes Run are all located within the Potomac River basin within HUC PL26. The impaired segment of Homes Run extends from the confluence of Holmes Run and Backlick Run upstream to the mouth of Lake Barcroft in Fairfax County. The impaired segment of Cameron Run extends from approximately Telegraph Road upstream to the confluence of Holmes Run and Backlick Run. The impaired segment of Hunting Creek extends from the confluence with the Potomac River at the state boundary to Telegraph Road. The corresponding TMDL document for these impaired stream sections is entitled *Bacteria TMDLs for the Hunting Creek, Cameron Run, and Holmes Run Watersheds* (ICPRB, 2010) and was

approved by EPA in November 2010. The TMDL report provides an aggregated WLA for the City for each of the three streams.

This action plan identifies best management practices (BMP) and other interim milestone activities that were identified during the 2013 – 2018 MS4 permit cycle and continue to be implemented during the 2018 – 2023 MS4 permit cycle. New or modified requirements will be considered and incorporated, as applicable.

3. Legal Authorities to Reduce Pollutant of Concern

The City has a number of legal tools available to address the possible discharge of bacteria from municipal facilities, development and redevelopment projects, or private properties.

The MS4 general permit regulates discharges from properties that are owned or operated by the City. The City may use its expressed or implied authorities to regulate private lands with regard to stormwater management and MS4 permit requirements. This action plan addresses possible pollutant sources from private properties as well as municipal properties. The City may utilize its rights as the property owner or lessee to address possible sources of bacteria which may originate from the property.

Article XII of the Alexandria Zoning Ordinance (the Environmental Management Ordinance) contains the requirements for standard plan submission requirements. Standard conditions developed during the plan review and Special Use Permit (SUP) processes are enforceable through the Zoning Ordinance. Development plans and SUPs subject to standard conditions must go before the Planning Commission and City Council for consideration before approval.

Section 5-7-42.1 of the City Code prohibits leaving dog waste in public parks or playgrounds, and Section 5-7-46 allows for levying fines for pet owners that do not pick up after their pets. Pet owners not cleaning up after their pet or disposing of pet waste bags in a storm drain may be subject to other parts of the City code.

For pet owners improperly disposing of pet waste, staff from the Fire Marshall's Office with the Environmental Investigations Unit (EIU) may enforce Chapter 13 of Title 11 of the City Code (Environmental Offenses), which prohibits non-stormwater discharges to the storm sewer system.

4. Planning Framework

a. Principles

The City has established the following overarching principles to guide the approach to meet the goals of this action plan:

- Utilize existing programs and efforts;
- Encourage voluntary, practical, and cost-effective practices;
- Follow an adaptive, iterative approach;
 - Replaces dependency on numerical models and traditional planning by applying a focused "learning-by-doing" approach to decision making;
- Focus on phased implementation over multiple permit cycles; and
- Identify additional funding needs.

b. Action Goals

The City has established the following goals consistent with the principles in developing the action plan:

- Consistent: The action plan is consistent with the assumptions and requirements of the TMDL and conforms to general permit requirements and current *MS4 Program Plan* efforts to reduce pollutants to the maximum extent practicable.
- Flexible: The controls, BMPs, design and methods discussed to reduce the pollutant of concern can be revised based on the observed effectiveness of these measures over multiple permit cycles, stakeholder involvement in the development of an implementation plan, change to a water quality standard, or introduction of new technologies and innovations to address the pollutant.
- Cost Effective: The City's 2019 *MS4 Program Plan* incorporates both (1) pet waste and (2) illicit discharges as the top high-priority stormwater issues which both help with reducing bacteria loads to local waterways as well as our MS4 permit requirements.

5. TMDL Development and Load Determination

The following sections provide an overview about the development of the bacteria TMDLs and corresponding WLA for the City.

The Commonwealth's Surface Water Standards with General, Statewide Application, 9VAC25-260-10, designates the following uses for all water bodies: recreational uses, e.g., swimming and boating; the propagation and growth of a balanced, indigenous population of aquatic life, including game fish, which might reasonably be expected to inhabit them; wildlife; and the production of edible and marketable natural resources, e.g., fish and shellfish.

a. Four Mile Run Non-Tidal

The recreation designated use for the non-tidal section of Four Mile Run is currently listed as impaired. The impairment for the non-tidal portion of Four Mile Run was originally listed in Virginia's *Final 1998 305(b)/303(d) Water Quality Assessment Integrated Report* due to exceedances of the state's water quality criteria for fecal coliform. The fecal coliform TMDL was approved by the SWCB on June 17, 2004, and EPA decision rationale dated May 31, 2002. The impairment for the non-tidal segment begins at the headwaters of Four Mile Run just over nine miles upstream of its confluence with the Potomac River and extends to the tidal/non-tidal boundary approximately 1.5 miles upstream of the Potomac River. Although the entire Four Mile Run watershed includes approximately 19.7 square miles of Northern Virginia, only 17.0 square miles were considered for this TMDL Study. The City of Alexandria makes up about 10 percent, 1.7 square miles, of the portion of the watershed included in the study.

The TMDL was developed prior to the issuance of the City's first MS4 general permit. Per Section 5.2.1 of the *Fecal Coliform TMDL (Total Maximum Daily Load) Development for Four Mile Run, Virginia* (NVRRC, 2002), since the City was expected to receive an MS4 permit soon after the TMDL was developed, WLAs for the TMDL were developed based on contributions from impervious surfaces in the study area. Per Section 5.2 of the TMDL report, there was no

WLA assigned to the City, however, the non-tidal section of Four Mile Run being included in this action plan is part of the City's ongoing proactive approach to protecting water resources. In general, "the Commonwealth intends for the required reductions to be implemented in an iterative process" as evidenced by the types of strategies discussed in the *Implementation Plan for Fecal Coliform TMDL (Total Maximum Daily Load) for Four Mile Run, Virginia* (NVRC, 2004).

b. Four Mile Run Tidal

The fish consumption and recreation designated uses for the tidal section of Four Mile Run are currently listed as impaired due to water quality exceedance associated with *Escherichia coli* (*E. coli*) bacteria. The tidal portion of Four Mile Run was originally listed as impaired for fecal coliform in 1996 and was listed as impaired for *E. coli* bacteria in 2008. The TMDL developed for the *E. coli* bacteria was approved by the SWCB on September 30, 2010, with the EPA decision rationale published June 14, 2010. The impairment for the tidal segment is from rivermile 1.46 (tidal/non-tidal boundary) downstream until the confluence with the Potomac River.

The *Bacteria TMDL for the Tidal Four Mile Run Watershed* (ICPRB, 2010) was built upon the TMDL for the non-tidal portion of the river, with WLAs developed only for the tidal drainage below the non-tidal portion of Four Mile Run. The model simulated fecal coliform bacteria which were converted to the equivalent *E. coli* bacteria using an instream translator. The TMDL documents an aggregate WLA of 1.53E+13 cfu/year for the City, Virginia Department of Transportation, and the George Washington Memorial Parkway. According to the TMDL, this equates to a 94 percent reduction for those regulated sources (see Table 2). A TMDL Implementation Plan has not been developed in response to this TMDL.

Table 2. *E. Coli* WLA for Four Mile Run (Tidal) for City of Alexandria

Water Name	Aggregated MS4s	WLA (cfu/yr)	Percent Reduction (%)
Four Mile Run (Tidal) VAN_A12E_FOU01A00	City of Alexandria, VDOT, G.W. Memorial Parkway	1.53E+13	94

c. Hunting Creek, Cameron Run, and Holmes Run

Hunting Creek, Cameron Run, and Holmes Run are all located within the Potomac River basin. The impaired segment of Hunting Creek extends from the confluence with the Potomac River at the state boundary to Telegraph Road. Hunting Creek is currently listed as impaired for the designated uses of aquatic life, fish consumption, open-water aquatic life, and recreation beginning in 1998.

Cameron Run (VAN-A13-CAM01A04) was delisted in the *Final 2014 305(b)/303(d) Water Quality Assessment Integrated Report* and was found as supporting in the *Final 2016 305(b)/303(d) Water Quality Assessment Integrated Report*. However, this stream segment is listed as impaired in the *Final 2018 305(b)/303(d) Water Quality Assessment Integrated Report*.

The impaired segment of Homes run extends from the confluence of Holmes Run and Backlick Run upstream to the mouth of Lake Barcroft. The designated use of recreation has a current status of impaired. Similarly to Hunting Creek and Cameron Run, Holmes Run was listed as impaired for bacteria in 2004.

The *Bacteria TMDLs for the Hunting Creek, Cameron Run, and Holmes Run Watersheds* (ICPRB, 2010) were developed using Hydrologic Simulation Program-Fortran (HSPF) and Euler-Lagrangian Circulation (ELCIRC) models.

Table 3 presents the aggregated WLAs for the City for each stream. *E. coli* bacteria concentrations are measured in coliform forming units (cfu) expressed annually.

Table 3. *E. Coli* WLA for Holmes Run, Hunting Creek, and Cameron Run for City of Alexandria

Water Name	Aggregated MS4s	WLA (cfu/yr)	Percent Reduction (%)
Holmes Run VAN_A13R_HOR01A00	City of Alexandria and VDOT	2.40E+13	83
Hunting Creek VAN_A13E_HUT01A02	City of Alexandria, VDOT, G.W. Memorial Parkway	3.73E+13	92
Cameron Run VAN_A13R_CAM01A04	City of Alexandria and VDOT	3.20E+13	83

6. Possible Significant Sources of Bacteria

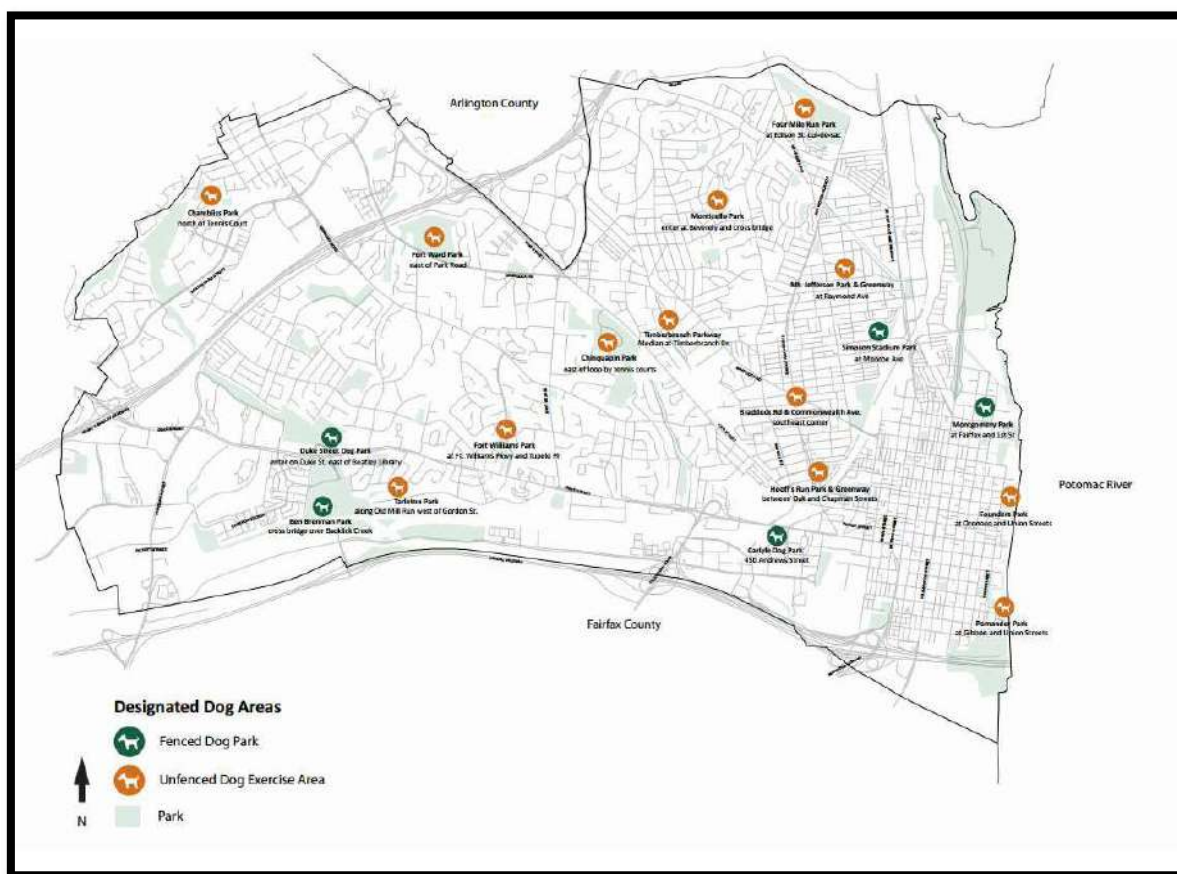
Potential contributors to the bacterial impairments, as documented in the TMDL reports, include wildlife (deer, raccoon, muskrat, beaver, and waterfowl), canine, human, and other. In April 2017, the Virginia General Assembly passed a new law requiring the remediation of the City's combined sewer outfalls by July 1, 2025. In partnership with Alexandria Renew Enterprises, the City submitted a Long Term Control Plan to VDEQ in 2018 which calls for the construction of a system of underground tunnels to convey combined sewage to the wastewater treatment facility.

As is the case for many streams, reductions from wildlife sources are not realistic and do not meet EPA's guidance for reasonable assurance. According to analyses of the water quality modeling, many streams with high wildlife inputs "will not attain standards under all flow regimes at all times." While there are a few options available, "the reduction of wildlife or changing a natural background

condition is not the intended goal of a TMDL.” According to the City’s bacteria TMDLs, “Virginia and EPA are not proposing the elimination of wildlife to allow for the attainment of water quality standards.”

The City does have several fenced dog parks and unfenced dog exercise areas as seen in Figure 1. These locations have been identified as having the potential to produce bacterial pollutant loadings which are greater than the average loading for the City’s MS4 area. As a result, the City targets dog owners for outreach and education. In addition, the City distributes dog waste bags and supports pet waste stations. See Section 7 for additional information.

Figure 1. Dog Parks within the City of Alexandria, VA



7. Best Management Practices, Controls, and Design

Adaptive management is an iterative implementation process that makes progress toward achieving water quality goals while using new data and information to reduce uncertainty and adjust implementation activities. The focus is oriented towards increasingly efficiently enforcing pet waste laws, educating the public on the impact of pet waste, implementation of the illicit discharge and dumping program, and performing routine inspection and maintenance of the infrastructure. Strategies may change if warranted by new data and information.

National Pollutant Discharge Elimination System regulations allow the use of non-numeric, BMP-based water quality based effluent limits (WQBEL) where “[n]umeric effluent limitations are

infeasible; or [t]he practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA” (40 CFR 122.44(k) 3-4). Adaptive implementation principles used to implement BMPs to address bacteria sources are appropriate due to the uncertainty associated with the TMDL loading capacity and specific allocation scheme.

The non-tidal Four Mile Run TMDL does not contain specific numeric waste load allocations for MS4 permits in the watershed, but rather discusses a number of best management practices that may be employed to address possible pollutant sources within the watershed. The tidal Four Mile Run and Hunting Creek/Cameron Run/Holmes Run TMDLs includes aggregated WLAs for the City’s MS4.

Many of the BMPs discussed in the *Implementation Plan for the Fecal Coliform TMDL for Four Mile Run, Virginia* (NVRC, 2004) have been and continue to be implemented by the City to address the bacteria impairment in the watershed. The City’s *2019 MS4 Program Plan* includes specific local education and outreach strategies to address “Bacteria from Pet Waste” as one of the identified top three high-priority water quality issues.

a. Pet Ordinance

Section 5-7-46 of the City Code allows for levying fines for pet owners that do not pick up after their pets at public parks. Pet owners not cleaning up after their pet or disposing of pet waste bags in a storm drain may be subject to the City Code of Ordinances Title 11, Chapter 13 Environmental Offenses for illicit discharges to the storm drain system.

Milestones, Measurable Goals and Assessment Methods

The City has found that these two codes sections are effective in reinforcing proper behavior for pet owners. The City will review the effectiveness of the pet ordinance and the Environmental Offenses annually. This effort will include a review of the annual follow-up survey data that is provided by the Northern Virginia Regional Commission (NVRC) Clean Water Partners – of which the City is a member partner – with the previous year’s survey data. Additionally, the City tracks citizen complaints and results of proactive staff efforts related to improper disposal of pet waste in an asset management system database and/or the permit tracking system. Annual results exported from these databases associated with pet waste will be compared to the previous year’s results.

The goal of these code sections is to illuminate and reinforce proper behavior. This review will seek to identify trends in behavior using these two metrics. If this review shows a precipitous upward trend in improper behavior, the City will consider revising the code to better address increased improper behavior. The results of these activities are presented in the MS4 annual report.

b. Education and Outreach

An enhancement to the MS4 Public Education and Outreach Plan that increased efforts and created more measurable goals and specifically identified “Bacteria from Pet Waste” as one of the top three high-priority water quality issues is included in the *2019 MS4 Program Plan*. BMPs to address bacteria were introduced in the City’s inaugural permit for the 2003 – 2008 permit cycle, the 2008 – 2013 permit cycle, the 2013 – 2018 permit cycle, and the current 2018 – 2023 permit. This is in addition to the City’s continued participation as an active partner in the NVRC Clean Water Partners regional education and outreach program. The goal of these efforts is to reduce bacteria pollution from pet sources by educating owners of the importance of picking up after their pets, while making it convenient for them to dispose of the waste after picking it up. Therefore, dog owners continue to be targeted with education and outreach efforts.

Milestones, Measurable Goals and Assessment Methods

Education and outreach messaging use various forms of media and message delivery, while pet waste stations make it more convenient for dog owners to perform this task. Given that addressing bacteria from pet waste is one of the City’s high-priority water quality issues, the goal of the outreach effort is to reach at least 20% of pet owners annually to comply with permit requirements. The City’s proposed efforts are captured in the *MS4 Program Plan* and actions are included in the annual report

- Create and distribute annually at least one education message for distribution via the City’s electronic email alert system (*eNews*) and estimate the number of dog owners reached.
- Create and distribute annually at least one message on social media about picking up after pets and properly disposal of the waste and estimate the number of dog owners reached.
- Distribute the Pet Waste brochure annually at appropriate events, at the Animal Shelter, and local businesses, and estimate the number of residents reached.
- Provide education on proper pet waste disposal during speaking engagements.
- Participate in the NVRC Clean Water Partners regional efforts and estimate the number of Alexandria residents reached through messaging.

The effectiveness of the City’s education and outreach efforts will be assessed annually using the NVRC Survey that is conducted following the annual campaign. The survey has been conducted for a number of years and is useful in showing trends over time. The City also will perform a survey at the annual Earth Day celebration and/or send out a survey via *eNews* to gauge possible changed behavior due to the City’s local efforts. Results will be provided in each annual report for the corresponding permit term.

c. Pet Stations, Dog Parks, and Street Cans

The City continues to support the installation of pet waste stations on public and private property. The City has installed pet waste stations in public parks and continues to look for

opportunities for installations. “Dog bone” shaped pet waste dispensers that can be attached to a dog leash are handed out during public outreach events as a more mobile way of dispensing pet waste bags.

The City Council approved the master plan for dog exercise areas in September 2000, which defines areas for unleashed dog exercise and established guidelines for the creation of any new fenced dog parks and exercise areas, and to ensure that these facilities do not contribute to bacteria from pet waste. The *City’s Plan for Dog Parks and Dog Exercise Areas* (2011) provides detailed information and rules governing the City’s designated dog park and exercise areas. One of the reasons for having dog exercise areas is to concentrate activity and provide the City with a way to focus education and outreach efforts. The plan includes recommendations for providing plastic bags at dog runs and the strategic placement of waste receptacles. The plan also requires new dog exercise areas to be located more than 75 feet from bodies of water, and in most cases outside the Resource Protection Area (RPA) associated with waterbodies and wetlands.

The City places “street cans” in parks and along public streets where residents can deposit used pet waste bags and routinely empties the cans to further encourage their use and to mitigate the emanation of odors.

Milestones, Measurable Goals and Assessment Methods

The City will continue to support installation of pet waste stations and report on new stations installed in the annual report for the corresponding reporting period. Statistics on “dog bone” pet waste dispensers is included in annual reports. Street cans will be provided and maintained for parks and public streets.

- The number of pet stations, bags used, and the number of newly installed pet waste stations will be documented and included in each annual report.
- The City will continue ongoing implementation of the master plan and revise it as necessary. Plan updates will be reported with the associated annual report.
- Street cans, especially in parks, are widely used by dog owners for disposal of pet waste. These will continue to be routinely emptied and staff will note any precipitous drop-off in pet waste in the cans that is not related to seasonal variations.

d. Illicit Discharge Detection and Elimination Program

The City has performed dry weather screening of regulated outfalls during the previous permit based on local the TMDLs. The 2018 MS4 permit requires the City to perform dry weather screening on at least 50 outfalls annually. However, as noted in the Fecal Coliform Non-Tidal Four Mile Run TMDL, Optical Brightener Monitoring (OBM) conducted on every outfall in the watershed “lends evidence that storm sewer outfalls are largely free from illicit connections.” An analogous conclusion can be inferred from the interpretation of similar analytical data for the Tidal Four Mile Run TMDL, and Holmes Run, Cameron Run and Hunting Creek TMDL – that storm sewer outfalls in those local watersheds are largely free from illicit connections and that OBM is not the preferred assessment approach to be implemented during outfall screening. The City continues to implement screening methods found in the *Illicit Discharge Detection and Elimination Program Policies and Procedures* included in the *MS4 Program Plan* as Appendix E.

In addition to dry weather outfall screening, the City maintains a public reporting mechanism to receive complaints. In February 2020, the City launched “Alex311” customer service initiative, replacing the City’s *Call.Click.Connect*. Alex311 services included new web, mobile app, social media, and phone options to submit requests for service or information. Similar to the previous, *Call.Click.Connect* system, Alex311 can be used by residents and others to report suspected illicit discharges and other environmental concerns.

The reporting form can be found at the homepage at alexandriava.gov and is available on subordinate webpages. Incidents are routed to the proper staff and cases may be tracked for resolution. In general, reports of illicit discharging must be investigated within 48-hours, but are done typically as soon as possible. City staff utilize the *Illicit Discharge Detection and Elimination Program Policies and Procedures* developed and included as Appendix C of the *2019 MS4 Program Plan*.

Formal illicit discharge detection and elimination (IDDE) training is provided to staff per the schedule in the program plan, while and informal staff training is provided continually as the opportunity arises. The public also receives informal messaging on recognizing and reporting illicit discharges to the storm drain system.

Milestones, Measurable Goals and Assessment Methods

- Annually conduct dry weather screening on at least 50 outfalls and note results of the screening, to include if sanitary cross connections are found in each year’s annual report.
- Report on the number of complaints received related to illicit bacteria discharges in the annual report.

e. Routine Infrastructure Cleaning and Maintenance

As part of the IDDE program, the City performs routine cleaning of storm drain inlets and catch basins, and frequent street sweeping to remove debris, organics and other items from the system so that these materials are not transported to nearby surface waters during a subsequent storm. Street sweeping is performed routinely from March to October annually

and suspended during the snow season. If blockages of the storm drain system are observed during routine maintenance, staff may perform CCTV of the lines to determine the extent of the blockage and the best course of remedial action required to remove the blockage. Proactive CCTV of storm and sewer lines is also performed on a regular basis. Assessing the condition of sanitary sewer lines can serve to catch an issue with blockage, deflection or root intrusion and prevent sanitary overflows or backups from occurring. Reconstruction and remediation of sanitary sewers such as relining old sewers, joint sealing, rerouting connections and manhole repairs are performed as warranted as part of the inflow and infiltration program.

Milestones, Measurable Goals and Assessment Methods

- The City is divided in to 11 separate sweeping areas that receive three passes annually from March to October (outside of snow season). Crews sweep approximately 30,000 lane miles each year and this information is provided in the annual report.
- Crews perform proactive catch basin and inlet cleaning from March to October annually based on 12 separate zones that correlate to the snow zones, with the goal of reaching all 12 separate zones every two years.
- Crews perform proactive catch basin and inlet cleaning following the leaf collection activities to remove leaf and organic material that may have accumulated.
- Crews perform reactive catch basin and inlet clearing according to service requests, resident complaints, and weather-related activities.
- Reactive CCTV inspections occur in response to resident complaints on sewer mains associated with private backups.

The City will continue to perform ongoing routine maintenance, cleaning and investigations of the sewer system and report related information in the associated annual report.

8. Methods to Assess Action Plan Effectiveness

The City will continue to implement those BMPs discussed in Section 7 per the milestones, measurable goals, and assessment tools.

Pursuant to the 2008 – 2013 MS4 General Permit and submitted with the 2009 – 2010 MS4 annual report, municipal facilities of concern were previously assessed as to whether these facilities may be expected to constitute a significant source of bacteria. The City has been implementing BMPs to address bacteria for successive permit cycles. Chapter 8 of the *Implementation Plan for the Fecal Coliform TMDL for Four Mile Run, Virginia* (NVRC, 2004) cites “actions taken” and “water quality data” as two types of criteria to be monitored to ensure implementation and evaluate efficacy. Implementation actions are included in Chapter 6 of this plan (NVRC, 2004). These are pollution prevention, mitigation measures, and indirect measures. Pollution prevention efforts related to Alexandria’s sewer system include the sewer rehabilitation program and routine inspection and maintenance.

As mentioned previously, implementation plans for Tidal Four Mile Run and the Hunting Creek, Cameron Run, and Holmes Run TMDLs have not yet been developed. Therefore, the following actions were identified for non-tidal Four Mile Run but can also be considered as applicable for the City's other bacteria TMDLs. The submitted delisting for Cameron Run may be partially attributed to the City's commitment to protecting our waters and preventing bacterial contamination.

a. Actions Taken

In the absence of implementation plans for the Tidal Four Mile Run TMDL, and the Holmes Run, Cameron Run, and Hunting Creek TMDL, the City has taken a holistic approach to addressing bacteria impairments by applying the following items that are discussed in the *Implementation Plan for the Fecal Coliform TMDL for Four Mile Run, Virginia* (NVRC, 2004) to other watersheds draining to impaired waters in the City. Other actions discussed herein constitute additional efforts the City performs to address bacteria impairments using this holistic approach. These City-wide actions are discussed in detail below:

Sanitary Sewer Infrastructure

- Sewer rehabilitation has taken place and continues to take place City-wide.
- Inspection and maintenance is performed as discussed in Section 7.e..

IDDE

- The *Implementation Plan for the Fecal Coliform TMDL for Four Mile Run, Virginia* (NVRC, 2004) required a pilot program that has since matured through successive permit cycles. Annual dry weather inspections are conducted on at least 50 outfalls City-wide, given that bacteria impairments within the City's watersheds.
- The local ordinance was updated in 2001 to include City Ordinance Title 11, Chapter 13 Environmental Offenses in the Environmental Management Ordinances per the *Implementation Plan for the Fecal Coliform TMDL for Four Mile Run, Virginia* (NVRC, 2004), and continues to be enforced City-wide.
- The Environmental and Industrial Unit (EIU) was created in July 1, 2009 to coordinate environmental issues among departments, with staff from the EIU enforcing Chapter 13 with support from Transportation and Environmental Services.
- The City maintains a Complaint Reporting system through Alex311 (formerly, *Call.Click.Connect*) for resident and staff complaint response and tracking.

Proper Pet Waste Disposal

- Consistent with the *Implementation Plan for the Fecal Coliform TMDL for Four Mile Run, Virginia* (NVRC, 2004), the entire City is targeted for the installation of pet waste stations and signage to promote responsible owner behavior. A memorandum of understanding was developed with the City's Department of Recreation, Parks, and Cultural Activities to install pet waste stations in public parks.
- The City anticipates initiating a new public awareness campaign targeted towards pet owners and picking up pet waste in public right of ways.

- The City performs additional efforts annually per Section 7.c. and will report of the activities annually.

Stormwater Treatment

- As a local Virginia Stormwater Management Program (VSMP) authority, the City administers the VSMP Regulations and the Chesapeake Bay Act. The VSMP Regulations have superseded the Bay Act for stormwater quality requirements, while existing portions of the Bay Act related to RPA protection and enhancement is retained.
- City has been awarded grants through the Stormwater Local Assistance Fund (SLAF) for retrofits under the Chesapeake Bay TMDL for Lake Cook and Ben Brenman (Cameron Station) Pond. These practices include features to enhance the exclusion of geese and improve water quality in the Cameron Run Watershed, the Potomac River, and the Chesapeake Bay.
- The City inspects and maintains public stormwater facilities, inspects private facilities, and requires private facility owners to maintain private facilities.
- The City has retrofitted publicly-owned facilities with stormwater management BMPs. The Burke Library with a StormFilter™ and bioretention facility, and pervious pavers and bioretention at Four Mile Run Park are a few examples.
- The City adopted the updated *Environmental Action Plan 2040* in 2019 which includes an updated Green Building policy effective March 2, 2020. This policy requires public development to meet 100% of the required stormwater treatment through green infrastructure.
- On January 24, 2018, the City's Transportation and Environmental Services issued Memorandum to Industry No. 01-18, "Use of Manufactured/Proprietary Stormwater BMPs". This memo outlines new requirements for new development and redevelopment to utilize non-proprietary surface BMPs approved by the Virginia BMP Clearinghouse to remove a minimum of 65% of the total phosphorus removal required by VSMP.

Street and Infrastructure Management

- City streets are swept per Section 7.e.
- Catch basins and inlets are cleaned per Section 7.e.
- The City maintains an ArcGIS database and provides updates and maintenance, as needed.

Stream Corridor & Wetlands Restoration

- The City completed the City-wide Phase III Stream Assessment and identified three streams for restoration: Lucky Run, Strawberry Run, and Taylor Run. The City received SLAF grant funding to support these stream restorations totaling 3,750 linear feet.
- The Four Mile Run wetlands restoration project was completed in FY16.
- Windmill Hill Living Shoreline project on the banks of the Potomac River was completed in FY19.

Stormwater Runoff Reduction and Reuse

- The City completed a number of retrofit projects recently, to include installation of green infrastructure at Charles Barrett Elementary School and Four Mile Run Park, and the installation of a cistern at Fire Station 206.
- The City ensures that municipal redevelopment projects explore the feasibility of implementing stormwater controls beyond VSMP requirements to address Chesapeake Bay TMDL target reductions and provide other ancillary benefits.

b. Water Quality and Estimation of Discharge

Per the *Implementation Plan for the Fecal Coliform TMDL for Four Mile Run, Virginia* (NVRC, 2004), water quality data will be reported by VDEQ through its own bacteria monitoring efforts. The ultimate goal is for that the water quality in Four Mile Run will respond to actions in the watershed. This TMDL implementation plan (NVRC, 2004) was created jointly by jurisdictions in the watershed and it requires actions of all parties to improve water quality in the run. VDEQ also performs bacteria monitoring on other impaired streams in the City. The City will rely on this water quality data for other TMDLs consistent with the approach identified in the implementation plan (NVRC, 2004). The City will continue to implement structural and non-structural BMPs to address bacteria impairments in its receiving waters.

c. Schedule

The 2018 MS4 permit, Part II. B. 3. h., identifies the requirement to incorporate a schedule of anticipated actions planned for implementation during the permit term (2018 – 2023). The best management practices described in this action plan have been and are currently being implemented.

The *2019 MS4 Program Plan* includes a schedule of strategies associated with pet waste and illicit discharge. Within these two “sources” are several strategies designed to reduce the load of bacteria to the MS4. These strategies are reported on annually in the MS4 report.

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City of Alexandria, Virginia

**Tidal Potomac Polychlorinated Biphenyls
(PCB) Total Maximum Daily Load (TMDL)
Action Plan**

**For compliance with 9VAC25-890, General VPDES Permit for Discharges
of Stormwater from Small Municipal Separate Storm Sewer Systems,
Permit No. VAR040057**

**June 28, 2015
Revised November 20, 2015
Revised April 14, 2020**

Prepared by:

City of Alexandria, Virginia
Department of Transportation and Environmental Services
Infrastructure and Environmental Quality

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1. Introduction

The General Virginia Pollutant Discharge Elimination System (VPDES) Permit for Discharges of Storm Water from Municipal Separate Storm Sewer Systems (MS4) No. VAR040057 was issued to the City of Alexandria (City) by Virginia Department of Environmental Quality (VDEQ) effective November 1, 2018 (2018 MS4 permit). This permit contains “Special Conditions” for local total maximum daily loads (TMDL) under Part II, TMDL Special Conditions, Section B, Local TMDL Special Condition that requires the City update any previously approved local TMDL action plan for TMDLs approved by U.S. Environmental Protection Agency (EPA) prior to July 1, 2013, no later than 18-months after the permit effective date.

This action plan builds on the action plan that was initially developed by the City and first submitted in 2015 in response to the Special Conditions included in the City’s General VPDES MS4 Permit, effective July 1, 2013 (2013 MS4 permit). The 2013 MS4 permit included the requirement for the City to develop initial action plans to address TMDLs where a wasteload allocation (WLA) was assigned to the MS4. The 2013 MS4 permit required the action plans be developed and incorporated into the updated MS4 program plan and implemented over multiple permit cycles using an iterative approach to adequately reduce the pollutant in a manner consistent with the assumptions and requirements of the specific WLA in the TMDL. This action plan identifies best management practices, measurable goals and milestones, and evaluation measures; assess all significant sources; and includes a method to assess effectiveness of the plan in reducing the WLA pollutant. In accordance with Table 1 in the 2013 MS4 permit, the City must develop action plans no later than June 30, 2015, for TMDLs approved by the State Water Control Board (SWCB) or EPA prior to July 2008, and no later than June 30, 2016, for TMDLs approved between July 2008 and June 2013. The updated action plan was developed based on the initial requirements in the 2013 MS4 permit as well as the local TMDL Guidance memo dated issued by VDEQ (April 2015) and incorporates any new information required under the 2018 MS4 Permit.

2. Background

The City of Alexandria’s (City) MS4 was assigned a WLA for polychlorinated biphenyls (PCB) in fish tissue in the Tidal Potomac PCB TMDL report completed by Interstate Commission on the Potomac River Basin (ICPRB) in 2007. The TMDL covers the Commonwealth of Virginia, the State of Maryland, and Washington, DC, and was approved by EPA on April 11, 2008. The TMDL was approved prior to July 9, 2008, and the initial PCB TMDL Action Plan was required to be submitted with the MS4 Program Plan submitted October 1, 2015. This action plan updates the previously submitted plan and includes best management practices and other interim milestone activities to be implemented during the 2018 – 2023 permit term, as well as activities that will continue beyond the current MS4 permit cycle. Any new or modified requirements will be considered and incorporated as applicable. To date, an implementation plan has not yet been developed for this TMDL.

PCBs were used as coolants and insulators, particularly in transformers, hydraulic equipment and electrical equipment. The manufacture of PCBs was banned in 1979 however, they are considered to be a “legacy pollutant” as they are very persistent in the environment and do not readily decompose under normal conditions. They also tend to sink into the sediment of waterways or terrestrial soils. PCBs may be released into the environment through leaks or fires in PCB containing equipment, accidental spills during transport, illegal or improper disposal,

burning of PCB containing oils in incinerators, leaks from hazardous waste sites, and historical releases during manufacture, use, and disposal.

3. Legal Authorities to Reduce Pollutant of Concern

The City has a number of legal tools available to address the possible discharge of PCBs from municipal facilities, development and redevelopment projects, or private properties. This action plan addresses possible pollutant sources from municipal properties as well as private properties.

The MS4 general permit regulates discharges from properties that are owned or operated by the City and discharges from private properties which drain to the MS4. The City may use expressed or implied authorities to regulate private lands with regard to stormwater management and MS4 permit requirements. The City may utilize its rights as the property owner or lessee to address possible sources of PCBs which may originate from City owned or operated properties.

Article XIII of the Alexandria Zoning Ordinance (the Environmental Management Ordinance) contains the requirements for standard plan submission requirements. Standard conditions developed during the plan review process and Special Use Permit (SUP) process are enforceable through the Zoning Ordinance. Development plans and SUPs subject to standard conditions must go before the Planning Commission for approval. Contaminated lands issues must be addressed by the applicant prior to approval.

Implementation of the City's Erosion and Sediment Control (E&SC) program derives authority from Chapter 4 of Title 5 (Transportation and Environmental Services, T&ES) of the Code of the City of Alexandria. This code requires that land-disturbing activities greater than or equal to 2,500 square feet develop an E&SC plan to be submitted for review and approval. Disturbances less than this threshold must implement E&SC measures, as needed, to prevent transport and deposition of sediment offsite. City staff performs inspections of land-disturbing activities per the requirements of the ordinance.

Chapter 13 of Title 11 of the City Code (Environmental Offenses) prohibits non-stormwater discharges to the storm sewer system. T&ES works closely with the Fire Marshall's Office Environmental Investigations Unit (EIU) to investigate and enforce illegal dumping and illicit discharge (IDDE) incidents.

4. Planning Framework

a. Principles

The City has established the following overarching principles to guide the approach to meet the goals of this action plan:

- Utilize existing programs and efforts;
- Encourage voluntary, practical, and cost-effective practices;
- Follow an adaptive, iterative approach;
 - Replaces dependency on numerical models and traditional planning by applying a focused "learning-by-doing" approach to decision making;
- Focus on phased implementation over multiple permit cycles; and
- Identify additional funding needs as necessary.

b. Action Goals

The City has established the following goals consistent with the principles in developing the action plan:

- **Consistent:** The action plan is consistent with the assumptions and requirements of the TMDL and conforms to general permit requirements and current MS4 program plan efforts to reduce pollutants to the maximum extent practicable.
- **Flexible:** The controls, best management plans (BMP), and design and methods discussed to reduce the pollutant of concern can be revised based on the observed effectiveness of these measures over multiple permit cycles, stakeholder involvement in the development of an implementation plan, changes to water quality standards, or introduction of new technologies and innovations to address the pollutant.
- **Cost Effective:** The 2008 – 2013, 2013 – 2018, and 2018 – 2023 MS4 general permits contained special conditions associated with existing TMDLs, which were integrated into program plan compliance activities. The appropriateness of existing efforts is considered first before revising these efforts. The cost of revising current efforts or creating additional measures, along with the incremental benefit of each, is taken into consideration.

5. TMDL Development and Load Determination

The Tidal Potomac PCB TMDL report (ICPRB, 2007) includes a study area of the tidal waters of Virginia on the Potomac River. As indicated in the TMDL report, the 2006 Water Quality Assessment Guidance Manual was used to develop the TMDL and provides specific descriptions of the geographic extent of the impairments. The Tidal Potomac PCB TMDL (ICPRB, 2007) includes regulated stormwater as a permitted point source and includes municipal and county level MS4 permittees with the following qualifier: “Some of the permits may cover areas located in direct drainage as well as tributary watershed segments, but the stormwater WLAs apply only to the direct drainage areas”. The TMDL document lists the impaired segments and associated WLAs, and contains an additional qualifier related to the applicable TMDLs which states “[d]irect drain loads were allocated to watershed segments and to FIPS [Federal Information Processing Standards] code jurisdictions within segments, and apply only to the portion of jurisdictions that are in direct drain watersheds.” And finally, the TMDL states that “...the NPDES [National Pollutant Discharge Elimination System] regulated stormwater WLAs, shown in Tables 5-7 and 12 apply only to the direct drainage portions of the MS4 permitted jurisdictions...tributary stormwater WLAs have not been characterized as part of this TMDL effort.” While it is clear that the WLA does not apply to the entire MS4 area, the City continues to target reduction strategies for the entire MS4 area, as appropriate. Figure 1 indicates the

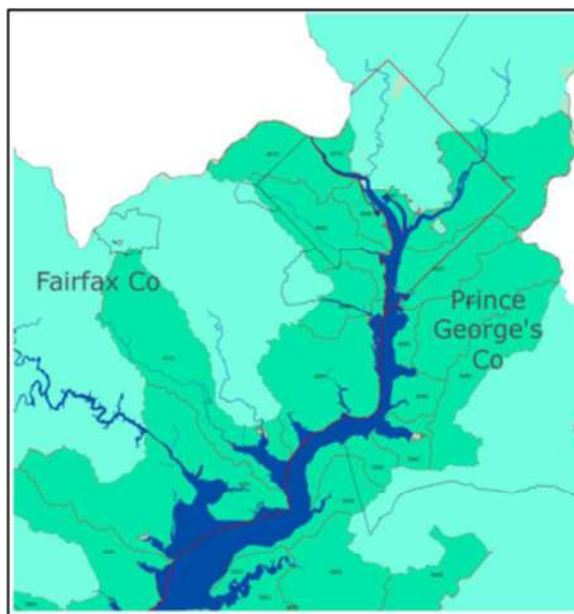


Figure 1. Direct Drain Watershed Segments in Upper Basin (ICPRB, 2007)

location of direct drain watersheds in green which were used to calculate the WLA for MS4 permits.

The TMDL states that the data and information used for setting loads are not detailed enough to determine WLAs for individual regulated outfalls; therefore, loads from regulated NPDES stormwater outfalls are expressed in the TMDL document as single stormwater WLAs for each impaired waterbody. These stormwater WLAs are calculated by multiplying the PCB direct drainage load by the percent of developed land. Table 1 provides the WLAs associated with impaired segments in the City.

Table 1. WLAs Associated with Impaired Segments for City of Alexandria

Impaired Waterbody	Watershed Code	WLA for Regulated Stormwater (g/yr)
Lower Potomac and Four Mile Run	4960	2.98
Lower Potomac and Hooff's Run & Hunting Creek	4980	0.503
Hooff's Run & Hunting Creek	5090	6.79
	Total	10.3

6. Best Management Practice, Controls, and Design

As referenced in the Tidal Potomac PCB TMDL (ICPRB, 2007), adaptive management is an iterative implementation process that makes progress toward achieving water quality goals while using new data and information to reduce uncertainty and adjust implementation activities. The focus is oriented towards increasingly efficient management and restoration. Strategies may change if warranted by new data and information. The jurisdictions involved in the Tidal Potomac PCB TMDL effort agreed that following the adaptive implementation guidelines are appropriate due to the uncertainty associated with the TMDL loading capacity and specific allocation scheme. Therefore, implementation strategies may include additional data collection concurrently with activities to reduce PCB loadings.

NPDES regulations allow the use of non-numeric, BMP-based water quality based effluent limits (WQBEL) where “[n]umeric effluent limitations are infeasible; or [t]he practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA [Clean Water Act].” (40 CFR 122.44(k)3-4) According to the implementation section of the TMDL document, non-numeric WQBELs are used to comply with the provisions of the WLA “because BMPs are appropriate and reasonably necessary to achieve water quality standards and to carry out the goals of the CWA for the Tidal Potomac PCB TMDL.” The TMDL document further states that these BMPs are intended to focus on PCB source tracking and elimination at the source, rather than end-of-pipe controls, and that the TMDL program does not impart new implementation authorities. Therefore, consistent with the Commonwealth’s approach, the City’s main focus is to “use existing programs in order to attain its water quality goals.”

This approach focuses on the development and implementation of procedures based on historical activity and land use that identifies potential high-risk properties. It also focuses on enhanced education and outreach, and employee training to eliminate and reduce potential PCB loads.

Based on this understanding and current permit requirements, the City will continue to implement the following strategies, which are discussed in greater detail in the preceding sections:

- Site review and evaluation of municipal facilities;
- Focus on screening for PCBs during the plan review process for development and redevelopment projects;
- Implementation of the erosion and sediment control program; and
- Enhanced education and outreach, and employee training.

a. Site Evaluation and Inspections for Municipal Facilities

In the 2008 – 2013 MS4 permit special conditions, the City was required to 1) perform outfall reconnaissance and to 2) evaluate all owned or operated properties for potential sources of the pollutant identified in the WLA. Within three years of the July 8, 2008 effective date, the City had to “conduct a site review and characterize the runoff for these properties where it determines that the pollutant identified in the WLA is currently stored, or has been transferred, transported or historically disposed of in a manner that would expose it to precipitation.” Through this evaluation, the City determined that it does not have any facilities that should be categorized as a “high risk” for PCBs and the stormwater runoff characterization was not warranted for this WLA pollutant. This evaluation was conducted during the 2009 – 2010 reporting period and included in the associated annual report. As part of this action plan and per the Special Condition requirements in the 2013 – 2018 MS4 general permit, the City reassessed possible significant sources of PCBs from facilities of concern owned or operated by the City that are not covered under a separate VPDES permit through the analyses of historical use. According to the 2013 – 2018 MS4 general permit, a significant source of pollutants from a facility of concern means a discharge where the expected pollutant load is greater than the average pollutant load for the land use identified in the TMDL. Additionally, municipal facility inspections are required to be conducted according to the requirements of Stormwater Pollution Prevention Plans (SWPPP).

i. Evaluation of Municipal Facilities

The City performed an assessment of municipal properties for sources of PCBs and searched for any “high risk” facilities that currently store, or have transferred, transported or disposed of PCBs in a manner that would expose it to precipitation and found none. The City also characterized stormwater runoff from “high risk” properties and found no evidence of PCBs. During the 2009 – 2010 permit reporting period, the property at 3550 Commonwealth Avenue was purchased by the City’s Department of Recreation, Parks & Cultural Activities (RPCA) using Open Space funding. It previously operated as an electrical substation from the mid 1950’s until recently. Due to historic transformer oil drippings confined to the equipment area, the site was remediated to remove the PCB-impacted soil documented as part of the Phase I/II Environmental Site Assessment (ESA) completed for the City in November 2008, with the remediation and confirmatory sampling completed by the seller per an agreement with the City. The consultant doing the remediation work provided a “Confirmation of Remediation Report for the Former Hume Substation” dated December 3, 2009.

A combination of historical data, aerial photos, interviews with City personnel, and review of the Alexandria County Land Records was used to ascertain the likelihood of past PCB contamination at municipal properties and found none. This research focused on those properties which may have operated at one time under one of DEQ’s high risk categories for PCBs. Identified high risk

category sites for potential sources of residual PCBs, which includes the following SICs: 26&27 (Paper and Allied Products), 30 (Rubber and Misc. Plastics), 33 (Primary Metal Industries), 34 (Fabricated Metal Products), 37 (Transportation Equipment), 49 (Electrical, Gas, and Sanitary Services), 5093 (Scrap Metal Recycling), and 1221&1222 (Bituminous Coal). The City evaluated the most current EPA PCB Transformer Registration Database to determine if any municipal properties are registered sites, indicating the presence and location of PCB-containing transformers that may be located on municipal properties, and found none.

Finally, the City reviewed data to determine if a Phase I ESA was performed and available for any municipal properties in conjunction with a real estate transaction or intention of develop / redevelop a property.

Milestones, Measurable Goals and Assessment Methods

ii. Municipal Facility Inspections

The City developed a facility inspection reporting form for use during the evaluation of municipal facilities determined to have the potential to discharge pollutants. This form was based on inspection requirements and sample forms used for facilities to comply with coverage under industrial stormwater permits. The SWPPPs created for high-priority municipal facilities include the requirement for quarterly visual inspections and annual comprehensive compliance evaluations. While the SWPPP lists possible site pollutants that may be discharged, the quarterly and annual inspections are conducted comprehensively such that other pollutants may be identified if present. Additionally, should any future evaluations of public facilities demonstrate the likelihood of the presence of PCBs due to past use, the SWPPP will include specific procedures to identify possible discharges of PCBs.

Milestones, Measurable Goals and Assessment Methods

The City performs inspections of high-priority municipal facilities based on the SWPPPs developed during the 2017 – 2018 MS4 program year, as required by the last two MS4 Permits. All SWPPP inspections are performed and documented in the SWPPP for that facility on a routine basis. A summary of the implementation and inspections performed during the reporting period are included in the appropriate associated annual report and included in the SWPPP.

b. Remediation Projects

If environmental investigations reveal the onsite presence of PCBs on a City owned or operated property, further investigations will be performed to determine the extent of onsite contamination. Remediation may be conducted if it is determined that remediation of the site is warranted. During the 2009 - 2010 reporting period under the 2008 - 2013 MS4 general permit, a PCB remediation project was conducted at the Hume Substation tract as described in Section 6.a.i. The resultant cleanup of the 0.53 acre former substation site resulted in a minor reduction in the overall City loading rate as modeled in the associated annual report.

Milestones, Measurable Goals and Assessment Methods

The City will coordinate with VDEQ in the ongoing consideration and execution of cleanup efforts for City-owned and operated facilities, as warranted. City projects whose past use includes any of the SIC codes identified in the identified high-risk category must include site investigations for PCBs.

c. Plan Review for Development and Redevelopment

The City adopted a standard condition used during the site plan review process for development projects and in and development SUPs requiring the screening for PCBs as part of the site characterization for sites that fall into VDEQ's identified high risk categories for PCBs. This standard condition was adopted during the 2009 - 2010 reporting period for the 2008 MS4 Permit and was revised during the 2014 - 2015 reporting period. The language reads:

The applicant shall screen for PCBs as part of the site characterization if any of the past uses are within the identified high risk category sites for potential sources of residual PCBs, which includes the following SICs: 26&27 (Paper and Allied Products), 30 (Rubber and Misc. Plastics), 33 (Primary Metal Industries), 34 (Fabricated Metal Products), 37 (Transportation Equipment), 49 (Electrical, Gas, and Sanitary Services), 5093 (Scrap Metal Recycling), and 1221&1222 (Bituminous Coal).

If environmental investigations discover the presence of PCBs onsite, the applicant must develop, implement, and submit for review, the proper environmental management plans prior to approval of the final site plan. These may include, but are not limited to, a Site Characterization Report/Extent of Contamination Study detailing the location, applicable contaminants, and the estimated quantity of any contaminated soils and/or groundwater at or in the immediate vicinity of the site; a Risk Assessment indicating any risks associated with the contamination; a Remediation Plan detailing how any contaminated soils and/or groundwater will be dealt with, including plans to remediate utility corridors. Utility corridors in contaminated soil shall be over excavated by two feet and backfilled with "clean" soil; a Health and Safety Plan indicating measures to be taken during remediation and/or construction activities to minimize the potential risks to workers, the neighborhood, and the environment.

The City developed a brochure about PCBs and why they are a concern in Alexandria. This brochure may be provided to target property owners during normal interactions (inspections, permit reviews, etc.) or during the redevelopment process.

Milestones, Measurable Goals and Assessment Methods

The City continues to include the standard condition and SUP language during the development review process.

- During the final site plan, staff ensures environmental reports are provided. All subject properties whose current or past use falls into one of the listed SIC codes are required to perform site investigations for PCBs.
- Annual MS4 reports include a sample of the language, a discussion of projects required to perform site testing, and a summary of findings, as warranted.

d. Implementation of Erosion and Sediment Control Program

Reductions in sediment loads from construction sites and development areas also will be of benefit for addressing the discharge of PCBs. The City administers a local E&SC program and Virginia Stormwater Management Program (VSMP). Staff are trained and receive certification through the Commonwealth for reviewing site plans for development and redevelopment, and for inspecting construction sites. Since PCBs may be associated with soils, the City will use designation of a responsible land disturber (RLD) per the Virginia Erosion and Sediment Control Regulations (VESCR) and project specifications to hold construction contractors responsible for

the proper implementation and maintenance of E&SC measures during development and redevelopment. The local E&SC program requires that any land-disturbing activity equal to or greater than 2,500 square feet must submit a grading plan and E&SC plan for review and approval prior to commencing a land-disturbing activity.

Additionally, the City operates a local VSMP effective July 1, 2014. Inspections related to E&SC and VSMP requirements are performed by the same staff. Inspection reports are completed every five business days and 48 hours following a measurable storm event. However, the inspectors also perform inspections for right-of-way, excavation, and other local permits. Therefore, the inspection staff visits active construction sites approximately every day; sometimes performing multiple visits in the same day. This level of oversight far exceeds regulatory requirements and helps provide extra assurance that E&SC measures are properly installed and maintained to control the export of soils.

Milestones, Measurable Goals and Assessment Methods

The City continues to implement the local E&SC and VSMP requirements, to include construction site inspection and reporting. The following take place:

- Ensure all applicable projects submit for coverage under the VPDES Construction General Permit, which includes updated SWPPP requirements for discharges to PCB impaired waters.
- Ensure all Chesapeake Bay land-disturbing activities have an approved grading plan prior to commencement.
- Ensure all required inspections are conducted by City staff.
- Ensure all corrective actions are complete within seven days.

e. Promotion of Elimination and Reduction

The standard condition language used during site plan review and SUPs also serves to educate the development community on PCBs and raise awareness of the possibility to encounter PCBs during redevelopment of private properties in the City. Given that the manufacture of PCBs was banned in 1979, the general public is unlikely to encounter PCBs. To be proactive, the City developed a brochure about PCBs and why they are a concern in Alexandria. This brochure is provided to target property owners during normal interactions (inspections, permit reviews, etc.) or during the redevelopment process. The brochure can be shared with staff and residents and is available online at alexandriava.gov/52652.

Employees receive training on pollution prevention and good housekeeping and recognizing and reporting illicit discharges. It is unlikely that staff will encounter PCBs during routine daily activities. However, if the site review and evaluation demonstrate the possible presence of PCBs at a municipal facility, staff working around or near the location will be trained measures to avoid exposure and how to identify possible discharges that may contain PCBs.

Finally, City staff perform investigations in response to public complaints about possible illicit discharges to the storm sewer system and surface waters. Staff from the Fire Marshall's Office with the EIU may enforce Chapter 13 of Title 11 of the City Code (Environmental Offenses), which prohibits non-stormwater discharges to the storm sewer system. EIU staff educates residents about illicit discharges, which may include distribution of the PCB brochure and related information.

Milestones and Measurable Goals

- Ensure inclusion of standard conditions during site plan and SUP reviews.
- Ensure information on PCBs is included in the City's website and update the information if appropriate.
- Ensure the PCB brochure is available to staff.
- Enhance illicit discharge employee training to include education on PCBs and document this training biennially.

7. Methods to Assess Action Plan Effectiveness

Demonstration of adequate progress may be achieved through tracking, monitoring, and/or reporting of BMP implementation, and/or other strategies as approved by VDEQ as part of the PCB TMDL Action Plan. Consistent with the Commonwealth's approach and the types of implementation strategies discussed in the TMDL document, the City will implement those BMPs discussed in Section 6. The successful implementation of the milestones and measurable goals of this action plan continue to demonstrate the effectiveness of the plan.

The Site Review was performed during the 2017 - 2018 reporting period. Site inspections associated with the development and implementation of SWPPPs for identified municipal facilities began during the 2017 - 2018 reporting period and are ongoing based on the City's internal implementation schedule. Remediation projects will occur on an as-needed basis. Plan review for development and redevelopment projects, to include review of SUP applications, is an ongoing process and standard conditions are included on all site plans related to the City's requirement to screen for PCBs, if warranted, based on past use. Sites whose historical use includes SIC codes that have been identified by VDEQ as having a likelihood of being associated with PCBs are required to screen for PCBs during environmental investigations. The City implements an aggressive E&SC program and VSMP that includes daily site visits and the requisite inspection reports completed at the required intervals. This level of oversight far exceeds the regulatory requirements and helps provide extra assurance that control measures and properly installed and maintained to control sediment export. Finally, the City has a robust illicit discharge and dumping investigation and enforcement program, along with an active education and outreach program for the possible presence of PCBs.

8. References

Developing Your Stormwater Pollution Prevention Plan: A Guide for Industrial Operators, Publication No. 833-B-09-002. U.S. Environmental Protection Agency. February 2009.

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