VIRGINIA GENERAL VPDES PERMIT FOR DISCHARGES FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS
PERMIT NUMBER: VA040063

Permit 4/Year 1 MS4 General Permit Annual Report
Reporting Period: July 1, 2018 – June 30, 2019

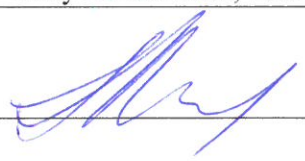
Submitted September 30, 2019

City of Manassas
Department of Utilities
8500 Public Works Drive
Manassas, VA 20110
703-257-8245

MS4 Owner: City of Manassas
Permit Number: VAR040063
MS4 General Permit 4/Year 1 (FY2019) Annual Report

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."

Print Name: Tony H. Dawood, P.E. Title: Utilities Director

Signature:  Date: Sept. 30, 2019

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1.0 INTRODUCTION

The City of Manassas (City) consists of approximately ten (10) square miles draining to the Occoquan River. It is composed of primarily urban mixed-use land development and surrounded by Prince William County. There are (4) four watershed areas, Broad Run-Rocky Branch, Middle Bull Run, Lower Bull Run, and Occoquan River-Lake Jackson, these watershed areas discharge into the Occoquan River.

This annual report was prepared by the City's Department of Utilities in accordance with Section II E of the Virginia Pollutant Discharge Elimination System (VPDES) Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4 General Permit), effective November 1, 2018. The MS4 General Permit expires October 31, 2023.

This annual report describes the City's collective efforts in stormwater management and updates the progress toward meeting the Best Management Practices (BMPs) for each of the six (6) Minimum Control Measures (MCMs) and special conditions required by the MS4 General Permit. This report covers items for Permit 4/Year 1 (P4/Y1) of the City's MS4 Program Plan in compliance with the MS4 General Permit.

The administration of the City's MS4 Program Plan is an important aspect of the plan itself. Throughout the life of the current permit, the plan is a dynamic document and it will continue to be during the next permit cycle. The process has been ongoing from one permit year to the next. The most recently updated MS4 Program Plan is provided in Appendix A. This MS4 Program Plan will remain on file with the Utilities Department or through Manassas's stormwater website via the following link:

http://www.manassascity.org/DocumentCenter/View/22712.

Table 1 Background Information

Name	City of Manassas Municipal Storm Sewer System
Permit #	VAR040063
Reporting Period:	Permit 4/Year 1; July 1, 2018 – June 30, 2019
Modifications to Operator's Roles and Responsibilities:	There were many internal changes to the City's MS4 program within this reporting period; however, the program is still managed within the Utilities Department, as it was last year.
New Outfalls and Associated Acreage by HUC	A clean answer cannot be provided; there is more on this topic later in the report. Last year we reported 279 MS4 Outfalls, but we currently do not know the methodology that the contractor used to derive this information. The City has since launched an aggressive GIS inventory of all stormwater assets, including outfalls. This process has significantly reduced the number of previously identified outfalls, because many turned out to be inlets. This inventory is still incomplete. As of August 7, 2019, there were 768 reported discharge points that may turn out to be regulated outfalls, and 179 tentatively identified as regulated outfalls. These numbers change on a daily basis as we aggressively continue with the defensible and reliable inventory.

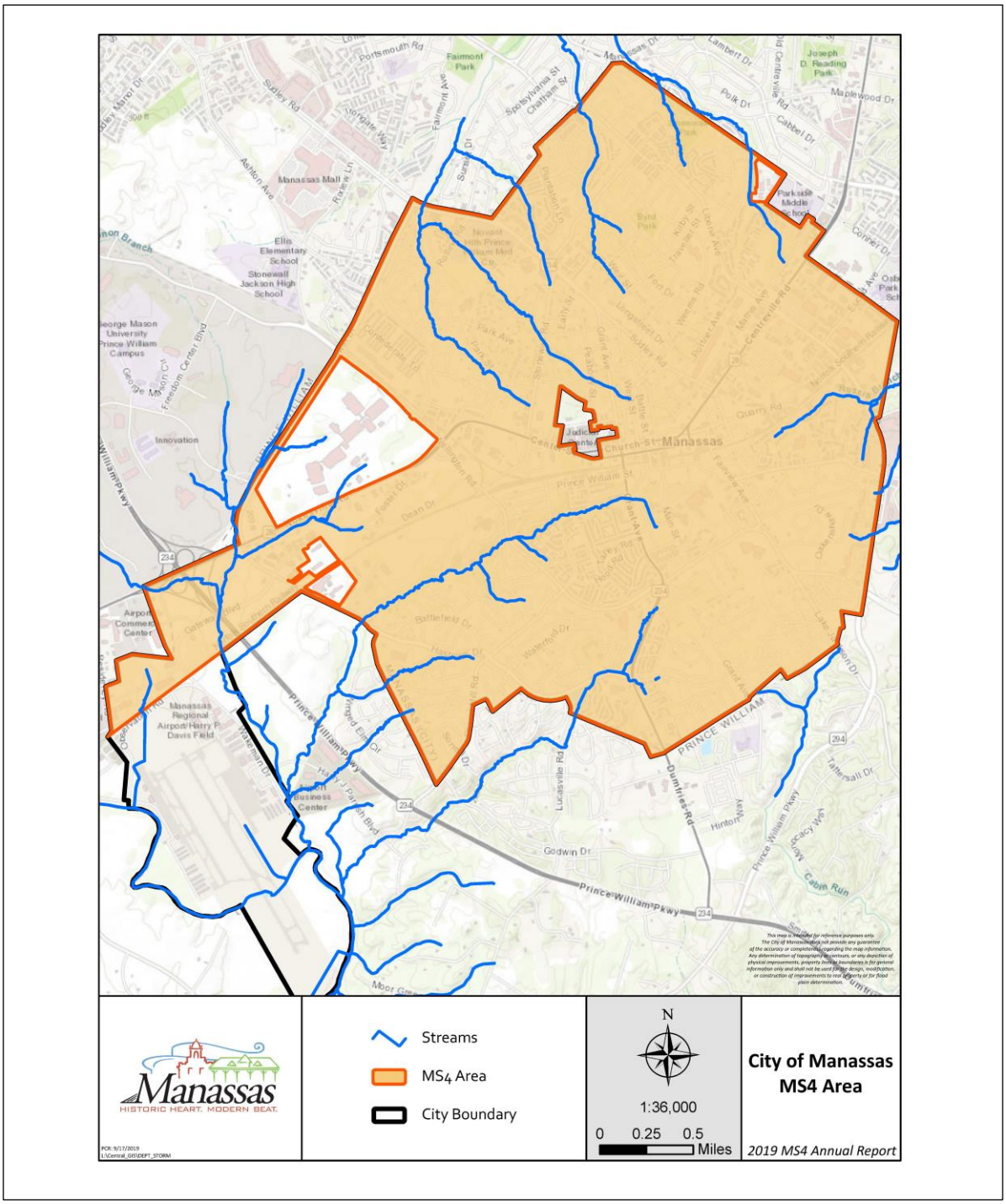

Figure 1 The City of Manassas' MS4 Area

2.0 STATUS OF COMPLIANCE (JULY 1, 2018 – JUNE 30, 2019)

The following summarizes activities performed by the City of Manassas for each of the six (6) Minimum Control Measures (MCM) and Special Conditions during the reporting period.

2.1 MCM 1: Public Education

The goals of this MCM are:

1) Develop a public education program to distribute information to the public and
2) Develop outreach activities to inform the public regarding steps they can take to reduce pollutants in stormwater runoff, targeted to those most likely to have a significant stormwater impact.

The City's latest (May 6, 2019) MS4 Program Plan identified the City's high-priority water quality issues that contribute to the discharge of stormwater:

1) Illicit Discharges and Illegal Dumping from Residents
2) Pet Wastes and Bacteria TMDL
3) Sediment

The following rationale provides the basis for selecting the high-priority water quality issues:

a) Illicit Discharges and Illegal Dumping from Residents

The City has identified litter and hazardous waste as problem pollutants through field observations and citizen complaints. Improper discharges and dumping can result in the release of toxic chemicals and bacteria to the waters of Virginia. This can be mitigated by increasing outreach to students, residents, and businesses on how to prevent pollution and the legal consequences of noncompliance.

b) Pet Wastes and Bacteria TMDL

The City has identified bacteria (i.e., *E. coli*) from pet waste as a high priority water quality issue. City watersheds including Broad Run, Occoquan River, and Bull Run have been designated as impaired for *E. coli* by DEQ. Public education can play an important role in reducing bacteria by educating pet owners about the human health and legal consequences of not picking up pet waste.

c) Sediment

Previously, the City identified Chesapeake Bay Nutrients as one of its high-priority water quality issues; however, beginning in 2019, this has been changed in order to be more focused and potentially more effectively implemented (phosphorus and nitrogen are no longer listed as separate concerns—outside the other parts of this General Permit coverage). Common sources of sediment include stormwater runoff from urban and suburban lawns, roadways, and other developed areas. Public education and outreach

efforts emphasize reductions of controllable sediment; which would in turn, reduce the quantities of sediment reaching the Chesapeake Bay.

Figure 2 Volunteers Cleaning Litter from Manassas' "Oakenshaw-Downstream" Stormwater Pond on August 14, 2018.

The May 6, 2019 Program Plan contained the following table (Program Plan's Table 2) that listed action items the City intended to implement to further this public education and outreach Minimum Control Measure:

Table 2 Planned Stormwater Education Tasks for this Reporting Period

Department	Description	Goal	Metric
Utilities	Pursue other outlets to distribute existing stormwater (e.g. pet waste management animal shelters and to City parks).	Expand audience from existing outlet locations	Number of outlet locations, and number of hand-outs distributed
Utilities	Initiate a comprehensive (City-wide) GIS data layer depicting the extent of existing stream-side vegetative buffers.	Analyze and document the health and condition of the City's riparian conditions	Percent of streams assessed and placed in City's GIS.
Schools	Create a working group of educators to advise and assist the Utilities Dept. in the development of curriculum-based stormwater educational material.	Incorporate stormwater into the school's curriculum.	Number of curriculum-base material created and implemented.
Development Services	Expand and update the City's Erosion and Sediment Control website(s).	Make it easier to understand and navigate the construction stormwater process.	Presence of updated website.
Schools	Provide in-house stormwater training for the schools custodial staff.	Increase City staff's awareness of stormwater and the MS4 permit.	Number of employees attending training.
Utilities	Post electronic versions of informational brochures on the City's website or create a web page with a stormwater focus.	Posting of information on the website.	Number of hits to the website.
Utilities	Place a link to the brochure/web page on the City Employee Intranet.	Public awareness.	Creation of the link.
Public Works	Continue distributing recycling and hazardous waste educational material to the public.	Public awareness and water quality improvement.	Number of educational material distributed.
Utilities	Develop an educational initiative focused on nutrients in the Sumner Lake region.	Increase Sumner Lake resident's awareness of stormwater and water quality issues in their neighborhood	The development of a strategic plan.
Utilities	Develop and disseminate educational hand-out material focused on stream sediment.	Increase the public's understanding of sediment impacts and what they can do to reduce these impacts.	Number and diversity of educational material created.
Utilities	Update the City's stormwater page, including developing a Spanish version.	Reach a different website audience.	Percent of website provided in Spanish.
Public Works	Continue disseminating informational and educational material on yard waste management, recycling, and hazard waste collection	Relay information to City-wide public	Number of hand-outs distributed
Park and Recreation	Provide in-house stormwater training for the parks and recreation staff.	Increase City staff's awareness of stormwater and the MS4 permit.	Number of employees attending training.
Utilities	With input and involvement from other departments, draft a City-wide communications plan.	Provide a strategic vision for the City's stormwater-related communications.	Development of the plan.
Utilities	Hold at least two stormwater/MS4 permit-focused sessions during the routine Water and Sewer Friday training schedules.	Increase stormwater awareness among City staff.	Number of employees attended.

As a result of significant organizational and staff changes within the City's stormwater program this last year, and several other related complications, not as much progress was made as originally anticipated on these elements during this last fiscal year. Although the City met the deadline for the latest Program Plan, that date (May 2019) had only less than two months to go before the end of the reporting period. Consequently, seven weeks proved insufficient time to accomplish fully many of these annual goals. Despite these complications, some preliminary progress in this MCM was made during this reporting year.

A summary of the public education and outreach activities conducted by the City during the reporting period is provided in Table 3.

Table 3 Public Education Activities Conducted by City this Last Year (continues)

Program Element	**Progress**
Articles, brochures, or other educational material published on stormwater, recycling, yard waste collection and/or management, household hazardous waste handling, and illegal stormwater discharges. Television appearances related to recycling, stormwater, or water quality.	The City has been promoting refuse, recycling, HHW, and eWaste information. • 4 television appearances on WDVM • 10 articles in local online and print publications • 11 articles in the City Connection newsletter • 3,000 Recycling "How-To" flyers • 3,000 Trash "How-To" flyers • 3,000 eWaste "How-To" flyers • 3,000 Bulk item "How-To" flyers • 3,000 Yard Waste "How-To" flyers • 3,000 Townhome generic trash and recycling "How-To" flyers • 1,500 HHW drop off day magnets • 3,000 Leaf Collection flyers • 4,000 reusable shopping bags with trashline number
Number and type of Resident Advisory Notices.	• 25 Resident Advisory Notices – Violation Warnings 5 Resident Advisory Notices – Service related
Status and deliverables related to the interactive website for children on refuse and recycling.	The City of Manassas has webpages dedicated to providing children information on refuse and recycling issues.
Number of web visits to refuse and recycling,eWaste and stormwater websites.	Stormwater official webpage 526 MS4 Stormwater Permits, Plans, and Reports 130 Stormwater Information page 147 Stormwater Corner 75 Additional Stormwater Resources 161
Number of calls received on the Trashline	15,600 calls to the Trashline.

Table 3 Public Education Activities Conducted by City this Last Year (continued)

Program Element	Progress
Explain/Summarize City involvement and participation in any citizen advisory committees or groups.	The Citizen's Advisory Committee on Solid Waste is a committee of residents appointed by City Council that: • evaluates trash, recycling and litter control activity within the City of Manassas; • explores opportunities for improving refuse and recycling services and community outreach; • provides staff with valuable knowledge and insight in developing new and improved way of keeping the City of Manassas clean, safe and beautiful. • 11Citizen's Advisory meetings were held in FY19 • 7 committee members consistently attended each meeting • The group is very active and attends community events and public meetings with the Refuse and Recycling Coordinator.
Number of stormwater-related activities (e.g. hazardous waste clean-up days, tree plantings, volunteer-oriented festivals, stream clean-ups, etc.) participated, promoted, or sponsored.	6 different outreach activities were held in FY19. The number of participants ranged averaged around 500 depending on the actual event and some activities were repeated by groups. • 8 HHW & eWaste drop off days avg. 800 people. 158 tons of recyclable material was collected during these events • 2 RecycleFests avg. 1000 people attending • 326 Adopta! volunteers collected over 1 ton of litter. • 3 community events including Latino Festival, Utilities Day, National Night Out and Spring City festivals avg 4000+ total attendance at events. • One stormwater demonstration/presentation to Weems Elementary School (March 6, 2019) to a total of 31 students.
Forms and variety of Public messages sent out promoting volunteer events and household hazardous waste collection events.	The City uses several methods of outreach to provide information on clean-up and drop-off events including: • Social media • City Connection Newsletter • Website • Posters and flyers • Press Releases • Government Channel • Email shots
Publish an article that addresses stormwater issues such as recycling, yard waste collection, hazardous waste handling, and illegal discharges.	The City has been promoting refuse, recycling, Household Hazardous Waste (HHW), and eWaste information. • 4 television appearances on WDVM • 10 articles in local online and print publications • 2 mentions of stormwater on preventing yard waste in storm drains in the City Connection Newsletter

Table 3 Public Education Activities Conducted by City this Last Year (continued)

Program Element	Progress
Provide printed brochures to citizens at various locations around the City to increase knowledge concerning stormwater pollution.	All brochures and additional materials were provided to residents at the following locations: • Customer service counter at the Department of Public Works and Utilities office • City Hall • HHW and eWaste drop off site • Town Hall meetings • City events • HOAs/Community Centers Evidence provided by the Virginia Recycling Association has suggested that the audience for printed material is shrinking and that younger residents are more inclined to use smartphones to access information. Therefore, the money spent on printed materials will slowly transition into the investment in more valuable forms of outreach relevant to our audience.
Evaluate the education and outreach program for appropriateness of high-priority issues and target audiences and the effectiveness of message and mechanisms of delivery employed in reaching the target audience.	High priority water quality messages: • Residents using the storm drain as a trash can. • Dog walkers using the storm drain to dispose of pet waste. • Street litter, TVs and HHW at the curb. Approximately 40,000 of the 42,500 City residents have been reached during the reporting period through the following efforts: • 11,000 residential and commercial utility customers the City Connection Newsletter • 30,000+ people reached through articles in advance of and information provided at RecycleFest and Spring RecycleFest • 4,000 people reached through City events • 7,000+ people reached through the Refuse and Recycling website
Post pet waste pick-up and trash dumping regulations in City parks.	The signs have been posted in all parks.
Place trash receptacles in City parks.	All City parks have trash receptacles.
Place pet waste stations in City parks.	Five (5) of the City's 17 parks have pet waste stations. The servicing of both the trash receptacles and pet waste stations is fulfilled through the Didlake, Inc. contract administered through the Refuse & Recycling Coordinator.
Adaptively manage trash in City parks.	Over a course of time City staff noticed an issue with illegal dumping at Stonewall Park. In an effort to protect the environment, the police department has increased patrols in the park. Signs have been erected in the common areas where the dumping was occurring.
Explore creative ways to use the Adopta! Program to accomplish the City's MS4 goals.	The Refuse & Recycling Coordinator has created pamphlets and booklets for the Adopta! Program. In these materials the Adopta! Program offers the opportunity for citizens to adopt a park or an athletic field on an annual basis. This program has led to the reduction of trash in City parks.

Discussion on the FY2019 accomplishments and progress on these goals is as follows:

- Pursue other outlets to distribute existing stormwater (e.g. pet waste management animal shelters and to City parks) in order to expand audience from existing outlet locations.

  Some expansion of outlets occurred, including in the City's Recycling and Re-use Program, and the addition of new pet waste collection stations within Kinsley Mill Park. Regardless, much more effort on this recurring element needs to be carried over to the next year and reporting period.

- Create a working group of educators to advise and assist the Utilities Department in the development of curriculum-based stormwater educational material for City schoolchildren: incorporate stormwater into the school's curriculum.

  During this last reporting year, the Departments of Utilities and Schools met and began this discussion. Later, the Department of Schools met internally and agreed to pursue forming such an advisory team. Leslie Jones, Manassas City Public Schools K-12 Science Specialist, was designated as the point-of-contact to represent the Department of Schools. End-of-school year preparations and the summer break postponed further progress until fall and the next reporting period.

- Provide in-house stormwater training for the schools custodial staff; increase their awareness of stormwater and the MS4 permit.

  This training was not provided during this last reporting year. The City will carry this goal over into the next permit year.

- Post electronic versions of informational brochures on the City's website or create a web page with a stormwater focus.

  The City's stormwater webpage was nearly completely revised and updated this last reporting year. This website contains a variety of information potentially useful for both residents and business owners.

- Initiate a comprehensive (Citywide) GIS data layer depicting the extent of existing streamside vegetative buffers.Analyze and document the health and condition of the City's riparian conditions.

  The inaccuracies in the City's stormwater GIS database were much more prevalent than originally anticipated. Consequently, much of the City's GIS staff and capability was diverted and invested in the City's complete overhaul and development of the City's main stormwater GIS baseline database. In addition, before riparian condition inventory data could be reasonably collected, a more thorough and accurate baseline stream GIS database needed to be obtained. An updated improvement to the City's baseline stream GIS dataset was accomplished this last reporting period; however, the creation of the actual stream buffer condition dataset will be carried over into the next Annual Report.

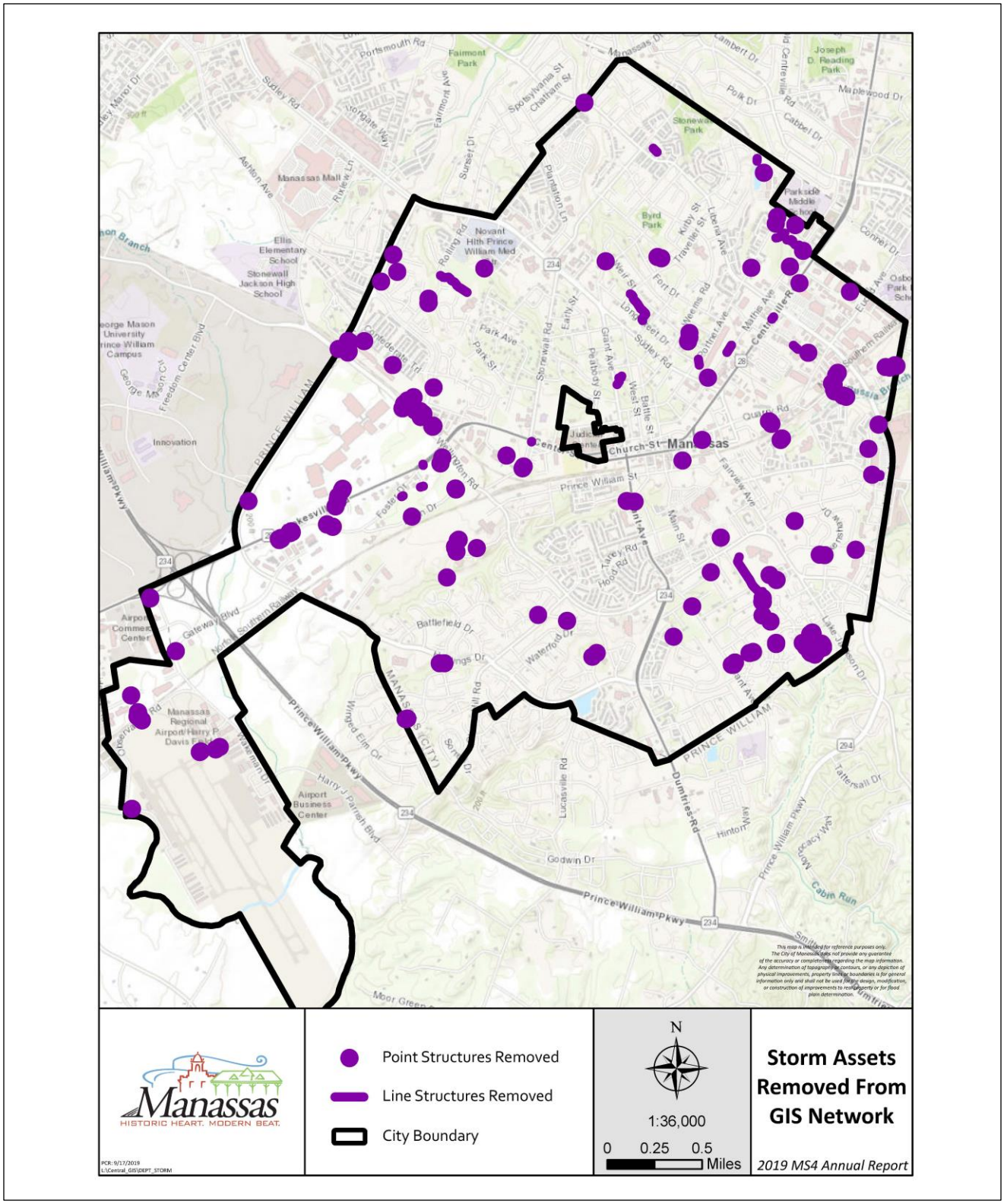

Figure 3 Stormwater Assets Removed as Part of GIS Data Clean-up Initiative

- Expand and update the City's Erosion and Sediment Control website(s) and make it easier for the public to understand and navigate the construction stormwater process.

  Over the last few years, elements of the Stormwater Program have been moved from the Engineering Department, to the Department of Public Works, and into the Utilities Department. During each of these moves, there was not clear and substantive discussion of what program responsibilities were moving along with specific tasks. Consequently, while specific tasks, such as Erosion and Sediment Control permitting and review continued, there remained widespread confusion and misunderstanding of who had management authority and responsibilities for these program elements. For instance, both the Engineering and Community Development Departments have a role in the Erosion and Sediment Control program, but no one fully understood which department had the overall program management responsibilities. Consequently, no one took the initiative to revamp and improve the Erosion and Sediment Control web presence. Therefore, to help resolve this and many other similar issues, the City contracted with the consulting firm GKY & Associates to review the City's entire stormwater program and related functions and provide the City with comprehensive strategic and operational recommendations, including which division would most effectively manage the City's Erosion and Sediment Control program. After receiving the report, the City will adopt whichever recommendations it feels is warranted, and therefore, settle many of these outstanding issues and complications. During this last reporting year, City staff met with GKY seven times in order to provide them with the input necessary for their analysis. Therefore, once the final report arrives, the Directors of Engineering, Community Development, and Utilities will meet and decide who has management authority of the City's Erosion and Sediment Control Program. Once that decision is made, the appropriate department will update the website and communicate these program clarifications with the public.

- Place a link to the informational brochure/web page on the City Employee Intranet.

  While the City placed a link to the City's Stormwater website (under the "Our Community" tab), we have not yet placed this information on the City Employee Intranet; therefore, this task will need to be carried over into the next reporting year.

- Continue distributing recycling and hazardous waste educational material to the public.

  The City continues to distribute recycling and hazard waste educational material, as well as manage and carry out an effective and aggressive recycling and hazard waste coordination program. These materials are provided in both English and Spanish languages.

- Develop an educational initiative focused on nutrients in the Sumner Lake region in order to increase resident's awareness of stormwater and water quality issues in their neighborhood.

  City staff increased contact and communication with Sumner Lake residents this last reporting year, with a focus of many of these interactions on Sumner Lake's nutrient

problem. In addition, a water quality monitoring project, including nutrients, was initiated this last reporting year, and the results of this monitoring were shared with board members of the Sumner Lake HOA. While these communication and educational nutrient-related efforts have increased at Sumner Lake this last year, they have not risen to the level of a comprehensive and focused educational initiative. Therefore, this aspect will be carried over into the next reporting year.

- Develop and disseminate educational handout material focused on stream sediment.

  No progress towards this task was made this last year; it will be carried over into the next reporting year.

- Update the City's stormwater page, including developing a Spanish version.

  The City's stormwater website was completely revised and updated this last reporting year, but the creation of a Spanish version will be carried over into the next reporting year. Additionally, the Google Translate function is available on all City webpages to translate English text into one of over 100 different languages.

- Continue disseminating informational and educational material on yard waste management, recycling, and hazardous waste collection

  The City continues to disseminate yard waste management, recycling, and hazardous waste collection educational material, as well as manage and carry out an effective and aggressive recycling and hazard waste coordination program.

- Provide in-house stormwater training for the parks and recreation staff.

  This task was not accomplished this last year; it will be carried over into the next reporting year.

- With input and involvement from other departments, draft a City-wide communications plan; and provide a strategic vision for the City's stormwater-related communications.

  The City found that there were greater internal communication barriers for its stormwater program than originally anticipated. Therefore, in order to develop an effective communications plan; we determined that as a prerequisite, broader and more systemic issues and challenges needed to be addressed first. The City hired a contractor to perform a comprehensive review of the City's combined stormwater, dam safety and regulation, floodplain, and water drainage issues, and to provide the City with strategic recommendations that would enable these programs areas to be more successful, efficient, and streamline communications. These recommendations will likely include organizational changes. Once the City adopts whatever appropriate recommendations contained in this and other related reports, it will then be poised to begin the much-needed process of developing a comprehensive communications plan. Therefore, this task will be carried over into the next reporting year.

- Hold at least two stormwater/MS4 permit-focused sessions during the routine Water and Sewer Friday training schedules.

  This task was not met; therefore, this task will be carried over into the next fiscal year.

Figure 4 "Mutt Mitt" Pet Waste Station at Sumner Stormwater Pond (that the Sumner Lake Home Owners Association paid for and installed)

2.2 MCM 2: Public Involvement/Participation

The goals of this MCM are to promote the availability of the MS4 Program Plan to the public for review and comment, provide access to the annual stormwater report, and to promote participation in activities that will reduce stormwater pollution.

A summary of the public involvement/participation activities conducted by the City during the reporting period is provided in Table 4.

Table 4. Summary of P4/Y1 Public Involvement/Participation Activities

Program Element	Progress
Stormwater telephone hotline and See Click Fix program established for citizens to report a concern regarding spills, illegal dumping, BMP problems, and construction site complaints.	A 24-hour/7-day per week stormwater telephone hotline number has been made available on the Stormwater web pages. In addition, an online comment section has been added to the "Report a Concern Form" on the City's website. **The web link for reporting stormwater concerns is:** https://www.manassascity.org/1418/I-Want-To See Table 12 for the specific complaints submitted for this reporting year.
Publish MS4 Program Plan and annual reports on the City of Manassas website for download. Also, provide printed copies of the MS4 Program Plan and annual reports to any interested parties upon request.	The MS4 Program Plan and annual reports are provided to the public on the City's website. PDFs of the Program Plan and annual reports are available on the site. Hard copies of the Plan and associated reports have been made available at all public meetings. Web links for annual reports and the program plan are provided below. The webpage for City MS4 plans and reports was visited 130 times during this reporting period: • **Annual Reports:** http://www.manassascity.org/1791/Stormwater-Plan-Reports-to-State • **Program Plan:** http://www.manassascity.org/DocumentCenter/View/22712
City park managers organizes litter pick-up volunteer events and supports similar efforts conducted by others.	• The Parks, Culture & Recreation division supports volunteer litter pick-up efforts by supplying available tools and resources. Volunteer litter pick-up events advertised on the City's website: http://manassascity.org/2269/Volunteer and is linked to http://www.manassascity.org/2272/Keep-Manassas-Beautiful

The City's Parks, Culture, and Recreation Division hosts the annual "Clean the Bay Day" event: it is held in one of the City parks annually. This event has been a great way to educate the public that the City is part of the Chesapeake Bay watershed. Volunteers spend a few hours in the park picking up litter on the parkland and off the stream embankments. After the event, statistics are sent to the Chesapeake Bay Foundation to support their efforts.

2.3 MCM 3: Illicit Discharge Detection and Elimination (IDDE)

The goal of this Minimum Control Measure is to develop, implement, and enforce a program to detect and eliminate illicit discharges into regulated small MS4s. To meet this goal, operators of a regulated small MS4 must:

- Develop and maintain an updated storm sewer map and outfall database;
- Prohibit through ordinance or other legal mechanism non-stormwater discharges to the extent allowable by law;
- Develop and implement procedures to detect and eliminate illicit discharges;
- Promote public reporting of potential illicit discharges; and
- Notify any downstream-regulated MS4s of physical interconnections.

As in many other sections of this report, illicit discharge monitoring proved challenging this reporting year due to the quantity and variety of transitions occurring this year within the City's stormwater program. To begin with, upon close scrutiny, the City realized that previous estimate of the number of stormwater outfalls within the City was woefully inaccurate. Last year the City reported a total of 279 outfalls. However, within this current reporting period, the City launched an ambitious comprehensive and system-wide assessment of all stormwater features within the City's jurisdiction. Besides the City recording outfalls not previously recorded, the City found through this new assessment, that a significant number of facilities previously counted as an outfall, in reality, are not. For instance, many stormwater inlets were classified as outfalls. There were even many situations in which both ends of every culvert running under each private driveway along an entire street were labeled as outfalls. Due to these previous errors and oversights, conducting dry weather screening this year proved especially challenging. There were situations in which City staff spent the entire day visiting pre-determined (through random sampling) "outfalls" and not located a single one that qualified as a regulated outfall. The City initiated this updated inventory a relatively short time before the conclusion of the reporting year. Therefore, at the time of this writing, the City has little confidence in the number of true outfalls within its jurisdiction. It will likely be less than the 279 reported last year.

<u>Geographic Information System (GIS) Stormwater IDDE Support</u>

To aid the City in managing and tracking illicit stormwater discharges, among other MS4 stormwater management purposes—the City developed and maintains a stormwater GIS database. In this regard, the City has made tremendous strides during this last reporting period. In this last year, the City developed and launched a totally revamped stormwater GIS geospatial database. The previous version was rife with errors, confusions, and missing data. Consequently, the City is still discovering errors not only in the previous GIS data, but also what was reported in last year's annual report. For instance, last year's annual report stated:

- "99% of the City's stormwater conveyance system has been field located and mapped in GIS with asset data that is managed through the citywide asset management system."

This was a figure provided by environmental consultants charged with performing an inventory of the City stormwater infrastructure in 2017, and has since been found to be vastly inaccurate. There were many end-of-pipes listed as "outfalls" that did not meet the definition of an "outfall,"

and even then, there were dozens of short culverts that crossed simple driveways that were labeled as "outfalls" on both ends of the culvert. Many stormwater grate inlets were labeled as outfalls, and there were numerous omissions, oversights, incorrect conveyance depictions, etc. This was the reason that the City launched a new GIS and has begun to visit each stormwater feature to truly and accurately verify and correct issues.

Another misnomer and inaccuracy that found its way into last year's annual report, was the statement:

> "96 Priority Areas for Potential Pollution Problems have been identified and a GIS layer has been created. Data will be continuously updated as required by development."

If this database ever was created and ever existed, no one currently working in the City is aware of such delineated identified priority areas.

At the time of this writing (August 2019) the City's GIS is currently being updated and verified. Consequently, to this and the poor state of our non-verified data, the City currently does not know how many regulated outfalls that exist within the City's jurisdiction. Last year, the City reported that we had 279 regulated outfalls. For this updated effort, all probable "discharges" (locations where stormwater leaves one stormwater conveyance) were labeled as a "discharge." As we verify the data, corrections are made to these "discharges" and decisions are made to which of these "discharges" are regulated "outfalls." Consequently, the total amount of actual outfalls is in a degree of constant flux.

For instance, as of August 7, 2019, the City's GIS data indicated 768 discharges, of these 179 have been tentatively labeled as outfalls. So far in the City's inspections and verifications, we inspected 310 reported discharges, and out of these, approximately 143 were deleted because of errors (such as was recoded to be another stormwater features, like an "inlet"). So far, approximately 50-percent of the stormwater features visited required some degree of re-coding, correction, or revision.

For an un-related example of the changes needed in the previous stormwater GIS data, City staff have recently discovered several errors in the number of stormwater BMPs. There are a few stormwater BMPs that have even received previous BMP inspections by City staff, but were not even listed in the GIS database. There were some BMPs listed as private BMPS, but in fact are owned, and/or supposed to be maintained, by the City. Therefore, even the number of BMPs we have are in a degree of flux while we develop this more comprehensive and professional approach to our stormwater management. All these changes and improvements occurred within this last reporting year.

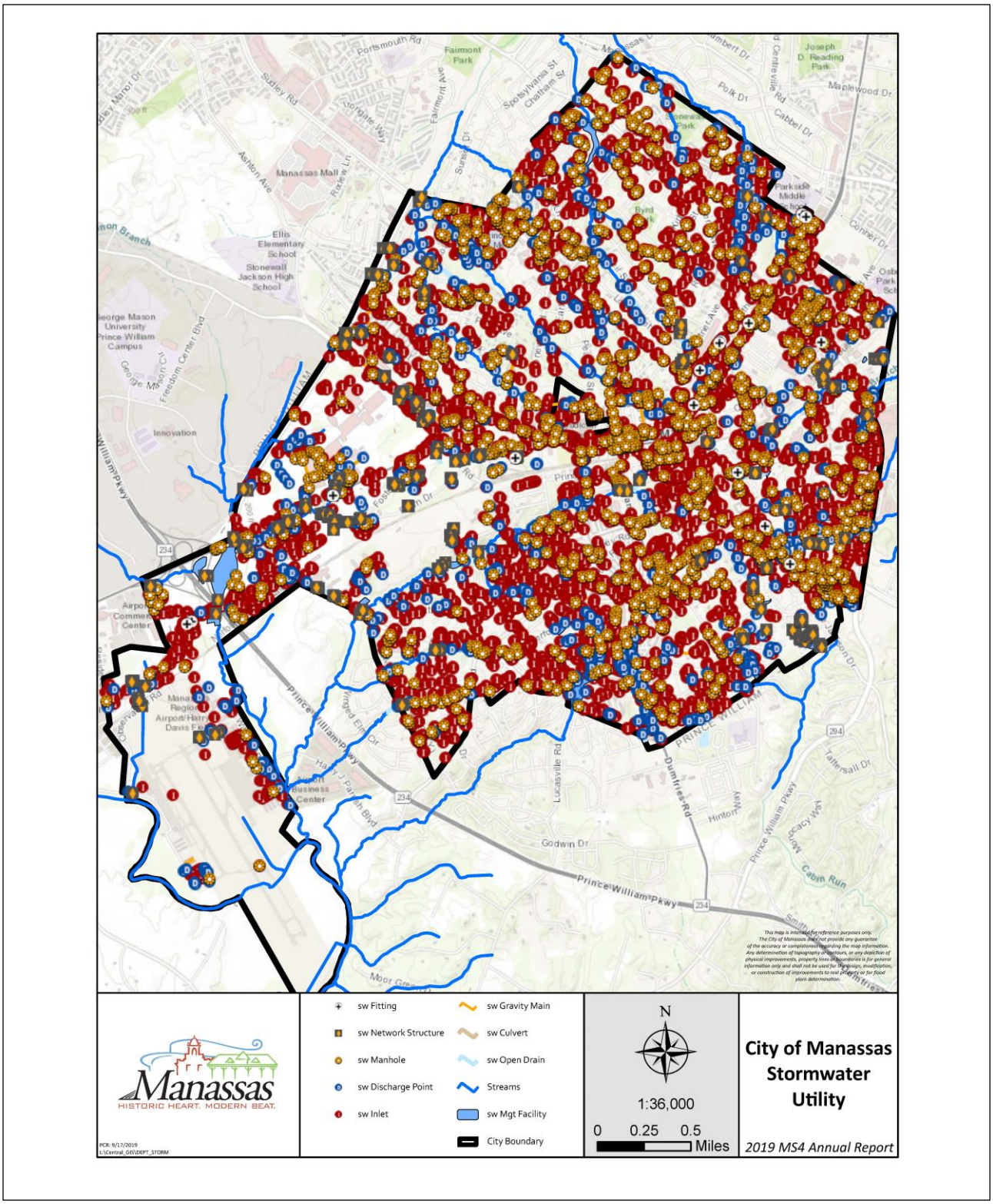

Figure 5 The City Manassas' Stormwater System

Table 5 Inventory Validation Progress of Stormwater Facilities (as of August 7, 2019)

Item	Number Inspected	Estimated Overall Total	Estimated Percentage Inspected
Stormwater Inlets Inspected	317	5,100	6%
Stormwater Discharges Inspected	293	768	38%
Stormwater Manholes Inspected	52	998	5%
Stormwater Network Structures Inspected	61	152	40%
Stormwater Gravity Mains Inspected	52	6,200	1%
Stormwater Culverts Inspected	26	90	29%
Stormwater Open Drains Inspected	20	104	19%
Stormwater BMPs Inspected	26	55	47%
Total	**847**	**13,467**	**6%**

Dry Weather Screening

Regardless of these complications, City staff performed 55 Dry Weather Screening assessments during this reporting year.

Table 6 Watersheds where Dry Weather Screenings Occurred in Reporting Year

HUC12 Watershed Code	VAHU6 Watershed Code	Watershed Name	Percent of City (Area)	Outfalls Screened FY19	Percent of Total Outfalls Screened FY19
20700100504	PL34	Broad Run-Rocky Branch	52.6%	40	73%
20700100801	PL41	Occoquan River-Occoquan Reservoir-Lake Jackson	4.9%	1	2%
20700100705	PL46	Lower Bull Run	42.5%	14	25%
		Total	**100%**	**55**	**100%**

Broad Run-Rocky Branch:

Outfall ID#	Micro-Watershed Name	Date Monitored
89764	Cannon Branch	06/28/2019
89765	Cannon Branch	06/28/2019
59291	Cannon Branch	06/28/2019
89762	Cannon Branch	06/28/2019
59299	Cannon Branch	06/28/2019
59298	Cannon Branch	06/28/2019
59290	Cannon Branch	06/28/2019
59426	Cannon Branch	06/28/2019
nn[1]	Winters Branch	06/28/2019
89916	Winters Branch	06/28/2019
59535	Winters Branch	06/28/2019
89917	Winters Branch	06/28/2019
59685	Winters Branch	06/28/2019
59686	Winters Branch	06/28/2019
89731	Winters Branch	06/28/2019

[1] This previously unknown Outfall has not been added to our inventory; yet to be assigned a unique ID #.

Broad Run-Rocky Branch (continued):

Outfall ID#	Micro-Watershed Name	Date Monitored
89732	Winters Branch	06/28/2019
89730	Winters Branch	06/28/2019
59528	Winters Branch	06/28/2019
59678	Winters Branch	06/28/2019
59529	Winters Branch	06/28/2019
59532	Winters Branch	06/30/2019
59442	Cockerille Branch	06/07/2019
59563	Cockerille Branch	06/07/2019
59641	Cockerille Branch	06/07/2019
59441	Cockerille Branch	06/07/2019
59440	Cockerille Branch	06/07/2019
59562	Cockerille Branch	06/07/2019
59439	Cockerille Branch	06/07/2019
59420	Cockerille Branch	06/07/2019
59438	Cockerille Branch	06/07/2019
59367	Cockerille Branch	06/07/2019
59266	Cockerille Branch	06/07/2019
59366	Cockerille Branch	06/07/2019
59265	Cockerille Branch	06/07/2019
89729	Cockerille Branch	06/07/2019
59436	Cockerille Branch	06/07/2019
59556	Cockerille Branch	06/07/2019
59645	Cockerille Branch	06/07/2019
59422	Cockerille Branch	06/07/2019
59669	Cockerille Branch	06/07/2019

Occoquan River-Occoquan Reservoir-Lake Jackson:

Outfall ID#	Micro-Watershed Name	Date Monitored
89734	Cabin Run	06/30/2019

Lower Bull Run:

Outfall ID#	Micro-Watershed Name	Date Monitored
59725	Flat Branch	06/06/2019
59234	Flat Branch	06/06/2019 & 06/30/2019 & 08/05/2019
59760	Flat Branch	06/06/2019
59759	Flat Branch	06/06/2019
59713	Flat Branch	06/24/2019
59736	Flat Branch	06/24/2019
59888	Flat Branch	06/24/2019
59892	Flat Branch	06/24/2019
89926	Flat Branch	06/24/2019
89911	Flat Branch	06/24/2019
59795	Buckhall Branch	06/30/2019
59238	Russia Branch	05/20/2019
59604	Russia Branch	06/07/2019 & 06/30/2019 & 08/05/2019
59476	Russia Branch	06/07/2019[2]

Out of these 55 outfalls, all were dry, and had no potential illicit discharges, except for two, one in the Russia Branch micro-watershed [59604], and one in the Flat Branch micro watershed [59234]. Both of these illicit discharges were within the Lower Bull Watershed.

[2] While Outfall 59476 did not contain an illicit discharge on 6/7/19, there was a slight moisture stain on the bottom of the concrete pipe. This was assumed to be residual moisture since it had been very humid since the last rain, and not been very warm, so it probably took longer than normal for this stormwater to fully evaporate from the pipe's outlet. It was marked as "no illicit discharge", but staff returned on subsequent days to confirm that it was as expected.

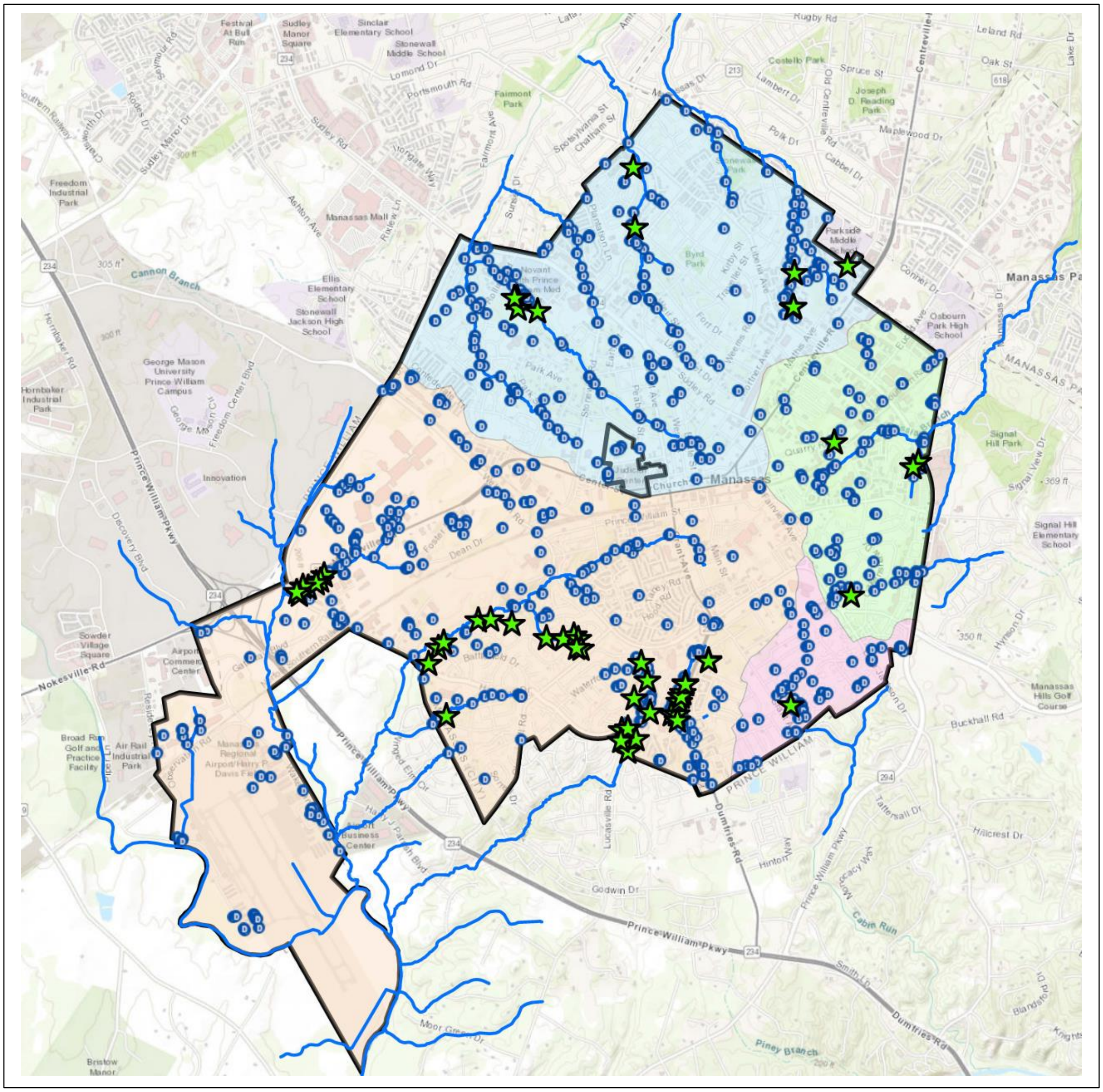

Figure 6 Dry Weather Screening Locations Conducted this Last Year

Dry Weather Screening Investigations:

Outfall 59604 (Russia Branch)

There was a standing pool of water at Outfall 59604 when first inspected (Figure 7). This pool was located in a low depression immediately outside of the outfall pipe. The water was not flowing at the time. Since this low depression was one of the lowest spots in the vicinity, the City employee conducting the assessment believed the water was mostly groundwater seepage and residual water from the last rain event (it had not been too long since then, and this pooled water would take a long time to evaporate away in this shady recess). Upon return, three weeks later, and a similar pool of water was present then as well (Figure 8): there had been some intervening rain within this three-week period. A water sample was taken and sent to the lab for analysis. In addition, some water quality parameters were obtained in the field at the time of collection. Nothing in these data indicate that the standing pool of water was not simply residual stormwater that has not yet evaporated from this low-lying basin. This same employee returned about five weeks later during an especially dry time, considering how wet it had been this overall season. The pool was gone. Without the water, an encircling sediment dam was clearly visible (Figure 9). This sediment dam would routinely pool water; thereby creating such pools as seen during the last two site visits. From this information, the City determined that the pools of water observed the two previous times would not count as illicit discharges warranting any further investigation.

Figure 7: Pool 59604 on June 7, 2019

Figure 8: Pool 59604 on June 30, 2019

Table 7 Water Quality Data from Outfall 596704 (collected on June 30, 2019)

Field Data		**Analytical Results from Lab**	
Temperature, degrees C	23.7	Nitrite (mg/L)	0.013
Dissolved Oxygen Saturation (%)	47.2	Orthophosphate (mg/L)	0.59
Dissolved Oxygen (mg/L)	3.91	Free Ammonia (mg/L)	0.14
Specific Conductance (uS/cm)	113	Alkalinity (mg/L)	34.0
pH	7.76	Hardness (mg/L)	25.0
Chlorophyll-a (ug/L)	7.80		

Note: for a comparison of the water quality and water chemistry of this pool and others in the vicinity, please refer to Tables 28 and 29.

Figure 9 Outfall 59604 with Dried-up "Pool" on August 5, 2019

Outfall 59234 (Flat Branch)

There was a standing pool of water at Outfall 59234 when first inspected (Figure 10). This pool was located in a shallow depression immediately outside of the outfall pipe. The water was not flowing at the time. During the inspection, the source of the standing water in and near the pipe was unknown. Groundwater seepage appeared to be the most likely explanation, partly because according to the City's GIS stormwater infrastructure database, there was only one drain contributing to this outfall, and that one inlet was dry.

Upon return three weeks later, a similar pool of water was present there as well (Figure 11). There had been some intervening rain within this three-week period. A water sample was taken and sent to the lab for analysis. In addition, some water quality parameters were obtained in the field at the time of collection. Nothing in these data indicate that the standing pool of water was not simply residual stormwater that had not yet evaporated from this low-lying basin. About five weeks later, during an especially dry time, considering how wet it had been this overall season, the site was re-inspected.

Figure 10 Pool from Outfall 59234 on June 6, 2019

During re-inspection of this site on August 5, 2019, City employees lifted several manhole covers in the area and determined that the City's GIS stormwater map is incorrect in this area. Instead of receiving drainage from only one inlet--in the main office parking lot (Figure 13), it also received stormwater inputs from the building roof, the back of the building and its associated utility doors, pipes, and infrastructure, but also an adjacent playground, and a pipe from an unknown source. None of these pipes were flowing at the time of this latest inspection. Later, the City sent down-pipe cameras into these unknown pipe discharges. They were traced to the adjoining day-care center (Figure 14). This latest investigation showed that many more buildings and parking lots are drained by this outfall. City stormwater staff contacted the owners of these buildings, and found that large air conditioning units are also located on these rooftops, and they omit a small but consistent water discharge. This air conditioning water plus the stormwater from the additional roof top and other impervious surfaces are enough to explain the discharge characteristics of this outfall. Therefore, the earlier discharges noted in this investigation should not be considered illicit discharges, so this investigation has concluded.

Figure 11 Pool from Outfall 59234 on June 30, 2019

Figure 12 Pool from Outfall 59234 on August 5, 2019

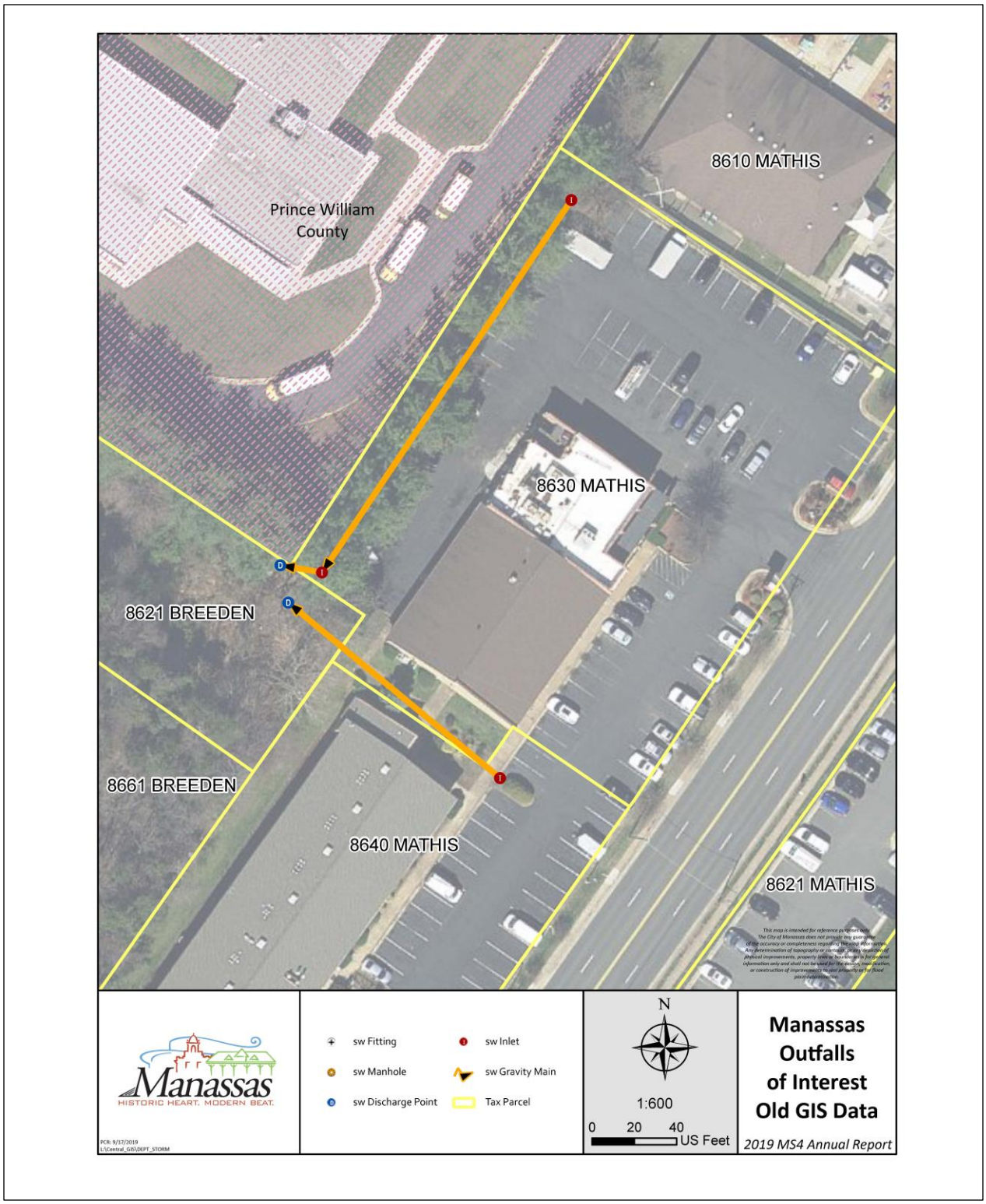

Figure 13 The Flow-Path to Outfall 59234 Known Prior to Investigation

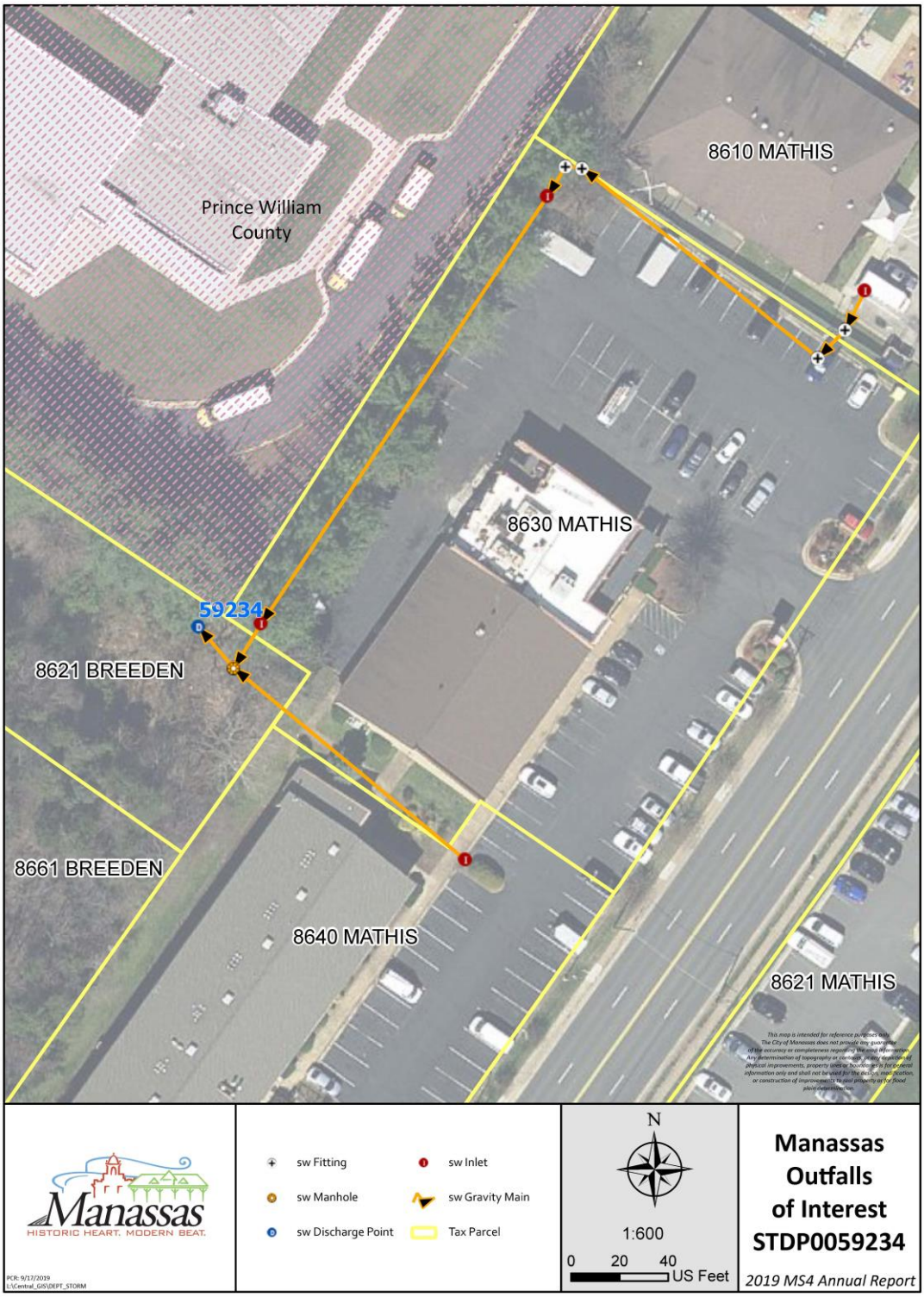

Figure 14 Flow-Path to Outfall 59234 as Known after Investigation

Table 8 Water Quality Data for Illicit Discharge from Outfall 59234

Field Data		Analytical Results from Lab	
Temperature, degrees C	20.9	Nitrite (mg/L)	0.014
Dissolved Oxygen Saturation (%)	74.0	Orthophosphate (mg/L)	0.57
Dissolved Oxygen (mg/L)	6.61	Free Ammonia (mg/L)	0.02
Specific Conductance (uS/cm)	417.8	Alkalinity (mg/L)	55.0
pH	7.45	Hardness (mg/L)	95.0
Chlorophyll-a (ug/L)	0.53		

Note: for a comparison of the water quality and water chemistry of this pool and others in the vicinity, please refer to Tables 28-29.

Other Illicit Discharges

On November 9, 2018, the City created and launched a new spreadsheet to track resident stormwater and utility-related complaints. These complaints range from trash in area streams, flooding concerns, failing stormwater infrastructure, poor stormwater drainage problems, to reports of illicit discharge. Since the inception of this spreadsheet until the end of this MS4 permit reporting period, there were 36 recorded complaints. Of these, 8 were not MS4-related, and out of the remaining 28 reports, 7 related to illicit discharges.:

The City's Safety Officer also maintains a separate spreadsheet tracking illicit discharges involving HAZMAT response. On this spreadsheet, he had one entry for this reporting period.

Table 9 Safety Officer's Reported Illicit Discharges

Complaint Date	How Received	Complaint	Date Resolved
4/10/19	Phone Call	2-3 gallons motor oil spilled into roadway (cleaned up before entered stormdrain, so it was another "near miss).	4/10/19

The City's Fire and Rescue Services responds and manages illicit discharges that involve an immediate public health threat, such as the spillage of flammable chemicals. They reported no such illicit discharges for this reporting period.

Each of the accidental sewer discharges into the City's stormwater system depicted in Table 10 were reported to Virginia's Department of Environmental Quality.

Table 10 Estimate of Sanitary Sewage Entering City Streams in Reporting Period

Item	Estimated Sewage Waste Entering Stream or Stormwater System: Period July 1, 18 to June 30, 19
March 21, 2019 Spill #1 (Middle Bull Run Watershed) [IR#200815]	20,000 Gallons
March 21, 2019 Spill #2 (Lower Bull Run Watershed) [IR#200835]	1,500 Gallons

Water losses from the City's public water system totaled 286.9 million gallons durng the reporting period (Table 11). The total number represents the maximum quantity of drinking water that could have entered the City MS4 in FY2019. Water losses from the City's public water system are largely attributable to water main breaks and routine hydrant and water line flushing activities. This figure represents the cumulative water losses reported to the VDH Office of Drinking Water for the City of Manassas Public Water System (PWSID VA6685100) during the reporting period. A small percentage of the volume discharged was dechlorinated during hydrant flushing activities.

Table 11 Estimated Municipal Water Entering City's Stormwater System

Month in 2019	Total Produced (Thousand Gallons)	Total Produced (Million Gallons)	Water losses (%)	Potential discharges to MS4 (Million Gallons)
Jul-18	351384.00	351.38	9.29	32.6
Aug-18	355352.67	355.35	7.87	28.0
Sep-18	347880.00	347.88	7.34	25.5
Oct-18	359836.00	359.84	6.07	21.8
Nov-18	348230.00	348.23	7.12	24.8
Dec-18	346552.67	346.55	6.47	22.4
Jan-19	325786.00	325.79	7.56	24.6
Feb-19	293568.00	293.57	6.78	19.9
Mar-19	326782.21	326.78	6.52	21.3
Apr-19	306635.00	306.64	6.97	21.4
May-19	325135.00	325.14	6.84	22.2
Jun-19	313960.00	313.96	7.07	22.2
			TOTAL for FY19 (million Gallons):	**286.9**

- The City has identified storm sewer interconnections with the following three (3) neighboring MS4s:

  - City of Manassas Park
  - Prince William County
  - Virginia Department of Transportation (VDOT)

  Written notifications were sent to these interconnected MS4s on June 23, 2014, in P3/Y1.

- Chapter 118, Article IV, Section 118-369, Division 5 (Wastewater Discharge), Subdivision II(A) (Stormwater Pollution) of the City of Manassas Code of Ordinances prohibits nonstormwater discharges into the City's storm sewer system.

Table 12 Other Known Illicit Discharges in Reporting Year

Date Illicit Discharge	Lead Department	Incident	Watershed	Resolution	Enforcement Action
2/4/2019	Public Works	Trash backing up in stormdrain	Broad Run-Rocky Branch	Trash removed	None
2/21/2019	Public Works	Land Disturbance cased sediment to run into stormwater system	Broad Run-Rocky Branch	Requested contractor apply for ESC permit	None
3/19/2019	Utilities	Large deposit of salt discovered on public roadway	Unknown	Street Crew swept salt up and disposed of it	None
3/25/2019	Utilities	Sheen on ground under home determined to be from stormwater	Lower Bull Run	Still open	Still open
4/9/2019	Public Works	Household debris dumped along shores of public stormwater pond	Middle Bull Run	City staff cleaned up trash	None
4/10/2019	Safety and Risk Management	2-3 Gallons of motor oil spilled on Roadway	Lower Bull Run (Middle Bull Run)	Spill Kits provided and the spill cleaned up	None
5/9/2019	Utilities	Report of HOA draining and cleaning a large swimming pool directly into stormwater wet pond	Middle Bull Run	Investigation and Follow-up communications	Warning Letters Issued to property manager, pool management contractor, and pool cleaning subcontractor
6/17/2019	Utilities/City Police	Trash being dumped directly into stormwater inlet	Middle Bull Run	Police issued Written Warning/Utilities arranging direct educational talk to HOA residents	Police issued Written Warning/Utilities arranging direct educational talk to HOA residents
6/26/2019	Fire and Rescue	Illegal Dumping and Run off from Parking Lot	Middle Bull Run	Contractor cleaned up before entered stormwater system	Notice of Violation Issued

2.4 MCM 4: Construction Site Stormwater Runoff Control

The goal of this MCM is to develop, implement, and enforce procedures to reduce pollutants in stormwater runoff from construction activities that result in a land disturbance of greater than or equal to one (1) acre. This has been modified by the City's ordinance which has a disturbed area threshold of 2,500 square feet or greater and all erosion control devices inspected and approved by the City Inspector prior to the initiation of any land disturbing activity. Construction site runoff control in the City is implemented through its Erosion and Sediment (E&S) Control Program. A summary of the construction site stormwater runoff control activities conducted by the City during the reporting period is provided below.

- The Virginia Stormwater Management Program (VSMP) was adopted by the City Council on June 16, 2014 and became effective as of July 1, 2014. During the reporting period, the City remained fully consistent with the requirements of the Virginia Erosion and Sediment Control Law and Regulations. The Department of Community Development is the responsible party for administering the City's E&S Control Program. Table 13 provides a summary of land-disturbing activities for the reporting period.

Table 13 Summary of Land Disturbing Activities, Inspections, and Enforcement Actions Taken by the City during the Reporting Period

Item	Quantity Period July 1, 2018 to June 30, 2019
Total Number of Land-Disturbing Activities	19
Total Number of Disturbed Acres	59.14
Total Number of E&S Inspections Conducted	586
Number of Stop Work Orders	3
Number of Notices to Comply	610
Number of Enforcement Actions	633

- The City's E&S Control staff is required to remain certified by the Virginia Erosion and Sediment Control Law, attendant regulations, and the City's E&S Control Program. Recertification is required on a rolling schedule at least once every three (3) years. Table 14 provides information on City E&S staff certification statuses.

Table 14 Summary of E&S Staff Certifications Held During the Reporting Period

Item	Quantity Period July 1, 2018 to June 30, 2019
Total Number of E&S Staff Members	2
Number of E&S Staff Members Certified for Combined Administration*	2
Number of E&S Staff Members Certified for Plan Review	0
Number of E&S Staff Members Certified for Program Administration	0
Number of E&S Staff Members Certified for Inspection	2

*Combined Administrators are co-certified at the Plan Review, Program Administration, and Inspection levels.

Note: Two staff attended DEQ sponsored training for stormwater review certification.

Other Accomplishments:

Within this reporting period, the City developed a system to automate inspection reports. The system is currently in its testing phase. The results of this testing will be reported in next year's Annual Report.

2.5 MCM 5: Post-Construction Stormwater Management

The goal of this MCM is to develop and implement procedures for design review/approval, construction inspection, operational inspections, and follow-up maintenance of permanent structural and non-structural stormwater management (SWM) facilities for both City-maintained and privately-maintained facilities. As such, the City utilizes its legal authority to ensure that stormwater runoff controls are designed, approved, installed, and maintained according to state and local criteria standards. Periodic routine inspections are conducted for both City-maintained and privately-maintained permanent structural and non-structural stormwater facilities. The City maintains a database of all SWM facilities and related inspection activities.

The City has developed requirements for the design, implementation, and construction of SWM facilities as outlined in the Design and Construction Standards Manual (DCSM). The City adheres to these requirements, which provides for the proactive management of post-construction stormwater runoff.

A summary of the post-construction SWM activities conducted by the City during the reporting period is provided below.

- The City has made considerable progress in improving the condition of this Minimum Control Measure. After City managers moved the stormwater program to the Utilities Department and Utilities staff delved into the details, the true extent of long-outstanding legacy issues became apparent. The bulk of the City's stormwater time had been spent in correcting and improving these institutional legacy issues. Some legacy complications include the following:
  - The City listed stormwater BMPs as private facilities, but in reality are owned by the City.
  - There were several obviously visible stormwater facilities that were not recorded as such.
  - Some of the listed stormwater BMPs turned out not to even be stormwater features, instead they were emergency sanitary sewer-containment berms surrounding sanitary sewer treatment plants.
  - All the City's previous inspections of private BMPs were only filed in City drawers, they were not shared with the owner, and there was no communication with BMP owners regarding outstanding maintenance needs. Consequently, BMP owners made no needed repairs—ever. They often had no idea that they were expected to maintain the BMP or that they even owned the facility.
  - Most of the private BMPs in the City have no maintenance agreements, and the few that do, are often too vague to be useful for maintenance enforcement purposes.
  - Formerly, the City made substantive decisions affecting stormwater BMPs, but there is incomplete or missing written records; instead, staff have relied on verbal decisions and institutional memory.
  - Since the stormwater program had been moved from department to department over the years, there is little understanding or awareness of who performs what stormwater function. For instance, currently there are still disagreements and misunderstanding of

which department manages the construction stormwater permit and erosion and sediment control stormwater programs.
  - Considerable time was spent on determining who owned which private stormwater BMP and in locating contact information on the responsible manager. In addition, the City staff has since been keeping and maintaining frequent contact and communications during this critical period of getting the outstanding issues in order.

- As of June 30, 2019, the City had identified 39 private stormwater BMPs, 23 City-owned stormwater BMPs, and 1 Virginia Department of Transportation stormwater BMP within the City's jurisdiction. This totals 63 stormwater BMPs. Some of the changes made in the City's BMP records during this last reporting year include the following:
  - The "UOSA Pond" was removed from the BMP list since it is not a stormwater facility.
  - The private "Wellington Gloxinia" dry pond was removed from the list, since in the late 1980s the City gave the owners of this BMP permission to dismantle the stormwater retaining components of the pond, so it had not been operating as a dry pond for several decades; and, at the time, the stormwater treatment functions were transferred to the newly constructed regional stormwater wet pond.
  - The "Cannon Industrial Park" dry pond was formerly listed as a private pond, but the City owns the land, the pond, and had been maintaining it.
  - The "Point of Woods" wet pond was formerly listed as a private pond, but the City owns the land and the pond, but as far as can tell at the time of this writing, no one had been maintaining.
  - The "Manassas Lumber" dry pond ownership and maintenance responsibilities has been a confusing and lengthy issue to resolve. It is a privately owned facility, but the City's records listed the wrong owner. This stormwater BMP serves at least nine businesses, as well as a portion of the City's road network; however, the City's records are unclear who was to maintain it. Some indications are that one of the owners has at least some responsibility, but no one communicated this with them, or anyone else. Consequently, the BMP has fallen in disrepair, and the City's recent communications with the affected owners have taken everyone by surprise. This issue will take some time to fully resolve.
  - Hastings Market Place is an underground facility listed as one BMP. Shortly after the end of the reporting period, the City found that instead there are four separate BMPs on this parcel. Next year, the inventory will be adjusted to account for the true number.
  - Prince William Judicial Center's BMP was removed from our inventory, since this stormwater facility is owned and operated by Prince William County and it is not in the City's jurisdiction.
  - Liberty Commons underground BMP was listed as one BMP, but it is two separate ones. The inventory was adjusted accordingly.
  - The "234 Bypass Pond" is a stormwater wet pond that was listed on the City's inventory as a City-owned facility. Investigations by the City's MS4 Coordinator revealed that Virginia Department of Transportation (VDOT) owns and maintains this BMP, but since it is located within the City limits, the City removed it as a

City-owned facility, and instead the City now tracks it in their MS4 program as an "other" (not city owned, but not private).

- Metz Junior High School stormwater BMP had been listed as a stormwater BMP, but this status is still in doubt. Indications are that this facility, that does not conform to any recognized BMP standard, may not truly be a stormwater BMP. However, this has not been resolved at the time of this writing, so the City still tracks this as a City-owned and maintained BMP.
- The former status of the "Wakeman Pond", a city-owned regional wet pond facility was unclear. Some versions of the City's inventories listed it as City-owned facility, while another version listed it as a VDOT facility, and yet another version did not list it at all. This large stormwater facility is City-owned and maintained, and the newly revised stormwater BMP inventory now reflects this.
- Adjacent to the "Wakeman Pond" is another large stormwater wet pond that according to the records was constructed the same time as the nearby larger facility; however, no former inventory accounted for this smaller of the two ponds. Therefore, the City has recently added this stormwater pond to its inventory (as "Wakeman-Small" versus the other is "Wakeman-Large").
- The "Walmart Pond has been added to the City's inventory. This pond was built years previously to serve and treat the Walmart store located outside of the City's jurisdiction (Prince William County), but the pond itself is located across the boundary within the City's jurisdiction. This is a private pond, and the City has been working with the responsible party to resolve the many substantive and long-outstanding maintenance and repairs needed to bring this neglected BMP up to standards.
- The "Shemin Nursery" BMP was added to the City's inventory as a private stormwater BMP. This is an old facility, but somehow it has escaped inclusion in any former stormwater inventory.
- The "Bristow-Caitlin" BMP was added to the City's inventory as a private stormwater BMP. This is an old facility, but somehow it has escaped inclusion in any former stormwater inventory.
- The "Bristow-Milroy" BMP was added to the City's inventory as a private stormwater BMP. This is an old facility, but somehow it has escaped inclusion in any former stormwater inventory.
- The "Lockheed Martin" BMP was added to the City's inventory as a private stormwater BMP. This is an old facility, but somehow it has escaped inclusion in any former stormwater inventory.
- Another "UOSA" sanitary sewer treatment facility emergency sanitary sewer retaining berm has been removed from the inventory, since it is not a stormwater facility.

- The City maintains a new, and updated list of stormwater BMPs, within an electronic database and includes the following information on the City's stormwater BMPs[3]:

  - Facility Name
  - Facility ID (New Designation)
  - Facility ID (Old Archived Designation)
  - Facility Type
  - Facility Street Address
  - Location, Latitude
  - Location, Longitude
  - Surface Area of BMP
  - Acres Treated
  - Pervious Acres Treated
  - Impervious Acres Treated
  - Date Brought Online
  - Ownership/Management Category (City, private, other)
  - Receiving Water Body (Watershed Name)
  - HUC Number
  - ID Number of Outfall BMP Discharges To
  - Impaired Water Segments
  - Site Plan ID
  - Tax Map ID
  - Date of Most Recent Inspection

  The electronic database is maintained by the City and is available upon request.

- The City performs visual inspections of the City-owned SWM facilities after each significant rainfall event to check for debris or any physical failures that may require immediate attention.

- During the reporting period, the City completed inspections of all public SWM facilities. All facilities were determined to be operating as designed and inspection records are maintained and available upon request.

  All appropriate City BMPs were inspected during the previous reporting period. Out of these, 13 were performed by City staff (Addie Aufforth), while the remainders by contract.

- The private SWM facilities were required to be inspected during the reporting period;

  All SWM facilities were inspected within this reporting period (two were inspected by City employee Addie Auforth, and the remainders by contract (GKY).

[3] Not all these fields in this database are populated yet; City staff continually attempt to resolve these data gaps.

- The City has developed tools to aid in the implementation of the SWM program through databases, GIS, and spreadsheets. These tools are updated on an as-needed basis to remain current with field conditions.

- The City SWM Facility Plan Reviewers and Inspectors are required to remain certified by the Virginia Erosion and Sediment Control Law, attendant regulations, and the City's SWM facility Inspection and Maintenance Program. Recertification is required on a rolling schedule at least once every three (3) years. Table 15 provides information on the status of the City's stormwater staff certifications.

Table 15 Summary of Staff SWM Certifications Held During the Reporting Period

Item	Quantity Period July 1, 2018 to June 30, 2019
Total Number of SWM Staff Members	3
Number of SWM Staff Members Certified for Combined Administration*	2
Number of SWM Staff Members Certified for Plan Review	1
Number of SWM Staff Members Certified for Program Administration	0
Number of SWM Staff Members Certified for Stormwater Inspections	2

*Combined Administrators are co-certified at the Plan Review, Program Administration, and Inspection levels.

During this reporting year, one City employee (Utilities Department) received her first stormwater inspection certification.

2.6 MCM 6: Pollution Prevention/Good Housekeeping for Municipal Operations

The goal of this MCM is to develop and implement written procedures designed to minimize or prevent pollution discharge, to the maximum extent possible (MEP), from normal daily municipal operations. These procedures cover the planning and tracking necessary to ensure the following activities are conducted:

- Staffing

Table 16 Stormwater Staffing

City Department	Number Staff that Performs Stormwater Functions	Percentage of Time Staff Devote to Stormwater Issues	Approximate Full-Time-Equivalents (FTE)
Utilities Department—Environmental Programs	3	67%	2.0
Utilities Department—Water &Sewer	4	60%	2.4
Utilities Department—Adm./Management	5	8%	0.4
Engineering Department	9	25%	2.3
Community Development—Development Services	2	3%	0.1
Community Development—Parks, Culture & Recreation*	3*	25%*	0.8*
Community Development—Planning and Zoning	1	1%	0.1
Department of Public Works—Streets	7	50%	3.5
Department of Public Works—Buildings & Grounds	4	12.5%	0.5
Department of Public Works—Recycling Programs	1	1%	0.1
Fire & Rescue	4	4% (as needed)	0.2
Risk Management*	1	4%*	0.1*
Communications	2	2%	0.1
Code Enforcement*	3*	10%*	0.3*
GIS Department	4	38%	1.5
Department of Public Schools*	5*	4%*	0.2*
TOTAL	**58**	**25%**	**14.6**

Key: * = Data not available at time of report, so the MS4 Coordinator estimated these values.

- Identification of high priority facilities with a high potential for discharging pollutants

  There have been many changes to this listing over the last year. The Fiscal Year 2018 MS4 Program Plan listed the airport, public works facility, and water treatment plant. However, all three of these are exempt from the general MS4 plan, since they are each covered under their own specific Individual Permit; therefore, the FY2019 MS4 Program Plan listed the City Storage/Boneyard, Sumner Lake, Euclid Industrial Park public pond, and the City's sidewalks and adjacent areas. The rationale for choosing these areas was an attempt to link integrally these priorities with the education and outreach priorities listed under Minimum Control Measure 1. For instance, the three-priority education and

outreach topics and issues are illicit discharges and illegal dumping from residents; pet wastes and bacteria TMDL; and Sediment.

Sumner Lake is a City of Manassas operated and maintained regional stormwater wet pond that contains elevated levels of nutrients and a significant amount of public complaints wanting the water resources to be treated with algaecide.

Euclid Industrial Park is a City of Manassas-managed stormwater facility that receives a high quantity of trash dumped there frequently.

City's Sidewalks and Streets were chosen due to the most likely areas for the City's residents to use for pet waste and bacteria.

However, no matter how closely linked these are with other chosen priorities, they nonetheless do not fit cleanly into the MS4 permit standards; for instance, it would be problematic attempting to develop a SWPPP for Sumner Lake when nearly all of the nutrients entering the lake are from private homes. Similar challenges would be present for the development of a SWPPP for the City's sidewalks and streets, regardless, if the majority of the City's pet wastes come from these areas. Therefore, after the development of the City's last MS4 Program Plan, the City's choices for high priority facilities that have a high potential to discharge pollutants have changed once again. The new list consists of the following four sites:

1) Boneyard/Sort Yard
2) Police Vehicle Impound Yard
3) Fire Stations
4) Water Storage Facilities [note: City staff have already begun developing the draft SWPPP for these facilities: it will be listed in next year's accomplishments]

Since this change, little progress has made on the development of a SWPPP for these sites and the other permit requirements; therefore, these tasks will need to be moved into the next reporting year.

- Identification of contiguous areas over one (1) acre receiving applied nutrients

Table 17 List of Applicable Lands where Nutrients are Applied to Contiguous Areas of More Than One (1) Acre for which Nutrient Management Plans (NMPs) have been developed

Land	Acreage	Watershed	Latitude	Longitude	Plan Status
IBM Ball Fields	16.43	Rocky Branch-Broad Run	38°44'46.0"N	77°30'40.8"W	Complete
Manassas Museum	3.55	Rocky Branch-Broad Run	38°44'54.9"N	77°28'19.1"W	Complete
Jennie Dean Ball Fields	5.73	Rocky Branch-Broad Run	38°44'42.0"N	77°29'28.4"W	Complete
Byrd Park Ball Fields	2.62	Middle Bull Run	38°46'08.1"N	77°28'20.0"W	Complete
Public Works Hillsides	2.41	Middle Bull Run	38°46'11.7"N	77°27'39.9"W	Complete
Total	**30.74**				

Note: the approved NMPs call for both nitrogen and phosphorus nutrients, but due to the anticipated uses of these fields, and the City's attempts to reduce unneeded phosphorus use, the City's Arborist has only been applying the nitrogen fertilization called for in the NMP; we have not been applying any of the phosphorus.

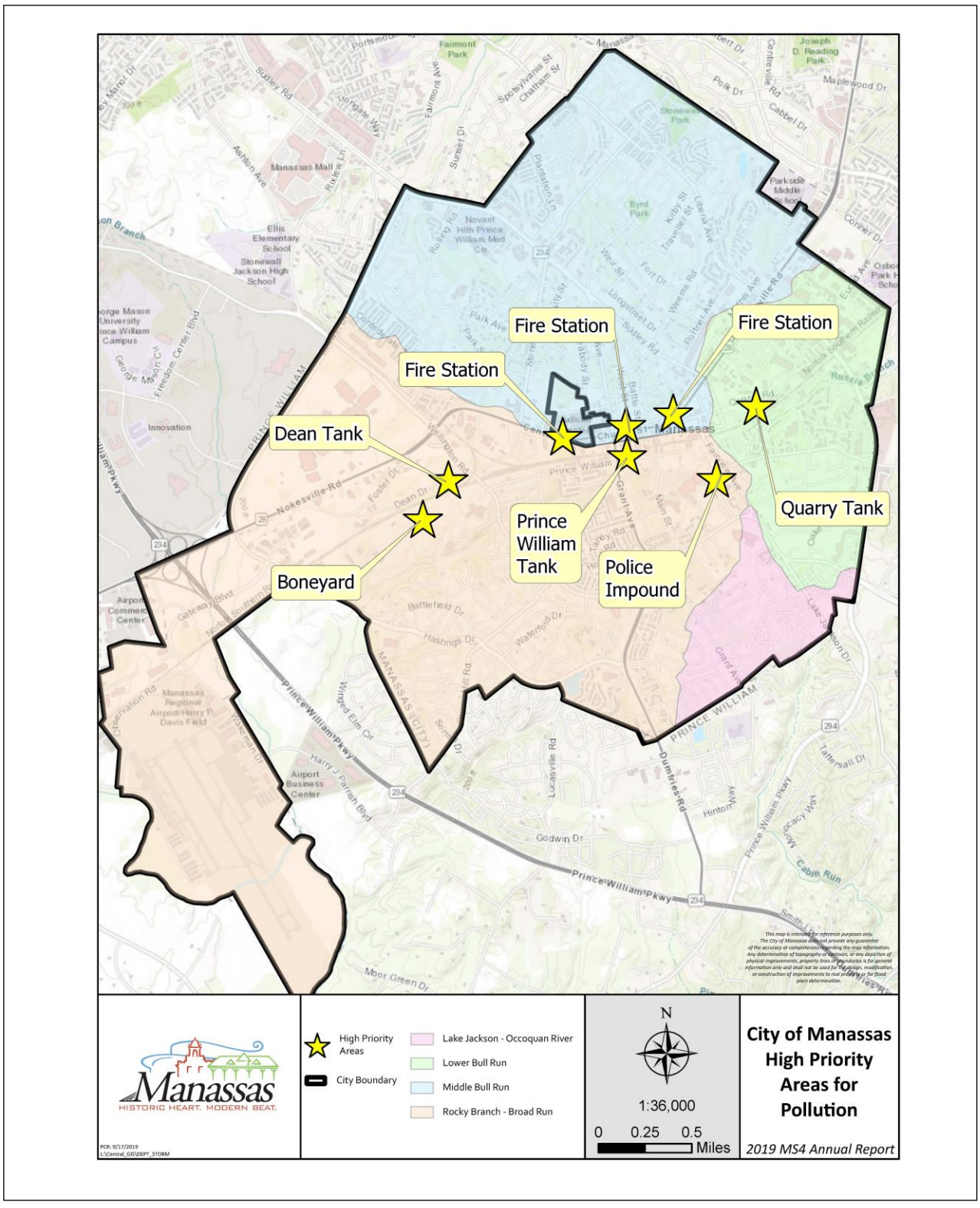

Figure 15 Location of High Priority Facilities

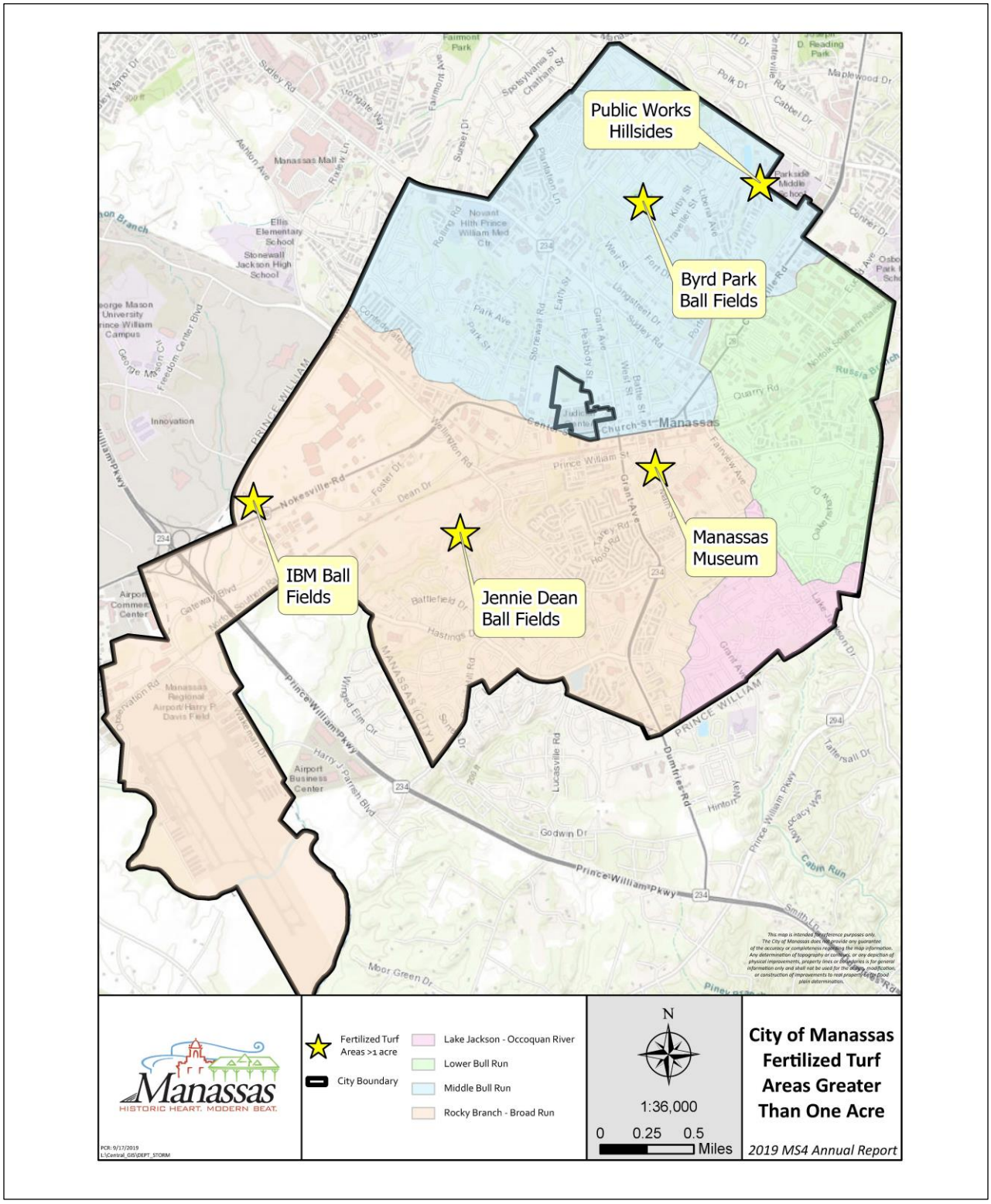

Figure 16 Location of Fertilized Turf Areas Greater than One Acre where NMPs have been Developed

Chemical Applications by TruGreen:

The City requires TruGreen to use appropriate control measure procedures by requiring that all employees applying pesticides and herbicides to be properly trained or certified in accordance with State Law. Businesses that apply pesticides for compensation must be registered with the Virginia Department of Agriculture and Consumer Services (VDACS), and their employees must hold the appropriate certifications. This requirement is enforced through the language in TruGreen's contract, which is available upon request.

Products applied by TruGreen

Table 18 Summary of Nitrogen Fertilizer Applied

Summary of Nitrogen Fertilizer Applied					
Watershed	**Land**	**Acreage**	**Acreage Summary**	**Lbs. N Fertilizer Applied**	**Pounds N Applied**
Rocky Branch-Broad Run	IBM Ball Fields	16.43	25.71	1,933	3,022
	Manassas Museum	3.55		418	
	Jennie Dean Ball Fields	5.73		671	
Middle Bull Run	Byrd Park Ball Fields	2.62	5.03	306	593
	Public Works Hillsides	2.41		287	
Total		**30.74**	**30.74**	**3,615**	**3,615**

Table 19 Summary of Tri-Power Post Emergent Herbicide Applied

Summary of Tri-power Post Emergent Herbicide Applied					
Watershed	**Land**	**Acreage**	**Acreage Summary**	**Gallons Applied**	**Gallons Applied**
Rocky Branch-Broad Run	IBM Ball Fields	16.43	25.71	13.36	20.90
	Manassas Museum	3.55		2.90	
	Jennie Dean Ball Fields	5.73		4.64	
Middle Bull Run	Byrd Park Ball Fields	2.62	5.03	2.13	4.08
	Public Works Hillsides	2.41		1.95	
Total		**30.74**	**30.74**	**24.98**	**24.98**

Table 20 Summary of Barricade 4 FL Pre-emergent Herbicide Applied

Summary of Barricade 4 FL Pre-emergent Herbicide Applied					
Watershed	**Land**	**Acreage**	**Acres**	**Pounds**	**Pounds Applied**
Rocky Branch-Broad Run	IBM Ball Fields	16.43	25.71	10.27	16.07
	Manassas Museum	3.55		2.23	
	Jennie Dean Ball Fields	5.73		3.57	
Middle Bull Run	Byrd Park Ball Fields	2.62	5.03	1.63	3.13
	Public Works Hillsides	2.41		1.50	
Total		**30.74**	**30.74**	**19.2**	**19.2**

Table 21 Summary of Escalade 2 BCW Post-emergent Herbicide Applied

Summary of Escalade 2 BCW Post-emergent Herbicide Applied					
Watershed	**Land**	**Acreage**	**Acres**	**Gallons**	**Gallons Applied**
Rocky Branch-Broad Run	IBM Ball Fields	16.43	25.71	10.28	16.08
	Manassas Museum	3.55		2.22	
	Jennie Dean Ball Fields	5.73		3.58	
Middle Bull Run	Byrd Park Ball Fields	2.62	5.03	1.64	3.12
	Public Works Hillsides	2.41		1.48	
Total		**30.74**	**30.74**	**19.2**	**19.2**

<u>Chemicals Applied by City of Manassas Employees (the City has one certified Pesticide Applicator):</u>

Ranger Pro Herbicide- 30 gallons non-diluted
3D 3-way broad leaf herbicide- ½ gallon non-diluted
Alligar (Triclopyr) Herbicide- ½ gallon non-diluted
Garlon 4 Herbicide- 10 oz non-diluted
Atrimec growth regulator- 20 gallon diluted
Daconil Fungicide- 35 gallon diluted
Bifenthrin insecticide- 40 gallon diluted
Zylam insecticide- 205 gallon diluted
Prodiamine 65 WDG Herbicide (Pre-emergent)- 2854 gallon diluted
Snapshot Herbicide (pre-emergent)- 5 lbs
Horticultural Oil insecticide- 50 gallon diluted
Spreader Sticker Surfactant- ½ gallon
Bio-Advantage Fertilizer- 5 gallon non-diluted
Sea 3 Fertilizer- 5 gallon non-diluted

Nutricote 18-6-8 Fertilizer- 40 lbs

Public Stormwater Wet Pond Algae and Weed Management

The contract for nuisance algae and aquatic weed treatment, and fountain and aerator maintenance in City owned ponds expired in May 2019. At that time, the current contractor indicated they would discontinue provision of these services by their company in the future. The City solicited bids for these services with other providers, and entered a new contract for pond maintenance services on 7/16/2019. Modifications were made to the scope of services on the previous contract to limit routine algaecide and herbicide applications to ponds with residential or business waterfront. The less visible City ponds requiring treatment will receive those services on an on-call basis under the new contract. These changes were made to reduce the overall load of these chemicals discharged from the City's MS4, and to re-allocate funds previously spent on excessive treatments to other stormwater program areas.

Table 22 Algaecide Applied to Public Stormwater Ponds

	Gallons Applied					**Pounds Applied**
Pond Name	**Aquathol**	**Captain**	**Clipper**	**Diquat**	**Platoon**	**Copper Sulfate**
Hospital Pond		1.0			0.2	
Lucasville		1.0				50
Owens Brooke Downstream		4.5				170
Owens Brooke Upstream		2.5				140
Sumner Lake		29.5	24.0			525
Wakeman Large						120
Wakeman Small	1.5	3.0		1.5		140
TOTAL	**1.5**	**41.5**	**24.0**	**1.5**	**0.2**	**1,145**

Note: Blue dye was also applied in these ponds this last year, but it was not quantified.

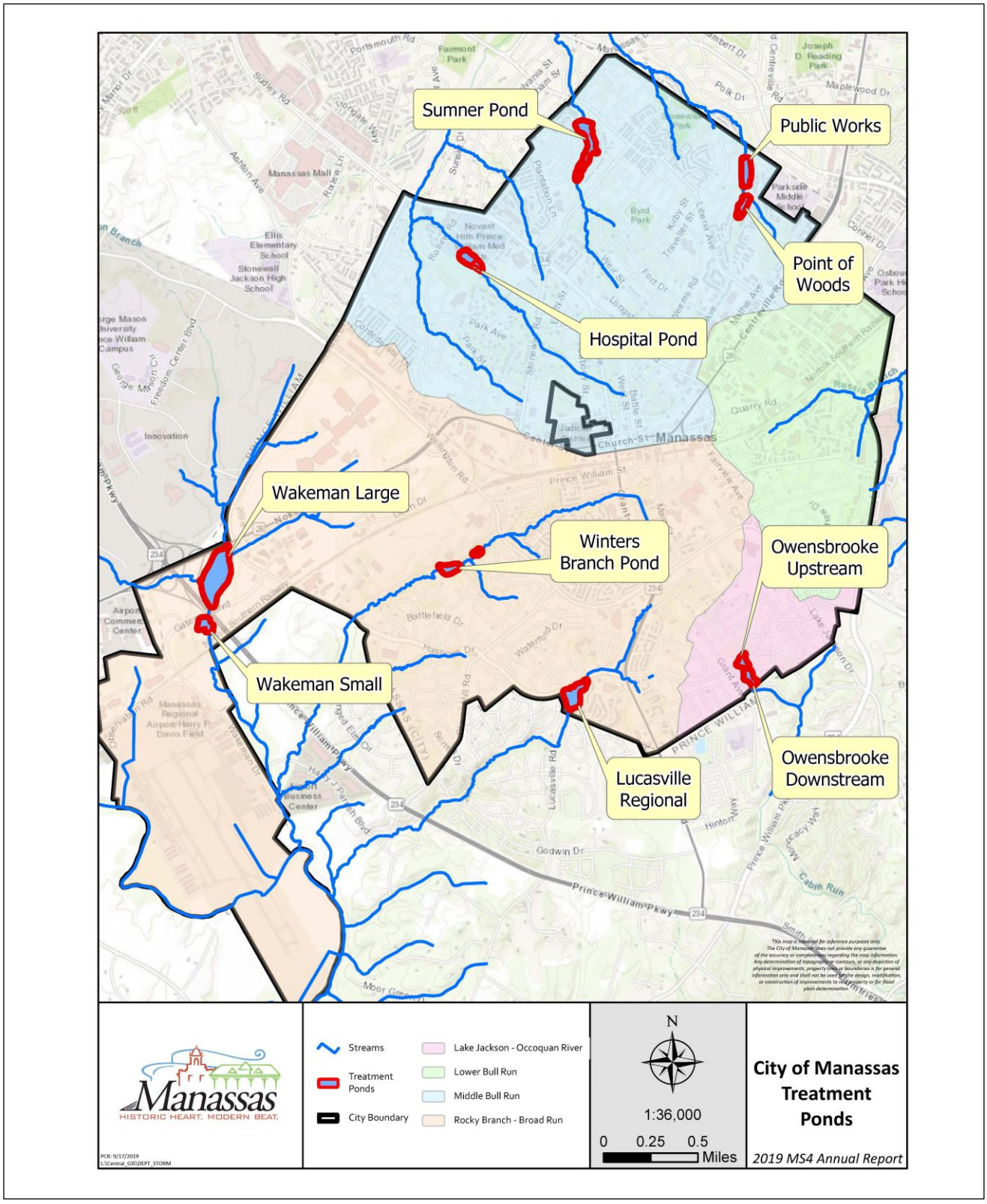

Figure 17 Location of Stormwater Ponds that are Routinely Treated with Algaecide

- Maintenance of applicable certification and related training [Virginia Erosion and Sediment Control Law certification Proper application/storage/disposal of land-applied substances (e.g., pesticides, herbicides, and fertilizers)]:

  A summary of the pollution prevention/good housekeeping for municipal operations activities conducted by the City during the reporting period is provided below.

- The City has developed and implemented Standard Operating Procedures (SOPs) for the following activities;

  1) Proper storage of de-icing salt and chemicals [a component of a SWPPP],
  2) Proper street sweeping techniques and debris disposal [a component of a SWPPP],
  3) Shop maintenance/storage and disposal of grease, oil, and chemicals [a component of a SWPPP], and
  4) Enforcement regulations as outlined in our adopted illicit discharge ordinance.

  This list is complete and is updated as required by changes in operational requirements. Currently, there have been no changes to the policy since the last annual report submission to DEQ.

- City Staff Training. Training programs for City staff have been established and conducted for the following:
  - Hazardous Materials Operations/OSHA Level II
  - Stormwater Pollution Prevention Plan/Spill Prevention, Control, and Countermeasures Plan
  - Spill Response Training

  A total of 66 City employees attended the Hazardous Communication and Basic Spill Response Training during the reporting period. Hazardous Materials Operations/OSHA Level II training is typically scheduled in October for the Public Works Department and Stormwater Pollution Prevention Plan/Spill Prevention, Control, and Countermeasures Plan and Spill Response training are scheduled biennially for the Public Works Department and Water and Sewer Department employees with multiple sessions occurring throughout the reporting period.

Table 23 Stormwater-related Trainings

Trainings	Trainer	Date	Location	Number Attendees
Hazardous Communication and Basic Spill Response Training	Vinny Gallo, Manassas Sr. Safety & Risk Analyst	July 2018	Fleet Maintenance/Garage	5
Hazardous Communication and Basic Spill Response Training	Vinny Gallo, Manassas Sr. Safety & Risk Analyst	July 2018	Water & Sewer Shop	8
Hazardous Communication and Basic Spill Response Training	Vinny Gallo, Manassas Sr. Safety & Risk Analyst	August 2018	Public Works Facility	35
Hazardous Communication and Basic Spill Response Training	Vinny Gallo, Manassas Sr. Safety & Risk Analyst	September 2018	Manassas Airport	5
Hazardous Communication and Basic Spill Response Training	Vinny Gallo, Manassas Sr. Safety & Risk Analyst	October 2018	Manassas' Water Treatment Plant	13
OSHA 10 certification provided by the City's Safety Officer.	Christen Fox (Parks Department)			1
Attended VRPS 2018 conference workshops for Turf Management.	Christen Fox (Parks Department)			1
Attended Athletic Field Maintenance one-day seminar.	Christen Fox (Parks Department)			1
Facility Management certification	Christen Fox (Parks Department)		Eppley Institute	1
NSPF Pool Operations certificate renewal.	Alex Hamilton (Parks Department)			1
Stormwater Inspection training and certification	Addie Aufforth			1
Total				**71**

- The City applied deicing materials throughout the City during the reporting period. A summary of the types and amounts of deicing materials applied is provided in Table 24.

Table 24 Summary of Deicing Materials Applied

Item	Quantity Period July 1, 2018 to June 30, 2019	Units
Road Salt[4]	1,692.1	tons
Sand[5]	0	tons
Ice Ban Liquid[6]	9,000	gallons

[4] Based on the quantity purchased during the reporting year (the City does not track the amount actually used).
[5] Based on the quantity purchased during the reporting year (the City does not track the amount actually used).
[6] Purchased no de-icer during the reporting year, but filled up the tanks at the end of the previous year, and at the end of the reporting year, the two tanks are mostly empty; therefore, this data is the estimate of the tank's capacity.

- The City conducted street/sidewalk sweeping throughout the City during the reporting period and collected 381.5 tons of sweepings. A summary of the sweeping activities collected is provided in Table 25.

Table 25 Summary of Street and Sidewalk Sweeping

Item	Period July 1, 2018 to June 30, 2019
Downtown Streets	Approximately 1,060 lane miles swept (7.8 lane miles of sweeping performed 4 times a week for 2/3rds of the year for downtown streets)
All other City Streets	Approximately 1,695 lane miles swept (254 lane miles of sweeping performed 6.7 times a year for all other City streets)
Downtown Sidewalks	Approximately 265 sidewalk miles swept (approximately 3.9 miles of downtown sidewalks are cleaned twice a week for 2/3rds of the year)

In addition to the normal sweeping schedule, after the winter snow season, the City also sweeps primary and secondary roads for a typical two-week period to clear all sand, salt, and debris and may assist the schools in cleaning their lots during school breaks (i.e., Spring Break, Summer Break, etc.).

- The City continued its storm structure inspection and cleaning program during the reporting period.

Other Additional Accomplishments

The City of Manassas totally replaced the failing safety fence enclosure around the riser structure at Winters Branch pond. The City accomplished this through a contract by Hercules Fence in March 2019, costing $6,535.00.

In the spring of 2019, the City contracted with Solitude Lake Management to replant aquatic vegetation around and in the Hospital Pond. The contract was awarded and completed this same reporting year. The total cost of the task was $5,816.

During this last reporting period, the City's Parks Department at Stonewall Park Pool worked closely with the pool contractor during de-winterization, operational season and winterization of the pool. At the time of de-winterization both pools were completely emptied to clean and prepare for the swim season. During winterization, the baby pool was completely emptied and the main pool was partially drained. The preferred method to drain pool water is through the filtration trash line to the City's waste water system underground. If a second method of draining is deemed necessary, the contractor is required to drain the pool water over vegetation that does not directly flow into City waterways.

City Parks Department staff is primarily responsible for the cleanliness of the pool water during the operational season (Memorial Day to Labor Day annually). Staff records the water quality results hourly to properly maintain the health department regulations for safe water quality. The filtration system is cleaned weekly, and the dirty water is emptied through the trash line into the

City's waste water system underground. All chemicals located on site are properly stored separately with a protective containment barrier. In FY19, staff exceeded the safety protocol by making available additional chemical spill kit that contained absorbent pads, containment barrel, absorbent powder and chlorine reduction chemicals.

The City Park Maintenance Manual, produced in January 2017, was made available to the public by being posted online a Park Maintenance manual was published and made available online to the public. This manual can be found at http://www.manassascity.org/DocumentCenter/View/29195/Maintenance-Task-Frequency-Chart_Final?bidId=. This manual goes into great detail on how the City maintains the park land, stormwater, site amenities, athletic fields, etc.
Park maintenance is carried out by the Public Works Building & Grounds division and supplemented by City contractors.

City staff spent a total of 97 hours on coordination meetings and trainings involving regional MS4 partners (see Table 26).

Table 26 Summary of Coordination and Training Meetings Involving Regional Partners

Date	Staff Participant(s)	Hours	Location	Details
6/12/18	Ivy Ozmon	3.0	PWC	Innovative TMDL Compliance Workshop by RES; Legislative update from Governor's office & Information on stream restoration services and changes in crediting by RES (consulting firm)
7/24/18	Ivy Ozmon, Tony Dawood and PWC Stormwater group, Mark Aveni, Prem Poudel, Madan Mohan and David Unger	7.0	PWC	Met with Prince William County stormwater/watershed group to discuss their MS4 experience, challenges, recent EPA inspection outcome, staffing needs, etc.
8/3/18	Ivy Ozmon, Addie Aufforth, PWC Stormwater staff: Jessica Adams, David Unger, Prem Poudel	6.0	PWC	Met with MS4 coordinator and stormwater inspectors for demonstration of inspections procedures and web application used to document inspections.
11/30/18	Ivy Ozmon, Tony Dawood	2.0	PWC	Meeting between County Management and DEQ NRO staff to discuss participation in SAMS & other water quality issues related to sodium and chloride.
12/3/18	Ivy Ozmon	2.5	NVRC	SAMS 1st Government Coordination Workgroup Meeting
1/8/19	Ivy Ozmon, Tony Dawood	11.0	Richmond	VAMSA members meeting.
1/23/19	David Ek, Ivy Ozmon, Tony Dawood	3.0		SAMS strategy coordination meeting
2/12/19	David Ek, Ivy Ozmon, Tony Dawood	3.0		SAMS City strategy coordination meeting
2/14/19	Ivy Ozmon	2.5	Alexandria	SAMS 2nd Water Quality Monitoring & Research Workgroup meeting
3/1/19	David Ek, Ivy Ozmon, Tony Dawood	3.0		SAMS City's strategy coordination meeting
3/8/19	Ivy Ozmon, Tony Dawood	11.0	DEQ NRO	Occoquan Watershed Monitoring Subcommittee meeting; Provided CoM Preliminary Salt Strategy powerpoint presentation
3/29/19	Ivy Ozmon	4.0	NVRC	MS4 Regional Update Meeting
4/1/19	Ivy Ozmon, David Ek	10.0	COG Office	COG's regional winter salts and water quality workshop
5/10-11/19	Ivy Ozmon	16.0	West Virginia	Baywide Stormwater Partners retreat hosted by Chesapeake Stormwater Network.
5/23/19	Ivy Ozmon	2.5	NVRC	NVRC Commissioners meeting where presentation given by Norm Goulet on the Draft Virginia Phase III WIP for the Potomac Basin.
5/29/19	Ivy Ozmon, David Ek	8.0	DEQ NRO	SAMS coordination meeting
6/19/19	Ivy Ozmon	2.5	NVRC	SAMS 3rd Water Quality Monitoring & Research Workgroup Meeting

Key:
PWC = Public Works Complex
DEQ NRO = Virginia Department of Environmental Quality Northern Virginia Regional Office.
COG = Council of Government
SAMS = Salt Area Management Strategies
NVRC = Northern Virginia Regional Commission

In addition to these regional coordination meetings, the City's stormwater staff also committed 177.5 hours of staff hours toward a wide variety of stormwater topics, including the following:

- Meeting with City Airport staff to coordinate shared stormwater issues and concerns
- Meetings with stormwater consultants/contractors (over everything from stormwater plan preparation to inspections)
- Presenting justification for proposed stormwater inspections
- Strategy and coordination meetings to transition the stormwater program from the Engineering Department to the Utilities Department
- Meetings to develop stormwater protection protocols for the City's Public Works Facility/Complex
- Extensive meetings with nearly all City departments to receive input for GKY's contracted stormwater program evaluation
- Coordination meetings with City staff over stormwater Capital Improvement Projects (CIP)
- Meetings with contractor
- Planning meetings to develop a new comprehensive stormwater Geographic Information System (GIS) database
- Preparation meeting for stormwater presentation to local elementary school group
- MS4 coordination meeting with DEQ's Regional MS4 Coordinator

2.7 Special Conditions – Implementation of TMDL Action Plans (SECTION I B 5 and SECTION I C 2)

Special Conditions for Approved Total Maximum Daily Loads (TMDLs) other than the Chesapeake Bay TMDL: the City currently has four (4) local wasteload allocations (WLAs) assigned for local waters. Table 13 provides a summary of those WLAs**.**

Table 27 Summary of Current WLAs Assigned to the City for Local Waters

Watershed	Pollutant	WLA	*Est. Watershed Discharge (cu. ft.)	*Est. Pollutant Discharge
Bull Run	Sediment	210 tons	~129499	< 210 tons
Bull Run	E. coli	6.82 E+09 cfu	~129499	< 6.82 E+09 cfu
Broad Run	E. coli	1.15 E+10 cfu	~129499	< 1.15 E+10 cfu
Occoquan River	E. coli	2.95 E+10 cfu	~258999	< 2.95 E+10 cfu

*Quantities derived from average rainfall and drainage area, no field testing was completed.

<u>Bacteria TMDLs for Popes Head Creek, Broad Run, Kettle Run, South Run, Little Bull Run, Bull Run and the Occoquan River</u>

P4/Y1 (FY2019) Accomplishments

The TMDL details that 99% of Manassas City properties are tied directly to the sanitary sewer. As such, bacteria contribution from human sources is currently being managed. To minimize contribution from the sanitary system, the City's Department of Utilities maintains an annual inspection and maintenance program. The Department of Utilities also implements a capital improvement program aimed, in part, to replace and rehabilitate aging sewer infrastructure, increase system reliability and maintain regulatory compliance. These pollutant reduction activities represent a significant effort by the City to reduce bacteria discharges to receiving waters that are outside of the City MS4 program.

In addition to the efforts regarding sanitary sewer described above, the City continues to expend effort to reduce other sources of bacteria contribution to the impaired receiving waters through IDDE and public education and outreach. Aside from those activities discussed regarding the six (6) MCMs, the City of Manassas completed the following during the reporting period:

- Maintenance and upkeep of a web page for submitting concerns regarding both sanitary and storm sewer issues.

- Continued pet waste facility implementation at locations where pet owners often frequent with their pets such as within the stormwater BMP located in Kinsley Mill Park, and the Sumner Lake Regional Stormwater Management Facility (Figure 4).

- Continued outreach to increase public awareness regarding pet cleanup through public signage and the City web page.

- The City also installed a number of pet waste stations in parks, expanding on stations already located in many private residential developments in Manassas.

P4/Y2 (FY2020) Proposed Activities

The City proposes to implement the following during the upcoming reporting period:

- Continued implementation of its IDDE program.

- Continued implementation of its public outreach program.

- Evaluation and update of the Bacteria TMDLs for Popes Head Creek, Broad Run, Kettle Run, South Run, Little Bull Run, Bull Run and the Occoquan River Action Plan in a manner compliant with the 2018 MS4 General Permit.

Benthic TMDLs for the Bull Run Watershed

P4/Y1 (FY2019) Accomplishments

In addition to the pollutant reduction efforts discussed regarding the six (6) MCMs, the City of Manassas completed the following during the current reporting period:

- Continued implementation of its Virginia Erosion and Sediment Control Program (VESCP) including the more conservative requirement that land disturbing activities that disturb greater than 2,500 square feet obtain a permit from the City.

- Continued implementation of its VSMP program.

- Continued implementation of its enhanced street sweeping program.

- Implementation of the Prince William Hospital Regional SWM Facility, as funded by a 2013 Stormwater Local Assistance Fund (SLAF) grant [aquatic vegetation replanted in spring 2019].

- The City took the initiative to contract with GKY for them to perform a detailed and comprehensive program evaluation for the entire stormwater-related functions within the City. While the result will be summarized in the next reporting period, the entire input, interviews, coordination meetings, and other supporting tasks were completed in this current reporting period.

P4/Y2 (FY2020) Proposed Activities

The City proposes to implement the following during the upcoming reporting period:

- Continued implementation of its VESCP including the more conservative requirement that land disturbing activities that disturb greater than 2,500 square feet obtain a permit from the City.

- Continued implementation of its VSMP program.

- Continued implementation of its enhanced street sweeping program.

- Evaluation and update of the Benthic TMDLs for the Bull Run Watershed Action Plan in a manner compliant with the 2018 MS4 General Permit.

Special Condition for the Chesapeake Bay TMDL

Chesapeake Bay Total Maximum Daily Load for Nitrogen, Phosphorus and Sediment

P4/Y1 (FY2019) Accomplishments

During the current reporting period, the City continued to address required pollutant of concern (POC) reductions in response to the Chesapeake Bay TMDL for Nitrogen, Phosphorus and Sediment as follows:

- Continued implementation of its VESCP to address POC loads from Transitional Sources. The City continues to require E&S control plans from land disturbing activities greater than 2,500 square feet, which is more conservative than the State mandated 10,000 square feet.

- Continued implementation of its VSMP to address POC loads from New Sources.

- Continue to address Existing Source POC loads by:
  - DEVELOPING SALT MANAGEMENT STRATEGIES
  - Continued implementation of its contract with TruGreen to ensure proper nutrient management on 30.74 acres of City property.
  - Requiring purchase of nutrient credits as part of the Novant Health redevelopment project, which resulted in the purchase of 0.59 lbs. of phosphorus and the retirement of 4.07 lbs. of associated nitrogen.[7]
  - Completing construction of the SLAF-funded Prince William Hospital Regional SWM facility, which resulted in POC reductions of 641.87 lbs. of nitrogen,

[7] The sediment load associated with this purchase that the City for which the City can take credit has not yet been published by DEQ.

146.95 lbs. of phosphorus; and 86,977.51 lbs. of sediment. The hospital pond aquatic plants were replanted in Spring of 2019 by Solitude Lake Management. This is the second attempt at planting; the first planting failed. The contract for those services is attached here as well.

P4/Y2 (FY2020) Proposed Activities

The City proposes to implement the following during the upcoming reporting period:

- Continued implementation of its VESCP including the more conservative requirement that land disturbing activities that disturb greater than 2,500 square feet obtain a permit from the City.

- Continued implementation of its VSMP program.

- Continued implementation of its enhanced street sweeping program.

- Evaluation and update of the Chesapeake Bay TMDL Action Plan in a manner compliant with the 2018 MS4 General Permit.

- Preliminary planning of CIP projects related to retrofit and expansion of the Lucasville Pond (Cockrell Branch Pond), identified in 2018 by GKY as the City's most cost effective BMP retrofit option.

- Evaluation of stream restoration opportunities to build TMDL credits inside versus outside of the City's jurisdiction

3.0 RESULTS OF INFORMATION COLLECTED AND ANALYZED

While there are currently no requirements for monitoring or data analysis in the MS4 General Permit, nonetheless, the City of Manassas voluntarily began in this last reporting year a preliminary monitoring program of the City's stormwater. Some goals and focus areas of this monitoring is as follows:

- Using water quality sondes sampling equipment, better characterize and identify typical surfacewater, groundwater, and stormwater water in order to aide illicit discharge investigations.
- Better understand and identify the source(s) of the high nutrients in Sumner Lake.
- Provide sound water quality data to inform management decisions relative to stormwater and natural stream activities.
- Explore better ways to manage and implement its algae management program and responses that are more consistent with water quality and ecosystem function improvement.
- Explore better metrics to gage the effectiveness of algae treatment and water quality improvement projects.

This monitoring program is intended to be a long-term monitoring effort. There was only one sampling event during this permit reporting period. Water quality data was collected from 24 different locations, ranging from public and private stormwater ponds (both the inlet and outlets), natural surface water streams, and illicit discharges currently under investigation. Field data collected from the 24 sampling locations is summarized in Table 28:

Table 28 Summary of Field-Derived Water Quality Data

	Temp(C)	Barometric Pressure (mmHg)	DO Saturation (%)	DO Saturation (mg/L)	SpC (uS/cm)	pH	pH (mV)
Mean	27.6	751.1	108.0	8.3	269.0	8.0	-104.7
St. Dev.	3.7	1.2	46.7	3.2	114.2	0.6	67.1
Median	28.0	751.1	95.8	7.7	237.8	7.7	-76.7
Min. Value	19.9	748.8	39.3	3.56	112.7	7.09	-368.0
Max. Value	36.8	753.4	193.8	14.71	532.0	9.81	-49.6

Grab samples of water were collected from a total of eight of these sites and analyzed later in the City's water quality lab. The results are summarized in Table 29.

Table 29 Summary of Water Quality Parameters Derived from Lab Analysis

	Nitrite (mg/L)	Orthophosphate (mg/L)	Free Ammonia (mg/L)	MonoChloramine (mg/L)	Alkalinity (mg/L)	Hardness (mg/L)
Mean	0.014	0.339	0.085	0.006	62.5	71.9
St. Dev.	0.0216	0.2965	0.0609	0.0177	55.9	65.7
Median	0.007	0.230	0.090	0.000	44	52
Min. Value	0.000	0.04	0.02	0.00	29	23
Max. Value	0.066	0.85	0.18	0.05	23	220

As this long-term monitoring project continues, it will provide the City with more refined data to better characterize water quality parameters within the City's waters.

4.0 SUMMARY OF ACTIVITIES PLANNED FOR PERMIT 4/PERMIT YEAR 2

During P4/Y2, the City will continue to implement the activities identified in the current MS4 Program Plan, relating to public outreach and participation, public involvement, illicit discharge and elimination, construction site stormwater runoff control, post-construction stormwater management, good housekeeping for municipal operations, and TMDL specific projects. The City will update the MS4 Program Plan to meet the requirements of the reissued permit in November 2019.

5.0 CHANGES IN IDENTIFIED BMPs OR MEASURABLE GOALS

No changes in BMPs or measurable goals were identified for any of the MCMs including steps to be taken to address any deficiencies.

6.0 RELIANCE ON OTHER GOVERNMENT AND THIRD-PARTY ENTITIES

The City MS4 Permit and Stormwater Program is implemented under the supervision of the City's Department of Utilities. Utilities utilizes other City departments to assist in the implementation of the City's stormwater management program. The City does not rely on any other government entities or third parties to meet the requirements of the MS4 General Permit.

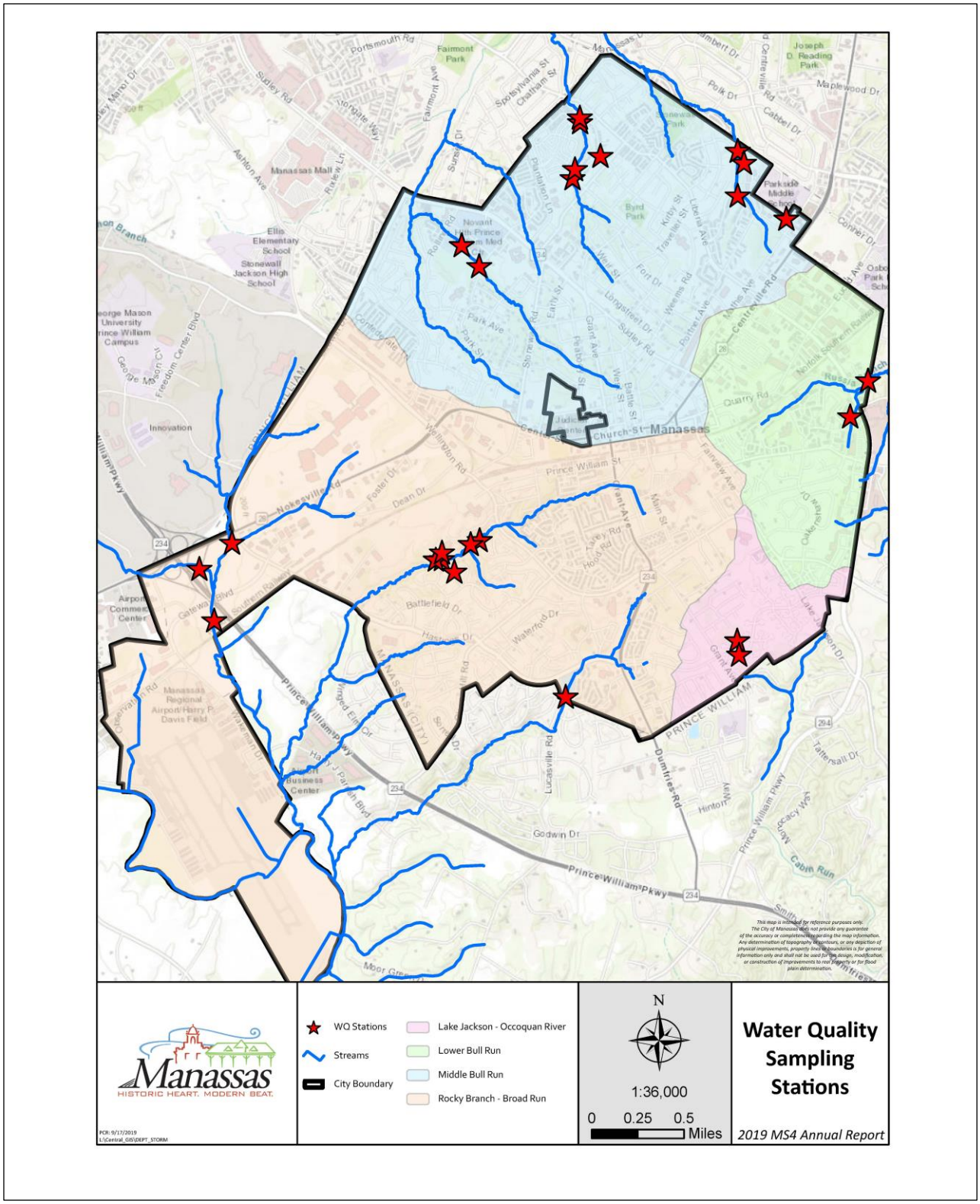

Figure 18 Location of the City's Water Quality Monitoring Stations