



MS4 ANNUAL REPORT
PERMIT NUMBER VAR040106

September 2018

Subject: GEORGE MASON UNIVERSITY MS4 ANNUAL REPORT, PERMIT NUMBER VAR040106

Dated: September 28, 2018

I certify under penalty of law that all documents and all attachments related to the submission and updating of the GEORGE MASON UNIVERSITY MS4 ANNUAL REPORT were prepared under my direction or supervision in 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 a fine and imprisonment for knowing violations.

Sincerely,



Frank Strike, P.E.

Vice President of Facilities

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I. ABBREVIATIONS and ACRONYMS

Abbreviation/ Acronym	Term
BMP	Best Management Practice
CWP	Clean Water Partners
DEQ	Virginia Department of Environmental Quality
EHS	George Mason University's Environmental, Health, & Safety
ESC	Erosion and Sediment Control
FM	Facilities Maintenance
Mason LD	George Mason University Facilities Land Development Division
MS4	Municipal Separate Storm Sewer System
OoS	Office of Sustainability
SWM	Stormwater Management
VESCL&R	Virginia Erosion and Sediment Control Law and Regulations
VESCP	Virginia Erosion and Sediment Control Plan
VSMP	Virginia Stormwater Management Program

II. SUMMARY

As legislated by the Virginia Stormwater Management Program (VSMP) Permit Regulations (9VAC25-870-400 et. seq.), the Virginia Department of Conservation and Recreation (DCR) issued a VSMP General Permit (VAR040106) for small Municipal Separate Storm Sewer Systems (MS4) to George Mason University (Mason) on 09 July 2008. This permit was updated and extended effective 01 July 2013 by Virginia Department of Environmental Quality (DEQ). This permit holds Mason accountable for developing and implementing an MS4 Program. The program guides Mason's design, construction, maintenance, and management of its facilities and campuses.

Mason's MS4 Program applies to all activities undertaken by Mason, either by its internal workforce or contracted to external entities, where such activities are regulated by VSMP Permit Regulations. Compliance with the permitted MS4 Program (and all parts thereof) will be verified during inspections of Mason's land disturbing activities, whether internally or by DEQ, Environmental Protection Agency (EPA), or other applicable environmental agencies. This MS4 permit covers the Fairfax campus and Science and Technology Campus (previously Prince William campus). As requested in DEQ MS4 Program Audit Report dated July 27, 2016, Mason has added Arlington Campus to the MS4 program on an administrative basis. Other remote locations are included under the MS4 permits for each of their respective local jurisdictions.

Mason's MS4 Report is submitted to the DEQ for review and approval on an annual basis. Mason will ensure compliance with the VSMP General Permit for MS4s issued 01 July 2013. This submittal constitutes Mason's commitment to execute all provisions contained herein on regulated land disturbing activities, land development projects, and operation and maintenance of installed stormwater management facilities. As such, this report will be made available to all appropriate Mason and DEQ personnel and is available for download as a PDF file at: <https://stormwater.gmu.edu>. Specifics on compliance with the updated MS4 permit are included in Appendix A, where the general permit is broken down and a more detailed review of Mason's compliance within the permit for the reported year is provided.

Mason remains compliant with the previously submitted Annual Reports in addition to this 2018 Annual Report. During this permit cycle, Mason continued collecting and analyzing water samples at the Fairfax Campus and the Science and Technology Campus. Refer to Appendix B for more information on the sample locations and results.

Information regarding Mason's public outreach and education programs for stormwater management on campus can be found in Appendix C. A list of campaigns and activities conducted during this reporting is provided.

The MS4 permit effective 01 July 2013 requires compliance on a structured timeline throughout the duration of the permit. The schedule of MS4 program plan updates can be found in Appendix D and will be further elaborated in future Annual Reports.

Mason Land Development (Mason LD, previously known as Civil and Environmental Engineering Division (CEED)) collaborates with Mason's Environmental, Health, and Safety Department (EHS) to adopt an Illicit Discharge Detection and Elimination Policy to report spills (Appendix E). Zero reportable illicit discharge incident occurred in the permit year.

Mason LD conducts outfall reconnaissance annually to evaluate the conditions of the outfalls and assess and

report illicit discharges if any. Maps depicting the outfall locations within the permitted areas are included as Appendix F.

All stormwater interconnections with outside stormwater systems are currently depicted on the MS4 maps in Appendix G for both Fairfax and Science and Technology Campuses. Copies of the letters sent to all potential interconnected MS4s are located within Appendix G.

Mason strives to provide a bright and innovative environment for our growing campus community. As a result, our campuses continue to expand through new construction projects. A list of the current and future land disturbing projects can be found in Appendix H.

Mason did not issue Notice of Corrective Action during this permit cycle (Appendix I).

There is an array of stormwater facilities on campus including structural BMPs like rain gardens, vegetative swales, pervious surfaces, green roof, retention, and detention ponds. A list of the Mason's permanent stormwater facilities can be found in Appendix J.

The Nutrient Management Plans for Mason were approved by DCR in August 2018. More information on this plan can be found in Appendix K.

Mason developed Stormwater Pollution Prevention Plan (SWPPP) for high priority facilities. The plan can be found in Appendix L.

Mason implemented a stream restoration project and exceeded the Chesapeake Bay TMDL Phase I requirements. The details can be found in Appendix M.

III. ANNUAL REPORT ADMINISTRATION

- 3.1 *George Mason University Annual MS4 Report* submitted to DEQ includes the following background information as required by the General Permit:

- 3.1.1 The name and permit number of the program submitting the annual report.
This report is submitted under permit number VAR040106 by Zhongyan Xu under the supervision of Frank Strike, Vice President of Facilities.
- 3.1.2 The annual report permit year.
This Annual Report is for the year from 01 July 2017 to 30 June 2018.
- 3.1.3 Modifications to any operator's department's roles and responsibilities.
Mason Civil and Environmental Engineering Division (Mason CEED) was renamed to Mason Land Development (Mason LD) in 2018. There are no changes in Mason LD MS4 related roles and responsibilities.
- 3.1.4 Number of new MS4 outfalls and associated acreage by HUC added during the permit year.
There are no new MS4 outfalls added during this permit year. All outfalls can be found on Mason's MS4 database and internal MS4 maps. Refer to Appendix F
- 3.1.5 A signed certification.
Refer to Page 1 of this report.
- 3.1.6 The status of compliance with permit conditions, an assessment of the appropriateness of the identified BMPs and progress towards achieving the identified measureable goals for each of the minimum control measures.
Mason continues to implement Best Management Practices in order to meet all requirements of the general permit. A summary of BMPs implemented by Mason is included in Appendix A of this document. As a result of the annual program evaluation of the Mason's MS4, Mason LD has identified zero program deficiencies or areas that need immediate improvements.
- 3.1.7 Results of information collected and analyzed, including monitoring data, if any, during the reporting cycle.
Mason LD continues the water quality monitoring program for surface waters within campuses. Refer to Appendix B for monitoring locations and results.
- 3.1.8 A summary of the stormwater activities the operator plans to undertake during the next reporting cycle.
Refer to Appendix H for a list of the projects expected to begin during the next permit cycle. Some projects include a stormwater portion.
- 3.1.9 A change in any identified BMPs or measureable goal for any of the minimum control measures including steps to be taken to address any deficiencies.
No changes have been made during this permit year.
- 3.1.10 Notice that the operator is relying on another government entity to satisfy some of the permit obligations (if applicable).
Mason identified several points where Mason discharges into other regulated MS4 areas. A notification of potential interconnected stormwater system was addressed to respective jurisdictions. Refer to Appendix G.

This MS4 permit covers the Fairfax Campus, and Science and Technology campus. As requested in DEQ MS4 Program Audit Report dated July 27, 2016, Mason has added Arlington Campus to the MS4 program on an administrative basis.

Since the permit does not cover the other properties owned by Mason, these areas are automatically included under the local jurisdictions' MS4s and no additional notifications are necessary (9VAC25-870-400-D.7.c.5). The properties not covered in this permit include Potomac Science Center (Prince William County), and Point of View (Fairfax County).

- 3.1.11** The approval status of any programs pursuant to Section II C (if appropriate), or the progress towards achieving full approval of these programs.

There are no programs waiting for approval.

- 3.1.12** Information required pursuant to Section I B 9.

No TMDL or WLA are calculated for this permit duration. More information is intended to be provided as the revised program develops.

- 3.1.13** The number of illicit discharges identified and the narrative on how they were controlled or eliminated pursuant to Section II B 3 f.

Mason responded to five non-reportable incident this permit year with no potential to impact the environment. Refer to Appendix A for details.

- 3.1.14** Regulated land-disturbing activities data tracked under Section II 4 c.

Refer to Appendix H for the table of tracked land-disturbing activities.

- 3.1.15** All known permanent SWM facility data tracked under Section II B 5 b (6) submitted in database format to be prescribed by the department. Upon filing of this list, subsequent reports shall only include those new SWM facilities that have been brought online during the reporting period.

Refer to Appendix J for a list of permanent stormwater management facilities.

- 3.1.16** A list of new or terminated signed agreements between the operator and any applicable third parties where the operator has entered into an agreement in order to implement minimum control measures or portions of minimum control measures.

There are no new or terminated agreements with third parties.

- 3.1.17** Copies of any written comments received during a public comment period regarding the MS4 Program Plan or any modifications.

No written comments were received by the public concerning the MS4.

Appendix A:

Minimum Control Measures

Minimum Control Measure No. 1: Public Education and Outreach on Stormwater Impacts							
BMP CATEGORY	PROPOSED BMP	PROGRAM	MEASURABLE GOAL	RESPONSIBLE PERSON/ DEPARTMENT	CURRENT PROGRAM IN PLACE	ESTIMATED DATE OF IMPLEMENTATION	ANNUAL OBJECTIVES ACHIEVED/INTENDED ACHIEVEMENT
1.a -2008-2013 Program	1.a.1 Implement Old Program	Continue to implement the public education and outreach program until the program is updated to meet the conditions of this state permit.	Comply with the 2008-2013 General Permit.	FM/ Mason LD	-	Complete	Information on the previous program is available at the http://stormwater.gmu.edu
1.b -Public Education and Outreach Program	1.b.1 Increase Pollution Awareness	Increase target audience knowledge about the steps that can be taken to reduce stormwater pollution, placing priority on reducing impacts to impaired waters and other local water concerns.	Provide public information on how to reduce Stormwater pollution, impaired waters and other local pollution concerns.	Mason LD	Yes	Complete	During various events including freshman and transfer orientation, sustainability showcase, Mason LD hands out brochures, flyers, postcards, and dog bags provided by the Northern Virginia Clean Water Partners (CWP) to raise awareness of faculty and staff, current and future students, and their guardians.
	1.b.2 Hazards Waste Management	Increase target audience knowledge of hazards associated with illegal discharges and improper disposal of waste, including pertinent legal implications	Provide information on proper hazardous material handling, storage and disposal during students and staff training sessions.	EHS/Mason LD	Yes	Complete	Annual training to non-academic and academic personnel is provided by EHS to ensure proper disposal of hazardous waste. A total of 185 students and staff members received the Chemical Safety and Hazard Communication training, and 487 received Laboratory Safety training this year. Both trainings include spill response and notification. Information on hazards wastes is also

Minimum Control Measure No. 1: Public Education and Outreach on Stormwater Impacts							
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							available thought EHS website .
	1.b.3 Diverse Program	Implementing a diverse program with strategies that are targeted towards audiences most likely to have significant stormwater impacts.	Develop and Implement a diverse program with strategies that are targeted towards audiences most likely to have significant stormwater impacts.	Mason LD /OoS	Yes	Complete	Mason LD works with Engineering Department and student organizations to reach out to targeted students. Refer to Appendix C for current outreach activities.
1.c - Program Design	1.c.1 Water Quality Issues	Identify high-priority water quality issues, and a rationale for the selection of these issues	Indicate three high priority water quality issues on campus and how to treat them.	Mason LD	Yes	Complete	Refer to Appendix B for Mason Water Quality Monitoring program. Mason LD tests contaminants including phosphorus, nitrogen, and total suspended solids.
	1.c.2Population Size	Identify and estimate the population size of the target audience or audiences who is most likely to have significant impacts of the three high-priority water quality issues.	20% of all on campus students, faculty, and staff.	Mason LD	Yes	Complete	The 2018 headcount for both full and part time students was 37,293. As of October 2017, Mason had 6,688 faculty and staff (https://ira.gmu.edu/)
	1.c.3 Messages	Develop relevant message or messages and associated educational and outreach materials targeting the selected audiences.	Develop and distribute educational materials for public outreach.	Mason LD	Yes	Complete	Mason LD has developed and handed out brochures around campus through the year. These brochures are attached in Appendix C. Mason has BMP signage and electronic flyers in commonly toured areas around the campus.

Minimum Control Measure No. 1: Public Education and Outreach on Stormwater Impacts							
BMP CATEGORY	PROPOSED BMP	PROGRAM	MEASURABLE GOAL	RESPONSIBLE PERSON/ DEPARTMENT	CURRENT PROGRAM IN PLACE	ESTIMATED DATE OF IMPLEMENTATION	ANNUAL OBJECTIVES ACHIEVED/INTENDED ACHIEVEMENT
							Mason teams up with CWP and participates in a regional stormwater education campaign.
	1.c.4 Public Participation	Provide for public participation during public education and outreach program development.	Reach out to students/faculty/staff on the importance of stormwater management.	Mason LD	Yes	Complete	Mason LD hosts stream cleanups events twice a year to promote public involvement and participation. Refer to Appendix C for a list of current and future education and outreach activities.
	1.c.5 Target Audience	Annually conduct sufficient education and outreach activities designed to reach 20% of each high-priority issue target audience.	Reach out to students /faculty/staff on our high-priority stormwater issues.	Mason LD	Yes	Complete	Mason LD partners with CWP to raise awareness through a regional stormwater education campaign.
	1.c.6 Adjusting Target Audience	Provide for the adjustment of target audiences and messages including educational materials and delivery mechanisms.	Campus life changes every year and. Mason LD plans to evaluate target audience based on enrollment profile of students, faculty, and staff and adjust target audience if necessary	Mason LD	Yes	Complete	Mason LD makes necessary adjustment on delivery mechanisms based on student's profiles provided by Office of Institutional Research and Reporting.
1.d - Other Operators	1.d.1 Public Outreach and Outreach Efforts	Coordinate the public education and outreach efforts with other MS4 operators	Coordinate between other MS4 operators on public education and outreach efforts.	Mason LD	Yes	Complete	Mason is an active member of CWP, which provides a platform to coordinate with neighborhood MS4 operators.

Minimum Control Measure No. 1: Public Education and Outreach on Stormwater Impacts							
BMP CATEGORY	PROPOSED BMP	PROGRAM	MEASURABLE GOAL	RESPONSIBLE PERSON/ DEPARTMENT	CURRENT PROGRAM IN PLACE	ESTIMATED DATE OF IMPLEMENTATION	ANNUAL OBJECTIVES ACHIEVED/INTENDED ACHIEVEMENT
1.e - Evaluation	1.e.1 Education and Outreach Program Evaluation	Appropriateness of High-priority stormwater issues.	Update the Program based on the evaluation.	Mason LD	Yes	Complete	Mason evaluated the education and outreach program and is in the process to update the MS4 Program Plan to meet the new state permit requirements.
	1.e.2 Education and Outreach Program Evaluation	Appropriateness of the selected target audiences for each high priority stormwater issue.	Update the Program based on the evaluation.	Mason LD	Yes	Complete	Mason evaluated the education and outreach program and is in the process to update the MS4 Program Plan to meet the new state permit requirements.
	1.e.3 Education and Outreach Program Evaluation	Effectiveness of the message or messages being delivered.	Update the Program based on the evaluation.	Mason LD	Yes	Complete	Mason evaluated the education and outreach program and is in the process to update the MS4 Program Plan to meet the new state permit requirements.
	1.e.4 Education and Outreach Program Evaluation	Effectiveness of the mechanism or mechanisms of delivery employed in reaching the target audiences.	Update the Program based on the evaluation.	Mason LD	Yes	Complete	Mason evaluated the education and outreach program and is in the process to update the MS4 Program Plan to meet the new state permit requirements.
1.f - MS4 Program Plan Updates	1.f.1 Table 1	Describe how the conditions of this permit shall be updated in accordance with Table 1.	Update the program plan.	Mason LD	Yes	Complete	Refer to Appendix D for an updated Schedule of MS4 Program Plan Updates for the 2013-2018 Permit.
1.g - Annual Reporting	1.g.1 Education and Outreach Activities- Current Reporting Period	Maintain a list of education and outreach activities.	Maintain a list of education and outreach activities conducted during the reporting period, the estimated number of people reached, and an	Mason LD	Yes	Complete	Mason partners with CWP and participates in a regional stormwater education campaign. In addition, Mason LD leads several campus outreach activities including bi-annual stream clean-ups,

Minimum Control Measure No. 1: Public Education and Outreach on Stormwater Impacts							
BMP CATEGORY	PROPOSED BMP	PROGRAM	MEASURABLE GOAL	RESPONSIBLE PERSON/ DEPARTMENT	CURRENT PROGRAM IN PLACE	ESTIMATED DATE OF IMPLEMENTATION	ANNUAL OBJECTIVES ACHIEVED/INTENDED ACHIEVEMENT
			estimated percentage of the target audience or audiences that will be reached.				escorting classes, and freshman and transfer orientation. Refer to Appendix C for a complete list of activities.
	1.g.2 Education and Outreach Activities- Next Reporting Period	Maintain a list of future education and outreach activities for each high priority water quality issue.	Maintain a list of education and outreach activities that will be conducted during the next reporting period for each high-priority water quality issue, the estimated number of people reached, and an estimated percentage of the target audience or audiences that will be reached.	Mason LD	Yes	Complete	Refer to Appendix C for a list of current education and outreach activities. Mason is in the process to evaluate the future education and outreach activities to meet the new state permit requirements.

Minimum Control Measure No. 2: Public Involvement and Participation							
BMP CATEGORY	PROPOSED BMP	PROGRAM	MEASURABLE GOAL	RESPONSIBLE PERSON/ DEPARTMENT	CURRENT PROGRAM IN PLACE	ESTIMATED DATE OF IMPLEMENTATION	ANNUAL OBJECTIVES ACHIEVED/INTENDED ACHIEVEMENT
2.a - Public Involvement	2.a.1-2 Compliance	Comply with any applicable federal, state, and local public notice requirements.	Maintain an updated MS4 Program Plan. Copies of each MS4 program plan shall be posted on its website at a minimum of once a year and within 30 days of submittal of the annual report to the department.	Mason LD	Yes	Complete	All previous and current MS4 Annual Reports are available on http://stormwater.gmu.edu
2.b - Public Participation	2.b.1 Participation	Participate in a minimum of four local activities annually.	Involve campus life in a minimum of four activities around campus yearly.	Mason LD	Yes	Complete	Mason LD leads two outreach activities (one in spring and one in fall), and attends CWP meetings regularly.
2.c. - Procedures for Implementation	2.c.1 Written Procedures	The MS4 Program Plan shall include written procedures for implementing the program.	Address how Mason considered the comments received in the development of its MS4 Program Plan.	Mason LD	Yes	Complete	Mason MS4 Program Plan includes written procedures for program implementation. Mason is in the process to update the MS4 Program Plan to meet the new state permit requirements
2.d - Annual Report	2.d.1 Website	A web link to the MS4 Program Plan and annual report.	Keep the website up to date and upload annual MS4 report when available.	Mason LD	Yes	Complete	All previous and current MS4 Annual Reports are available on http://stormwater.gmu.edu
	2.d.2 Proof of Compliance	Documentation of compliance with the public participation requirements of this section.	Maintain the document in activities Mason LD organizes and the number of participants per event.	Mason LD	Yes	Complete	Mason LD keeps records of volunteers' headcounts in each stream clean-up events. Volunteers are required to fill out compliance and safety forms before participation. Refer to Appendix C for a complete list of activities.

Minimum Control Measure No. 3: Illicit Discharge Detection and Elimination							
BMP CATEGORY	PROPOSED BMP	PROGRAM	MEASURABLE GOAL	RESPONSIBLE PERSON/ DEPARTMENT	CURRENT PROGRAM IN PLACE	ESTIMATED DATE OF IMPLEMENTATION	ANNUAL OBJECTIVES ACHIEVED/INTENDED ACHIEVEMENT
3.a - Storm Sewer System Map	3.a.1 Outfall Map	Maintain the storm sewer system map	Maintain the storm sewer system map showing the names and locations of the outfalls. As new outfalls are located or new infrastructure is constructed, the outfalls and associated stormwater systems will be added to the existing system mapping	Mason LD	Yes	Complete	An outfall reconnaissance is conducted every year and necessary updates of the outfall map are made. Refer to Appendix F for outfall maps for Fairfax and Science and Technology campuses.
	3.a.2-3 Associated Information Table	Maintain information on every outfall located on the storm sewer system map	Complete the information table including a unique identifier, estimated MS4 acreage served, and the name of the receiving surface water	Mason LD	Yes	Complete	Data have been collected for MS4 outfalls including unique identifier, and receiving surface water. Please see Appendix F for information.
	3.a.4 Completed Map	Complete and maintain the storm sewer system map and information table.	Maintain mapping and information table.	Mason LD	Yes	Complete	The storm sewer system map and outfall information table are available upon request.
	3.a.5 Interconnection	Notify the downstream MS4	Send the interconnection notice to downstream MS4	Mason LD	Yes	Complete	Mason sends the interconnection notice to neighboring MS4 operators annually. Please see Appendix G for details.

Minimum Control Measure No. 3: Illicit Discharge Detection and Elimination							
BMP CATEGORY	PROPOSED BMP	PROGRAM	MEASURABLE GOAL	RESPONSIBLE PERSON/ DEPARTMENT	CURRENT PROGRAM IN PLACE	ESTIMATED DATE OF IMPLEMENTATION	ANNUAL OBJECTIVES ACHIEVED/INTENDED ACHIEVEMENT
3.b - Prohibited Discharge	3.b.1 - Prohibit nonstormwater Discharge	The operator shall effectively prohibit, through ordinance or other legal mechanism, nonstormwater discharges into the storm sewer system to the extent allowable under federal, state, or local law, regulation, or ordinance.	Implement the illicit discharge policy	Mason LD/EHS	Yes	Complete	Mason Illicit Discharge Detection and Elimination (IDDE) Policy prohibits nonstormwater discharges into the Mason's MS4. The policy educates and instructs the public on what illicit discharges are and how to notify Mason LD and/or EHS of a spill. The policy also establishes enforcement procedures for violators. Refer to Appendix E for Mason's IDDE Policy implemented since 2013.
3.c - IDDE Procedures	3.c.1 Written dry weather field screening	Dry Weather Field Screenings are to detect and eliminate illicit discharges to the MS4.	Develop and implement a field observation and field screening monitoring program to detect and eliminate illicit discharges.	Mason LD/EHS	Yes	Complete	Mason LD developed Outfall Reconnaissance Procedures and Guideline to conduct field screenings of illicit discharge. Information are collected during the inspection.
3.d - Inspections	3.d.1 Promote, publicize, and facilitate public reporting of illicit discharges into or from MS4	The operator shall conduct inspections in response to complaints and follow-up inspections as needed to ensure that corrective measures have been implemented by the responsible party.	Inspect all stormwater outfalls regularly. Inspection reports are based on odor, visual observation, and other indicators to identify illicit discharges.	Mason LD/FM/EHS	Yes	Complete	Mason conducts annual outfall inspection following the procedures in the Outfall Reconnaissance Procedures and Guideline. If any violation is found between screenings, Mason LD has an understanding with EHS as to reporting any illicit discharge found on campus. Refer to Appendix E for Mason's IDDE

Minimum Control Measure No. 3: Illicit Discharge Detection and Elimination							
BMP CATEGORY	PROPOSED BMP	PROGRAM	MEASURABLE GOAL	RESPONSIBLE PERSON/ DEPARTMENT	CURRENT PROGRAM IN PLACE	ESTIMATED DATE OF IMPLEMENTATION	ANNUAL OBJECTIVES ACHIEVED/INTENDED ACHIEVEMENT
							policy and how to report potential violation.
3.e - Development Procedures	3.e.1 MS4 Program Updates	The MS4 Program plan shall include all procedures developed by the operator to detect, identify, and address nonstormwater discharges to the MS4 in accordance with the schedule given in Appendix D.	Follow procedures for reporting and tracing all illicit discharges. Appropriate staff will be instructed with these procedures.	Mason LD/FM/EHS	Yes	Complete	Mason's IDDE policy is included in the MS4 Program Plan. Mason is in the process to update the MS4 Program Plan to meet the new state permit requirements
3.f - Annual Reporting	3.f.1-3 Requirements	Each annual report shall include a list of any written notifications of physical interconnection, the total number of outfalls screened during the reporting period, the screening results, details of any follow-up actions necessitated by the screening results, and a summary of each investigation.	Maintain written notifications with outside stormwater systems and complete an inventory form for all MS4 outfalls.	Mason LD/EHS	Yes	Complete	The written notifications of physical interconnection can be found in Appendix G. Mason conducted outfall screen for 53 outfalls. There was five no-reportable incident and zero reportable incident in this permit year.

Minimum Control Measure No. 4: Construction Site Stormwater Runoff Control							
BMP CATEGORY	PROPOSED BMP	PROGRAM	MEASURABLE GOAL	RESPONSIBLE PERSON/ DEPARTMENT	CURRENT PROGRAM IN PLACE	ESTIMATED DATE OF IMPLEMENTATION	ANNUAL OBJECTIVES ACHIEVED/INTENDED ACHIEVEMENT
4.a - Oversight Requirements	4.a.1-4 Land Disturbing Activities	The operator shall utilize its legal authority to address discharges entering the MS4.	Implement the Land Disturbance Permit process to address discharges entering the MS4.	Mason LD	Yes	Complete	Mason LD is the VSMP authority under the Annual Standards and Specifications for Erosion and Sediment Control and Stormwater Management approved by DEQ. This document can be found at http://masonld.gmu.edu Mason LD review, approve, and permit land disturbing projects in accordance with the Annual Standards and Specifications for Erosion and Sediment Control and Stormwater Management.
4.b - Required Plan Approval	4.b.1-2 Land Disturbing Activities	The operator shall require that land disturbance not begin until an erosion and sediment control plan or an agreement in lieu of a plan is approved by a VESCP authority	Implement the land disturbance permit process to be compliance with department-approved annual standards and specifications.	Mason LD	Yes	Complete	Mason LD review, approve, and permit land disturbing projects in accordance with the Annual Standards and Specifications for Erosion and Sediment Control and Stormwater Management.
4.c - Compliance and Enforcement	4.c.1 – 8 Inspections	The operator shall inspect land-disturbing activities for compliance with an approved erosion and sediment control plan or agreement in lieu of a plan in	Maintain an inspection schedule that includes inspections upon installation, every two weeks and within 48 hours of a 10-year storm, and at completion of the project.	Mason LD	Yes	Complete	Mason LD inspects land disturbing activities in accordance with the Annual Standards and Specifications for Erosion and Sediment Control and Stormwater Management.

Minimum Control Measure No. 4: Construction Site Stormwater Runoff Control							
BMP CATEGORY	PROPOSED BMP	PROGRAM	MEASURABLE GOAL	RESPONSIBLE PERSON/ DEPARTMENT	CURRENT PROGRAM IN PLACE	ESTIMATED DATE OF IMPLEMENTATION	ANNUAL OBJECTIVES ACHIEVED/INTENDED ACHIEVEMENT
		accordance with the minimum standards.					
4.d - Regulatory Coordination		The operator shall implement enforceable procedures to require small and large construction activities secure necessary state permit authorization from the department to discharge stormwater.	Implement procedures to require all construction activities on campus to obtain proper permits.	Mason LD/FM	Yes	Complete	Mason LD requires that all construction entities abide the Annual Standards and Specifications for Erosion and Sediment Control and Stormwater Management approved by DEQ. Land disturbing activities larger than one acre are required to obtain Construction General Permit.
4.e - MS4 Program Requirements	4.e.1 MS4 Program Plan Updates	The operator's MS4 Program must include a description of a legal authorities utilized to ensure compliance with the minimum control measures related to construction site stormwater runoff control.	Maintain compliance with the minimum control measures.	Mason LD/EHS	Yes	Complete	Mason is in the process to update the MS4 Program Plan to meet the new state permit requirements
	4.e.2 MS4 Program Plan Updates	The operator's MS4 Program must include written plan review procedures and all associated documents utilized in plan review	Maintain compliance with the minimum control measures.	Mason LD/EHS	Yes	Complete	Mason is in the process to update the MS4 Program Plan to meet the new state permit requirements

Minimum Control Measure No. 4: Construction Site Stormwater Runoff Control							
BMP CATEGORY	PROPOSED BMP	PROGRAM	MEASURABLE GOAL	RESPONSIBLE PERSON/ DEPARTMENT	CURRENT PROGRAM IN PLACE	ESTIMATED DATE OF IMPLEMENTATION	ANNUAL OBJECTIVES ACHIEVED/INTENDED ACHIEVEMENT
	4.e.3 MS4 Program Plan Updates	The operator's MS4 Program must include a copy of the annual standards and specifications	Maintain compliance with the minimum control measures.	Mason LD	Yes	Complete	Mason is in the process to update the MS4 Program Plan to meet the new state permit requirements
	4.e.4 MS4 Program Plan Updates	The operator's MS4 Program must include written inspection procedure	Maintain compliance with the minimum control measures.	Mason LD	Yes	Complete	Mason is in the process to update the MS4 Program Plan to meet the new state permit requirements
	4.e.5 MS4 Program Plan Updates	The operator's MS4 Program must include a written procedure for compliance and enforcement.	Maintain compliance with the minimum control measures.	Mason LD	Yes	Complete	Mason is in the process to update the MS4 Program Plan to meet the new state permit requirements
	4.e.6 MS4 Program Plan Updates	The operator's MS4 Program must define the roles and responsibilities.	Maintain compliance with the minimum control measures	Mason LD	Yes	Complete	Mason is in the process to update the MS4 Program Plan to meet the new state permit requirements
4.f - Reporting Requirements	4.f.1 – 4.f.4 Track regulated land disturbing activities	Report the total number of regulated land disturbing activities, acreage disturbed, number of inspections, and a summary of the actions taken during the reporting period.	Maintain an up-to-date list of all current and future land disturbing activities.	Mason LD	Yes	Complete	Refer to Appendix H for a complete list of all current and future land disturbing activities. No notice of corrective action was issued for FY18 (Refer to Appendix I).

Minimum Control Measure No. 5: Post Construction Site Stormwater Runoff Control							
BMP CATEGORY	PROPOSED BMP	PROGRAM	MEASURABLE GOAL	RESPONSIBLE PERSON/ DEPARTMENT	CURRENT PROGRAM IN PLACE	ESTIMATED DATE OF IMPLEMENTATION	ANNUAL OBJECTIVES ACHIEVED/INTENDED ACHIEVEMENT
5.a - Oversight Requirements	5.a.1-3 New and Old Development	The operator shall address post construction stormwater runoff that enters the MS4.	Implement procedures to require all construction activities on campus to obtain proper permits.	Mason LD	Yes	Complete	Mason LD reviews and inspects land disturbing activities in accordance with Annual Standards and Specifications for Erosion and Sediment Control and Stormwater Management approved by DEQ.
5.b - Design Criteria	5.b.1-3 Legal Authority	The operator shall utilize legal authority to address stormwater runoff.	Require design and installation of stormwater runoff controls compliant with the water quality criteria, design criteria, and department approved annual standards and specifications for land disturbing activities.	Mason LD	Yes	Complete	Mason LD reviews, approves, and permits land disturbing projects in accordance with Annual Standards and Specifications for Erosion and Sediment Control and Stormwater Management approved by DEQ.
5.c - Inspection, Operation, and Maintenance	5.c.1-2 Stormwater Management Facilities	Provide for adequate long-term operation and management of its stormwater management facilities.	Long term operations and management procedures for all stormwater management facilities. An inspection must be completed annually.	Mason LD	Yes	Complete	Mason LD inspects stormwater management facilities annually. Refer to Appendix J for a list of stormwater management facilities on campus.
5.d - Program Plan Requirements	5.d.1 MS4 Program Plan Updates	Maintain a list of the applicable legal authorities that ensure compliance with the minimum control measures related to post-construction	MS4 Program Plan shall be updated in accordance with the table in Appendix D.	Mason LD	Yes	Complete	Mason is in the process to update the MS4 Program Plan to meet the new state permit requirements

Minimum Control Measure No. 5: Post Construction Site Stormwater Runoff Control							
BMP CATEGORY	PROPOSED BMP	PROGRAM	MEASURABLE GOAL	RESPONSIBLE PERSON/ DEPARTMENT	CURRENT PROGRAM IN PLACE	ESTIMATED DATE OF IMPLEMENTATION	ANNUAL OBJECTIVES ACHIEVED/INTENDED ACHIEVEMENT
		stormwater management in new development and development on prior developed lands.					
	5.d.2 MS4 Program Plan Updates	Written policies and procedures utilized to ensure that stormwater management facilities are designed and installed in accordance with legal authority	MS4 Program Plan shall be updated in accordance with the table in Appendix D.	Mason LD	Yes	Complete	Mason is in the process to update the MS4 Program Plan to meet the new state permit requirements
	5.d.3 MS4 Program Plan Updates	Written inspection policies and procedures utilized in conducting inspections.	MS4 Program Plan shall be updated in accordance with the table in Appendix D.	Mason LD	Yes	Complete	Mason is in the process to update the MS4 Program Plan to meet the new state permit requirements
	5.d.4 MS4 Program Plan Updates	Written procedures for inspection, compliance and enforcement to ensure maintenance is conducted on private stormwater facilities to ensure long-term operation in accordance with approved design.	MS4 Program Plan shall be updated in accordance with the table in Appendix D.	Mason LD	Yes	Complete	Mason is in the process to update the MS4 Program Plan to meet the new state permit requirements

Minimum Control Measure No. 5: Post Construction Site Stormwater Runoff Control							
BMP CATEGORY	PROPOSED BMP	PROGRAM	MEASURABLE GOAL	RESPONSIBLE PERSON/ DEPARTMENT	CURRENT PROGRAM IN PLACE	ESTIMATED DATE OF IMPLEMENTATION	ANNUAL OBJECTIVES ACHIEVED/INTENDED ACHIEVEMENT
	5.d.5 MS4 Program Plan Updates	Written procedures for inspection and maintenance of operator owned stormwater management facilities.	MS4 Program Plan shall be updated in accordance with the table in Appendix D.	Mason LD	Yes	Complete	Mason is in the process to update the MS4 Program Plan to meet the new state permit requirements
	5.d.6 MS4 Program Plan Updates	The roles and responsibilities of each of the operator's departments, divisions, or subdivisions in implementing the minimum control measures related to post construction stormwater management in new development and development on prior developed lands.	MS4 Program Plan shall be updated in accordance with the table in Appendix D.	Mason LD	Yes	Complete	Mason is in the process to update the MS4 Program Plan to meet the new state permit requirements
5.e - Tracking and Reporting	5.e.1-9 Electronic Database or Spreadsheet	The operator shall maintain an updated electronic database of all known operator-owned and privately-owned stormwater management facilities that discharge into the MS4.	Maintain a updated electronic database of all known operator-owned or privately-owned stormwater management facilities that discharge into the MS4.	Mason LD	Yes	Complete	Mason LD developed a spreadsheet to include relevant information for Stormwater facilities. Refer to Appendix J for Stormwater Management Facilities. The information has been updated to BMP warehouse.

Minimum Control Measure No. 6: Pollution Prevention and Good Housekeeping							
BMP CATEGORY	PROPOSED BMP	PROGRAM	MEASURABLE GOAL	RESPONSIBLE PERSON/ DEPARTMENT	CURRENT PROGRAM IN PLACE	ESTIMATED DATE OF IMPLEMENTATION	ANNUAL OBJECTIVES ACHIEVED/INTENDED ACHIEVEMENT
6.a - Operations and Maintenance Activities	6.a.1- Staff Education -	The operator shall develop and implement written procedures designed to minimize or prevent pollutant discharge.	At a minimum, the written procedures shall be designed to: prevent illicit discharge, ensure the proper disposal of waste, prevent the discharge of municipal vehicle wash water into MS4, prevent the discharge of wastewater into MS4, require implementation of BMPs, minimize the pollutants in stormwater runoff from bulk storage areas, prevent pollution discharge into the MS4, and ensure that the application of materials is conducted in accordance with the manufacturer's recommendations.	Mason LD/ EHS/ FM	Yes	Complete	Mason has adopted Illicit Discharge Detection and Elimination (IDDE) Policy, Waste Management, Recycling policy, etc, which are available in Appendix E and at Mason website .
6.b - Municipal Facility	6.b.1 - Municipal high-priority facilities	Within 12 months of the state permit coverage, the operator shall identify all municipal high-priority facilities.	The high-priority facilities shall include composting facilities, equipment storage and maintenance facilities, materials storage yards, pesticide storage facilities,	Mason LD/ EHS/ FM	Yes	Complete	Mason has identified three high priority facilities, which can be found in Appendix L.

Minimum Control Measure No. 6: Pollution Prevention and Good Housekeeping							
BMP CATEGORY	PROPOSED BMP	PROGRAM	MEASURABLE GOAL	RESPONSIBLE PERSON/ DEPARTMENT	CURRENT PROGRAM IN PLACE	ESTIMATED DATE OF IMPLEMENTATION	ANNUAL OBJECTIVES ACHIEVED/INTENDED ACHIEVEMENT
			public works yards, recycling facilities, salt storage facilities, solid waste handling and transfer facilities, and vehicle storage and maintenance yards.				
	6.b.2 - High potential of discharging pollutants	Within 12 months of the state permit coverage, the operator shall identify which of the municipal high-priority facilities have a high potential of discharging pollutants.	The high-priority facilities shall include composting facilities, equipment storage and maintenance facilities, materials storage yards, pesticide storage facilities, public works yards, recycling facilities, salt storage facilities, solid waste handling and transfer facilities, and vehicle storage and maintenance yards.	Mason LD	Yes	Complete	Mason has policies and procedures in place (refer to Appendix E) if there is a potential of pollutant discharge at any of the municipal high-priority facilities on campus. Stormwater Pollution Prevent Plan (Appendix L) has been developed for high priority facilities.
	6.b.3-4 Stormwater Pollution Prevention Plans	The operator shall complete SWPPP development and implementation shall be completed within 48 months of coverage under this state permit	Develop and Implement Stormwater Pollution Prevention Plan.	Mason LD	Yes	Complete	Mason LD has updated Stormwater Pollution Prevention Plan in the permit year. Please refer to Appendix L.

Minimum Control Measure No. 6: Pollution Prevention and Good Housekeeping							
BMP CATEGORY	PROPOSED BMP	PROGRAM	MEASURABLE GOAL	RESPONSIBLE PERSON/ DEPARTMENT	CURRENT PROGRAM IN PLACE	ESTIMATED DATE OF IMPLEMENTATION	ANNUAL OBJECTIVES ACHIEVED/INTENDED ACHIEVEMENT
6.c - Turf and Landscaping Management	6.c.1 (a)- Turf and Landscaping	The operator shall implement turf and landscape nutrient management plans that have been developed by a certified turf and landscape nutrient management planner	Implement turf and landscape nutrient management plans. Implementation shall be within 12 months of state permit coverage, the operator shall identify all applicable lands where nutrients are applied to a contiguous area of more than one acre.	Mason LD/FM	Yes	Complete	Mason developed the Nutrient Management Plans for Fairfax and Science and Technology campuses on August 2015. The Plans were updated and approved by DCR on Aug 2018. Refer to Appendix K for the approved 2018 Nutrient Management Plans.
	6.c.1 (b)- Turf and Landscaping	The operator shall implement turf and landscape nutrient management plans that have been developed by a certified turf and landscape nutrient management planner	Implementation shall be within 60 months of state permit coverage, the operator shall implement turf and landscape nutrient management plans on all lands where nutrients are applied to a contiguous area of more than one acre.	Mason LD	Yes	Complete	Mason has implemented the approved Nutrient Management Plans for identified acres.
	6.c.2 - Annual Tracking	Operators shall annually track nutrient management Plans	Track the total acreage of lands where turf and landscape nutrient management plans are required and the total acreage of lands upon which turf and landscape nutrient management plans have been implemented.	Mason LD/FM	Yes	Complete	Mason LD tracks the total acreage of lands where turf and landscape nutrient management plans are required and the total acreage of lands upon which turf and landscape nutrient management plans have been implemented. Refer to Appendix K

Minimum Control Measure No. 6: Pollution Prevention and Good Housekeeping							
BMP CATEGORY	PROPOSED BMP	PROGRAM	MEASURABLE GOAL	RESPONSIBLE PERSON/ DEPARTMENT	CURRENT PROGRAM IN PLACE	ESTIMATED DATE OF IMPLEMENTATION	ANNUAL OBJECTIVES ACHIEVED/INTENDED ACHIEVEMENT
	6.c.3 - Deicing	The operator shall not apply any deicing agent containing urea or other forms of nitrogen or phosphorus to parking lots, roadways, and sidewalks, or other paved areas.	The operator shall not apply any deicing agent containing urea or other forms of nitrogen or phosphorus.	Mason LD/FM	Yes	Complete	When necessary, Mason applies Kissner Salts and Chemicals: Landscaper's Choice Ice Melter for sidewalks on campuses. For all parking lots and roadways, FM applies the identical deicing agent as Virginia Department of Transportation (VDOT).
6.d - Training	6.d.1 - Field Personnel	The operator shall conduct training for employees, determine and document the applicable employees or positions to receive each type of training, and develop an annual written training plan.	Provide biennial training to applicable field personnel in the recognition and reporting of illicit discharges.	Mason LD/EHS	Yes	Complete	EHS has personnel and procedures in place for staff training.
	6.d.2 - Road, Street, and Parking Lot Maintenance	The operator shall conduct training for employees, determine and document the applicable employees or positions to receive each type of training, and develop an annual written training plan.	Provide biennial training to applicable employees in good housekeeping and pollution and prevention practices that are to be employed during road, street, and parking lot maintenance.	Mason LD	Yes	Complete	Employees working on maintenance of roads, streets, and parking lots receive training by an outside contractor.

Minimum Control Measure No. 6: Pollution Prevention and Good Housekeeping							
BMP CATEGORY	PROPOSED BMP	PROGRAM	MEASURABLE GOAL	RESPONSIBLE PERSON/ DEPARTMENT	CURRENT PROGRAM IN PLACE	ESTIMATED DATE OF IMPLEMENTATION	ANNUAL OBJECTIVES ACHIEVED/INTENDED ACHIEVEMENT
	6.d.3 - Maintenance and Public Works Facilities	The operator shall conduct training for employees, determine and document the applicable employees or positions to receive each type of training, and develop an annual written training plan.	Provide biennial training to applicable employees in good housekeeping and pollution and prevention practices that are to be employed in and around maintenance and public works facilities.	Mason LD/FM	Yes	Complete	Employees working in and around maintenance and public works facilities receive training by an outside contractor.
	6.d.4 - Pesticides and Herbicides	The operator shall conduct training for employees, determine and document the applicable employees or positions to receive each type of training, and develop an annual written training plan.	Require employees, and contractors, who apply pesticides and herbicides to be properly trained or certified in accordance with the Virginia Pesticide Control Act.	Mason LD/FM	Yes	Complete	Employees managing contracts of pesticides and herbicides application have completed their yearly certifications. One employee is currently certified as pesticide applicator
	6.d.5 - Plan Reviewers, Inspectors, Program Administrators, and Construction Site Certifications	The operator shall conduct training for employees, determine and document the applicable employees or positions to receive each type of training, and develop an annual written training plan.	Require employees and contractors serving as plan reviewers, inspectors, program administrators, and construction site operators to obtain the appropriate certifications.	Mason LD	Yes	Complete	Mason staff members receive the appropriate training and certifications from DEQ to serve as plan reviewers, inspectors and program administrators

Minimum Control Measure No. 6: Pollution Prevention and Good Housekeeping							
BMP CATEGORY	PROPOSED BMP	PROGRAM	MEASURABLE GOAL	RESPONSIBLE PERSON/ DEPARTMENT	CURRENT PROGRAM IN PLACE	ESTIMATED DATE OF IMPLEMENTATION	ANNUAL OBJECTIVES ACHIEVED/INTENDED ACHIEVEMENT
	6.d.6 - ESC Certifications	The operator shall conduct training for employees, determine and document the applicable employees or positions to receive each type of training, and develop an annual written training plan.	Require applicable employees to obtain appropriate certifications as required under the Virginia Erosion and Sediment Control Law (VESCL) and its attendant regulations.	Mason LD	Yes	Complete	Mason staff members receive the appropriate training and certifications from DEQ. One staff member is certified as combined administrator for ESC and two for dual combined administrator for SWM. Two staff members are certified as ESC inspector.
	6.d.7 - In and Around Recreational Facilities	The operator shall conduct training for employees, determine and document the applicable employees or positions to receive each type of training, and develop an annual written training plan.	Provide biennial training to applicable employees in good housekeeping and pollution and prevention practices that are to be employed in and around recreational facilities.	Mason LD/EHS	Yes	Complete	Mason contracts all work in and around recreational facilities to BrightView and Game Day, Inc. Both companies provide their own training to employees.
	6.d.8 - Emergency Response	The operator shall conduct training for employees, determine and document the applicable employees or positions to receive each type of training, and develop an annual written training plan.	Provide spill response training to appropriate emergency response employees.	Mason LD/EHS	Yes	Complete	Mason has 20 staff members who have received 40 hour HAZWOPER training to act as emergency spill responders.
	6.d.9 - Training Documentation	The operator shall conduct training for employees, determine and document the	Keep documentation on each training event including the training date, the number of	Mason LD/EHS	Yes	Complete	Mason keeps documentation on each training event including the training date, the number of employees

Minimum Control Measure No. 6: Pollution Prevention and Good Housekeeping							
BMP CATEGORY	PROPOSED BMP	PROGRAM	MEASURABLE GOAL	RESPONSIBLE PERSON/ DEPARTMENT	CURRENT PROGRAM IN PLACE	ESTIMATED DATE OF IMPLEMENTATION	ANNUAL OBJECTIVES ACHIEVED/INTENDED ACHIEVEMENT
		applicable employees or positions to receive each type of training, and develop an annual written training plan.	employees attending the training, and the objective of the training event for a period of three years after each training.				attending the training, and the objective of the training event for a minimum period of three years after each training.
6.e - Control Measures and Procedures	6.e.1 - Stormwater Discharge Procedures	The operator shall require that municipal contractors use appropriate control measures and procedures for stormwater discharge to the MS4 system.	Describe oversight procedures in the MS4 Program Plan.	Mason LD	Yes	Complete	Mason staff members receive the appropriate training and certifications from DEQ as combined administrator for ESC, combined administrator for SWM, SWM plan reviewers, and ESC inspector. These employees inspect construction sites to ensure the control measures and procedures are being implemented correctly.
6.f - MS4 Program Plan		At a minimum, the MS4 Program Plan shall contain: written protocols being used to satisfy the daily operations and maintenance requirements, a list of all municipal high-priority facilities, a list of lands where nutrients are applied to a contiguous area of more than one acre, and the annual written training plan	Maintain protocols being used to satisfy the daily operations and maintenance requirements, a list of all municipal high-priority facilities, a list of lands where nutrients are applied, and the annual written training plan for the next reporting cycle.	Mason LD	Yes	Complete	Mason is in the process to update the MS4 Program Plan to meet the new state permit requirements

Minimum Control Measure No. 6: Pollution Prevention and Good Housekeeping							
BMP CATEGORY	PROPOSED BMP	PROGRAM	MEASURABLE GOAL	RESPONSIBLE PERSON/ DEPARTMENT	CURRENT PROGRAM IN PLACE	ESTIMATED DATE OF IMPLEMENTATION	ANNUAL OBJECTIVES ACHIEVED/INTENDED ACHIEVEMENT
		for the next reporting cycle.					
6.g - Annual Reporting Requirements		Summaries on the development and implementation of daily operational procedures, required SWPPPs, turf and landscape required, and the required training information.	Compile summaries of all procedures, SWPPPs, turf and landscaping, and training information.	Mason LD	Yes	Complete	Annual SWPPP inspection for high priority facilities was conducted in June 2018. Inspection reports with corrective action were shared with operation managers. Follow-up inspections were performed to ensure compliance. The nutrient management plans were approved by DCR in August 2018 (Appendix K).

Appendix B:

Water Quality Monitoring

Water Quality Monitoring

In accordance with the MS4 Permit 2013-2018, George Mason University (Mason) has created a Water Quality Monitoring Procedure that includes Water Quality Monitoring Manual that provides detailed instructions and information about proper testing and reporting procedures. In order to ensure that Mason is properly discharging waters across the campuses, Mason requires testing on an annual basis with a goal of quad-annual testing. George Mason University has identified the parameters/characteristics (listed below) as top priority for monitoring.

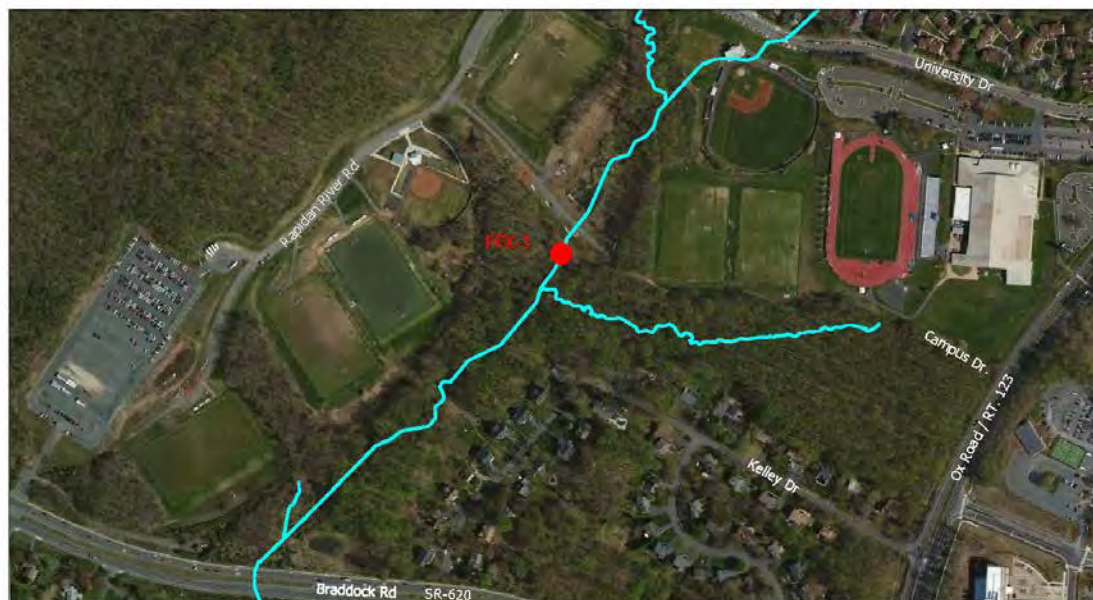
During this permitting period, Mason collected water samples at six outfalls on Fairfax Campus and one outfall on Science and Technology Campus. The samples were analyzed by Occoquan Watershed Monitoring Laboratory, a VELAP certified laboratory. The sample locations and the results are provided below.

Location	Date	Temperature (°C)	pH	Dissolved Oxygen (mg/L)	Total Nitrogen (mg/L)	Nitrate-Nitrogen (mg/L)	Total Phosphorus (mg/L)	Turbidity (NTU)	Total Suspended Solids (mg/L)
FFX-1	03/02/2018	0.1	6.9	9.67	1.88	1.62	0.04	3.6	5.5
FFX-2	03/02/2018	4.3	7.2	9.40	1.81	0.21	0.11	11.1	9.0
FFX-3	03/02/2018	3.2	6.6	9.08	1.37	0.83	0.03	7.3	5.1
FFX-4	03/02/2018	0.1	6.8	11.8	0.86	0.68	0.03	1.9	1.5
FFX-5	03/02/2018	0.5	6.8	12.4	1.03	0.67	0.04	3.0	6.5
FFX-6	03/02/2018	3.6	7.4	13.8	0.53	0.26	0.04	1.5	1.8
PW-1	03/02/2018	0.1	6.6	5.3	3.06	0.01	0.44	136	185
FFX-1	06/12/2018	17.4	7.0	8.45	1.05	0.72	0.05	16.9	7.8
FFX-2	06/12/2018	20.1	6.8	5.32	1.03	0.45	0.06	9.0	6.4
FFX-3	06/12/2018	19.8	6.7	6.88	1.41	0.70	0.08	25.9	15.2
FFX-4	06/12/2018	18.8	6.9	8.36	0.79	0.50	0.05	4.5	2.5
FFX-5	06/12/2018	22.4	6.9	7.85	1.22	0.60	0.05	5.8	3.3
FFX-6	06/12/2018	25.6	7.2	8.47	0.78	0.50	0.05	4.1	2.8
PW-1	06/12/2018	20.3	6.7	5.67	1.09	0.16	0.14	23.7	11.9

Water Quality Monitoring Map
George Mason University - Fairfax Campus



Water Quality Monitoring Map
George Mason University - Fairfax West Campus

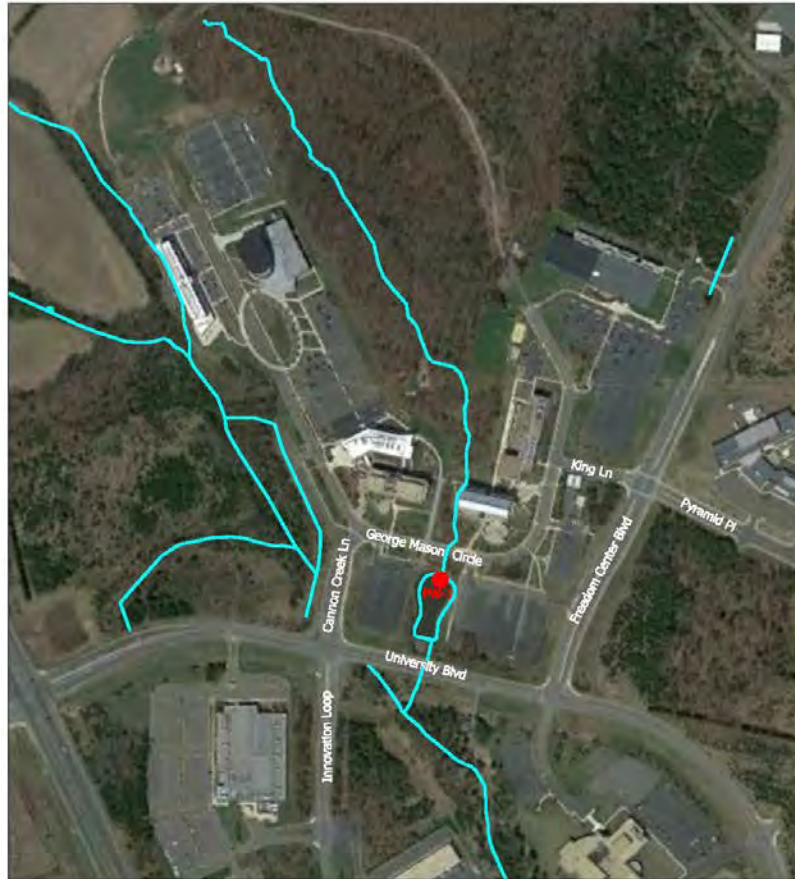


LEGEND
 EX. STREAM
 SAMPLING SITE

0 500' 1000'
 SCALE: 1" = 500'

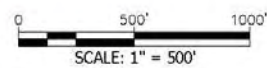


Water Quality Monitoring Map
George Mason University - Science and Technology Campus



LEGEND

- EX. STREAM
- SAMPLING SITE



Appendix C:

Public Education and Outreach Campaigns and Activities

Education and Outreach Activities- July 1, 2017-June 30, 2018		
Date	Activity	Notes
August 23, 2017	Students Move-in Day	Handed out Mason LD brochures with facts about stormwater to new students and faculty.
September 11, 2017	ASCE Mason Chapter Meeting	Explained Mason's MS4 Phase II permit program to 30+ students from ASCE Mason Chapter
September 11, 2017	Stream Clean-up	Collected 28.4 pounds of garbage and 32.7 pounds of recyclables with students volunteers
November 10, 2017	Rain garden Maintenance	Weeded and replanted rain gardens with 10+ student volunteers.
November 27, 2017	Outfall Labeling	Labeled 10+ outfalls with student volunteers.
February 14, 2018	Staff Appreciation Day	Handed out Mason LD brochures with facts about stormwater to students, faculty, and staff on campus.
April 4, 2018	Wellness Fair at Science and Tech Campus	Handed out Mason LD brochures with facts about stormwater to students and community members
April 18, 2018	Campus Clean-up	Collected 483.9 pounds of garbage and 200.5 pounds of recyclables with 50+ students, staff, and faculty volunteers
April 19, 2018	Mason EcoFest	Handed out Mason LD brochures with facts about stormwater to students, faculty, and staff on campus.
April 21, 2018	Bioswale Restoration	Planted 30+ shrubs and spread more than 400 cubic feet of mulch on four bioswales with 100+ community volunteers.

The Land Development Team at George Mason University seeks to alert homeowners, students, and staff on the impacts of stormwater runoff on water quality through free training sessions, workshops and distributions of educational materials. The public outreach program at Mason also provides guidance on how the community can help in minimizing adverse impacts of urban runoff in waterways.



George Mason University marks all inlets around all three main campuses with this drainage marker.



George Mason University
4400 University Drive, MS 1E4
Fairfax, Virginia 22030

CONTACT
MasonLD@gmu.edu
<http://facilities.gmu.edu>



Land Development



photo credit: George Hodar

STORMWATER MANAGEMENT

STORMWATER MANAGEMENT

Stormwater runoff is rainwater that doesn't soak into the ground. The rain that runs off is often washed pollutants from impervious surfaces like parking lots, streets, and gutters into the storm drain system, which then flows into our streams, ponds, and bays. Stormwater can flow into a storm sewer system or directly to a stream, wetland, river, or pond. Anything that enters a storm sewer system is discharged untreated into these bodies.

EROSION AND SEDIMENT CONTROL

Erosion and Sediment Control and Stormwater Management Programs are integral components of GMU's design, construction, maintenance, and management of the university's facilities and campuses.



Masonvale Rain Garden

HOW DOES STORMWATER MANAGEMENT WORK?

Under natural conditions, rainwater is dissipated through the processes of transpiration, evaporation and percolation. Through transpiration, a large quantity of water is intercepted by plant foliage and evaporates back into the atmosphere. The remaining water that reaches the surface of ground infiltrates into the soils and through percolation, continues to travel under ground until it slowly makes its way into the streams and aquifers.

As water seeps into the ground the process of percolation also allows for the removal of pollutants present in stormwater. The ability of water to seep into the ground, as well as, the amount of water that can be retained depends on soil properties such as porosity and permeability. A high porosity soil can hold large amounts of water and usually allows for rapid infiltration. When precipitation reaches the soil surface faster than it can be infiltrated into the ground, water collects at the surface and travels downhill.

WHY IS STORMWATER MANAGEMENT NECESSARY?

As more land cover is replaced with impervious surfaces, less rain can be naturally absorbed and treated by the environment. After development, stormwater discharges can increase by more than twice the amount under natural conditions. If not controlled, large quantities of water can cause flooding in our communities and stream channel erosion. Stormwater Management's policies are necessary in order to address impacts of urbanization on water resources, minimize flood damage, and significant erosion of channel bed and banks.



stormwater graphic courtesy John David Hardee

Proposed Education and Outreach Activities 2014-2018	
Activity	Goal
Bi-annual Stream Clean Up	Clean every stream on campus.
Information Stations around Campus	Increase awareness and public education on high-priority water quality issues by using kiosks in commonly occupied buildings on campus.
Guest Lecture	Attend more classes to teach students the importance on high-priority water quality issues and reducing waste on campus.

Appendix D:

Schedule of MS4 Program Plan Updates Required

Schedule of MS4 Program Plan Updates Required			
Program Update Requirement	Permit Reference	Update Completed By	Where added in Appendix A
Public Education Outreach Plan (MCM 1)	Section II B 1	12 months after permit coverage (by June 30, 2014)	MCM 1.b-g Also in Appendix C
Illicit Discharge Procedures (MCM 3)	Section II B 3		MCM 3.e Also in Appendix E
Individual Residential Lot Special Criteria (MCM 5)	Section II B 5 c (1) (d)		MCM 5.c.1-2 Also in Appendix H
Operator-Owned Stormwater Management Inspection Procedures (MCM 5)	Section II B 5		MCM 5.d Also in Appendix H
Identification of Locations Requiring SWPPPs (MCM 6)	Section II B 6 b		MCM 6.b.1-2 Appendix L
Nutrient Management Plan (NMP) Locations (MCM 6)	Section II B 6 c (1) (a)		MCM 6.c.1 (a) Appendix K
Training Schedule and Program (MCM 6)	Section II B 6		MCM 6.d

Updated TMDL Action Plans	Section I B	24 months after permit coverage (by June 30, 2015)	Available online http://stormwater.gmu.edu
Chesapeake Bay TMDL Action Plan	Section I C		Available online http://stormwater.gmu.edu
Stormwater Management Progressive Compliance and Enforcement (MCM 4)	Section II B 5		MCM 4
Daily Good housekeeping Procedures (MCM 6)	Section II B 6 a		MCM 6.a
Other TMDL Action Plans for applicable TMDLs approved between June 2008 and June 2013	Section I B	36 months after permit coverage (by June 30, 2016)	N/A
Outfall Map Completed (MCM 3)	Section II B 3 a (3)	48 months after permit coverage (by June 30, 2017)	MCM 3.a.2-5
SWPPP Implementation (MCM 6)	Section II B 6 b (3)	48 months after permit coverage (by June 30, 2017)	MCM 6.b.3-4 Appendix L
NMP Implementation (MCM 6)	Section II B 6 c (1) (b)	60 months after permit coverage (by June 30, 2018)	MCM 6.c.2 Appendix K

Appendix E:

Illicit Discharge Detection and Elimination Program

Illicit Discharge Detection and Elimination

University Policy Number 1409

Categorized: [General Policies](#)

Responsible Office: [Environmental Health and Safety](#)

Policy Procedure:

- George Mason University MS4 Program Plan

Related Law & Policy:

- Virginia Stormwater Management Program (VSMP) Permit Regulations 4VAC50-60-10 et seq.
- Clean Water Act 33 U.S.C. § 1251 et seq.
- [Policy 1406: Environmental Health and Safety](#)
- [Policy 1408: Environmental Management and Sustainability System](#)

I. PURPOSE AND SCOPE

The purpose of this policy is to provide for the health, safety, and general welfare of the students, staff and visitors of George Mason University through the regulation of non-storm water discharges to the storm drainage system to the maximum extent practicable as required by federal and state law. This policy establishes methods for controlling the introduction of pollutants into the municipal separate storm sewer system (MS4) in order to comply with requirements of Virginia Stormwater Management Program permit for George Mason University.

II. DEFINITIONS

"Best Management Practices" (BMPs) means schedules of activities, prohibitions of practices, general good housekeeping practices, pollution prevention and educational practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants directly or indirectly to storm water, receiving waters, or storm water conveyance systems. BMPs also include treatment practices, operating procedures, and practices to control site runoff, spillage or leaks, sludge or water disposal, or drainage from raw materials storage.

"De Minimis" means small, minor, or insignificant spills of materials that occur during normal material handling operations (e.g., spills from unloading or transfer of materials, leaks from pipes or valves, minor leaks of process equipment, etc.).

"Hazardous Materials" means any material, including any substance, waste, or combination thereof, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, a substantial present or potential hazard to human health, safety, property, or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

"Illegal Discharge" means any direct or indirect non-storm water discharge to the storm drain system, except as exempted in Section III of this policy.

"Municipal Separate Storm Sewer System" (MS4) means the system of conveyances (including, roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) owned and operated by George Mason University and designed or used for collecting or conveying storm water, and that is not used for collecting or conveying sewage.

"Non-Storm Water Discharge" means any discharge to the storm drain system that is not composed entirely of storm water.

"Pollutant" means anything which causes or contributes to pollution. Pollutants may include, but are not limited to: paints, varnishes, and solvents; oil and other automotive fluids; non-hazardous liquid and solid wastes and yard wastes; refuse, rubbish, garbage, litter, or other discarded or abandoned objects, piles, and accumulations, so that same may cause or contribute to pollution; floatables; pesticides, herbicides, and fertilizers; hazardous substances and wastes; sewage, fecal coliform and pathogens; dissolved and particulate metals; animal wastes; wasteland residues that result from constructing a building or structure; and noxious or offensive matter of any kind.

"Storm Drainage System" means publicly-owned facilities by which storm water is collected and/or conveyed, including but not limited to any roads with drainage systems, municipal streets, gutters, curbs, inlets, piped storm drains, pumping facilities, retention and detention basins, natural and human-made or altered drainage channels, reservoirs, and other drainage structures.

"Storm Water" means any surface flow, runoff, and drainage consisting entirely of water from any form of natural precipitation, and resulting from such precipitation.

"Wastewater" means any water or other liquid, other than uncontaminated storm water, discharged from a facility.

III. PROHIBITION OF ILLICIT DISCHARGES

No university employee, student, visitor or contractor shall throw, drain, or otherwise discharge, cause, or allow others under its control to throw, drain, or otherwise discharge into the university's storm water drainage system any pollutants or waters containing any pollutants, other than storm water. It is the responsibility of the Offices of Environmental Health and Safety (EHS), Facilities Management and Facilities Project Management and Construction Management to train employees to recognize the hazards associated with illicit discharges and to identify illicit discharge sources. Additionally, Facilities Land Development ("Mason LD") is responsible for performing outfall inspections and surveys, including observation, documentation, and sampling (if deemed necessary).

The commencement, conduct, or continuance of any illegal discharge to the storm drain system is prohibited except as described as follows:

1. The following discharges are exempt as they are considered to be not significant contributors of pollutants to the MS4: water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration, uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, flows from riparian habitats and wetlands, de-chlorinated swimming pool discharges, street wash water and flows that have been identified in writing by Virginia's Department of Environmental Quality as de minimis discharges that are not significant sources of pollutants to state waters and not requiring a VPDES permit.

2. Discharges or flow from firefighting, and other discharges specified in writing by Mason LD as being necessary to protect public health and safety.

3. Discharges associated with dye testing; however, this activity requires notification to Mason LD prior to the time of the test.

4. The prohibition shall not apply to any non-storm water discharge permitted under an NPDES permit, waiver, or waste discharge order issued to the discharger and administered under the authority of the United States Environmental Protection Agency (EPA), provided that the discharger is in full compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations, and provided that written approval has been granted for the permitted discharge to the storm drain system.

IV. NOTIFICATION OF SPILLS

Notwithstanding other requirements of law, as soon as any person responsible for a facility or operation, or responsible for emergency response for a facility or operation has information of any known or suspected release of materials, which are resulting or may result in illegal discharges or pollutants discharging into storm water, the storm drain system, or waters of the United States, said person shall take all necessary steps to ensure the discovery, containment, mitigation, and proper reporting of such release.

In the event of a release of non-hazardous materials; said person shall notify EHS within 24 hours via email (safety@gmu.edu), phone (703-993-8448), or by calling University Police, who in turn will contact EHS. If hazardous material of any amount enters a storm sewer; said person shall immediately notify University Police, who will then notify EHS. Failure to provide notification of a release as provided above is a violation of this Policy.

V. COMPLIANCE

A. The university may suspend or cease activities and operations that are not in full compliance with this policy.

B. Whenever George Mason University finds that a violation of this Policy has occurred, EHS may order compliance by written notice to the responsible person. Such notice may require, without limitation:

1. The performance of monitoring, analyses, and reporting;
2. The elimination of prohibited discharges or connections;
3. Cessation of any violating discharges, practices, or operations;
4. The abatement or remediation of storm water pollution or contamination hazards and the restoration of any affected property;
5. Payment of any fee, penalty, or fine assessed against the university to cover remediation cost;
6. The implementation of new storm water management practices; and
7. Disciplinary action up to and including dismissal, where appropriate.

C. Such notification shall set forth the nature of the violation(s) and establish a time limit for correction of these violation(s). Said notice may further advise that, if applicable, should the violator fail to take the required action within the established deadline. EHS will then initiate work orders for the appropriate corrective actions and the violator or university department will be charged for the cost.

D. The remedies listed in this Policy are not exclusive of any other remedies available under any applicable federal, state, or local law.

VI. EFFECTIVE DATE, REVIEW, AND APPROVAL:

This policy will become effective upon the date of approval by the Senior Vice President and Provost. This Policy, and any related procedures, shall be reviewed annually.

Approved:

_____/S_____
Senior Vice President

____1/22/2013_____
Date

Approved:

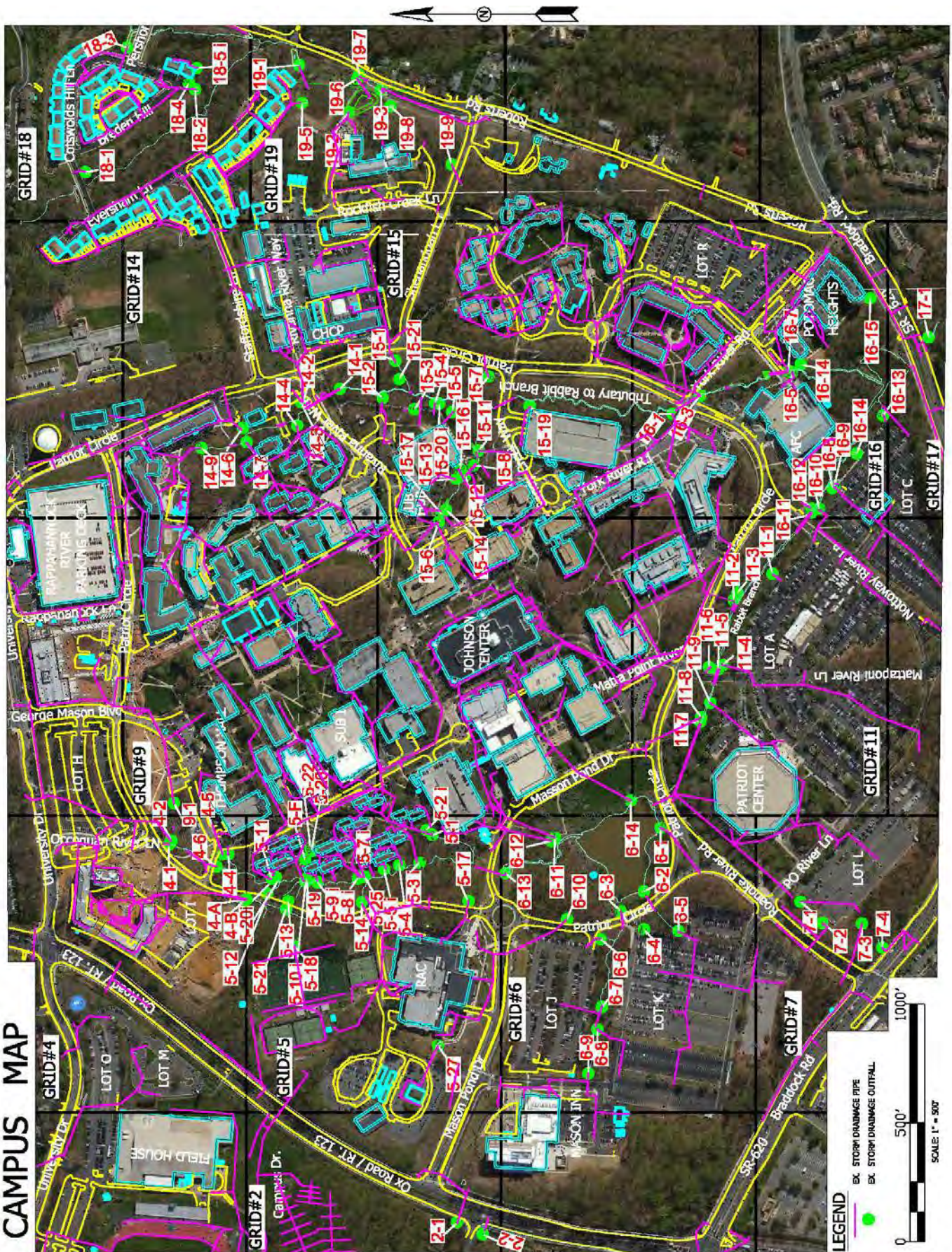
_____/S_____
Provost

____1/22/2013_____
Date

Appendix F:

MS4 Internal Outfalls

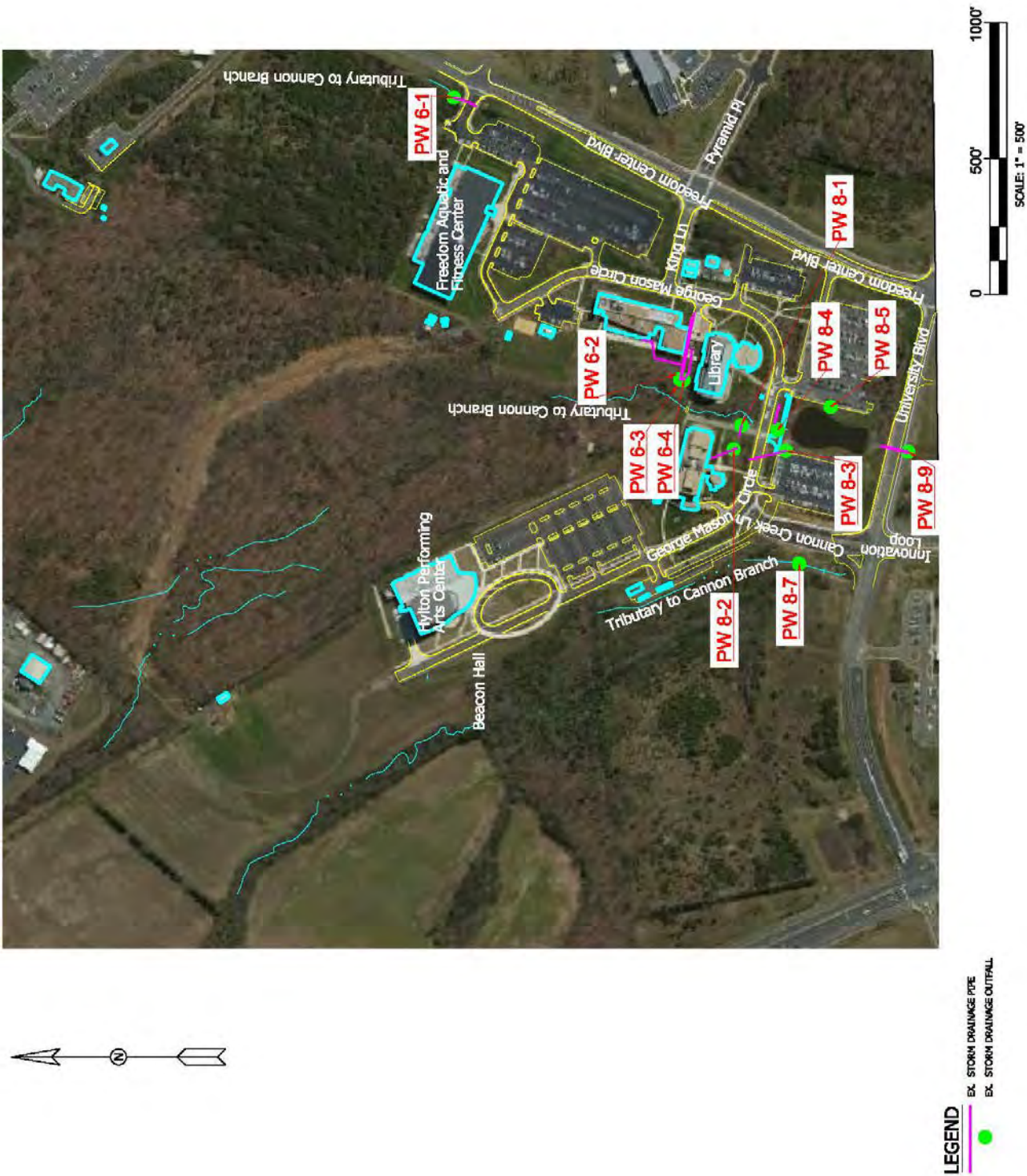
CAMPUS MAP



WEST CAMPUS MAP



PRINCE WILLIAM CAMPUS



Appendix G:

Notice of Potential Interconnected MS4



Facilities Project Management & Construction
4400 University Drive - MSN 1E4
Fairfax, VA 22030-4444

(703) 993-2542
Fax: (703) 993-2539
e-mail: fstrike@gmu.edu

June 19, 2018

City of Fairfax
City Hall Room 316
10455 Armstrong Street
Fairfax, VA 22030

Subject: MS4 Permit; Notice of Potential Interconnected Stormwater System

Attention: Robert Sisson, City Manager

George Mason University (Mason) is a Phase II small MS4 and is covered under the Virginia Stormwater Management Program (VSMP) General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (Permit Number VAR040106).

The purpose of this letter is to notify you of the potential for interconnections between the stormwater system operated by Mason and the stormwater systems that you operate. The MS4 permit requires Mason notify in writing, any downstream regulated MS4 to which Mason is physically interconnected. We have identified several points where Mason discharges stormwater into your regulated MS4 stormwater system. Please see attached Figure 1: Map of MS4 Interconnectivity. There is no action required on your part at this time, as this letter is for notification purposes only. Please keep this for your records.

If you have any questions or desire additional information related to this subject, please contact me or

Zhongyan Xu
Manager, Land Development
(703) 993-4051
Email: zxu8@gmu.edu

Sincerely,


Frank Strike
Vice President of Facilities
Phone: (703) 993-2542
Email: fstrike@GMU.EDU

Attachment(s):

(1) Figure 1: Map of MS4 Interconnectivity

Copy to:

- ☐ Brenda Claudio, Mason, Land Development
- ☐ Zhongyan Xu, Mason, Land Development



Facilities Project Management & Construction
4400 University Drive - MSN 1E4
Fairfax, VA 22030-4444

703-993-2542
Fax: 703-993-2539
e-mail: fstrike@gmu.edu

June 19, 2018

Fairfax County
DPWES Director's Office
12055 Government Center Pkwy
Fairfax, VA 22035

Subject: MS4 Permit; Notice of Potential Interconnected Stormwater System

Attention: James Patteson, Appointed Director of DPWES

George Mason University (Mason) is a Phase II small MS4 and is covered under the Virginia Stormwater Management Program (VSMP) General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (Permit Number VAR040106).

The purpose of this letter is to notify you of the potential for interconnections between the stormwater system operated by Mason and the stormwater systems that you operate. The MS4 permit requires Mason notify in writing, any downstream regulated MS4 to which Mason is physically interconnected. We have identified several points where Mason discharges stormwater into your regulated MS4 stormwater system. Please see attached Figure 1: Map of MS4 Interconnectivity. There is no action required on your part at this time, as this letter is for notification purposes only. Please keep this for your records.

If you have any questions or desire additional information related to this subject, please contact me or

Zhongyan Xu
Manager, Land Development
Phone: (703) 993-4051
Email: zxu8@gmu.edu

Sincerely,

A handwritten signature in black ink, appearing to read "Frank Strike".

Frank Strike
Vice President of Facilities
Phone: (703) 993-2542
Email: fstrike@gmu.edu

Attachment(s):

(1) Figure 1: Map of MS4 Interconnectivity

Copy to:

- ☐ Brenda Claudio, Mason, Land Development
- ☐ Zhongyan Xu, Mason, Land Development



Facilities Project Management & Construction
4400 University Drive - MSN 1E4
Fairfax, VA 22030-4444

703-993-2542
Fax: 703-993-2539
e-mail: fstrike@gmu.edu

June 19, 2018

Prince William County
Watershed Management Branch
5 County Complex Suite 170
Prince William, VA 22192

Subject: MS4 Permit; Notice of Potential Interconnected Stormwater System

Attention: Benjamin Eib, Assistant Branch Chief of Watershed Management

George Mason University (Mason) is a Phase II small MS4 and is covered under the Virginia Stormwater Management Program (VSMP) General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (Permit Number VAR040106).

The purpose of this letter is to notify you of the potential for interconnections between the stormwater system operated by Mason and the stormwater systems that you operate. The MS4 permit requires Mason notify in writing, any downstream regulated MS4 to which Mason is physically interconnected. We have identified several points where Mason discharges stormwater into your regulated MS4 stormwater system. Please see attached Figure 1: Map of MS4 Interconnectivity. There is no action required on your part at this time, as this letter is for notification purposes only. Please keep this for your records.

If you have any questions or desire additional information related to this subject, please contact me or

Zhongyan Xu
Manager, Land Development
Phone: (703) 993-4051
Email: zxu8@gmu.edu

Sincerely,

A handwritten signature in black ink, appearing to read "Frank Strike".

Frank Strike
Vice President of Facilities
Phone: (703) 993-2542
Email: fstrike@gmu.edu

Attachment(s):

(1) Figure 1: Map of MS4 Interconnectivity

Copy to:

- ☐ Brenda Claudio, Mason, Land Development
- ☐ Zhongyan Xu, Mason, Land Development



Facilities Project Management & Construction
4400 University Drive - MSN 1E4
Fairfax, VA 22030-4444

703-993-2542
Fax: 703-993-2539
e-mail: fstrike@gmu.edu

June 19, 2018

Department of Transportation
Location and Design Division
1401 East Broad Street
Richmond, VA 23219-2000

Subject: MS4 Permit; Notice of Potential Interconnected Stormwater System

Attention: Roy T. Mills, State Stormwater Program Administrator

George Mason University (Mason) is a Phase II small MS4 and is covered under the Virginia Stormwater Management Program (VSMP) General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (Permit Number VAR040106).

The purpose of this letter is to notify you of the potential for interconnections between the stormwater system operated by Mason and the stormwater systems that you operate. The MS4 permit requires Mason notify in writing, any downstream regulated MS4 to which Mason is physically interconnected. We have identified several points where Mason discharges stormwater into your regulated MS4 stormwater system. Please see attached Figure 1: Map of MS4 Interconnectivity- Fairfax Campus and Figure 2: Map of MS4 Interconnectivity- Prince William Campus. There is no action required on your part at this time, as this letter is for notification purposes only. Please keep this for your records.

If you have any questions or desire additional information related to this subject, please contact me or

Zhongyan Xu
Manager, Land Development
Phone: (703) 993-4051
Email: zxu8@gmu.edu

Sincerely,


Frank Strike
Vice President of Facilities
Phone: (703) 993-2542
Email: fstrike@gmu.edu

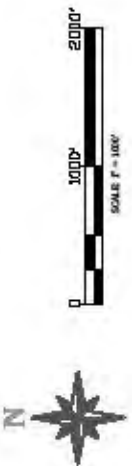
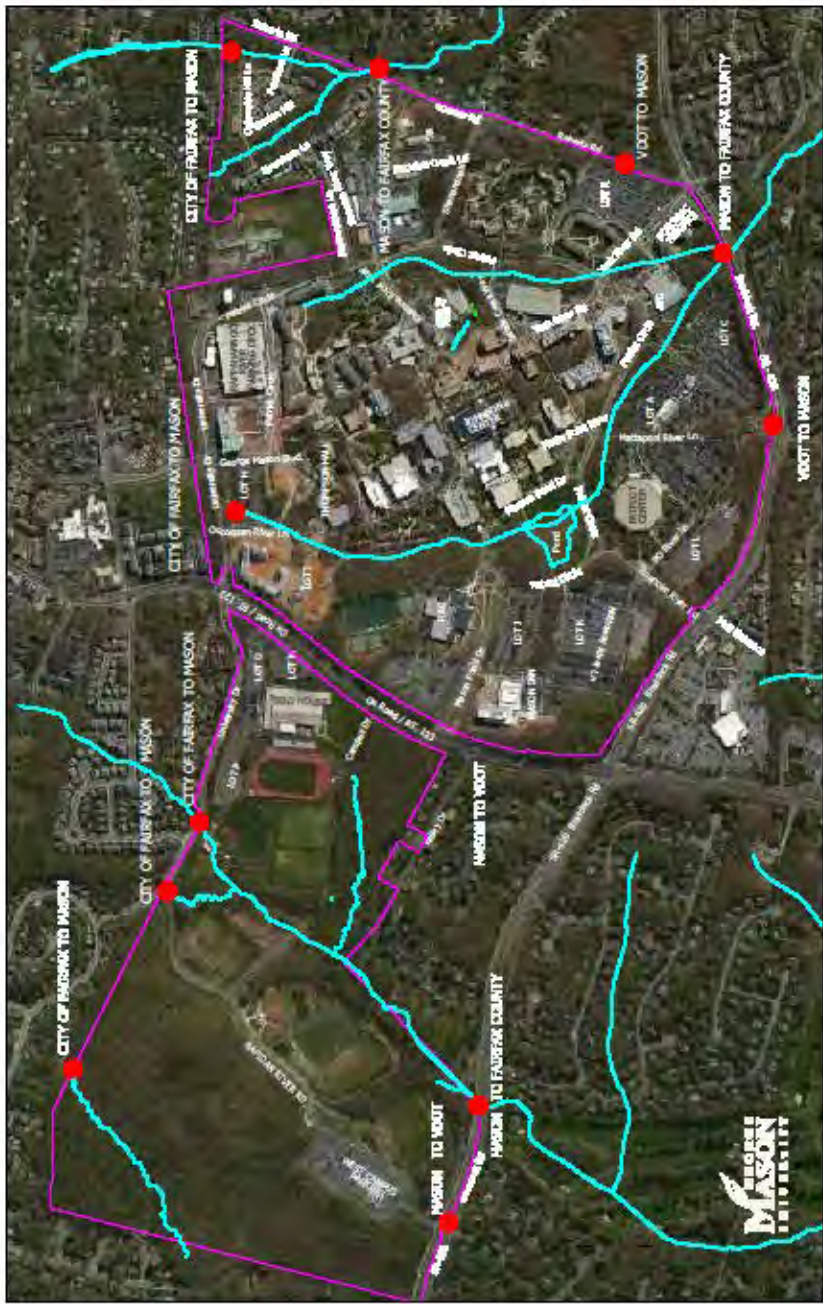
Attachment(s):

- (1) Figure 1: Map of MS4 Interconnectivity – Fairfax Campus
- (2) Figure 2: Map of MS4 Interconnectivity – Science and Technology Campus

Copy to:

- Chris Swanson, VDOT, State MS4/SWM Engineer
- John D. Olenik, VDOT, VSMP Construction Permit Coordinator
- Brenda Claudio, Mason, Land Development
- Zhongyan Xu, Mason, Land Development

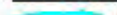




Map of MS4 Interconnectivity
George Mason University-Fairfax Campus

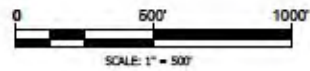


Map of MS4 Interconnectivity
George Mason University - Science and Technology Campus



LEGEND

-  STREAMS
-  MASON BOUNDARY
-  GEORGE MASON UNIVERSITY
-  PRINCE WILLIAM COUNTY
-  VIRGINIA DEPARTMENT OF TRANSPORTATION



Appendix H:

Current and Future Land Disturbance Projects

2017/2018 Construction Projects							
Project Name	Total Disturbed Area (ac)	Project Start	Project Finish	Location	On-Site Project Manager	Project Description	Number of Inspections
Academic VII	5.54	July - 15	Dec -18	Fairfax	Alexis Iszard (703) 462-4597	Academic Building	56
Stream Restoration	0.6	June-17	Sept-17	Fairfax	Christy Hogan (703)993-2559	Stream Restoration	18
AFC Improvement	0.5	May-17	Aug-17	Fairfax	Christy Hogan (703)993-2559	Connection to Sanitary System	15
JC Dining Improvement	0.2	May-17	Spet-17	Fairfax	Annmair Irwin (571) 455-3678	Outdoor Patio	30
Student Housing Demolition	3.4	June-18	Oct-18	Fairfax	Annmair Irwin (571) 455-3678	Building Demolition	9
Fairfax Water Transmission Line (Campus Dr.)	6.5K linear ft	Dec-17	Aug-18	Fairfax	Nancy Pickens (703) 993-2644	Waterline work	43
Fairfax Water Transmission Line (Roanoke)	900 linear ft	June-17	Oct-17	Fairfax	Nancy Pickens (703) 993-2644	Waterline work	11
Salt Shed	0.1	May-17	May-18	Fairfax	Caroline Sonner (703) 993-3910	Salt storage	41
Lot O, M, P Improvement	0.2	June-17	Sept -17	Fairfax	Chris Maier (703) 993-2957	Parking Lot paving	19

2018/2019 Proposed/Potential Future Construction Projects							
Project Name	Approx. Disturbed Area (ac)	Projected Start	Projected Finish	Location	Project Manager	Project Description	Stormwater Management Component
Hilton Performing Arts Addition	2.1	Aug -18	Aug-19	Science and Tech.	Mike Herman (703) 993-2242	Concert Hall	Rain garden
Robinson Hall	3.8	Sept-18	Jan-22	Fairfax	Cathy Pinskey (703) 993-2610	Building replacement	Detention system
Infrastructure Utility	6.9	Aug-18	Jan-22	Fairfax	Cathy Pinskey (703) 993-2610	Upgrade underground hot water/chill water line	Detention system
Fairfax Water Tower Replacement	0.3	Sept-18	Sept-20	Fairfax	Nancy Pickens (703) 993-2644	Water tower replacement	N/A

Appendix I:

Notice of Corrective Action

Left Blank Intentionally

Appendix J:

Permanent Stormwater Management Facilities

Inventory of Permanent Stormwater Management Facilities

Facility Name	Type	Location	HUC 12 Code	Virginia Code	Discharging Surface Waters	Drainage area (acres)	Facility size (acres)	BMP Efficiency (%)	TMDL	WQ Treatment Area (Acres)	Geographic Coordinates
Braddock Road Pond	Wet Pond	East Fairfax Campus	020700100401	PL29	Pohick Creek	315	~1.40 ac-ft	40	N/A	159.9	38.825243, -77.303450
Mason Pond	Wet Pond	East Fairfax Campus	020700100401	PL29	Pohick Creek	137	~9.79 ac-ft	50	N/A	163.02	38.828948, -77.310392
Rivanna Basin	Dry Pond	East Fairfax Campus	020700100401	PL29	Pohick Creek	28.12	28.12	N/A	N/A	Quantity Only	38.832147, -77.303623
Krasnow Pond	Dry Pond	East Fairfax Campus	020700100401	PL29	Pohick Creek	8.5	3.06	44	N/A	8.52	38.831439, -77.299742
Masonvale Pond	Dry Pond	East Fairfax Campus	020700100401	PL29	Pohick Creek	17.4	8.83	35	N/A	6.99	38.832049, -77.299455
West Campus Pond	Dry Pond	West Campus	020700100705	PL46	Lower Bull Run	46.98		40	N/A		38.831387, -77.324588
PW Pond	Wet Pond	Science and Tech Campus	020700100504	PL34	Broad Run-Rocky Branch	70.53		50	N/A		38.755797, -77.522198
Roanoke SWM pond	Dry Pond	East Fairfax Campus	020700100401	PL29	Pohick Creek	4.98	0.37	40	N/A	0.92	38.826520, -77.311293
MHI Rain Garden #1	Rain Garden	East Fairfax Campus	020700100401	PL29	Pohick Creek	0.12	0.002	50	N/A	0.09	38.834585, -77.299988
MHI Rain Garden #2	Rain Garden	East Fairfax Campus	020700100401	PL29	Pohick Creek	0.08	0.002	50	N/A	0.06	38.833592, -77.299156
MHI Rain Garden #3	Rain Garden	East Fairfax Campus	020700100401	PL29	Pohick Creek	0.2	0.002	50	N/A	0.16	38.834441, -77.298927
Piedmont Rain Garden #1	Rain Garden	East Fairfax Campus	020700100401	PL29	Pohick Creek	0.04	0.01	50	N/A	0.02	38.832089, -77.306059
Piedmont Rain Garden #2	Rain Garden	East Fairfax Campus	020700100401	PL29	Pohick Creek	0.045	0.006	50	N/A	0.04	38.832404, -77.306244
Permeable Pavers	Permeable Surface	East Fairfax Campus	020700100401	PL29	Pohick Creek	4.6	.09	40	N/A	4.6	38.833084, -77.301103
Eastern Shore bike rack	Pervious Surface	East Fairfax Campus	020700100401	PL29	Pohick Creek	0.01	0.01	45	N/A	0	38.833318, -77.304331
Hampton Roads bike rack	Pervious Surface	East Fairfax Campus	020700100401	PL29	Pohick Creek	0.01	0.01	45	N/A	0	38.834022, -77.305071
Piedmont infiltration trench	Infiltration Trench	East Fairfax Campus	020700100401	PL29	Pohick Creek	0.05	0.006	50	N/A	0.03	38.832406, -77.306177
Bio-Swale #1	Bio-Swale	East Fairfax Campus	020700100401	PL29	Pohick Creek	0.6	0.04	35	N/A	0.15	38.827410, -77.306680

Bio-Swale #2	Bio-Swale	Science and Tech Campus	020700100504	PL34	Broad Run-Rocky Branch	1.52	0.13	40	N/A	0	38.758298, -77.523085
Potomac Heights infiltration trench	Infiltration Trench	East Fairfax Campus	020700100401	PL29	Pohick Creek	0.10	0.008	50	N/A	0.02	38.826544, -77.302922
Research Hall Green Roof	Green Roof	East Fairfax Campus	020700100401	PL29	Pohick Creek	0.019	0.019	50	N/A	0	38.828800, -77.305494
PV Lot Jellyfish Filter	Jellyfish Filter	East Fairfax Campus	020700100401	PL29	Pohick Creek	0.57	0.003	50	N/A	0.57	38.830892, -77.313918
Transit Center CDS	Continuous Deflective Separator (CDS)	East Fairfax Campus	020700100401	PL29	Pohick Creek	1.65	0.003	20	N/A	1.65	38.827989, -77.304552
JC Patio Rain Garden	Rain Garden	East Fairfax Campus	020700100401	PL29	Pohick Creek	0.10	0.01	40	N/A	0.10	38.82999, -77.307938
Lot P Filterra	Filterra	West Campus	020700100705	PL46	Lower Bull Run	0.001	N/A	50	N/A	0.04	38.835046, -77.316677

Appendix K:

Nutrient Management Plan

Matthew J. Strickler
Secretary of Natural Resources

Clyde E. Cristman
Director



COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

Rochelle Altholz
Deputy Director of
Administration and Finance

Russell W. Baxter
Deputy Director of
Dam Safety & Floodplain
Management and Soil & Water
Conservation

Thomas L. Smith
Deputy Director of Operations

Zhongyan Xu
4400 University Blvd.
Fairfax, VA 22030

9/21/2018

Subject: GMU Fairfax Campus and Point of View

The following nutrient management plan has been reviewed by Nick Yakish and approved by the Virginia Department of Conservation & Recreation as compliant with the provisions of the Code of Virginia 10.1-104.4. Please note that this plan has not been reviewed for compliance with more restrictive requirements from other specific legislative, regulatory or incentive programs.

Plan Name	Planner	Acres	Start Date	Expiration Date
GMU Fairfax and POV	Marjorie Siwy	210.7	8/14/2018	8/14/2021

A copy of this letter should be kept with your nutrient management plan. Initiation of plan revision is recommended by the Department to occur at least six months prior to the expiration date. If you have any questions concerning this letter or approvals, please contact me via phone or email.

Sincerely,

A handwritten signature in blue ink, appearing to read "Nick Yakish".

Nick Yakish
Urban Nutrient Management Coordinator
Department of Conservation and Recreation
600 East Main St., 24th Floor
Richmond, Virginia 23219
(804) 389-5439
nicholas.yakish@dcr.virginia.gov

600 East Main Street, 24th Floor | Richmond, Virginia 23219 | 804-786-6124

*State Parks • Soil and Water Conservation • Outdoor Recreation Planning
Natural Heritage • Dam Safety and Floodplain Management • Land Conservation*



1001 Boulders Parkway
Suite 300
Richmond, VA 23225

P 804.200.6500
F 804.560.1016
www.timmons.com

September 17, 2018

Mr. Nick Yakish
Urban Nutrient Management Specialist
Virginia Department of Conservation and Recreation
600 East Main Street, 24th Floor
Richmond, Virginia 23219

**Re: Nutrient Management Plan
George Mason University –
Fairfax Campus
Fairfax, Virginia**

Dear Mr. Yakish:

On behalf of George Mason University, Timmons Group has prepared this Nutrient Management Plan in accordance with the *Virginia Nutrient Management Standards and Criteria, revised July 2014*. This Nutrient Management Plan encompasses the approximately 200 acre area that contains turfgrass and could receive fertilizer applications at the George Mason University Fairfax Campus and Point of View site. Please find the enclosed plan for your review and approval.

Please feel free to contact me at (804) 200-6370, marjorie.siwy@timmons.com, or Bill Vest at (703) 554-6705, bill.vest@timmons.com, if you require additional information, or have any questions or additional recommendations.

Sincerely,

Timmons Group

Marjorie Siwy, WPIT
Certified Nutrient Management Planner (No. 844)

Enclosures:
George Mason University – Fairfax Campus Nutrient Management Plan

GEORGE MASON UNIVERSITY – FAIRFAX CAMPUS AND POINT OF VIEW (POV) SITE NUTRIENT MANAGEMENT PLAN

DIRECTOR OF FACILITIES

GEORGE MASON UNIVERSITY – FAIRFAX CAMPUS
ZHONGYAN XU, PhD, PE, CFM
PROJECT MANAGEMENT AND CONSTRUCTION, FACILITIES
703-993-4051, ZXU8@GMU.EDU

NUTRIENT MANAGEMENT PLANNER INFORMATION

MARJORIE SIWY
1001 BOULDERS PARKWAY, SUITE 300
RICHMOND, VA 23225
804-200-6370, MARJORIE.SIWY@TIMMONS.COM
VIRGINIA NUTRIENT MANAGEMENT PLANNER CERTIFICATION # 844

LOCATION INFORMATION – FAIRFAX CAMPUS

4400 UNIVERSITY BOULEVARD
FAIRFAX, VA 22030
38.653944 N, -77.194888 W
FAIRFAX COUNTY, VIRGINIA
VAHU6: LOWER BULL RUN - PL46 (APPROX. 45 ACRES) AND POHICK CREEK - PL29 (APPROX. 158 ACRES)

LOCATION INFORMATION – POINT OF VIEW SITE

7301 OLD SPRING DRIVE
LORTON, VA 22079
38° 39' 14.2" N, 77° 11' 41.6" W
FAIRFAX COUNTY, VIRGINIA
VAHU6: OCCOQUAN RIVER – BELMONT BAY - PL48

FAIRFAX CAMPUS TURF ACREAGE

TOTAL: 203.4 ACRES
MANAGEMENT AREA 1: 17.9 MANAGEMENT AREA 4: 32.0
MANAGEMENT AREA 2: 6.16 MANAGEMENT AREA 5: 24.2
MANAGEMENT AREA 3: 112.2 MANAGEMENT AREA 6: 10.9

POINT OF VIEW SITE TURF ACREAGE

TOTAL: 7.3 ACRES
MANAGEMENT AREA 3: 1.83 MANAGEMENT AREA 5: 5.46

PLAN START DATE: 8/14/2018

PLAN END DATE: 8/14/2021



MARJORIE SIWY



TIMMONS GROUP PROJECT No. 36158.012

GEORGE MASON UNIVERSITY – FAIRFAX CAMPUS AND POV SITE NUTRIENT MANAGEMENT PLAN

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Figure 2	Environmental Inventory Map
Figure 3	Environmentally Sensitive Areas Map
Figure 4	Nutrient Management Areas Map
Figure 5	George Mason University-Fairfax Campus Map

APPENDICES

Appendix A	Soil Test Summaries
Appendix B	Nutrient Application Worksheets
Appendix C	Fertilizer Application Records
Appendix D	Reference Materials

1.0 STATEMENT OF COMPLIANCE

The George Mason University (Mason) agrees to comply with all requirements set forth in the *Nutrient Management Training and Certification Regulations 4VAC50-85*, and to follow recommendations for turf fertilization and management as described in the *Virginia Nutrient Management Standards and Criteria, revised July 2014*. This includes implementing this Nutrient Management Plan and maintaining fertilization records. All nutrient applications performed by Mason staff or associated contractors shall comply with the provisions of this Nutrient Management Plan as of August 14, 2018. This plan is effective for three years (until August 14, 2021) or until major changes to maintenance practices or grounds conditions occur. Mason is committed to environmental sustainability and adhering to this Nutrient Management Plan in order to protect the water quality of downstream aquatic resources while optimizing the health and performance of turf species.

2.0 SITE LOCATION AND DESCRIPTION

The Mason Fairfax Campus (Campus) is located northeast of Braddock Road (Route 620) Virginia (see Figure 1A: Vicinity Map). The Campus encompasses approximately 456.0 acres and drains south to Rabbits Branch and ultimately flows into Pohick Bay. Also included in this nutrient management plan is a small property owned by Mason named the Point of View (POV) site. The POV site is located in southeastern Fairfax County on Belmont Bay and encompasses approximately 38.2 acres (see Figure 1B: Vicinity Map). The Campus and POV site are both located within the Middle Potomac-Anacostia-Occoquan Watershed (HUC 02070010).

The Campus consists of approximately 100 academic and residential buildings, paved parking lots, maintained lawns that surround the Campus buildings and parking lots, common turf areas surrounding the athletic fields, and turf areas along West Campus Drive. All turfgrass areas on the Campus are dominated by tall fescue. Several areas of ornamental plantings and flowerbeds are intermittently dispersed throughout the Campus. The turf areas at the POV site included in this nutrient management plan consist of maintained open lawn adjacent to mature hardwood forests with an understory dominated by fescue turfgrasses.

2.1 Environmentally Sensitive Areas

All areas within the project limits were evaluated based on susceptibility of nutrient loss to ground and surface water. No areas within the Campus or POV project limits are categorized as environmentally sensitive areas as depicted in Figure 3: Environmentally Sensitive Areas Map.

Subsurface Drains: There are no subsurface tile drains located at the Campus or POV sites. There are underground stormwater conveyance systems present throughout the Campus that convey water to stormwater treatment BMPs. Given that this stormwater is being treated by the existing stormwater management BMPs, this underground stormwater conveyance system does not qualify as a subsurface tile drain. The POV site does not currently have an underground stormwater conveyance system.

Soils: The NRCS soil survey map depicts 12 distinct soil series within the Campus and POV site, the majority of which are well drained loamy soils. None of the soil series are listed as H (high) for Environmentally Sensitive Rating in Table 1-4 of the *Virginia Nutrient Management Standards and Criteria*, revised July 2014.

Streams and Wetlands: There are several perennial and intermittent streams, and wetlands located adjacent to turfgrass areas at the Campus. These streams and wetlands are depicted on Figure 3A: Environmentally Sensitive Areas Map. The POV site is located directly adjacent to Belmont Bay. The streams and wetlands within and adjacent to the POV site are depicted on Figure 3B: Environmentally Sensitive Areas Map. There are no restrictions applicable when applying fertilizers to turfgrass adjacent to streams and wetlands. However, special care should be taken to avoid applying fertilizers within streams and wetlands.

Other Environmentally Sensitive Areas: There were no wells, springs, sinkholes, rock outcrops, or land with slopes steeper than 15% identified during the June 19, 2018 site visit.

2.2 Fertilization Season

The recommended season of application for nitrogen fertilizers for all turf species at both the Fairfax Campus and POV Sites begins on February 27 and ends on December 6, as shown below in Table 2.1 – Fertilization Season at Mason – Fairfax Campus and POV Site.

Table 2.1 – Fertilization Season at Mason-Fairfax Campus and POV Site

	Killing Frost Dates	Cool Season Application Window (All Turf Areas Onsite)
Spring	April 10	February 27
Fall	October 25	December 6

3.0 SOIL SAMPLING METHODS, MANAGEMENT AREAS, AND NUTRIENT RECOMMENDATIONS

3.1 Soil Sampling Methods and Management Areas

A total of 21 soil samples were taken from turfgrass areas throughout the Campus and POV site. At least 10 sub-samples for each sample area were randomly taken from within the upper four inches of soil and mixed at each designated sampling area to create a representative sample. The soil samples were collected in June 2018 and analyzed at the Virginia Tech soils laboratory.

These 21 sample areas were categorized into six different nutrient management areas based on the soil test results and turfgrass species present. These nutrient management areas are shown in Figure 4A and Figure 4B: Nutrient Management Areas Map. Figures 4A and 4B should be used as a reference when interpreting nutrient recommendations in Table 3.1 on page 4 of this document.

For all the nutrient management areas, applications of nutrients should not occur on frozen or snow-covered ground. Any fertilizers that make their way onto impervious surfaces such as parking lots or sidewalks should be swept or blown back into pervious, or turfgrass covered areas. Furthermore, fertilizers will not be used as ice melt.

3.2 Fairfax Campus and POV Turfgrass Areas – 210.65 Acres

The lime and nutrient recommendations for the Fairfax Campus and POV Site are listed in Table 3.1: Fairfax Campus and POV Site Lime and Nutrient Recommendations on page 4. The lime and nutrient recommendations in this table are based on the *Virginia Nutrient Management Standards and Criteria, revised July 2014*. Figure 5: Mason – Fairfax Campus Map should be used as a reference when interpreting Table 3.1. Several of the turf area locations are referenced by the Campus building numbers as identified in Figure 5. The specified lime applications should be completed in small applications of up to 50 pounds each at intervals of 1 to 6 months until the full amount is applied in the form of ground, pulverized, or pelletized agricultural limestone.

The annual maximum nitrogen application for all turfgrass areas onsite is 3.5 lbs. per 1,000 square feet (SF). Per application rates of nitrogen vary depending on whether water soluble nitrogen (WSN) or slowly available nitrogen (SAN) fertilizers are used. WSN fertilizers should be applied at a rate no greater than 0.7 lbs. per 1,000 SF at intervals no less than 30 days apart, between the dates of February 27 and December 6. SAN fertilizer sources can be applied at a rate no greater than 0.9 lbs. per 1,000 SF at intervals no less than 30 days apart, between the dates of February 27 and December 6.

The recommended potassium application rates in some areas are greater than the amount specified in the soil lab analyses results. At this time, potassium is not considered to be an environmental concern that negatively impacts water quality, so slight over application of potassium only contributes to health and vigor of turfgrasses.

Table 3.1: Fairfax Campus and POV Site Lime and Nutrient Recommendations

MAN. AREA #	SOIL SAMPLE AREA	SOIL pH	LIME REC. (LBS/1000 SF)	**VA Nutrient Management Standards and Criteria PHOSPHORUS (P ₂ O ₅) REC. (LBS/1,000 SF)	** VA Nutrient Management Standards and Criteria POTASSIUM (K ₂ O) REC. (LBS/1,000 SF)	FINAL PHOSPHORUS (P ₂ O ₅) REC. (LBS/1,000 SF)	FINAL POTASSIUM (K ₂ O) REC. (LBS/1,000 SF)
1	CP-13 (45, Lots A, & Lot L)	7.5	0	0	1.5	0	1.5
2	CP-2 (8, 35, & 41)	6.4	0	1.5	2	1.5	2
3	CP-1 (96, Lot K)	5.9	100	2.5	1.5	2	1
	CP-4 (97, 99, Lot H)	6.3	0	2.5	1.5	2	1
	CP-8 (Lot C)	5.8	60	2	1	2	1
	CP-10 (2, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, Lot R)	7.3	0	2	1	2	1
	CP-12 (10)	6.8	0	2	1	2	1
	CP-14 (Tallwood Center)	5.6	140	2.5	1.5	2	1
	AF-3 (Turf Areas Along West Campus Dr.)	6.7	0	2	1	2	1
	AF-10 (Turf Areas Adjacent to Fields 2, 4, 5, and Softball Field)	5.9	70	2	1.5	2	1
	AF-11 (Turf Areas Surrounding Soccer Field A & B, and Spuhler field)	5.4	100	3	1.5	2	1
	AF-12 (Turf Areas Surrounding Field House)	6.2	30	2	1	2	1
	AF-13 (Turf Area Adjacent to Braddock Road)	6.2	50	2	1	2	1
	POV-1	5.6	100	2	1	2	1
4	CP-9 (3, 4, 7, 14, 17, 29, 30, 46, 50)	6.6	0	2	2	2	2
	CP-11 (19, 20, 21)	6.5	0	2	2.5	2	2
5	CP-3 (48 & Lot J)	6.3	0	1.5	1.5	1	1
	CP-5 (1 & 24)	8.0	0	1	0.75	1*	1
	CP-6 (51, 56, 61 through 79)	6.5	0	1.5	1.5	1	1
	POV-2	5.7	170	1	0.75	1*	1
6	CP-7 (3, 16, 22, 24, 27, 33, 34, 41, 52, 53, 54, 57, 59, 98)	6.9	0	2	0	2	0

Notes: **These nutrient needs are the exact needs of the soil at each particular soil sampling area. These values were averaged and grouped into the final nutrient recommendations seen in the last two columns based on soil nutrient need similarities to create a more easily implemented plan.

*Due to high phosphorus levels, fertilizers in the form of 10-10-10 or 5-10-10 should not be used.

- See attached Figure 5: Mason Fairfax Campus Map for references to buildings and building numbers.
- Agricultural limestone (ground, pulverized, or pelletized) should be broadcast in small applications of up to 50 lbs. per 1000 SF, at intervals of 1 to 6 months, until the full amount is applied.
- Nitrogen applications may not exceed 3.5 lbs per 1,000 square feet (SF) annually. No more than
- No more than 0.7 lbs. of WSN or 0.9 lbs. of SAN per 1,000 SF may be applied within a 30 day period.

4.0 MAINTENANCE OF PLAN

This nutrient management plan will be maintained by Mason and will expire on August 14, 2021. As part of this plan, fertilizer application records shall be recorded and maintained (see Appendix C: Fertilizer Application Records). Please note that soil samples need to be collected at least once every three years in order to maintain this plan. If significant changes to the Campus or POV sites occur, this plan is required to be updated accordingly by a Virginia Certified Nutrient Management Planner. Significant changes would include: changing turf species in the campus grounds, adding significant soil amendments, expansion of the area to be included under this nutrient management plan, or other changes that could alter nutrient recommendations and timing.

5.0 NUTRIENT APPLICATION, INCORP., AND SPECIAL CONDITIONS

There are multiple drop inlets associated with the underground stormwater system at the Campus. This drainage system ultimately outfalls to several stormwater BMPs that are designed to remove sediment and nutrients from stormwater. Special care should be taken to avoid applying fertilizers directly on top of drop inlet structures. No fertilizer should be applied to stormwater BMPs as these facilities already receive excess nutrients during stormwater events. Nutrient applications should not be completed when significant runoff producing events are anticipated. Applying only WIN, or slowly available forms of nitrogen, will help minimize the nutrient loss potential.

Special care should be taken when applying fertilizers near impervious surfaces, streams, and wetlands. Allowing vegetation to grow taller near stream and wetland areas would help prevent offsite nutrient loss that could result from fertilizer application errors, or significant runoff producing storm events.

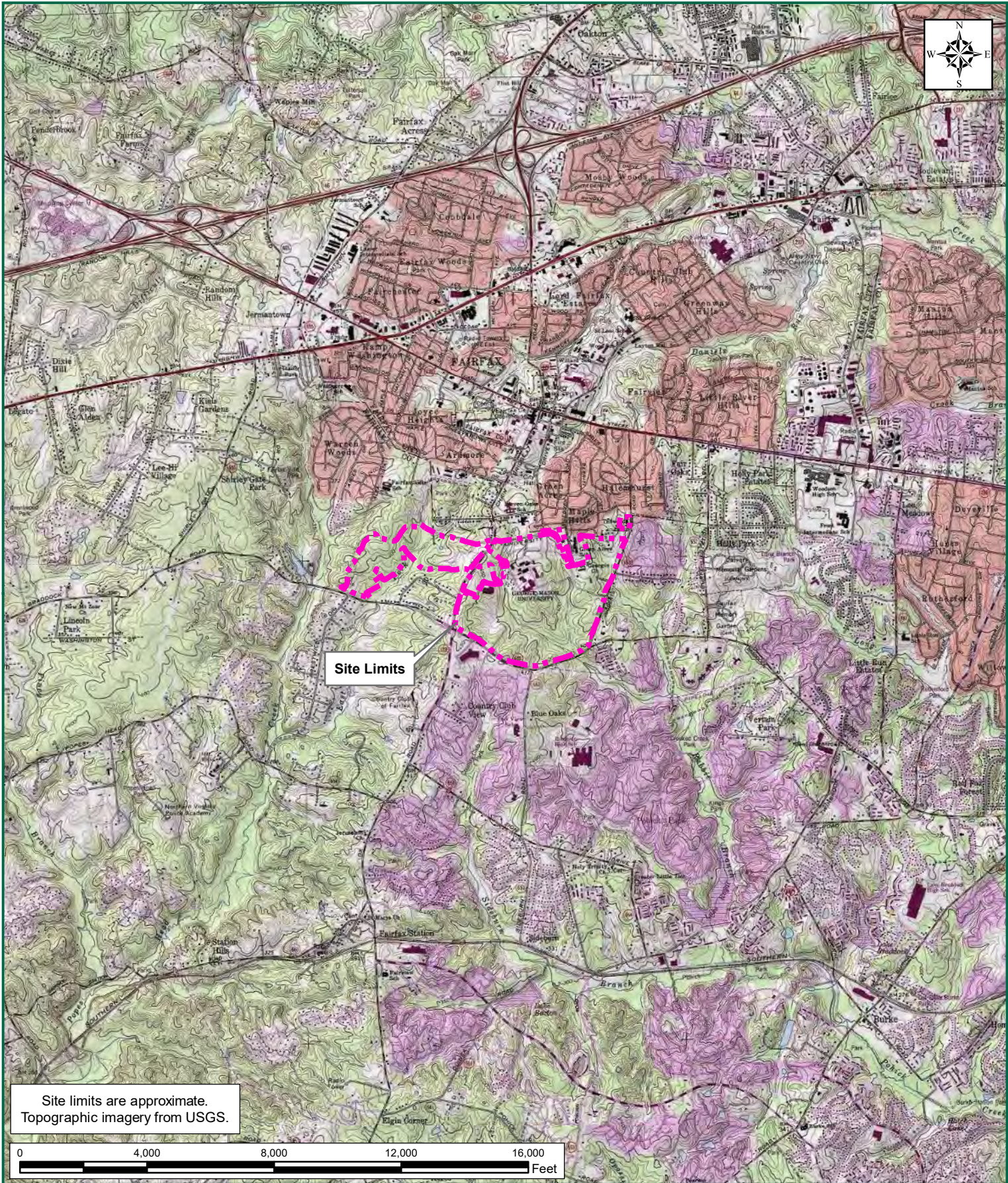
6.0 REFERENCES

VADCR. March 2014. Nutrient Management Training and Certification Regulations 4VAC50-85. Virginia Soil and Water Conservation Board.

VADCR. July 2014. Virginia Nutrient Management Standards and Criteria. Division of Soil and Water Conservation: Richmond, VA.

Virginia Cooperative Extension. May 2011. Urban Nutrient Management Handbook. Funding by: VADCR; Produced by: Virginia Polytechnic Institute and State University.

FIGURES



MASON - FAIRFAX CAMPUS NUTRIENT MANAGEMENT PLAN
FAIRFAX COUNTY, VIRGINIA
FIGURE 1A: VICINITY MAP

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YOUR VISION ACHIEVED THROUGH OURS.

TIMMONS GROUP JOB NUMBER: 36158.012
PROJECT STUDY LIMITS: 456.0 ACRES
LATITUDE: 38.828633
LONGITUDE: -77.312291

U.S.G.S. QUADRANGLE(S): FAIRFAX
DATE(S): 2016
WATERSHED(S): MIDDLE POTOMAC-ANCOSTIA-OCOQUAN (POTOMAC RIVER BASIN)
HYDROLOGIC UNIT CODE(S): 02070010

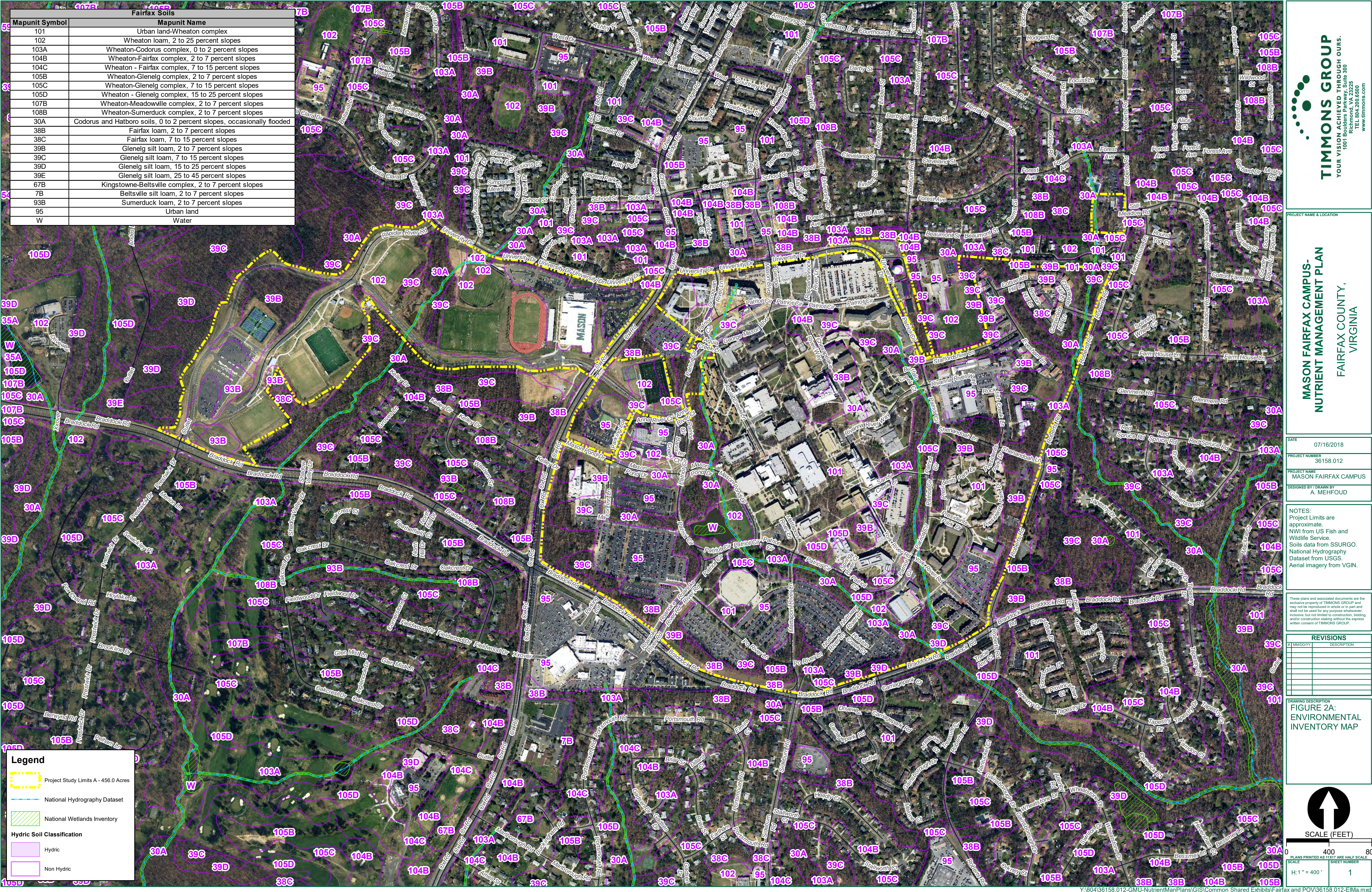


MASON - POINT OF VIEW SITE NUTRIENT MANAGEMENT PLAN
FAIRFAX COUNTY, VIRGINIA
FIGURE 1B: VICINITY MAP

TIMMONS GROUP JOB NUMBER: 36158.012
PROJECT STUDY LIMITS: 38.2 ACRES
LATITUDE: 38.655278
LONGITUDE: -77.194808

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U.S.G.S. QUADRANGLE(S): FAIRFAX
DATE(S): 2016
WATERSHED(S): MIDDLE POTOMAC-ANCOSTIA-OCOQUAN (POTOMAC RIVER BASIN)
HYDROLOGIC UNIT CODE(S): 02070010



Fairfax Soils	
Mapunit Symbol	Mapunit Name
101	Urban land-Wheaton complex
102	Wheaton loam, 2 to 25 percent slopes
103A	Wheaton-Codorus complex, 0 to 2 percent slopes
104B	Wheaton-Fairfax complex, 2 to 7 percent slopes
104C	Wheaton - Fairfax complex, 7 to 15 percent slopes
105B	Wheaton-Glenelg complex, 2 to 7 percent slopes
105C	Wheaton-Glenelg complex, 7 to 15 percent slopes
105D	Wheaton - Glenelg complex, 15 to 25 percent slopes
107B	Wheaton-Meadowville complex, 2 to 7 percent slopes
108B	Wheaton-Sumerduck complex, 2 to 7 percent slopes
30A	Codorus and Hatboro soils, 0 to 2 percent slopes, occasionally flooded
38B	Fairfax loam, 2 to 7 percent slopes
38C	Fairfax loam, 7 to 15 percent slopes
39B	Glenelg silt loam, 2 to 7 percent slopes
39C	Glenelg silt loam, 7 to 15 percent slopes
39D	Glenelg silt loam, 15 to 25 percent slopes
39E	Glenelg silt loam, 25 to 45 percent slopes
67B	Kingstowne-Beltsville complex, 2 to 7 percent slopes
7B	Beltsville silt loam, 2 to 7 percent slopes
93B	Sumerduck loam, 2 to 7 percent slopes
95	Urban land
W	Water

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PROJECT NAME & LOCATION

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NUTRIENT MANAGEMENT PLAN**
FAIRFAX COUNTY,
VIRGINIA

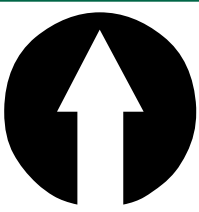

DATE	07/16/2018
PROJECT NUMBER	36158.012
PROJECT NAME	MASON FAIRFAX CAMPUS
DESIGNED BY / DRAWN BY	A. MEHFOUD

NOTES:
Project Limits are approximate.
NWI from US Fish and Wildlife Service.
Soils data from SSURGO.
National Hydrography Dataset from USGS.
Aerial imagery from VGIN.

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REVISIONS	
#	DESCRIPTION

DRAWING DESCRIPTION
**FIGURE 2A:
ENVIRONMENTAL
INVENTORY MAP**


SCALE (FEET)

0 400 800
PLANS PRINTED AS 11X17 ARE HALF SCALE
SCALE SHEET NUMBER
H:1" = 400' 1



Legend

Project Study Limits A - 456.0 Acres

Athletic Fields (not included in Fairfax Campus project limits)

Environmentally Sensitive Areas - Not Present

Wetlands

Streams

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NUTRIENT MANAGEMENT PLANS
FAIRFAX COUNTY,
VIRGINIA

DATE

07/16/2018

PROJECT NUMBER

36158.012

PROJECT NAME

MASON FAIRFAX CAMPUS

DESIGNED BY / DRAWN BY

A. MEHFOUD

NOTES:
Project Limits are approximate.
NWI from US Fish and Wildlife Service.
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REVISIONS	
#	DESCRIPTION

DRAWING DESCRIPTION

FIGURE 3A:
ENVIRONMENTALLY
SENSITIVE AREAS
MAP

SCALE (FEET)

0360720

PLANS PRINTED AS 11X17 ARE HALF SCALE

SCALE

H:1" = 350'

1



Legend

Project Study Limits B - 38.2 Acres

Environmentally Sensitive Areas - Not Present

Streams

Wetlands

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PROJECT NAME & LOCATION

MASON POINT OF VIEW SITE -
NUTRIENT MANAGEMENT PLANS

FAIRFAX COUNTY,
VIRGINIA

DATE	07/16/2018
PROJECT NUMBER	36158.012
PROJECT NAME	MASON POINT OF VIEW SITE
DESIGNED BY / DRAWN BY	A. MEHFOUD

NOTES:
Project Limits are approximate.
NWI from US Fish and Wildlife Service.
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#	MMDDYY	DESCRIPTION

DRAWING DESCRIPTION
FIGURE 3B:
ENVIRONMENTALLY
SENSITIVE AREAS
MAP

SCALE (FEET)

0150300

PLANS PRINTED AS 11X17 ARE HALF SCALE

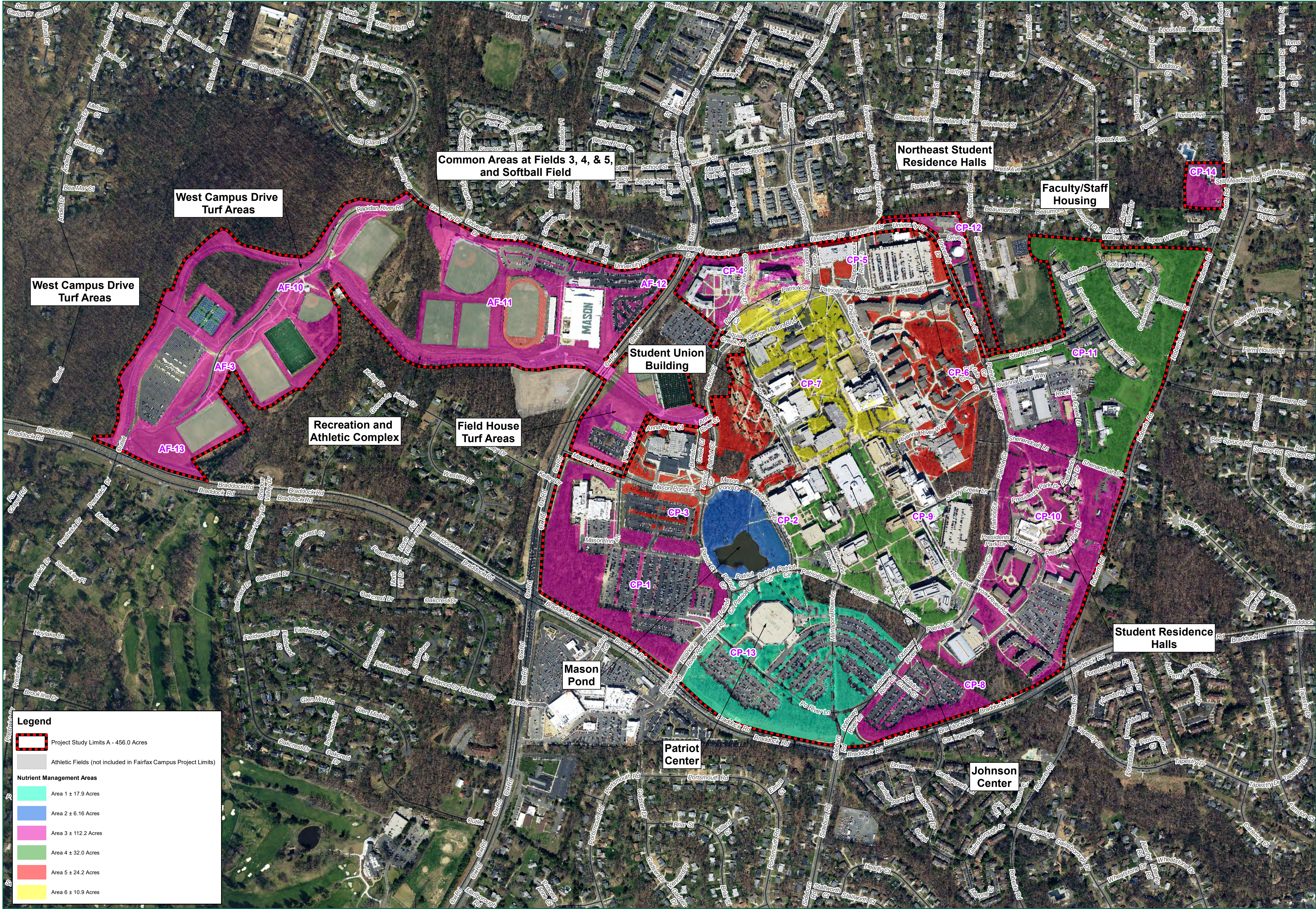
SCALE

SHEET NUMBER

H:1" = 150'

1

Y:\804\36158.012-GMU-NutrientManPlans\GIS\Common Shared Exhibits\Fairfax and POV\36158.012-ESAb.mxd





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FAIRFAX COUNTY,
VIRGINIA

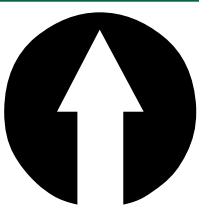
DATE	07/13/2018
PROJECT NUMBER	36158.012
PROJECT NAME	MASON FAIRFAX CAMPUS
DESIGNED BY / DRAWN BY	A. MEHFOUD

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REVISIONS	
#	DESCRIPTION

DRAWING DESCRIPTION
**FIGURE 4A:
NUTRIENT
MANAGEMENT
AREAS MAP**



SCALE (FEET)

0 360 720

PLANS PRINTED AS 11X17 ARE HALF SCALE

SCALE	SHEET NUMBER
H:1" = 350'	1



Legend

Project Study Limits B - 38.2 Acres

Nutrient Management Areas

Area 3 ± 1.83 Acres

Area 5 ± 5.46 Acres

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PROJECT NAME & LOCATION

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NUTRIENT MANAGEMENT PLANS

FAIRFAX COUNTY,
VIRGINIA

DATE	07/13/2018
PROJECT NUMBER	36158.012
PROJECT NAME	MASON POINT OF VIEW SITE
DESIGNED BY / DRAWN BY	A. MEHFOUD

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#	MMDDYY	DESCRIPTION

DRAWING DESCRIPTION
**FIGURE 4B:
NUTRIENT
MANAGEMENT
AREAS MAP**

SCALE (FEET)

0150300

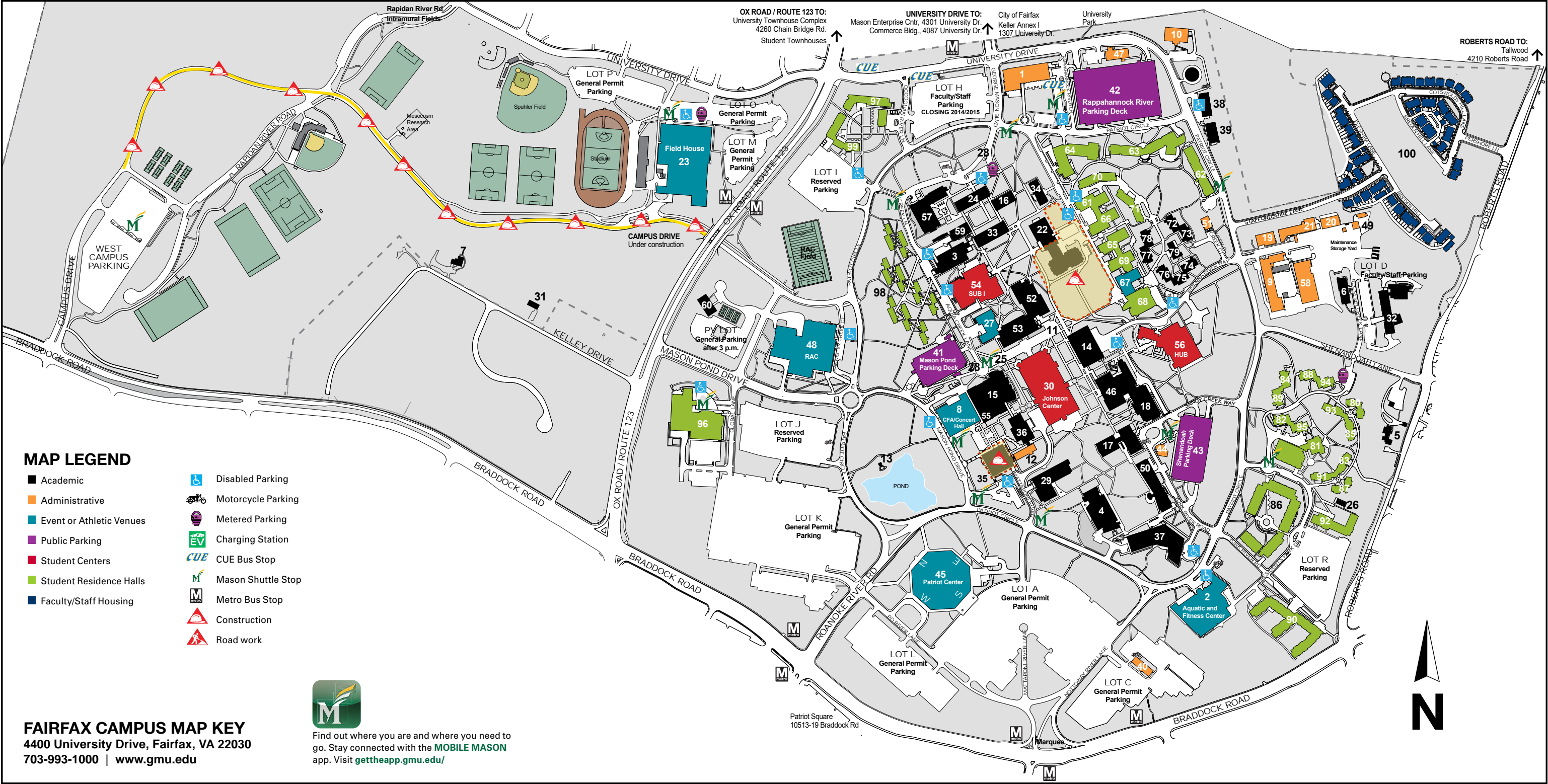
PLANS PRINTED AS 11X17 ARE HALF SCALE

SCALE

SHEET NUMBER

H:1" = 150'

1



- 1 Alan and Sally Merten Hall (formerly University Hall)
- 2 Aquatic and Fitness Center
- 3 Aquia Building
- 4 Art and Design Building
- 5 Buchanan House
- 6 Carow Hall
- 7 Carty House
- 8 Center for the Arts/Concert Hall
- 9 Central Heating and Cooling Plant
- 10 Child Development Center
- 11 Clock
- 12 College Hall
- 13 Cross Cottage
- 14 David King Hall

- 15 de Laski Performing Arts Building
- 16 East Building
- 17 Enterprise Hall
- 18 Exploratory Hall
- 19 Facilities Administration
- 20 Facilities Management, Archives
- 21 Facilities Management, Customer Service Center
- 22 Fenwick Library
- 23 Field House and Module
- 24 Finley Building
- 25 George Mason Statue
- 26 Greenhouse
- 27 Harris Theatre
- 28 Information

- 29 Innovation Hall
- 30 Johnson Center
- 31 Kelley II
- 32 Krasnow Institute
- 33 Krug Hall
- 34 Lecture Hall
- 35 Mason Hall
- 36 Music/Theater
- 37 Nguyen Engineering Building
- 38 Northeast Module
- 39 Northeast Module II
- 40 Nottoway Annex
- 41 Parking Deck, Mason Pond
- 42 Parking Deck, Rappahannock Rvr
- 43 Parking Deck, Shenandoah

- 44 Parking Services
- 45 Patriot Center
- 46 Planetary Hall
- 47 Police and Safety Hdqrt.
- 48 Recreation and Athletic Complex (RAC)
- 49 Recycling Center
- 50 Research Hall
- 51 Rivanna Module
- 52 Robinson Hall A
- 53 Robinson Hall B
- 54 Student Union Building I
- 55 TheaterSpace/Black Box
- 56 The Hub
- 57 Thompson Hall

- 58 Warehouse
- 59 West Building
- 60 West PE Module
- Residential**
- STUDENT HOUSING**
- Rappahannock Neighborhood**
- 61 Blue Ridge
- 62 Eastern Shore
- 63 Hampton Roads and Pilot House
- 64 Northern Neck
- 65 Piedmont*
- 66 Sandbridge
- 67 Skyline Fitness Center
- 68 Southside Dining

- 69 Tidewater
- 70 Commonwealth
- 71 Dominion
- The Commons**
- 72 Amherst
- 73 Brunswick
- 74 Carroll
- 75 Dickenson
- 76 Essex
- 77 Franklin
- 78 Grayson
- 79 Hanover
- Shenandoah Neighborhood**
- 80 Adams

- 81 Eisenhower* and Ike's Diner
- 82 Harrison
- 83 Jackson
- 84 Jefferson
- 85 Kennedy
- 86 Liberty Square
- 87 Lincoln
- 88 Madison
- 89 Monroe
- 90 Potomac Heights/Housing Office
- 91 Roosevelt
- 92 Taylor
- 93 Truman
- 94 Washington
- 95 Wilson

- Aquia Neighborhood**
- 96 Mason Global Center (formerly Mason Inn)
- 97 Rogers
- 98 Student Apartments
- 99 Whitetop*
- *24-hour Residential Desk
- FACULTY/STAFF HOUSING**
- 100 Masonvale
- Revised 06/2014



APPENDIX A
SOIL TEST SUMMARIES

Soil Test Summary - Fairfax Campus

Customer Name:	Mason - Fairfax Campus						
Testing Lab:	Virginia Tech Soil Testing Laboratory						
Sample Date:	6/19/2018						
Planner Name	Marjorie Siwy						
Certification Number	Certification #: 844						
Managed Area ID	Soil pH	Buffer pH	Lab Test P (lbs/A)	VT (H/M/L)	Lab Test K (lbs/A)	VT (H/M/L)	Species
CP-1	5.9	6.11	6	L	129	M	Fescue
CP-2	6.4	6.34	22	M	62	L+	Fescue
CP-3	6.3	6.30	29	M	110	M	Fescue
CP-4	6.3	6.33	8	L	123	M	Fescue
CP-5	8.0	6.60	40	H-	247	H	Fescue
CP-6	6.5	6.22	26	M	125	M	Fescue
CP-7	6.9	6.48	20	M-	312	VH	Fescue
CP-8	5.8	6.23	3	L-	159	M+	Fescue
CP-9	6.6	6.39	20	M-	94	M-	Fescue
CP-10	7.3	6.60	19	M-	199	H-	Fescue
CP-11	6.5	6.32	13	M-	44	L	Fescue
CP-12	6.8	6.41	15	M-	193	H-	Fescue
CP-13	7.5	6.60	248	VH	118	M	Fescue
CP-14	5.6	5.99	8	L	108	M	Fescue
POV-1	5.6	6.12	12	M-	157	M+	Fescue
POV-2	5.7	5.90	36	H-	265	H	Fescue
Common Areas at Field 3, 4, 5, and Softball Field (AF-3)	6.7	6.40	18	M-	202	H-	Fescue
Common Areas at Soccer Fields A and B, and Spuhler Field (AF-11)	5.4	6.12	1	L-	108	M	Fescue
Turf Area Adjacent to Braddock Road (AF-13)	6.2	6.27	11	L+	184	H-	Fescue
Turf Area Adjacent to West Campus Drive (AF-10)	5.9	6.21	10	L+	111	M	Fescue
Turf Areas Surrounding Field House (AF-12)	6.2	6.31	9	L+	182	H-	Fescue

APPENDIX B
NUTRIENT APPLICATION WORKSHEETS

APPENDIX C
FERTILIZER APPLICATION RECORDS

Fertilizer Application Records

Fertilizer Application Records									
Customer Information					Management Area Information				
Name:	Mason - Fairfax Campus				Management Area ID:				
Address:	4400 University Drive				Management Area Size:				
	Fairfax, Virginia 22030				Plant Species:				
					Notes:				
Phone #:									
Date (M/D/Y)	Supervisor/Applicator	Weather Conditions			Fertilizer Analysis	Rate	Amount Fertilizer Used	Application Equipment Used	
		Temp	Wind Speed	Precip					

When was the last time your fertilizer equipment was calibrated???

For information on calibration see Chapter 10 of the "Urban Nutrient Management Handbook".

Available for download at <http://pubs.ext.vt.edu/430/430-350/430-350.html>

APPENDIX D
REFERENCE MATERIALS

Table 7.4. Recommended fertilization rates for newly planted ornamental plants during the first growing season (use only one of the fertilizers listed at the rate recommended).

Plant type/size	12-4-8	16-4-8	10-10-10	Application frequency
	Application rate*/plant			
1-gallon shrubs	1 tsp	1 tsp	1 tbsp	March, May, July
3-gallon shrubs	2 tsp	2 tsp	2 tbsp	March, May, July
5-gallon shrubs	3 tsp	3 tsp	3 tbsp	March, May, July
Trees under 4 feet	1 tbsp	1 tbsp	2 tbsp	March, July
Trees 4-6 feet	3 tbsp	3 tbsp	5 tbsp	March, July
Trees 6-8 feet	4 tbsp	4 tbsp	6 tbsp	March, July
Application rate 100/sq ft				
Ground covers, annuals, and herbaceous perennials	0.5 lb	0.5 lb	1.0 lb	Each 4-6 weeks

Source: Georgia Cooperative Extension bulletin 1065 (2009).* When using slow-release or soluble fertilizers, follow label recommendations for application rate.

Table 7.5. Recommended application rates of various general-purpose granular fertilizers on established ornamental plants in the landscape.

Source	Application rate ^a				
	1,000 sq ft		100 sq ft		10 sq ft
	Pounds	Cups	Pounds	Cups	Tablespoons
10-10-10	10.0	20.0	1.0	2.0	4.0
8-8-8	12.5	25.0	0.5	2.5	5.0
13-13-13	6.0	12.0	0.75	1.5	3.0
12-3-6	6.0	12.0	0.75	1.5	3.0
12-4-8	6.0	12.0	0.75	1.5	3.0
12-6-6	6.0	12.0	0.75	1.5	3.0
16-4-8	6.0	12.0	0.5	1.0	2.0
4-12-12	25.0	50.0	2.5	5.0	10.0
5-10-10	20.0	40.0	2.0	4.0	8.0

Source: Georgia Cooperative Extension bulletin 1065 (2009).

^aThis rate will supply 1 pound of actual nitrogen per 1,000 square feet. For optimum growth of young shrubs, ground covers, and trees, three to five applications are recommended at six- to 10-week intervals from March to August. Application frequency varies with the amount of slow-release nitrogen in the product, so consult the label for specific recommendations. Established trees and shrubs will benefit from one to two applications during the growing season. Annual flowers and roses should receive applications at four- to six-week intervals from March to August. When using slow-release or specialty fertilizers, follow the manufacturer's recommendation on the container.

Section VI. Turfgrass Nutrient Recommendations for Home Lawns, Office Parks, Public Lands and Other Similar Residential/Commercial Grounds

Definitions

For the purposes of this section, the following definitions, as presented by the Association of American Plant Food Control Officials (AAPFCO), apply:

"Enhanced efficiency fertilizer" describes fertilizer products with characteristics that allow increased plant nutrient availability and reduce the potential of nutrient losses to the environment when compared to an appropriate reference product.

"Slow or controlled release fertilizer" means a fertilizer containing a plant nutrient in a form which delays its availability for plant uptake and use after application, or which extends its availability to the plant significantly longer than a reference "rapidly available nutrient fertilizer" such as ammonium nitrate, urea, ammonium phosphate or potassium chloride. A slow or controlled release fertilizer must contain a minimum of 15 percent slowly available forms of nitrogen.

"Water soluble nitrogen", "WSN" and "readily available nitrogen" means: Water soluble nitrogen in either ammonical, urea, or nitrate form that does not have a controlled release, or slow response.

Recommended Season of Application For Nitrogen Fertilizers - Applies to all Turf

A nitrogen fertilization schedule weighted toward fall application is recommended and preferred for agronomic quality and persistence of cool season turfgrass; however, the acceptable window of applications is much wider than this for nutrient management. The nutrient management recommended application season for nitrogen fertilizers to cool season turfgrasses begins six weeks prior to the last spring average killing frost date and ends six weeks past the first fall average killing frost date (see Figures 6-1 & 6-2). Applications of nitrogen during the intervening late fall and winter period should be avoided due to higher potential leaching or runoff risk, but where necessary, apply no more than 0.5 pounds per 1,000 ft² of water soluble nitrogen within a 30 day period. Higher application rates may be used during this late fall and winter period by using materials containing slowly available sources of nitrogen, if the water soluble nitrogen contained in the fertilizer does not exceed the recommended maximum of 0.5 pounds per 1,000 ft² rate. Do not apply nitrogen or phosphorus fertilizers when the ground is frozen.

The acceptable nitrogen fertilizer application season for non-overseeded warm season turfgrass begins no earlier than the last spring average killing frost date and ends no later than one month prior to the first fall average killing frost date (see Figures 6-1 & 6-2).

Figure 6-1

VIRGINIA

AVERAGE DATES OF FIRST
KILLING FROST IN FALL

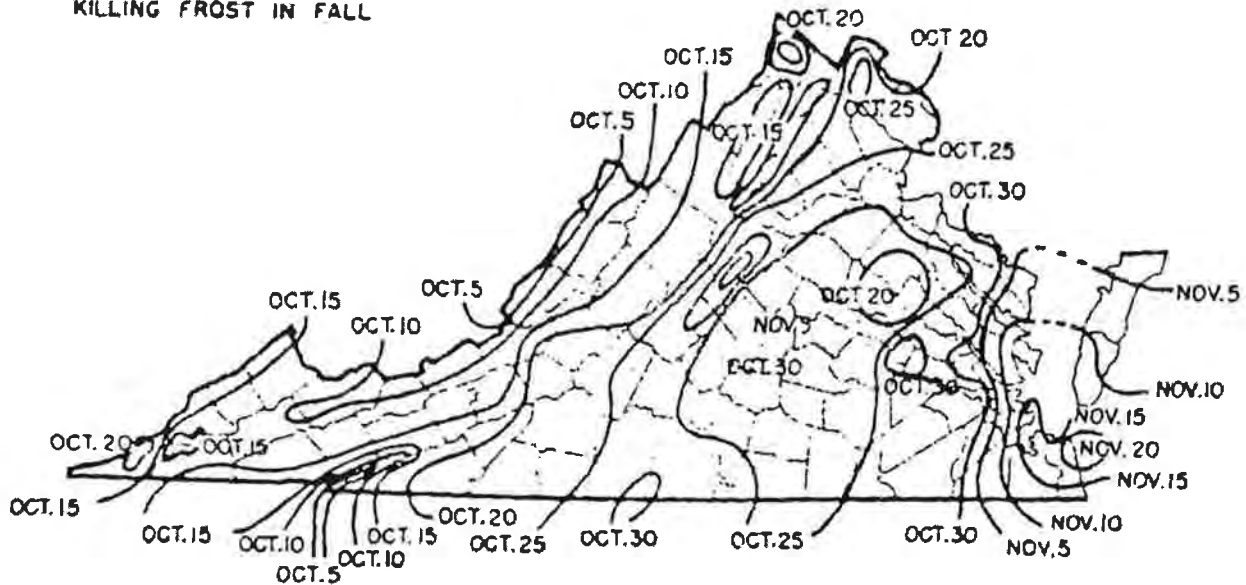
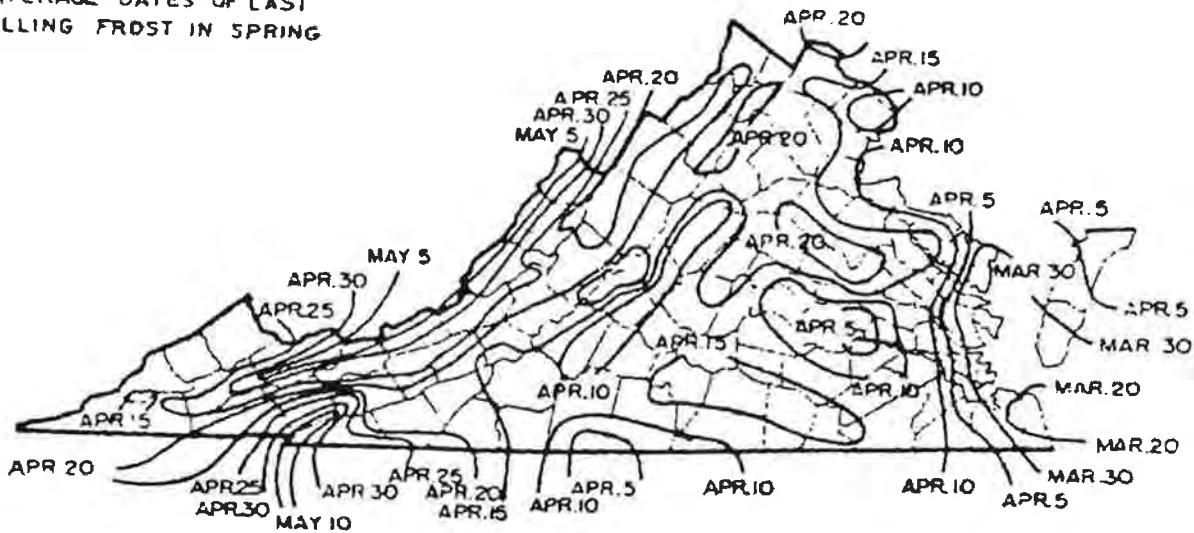


Figure 6-2

VIRGINIA

AVERAGE DATES OF LAST
KILLING FROST IN SPRING



Per Application Rates

Do not apply more than 0.7 pounds of water soluble nitrogen per 1,000 ft² within a 30 day period. For cool season grasses, do not apply more than 0.9 pounds of total nitrogen per 1,000 ft² within a 30 day period. For warm season grasses, do not apply more than 1.0 pounds of total nitrogen per 1,000 ft² within a 30 day period. Lower per application rates of water soluble nitrogen sources or use of slowly available nitrogen sources should be utilized on very permeable sandy soils, shallow soils over fractured bedrock, or areas near water wells.

Annual Application Rates for Home Lawns and Commercial Turf

Up to 3.5 pounds per 1,000 ft² of nitrogen may be applied annually to cool season grass species or up to 4 pounds per 1,000 ft² may be applied annually to warm season grass species using 100 percent water soluble nitrogen sources. Lower rates of nitrogen application may be desirable on those mature stands of grasses that require less nitrogen for long-term quality. As a result, lower application rates will probably be more suited to the fine leaf fescues (hard fescue, chewings fescue, creeping red fescue, and sheep fescue) and non-overseeded zoysiagrass. Lower rates should also be used on less intensively managed areas.

Use of Slowly Available Forms of Nitrogen

For slow or controlled release fertilizer sources, or enhanced efficiency fertilizer sources, no more than 0.9 pounds of nitrogen per 1,000 ft² may be applied to cool season grasses within a 30 day period and no more than 1.0 pounds of nitrogen per 1,000 ft² may be applied to warm season grasses within a 30 day period.

Provided the fertilizer label guarantees that the product can be used in such a way that it will not release more than 0.7 pounds of nitrogen per 1,000 ft² in a 30 day period, no more than 2.5 pounds of nitrogen per 1,000 ft² may be applied in a single application. Additionally, total annual applications shall not exceed 80 percent of the annual nitrogen rates for cool or warm season grasses.

Phosphorus and Potassium Nutrient Needs (Established Turf)

Apply phosphorus (P₂O₅) and potassium (K₂O) fertilizers as indicated necessary by a soil test using the following guidelines:

<u>Soil Test Level</u>	<u>Nutrient Needs (pounds per</u>	
	<u>1000 ft²) *</u>	
	<u>P₂O₅</u>	<u>K₂O</u>
L	2-3	2-3
M	1-2	1-2
H	0.5-1	0.5-1
VH	0	0

- * For the lower soil test level within a rating, use the higher side of the range and for higher soil test level within a rating use the lower side of the recommendation range. (For example the recommendation for a P₂O₅ soil test level of L- would be 3 pounds per 1,000 ft².)

Do not use high phosphorus ratio fertilizers such as 10-10-10 or 5-10-10, unless soil tests indicate phosphorus availability below the M+ level.

Matthew J. Strickler
Secretary of Natural Resources

Clyde E. Cristman
Director



Rochelle Altholz
*Deputy Director of
Administration and Finance*

Russell W. Baxter
*Deputy Director of
Dam Safety & Floodplain
Management and Soil & Water
Conservation*

Thomas L. Smith
Deputy Director of Operations

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

Zhongyan Xu
4400 University Blvd.
Fairfax, VA 22030

9/21/2018

Subject: GMU Athletic Fields

The following nutrient management plan has been reviewed by Nick Yakish and approved by the Virginia Department of Conservation & Recreation as compliant with the provisions of the Code of Virginia 10.1-104.4. Please note that this plan has not been reviewed for compliance with more restrictive requirements from other specific legislative, regulatory or incentive programs.

Plan Name	Planner	Acres	Start Date	Expiration Date
GMU Athletic Fields	Marjorie Siwy	22.7	8/14/2018	8/14/2021

A copy of this letter should be kept with your nutrient management plan. Initiation of plan revision is recommended by the Department to occur at least six months prior to the expiration date. If you have any questions concerning this letter or approvals, please contact me via phone or email.

Sincerely,

A handwritten signature in black ink, appearing to read "Nick Yakish".

Nick Yakish
Urban Nutrient Management Coordinator
Department of Conservation and Recreation
600 East Main St., 24th Floor
Richmond, Virginia 23219
(804) 389-5439
nicholas.yakish@dcr.virginia.gov



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September 17, 2018

Mr. Nick Yakish
Urban Nutrient Management Specialist
Virginia Department of Conservation and Recreation
600 East Main Street, 24th Floor
Richmond, Virginia 23219

**Re: Nutrient Management Plan
George Mason University – Athletic Fields
Fairfax County, Virginia**

Dear Mr. Yakish:

On behalf of George Mason University, Timmons Group has prepared this Nutrient Management Plan in accordance with the *Virginia Nutrient Management Standards and Criteria, revised July 2014*. This Nutrient Management Plan encompasses the approximately 18.6 acre area that contains turfgrass and could receive fertilizer applications at the George Mason University athletic fields. Please find the enclosed plan for your review and approval.

Please feel free to contact me at (804) 200-6370, marjorie.siw@timmons.com, or Bill Vest at (703) 554-6705, bill.vest@timmons.com, if you require additional information, or have any questions or additional recommendations.

Sincerely,

Timmons Group

Marjorie Siwy, WPIT
Certified Nutrient Management Planner (No. 844)

Enclosures:

George Mason University – Athletic Fields Nutrient Management Plan

GEORGE MASON UNIVERSITY – ATHLETIC FIELDS NUTRIENT MANAGEMENT PLAN

DIRECTOR OF FACILITIES

GEORGE MASON UNIVERSITY – ATHLETIC FIELDS
ZHONGYAN XU, PHD, PE, CFM
PROJECT MANAGEMENT AND CONSTRUCTION, FACILITIES
703-993-4051
ZXU8@GMU.EDU

NUTRIENT MANAGEMENT PLANNER INFORMATION

MARJORIE SIWY
1001 BOULDERS PARKWAY, SUITE 300
RICHMOND, VA 23225
804-200-6370
MARJORIE.SIWY@TIMMONS.COM
VIRGINIA NUTRIENT MANAGEMENT PLANNER CERTIFICATION # 844

LOCATION INFORMATION

4400 UNIVERSITY DRIVE
FAIRFAX, VA 22030
38.833478 N
-77.319109 W
LOWER BULL RUN SUBWATERSHED – PL46
FAIRFAX COUNTY, VIRGINIA

ACREAGE

TOTAL ATHLETIC FIELD TURF: 22.7 ACRES
MANAGEMENT AREA 1: 2.5 ACRES MANAGEMENT AREA 3: 1.1 ACRES
MANAGEMENT AREA 2: 5.8 ACRES MANAGEMENT AREA 3: 13.3 ACRES

PLAN START DATE: 8/14/2018

PLAN END DATE: 8/14/2021



MARJORIE SIWY



TIMMONS GROUP PROJECT No. 36158.012

GEORGE MASON UNIVERSITY – ATHLETIC FIELDS NUTRIENT MANAGEMENT PLAN

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Figure 2	Environmental Inventory Map
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Figure 4	Nutrient Management Areas Map

APPENDICES

Appendix A	Soil Test Summaries
Appendix B	Nutrient Application Worksheets
Appendix C	Fertilizer Application Records
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1.0 STATEMENT OF COMPLIANCE

The George Mason University (Mason) agrees to comply with all requirements set forth in the *Nutrient Management Training and Certification Regulations 4VAC50-85*, and to follow recommendations for turf fertilization and management as described in the *Virginia Nutrient Management Standards and Criteria, revised July 2014*. This includes implementing this Nutrient Management Plan and maintaining fertilization records. All nutrient applications performed by Mason staff or associated contractors shall comply with the provisions of this Nutrient Management Plan as of August 14, 2018. This plan is effective for three years (until August 14, 2021) or until major changes to maintenance practices or grounds conditions occur. Mason is committed to environmental sustainability and adhering to this Nutrient Management Plan in order to protect the water quality of downstream aquatic resources while optimizing the health and performance of turf species.

2.0 SITE LOCATION AND DESCRIPTION

The Mason Athletic Fields (Site) are located between Ox Road (Route 123) and Braddock Road (Route 623), southwest of the City of Fairfax, Virginia, and encompass a total area of approximately 22.7 acres that contains maintained turfgrass (see Figure 1: Vicinity Map). The Site drains to Popes Head Creek and East Fork of Popes Head Creek, which both ultimately flow into Bull Run. The Site is located within the Lower Bull Run watershed (PL46) and the Piedmont physiographic province.

The Site consists of nine athletic fields that are all dominated by bermudagrass. All nine athletic field turf areas are heavily manicured, with turf heights of approximately 1 to 2 inches.

2.1 Environmentally Sensitive Areas

All areas within the project limits were evaluated based on susceptibility of nutrient loss to ground and surface water. None of the turf areas onsite are categorized as environmentally sensitive areas (see Figure 3: Environmentally Sensitive Areas Map). However, special care should be taken when applying nutrients near drop inlet structures, stormwater management BMPs, streams, and wetlands. All nutrient applications should adhere to the recommended fertilizer application rates and timing to avoid and minimize nutrient loss to the greatest extent practicable.

Subsurface Drains: There is an underground stormwater conveyance system present in areas surrounding the athletic fields that carries runoff to stormwater treatment ponds. Given that this stormwater is being treated by the existing stormwater management BMPs, this underground stormwater conveyance system does not qualify as a subsurface tile drain. However, special care should be taken when applying fertilizer near drop inlet structures, impervious surfaces, and stormwater management BMPs. Fertilizer should not be applied on drop inlets or impervious surfaces. Nor should fertilizer be applied to stormwater management BMPs.

Soils: The NRCS soil survey map depicts that all athletic fields are mapped as either the Wheaton loam, Glenelg silt loam or Codorus soil. These soil series do not have a high rating for leaching, lateral drainage flow, or shallow depth to bedrock in the Nutrient Loss Risk and

Environmental Sensitivity Ratings for Virginia Soils Table (Table 1.4 in the Virginia Nutrient Management Standards and Criteria).

Streams and Wetlands: Perennial and/or intermittent streams are present near several of the turf management areas. Fertilizer should not be applied within streams and/or wetlands. Allowing vegetation to grow taller along stream and wetland boundaries is an additional measure that can be taken to reduce nutrient loss to streams and wetlands. The approximate locations of streams and wetlands are depicted in Figure 3: Environmentally Sensitive Areas Map.

Land with Slopes Greater than 15%: There were no areas with greater than 15% slopes identified in any turf management areas.

2.2 Fertilization Season

The recommended season of application for nitrogen fertilizers for Bermudagrass, which is categorized as a warm season grass begins on April 10 and ends September 25 as shown in Table 2.1 – Fertilization Season at Mason – Athletic Fields.

Table 2.1 – Fertilization Season at Mason – Athletic Fields

	Killing Frost Dates	Warm Season Application Window (Athletic Fields)
Spring	April 10	April 10
Fall	October 25	September 25

3.0 SOIL SAMPLING METHODS, MANAGEMENT AREAS, AND NUTRIENT RECOMMENDATIONS

3.1 Soil Sampling Methods and Management Areas

A total of 9 soil samples were taken from athletic fields throughout the Site. At least 10 sub-samples from each of these nine athletic fields were randomly taken from within the upper four inches of soil and mixed to create a representative sample of each area. The soil samples were collected in June 2018 and analyzed at the Virginia Tech soils laboratory.

These 9 sample areas were categorized into four different management areas based on the soil test results and turfgrass species present. These nutrient management areas are shown in Figure 4: Nutrient Management Areas Map. Figure 4 should be used as a reference when interpreting nutrient recommendations in Table 3.1 on page 3 of this document.

For all the nutrient management areas, applications of nutrients will not occur on frozen or snow-covered ground. Any fertilizers that make their way onto impervious surfaces such as parking lots or sidewalks should be swept or blown back into pervious, or turfgrass covered areas. Furthermore, fertilizers must not be used as ice melt.

3.2 Athletic Fields – 22.7 acres

All athletic fields are dominated by Bermudagrass, which is a warm season turfgrass species. The lime and nutrient recommendations for each of these athletic fields within the Site are shown below in Table 3.1: Athletic Fields Lime and Nutrient Recommendations of this document. The lime and nutrient recommendations in this table are based on the *Virginia Nutrient Management Standards and Criteria, revised July 2014*. The prescribed lime applications should be completed in small applications of less than 50 lbs. per 1,000 square feet (SF), at intervals of 1 to 6 months, until the full amount is applied. The first nitrogen applications should not be made until after complete green-up of turf.

The recommended potassium application rates in some areas are greater than the amount specified in the soil lab analyses results. At this time, potassium is not considered to be an environmental concern that negatively impacts water quality, so slight over application of this nutrient only contributes to health and vigor of turfgrass.

Table 3.1: Athletic Fields Lime and Nutrient Recommendations

MAN. AREA #	SOIL SAMPLE AREA	SOIL pH	LIME REC. (LBS/1000 SF)	**VA Nutrient Management Standards and Criteria PHOSPHORUS (P ₂ O ₅) REC. (LBS/1,000 SF)	**VA Nutrient Management Standards and Criteria POTASSIUM (K ₂ O) REC. (LBS/1,000 SF)	FINAL PHOSPHORUS (P ₂ O ₅) REC. (LBS/1,000 SF)	FINAL POTASSIUM (K ₂ O) REC. (LBS/1,000 SF)
1	Field 5	6.6	0	1.5	2	1.5	2
2	Field 4	6.2	20	0.5	2.5	0.5	2
	Spuhler Field	6.3	0	0.75	1.5	0.5	2
3	GMU Softball Field	6.8	0	0	0.5	0	0.5
4	Field 1	6.1	20	1	1.5	1*	1.5
	Soccer Field A	6.6	0	1	1.5	1*	1.5
	Soccer Field B	5.4	100	1.5	1.5	1	1.5
	George Mason Stadium	6.2	20	1	2.5	1*	1.5
	Throwing Fields	6.2	20	1.5	1	1*	1.5

Notes:

**These nutrient needs are the exact needs of the soil at each particular soil sampling area. These values were averaged and grouped into the final nutrient recommendations seen in the last two columns based on soil nutrient need similarities to create a more easily implemented plan.

*Due to high phosphorus levels, fertilizers in the form of 10-10-10 or 5-10-10 should not be used.

- Agricultural limestone (ground, pulverized, or pelletized) should be broadcast in small applications of up to 50 lbs. per 1000 SF, at intervals of 1 to 6 months, until the full amount is applied.
- No more than 0.35 lbs. of water soluble nitrogen (WSN) or 0.5 lbs. of slowly available nitrogen (SAN) per 1,000 SF may be applied within a within a 15 day period.
- Nitrogen applications may not exceed 5.0 lbs. per 1,000 SF annually for WSN or SAN apps.

3.3 Sand Based Athletic Field Nitrogen Applications – 16.1 acres

The sand based athletic fields onsite require a lower nitrogen per application rate than fields with loam based soils. The sand based athletic fields onsite include Field 1, Field 4, Mason Stadium Field, Softball Field, Spuhler Field, Soccer Field A, Soccer Field B and the Throwing Field. These areas are noted as Management Areas 2, 3, and 4 on Figure 4.

The annual maximum nitrogen application for all of the sand based athletic fields is 5.0 lbs. per 1,000 SF. Per application rates of nitrogen vary depending on whether water soluble nitrogen (WSN) or slowly available nitrogen (SAN) fertilizers are used. WSN should be applied at a rate no greater than 0.35 lbs. per 1,000 SF at intervals no less than 15 days apart, between the dates of April 10th and September 25th. SAN can be applied at a rate no greater than 0.5 lbs. per 1,000 SF at intervals no less than 15 days apart, between the dates of April 10th and September 25th.

If athletic fields are overseeded with cool season grasses such as perennial ryegrass, an additional 0.7 lbs. per 1,000 SF of WSN may be applied in the fall after the perennial ryegrass overseeding is well established. The WSN must be applied as two applications not to exceed 0.35 lbs. per 1,000 SF of nitrogen, with a minimum of 15 days between applications. Additional WSN application of 0.5 lbs. per 1,000 SF may be made in February-March to overseeded perennial ryegrass if growth and color indicate need. Alternatively, split applications of 0.5 lbs. of nitrogen per 1,000 SF each with a minimum of 15 days between applications may be applied using a material containing slowly available water insoluble nitrogen sources.

3.4 Loam Based Athletic Field Nitrogen Applications – 2.5 acres

The loam based athletic field onsite requires a higher nitrogen per application rate than fields with sand based soils. The loam based athletic field onsite includes only Field 5 and is noted as Management Area 1 on Figure 4.

The annual maximum nitrogen application for Field 5 is 5.0 lbs. per 1,000 SF. Per application rates of nitrogen vary depending on whether WSN or SAN fertilizers are used and the timing of fertilizer application and at which point during the application window it is. WSN should be applied at a rate no greater than 0.35 lbs. per 1,000 SF at intervals no less than 15 days apart, between the dates of April 15 and May 15 and again between September 1 and September 15. During those same dates SAN can be applied at a rate no greater than 0.5 lbs. per 1,000 SF at intervals no less than 15 days apart. For the opening in the application window between May 15 and September 1, WSN should be applied at a rate no greater than 0.7 lbs. per 1,000 SF at intervals no less than 30 days apart. During those same dates SAN can be applied at a rate no greater than 1.0 lbs. per 1,000 SF at intervals no less than 30 days apart.

If Field 5 is overseeded with cool season grasses, an additional 0.7 lbs. per 1,000 SF of WSN may be applied in the fall after the perennial ryegrass overseeding is well established. The WSN must be applied as two applications not to exceed 0.35 lbs. per 1,000 SF of nitrogen, with a minimum of 15 days between applications. Additional WSN application of 0.5 lbs. per 1,000 SF may be made in February-March to overseeded perennial ryegrass if growth and color indicate need. Alternatively, split applications of 0.5 lbs. of nitrogen per 1,000 SF each with a minimum of 15 days between applications may be applied using a material containing slowly available nitrogen sources.

4.0 MAINTENANCE OF PLAN

This Nutrient Management Plan will be maintained by Mason and will expire on August 14, 2021. As part of this plan, fertilizer application records shall be recorded and maintained (see Appendix C: Fertilizer Application Records). Please note that soil samples should be collected at least once every three years in order to maintain this plan. If significant changes to

the Site occur, this plan is required to be updated accordingly by a Certified Nutrient Management Planner. Significant changes would include: changing turf species in the athletic fields, renovating an athletic field and the existing underlying soil, creation of additional athletic fields, expansion of the area to be included under this Nutrient Management Plan, or other changes that could alter nutrient recommendations and timing.

5.0 NUTRIENT APPLICATION, INCORP., AND SPECIAL CONDITIONS

There are multiple drop inlets associated with the underground stormwater system onsite. This drainage system ultimately outfalls to several stormwater BMPs that are designed to remove sediment and nutrients from stormwater. Special care should be taken to avoid applying fertilizers directly on top of drop inlet structures. No fertilizer should be applied to stormwater BMPs as these facilities already receive excess nutrients during stormwater events. Nutrient applications should not be completed when a significant runoff producing events are anticipated. Applying only slowly available forms of nitrogen will help minimize the nutrient loss potential.

Special care should be taken when applying fertilizers near impervious surfaces and near any streams or wetlands. The locations of streams and wetlands are depicted on Figure 3: Environmentally Sensitive Areas Map. Allowing vegetation to grow taller near stream and wetland areas would help prevent offsite nutrient loss that could result from fertilizer application errors, or significant runoff producing storm events.

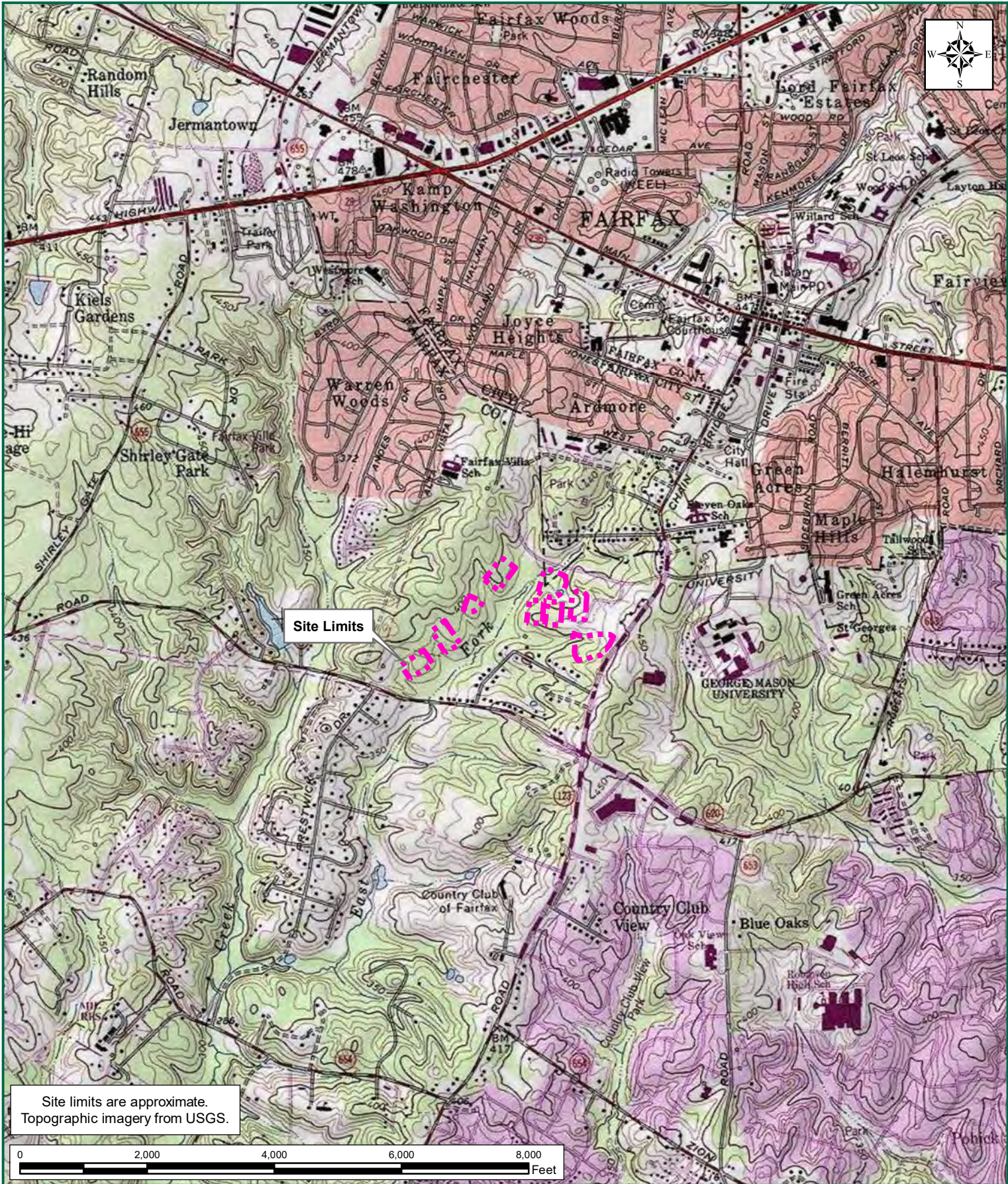
6.0 REFERENCES

VADCR. November 2014. Nutrient Management Training and Certification Regulations 4VAC50-85. Virginia Soil and Water Conservation Board.

VADCR. July 2014. Virginia Nutrient Management Standards and Criteria. Division of Soil and Water Conservation: Richmond, VA.

Virginia Cooperative Extension. May 2011. Urban Nutrient Management Handbook. Funding by: VADCR; Produced by: Virginia Polytechnic Institute and State University.

FIGURES



MASON ATHLETIC FIELDS
FAIRFAX COUNTY, VIRGINIA
FIGURE 1: VICINITY MAP

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

TIMMONS GROUP JOB NUMBER: 36158.012
PROJECT STUDY LIMITS: 22.7 ACRES
LATITUDE: 38.833478
LONGITUDE: -77.319109

U.S.G.S. QUADRANGLE(S): FAIRFAX
DATE(S): 2016
WATERSHED(S): MIDDLE POTOMAC-ANACOSTIA-OCOQUAN (POTOMAC RIVER BASIN)
HYDROLOGIC UNIT CODE(S): 02070010



Legend

Project Study Limits - 22.7 Acres

Environmentally Sensitive Areas - Not Present

Wetlands

Streams

TIMMONS GROUP

YOUR VISION ACHIEVED THROUGH OURS.

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Richmond, VA 23225
TEL 804.200.6500
www.timmons.com

PROJECT NAME & LOCATION

MASON ATHLETIC FIELD -
NUTRIENT MANAGEMENT PLANS
FAIRFAX COUNTY,
VIRGINIA

DATE

07/16/2018

PROJECT NUMBER

36158.012

PROJECT NAME

MASON ATHLETIC FIELDS

DESIGNED BY / DRAWN BY

A. MEHFOUD

NOTES:

Project Limits are approximate.
NWI from US Fish and Wildlife Service.
National Hydrography Dataset from USGS.
Aerial imagery from VGIN.

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REVISIONS	
#	DESCRIPTION

DRAWING DESCRIPTION

FIGURE 3:
ENVIRONMENTALLY
SENSITIVE AREAS
MAP

SCALE (FEET)

0 150 300

PLANS PRINTED AS 11X17 ARE HALF SCALE

SCALE SHEET NUMBER

H:1" = 150' 1



Legend

Project Study Limits - 22.7 Acres

Management Area 1

Field 5 - 2.5 Acres

Management Area 2

Field 4 - 2.6 Acres

Spuhler Field - 3.2 Acres

Management Area 3

GMU Softball Field - 1.1 Acres

Management Area 4

Field 1 - 2.8 Acres

George Mason Stadium - 2.2 Acres

Soccer Field A - 2.0 Acres

Soccer Field B - 2.0 Acres

Throwing Fields - 4.3 Acres

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.
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Richmond, VA 23225
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www.timmons.com

PROJECT NAME & LOCATION

**MASON ATHLETIC FIELD -
NUTRIENT MANAGEMENT PLANS**
FAIRFAX COUNTY,
VIRGINIA

DATE	07/13/2018
PROJECT NUMBER	36158.012
PROJECT NAME	MASON ATHLETIC FIELDS
DESIGNED BY / DRAWN BY	A. MEHFOUD

NOTES:
Project Limits are approximate.
Aerial imagery from VGIN.

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REVISIONS	
#	DESCRIPTION

DRAWING DESCRIPTION
**FIGURE 4:
NUTRIENT
MANAGEMENT
AREAS MAP**

SCALE (FEET)

0150300

PLANS PRINTED AS 11X17 ARE HALF SCALE

SCALE

SHEET NUMBER

H:1" = 150'

1

APPENDIX A
SOIL TEST SUMMARIES

Soil Test Summary - Athletic Fields

Customer Name:	Mason - Athletic Fields
Testing Lab:	Virginia Tech Soil Testing Laboratory
Sample Date:	6/19/2018
Planner Name	Marjorie Siwy
Certification Number	Certification #: 844

Managed Area ID	Soil pH	Buffer pH	Lab Test P (ppm)	Lab Test P (lbs/A)	VT (H/M/L)	Lab Test K (ppm)	Lab Test K (lbs/A)	VT (H/M/L)	Species
Field 1	6.1	6.39	22.5	45	H-	51.5	103	M	Bermudagrass
Field 4	6.2	6.37	47.5	95	H+	25	50	L	Bermudagrass
Field 5	6.6	6.45	13.5	27	M	45.5	91	M-	Bermudagrass
George Mason Stadium	6.2	6.47	18.5	37	H-	24	48	L	Bermudagrass
GMU Softball Field	6.8	6.46	55.5	111	VH	153.5	307	H+	Bermudagrass
Soccer Field A	6.6	6.44	18	36	H-	68.5	137	M	Bermudagrass
Soccer Field B	5.4	6.12	11.5	23	M	70.5	141	M	Bermudagrass
Spuhler Field	6.3	6.39	31.5	63	H	51.5	103	M	Bermudagrass
Throwing Fields	6.2	6.34	11.5	23	M	77	154	M+	Bermudagrass

Notes:	
--------	--

APPENDIX B
NUTRIENT APPLICATION WORKSHEETS

NAME:		Mason - Athletic Fields					
Prepared:		8/14/18				Species:	
Expires:		8/14/21				Bermudagrass	
Management Area	Application Month/Day	# of Apps	Application Interval	Fertilizer Type	Total NPK lbs/1000ft ²		
Management Area #1 (2.5 acres)					N	- P ₂ O ₅	- K ₂ O
	4/15 to 5/15	2	> 15 days		0.35	- 0.25	- 0.0
	5/15 to 9/1	4	> 30 days		0.70	- 0.25	- 0.5
	9/1 to 9/15	2	> 15 days		0.35	- 0.0	- 0.0
	Recommended Total Annual Application				4.20	- 1.5	- 2.0
Management Area #2 (5.8 acres)	4/10 to 7/25	8	> 15 days		0.35	- 0.25	- 0.25
	7/25 to 9/25	3	> 15 days		0.35	- 0.0	- 0.0
	Recommended Total Annual Application				3.85	- 0.5	- 2.0
Management Area #3 (1.1 acres)	4/10 to 5/10	2	> 15 days		0.35	- 0.0	- 0.25
	5/10 to 9/25	9	> 15 days		0.35	- 0.0	- 0.0
	Recommended Total Annual Application				3.85	- 0.0	- 0.5
Management Area #4 (13.3 acres)	4/10 to 6/25	6	> 15 days		0.35	- 0.00	- 0.25
	6/25 to 9/25	5	> 15 days		0.35	- 0.20	- 0.0
	Recommended Total Annual Application				3.85	- 1.0	- 1.5
Notes:	<p>*The fertilizer recommendations listed above can be in the form of several different fertilizer products. For additional details on athletic field application rates please reference sections 3.3 and 3.4 of the George Mason University - Athletic Fields Nutrient Management Plan. The first nitrogen application should not be made until complete green-up of turf.</p> <p>*Phosphorus application on Field 4, the Softball Field, Field 1, Spuhler Field, Soccer Field A, and the George Mason Stadium Field should not take place in the form of 10-10-10 or 5-10-10 fertilizers in this management area due to high content of phosphorus in the soil already.</p>						
Management Area #1 Lime Recommendations:	Field 5: This soil sampling area has a sufficient soil pH. No lime application is needed.						
Management Area #2 Lime Recommendations:	Field 4: This soil sampling area requires 20 lbs of agricultural lime (ground, pulverized, or pelletized) per 1,000 sq. ft.. The total 20 lbs. of lime can be applied in one application.						
	Spuhler Field: This soil sampling area has a sufficient soil pH. No lime application is needed.						
Management Area #3 Lime Recommendations:	GMU Softball Field: This soil sampling area has a sufficient soil pH. No lime application is needed.						
Management Area #4 Lime Recommendations:	Field 1: Soil pH = 6.1. This soil sampling area requires 20 lbs of agricultural lime (ground, pulverized, or pelletized) per 1,000 sq. ft. The total 20 lbs. of lime can be applied in one application.						
	Soccer Field A: This soil sampling area has a sufficient soil pH. No lime application is needed.						
	Soccer Field B: This soil sampling area requires 100 lbs of agricultural lime (ground, pulverized, or pelletized) per 1,000 sq. ft. in several small applications of up to 50 lbs each, at intervals of 1 to 6 months, until the full amount is applied.						
	George Mason Stadium: This soil sampling area requires 20 lbs of agricultural lime (ground, pulverized, or pelletized) per 1,000 sq. ft. The total 20 lbs. of lime can be applied in one application.						
	Throwing Fields: This soil sampling area requires 20 lbs of agricultural lime (ground, pulverized, or pelletized) per 1,000 sq. ft. The total 20 lbs. of lime can be applied in one application.						
Soil pH tests can be conducted annually to determine if additional lime is needed to raise the soil pH during years 2 and 3 of this nutrient management plan implementation.							

APPENDIX C
FERTILIZER APPLICATION RECORDS

Fertilizer Application Records

Fertilizer Application Records									
Customer Information					Management Area Information				
Name:	Mason - Athletic Fields				Management Area ID:				
Address:	4400 University Drive				Management Area Size:				
	Fairfax, Virginia 22030				Plant Species:				
					Notes:				
Phone #:									
Date (M/D/Y)	Supervisor/Applicator	Weather Conditions			Fertilizer Analysis	Rate	Amount Fertilizer Used	Application Equipment Used	
		Temp	Wind Speed	Precip					

When was the last time your fertilizer equipment was calibrated???

For information on calibration see Chapter 10 of the "Urban Nutrient Management Handbook".

Available for download at <http://pubs.ext.vt.edu/430/430-350/430-350.html>

APPENDIX D
REFERENCE MATERIALS

Figure 6-1

VIRGINIA

AVERAGE DATES OF FIRST
KILLING FROST IN FALL

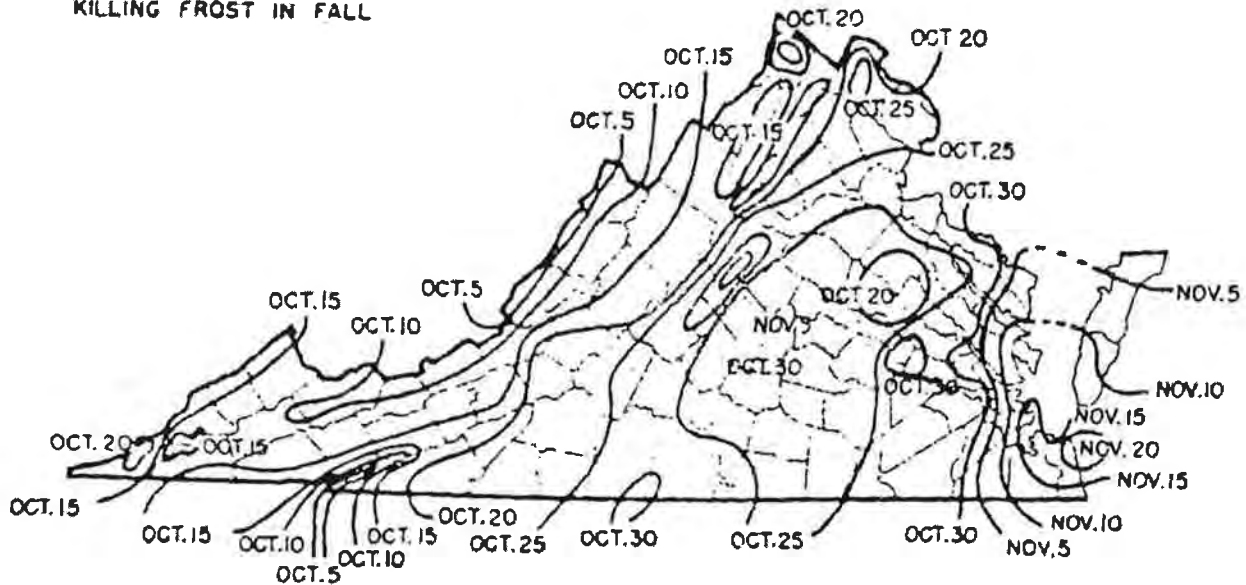
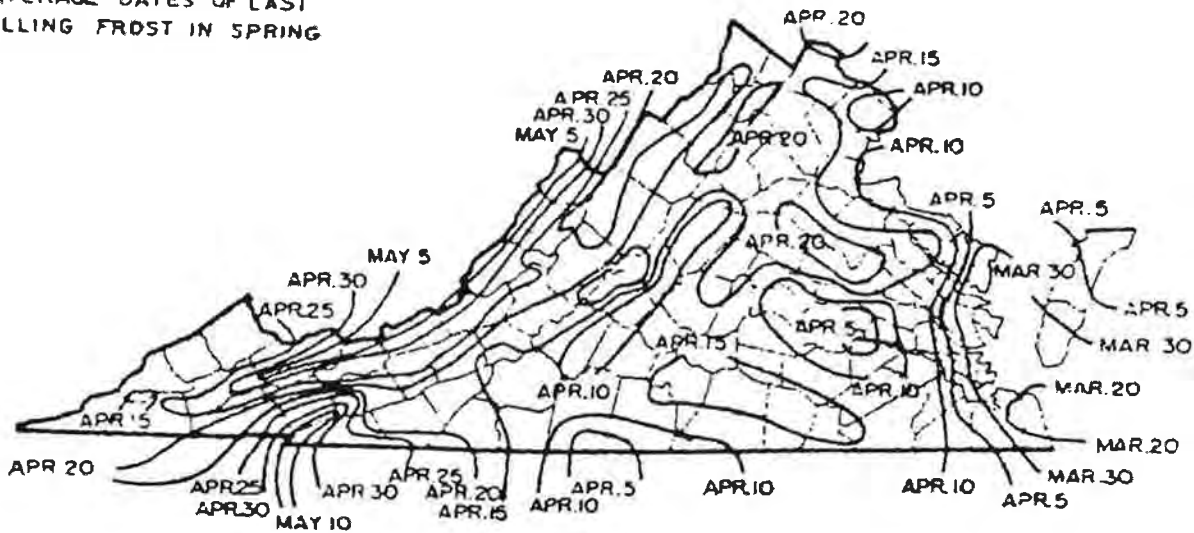


Figure 6-2

VIRGINIA

AVERAGE DATES OF LAST
KILLING FROST IN SPRING



Nitrogen Management on Athletic Fields - Warm Season Grasses

The following comments apply to both Naturally Occurring or Modified Sand based Fields and Predominantly Silt/Clay Soil Fields:

- Annual nitrogen rates for warm season grasses shall not exceed **4 pounds** in areas which have the average first killing frost on or before October 20, and shall not exceed **5 pounds** in areas which have the average first killing frost after October 20 as shown in Figure 6-1. Nitrogen rates and timings for overseeding warm season grasses are not included in these rates.
- April 15 - May 15 applications should not be made until after complete green-up of turf.
- Nitrogen applications June through August should be coordinated with anticipated rainfall if irrigation is not available.
- Use the lower end of the ranges for non-irrigated fields and the higher end of the ranges should be used on fields with irrigation.
- Nitrogen rates towards the higher end of the ranges may be applied on heavily used fields to accelerate recovery, however per application and annual rates cannot be exceeded.

Bermudagrass - Predominantly Silt/Clay Soil Fields ^a		
When to Apply^b	Pounds per 1,000 ft² Nitrogen	First Fall Killing Frost Date^b
April 15 - May 15	0.5 - 0.7 ^(c)	Before Oct. 20
June	0.7	
July	0.5 - 0.7 ^(d)	
August	0.5 - 0.7 ^(d)	
Sept 1 - Sept 15	0.5 - 0.7 ^(c)	After Oct. 20
If overseeded with perennial ryegrass		
Oct - Nov	0.5 ^(e)	
Feb-Mar	0.5 ^(e)	

Bermudagrass - Naturally Occurring or Modified Sand based Fields ^a		
When to Apply^b	Lbs/1,000 ft² Nitrogen^c	First Fall Killing Frost Date^b
April 15 - May 15	0.5 - 0.7 ^(c)	Before Oct. 20
June	0.7 ^(c)	
July	0.7 ^(c)	
August	0.7 ^(c)	
Sept 1 - Sept 15	0.7 ^(c)	After Oct. 20
If overseeded with perennial ryegrass		
Oct - Nov	0.5 ^(e)	
Feb - Mar	0.5 ^(e)	

The following notes apply to both of the Bermudagrass tables above:

- (a) In the Piedmont and the Ridge and Valley areas of Virginia, the existing native soil will normally be comprised predominantly of clay and/or silt and these soils have inherently

lower water infiltration and percolation rates and greater nutrient holding capacity. However, most areas of the Coastal Plain have existing native soils that are predominantly sandy textured soils and other facilities throughout the state may choose to install modified soil root zones that are predominantly sand (>50%) in order to maximize drainage and reduce compaction tendency. If subsurface drain tile surrounded by sand and/or gravel has been installed under the playing surface of any of these fields, their nitrogen programs should be managed as predominantly sand-based systems to minimize nutrient leaching.

- (b) The beginning and ending dates for application of nitrogen shall be determined using guidance and frost date maps contained in the Season of Application for Nitrogen section, Figures 6-1 and 6-2.
- (c) WSN must be applied as two applications not to exceed 0.35 pounds per 1,000 ft² each with a minimum of 15 days between applications. Alternatively, using a material that contains slowly available nitrogen sources, split applications of 0.5 pounds per 1,000 ft² may be applied with a minimum of 15 days between applications.
- (d) If a material containing slowly available forms of nitrogen is used, rates up to 1.0 pounds of nitrogen per 1,000 ft² may be applied in a single application with a minimum of 30 days between applications.
- (e) For overseeded warm season grasses, an additional 0.7 pounds per 1,000ft² of WSN may be applied in the Fall after the perennial ryegrass overseeding is well established. The WSN must be applied as two applications not to exceed 0.35 pounds per 1,000 ft² of nitrogen each, with a minimum of 15 days between applications. Additional WSN application of 0.5 pounds per 1,000 ft² may be made in February-March to overseeded perennial ryegrass if growth and color indicate need. Alternatively, split applications of 0.5 pounds of nitrogen per 1,000 ft² each with a minimum of 15 days between applications may be applied using a material containing slowly available nitrogen sources.

Phosphorus and Potassium Recommendations Athletic Fields

Apply phosphorus (P₂O₅) and potassium (K₂O) fertilizers as indicated by a soil test using the following guidelines:

<u>Soil Test Level</u>	<u>Nutrient Needs (pounds per</u>	
	<u>1000 ft²)*</u>	
	P₂O₅	K₂O
L	2-3	2-3
M	1-2	1-2
H	0.5-1	0.5-1
VH	0	0

- * For the lower soil test level within a rating, use the higher side of the range and for higher soil test level within a rating use the lower side of the recommendation range.
- For irrigated turf grown on Naturally Occurring and Modified Sand Based soils only, up to 0.5 pounds of P₂O₅ per 1,000 ft² may be applied, if needed, to aid in recovery of damaged turf during times of extreme use. No phosphorus applications shall be made when the soil phosphorus test level is above 65% saturation, based on the soil test phosphorus values and region as listed in Table 4-1 of Section IV.
- Avoid the general use of high phosphorus ratio fertilizers such as 10-10-10 or 5-10-10, unless soil tests indicate phosphorus availability below the M+ level.

Matthew J. Strickler
Secretary of Natural Resources

Clyde E. Cristman
Director



COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

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Conservation*

Thomas L. Smith
Deputy Director of Operations

Zhongyan Xu
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Fairfax, VA 22030

9/21/2018

Subject: GMU Science and Tech Campus Nutrient Management Plan Approval

The following nutrient management plan has been reviewed by Nick Yakish and approved by the Virginia Department of Conservation & Recreation as compliant with the provisions of the Code of Virginia 10.1-104.4. Please note that this plan has not been reviewed for compliance with more restrictive requirements from other specific legislative, regulatory or incentive programs.

Plan Name	Planner	Acres	Start Date	Expiration Date
GMU Science and Tech	Marjorie Siwy	29.17	8/14/2018	8/14/2021

A copy of this letter should be kept with your nutrient management plan. Initiation of plan revision is recommended by the Department to occur at least six months prior to the expiration date. If you have any questions concerning this letter or approvals, please contact me via phone or email.

Sincerely,

A handwritten signature in blue ink, appearing to read "Nick Yakish".

Nick Yakish
Urban Nutrient Management Coordinator
Department of Conservation and Recreation
600 East Main St., 24th Floor
Richmond, Virginia 23219
(804) 389-5439
nicholas.yakish@dcr.virginia.gov

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*State Parks • Soil and Water Conservation • Outdoor Recreation Planning
Natural Heritage • Dam Safety and Floodplain Management • Land Conservation*



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September 17, 2018

Mr. Nick Yakish
Urban Nutrient Management Specialist
Virginia Department of Conservation and Recreation
600 East Main Street, 24th Floor
Richmond, Virginia 23219

**Re: Nutrient Management Plan
George Mason University
Science and Technology Campus
Manassas, Virginia**

Dear Mr. Yakish:

On behalf of George Mason University, Timmons Group has prepared this Nutrient Management Plan in accordance with the *Virginia Nutrient Management Standards and Criteria, revised July 2014*. This Nutrient Management Plan encompasses the approximately 29.17 acre area that contains turfgrass and could receive fertilizer applications at the George Mason University – Science and Technology Campus. Please find the enclosed plan for your review and approval.

Please feel free to contact me at (804) 200-6370, marjorie.siwy@timmons.com, or Bill Vest at (703) 554-6705, bill.vest@timmons.com, if you require additional information, or have any questions or additional recommendations.

Sincerely,

Timmons Group

Marjorie Siwy, WPIT
Certified Nutrient Management Planner (No. 844)

Enclosures:

George Mason University – Science and Technology Campus Nutrient Management Plan

GEORGE MASON UNIVERSITY SCIENCE AND TECHNOLOGY CAMPUS NUTRIENT MANAGEMENT PLAN

DIRECTOR OF FACILITIES

GEORGE MASON UNIVERSITY
ZHONGYAN XU, PHD, PE, CFM
PROJECT MANAGEMENT AND CONSTRUCTION, FACILITIES
703-993-4051 (P)
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NUTRIENT MANAGEMENT PLANNER INFORMATION

MARJORIE SIWY
1001 BOULDERS PARKWAY, SUITE 300
RICHMOND, VA 23225
804-200-6370 (P)
MARJORIE.SIWY@TIMMONS.COM
VIRGINIA NUTRIENT MANAGEMENT PLANNER CERTIFICATION # 844

LOCATION INFORMATION

10900 UNIVERSITY BOULEVARD
MANASSAS, VA 20110
38.757348 N
-77.519874 W
BROAD RUN-ROCKY BRANCH WATERSHED
6TH ORDER NATIONAL WETLAND BOUNDARY DATASET CODE: PL34
PRINCE WILLIAM COUNTY, VIRGINIA

ACREAGE

TOTAL TURF ACREAGE: 29.17 ACRES
MANAGEMENT AREA 1: 8.66 ACRES
MANAGEMENT AREA 2: 20.51 ACRES

PLAN START DATE: 8/14/2018

PLAN END DATE: 8/14/2021



MARJORIE SIWY



TIMMONS GROUP PROJECT No. 36158.012

**GEORGE MASON UNIVERSITY – SCIENCE AND TECHNOLOGY CAMPUS
NUTRIENT MANAGEMENT PLAN**

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FIGURES

Figure 1	Vicinity Map
Figure 2	Environmental Inventory Map
Figure 3	Environmentally Sensitive Areas Map
Figure 4	Nutrient Management Areas Map

APPENDICES

Appendix A	Soil Test Summaries
Appendix B	Nutrient Application Worksheets
Appendix C	Fertilizer Application Records
Appendix D	Reference Materials

1.0 STATEMENT OF COMPLIANCE

The George Mason University (Mason) agrees to comply with all requirements set forth in the *Nutrient Management Training and Certification Regulations 4VAC50-85*, and to follow recommendations for turf fertilization and management as described in the *Virginia Nutrient Management Standards and Criteria, revised July 2014*. This includes implementing this Nutrient Management Plan and maintaining fertilization records. All nutrient applications performed by Mason staff or associated contractors shall comply with the provisions of this Nutrient Management Plan as of August 14, 2018. This plan is effective for three years (until August 14, 2021) or until major changes to maintenance practices or grounds conditions occur. George Mason is committed to environmental sustainability and adhering to a Nutrient Management Plan in order to protect the water quality of downstream aquatic resources while optimizing the health and performance of turf species.

2.0 SITE LOCATION AND DESCRIPTION

The Mason – Science and Technology Campus (Site) is located in the central portion of Prince William County, along Prince William Parkway (State Route 234), and encompasses approximately +/- 75 acres. The Site is located approximately one mile east of the Broad Run River and contains predominately flat topography (see Figure 1: Vicinity Map). The Site generally drains south to three separate stormwater treatment BMPs located along the southern property boundary and continues draining offsite to the southeast into an unnamed tributary. This unnamed tributary drains to Cannon Branch, which ultimately flows into the Potomac River. The Site is located within the Broad Run-Rocky Branch Watershed (VAHU6 PL34) and the Piedmont physiographic province.

The Site consists of the campus buildings, twelve paved parking areas, and maintained lawns that surround the campus. All turfgrass areas onsite are dominated by tall fescue. Several areas of ornamental plantings and flowerbeds are intermittently dispersed throughout the campus.

2.1 Environmentally Sensitive Areas

All areas within the project limits were evaluated based on susceptibility of nutrient loss to ground and surface water. Two soil complexes mapped onsite include the Catlett soil series in their description. This soil series is listed as H (high) for Environmental Sensitivity Rating due to shallow soils less than 41 inches deep likely to be located over fractured or limestone bedrock. However, during the site evaluation performed by Timmons Group on June 24, 2015, no bedrock was encountered at 41 inches and therefore the soils are not considered to be consistent with the NRCS description. As a result, no areas within the site limits are categorized as environmentally sensitive as depicted in Figure 3: Environmentally Sensitive Areas Map.

Subsurface Drains: There are no subsurface tile drains located on the Site. There is a large underground stormwater conveyance system present. Surface water runoff generally drains off of the campus turf areas and impervious surfaces to this underground stormwater system via drop inlets, and outfalls directly to stormwater BMPs.

Soils: The NRCS soil survey map depicts twelve distinct soil series present onsite, the majority of which are moderately well to well drained silt loam soils. Both the Catlett-Sycoline complex, 2 to 7 percent slopes (13B) and the Catlett-Sycoline complex, 7 to 15 percent slopes (13C) are listed as H (high) for Environmental Sensitivity Rating due to shallow soils less than 41 inches deep likely to be located over fractured or limestone bedrock. However, during the site evaluation no bedrock was encountered at 41 inches and therefore the soils are not considered to be consistent with the NRCS description.

Streams and Wetlands: An intermittent stream flows southwest through the central portion of the Site to the stormwater BMP pond located adjacent to University Boulevard. This stormwater BMP drains into an unnamed tributary of Cannon Branch. No wetlands were found to be present within the site limits during the June 24, 2015 site visit. Several wetland systems and intermittent streams surround the Site as seen on Figure 3: Environmentally Sensitive Areas Map.

Other Environmentally Sensitive Areas: There were no wells, springs, sinkholes, rock outcrops, or land with slopes steeper than 15% identified during the June 24, 2015 site visit.

2.2 Fertilization Season

The recommended season of application for nitrogen fertilizers for all turf species at the Site begins on February 27 and ends on December 6, as shown below in Table 2.1 – Fertilization Season at Mason – Science and Technology Campus.

Table 2.1 – Fertilization Season at Mason – Science and Technology Campus

	Killing Frost Dates	Cool Season Applications (All Turf Areas Onsite)
Spring	April 10	February 27
Fall	October 25	December 6

3.0 SOIL SAMPLING METHODS, MANAGEMENT AREAS, AND NUTRIENT RECOMMENDATIONS

3.1 Soil Sampling Methods and Management Areas

A total of 10 soil samples were taken from campus lawns throughout the Site. Soil samples were collected from turfgrass areas at the meadow north of Beacon Hall, Beacon Hall, Hylton Performing Arts Building, Life Science/Discovery Buildings, Freedom Aquatic Center, Vivarium Trailer, Bio-Medical Research Building, Parking Areas A, B, and C, and Occoquan/Bull Run Hall lawns. At least 10 sub-samples from each area were randomly taken from within the upper four inches of soil and mixed to create a representative sample of each area. The soil samples were collected on June 18, 2018 and analyzed at the Virginia Tech soils laboratory.

These ten sample areas were categorized into two different management areas based on the soil test results and turfgrass species present. These nutrient management areas are

shown in Figure 4: Nutrient Management Areas Map. Figure 4 should be used as a reference when interpreting nutrient recommendations in Table 3.1 on pages 4 of this document.

For all the nutrient management areas, applications of inorganic fertilizers will not occur on frozen or snow-covered ground. Any fertilizers that make their way onto impervious surfaces such as parking lots or sidewalks should be swept or blown back into pervious, or turfgrass covered areas. Furthermore, fertilizers will not be used as ice melt.

3.2 Lime and Nutrient Recommendations

The lime and nutrient recommendations for the campus lawns within the Site are shown in Table 3.1: Mason – Science and Technology Campus Lime and Nutrient Recommendations on the next page. The lime and nutrient recommendations in this table are based on the *Virginia Nutrient Management Standards and Criteria, revised July 2014*. All campus lawns within Management Area 2 onsite have an appropriate pH and require no lime application, with the exception of Parking Area B. The three lawns within Management Area 1 require lime applications in order to obtain a desirable soil pH. These lime applications should be completed in small applications of up to 50 pounds, each at intervals of 1 to 6 months, until the full amount is applied in the form of ground, pulverized, or pelletized agricultural limestone.

The annual maximum nitrogen application for all turfgrass areas onsite is 3.5 lbs. per 1,000 square feet (SF). Per application rates of nitrogen vary depending on whether water soluble nitrogen (WSN) or slowly available nitrogen (SAN) fertilizers are used. WSN should be applied at a rate no greater than 0.7 lbs. per 1,000 SF at intervals no less than 30 days apart, between the dates of February 27 and December 6. SAN fertilizers can be applied at a rate no greater than 0.9 lbs. per 1,000 SF at intervals no less than 30 days apart, between the dates of February 27 and December 6. Please note that to be considered a slowly available source, the fertilizer must have at least 15% nitrogen from SAN sources.

The recommended potassium application rates in some areas are greater than the amount specified in the soil lab analyses results. At this time, potassium is not considered to be an environmental concern that negatively impacts water quality, so slight over application of this nutrient only contributes to health and vigor of turfgrass.

Table 3.1: Mason – Science and Technology Campus Lime and Nutrient Recommendations

MANAGEMENT AREA #	SOIL SAMPLE AREA	SOIL pH	LIME REC. (LBS/1000 SF)	VA Standards and Criteria** PHOSPHORUS (P ₂ O ₅) REC. (LBS/1,000 SF)	VA Standards and Criteria** POTASSIUM (K ₂ O) REC. (LBS/1,000 SF)	PHOSPHORUS (P ₂ O ₅) REC. (LBS/1,000 SF)	POTASSIUM (K ₂ O) REC. (LBS/1,000 SF)
1	Bio Medical Research Center (PW-9)	6.1	70	2.5	3	2	2
	Meadow Area (PW-1)	6.2	50	3	1.5	2	2
	Vivarium Trailer (PW-8)	6.2	60	2.5	1.5	2	2
2	Freedom Aquatic Center (PW-7)	7.0	0	1.5	1	1	1
	Hylton Performing Arts and Beacon Hall (PW-3)	7.0	0	2	1.5	1	1
	Life Sciences and Discovery Buildings (PW-4)	7.0	0	2	0.5	1	1
	Occoquan Building and Bull Run Hall (PW-10)	6.4	0	1	1	1	1
	Parking Area A (PW-2)	6.7	0	1.5	0.5	1	1
	Parking Area B (PW-5)	6.2	50	1.5	1	1	1
	Parking Area C (PW-6)	7.5	0	1	1	1*	1

**These nutrient needs are the exact needs of the soil at each particular soil sampling area. These values were averaged and grouped into two nutrient recommendations based on soil nutrient need similarities to create a more easily implemented nutrient management plan, seen in the last two columns of the table.

*Due to high phosphorus levels, fertilizers in the form of 10-10-10 or 5-10-10 should not be used.

- Agricultural limestone (ground, pulverized, or pelletized) should be broadcast in small applications of up to 50 lbs. per 1000 SF, at intervals of 1 to 6 months, until the full amount is applied.
- Nitrogen applications may not exceed 3.5 lbs per 1,000 SF annually.
- No more than 0.7 lbs of WSN or 0.9 lbs of WIN per 1,000 SF, may be applied within a 30 day period.

3.4 Ornamental Landscape

During soil sampling it was observed that the *in situ* soil profile beneath the flower beds and ornamental landscape areas were generally the same as adjacent turf areas. Additionally, the ornamental flower beds, trees, and shrubs are fertilized upon installation and on an as-needed basis. It is recommended that the soil test results of nearby turf areas be considered when applying fertilizer to ornamental planting areas. Nutrient needs in the ornamental landscapes are variable and dependent on a variety of factors including maintenance objectives, the age of the plant, plant stress levels, and a visual inspection of the plant. Tables of recommended fertilization rates for newly planted and established ornamentals are included in Appendix D: References.

4.0 MAINTENANCE OF PLAN

This Nutrient Management Plan will be maintained by Mason and will expire on August 14, 2021. To maintain your plan, please note that soil tests need to be collected at least once every three years. As part of this plan, fertilizer application records shall be recorded and maintained (see Appendix C: Fertilizer Application Records). If significant changes to the Site occur, this plan is required to be updated accordingly by a Virginia Certified Nutrient Management Planner. Significant changes would include: changing turf species in the campus

grounds, renovating a lawn or the existing underlying soil, creation of athletic fields, expansion of the area to be included under this Nutrient Management Plan or other changes that could alter nutrient recommendations and timing.

5.0 NUTRIENT APPLICATION, INCORP., AND SPECIAL CONDITIONS

There are multiple drop inlets associated with the underground stormwater system onsite. This drainage system ultimately outfalls to several stormwater BMPs that are designed to remove sediment and nutrients from stormwater. Special care should be taken to avoid applying fertilizers directly on top of drop inlet structures. No fertilizer should be applied to stormwater BMPs as these facilities already receive excess nutrients during stormwater events. Nutrient applications should not be completed when a significant runoff producing events are anticipated. Applying only water insoluble nitrogen, or slowly available forms of nitrogen, will help minimize the nutrient loss potential.

Special care should be taken when applying fertilizers near impervious surfaces, streams, and wetlands. Allowing vegetation to grow taller near stream and wetland areas would help prevent offsite nutrient loss that could result from fertilizer application errors, or significant runoff producing storm events.

6.0 REFERENCES

VADCR. November 2014. Nutrient Management Training and Certification Regulations 4VAC50-85. Virginia Soil and Water Conservation Board.

VADCR. July 2014. Virginia Nutrient Management Standards and Criteria. Division of Soil and Water Conservation: Richmond, VA.

Virginia Cooperative Extension. May 2011. Urban Nutrient Management Handbook. Funding by: VADCR; Produced by: Virginia Polytechnic Institute and State University.

FIGURES

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U.S.G.S. QUADRANGLE(S): *GAINESVILLE*
DATE(S): *2016*
WATERSHED(S): *MIDDLE POTOMAC-ANACOSTIA-OCCHOQUAN (POTOMAC RIVER BASIN)*
HYDROLOGIC UNIT CODE(S): *02070010*

Prince William Soils	
Mapunit Symbol	Mapunit Name
13B	Catlett-Sycoline complex, 2 to 7 percent slopes
13C	Catlett-Sycoline complex, 7 to 15 percent slopes
17A	Dulles silt loam, 0 to 2 percent slopes
28C	Haymarket silt loam, 7 to 15 percent slopes
30B	Jackland silt loam, 2 to 7 percent slopes
31B	Jackland-Haymarket complex, 2 to 7 percent slopes
32A	Kelly silt loam, 0 to 2 percent slopes
35B	Manassas silt loam, 2 to 7 percent slopes
3A	Albano silt loam, 0 to 4 percent slopes
43D	Nestoria gravelly silt loam, 7 to 25 percent slopes
46B	Panorama silt loam, 2 to 7 percent slopes
48A	Reaville silt loam, 0 to 4 percent slopes
4B	Arcola silt loam, 2 to 7 percent slopes
53B	Sycoline-Kelly complex, 2 to 7 percent slopes
53C	Sycoline-Kelly complex, 7 to 15 percent slopes
56A	Waxpool silt loam, 0 to 2 percent slopes
5C	Arcola-Nestoria complex, 7 to 15 percent slopes
W	Water

Legend

Project Study Limits - 75.4 Acres

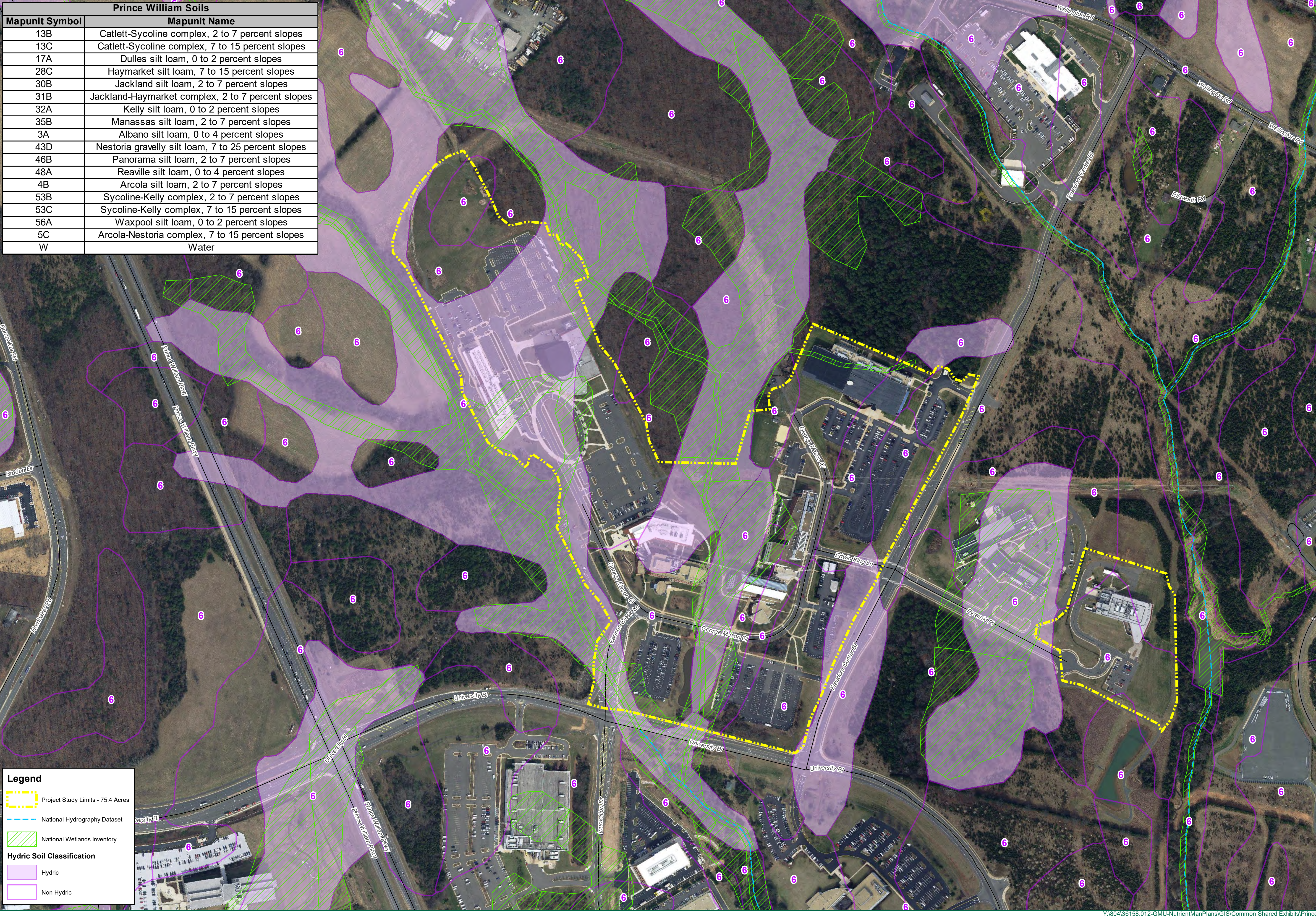
National Hydrography Dataset

National Wetlands Inventory

Hydric Soil Classification

Hydric

Non Hydric



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**MASON SCIENCE AND TECHNOLOGY CAMPUS -
NUTRIENT MANAGEMENT PLANS**
PRINCE WILLIAM COUNTY,
VIRGINIA

DATE07/16/2018

PROJECT NUMBER36158.012

PROJECT NAMEMASON SCIENCE AND TECHNOLOGY

DESIGNED BY / DRAWN BYA. MEHFOUD

NOTES:
Project Limits are approximate.
NWI from US Fish and Wildlife Service.
Soils data from SSURGO.
National Hydrography Dataset from USGS.
Aerial imagery from VGIN.

REVISIONS	
#	DESCRIPTION

DRAWING DESCRIPTION

**FIGURE 2:
ENVIRONMENTAL
INVENTORY MAP**

SCALE (FEET)

0200400

PLANS PRINTED AS 11X17 ARE HALF SCALE

SCALE

H:1" = 200'

SHEET NUMBER

1



Legend

Project Limits - 75.4 acres

Environmentally Sensitive Areas - Not Present

Wetlands

Streams

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PROJECT NAME & LOCATION

MASON SCIENCE AND TECHNOLOGY CAMPUS -
NUTRIENT MANAGEMENT PLANS

PRINCE WILLIAM COUNTY,
VIRGINIA

DATE

07/16/2018

PROJECT NUMBER

36158.012

PROJECT NAME

MASON SCIENCE AND TECHNOLOGY

DESIGNED BY / DRAWN BY

A. MEHFOUD

NOTES:
Project Limits are approximate.
NWI from US Fish and Wildlife Service.
National Hydrography Dataset from USGS.
Aerial imagery from VGIN.

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REVISIONS	
#	DESCRIPTION

DRAWING DESCRIPTION

FIGURE 3:
ENVIRONMENTALLY SENSITIVE AREAS MAP

SCALE (FEET)

0150300

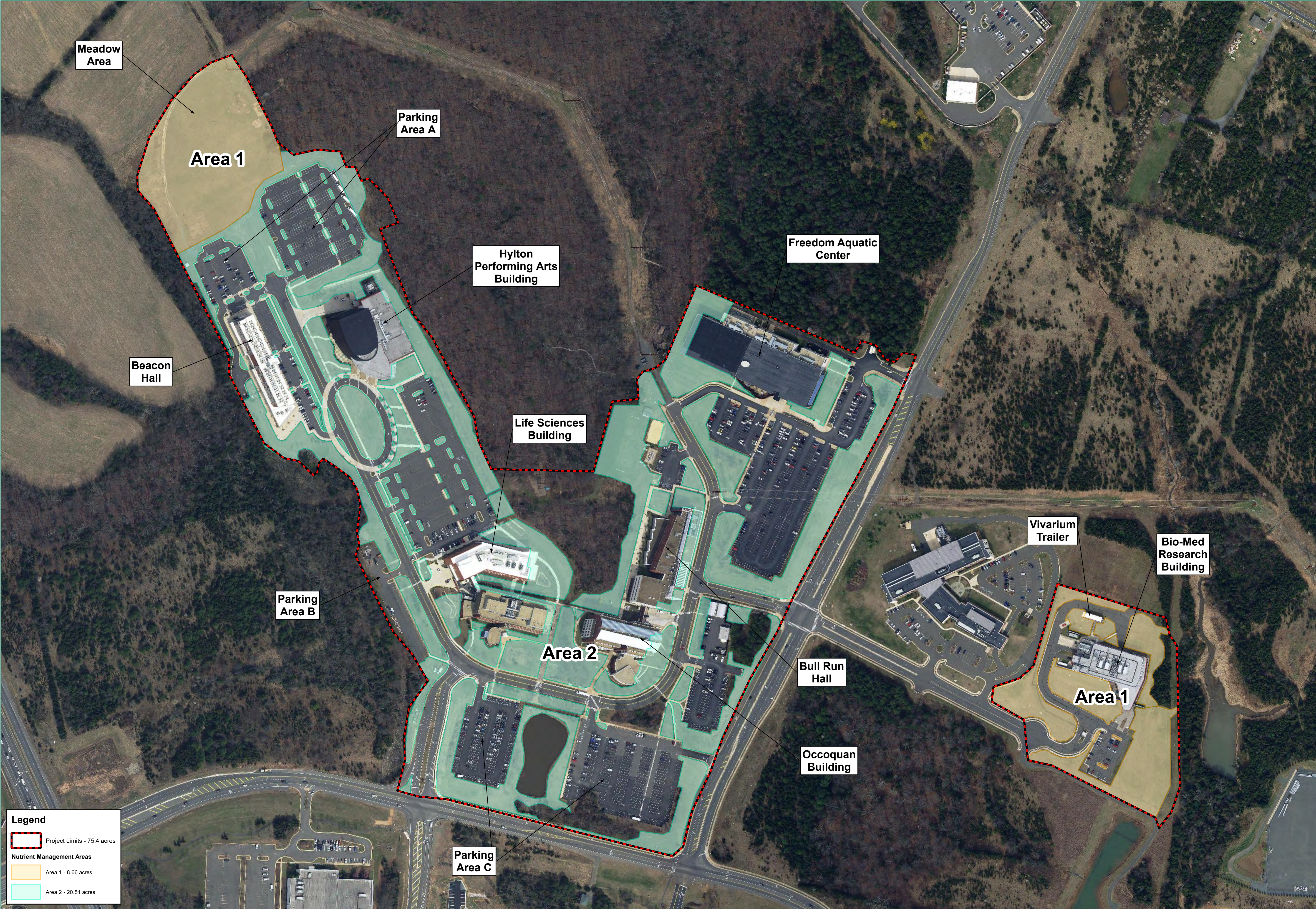
PLANS PRINTED AS 11X17 ARE HALF SCALE

SCALE

SHEET NUMBER

H:1" = 150'

1



Legend

Project Limits - 75.4 acres

Nutrient Management Areas

Area 1 - 8.66 acres

Area 2 - 20.51 acres

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NUTRIENT MANAGEMENT PLANS**
PRINCE WILLIAM COUNTY,
VIRGINIA

DATE	07/16/2018
PROJECT NUMBER	36158.012
PROJECT NAME	MASON SCIENCE AND TECHNOLOGY
DESIGNED BY / DRAWN BY	A. MEHFOUD

NOTES:
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REVISIONS	
#	DESCRIPTION

DRAWING DESCRIPTION
FIGURE 4:
NUTRIENT
MANAGEMENT
AREAS MAP

SCALE (FEET)

0 150 300

PLANS PRINTED AS 11X17 ARE HALF SCALE

SCALE

H:1" = 150'

SHEET NUMBER

1

APPENDIX A
SOIL TEST SUMMARIES

Soil Test Summary - Campus Lawns

Customer Name:	Mason - Science and Technology Campus
Testing Lab:	Virginia Tech Soil Testing Laboratory
Sample Date:	6/18/2018
Planner Name:	Marjorie Siwy
Certification Number:	Certification #: 844

Managed Area ID	Soil pH	Buffer pH	Lab Test P (ppm)	Lab Test P (lbs/A)	VT (H/M/L)	Lab Test K (ppm)	Lab Test K (lbs/A)	VT (H/M/L)	Species
Bio Medical Research Center (PW-9)	6.1	6.21	3	6	L	38	76	M-	Tall Fescue
Freedom Aquatic Center (PW-7)	7.0	6.60	13.5	27	M	86.5	173	M+	Tall Fescue
Hylton Performing Arts and Beacon Hall (PW-3)	7.0	6.60	10	20	M-	59.5	119	M	Tall Fescue
Life Sciences and Discovery Hall (PW-4)	7.0	6.60	9.5	19	M-	107	214	H	Tall Fescue
Meadow Area (PW-1)	6.2	6.27	1.5	3	L-	68.5	137	M	Tall Fescue
Occoquan and Bull Run Hall (PW-10)	6.4	6.28	11.5	23	M	80	160	M+	Tall Fescue
Vivarium (PW-8)	6.2	6.22	2	4	L	59.5	119	M	Tall Fescue
Parking Area A (PW-2)	6.7	6.36	11	22	M	120	240	H	Tall Fescue
Parking Area (PW-5)	6.2	6.25	14.5	29	M	95	190	H-	Tall Fescue
Parking Area C (PW-6)	7.5	6.60	23.5	47	H-	100.5	201	H-	Tall Fescue

Notes:

APPENDIX B
NUTRIENT APPLICATION WORKSHEETS

NAME:	Mason - Science and Technology Campus					
Prepared:	8/14/18				Species:	Tall Fescue
Expires:	8/14/21					
Management Area	Application Month/Day	# of Apps	Application Interval	Fertilizer Type	Total NPK lbs/1000ft²	
Management Area #1 (8.66 acres)					N - P ₂ O ₅ - K ₂ O	
	2/27 to 3/30	1		Water Soluble	0.70 - 1.00 - 1.00	
	8/15 to 12/6	4	> 30 days	Water Soluble	0.70 - 0.25 - 0.25	
	*Recommended Total Annual Application				3.50 - 2.00 - 2.00	
Management Area #2 (20.51 acres)	2/27 to 3/30	1		Water Soluble	0.70 - 0.00 - 0.00	
	8/15 to 12/6	4	> 30 days	Water Soluble	0.70 - 0.25 - 0.25	
	*Recommended Total Annual Application				3.50 - 1.00 - 1.00	
Notes:	<p>*The fertilizer recommendations listed above can be in the form of several different fertilizer products. If water soluble nitrogen (WSN) fertilizer is used, applications will not occur within 30 days of one another and must not exceed 0.7 lbs/1,000 sq. ft. If slowly available forms of nitrogen (SAN) are used the fertilizer can be applied at a rate of 0.9 lbs/1,000 sq. ft. at intervals at least 30 days apart between 2/27 and 12/6. Please note that slowly available fertilizers must have at least 15% nitrogen from SAN sources. Regardless of the fertilizer type used, the 3.5 lb. per 1000 SF annual nitrogen threshold is not to be exceeded.</p> <p>*Phosphorus application in Management Area #2 should not take place in the form of 10-10-10 or 5-10-10 fertilizers in this management area due to high content of phosphorus in the soil already.</p>					
Management Area #1 Lime Recommendations:	Meadow Area (PW-1): This soil sampling area requires 50 lbs of agricultural lime (ground, pulverized, or pelletized) per 1,000 sq. ft.. This amount can take place in one application.					
	Vivarium Lawn (PW-8): This soil sampling area requires 60 lbs of agricultural lime (ground, pulverized, or pelletized) per 1,000 sq. ft.. This lime application should take place in at least two applications of 50 lbs per 1,000 sq. ft. or less, at intervals of 1 to 6 months, until the full 60 lb. amount is applied.					
	Bio Medical Research Center (PW-9): This soil sampling area requires 70 lbs of agricultural lime (ground, pulverized, or pelletized) per 1,000 sq. ft.. This lime application should take place in at least two applications of 50 lbs per 1,000 sq. ft. or less, at intervals of 1 to 6 months, until the full 70 lb. amount is applied.					
Management Area #2 Lime Recommendations:	Parking Area B (PW-5): This soil sampling area requires 50 lbs of agricultural lime (ground, pulverized, or pelletized) per 1,000 sq. ft.. This lime amount can take place in one application.					
Note: The remaining areas have a sufficient soil pH and do not require any lime application. Soil tests can be conducted annually to determine if lime applications are warranted in years 2 and 3 of this nutrient management plan.						

APPENDIX C
FERTILIZER APPLICATION RECORDS

Fertilizer Application Records

Fertilizer Application Records									
Customer Information					Management Area Information				
Name:	Mason - Science and Technology Campus				Management Area ID:				
Address:	10900 University Boulevard,				Management Area Size:				
	Manassas, VA 20110				Plant Species:				
					Notes:				
Phone #:									
Date (M/D/Y)	Supervisor/Applicator	Weather Conditions			Fertilizer Analysis	Rate	Amount Fertilizer Used	Application Equipment Used	
		Temp	Wind Speed	Precip					

When was the last time your fertilizer equipment was calibrated???

For information on calibration see Chapter 10 of the "Urban Nutrient Management Handbook".

Available for download at <http://pubs.ext.vt.edu/430/430-350/430-350.html>

APPENDIX D
REFERENCE MATERIALS

Table 7.4. Recommended fertilization rates for newly planted ornamental plants during the first growing season (use only one of the fertilizers listed at the rate recommended).

Plant type/size	12-4-8	16-4-8	10-10-10	Application frequency
	Application rate*/plant			
1-gallon shrubs	1 tsp	1 tsp	1 tbsp	March, May, July
3-gallon shrubs	2 tsp	2 tsp	2 tbsp	March, May, July
5-gallon shrubs	3 tsp	3 tsp	3 tbsp	March, May, July
Trees under 4 feet	1 tbsp	1 tbsp	2 tbsp	March, July
Trees 4-6 feet	3 tbsp	3 tbsp	5 tbsp	March, July
Trees 6-8 feet	4 tbsp	4 tbsp	6 tbsp	March, July
Application rate 100/sq ft				
Ground covers, annuals, and herbaceous perennials	0.5 lb	0.5 lb	1.0 lb	Each 4-6 weeks

Source: Georgia Cooperative Extension bulletin 1065 (2009).* When using slow-release or soluble fertilizers, follow label recommendations for application rate.

Table 7.5. Recommended application rates of various general-purpose granular fertilizers on established ornamental plants in the landscape.

Source	Application rate ^a				
	1,000 sq ft		100 sq ft		10 sq ft
	Pounds	Cups	Pounds	Cups	Tablespoons
10-10-10	10.0	20.0	1.0	2.0	4.0
8-8-8	12.5	25.0	0.5	2.5	5.0
13-13-13	6.0	12.0	0.75	1.5	3.0
12-3-6	6.0	12.0	0.75	1.5	3.0
12-4-8	6.0	12.0	0.75	1.5	3.0
12-6-6	6.0	12.0	0.75	1.5	3.0
16-4-8	6.0	12.0	0.5	1.0	2.0
4-12-12	25.0	50.0	2.5	5.0	10.0
5-10-10	20.0	40.0	2.0	4.0	8.0

Source: Georgia Cooperative Extension bulletin 1065 (2009).

^aThis rate will supply 1 pound of actual nitrogen per 1,000 square feet. For optimum growth of young shrubs, ground covers, and trees, three to five applications are recommended at six- to 10-week intervals from March to August. Application frequency varies with the amount of slow-release nitrogen in the product, so consult the label for specific recommendations. Established trees and shrubs will benefit from one to two applications during the growing season. Annual flowers and roses should receive applications at four- to six-week intervals from March to August. When using slow-release or specialty fertilizers, follow the manufacturer's recommendation on the container.

Section VI. Turfgrass Nutrient Recommendations for Home Lawns, Office Parks, Public Lands and Other Similar Residential/Commercial Grounds

Definitions

For the purposes of this section, the following definitions, as presented by the Association of American Plant Food Control Officials (AAPFCO), apply:

"Enhanced efficiency fertilizer" describes fertilizer products with characteristics that allow increased plant nutrient availability and reduce the potential of nutrient losses to the environment when compared to an appropriate reference product.

"Slow or controlled release fertilizer" means a fertilizer containing a plant nutrient in a form which delays its availability for plant uptake and use after application, or which extends its availability to the plant significantly longer than a reference "rapidly available nutrient fertilizer" such as ammonium nitrate, urea, ammonium phosphate or potassium chloride. A slow or controlled release fertilizer must contain a minimum of 15 percent slowly available forms of nitrogen.

"Water soluble nitrogen", "WSN" and "readily available nitrogen" means: Water soluble nitrogen in either ammonical, urea, or nitrate form that does not have a controlled release, or slow response.

Recommended Season of Application For Nitrogen Fertilizers - Applies to all Turf

A nitrogen fertilization schedule weighted toward fall application is recommended and preferred for agronomic quality and persistence of cool season turfgrass; however, the acceptable window of applications is much wider than this for nutrient management. The nutrient management recommended application season for nitrogen fertilizers to cool season turfgrasses begins six weeks prior to the last spring average killing frost date and ends six weeks past the first fall average killing frost date (see Figures 6-1 & 6-2). Applications of nitrogen during the intervening late fall and winter period should be avoided due to higher potential leaching or runoff risk, but where necessary, apply no more than 0.5 pounds per 1,000 ft² of water soluble nitrogen within a 30 day period. Higher application rates may be used during this late fall and winter period by using materials containing slowly available sources of nitrogen, if the water soluble nitrogen contained in the fertilizer does not exceed the recommended maximum of 0.5 pounds per 1,000 ft² rate. Do not apply nitrogen or phosphorus fertilizers when the ground is frozen.

The acceptable nitrogen fertilizer application season for non-overseeded warm season turfgrass begins no earlier than the last spring average killing frost date and ends no later than one month prior to the first fall average killing frost date (see Figures 6-1 & 6-2).

Figure 6-1

VIRGINIA

AVERAGE DATES OF FIRST
KILLING FROST IN FALL

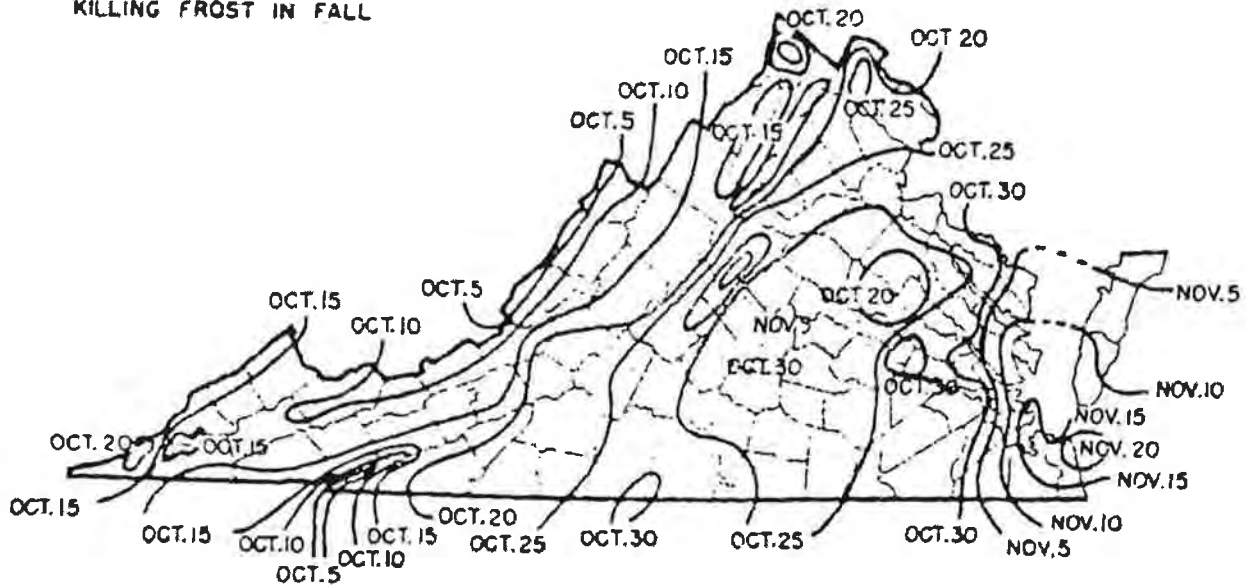
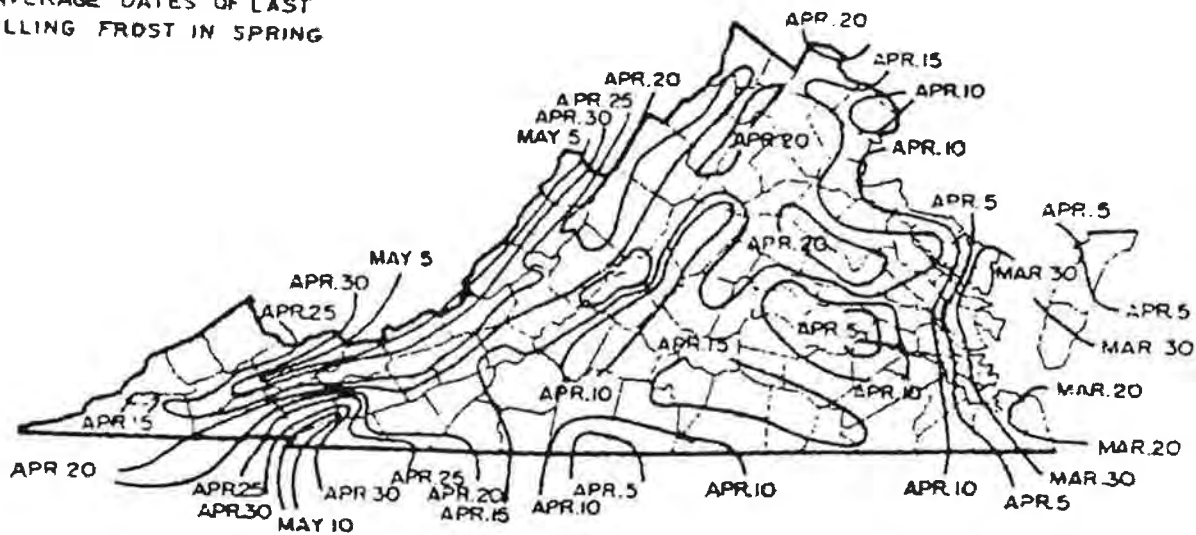


Figure 6-2

VIRGINIA

AVERAGE DATES OF LAST
KILLING FROST IN SPRING



Per Application Rates

Do not apply more than 0.7 pounds of water soluble nitrogen per 1,000 ft² within a 30 day period. For cool season grasses, do not apply more than 0.9 pounds of total nitrogen per 1,000 ft² within a 30 day period. For warm season grasses, do not apply more than 1.0 pounds of total nitrogen per 1,000 ft² within a 30 day period. Lower per application rates of water soluble nitrogen sources or use of slowly available nitrogen sources should be utilized on very permeable sandy soils, shallow soils over fractured bedrock, or areas near water wells.

Annual Application Rates for Home Lawns and Commercial Turf

Up to 3.5 pounds per 1,000 ft² of nitrogen may be applied annually to cool season grass species or up to 4 pounds per 1,000 ft² may be applied annually to warm season grass species using 100 percent water soluble nitrogen sources. Lower rates of nitrogen application may be desirable on those mature stands of grasses that require less nitrogen for long-term quality. As a result, lower application rates will probably be more suited to the fine leaf fescues (hard fescue, chewings fescue, creeping red fescue, and sheep fescue) and non-overseeded zoysiagrass. Lower rates should also be used on less intensively managed areas.

Use of Slowly Available Forms of Nitrogen

For slow or controlled release fertilizer sources, or enhanced efficiency fertilizer sources, no more than 0.9 pounds of nitrogen per 1,000 ft² may be applied to cool season grasses within a 30 day period and no more than 1.0 pounds of nitrogen per 1,000 ft² may be applied to warm season grasses within a 30 day period.

Provided the fertilizer label guarantees that the product can be used in such a way that it will not release more than 0.7 pounds of nitrogen per 1,000 ft² in a 30 day period, no more than 2.5 pounds of nitrogen per 1,000 ft² may be applied in a single application. Additionally, total annual applications shall not exceed 80 percent of the annual nitrogen rates for cool or warm season grasses.

Phosphorus and Potassium Nutrient Needs (Established Turf)

Apply phosphorus (P₂O₅) and potassium (K₂O) fertilizers as indicated necessary by a soil test using the following guidelines:

Soil Test Level	Nutrient Needs (pounds per 1000 ft ²) *	
	P ₂ O ₅	K ₂ O
L	2-3	2-3
M	1-2	1-2
H	0.5-1	0.5-1
VH	0	0

- * For the lower soil test level within a rating, use the higher side of the range and for higher soil test level within a rating use the lower side of the recommendation range. (For example the recommendation for a P₂O₅ soil test level of L- would be 3 pounds per 1,000 ft².)

Do not use high phosphorus ratio fertilizers such as 10-10-10 or 5-10-10, unless soil tests indicate phosphorus availability below the M+ level.

Appendix L:

SWPPP

**Stormwater Pollution Prevention Plan
For
Facilities Operations
George Mason University**



Prepared for:
George Mason University
Civil and Environmental Engineering Division
4400 University Drive MSN 2C1
Fairfax, Virginia 22030

THIS DOCUMENT SHALL BE UPDATED AS NEEDED AND KEPT ON SITE

6/30/2016

Prepared by:
Kimley»Horn
(757) 213-8600

KHA No. 110465002

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1 INTRODUCTION

1.1 BACKGROUND

In 1972, Congress passed the Federal Water Pollution Control Act (FWPCA), also known as the Clean Water Act (CWA), to restore and maintain the quality of the nation's waterways. The ultimate goal was to ensure that rivers and streams were fishable, swimmable, and drinkable. In 1987, the Water Quality Act (WQA) added provisions to the CWA that allowed the EPA to govern stormwater discharges from industrial activities.

George Mason University (Mason) operates their Municipal Separate Storm Sewer System (MS4) under the Virginia Stormwater Management Program (VSMP) General Permit number VAR040106 issued July 1, 2013.

Part I B 6. b. (3) of the Commonwealth of Virginia's MS4 General Permit, states "the [George Mason University] shall develop and implement specific stormwater pollution prevention plans (SWPPPs) for all high-priority facilities identified in subdivision 2 of this subsection". Subdivision 2 relates to high priority municipal facilities.

High priority municipal facilities are facilities owned and operated by Mason and include one or more of the following activities:

- Composting facilities
- Equipment storage and maintenance facilities;
- Material storage yards;
- Pesticide storage facilities;
- Public works yards;
- Recycling facilities;
- Salt storage facilities;
- Solid waste handling and transfer facilities; and,
- Vehicle storage and maintenance yards.

A high priority facility is considered to have a high potential of discharging pollutants if and of the following activities occur and are expected to have exposure to stormwater resulting from rain, snow, snowmelt or runoff:

- Areas where residuals from using, storing or cleaning machinery or equipment remain and are exposed to stormwater;

- Materials or residuals on the ground or in stormwater inlets from spills or leaks;
- Material handling equipment (except adequately maintained vehicles) (e.g. fork lifts, material loaders, cranes, etc.);
- Materials or products that would be expected to be mobilized in stormwater runoff during loading/unloading or transporting activities (e.g., rock, salt, fill dirt);
- Materials or products stored outdoors (except final products intended for outside use where exposure to stormwater does not result in the discharge of pollutants);
- Materials or products that would be expected to be mobilized in stormwater runoff contained in open, deteriorated or leaking storage drums, barrels, tanks, and similar containers;
- Waste material except waste in covered, non-leaking containers (e.g., dumpsters);
- Application or disposal of process wastewater (unless otherwise permitted); or
- Particulate matter or visible deposits of residuals from roof stacks, vents or both not otherwise regulated (i.e., under an air quality control permit) and evident in the stormwater runoff.

The Maintenance Storage Yard at George Mason University conducts multiple activities that categorize it as a high priority facility requiring a SWPPP. These activities include; storage of salt and building aggregates; storage of recyclables; vehicle maintenance services; and several others. The facility has a high potential for discharges into the stormwater system due to several of these activities occurring in areas that are not under cover and protected from rainfall events.

In addition to the Maintenance Storage Yard mentioned above Mason also has two satellite facilities that are covered by this SWPPP, the West Campus Yard and the Facilities Management site at the Prince William Science and Technology Campus in Manassas. The West Campus site has bulk material storage that is not covered and parking of Mason vehicles and snow plows. The Science and Technology has activities involving the parking of vehicles and snow plows.

This SWPPP identifies stormwater discharges at the facility, actual and potential sources of stormwater contamination, and describes the implementation of both structural and non-structural best management practices (BMPs) to reduce the pollutants contained in stormwater runoff discharging into receiving waters to the maximum extent practicable, and to meet water quality standards.

Development, implementation, and maintenance of the SWPPP provides Mason with the tools to reduce pollutants contained in stormwater discharges. The primary goals of the SWPPP are to:

- Identify potential sources of pollutants that affect stormwater discharges from the site;
- Describe the practices to prevent or control the release of pollutants in stormwater discharges; and,
- Create an implementation schedule to ensure that the practices described in this SWPPP are in fact implemented and to evaluate the plan's effectiveness in reducing the pollutant levels in stormwater discharges.

1.2 SWPPP CONTENT

This SWPPP includes all of the following:

- An existing site description that includes a site map identifying all outfalls, direction of flows, existing source controls and receiving water bodies;
- A discussion and checklist of potential pollutants and pollutant sources;
- A discussion of potential non-stormwater discharges;
- A maintenance schedule for existing source controls;
- Policies and procedures implemented at the facility to ensure source reduction;
- An inspection schedule and checklist;
- Appropriate training requirements;
- Procedures to conduct required stormwater discharge monitoring and reporting as applicable;
- Procedures to conduct an annual comprehensive site compliance evaluation;
- Procedures to conduct dry weather screening; and
- SWPPP modifications made as the result of any reportable release or spill.

2 SWPPP IMPLEMENTATION

2.1 SWPPP COORDINATOR

Zhongyan (Jane) Xu is the SWPPP Coordinator for the facility. The Coordinator's duties include the following:

- Create a SWPPP team to aid in the implementation of the SWPPP plan;
- Implement the SWPPP;
- Oversee maintenance practices on BMPs identified in the SWPPP;

- Implement and oversee employee training;
- Conduct or provide inspection and monitoring activities;
- Identify other potential pollutant sources and make sure they are added to the plan;
- Identify any deficiencies in the SWPPP and make sure they are corrected;
- Prepare and submit reports as required by the MS4 reporting procedures; and
- Ensure that any changes in facility operation are addressed in the SWPPP.

The SWPPP Coordinator will maintain the SWPPP document and update the SWPPP based on site conditions. The SWPPP Coordinator will maintain records of spills or discharges of petroleum, fuels or lubricants. As the George Mason University Facilities Civil and Environmental Engineering Division (the VPDES Administrator) is responsible for compliance with the MS4 permit, they will be informed of any spills or unauthorized discharges to surface waters or the stormwater system within 2 hours of discovery. The VPDES Administrator will report these to the appropriate agency pursuant to 62.1-44.34:19 if they exceed the reportable quantities of 25 gallons to soil, or any amount to state waters or the storm sewer system that cause a sheen on the surface of the water.

2.2 SWPPP TEAM

To aid in the implementation of the SWPPP, the SWPPP Coordinator will be supported by a SWPPP Team. The members of the SWPPP team will be identified by the SWPPP Coordinator and membership logs are maintained in **Appendix D** of this document.

The SWPPP team shall, as requested by the coordinator, undertake the following:

- Attend trainings;
- Report problems to SWPPP coordinator,
- Assign responsibilities with departments,
- Review modifications to this document and corresponding procedural operations; and,
- Provide assistance on other activities as requested by the SWPPP Coordinator.

3 EXISTING SITE CONDITIONS

3.1 FACILITY LOCATION

The Mason main campus contains the Maintenance Storage Yard in Fairfax, VA. **Figure 1.1** depicts the regional vicinity and location of the facility (**Appendix A**) and its location within the larger Mason campus area. **Figures 1.2 and 1.3** show the locations of the satellite facilities on the West Campus and the Prince William Science and Technology campus respectively.

3.2 SITE DESCRIPTION

3.2.1 *George Mason Maintenance Storage Yard*

The George Mason Maintenance Storage Yard site is approximately 8.24 acres on the main campus of Mason. It is bordered by Patriot Circle to the west, Staffordshire Lane to the north, Shenandoah Lane to the south, and a stormwater detention and Roberts Road to the east. The site is approximately 80% impervious and 20% pervious (dirt, grass, or gravel). It contains the operations of several different departments including: Environmental Health and Safety, Grounds Maintenance, Facilities Management, and the Heating and Cooling Plant.

Stormwater exiting the Mason Maintenance Storage Yard drains to an existing extended detention pond and then northeast to Pohick Creek.

3.2.2 *West Campus Yard*

The West Campus Yard is a satellite maintenance yard to the main Mason facilities area. The site is approximately 0.39 acres and consists of two small buildings and a parking area. The site is bordered to the north by Rapidan River Road, to the East by Campus Drive, and to the west by the Softball Stadium (Field #2). The majority of the facility is impervious and discharges through a ditch system and grassy areas before ultimately draining to tributaries of Popes Head Creek.

3.2.3 *Prince William Facilities Management Site*

The Prince William Science and Technology campus contains a small Facilities Management site located in Manassas, VA. The site consists of 0.43 acres of mostly impervious areas consisting of a parking lot and three buildings. It is bordered by Edwin King Lane to the north, Freedom Center Boulevard to the east, the King Parking Lot to the south, and George Mason Circle to the west. The site drains to a tributary to Broad Run via sheet flow through an adjacent parking lot.

3.3 SITE ACTIVITIES

3.3.1 *George Mason Maintenance Storage Yard*

The Mason Maintenance Storage Yard site houses a wide variety of services and activities including: storage of soil and sand; concrete aggregate; storage of grounds maintenance equipment including lawn mowers and grounds maintenance vehicles; storage of salvage parts in freight containers; storage of appliances while awaiting transport to offsite recycling or other facilities; recyclables; storage of snow plow accessories; storage of ice melt/salt; storage of hazardous waste; automotive repair; and the Mason heating and cooling plant.

Specific activities on the site include Environmental Health and Safety's (EHS) Central Accumulation and Storage Area which houses recyclable storage and hazardous waste accumulation, a salvage equipment parts storage, and bulk material storage including soil and sand, salt / ice melt storage, and Mason's central heating and cooling plant. Parking of Mason vehicles including maintenance, facilities, and grounds maintenance vehicles is common at the site. Adjacent to the maintenance garage there is an aboveground storage tank for waste oil and drums for the storage of waste antifreeze and waste oil filters.

Adjacent to the EHS Central Accumulation and Storage Area there is an above ground gasoline tank, an above ground diesel fuel tank, and there are two, 30,000 gallon above ground fuel oil #2 tanks that are used to fuel the heating and cooling plant on the opposite end of the site. The maintenance garage bays have floor drains that are connected to the sanitary sewer and an exterior wash bay also has drainage going to sanitary sewer through an oil/water separator. The central heating and cooling plant have floor drains that are connected to the sanitary sewer system. All other inlets and drains discharge to Mason's stormwater conveyance system.

Areas of activity are located on **Figure 2.1**.

3.3.2 West Campus Yard

The West Campus Yard is consists of two small buildings, a parking area for maintenance vehicles, snow plows, and lawn mowers and other grounds equipment, and bulk landscaping and athletic field maintenance material storage bins on the northern side of the facility. The majority of the facility is impervious and drains to a tributary of Popes Head Creek.

Areas of activity are located on **Figure 2.2**.

3.3.3 Prince William Facilities Management Site

The Prince William Science and Technology campus also has a small satellite maintenance yard with activities including snow plow, ground maintenance, and general vehicle parking and storage. The site consists of 0.43 acres of mostly impervious areas including the parking lot and three buildings. The site drains via sheet flow through a parking lot to the south of the yard to a tributary of Broad Run.

Areas of activity are located on **Figure 2.3**.

3.4 STORM WATER DRAINAGE SYSTEM

Figures 3.1, 3.2, and 3.3 identify onsite outfall locations, directions of flow, and receiving water bodies. A summary of drainage area sizes, runoff coefficients, and discharge locations is shown in **Table 1**. The individual drainage areas are further described in **Section 4.2**.

3.4.1 George Mason Maintenance Storage Yard

The Maintenance Storage Yard is divided into four (4) drainage areas as shown on **Figure 3.1**. Drainage Area 1 (DA-1) is the northwest corner of the site bordered by Patriot Circle and Staffordshire Lane including the administration building and a portion of the eastern heating and cooling plant building. Drainage Area 2 (DA-2) is the northern area including the automotive services and grounds maintenance area. DA-2 does not include the vehicle wash bay as this drains to the sanitary sewer system. Drainage Area 3 (DA-3) includes the rest of the heating and cooling plant including the above ground oil tanks for the generators, and also includes the central warehouse building. Drainage Area 4 (DA-4) is the eastern part of the site and includes the recyclables area, some storage of landscape materials, salt storage containers stored temporarily in the parking lot area, and the spare parts area.

3.4.2 West Campus Yard

The West Campus Yard has a single drainage area and is identified as DA-WC (**Figure 3.2**).

3.4.3 Prince William Facilities Management Site

Prince William Facilities Management site has a single drainage area is identified as DA-PW (**Figure 3.2**).

Table 1: Stormwater Drainage Areas				
Drainage Area Number	Drainage Area Size (ac)	Runoff Coefficient (C)	Drainage Area Discharge Location	Outfall Number
DA-1	1.73	89	Pohick Creek	001
DA-2	2.29	93	Pohick Creek	002 / 002a
DA-3	2.65	95	Pohick Creek	003
DA-4	1.57	92	Pohick Creek	N/A (Sheet flow)
DA-WC	0.39	98	Popes Head Creek	WC-001
DA-PW	0.43	98	Broad Run	N/A (Sheet flow)

3.4.4 Allowable Discharges to Stormwater Drainage System

The Virginia Stormwater Regulations under section 9VAC25-870-400 D.2.c(3) allow for certain non-stormwater discharges. Allowable non-stormwater discharges to the stormwater system at Mason may include but are not limited to:

- Discharges from firefighting activities;
- Fire hydrant flushing;
- Potable water including water line flushing;
- Uncontaminated condensate from air conditioners, coolers, and other compressors and from the outside storage of refrigerated gases or liquids;
- Landscape watering provided all pesticides, herbicides, and fertilizer have been applied in accordance with the approved labeling;
- Routine external building wash down that does not use detergents; and,
- Pavement wash waters where no detergents are used and no spills or leaks of toxic or hazardous materials have occurred (unless all spilled material has been removed).

Discharges from these activities if comingled with stormwater would ultimately drain to Pohick Creek, Popes Head Creek, and Broad Run. These discharges, should they occur are not anticipated to contribute significant pollutants to the stormwater system at Mason.

3.5 NON STORMWATER DISCHARGES

All maintenance bay runoff drains to floor inlets that are connected to the sanitary sewer. The drains are positioned at the front of each of the maintenance garage compartment to ensure that all maintenance waste is collected.

Inlets and floor drains connected to the sanitary sewer system are located throughout the central heating and cooling plant as well. This runoff does not discharge to the stormwater system.

The wash bay adjacent to the maintenance garage contains an inlet that is connected to an oil-water separator and then discharges to the sanitary sewer system. The wash bay is graded such that all wash water is directed to this inlet and does not leave the bay.

There are no floor drains or drains connected to sanitary at either the West Campus or Prince William yards and no other non-stormwater discharges.

4 POTENTIAL STORM WATER CONTAMINANTS

This section identifies and describes drainage areas at Mason and significant activities or material storage in those drainage areas that may potentially contaminate stormwater. All drainage areas and patterns are shown on **Figures 3.1, 3.2, and 3.3**.

4.1 POTENTIAL STORMWATER POLLUTANTS

The activities that may cause pollution to the stormwater system include:

- Leaks from parked vehicles;
- Leaks from fluids stored outside in barrels including used oil and antifreeze;
- Leaks or spills from the aboveground petroleum storage tanks during filling, fueling or other activities;
- Leaks or spills from aboveground waste oil storage tank during emptying or other activities;
- Runoff from aggregate storage including soil, sand, mulch, and ice melt/salt.
- Contamination from vehicle cleaning and maintenance not contained within the wash and/or maintenance bays;
- Leaks from cans stored outside including paints, ice melt, recyclables, oils, landscaping items, and other chemicals and/or substances.
- Contamination from recycled or salvaged appliances stored onsite waiting to be removed or serviced;
- Contamination from salvaged parts stored outside the salvaged parts containers.

Pollutants discharged from these conditions or activities if not contained and cleaned up could discharge to the stormwater system.

4.2 DRAINAGE AREA DESCRIPTION

This section describes the site drainage and flow regimes as well as the materials stored on-site and the potential stormwater pollutants at this facility. **Table 2** further describes potential pollutant sources, quantities and outfalls to which the pollutants would discharge.

4.2.1 *Drainage Area 1*

DA-1 is located on the northwest corner of the site and includes the administration building as well as the northwest portion of the heating and cooling plant. The drainage area is predominately impervious with a small grass hill behind the maintenance building. This drainage area discharges

offsite behind the vehicle wash bay (Outfall 001). The activities that may cause pollution in this area include runoff or leaks from chemicals being delivered to the heating and cooling plant or fluids leaking from vehicles parked at the site.

4.2.2 Drainage Area 2

DA-2 is the central portion of the site and contains the automotive services facility, the EHS collection and accumulation area for recyclables, paints, and other wastes, a carpenter shop, an aboveground diesel fuel tank, an aboveground gasoline tank, ground maintenance services, and parking for both personal and university vehicles, and landscaping equipment. Drainage from this portion of the site flows through drainage structures from the parking area and exits the site through a ditch and pipe structure located on the northern side of the facility (Outfall 002). Additional drainage is collected as sheet runoff from buildings and runs through a concrete swale, into the ditch, then offsite (Outfall 002A). Automotive services also maintains an aboveground waste oil tank that is located adjacent to the building as well as covered steel drums for waste oil filters and waste antifreeze that are stored outside.

The activities that may cause pollution in this area include fluids leaking from vehicles parked at the site; fluids or other debris on lawnmowers and other equipment stored on the pavement; spills of chemicals, paints, or other wastes being delivered to, removed from, or stored temporarily at the EHS holding facility; incidents during the replenishment of the aboveground diesel tank; incidents during replenishment of the aboveground gasoline tank; spills while fueling vehicles; spills of automotive materials not contained within the automotive maintenance bays; overflow of the wash bay drainage structure causing wash water to leave the wash bay; incidents during emptying of the oil waste tank; and, spills or leaks from drums of waste oil filters or antifreeze being stored outside while awaiting pickup.

4.2.3 Drainage Area 3

DA-3 consists of the majority of the heating and cooling plant on the southwest side of the site, including two 30,000-gallon aboveground #2 fuel oil tanks for fueling the plant. This area also includes the loading docks for the central warehouse where material shipping and receiving occurs. Drainage in this area runs through a combination of inlets, trench drain, and sheet flow to a ditch and riprap channel south of the property. Potential pollutants in this area could include releases during refueling of the diesel tanks and spills or leaks during loading or offloading of chemicals or other materials for the plant at the loading dock. Stormwater in this drainage area discharges through Outfall 003 on the southwest end of the site.

4.2.4 Drainage Area 4

DA-4 is the eastern portion of the site and includes uncovered aggregate storage, temporary salt storage in large covered containers, salvaged parts storage, storage of snow plow accessories; miscellaneous storage of landscaping materials in containers, and the salt loading area. Stormwater in this area drains via sheet flow to the east and south of the site where it is eventually captured in a large extended detention basin. Potential pollutants in this area include: runoff from salt storage as containers degrade; spills during loading of aggregates and salt into spreaders and trucks; leaks of fluids from vehicles, spreaders, and snow plow equipment stored onsite; and runoff from aggregate sand, gravel, and other materials stored in the uncovered concrete bays.

4.2.5 Drainage Area – West Campus

DA-WC covers the entire West Campus satellite facility. It includes uncovered aggregate storage, storage of snow plow accessories; and the parking of grounds maintenance vehicles including lawn mowers. Stormwater in this area drains to an inlet on the northeast corner of the site where it travels through a pipe then is collected discharged into a ditch system through a forested area. Potential pollutants in this area include: spills during loading of aggregates into spreaders and trucks; leaks of fluids from vehicles, spreaders, and snow plow equipment stored onsite; and runoff from athletic field clay, sand, gravel, and other materials stored in the uncovered concrete bays.

4.2.6 Drainage Area – Prince William Science and Technology Campus

DA-PW covers the entire Prince William Science and Technology Campus satellite maintenance facility. It includes the storage of snow plow accessories and the parking of grounds maintenance vehicles including lawn mowers and small golf cart vehicles. Stormwater in this area drains via sheet flow to the east offsite where it enters a roadside storm drainage conveyance system. Potential pollutants in this area include: drips and leaks during the installation of spreaders and plows onto tractors and equipment, and leaks of fluids from vehicles, spreaders, and snow plow equipment stored onsite.

5 SOURCE CONTROLS

This section describes the source controls implemented at the facility. Procedural and behavioral BMPs are emphasized as a means of effective stormwater control over structural or physical stormwater controls to promote better employee awareness of the risks and responsibilities associated with the handling, storage, use, and disposal of potential sources of pollutants on site.

5.1 PHYSICAL STORMWATER CONTROLS

5.1.1 *Automotive Maintenance*

All vehicle maintenance is completed indoors on a concrete floor that is sloped to drain to floor drains connected to the sanitary sewer system. Any spilled liquid drains into the floor drains, through an oil-water separator located in a sump and then is discharged to the sanitary sewer system. Storage drums in the maintenance garage are stored on oil containment pallets.

The waste oil tank adjacent to the maintenance garage is located within a steel, secondary containment tank designed to contain any leaks or spills from the tank should they occur. The secondary containment is shielded from rainfall by a steel cover with an inspection port for visual monitoring of the area between the tank and containment tub. A ball valve is located at the bottom of the tank to drain and properly dispose of any oily water that collects in the secondary containment basin.

The waste antifreeze and waste oil filter drums are stored in steel drums with tightly closed lids when not having materials placed in them. Full drums are removed from the site by a commercial recycler.

5.1.2 *Vehicle Fuel Tanks*

The two fuel tanks for servicing university vehicles are contained within a secondary containment berm that is designed to contain any spills from the tanks. Stormwater that collects in the basin drains through a locking valve after any petroleum products are skimmed from the water surface by oil absorbent materials. The fuel filling ports are kept locked except when product deliveries occur. Fuel filling nozzles are locked at the end of each work day and unlocked the following morning..

5.1.3 *Salt Storage and Use*

Currently, salt used for snow and ice removal is stored in covered containers with lockable doors. Salt is removed from the containers by small loaders and placed in the spreader hoppers immediately in front of the containers. If materials are spilled during loading of the spreaders, it is scooped up and placed back into the storage containers either by hand or by bobcat loader. The area downslope of the salt storage containers has sock booms to filter runoff from the area in front of the salt storage containers. The containers are inspected weekly for salt leakage. Any spilled/leaked salt is immediately cleaned up and the source of the leak repaired.

Mason is currently in the process of designing⁴ and building a new, permanent salt storage facility. Design plans for this facility will be added to this SWPPP when the facility becomes operational.

5.1.4 Steam Plant Fuel Tanks

The two 30,000 gallon fuel oil tanks are located within sealed, steel secondary containment basins designed to hold the contents of the tanks should they fail. During fuel deliveries the storm drain located in the containment area has a valve that is closed to prevent the discharge of any spilled product to the storm drain system.

An oil/water filter for the inlet next to the tank has been purchased, but is not yet installed as of the writing of this document. This document will be updated to reflect the changes when available.

5.1.5 Maintenance Schedule

Descriptions of maintenance procedures and logs of work performed are found in the maintenance log (**Appendix E**). As new BMPs are adopted or BMPs are modified, the maintenance schedules specific to those BMPs will be added and/or modified.

5.2 SITE POLICIES AND PROCEDURES

Mason has several written policies that apply directly to this site, as it hosts a variety of departments and services. Spill kits are kept throughout the site for spills and leaks that need to be contained. If a spill were to occur the procedure is to notify the Department of Police and Public Safety by dialing (703) 993-2810 from any phone or 911 from any university landline. EHS should also be contacted in case of a chemical spill.

Mason has written procedures for dealing with spills and activity involving different chemicals and fluids. The following draft procedural guides can be found in **Appendix F**.

1. Chemical, Hazardous, and Universal Waste Guide
2. Flammable and Combustible Universal Liquid Safety Guide
3. Hazardous Materials Shipping and Receiving Guide
4. Oil and Chemical Spill Guide

These plans detail additional inspection and spill response activities for the diesel and gasoline tanks at the site and is to be followed to address spills that occur at the facility. Additional procedures for delivering chemicals and the collection of hazardous waste also exist within these documents.

Mason also maintains an integrated contingency Plan (ICP) for managing incidents involving significant quantities of spilled materials or materials of high potential environmental and health hazards.

Mason has adopted standard operating procedures (SOPs) for vehicle washing, paint storage, vehicle fueling and salt storage. These SOPs are reviewed by staff responsible for these activities and updated as site activities or site conditions warrant. Copies of these SOPs are available from the SWPPP Coordinator.

5.3 INSPECTION PLAN

5.3.1 *Routine Inspection*

A routine visual inspection is performed by site personnel identified by the SWPPP Coordinator at least quarterly. The inspections are designed to minimize the potential occurrence of conditions that pose a risk to stormwater quality. These inspections address general housekeeping at the facility and identify any small conditions that pose a risk to stormwater quality. Deficiencies and necessary corrective actions are noted on the routine inspection log (**Appendix B**) and maintained in this SWPPP binder.

5.3.2 *Annual Comprehensive Facility Compliance Evaluation*

A comprehensive facility compliance evaluation is conducted annually by the SWPPP Coordinator. The evaluation assesses the effectiveness of the implementation of this SWPPP in minimizing the discharge of pollutants in stormwater. The annual comprehensive facility compliance evaluation includes a review of the following:

- Storage of industrial materials, residue, or trash that could come into contact with stormwater;
- Documentation and clean-up of leaks or spills that have occurred in the past three years;
- Off-site tracking of materials, sediment or waste from the site;
- Tracking or blowing of waste or materials from covered areas to open areas;
- Evidence of, or the potential for, pollutants to enter the drainage system;
- Evidence of, or the potential for, pollutants to discharge from facility outfalls;
- Outfall condition and evidence of erosion or scour; and
- Review of employee training, and BMP installation, operation and maintenance.

The evaluation also determines whether site operations have changed since the development of this SWPPP. If operational changes that are not documented in the SWPPP have been made, the SWPPP Coordinator determines whether these changes impact stormwater quality and develops new BMPs to address the change. All operational changes and new BMPs are recorded in this SWPPP. Additionally, the evaluation date, the evaluation personnel, the scope of the evaluation, major observations, and any needed revisions to the SWPPP are recorded on the evaluation form in **Appendix C**. Revisions to the SWPPP shall occur within thirty days after the annual compliance evaluation as stated in Section B.5. of Virginia Code 9VAC25-151-80 (Stormwater Pollution Prevent Plans).

5.3.3 Dry Weather Screening

Dry weather screening of the points of discharge from the facility to offsite areas or to other components of the stormwater system shall occur during at least one of the routine facility visual inspections. The purpose of the dry weather screening is to identify possible non-stormwater discharges leaving the site. If flow is observed during dry conditions at a site outfall, the upstream system shall be inspected to determine the source(s) of the flow. If the source of the flow cannot be verified to one of the allowed non-stormwater discharges listed in Section 3.4.1, by facility personnel, its presence shall be reported to the VPDES Administrator in the George Mason University Facilities Civil and Environmental Engineering Division for sampling and analysis in accordance with the ongoing Mason dry weather screening program.

5.4 DRAINAGE AREA BEST MANAGEMENT PRACTICES

This section describes specific BMPs for each drainage area. Specific pollutant sources and management practices, by Drainage Area, are presented in **Table 2**.

5.4.1 Drainage Area 1

DA-1 is impervious drainage area where the administration building and heating and cooling plant are located. Spills on pavement, or other impervious surface, within this area are contained with oil absorbing material, such as Oil-Dri, and collected immediately after it is used by a broom and dust pan and disposed in a dry storage drum. Oil drip pans or oil absorbent pads are placed under leaking vehicles when they are parked to collect the dripping fluids. Spills on pervious ground, soil or other, are cleaned up by digging out the affected area until no remnants appear. The waste material resulting from the cleanup are disposed of in a dry storage drum and sent to a petroleum recycler for disposal. Material handling when receiving or shipping materials from the Heating and Cooling Plant follows the guidelines set forth in the Hazardous Materials Shipping and Receiving

Guide referenced in this document.

5.4.2 Drainage Area 2

DA-2 consists of mostly impervious area and has diverse activities. The following practices are undertaken in this area. Drip pans are placed under any leaking vehicles, but in particular the lawn care equipment parked in this area. Storage drums containing waste oil filters and antifreeze are checked often and stored on containment pallets to decrease the risk of stormwater contamination. These storage drums are kept tightly closed to minimize potential spillage. The EHS collection and accumulation area for recyclables and other waste maintains storage indoors and any outdoor storage is contained in sealed drums or containers. The paint shop maintains all paint and chemical storage indoors where it has minimal risk of spills. Regardless of department, all additional materials including paints, fertilizers, and chemicals is always kept indoors away from weather elements.

The secondary containment areas surrounding the above ground storage tanks is checked frequently for leaks that occur during operation or filling, and spills are cleaned promptly. Drainage plugs on secondary containment systems are always kept closed except when in operation. Oil adsorbent materials are replaced when they become stained with product or excessively worn or damaged.

Spills on pavement, or other impervious surfaces, within this area are contained with oil absorbing material, such as Oil-Dri, and collected immediately after it is used by a broom and dust pan and disposed in a dry storage drum. Spills on pervious areas, are cleaned up by digging out the affected area until no remnants appear. The waste material resulting from the cleanup is disposed of in a dry storage drum and sent to a petroleum recycler for disposal.

5.4.3 Drainage Area 3

DA-3 consists of the heating and cooling plant and its corresponding aboveground fuel oil tanks. Chemicals used for plant operations if stored outdoors have the potential to leak or spill into the stormwater system. All chemicals used are stored indoors and contained properly. The containment areas surrounding the fuel oil tanks for the heating and cooling plant are checked frequently and spills that occur during fueling or operation are cleaned promptly. Spills on pavement, or other impervious surface, within this area are contained with oil absorbing material, such as Oil-Dri, and collected immediately after it is used by a broom and dust pan and disposed in a dry storage drum. Spills on pervious ground, soil or other, are cleaned up by digging out the

affected area until no remnants appear. The waste material resulting from the cleanup is disposed of in a dry storage drum and sent to a petroleum recycler for disposal.

Material handling when receiving or shipping materials from the Heating and Cooling Plant or Central Warehouse follows the guidelines set forth in the Hazardous Materials Shipping and Receiving Guide referenced in this document.

5.4.4 Drainage Area 4

DA-4 sheet flows off the site to the southwest into a wooded area then into a drainage basin connected to the stormwater system. The bulk storage items including soil, sand, and aggregate are contained properly to lower the risk of it being discharged into the stormwater system. Any material that is spilled during the loading of materials for offsite use is pushed back within the storage bins. Materials that overtop the storage bins during deliveries are scooped up and placed back within the storage bins.

Drip pans are placed under other equipment, such as the stored snow plows that are observed to be leaking fluids. Salt and ice melt substances are contained to prevent runoff. Spilled ice melt materials is swept and shoveled back into the bins after each use of the substance regardless of the activity. Materials, including paints and bags of mulch and fertilizers stored in the miscellaneous and recyclables storage shipping containers are stored indoors instead of outdoors on pallets to prevent leaks and discharge with stormwater. Regardless of department, all additional materials including paints, fertilizers, and chemicals are always kept indoors away from weather elements.

Spills on pavement, or other impervious surface, within this area are contained with oil absorbing material, such as Oil-Dri, and collected immediately after it is used by a broom and dust pan and disposed in a dry storage drum. Spills on pervious ground, soil or other, are cleaned up by digging out the affected area until no remnants appear. The waste material resulting from the cleanup is disposed of in a dry storage drum and sent to a petroleum recycler for disposal.

5.4.5 Drainage Area – West Campus

DA-WC flows into a drop inlet on the northeast corner of the site where it is piped to a ditch system in the forested area to the south of the site. The bulk storage items including athletic field clay, sand, and aggregate are contained properly to lower the risk of it being discharged into the stormwater system. Any material that is spilled during the loading of materials for offsite use is

pushed back within the storage bins. Materials that overtop the storage bins during deliveries are scooped up and placed back within the storage bins.

Drip pans are placed under other equipment, such as the stored snow plows that are observed to be leaking fluids. Spills on pavement, or other impervious surface, within this area are contained with oil absorbing material, such as Oil-Dri, and collected immediately after it is used by a broom and dust pan and disposed in a dry storage drum. Spills on pervious ground, soil or other, are cleaned up by digging out the affected area until no remnants appear. The waste material resulting from the cleanup is disposed of in a dry storage drum and sent to a petroleum recycler for disposal. All materials including paints, fertilizers, and chemicals are always be kept indoors away from weather elements.

5.4.6 Drainage Area – Prince William

DA-PW drains via sheet flow to the east offsite where it enters a ditch and travels south and west in a roadside drainage conveyance system. Drip pans are be placed under equipment, such as the stored snow plows that are observed to be leaking fluids. Spills on pavement, or other impervious surface, within this area are contained with oil absorbing material, such as Oil-Dri, and collected immediately after it is used by a broom and dust pan and disposed in a dry storage drum. Spills on pervious ground, soil or other, are cleaned up by digging out the affected area until no remnants appear. The waste material resulting from the cleanup is disposed of in a dry storage drum and sent to a petroleum recycler for disposal. All materials including paints, fertilizers, and chemicals are kept indoors away from weather elements.

Table 2: Pollutant Sources and Minimization Strategies

Drainage Area	Potential Pollutant Source	Pollutant Pathway to State Waters	Risk of Discharge	Potential Discharge Volume	Discharge Minimization Strategy
DA-1	Leaked vehicle liquids	Pohick Creek	Low	0.1-1 gallon / vehicle	Clean up leaks and drips immediately upon discharge. Use drip pans or oil absorbent pads for persistent leaks.
DA-1	Materials shipping and receiving	Pohick Creek	Low	1-5 gallons / event	Clean up immediately upon discovery. Follow all procedures in the Hazardous Materials Shipping and Receiving Guide
DA-2	Leaks from waste oil tank	Pohick Creek	Low	1-5 gallons / event	Clean up leaks and drips immediately upon discovery. Follow inspection procedures from Mason Oil and Chemical Spill Guide.
DA-2	Leaks from diesel and/or gasoline storage tank	Pohick Creek	Low	1-5 gallons / event	Clean up leaks and drips immediately upon discovery. Follow inspection procedures from Mason Oil and Chemical Spill Guide.
DA-2	Leaks from automotive service storage bins (waste oil filters / antifreeze)	Pohick Creek	Low	<1 gallon / event	Clean up leaks and drips immediately upon discovery. Follow inspection procedures from Mason Oil and Chemical Spill Guide.
DA-2	Leaked vehicle liquids	Pohick Creek	Low	0.1-5 gallons / vehicle	Clean up leaks and drips immediately upon discharge. Use drip pans or oil absorbent pads for persistent leaks.
DA-2	Leaks from EHS Central Accumulation area	Pohick Creek	Low	0.1-5 gallons / event	Clean up leaks immediately. Follow procedures for appropriate material in Mason Oil and Chemical Spill Guide or Mason Chemical, Hazardous, and Universal Waste Guide
DA-3	Leaks from fuel oil storage tanks	Pohick Creek	Moderate	1 – 100 gallons / event	Clean up leaks and drips immediately upon discovery. Follow procedures from Mason Oil and Chemical Spill Guide.

DA-3	Leaks or spills during chemical delivery	Pohick Creek	Low	0.1-5 gallons / event	Clean up leaks or spills immediately. Follow procedures in Mason Hazardous Materials Shipping and Receiving Guide
DA-3	Materials shipping and receiving	Pohick Creek	Low	1-5 gallons / event	Clean up immediately upon discovery. Follow all procedures in the Hazardous Materials Shipping and Receiving Guide
DA-4	Sediment runoff from bulk material storage	Pohick Creek	Low	0.5-1 cubic yard / event	Contain bulk material to prevent it from being mobilized by stormwater.
DA-4	Leaks from old equipment parts	Pohick Creek	Low	0.1-1 gallon / event	Clean up leaks and drips immediately upon discharge. Use drip pans or oil absorbent pads for persistent leaks
DA-4	Leaked vehicle liquids	Pohick Creek	Low	0.1-1 gallon / vehicle	Clean up leaks and drips immediately upon discharge. Use drip pans or oil absorbent pads for persistent leaks.
DA-4	Leaked / spilled salt	Pohick Creek	Mod	0.5 – 1.0 pounds / event	Sweep up salt residue upon discovery and place in container. Identify and eliminate source of leak.
DA-WC	Leaked vehicle liquids	Popes Head Creek	Low	0.1-1 gallon / vehicle	Clean up leaks and drips immediately upon discharge. Use drip pans or oil absorbent pads for persistent leaks.
DA-WC	Sediment runoff from bulk material storage	Popes Head Creek	Low	0.5-1cubic yard / event	Contain bulk material to prevent it from being mobilized by stormwater.
DA-PW	Leaked vehicle liquids	Broad Run	Low	0.1-1 gallon / vehicle	Clean up leaks and drips immediately upon discharge. Use drip pans or oil absorbent pads for persistent leaks.

6 COMPLIANCE AND REPORTING REQUIREMENTS

This section describes the required employee training, record keeping, signatory and updating requirements of the SWPPP as contained in the MS4 permit.

6.1 EMPLOYEE TRAINING

An employee training program is conducted by the SWPPP Team to educate employees about the requirements of the SWPPP. This education program includes background on the components and goals of the SWPPP and hands-on training with spill prevention and response; recognition and reporting of illicit discharges; good housekeeping; proper material handling; disposal and control of waste; container filling and transfer; and proper storage, washing, and inspection procedures. Training is conducted on a biennial basis as required. New employees that have not yet had training on these procedures are enrolled in the first available training after their start date. Employee sign-in sheets for training courses can be found in **Appendix G** of this document. The training program is reviewed periodically by the SWPPP Coordinator to determine its effectiveness and to make any necessary changes to the program.

6.2 RECORD RETENTION REQUIREMENTS

Records described in the SWPPP are retained on site for three years beyond the calendar year they are created, and are made available to the state or federal compliance inspection officer upon request. Additionally, employee training records and amendment logs are maintained for a period of three years from the date of their creation.

6.3 PROVISIONS FOR AMENDMENT OF THE PLAN

If the facility expands, experiences significant process modifications, or changes significant material handling or storage practices which could impact stormwater, the SWPPP will be amended appropriately. The amended SWPPP will have a description of the new activities that contribute to the increased pollutant loading and planned source control activities. A log of SWPPP amendments can be found in **Appendix H**.

The SWPPP will also be amended if the findings of the annual facility compliance evaluation indicate changes to the SWPPP are necessary to minimize the discharge of pollutants, or if a state or federal compliance inspection officer determines that the SWPPP is ineffective in controlling stormwater pollutants discharged to state waters.

6.4 REPORTING REQUIREMENTS

The SWPPP Coordinator shall be responsible for all MS4 reporting requirements pertaining to this facility. By July 30 of each calendar year the SWPPP coordinator will provide the following items to the Mason MS4 administrator.

- Training logs for the period of July 1 – June 30 of the current year;
- Inspection logs for the period of July 1 – June 30 of the current year;
- Summary of any spills that occurred at the facility for the period of July 1 – June 30; and,
- Maintenance logs for the period of July 1 – June 30.

6.5 SIGNATORY

Responsible Party: _____

Title (print): _____

Date: _____

Appendix A: Figures

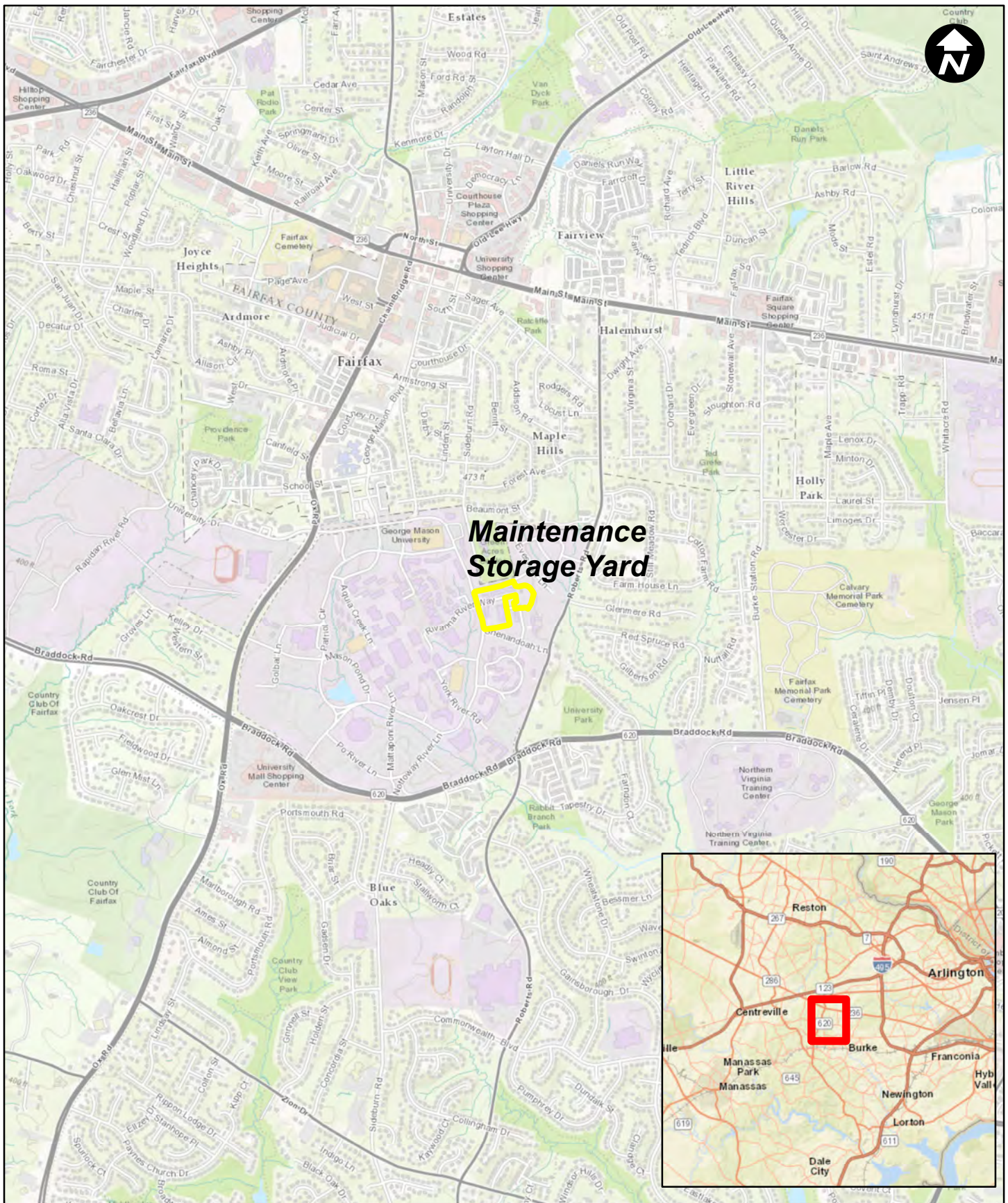



Figure 1.1: Vicinity Map
Maintenance Storage Yard

 Limit of SWPPP Study
 0 1,000 2,000 Feet



Kimley»Horn

Date: 6/30/2016

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
 Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

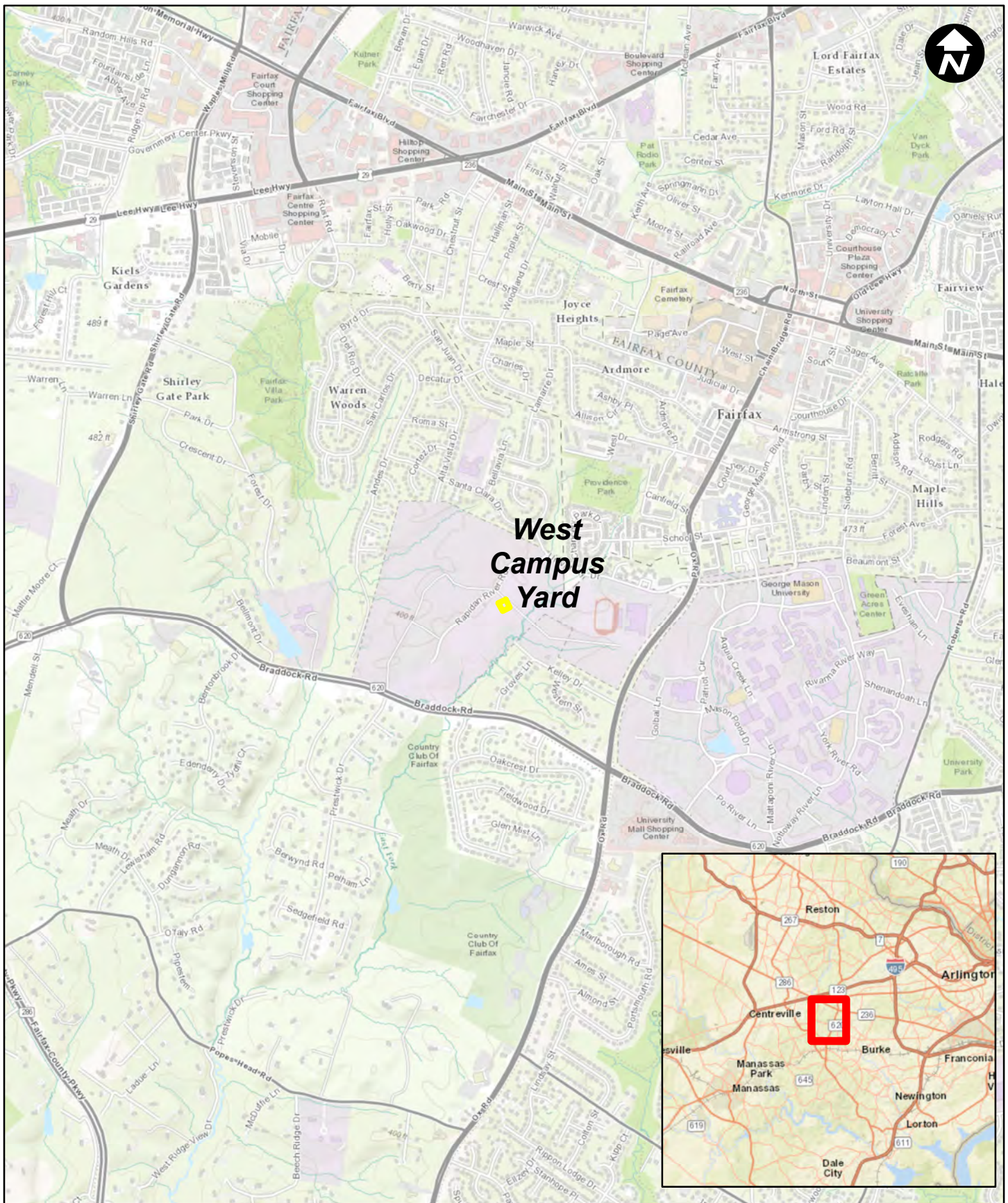
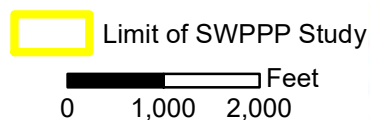


Figure 1.2: Vicinity Map
West Campus Yard



Kimley»Horn
 Date: 6/30/2016

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
 Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

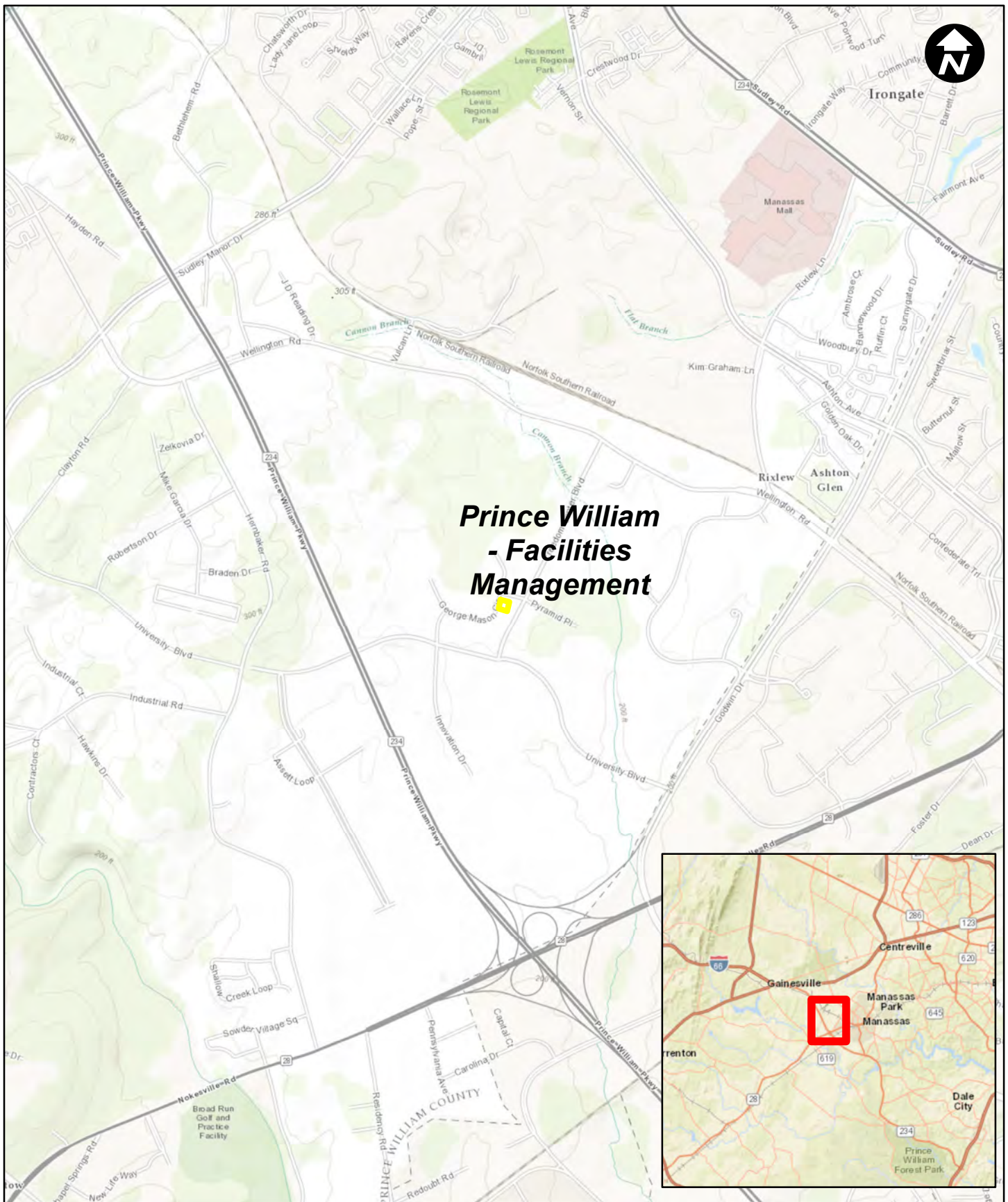
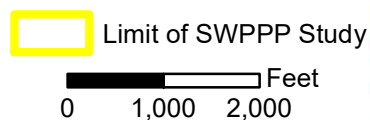


Figure 1.3: Vicinity Map

Prince William - Facilities Management

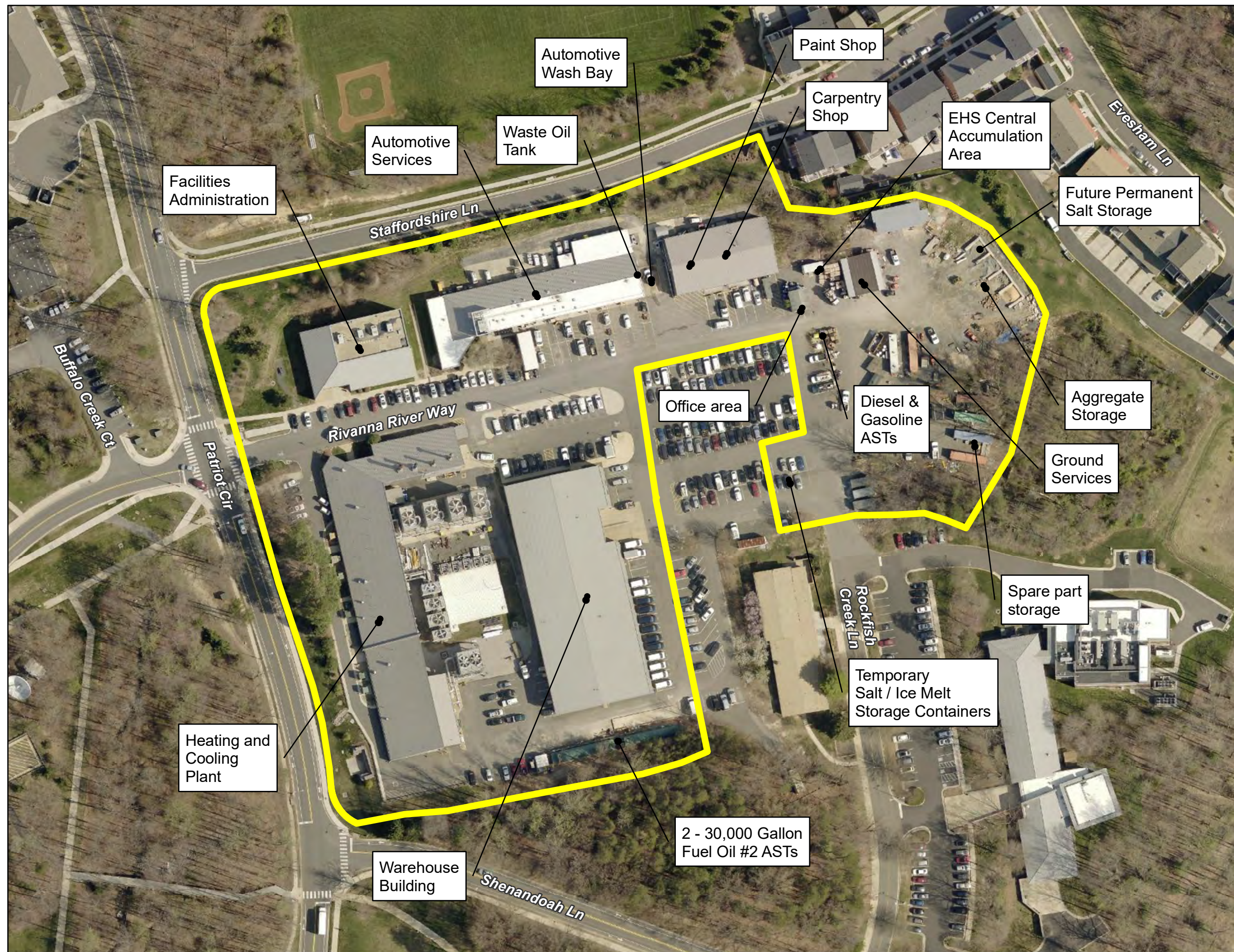


Kimley»Horn

Date: 6/30/2016


Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

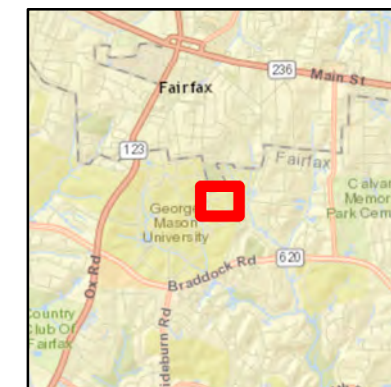
Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



**Figure 2.1:
Site Layout**

Maintenance Storage Yard

 Limit of SWPPP Study



0 100 200 Feet



Kimley»Horn


Date: 6/30/2016

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Fairfax County, Virginia



**Figure 2.2:
Site Layout**

West Campus Yard

 Limit of SWPPP Study



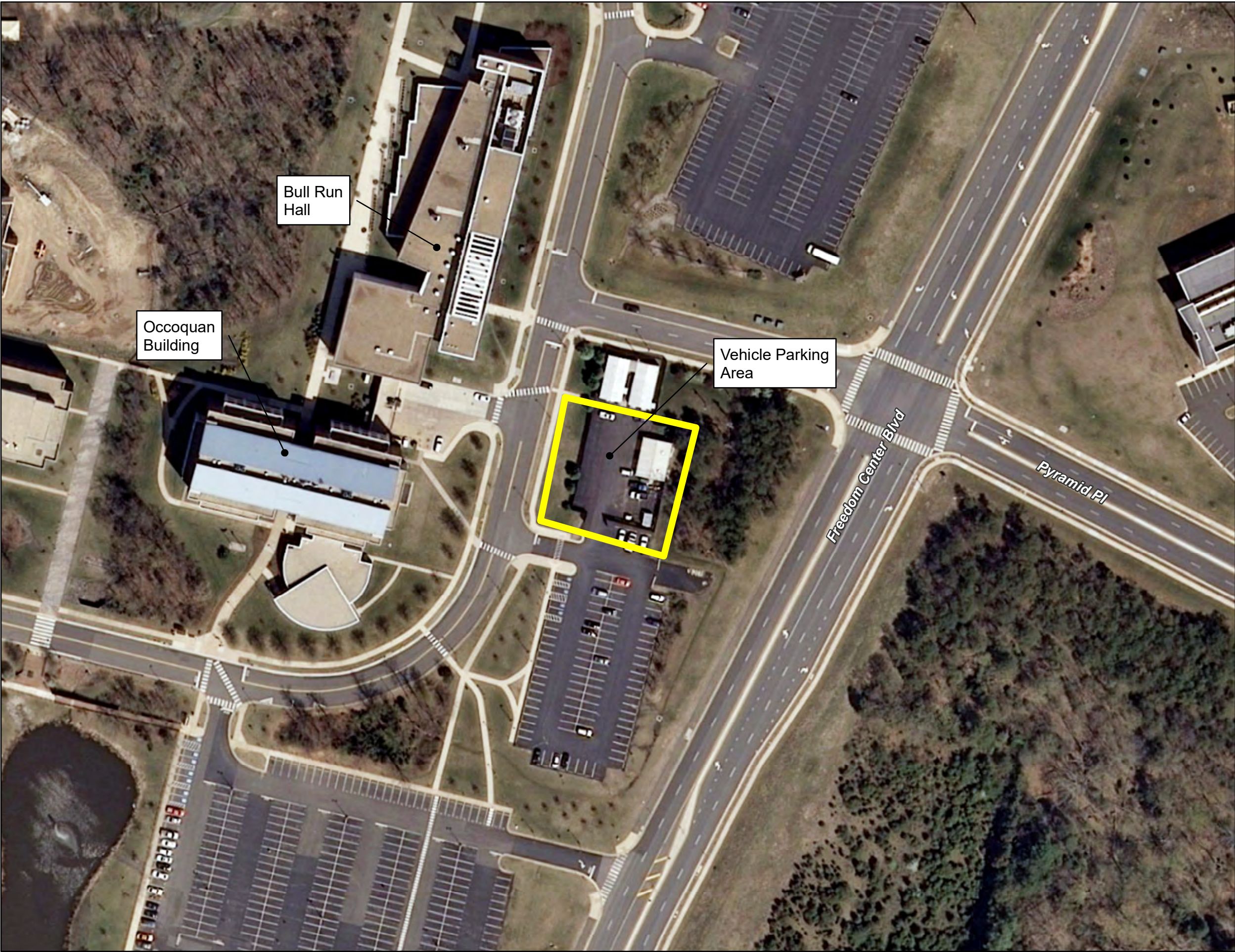
0 75 150 Feet



Kimley»Horn


Date: 6/30/2016

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Fairfax County, Virginia



**Figure 2.3:
Site Layout**

*Prince William - Facilities
Management*

 Limit of SWPPP Study



0 100 200 Feet



Kimley»Horn

Date: 6/30/2016

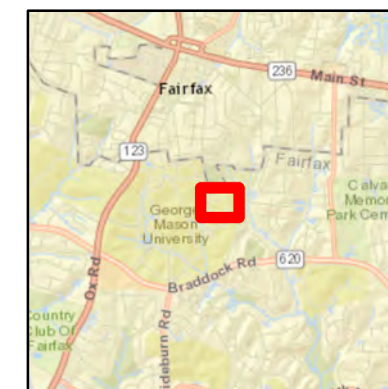
Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Fairfax County, Virginia



**Figure 3.1:
Drainage**

Maintenance Storage Yard

- Facility Outfall
- ▲ Outfall
- ⊠ Storm Inlets
- Trench Drain
- Storm Pipe
- Ditch / Swale
- Limit of SWPPP Study
- Drainage Area



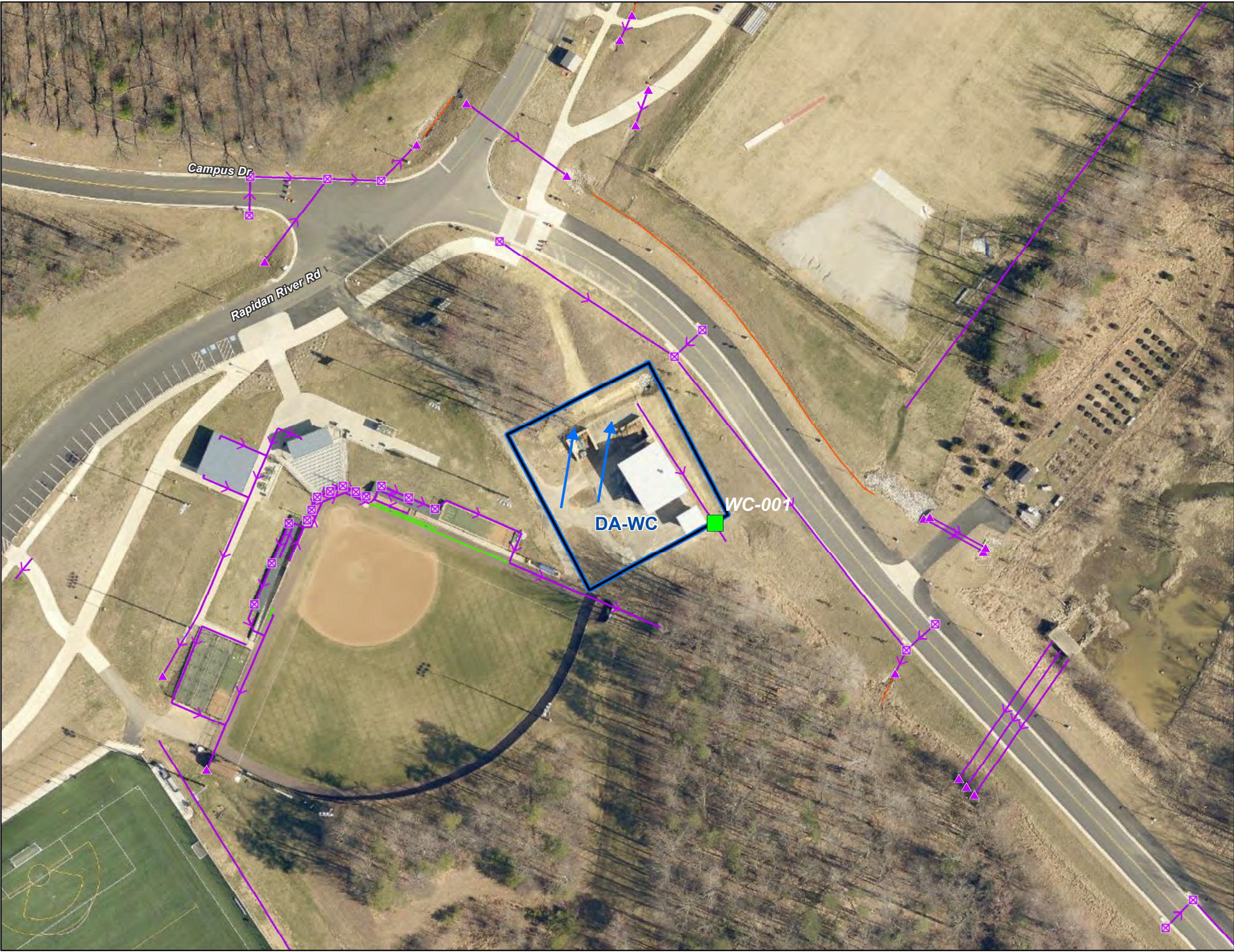
0 100 200 Feet



Kimley»Horn

Date: 6/30/2016

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Fairfax County, Virginia



**Figure 3.2:
Drainage**

West Campus Yard

- Facility Outfall
- Outfall
- Storm Inlets
- Trench Drain
- Storm Pipe
- Ditch / Swale
- Limit of SWPPP Study
- Drainage Area



0 75 150 Feet



Kimley»Horn

Date: 6/30/2016

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Fairfax County, Virginia



**Figure 3.3:
Drainage**

*Prince William - Facilities
Management*

- Facility Outfall
- Outfall
- Storm Inlets
- Trench Drain
- Storm Pipe
- Ditch / Swale
- Limit of SWPPP Study
- Drainage Area



0 100 200 Feet



Kimley»Horn

Date: 6/30/2016

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Fairfax County, Virginia

Appendix B: Routine Facility Compliance Inspection Form

HIGH PRIORITY MUNICIPAL FACILITY ROUTINE FACILITY COMPLIANCE INSPECTION REPORT

Inspector Name: _____ **Inspector Title:** _____

Inspection Date/Time: _____ **Weather:** _____

Reason for Inspection: _____ Regular _____ Storm Event _____ Re-inspection

Has a pollutant discharge occurred since the last inspection? YES / NO / NA **Is the site in compliance? YES / NO / NA**

ITEM #	INSPECTION ITEM	RESULT	IN COMPLIANCE	ACTION TO BE TAKEN/NOTES
1	Have facility operations changes since previous inspection?	YES / NO / NA	YES / NO / NA	
2	Inlet filters installed and functioning?	YES / NO / NA	YES / NO / NA	
3	Spill containment materials available, accessible, and in good working order?	YES / NO / NA	YES / NO / NA	
4	Spill clean-up materials available, accessible and in good working order?	YES / NO / NA	YES / NO / NA	
5	AST volume gauges functioning properly? On all ASTs?	YES / NO / NA	YES / NO / NA	
6	Evidence of leaks, overfilling or spillage at AST?	YES / NO / NA	YES / NO / NA	
7	Oil waste tank drain plug closed when not operational?	YES / NO / NA	YES / NO / NA	
8	Are paved roadways free of debris / off-site tracking?	YES / NO / NA	YES / NO / NA	
9	Discharge points free of sediment deposits and trash?	YES / NO / NA	YES / NO / NA	
10	Salt storage properly contained?	YES / NO / NA	YES / NO / NA	
11	Discharge points experiencing erosion or scour?	YES / NO / NA	YES / NO / NA	
12	Trash/litter collected & receptacles covered?	YES / NO / NA	YES / NO / NA	
13	Evidence of major spills / leaks in vehicle parking area?	YES / NO / NA	YES / NO / NA	

ITEM #	INSPECTION ITEM	RESULT	IN COMPLIANCE	ACTION TO BE TAKEN/NOTES
14	EHS Accumulation area properly maintained?	YES / NO / NA	YES / NO / NA	
15	Aggregate storage piles well-contained?	YES / NO / NA	YES / NO / NA	
16	Grounds maintenance storage area in compliance? Paint and other items stored appropriately?	YES / NO / NA	YES / NO / NA	
17	Debris in wash rack? Evidence of spills in or around wash rack?	YES / NO / NA	YES / NO / NA	
18	Heating and cooling plant chemicals stored indoors and maintained?	YES / NO / NA	YES / NO / NA	

CORRECTIVE ACTIONS TO BE TAKEN: (Explain each "NO" circled above)

ADDITIONAL COMMENTS:

This report shall be kept on file as part of the Storm Water Pollution Prevention Plan for at least **3 years** from the date of the evaluation.

Certification Statement

I certify under penalty of law that I have read and understand this document and the this document and all attachments were prepared in accordance with a system designed to assure that qualified personnel properly gathered and evaluated 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 and Title: _____
(Facility Operator)

Signature: _____ Date/Time: _____
(Facility Operator)

Print name and Title: _____
(Inspector)

Signature: _____ Date/Time: _____
(Inspector)

**Appendix C: Annual Comprehensive Facility Compliance
Evaluation Form**

MUNICIPAL HIGH PRIORITY FACILITY COMPREHENSIVE FACILITY COMPLIANCE INSPECTION REPORT

Inspector Name: _____ Inspector Title: _____

Inspection Date/Time: _____ Weather: _____

Reason for Inspection: _____ Regular _____ Storm Event _____ Re-inspection

Has a pollutant discharge occurred since the last inspection? YES / NO Is the site in compliance? YES / NO

ITEM #	INSPECTION ITEM	RESULT	IN COMPLIANCE	ACTION TO BE TAKEN/NOTES
1	Have facility operations changes since previous inspection?	YES / NO / NA	YES / NO / NA	
2	Inlet filters installed and functioning?	YES / NO / NA	YES / NO / NA	
3	Spill containment materials available, accessible, and in good working order?	YES / NO / NA	YES / NO / NA	
4	Spill clean-up materials available, accessible and in good working order?	YES / NO / NA	YES / NO / NA	
5	AST volume gauges functioning properly? On all ASTs?	YES / NO / NA	YES / NO / NA	
6	Evidence of leaks, overfilling or spillage at AST?	YES / NO / NA	YES / NO / NA	
7	Oil waste tank drain plug closed when not operational?	YES / NO / NA	YES / NO / NA	
8	Are paved roadways free of debris / off-site tracking?	YES / NO / NA	YES / NO / NA	
9	Discharge points free of sediment deposits and trash?	YES / NO / NA	YES / NO / NA	
10	Salt storage properly contained?	YES / NO / NA	YES / NO / NA	
11	Discharge points experiencing erosion or scour?	YES / NO / NA	YES / NO / NA	
12	Trash/litter collected & receptacles covered?	YES / NO / NA	YES / NO / NA	
13	Evidence of major spills / leaks in vehicle parking area?	YES / NO / NA	YES / NO / NA	
14	EHS Accumulation area properly maintained?	YES / NO / NA	YES / NO / NA	
15	Aggregate storage piles well-contained?	YES / NO / NA	YES / NO / NA	

ITEM #	INSPECTION ITEM	RESULT	IN COMPLIANCE	ACTION TO BE TAKEN/NOTES
16	Grounds maintenance storage area in compliance? Paint and other items stored appropriately?	YES / NO / NA	YES / NO / NA	
17	Debris in wash rack? Evidence of spills in or around wash rack?	YES / NO / NA	YES / NO / NA	
18	Heating and cooling plant chemicals stored indoors and maintained?	YES / NO / NA	YES / NO / NA	
19	Records of spills properly documented?	YES / NO / NA	YES / NO / NA	
20	SWPPP located on-site with all facility changes documented?	YES / NO / NA	YES / NO / NA	
21	Previous inspection reports and documentation of corrective actions undertaken in SWPPP?	YES / NO / NA	YES / NO / NA	
22	Are employee training records complete and up to date?	YES / NO / NA	YES / NO / NA	
23	Quarterly visual monitoring reports complete and contained in SWPPP?	YES / NO / NA	YES / NO / NA	
24	Have benchmark values for TPH and TSS been exceeded in previous 12 months?	YES / NO / NA	YES / NO / NA	
23	Annual outfall evaluation for unauthorized discharges contained in SWPPP?	YES / NO / NA	YES / NO / NA	
24	Discharge Monitoring Reports complete and contained in SWPPP?	YES / NO / NA	YES / NO / NA	
25	Proof of submittal of previous year's DMR to DEQ by Jan 10 in SWPPP?	YES / NO / NA	YES / NO / NA	

CORRECTIVE ACTIONS TO BE TAKEN: (Explain each "NO" circled above)

ADDITIONAL COMMENTS:

This report shall be kept on file as part of the Storm Water Pollution Prevention Plan for at least **3 years** from the date of the evaluation.

Certification Statement

I certify under penalty of law that I have read and understand this document and the this document and all attachments were prepared in accordance with a system designed to assure that qualified personnel properly gathered and evaluated 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 and Title: _____
(Facility Operator)

Signature: _____ Date/Time: _____
(Facility Operator)

Print name and Title: _____
(Inspector)

Signature: _____ Date/Time: _____
(Inspector)

Appendix D: SWPPP Team

SWPPP Team

[illegible]

Appendix E: SWPPP Maintenance Logs

SWPPP Maintenance Log

[illegible]

Appendix F: GMU Policies and Procedures

CHEMICAL, HAZARDOUS, AND UNIVERSAL WASTE MANAGEMENT GUIDE

Version	Date	Comments
3	April, 2014	Waste Management Guide

A. INTRODUCTION

This Guide applies to all employees and contractors who use, store, or generate chemical, hazardous, or universal waste on George Mason University property. Employees are responsible for ensuring that waste is properly labeled and stored prior to collection by Environmental Health and Safety Office (EHS) staff.

B. SCOPE

Hazardous waste is defined by the US Environmental Protection Agency (EPA) and Virginia Department of Environmental Quality (DEQ) as any material that “may pose a substantial or potential hazard to human health and safety and to the environment when improperly managed.” The purpose of this Guide is to provide guidance to all George Mason University personnel for the safely handling, labeling, and storing all chemicals, hazardous and universal waste. This Guide is based upon EPA Standards 40 CFR Subchapter I, *Solid Wastes*, and DEQ regulations 9VAC 20-60 and 20-60-273.

C. EMPLOYEE RESPONSIBILITIES

- Receive appropriate training commensurate with assigned work or position.
- Properly manage chemicals and hazardous waste in accordance with EPA and DEQ regulations, and George Mason University policies.
- Attempt to reduce the volume of hazardous waste generated whenever possible.
- Report any waste spills immediately to your supervisor, EHS, or University Police.

D. TRAINING

- Hazard Communication Training, or Laboratory Safety Orientation Training for employees working in laboratories, is required upon initial assignment to a position that requires the management of hazardous chemicals.
- George Mason University requires Safety Refresher training be taken annually. Contact EHS for training information.
- Chemical-specific training should be provided by supervisors whenever a new hazardous chemical(s) is used in the work area.
- Annual hazardous waste management refresher training is required for all individuals generating or handling hazardous waste. Training is available through EHS via the Laboratory Safety Refresher training or Safety Refresher training.

E. WASTE COLLECTION

- Waste shall be accumulated in designated Satellite Accumulation (SAA) areas throughout facilities areas at or near the point of waste generation.
- Any areas that need a new SAA location must be coordinated with EHS to ensure an accurate inventory of the location is maintained and collections are being routinely performed.
- EHS will collect hazardous waste, and universal waste; to include batteries, mercury contained in manufactured articles, and small light bulbs on a routine basis from SAA's and transfer them to a Central Accumulation and Storage Area managed by EHS.
- Fluorescent light tubes shall be transported to and accumulated in the warehouse for pickup by a state approved universal waste vendor.

F. WASTE STORAGE

- Containers used to collect waste must be in good condition (i.e., free of cracks, punctures, dents, or other defects), have screw-top caps or lids, and be compatible with its contents.
- Waste containers shall be vapor tight and spill proof to prevent a release to the environment, and stored in secondary containment.
- Waste containers may not be larger than 55 gallons. EHS provides waste containers upon request.
- All waste containers must be free of conflicting markings or labels.
- Food and drug containers may not be used for collection of chemical or hazardous waste.
- Chemical wastes that are mixed together must be compatible with one another.
- Containers should never be filled beyond 90% capacity.
- Never dispose of hazardous waste in a sink, drain, sewer, municipal trash, or outdoors into the environment.

G. LABELING WASTE

Hazardous and universal waste labels are provided by EHS upon request. All waste must be labeled with an appropriate label that displays the complete chemical name and the date that the chemical is determined to be waste.

- Waste placed in an SAA must bear an appropriate hazardous waste or universal waste label and include the type of waste, and date the waste was placed in the SAA.
- Labels must be affixed to a container when waste is first placed in a container.
- All labels should be filled out using permanent ink.
- The complete chemical name (no abbreviations, chemical structures, or formulas) must be used to indicate the contents of a container. If more than one ingredient, percentages of constituents must be listed.
- The building and room number must be indicated on the label.

H. SATELLITE ACCUMULATION AREAS

A SAA is a space within the work area designated for the temporary accumulation and storage of hazardous waste. EHS will collect hazardous waste from the SAA on a routine basis. The following rules apply to satellite accumulation areas:

- Each work area that generates hazardous, universal, or chemical waste must have access to a SAA.
- Supervisors, Principal Investigators, or Laboratory Supervisors are responsible for establishing and managing the SAA and training staff on its use. Contact EHS for assistance with set-up and training.
- The SAA must be located in an area that is accessible to staff and EHS.
- Waste should be stored in secondary containment and segregated according to chemical compatibility. A chemical compatibility chart is provided in Appendix A.

I. SUPPLIES AND ASSISTANCE

EHS will provide the following supplies and assistance to support the proper management of chemical, hazardous, and universal wastes:

- Waste containers appropriate for a variety of chemical and hazardous waste.
- Supplies for creating a SAA such as secondary containment and signage.
- Labels (e.g., “Hazardous Waste” and “Universal Waste”).
- Routine inspections of the SAA and transport of waste from the SAA to a central accumulation area.
- Assistance in identifying, accumulating, storing, and reducing hazardous wastes.
- Additional training as needed or as requested by supervisors or employees.

J. “NON HAZARDOUS” CHEMICAL WASTE

George Mason University recycles non-hazardous chemical waste whenever possible. The following chemical wastes do not require a hazardous waste label; however they must be labeled as waste with the words “Used Oil, Used Antifreeze” etc., collected and stored in the SAA for collection by EHS or authorized recycling vendor.

- **Antifreeze/Glycol**
 - All heat transfer fluids and glycol based products must be collected.
- **Latex Paint**
 - Excess latex paint cans and pails should be collected in a SAA.
- **Oil**
 - All oil (e.g., motor, refrigeration, vacuum, pump, and lubricating oil)
- **Oil Filters**
 - Oil should first be drained from the filter into a waste container or tank
 - Filters must be placed in a drum labeled “Waste Oil Filters”.

K. HAZARDOUS WASTE

The following wastes must be collected, labeled, and placed in the SAA for collection by EHS. Hazardous waste labels are provided in the *Safety Manual* in facilities or non-laboratory work areas and in the *Safety Records and Resources Binder* in all laboratories.

- **Laboratory Chemicals**
 - Flammable
 - Corrosive
 - Oxidizer
 - Reactive
 - Toxic
- **Aerosol Cans**
 - All aerosol cans; empty, new, or partially full must be collected.
- **Cylinders**
 - An attempt to return cylinders to the distributor or manufacture must be made.
 - If the cylinder is unable to be returned, it must be managed as hazardous waste.
- **Corrosive Cleaning Compounds**
 - All corrosive cleaning compounds, such as those used to treat boilers, coils, or pipes.
 - Corrosive and caustic compounds must be collected in plastic containers.
- **Flammable Adhesives**
 - Epoxy, resins, glues, and sealants which contain solvents, organics, or petroleum distillates.
- **Oil-based Paint and Stains**
 - Containers must be collected in SAA.
- **Solvents, Paint Thinner, Mineral Spirits, and Parts Cleaner**
 - Flammable liquids that are poured off must be collected in grounded metal containers or safety cans.
- **PCB Containing Light Ballasts**
 - Ballasts that are clearly marked as not containing PCBs can be disposed in the municipal trash.
- **Broken or Damaged Fluorescent Lamps or Batteries**
 - Broken lamps or batteries must be collected in a sealed screw top container and labeled as hazardous waste.
- **Shop Rags**
 - Shop rags used with solvents or oil-based products must be placed in flame-arresting collection cans.

<p style="text-align: center;">HAZARDOUS WASTE George Mason University</p> <p>Chemical Name: _____</p> <p>Accumulation Date: ____/____/____</p> <p>Building: _____</p> <p>Room #: _____</p> <p><small>Caution: This container contains toxic or hazardous material, in an emergency please contact GMU police by dialing 911 or 993-2810</small></p>

L. UNIVERSAL WASTE

A subset of very common hazardous waste is collected, managed, and labeled as universal waste and is therefore not subject to the same regulations as other hazardous waste; typically this means they may be collected and stored in greater quantity and for longer periods of time.






- **Fluorescent bulbs**
 - Tubes- all lengths
 - Compact fluorescents
- **High Intensity (HID) Lamps**
 - Mercury Vapor
 - Metal-Halides
- **Intact Mercury-containing Equipment**
 - Thermostats, switches, and intact mercury thermometers.
 - Broken or breached mercury-containing equipment should be reported immediately to EHS. Do not attempt to clean up a mercury spill.
- **Pesticides, Fertilizers, Insecticides and Herbicides**
 - All containers that contain or previously contained pesticides, insecticides, or herbicides.
- **Lead Acid Batteries**
 - All caps on the battery must be present.
 - Battery terminals without caps should be taped with duct tape, or electrical tape.
 - Leaking batteries should be placed in secondary containment to prevent a release to the environment, labeled as hazardous waste, and reported to EHS immediately.
- **Rechargeable Batteries**
 - Nickel cadmium, Lithium ion, Nickel metal Hydride (e.g., NiCad, Li-ION, NiMH)
 - Must be collected in sealed containers and labeled with their contents.


M. EMERGENCY SPILLS AND RESPONSE

In the event of a spill involving hazardous material or waste employees must follow the appropriate reporting and response procedures.

- **Facilities Personnel**
 - Contact University Police immediately at (703) 993-2810 for any spill that is not contained, uncontrollable, or greater than 25 gallons.
 - Leave the area and report the location to the police
 - Identify the hazardous material(s), if safe to do so, using available labels or SDS.
 - Follow Police instructions
 - Contact EHS at (703) 993-8448 for assistance with spills less than 25 gallons involving materials that do not pose a threat to human health, safety, or the environment.
- **Laboratory Personnel**
 - Follow procedures outlined in *Laboratory Safety Orientation* or *Biological Safety for BSL-2 Laboratories* training, or contact University Police at (703) 993-2810.
 - Leave the area and report the location to the police
 - Identify the hazardous material(s), if safe to do so, using available labels or SDS
 - Follow Police instructions

Appendix A. Chemical Segregation Chart

Chemical Hazard Class	Incompatible Materials	Hazard Symbols
Flammable Materials Materials with a flashpoint less than 60°C (140°F). Examples: gasoline, xylene, turpentine, paint thinner, acetone, solvents, alcohols, and ketones	Oxidizing materials, Acids, Toxic materials, Reactive materials	
Oxidizing Materials Readily release oxygen or oxidize surrounding compounds. Examples: nitrates, nitrites, peroxides, and strong acids	Flammable materials, Bases, Acids, Reactive materials	
Acidic Materials pH less than 5. Examples: hydrochloric acid, nitric acid, butyric acid, formic acid, acetic acid, and phosphoric acid	Cyanides, Bases, Oxidizing materials, Toxic materials, Reactive materials	
Basic Materials pH higher than 10. Examples: sodium hydroxide, potassium hydroxide, amines, and ammonium hydroxide solutions	Acids, Oxidizing materials	
Toxic Materials Materials that are carcinogenic, teratogenic or pose an inhalation hazard. Examples: pesticides, solvents, cyanides, and heavy metals.	Acids, Bases, Flammable materials	

<p>Reactive Materials</p> <p>Materials that react with water/air or spontaneously combust on contact with other chemicals. Examples: metal hydrides, and metal powders.</p>	<p>Acids, Bases, Flammable materials, Oxidizing materials</p>	
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The information contained in this Guide is not inclusive of all OSHA or EPA regulations. Please contact Environmental Health and Safety Office at (703) 993-8448 or visit www.OSHA.gov or www.EPA.gov for more information regarding workplace hazards, safety precautions, and regulations.

FLAMMABLE AND COMBUSTIBLE LIQUID SAFETY GUIDE

Version	Date	Comments
1	August, 2008	Initial <i>Flammable and Combustible Liquid Safety Guide</i>
2	March, 2010	Routine review
3	August, 2011	Routine review
4	May, 2015	Routine review

A. INTRODUCTION

The purpose of this Guide is to explain the safe storage and use of flammable and combustible liquids. This Guide is based upon Occupational Health and Safety Administration (OSHA) Standard 29 CFR 1910.106: *Flammable and Combustible Liquids*.

B. SCOPE

This Guide applies to all George Mason University employees and persons that work with flammable and combustible liquids.

C. FLAMMABLE AND COMBUSTIBLE LIQUIDS

A flashpoint is the minimum temperature at which a liquid gives off enough vapor to form an ignitable mixture in air.

- A flammable liquid (Class I liquid) is any liquid that has a flashpoint less than 100° F.
- A combustible liquid (Class II and III liquids) is any liquid that has a flashpoint equal to or greater than 100° F but less than 200° F.

D. GENERAL REQUIREMENTS

- All containers must be properly labeled and marked with the complete chemical name and associated hazards (e.g., flammable, flammable liquid, combustible, etc.).
- All containers must be metal, sealed with a cap or lid, and not be damaged or leaking.
- Sources of ignition (e.g., smoking and open flames) are prohibited in flammable or combustible liquid storage areas or within 25 feet where these materials are used. Other sources of ignition include: cutting and welding, hot surfaces, frictional heat, radiant heat, and static, electrical, and mechanical sparks.
- Containers, tanks, cabinets, and inside storage areas must be designed in conformity with OSHA standards. Contact EHS for evaluation and assistance.
- Flammable and combustible liquids must not limit or obstruct exits, stairways, or areas normally used for safe egress.
- Leaking containers must be placed in secondary containment and taken to a storage room or a safe location outdoors and the contents must be transferred to an undamaged container as soon as possible. Contact EHS for assistance.

- At least one Class ABC fire extinguisher must be located within 10 feet of any flammable and/or combustible liquid storage area and within 50 feet of a flammable liquid use area.
- Other combustible materials (e.g., wood, cloth, paper) must not be stored in the same area or on top of flammable or combustible liquids storage areas.
- When transferring flammable liquids from one container to another, the two containers must be bonded (connected by a bonding wire) and grounded (one container connected to a grounded point), see Figure 1.
- The volume of flammable and combustible liquids in one area may not exceed OSHA, International Fire Code, or NFPA limitations. Contact EHS for additional information.

E. CONTAINERS AND TANKS

- A container is any can, barrel, or drum that has a capacity not exceeding 60 gallons.
- All portable gasoline and flammable liquid cans and containers must be made of metal and have a flame arresting cap or lid. Plastic gasoline/flammable liquid cans and containers are not appropriate for the work place.
- A portable tank is a closed container, not intended for fixed installation, which has a liquid capacity between 60 and 660 gallons.
- All tanks must have at least one venting device installed in the top of the tank that would sufficiently limit the internal pressure under fire exposure conditions. All tanks must be equipped with secondary containment.
- The distance between any two flammable or combustible liquid storage tanks shall not be less than three feet.

F. STORAGE CABINETS

- No more than 10 gallons of flammable and/or combustible liquids may be stored outside of a storage cabinet.
- No more than 60 gallons of Class I or Class II liquids, or more than 120 gallons of Class III liquids may be stored in a flammable storage cabinet.
- All storage cabinets must be clearly labeled **“Flammable – Keep Fire Away.”**

G. STORAGE AREAS

Flammable and combustible liquid storage areas must meet the following conditions:

- There must be at least one clear aisle, no less than three feet wide, within the storage area.
- There must be at least six complete air changes per hour.
- Containers larger than 30 gallon may not be stacked upon one another.
- Areas where flammable or combustible liquids are transferred from one tank or container to another must be separated from other operations in the building.
- A pump or self-closing faucet must be used to transfer liquids. A method for controlling spills and spill supplies must be located near the transfer area. Adequate natural or mechanical ventilation must be provided.
- Storage of flammable and combustible liquids is prohibited in office spaces.

H. OUTSIDE STORAGE

- Outside storage areas that contain flammable and combustible liquids may not be located within 10 feet of buildings, streets, alleys, and public areas, and less than 20 feet from adjacent property lines.
- Outside storage must be provided with secondary containment.
- Outside storage areas must be secured and protected against tampering or trespassers and kept free of debris and other unnecessary combustible material.
- An unobstructed access way within 200 feet of the outside storage area and at least 12 feet wide is required to permit access for fire control and emergency response equipment.

I. BONDING AND GROUNDING

- Any time a flammable material is transferred from one container to another, each container must be bonded to the other and one container grounded using the following procedure (see Figure 1 below).
 - Before opening each container, attach the containers to one another using a conductive material such as a bonding wire with alligator clips.
 - Attach the container that is resting closest to the ground to a conductive metal object that is firmly in contact or implanted into the ground soil.
 - Once the transfer is complete, reseal the containers and remove the bonding and grounding devices.

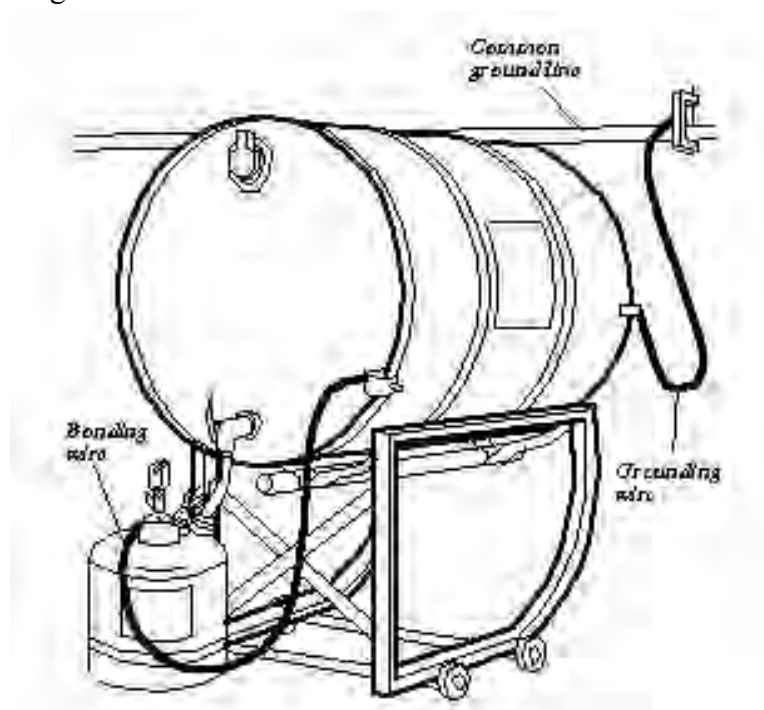


Figure 1

The information contained in this Guide is not inclusive of all OSHA regulations. Please contact Environmental Health and Safety Office at (703) 993-8448 or visit www.OSHA.gov for more information regarding workplace hazards, safety precautions, and regulations.

Environmental Health and Safety Office

HAZARDOUS MATERIALS SHIPPING & RECEIVING GUIDE

Version	Date	Comments
1	September, 2013	Initial <i>Hazardous Materials Shipping and Receiving Guide</i>

A. INTRODUCTION

This *Hazardous Materials Shipping and Receiving Guide* outlines the requirements necessary for the proper acceptance procedures for receipt of all shipments of hazardous materials and for shipment of hazardous materials by university employees. Following this Guide will facilitate safe and secure receipt of packages as well as proper, safe, an expedient shipment of hazardous materials in accordance with US Department of Transportation (DOT) regulations outlined in 49CFR172.

B. SCOPE

This Guide applies to all university employees who receive or sign for packages containing hazardous materials and any personnel who may be required to ship hazardous materials on an infrequent basis.

C. HAZARDOUS MATERIALS

A hazardous material is defined as a substance or material that is capable of posing an unreasonable risk to health, safety, and property when transported in commerce. The term includes hazardous substances, hazardous wastes, marine pollutants, and elevated temperature materials. The Environmental Health and Safety Office (EHS) will assist in identifying what materials are and are not hazardous materials upon request. There are nine hazard classes:

Hazard class	Name of class or division	Examples of Materials
Class 1	Explosives	Picric acid, nitroglycerin, ammunition
Class 2.1	Flammable gas	Hydrogen, acetylene, butane
Class 2.2	Non-flammable gas	Nitrogen, helium, argon
Class 3	Flammable liquid	Alcohols, Ethers, acetone, acrylonitrile
Class 4.1	Flammable solid	Paraformaldehyde, aluminum powder
Class 4.2	Spontaneously combustible	Sodium hydrosulfite, potassium sulfide
Class 4.3	Dangerous when wet	Sodium borohydride, sodium metal
Class 5.1	Oxidizer	Potassium permanganate, sodium nitrate
Class 5.2	Organic peroxide	Benzoyl peroxide
Class 6.1	Toxic substance	Azides, cyanides, mercury compounds
Class 6.2	Infectious substance	HIV cultures, human materials
Class 7	Radioactive material	³⁵ S, ¹⁴ C, ³ H, ³² P
Class 8	Corrosive	Hydrochloric acid, sulfuric acid
Class 9	Miscellaneous dangerous goods	Dry ice, lithium batteries, PCB's

D. IDENTIFYING A HAZARDOUS MATERIALS PACKAGE

DOT-approved packaging is the primary indication that a shipment contains hazardous materials (See *Attachment A: Indications of a Hazardous Materials Package* for examples):

- Packages marked or labeled with a “UN” or “NA” notation followed by a 4 digit number and the proper name and quantity of the hazardous material being shipped.
- The present of a square on point or diamond shaped label(s) or markings containing an associated hazard class number also indicate that the package contains hazardous materials.
- Packages of exempt or limited quantities may be marked “Limited Quantity”, or DOT-E followed by a four digit number.
- Or the package may have a square on point label or marking with the top and bottom portions in black with a white center or a suitable contrasting color to the background. A black letter “Y” may be present in the white center indicating a “limited quantity” shipped by air.

Hazardous material is commonly shipped with a hazardous material shipping paper, dangerous goods declaration, or bill of lading, which will directly identify the proper name, class, and amount of hazardous material being shipped. See Attachment A for example. Some hazardous materials are sent in exempt or limited quantities and will not be accompanied by, or identified on, a shipping paper.

E. RECEIVING HAZARDOUS MATERIALS

When receiving hazardous materials always follow these steps before signing for them:

- Verify that you are approved to accept the package.
 - If you did not place the order, or were not given prior authorization to accept it by a supervisor, do not accept or sign for the package.
- Examine the exterior of all packages.
 - If any physical damage is noted; rips, tears, leaking, staining or discoloration do not accept the package.
 - If the package is producing a strong odor contact EHS at (703) 993-8448 for further guidance.
 - If the contents sound loose or broken while handling do not accept the package.
- Review the shipping papers to ensure the items described are present.
 - If the items do not match the description do not accept the package.

If any discrepancies or damages are observed and the shipper refuses to return the package, has left the premises, or is otherwise unavailable, contact EHS immediately and EHS personnel will handle the package in accordance with transportation and safety regulations.

Once the package has been examined and accepted, immediately secure the package in proper storage to prevent theft, loss, or damage. Do not leave the package unsecured.

Do not handle any contents of a hazardous materials package unless you have been properly trained in the hazards that may be present and how to protect your health and safety. If you discover a damaged, leaking or open container of hazardous material after receiving a package immediately contact campus police and inform them of your location and situation. Secure the package in a safe location, if you have access to a fume hood place the package inside and close the sash, and do not attempt any other actions until EHS has made an evaluation of the situation.

F. SHIPPING HAZARDOUS MATERIALS

Both the International Air Transport Association (IATA) and DOT regulate the shipping of hazardous materials and/or dangerous goods transported via road or air, respectively. This includes the transport of all chemicals with the exception of sample amounts (49CFR173.4) between university campuses. Specific training is required and necessary to prepare and package a shipment of hazardous material.

Employees who may be required to ship such items infrequently must contact EHS who will then provide this service. In order for a shipment to be prepared and expedited properly the individual seeking shipment must notify EHS at least five business days for chemical shipments and at least two days for biological materials (including dry ice) in advance of the desired shipping date and provide:

- Itemized list of contents of the package to include volume, weight, and size of the container(s).
- An appropriate shipping container that meets UN packaging requirements (can be purchased through EHS if the department does not have the appropriate containers and the shipment is urgent)
- Dry ice and quantity to be included in the package (if required).
- Package (length, width, height, and weight).
- Insurance for the package (if any).
- Payment information; org and account number or third party FedEx account number to charge the shipment.
- Shipper's name and a 24-hour phone number
- Consignee's (receiver's) name, address, and phone number.

Individuals who ship hazardous materials on a frequent or routine basis must contact EHS to coordinate training for them to perform this task. Under no conditions are students permitted to offer hazardous materials for shipment on behalf of the university.

Attachment A: Indications of a Hazardous Materials Package



Figure 1. “Square on point” DOT Hazard classification labels



Figure 2. DOT specification packaging with square on point label

OIL AND CHEMICAL SPILL GUIDE

Version	Date	Comments
1	October, 2008	Initial <i>Oil and Chemical Spill Guide</i>
2	July, 2009	Inclusion of exposure and shelter in place information
3	June, 2013	Routine review
4	February, 2015	Routine review

A. SUMMARY

The purpose of this Guide is to explain the stepwise procedures that must be followed in the event of an oil or chemical spill.

B. SCOPE

This Guide applies to all George Mason University employees and contractors who use and store oil and chemicals on George Mason University property. This Guide also applies to George Mason employees and contractors that service equipment that contains oil or chemical products.

C. RESPONSIBILITIES

- Contact the Department of Police and Public Safety by dialing (703) 993-2810 from any phone or 911 from any university landline in the event of a chemical or oil spill that is uncontained and/or poses a threat to human health and/or the environment.
- Report oil and chemical spills, releases, or leaks to the Environmental Health and Safety Office (EHS). Federal, state, and local environmental regulations may require reporting and/or specific response procedures.
- Contractors must report oil and chemical spills to the Department of Police and Public Safety or to the appropriate contract administrator or project manager.
- Comply with this Guide and if necessary seek the assistance from EHS in the event of a chemical or oil spill.
- Employees may only respond to small incidental oil or chemical spills. Large oil spills/leaks (greater than 5 gallons) or chemical spills/leaks (greater than 1 gallon) must be managed by EHS or emergency response personnel.
- When responding to a small incidental spill, follow all relevant health and safety guidance provided by safety data sheets (SDS), training, and EHS.

D. TRAINING

- *Hazard Communication Training* is required upon assigned to a position that requires the use of hazardous materials and when significant changes in job tasks involving chemicals occur. For more information on training visit the EHS website at <http://ehs.gmu.edu>.

E. CHEMICAL SPILL

Employees and students may respond to small incidental chemical spills that occur during the course of a routine work task or project so long as the spill is not greater than one gallon and does not pose a threat to human health, safety, or the environment. See Section H. of this guide for spill cleanup instructions. If a chemical spill occurs and the product is unknown, uncontrollable, immediately hazardous to human health or the environment, evacuate and secure the area then contact Department of Police and Public Safety immediately and report the spill (see Section G). Hazardous chemical spills may only be managed by trained personnel.

Exposure: In the event that you are exposed to a chemical, immediately wash/flush the exposed area for 15 minutes with water. Emergency shower and eyewash stations are located in laboratories and areas where hazardous materials are used or stored. If an emergency shower or eyewash is unavailable use a restroom sink or shower.

Locate the chemical *Safety Data Sheet* (SDS) and review Section 4 “First Aid Measures” to determine the appropriate treatment and response actions; seek medical attention if necessary. SDS must be located and available in areas where hazardous chemicals are used or stored.

Shelter-In-Place: In the event of a large hazardous chemical spill that occurs outdoors, it may be necessary to take refuge within a building to help protect against exposure to hazardous gases, vapors, or fumes. If you are instructed to shelter-in-place do the following:

- Do not leave the building.
- Locate a designated shelter area within the building or move to an appropriate shelter area that meets the following conditions:
 - A room located in an interior space of a hardened structure on the second floor or above (many chemicals are denser than air and will collect in low areas).
 - Not possess any windows or skylights
 - Be equipped with a door
 - Have ample seating space for everyone who is expected to occupy the shelter
- Attempt to block all vents and openings into the room with whatever materials are present in the room such as tape, plastic trash bags, or clothing.
- Remain sheltered in place until instructed to leave by emergency response personnel.
- Notify the Department of Police and Public Safety at (703) 993-2810 or emergency response personnel at 911 of your location and status.

F. OIL SPILL

Determine the quantity and source of oil spilled. Oil spills less than 5 gallons that are contained and do not have the potential to impact the environment may be managed by trained employees and students. If the oil spill is greater than 5 gallons, or has or may impact the environment, contact the Department of Police and Public Safety immediately and report the spill (see Section G)

G. REPORTING A SPILL

Notify the Department of Police and Public Safety by dialing (703) 993-2810 from any phone or 911 from any university landline and provide the following details to the Police Dispatcher.

- Your name
- Contact information
- Location of the spill
- Chemical(s) or product(s) involved
- Approximate quantity
- Injuries and/or property damage
- Status of the spill (e.g. contained, continued, abating, increasing, etc.)
- Any other information that can assist in identifying, containing, or responding to the spill.

University Police will contact EHS to respond to the spill and will contact additional emergency services if necessary.

H. SPILL CLEAN UP

1. Contact EHS prior to responding to a chemical spill for assistance if needed.
2. Review the SDS to determine the appropriate PPE and clean up procedures. If the SDS is unavailable contact EHS for assistance. Do not respond to a spill unless you have reviewed the SDS. Refer to the following sections of the SDS for cleanup information:
 - Section 3 – Hazard Identification
 - Section 6 – Accidental Release Measures
 - Section 8 – Exposure Control and Personal Protection
3. Retrieve spill cleanup supplies and PPE. EHS has placed spill response equipment throughout the university; contact EHS for spill supplies and assistance.
4. Wear appropriate PPE as recommended by the SDS.
5. Check equipment and containers for leaks, damage, or holes. Place damaged or leaking containers in impervious secondary containment.
6. Surround the spill with absorbent materials to contain it and prevent further contamination.
7. If the spill is increasing in size, use absorbent or impervious material to block the most likely path the spilled material(s) will take.
8. Ensure that spill cleanup equipment is compatible with the spilled chemical(s).
9. Start from the outside perimeter of the spill and begin absorbing the product using absorbent pads, booms, rags, or other media.
10. Collect all contaminated absorbent materials, PPE, and tools and place them in an appropriate rigid sealable container or sturdy plastic bag.
11. Label the container holding the spill debris with a label that has both the date and the name of the spilled material(s) and include the words “Hazardous Waste”.
12. Contact EHS to remove and dispose of the spill debris. Do not dispose contaminated clean up materials in the municipal waste bins.

Appendix G: Employee Training Log

SWPPP Training Log

Date of Training_____ **Trainer(s)**_____ **Title**_____

[illegible]

Appendix H: SWPPP Amendments Log

SWPPP Amendment Log

[illegible]

Appendix M:

Chesapeake Bay TMDL Action Plan Update

Mason is required to develop Chesapeake Bay TMDL Action Plans that show how Mason intends to meet the three milestones: a 5% reduction in nitrogen, phosphorus and suspended solids by June 30, 2018. Mason will be required to offset an additional 35% reduction by June 30, 2023, and the final 60% by June 30, 2028.

Mason developed the Phase 1 TMDL Action Plan in 2015.

For compliance with the first permit cycle ending June 30, 2018, Mason utilized credit from existing oversized stormwater best management practices (BMPs) and implemented 320' of urban stream restoration on the Fairfax Campus in 2017 summer. This provided reductions above and beyond the 5% requirement for the Phase 1 TMDL Action Plan. The required reduction goals and the credits generated by the stream restoration project are summarized in the table below.

Subsource	Campus	POC	Total Existing Acres Served by MS4 as of 6/30/2009 (acres)	Loading Rate (lbs/acre)	Estimated POC Load (lbs)	5% Total Reduction Required First Permit Cycle lbs	Reduction Achieved First Permit Cycle lbs
Regulated Urban Impervious	Fairfax	N	185.01	16.86	3,119.27	22.53	43.87
	Sci.&Tech		22.94		386.77		
Regulated Urban Pervious	Fairfax		161.80	10.07	1,629.33		
	Sci.&Tech		34.73		349.73		
Regulated Urban Impervious	Fairfax	P	185.01	1.62	299.72	2.28	18.88
	Sci.&Tech		22.94		37.16		
Regulated Urban Pervious	Fairfax		161.80	0.41	66.34		
	Sci.&Tech		34.73		14.24		
Regulated Urban Impervious	Fairfax	TSS	185.01	1,171.32	216,705.91	2,586.42	35,086.26
	Sci.&Tech		22.94		26,870.08		
Regulated Urban Pervious	Fairfax		161.80	175.80	28,444.44		
	Sci.&Tech		34.73		6,105.53		