

**VPDES MUNICIPAL SEPARATE STORM SEWER  
SYSTEM (MS4)  
PERMIT: VAR040094**

**Third Phase Chesapeake Bay  
TMDL Action Plan**

**University of  
Mary Washington**

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**REVISED APRIL 8, 2024**



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## 1.0 INTRODUCTION

The University of Mary Washington (UMW) was originally issued an MS4 permit in 2003 by the Commonwealth of Virginia. This permit outlines minimum requirements for the operation of the university's storm sewer system, including storm water treatment systems (BMPs). UMW's current permit number is VAR040094, and the permit cycle duration is from November 1, 2023, to October 31, 2028.

As a condition of the permit, UMW is required to prepare a Chesapeake Bay TMDL Action Plan demonstrating that UMW has achieved required removals of nutrients from stormwater runoff based on existing land cover as of June 30, 2019. UMW has issued this plan for the previous two permit cycles and has issued a draft plan for the third permit cycle.

This document is a comprehensive revision of the Action Plan that examines all of the previous calculations against the latest MS4 permit, DEQ guidance, and available record documents. This effort included:

- Compilation of all properties currently owned by UMW within the 2010 US Census Urbanized Areas. This determined that the MS4 permit covers the Fredericksburg and Stafford campuses, but not the Dahlgren campus. Also, UMW has acquired additional parcels since 2009.
- Re-calculation of the regulated urban impervious and pervious areas as of June 30, 2009 using the land cover definitions in DEQ Guidance Memo 20-2003 *Chesapeake Bay TMDL Special Condition Guidance* (Guidance Memo). Forested areas are excluded from the urban pervious area.
- Identification of additional nutrient removal credits in accordance with the Guidance Memo.

## **2.0 LEGAL AUTHORITIES**

No new or modified legal authorities, such as ordinances, permits, policy, specific contract language, orders, and interjurisdictional agreements have been implemented and no additional authorities are required at this time.

## **3.0 DISCHARGES FROM NEW SOURCES**

Discharges into UMW's MS4 from new sources will be addressed by adherence to the VSMP regulations for the implementation of post-development stormwater management facilities.

## **4.0 REQUIRED LOAD REDUCTIONS**

### **4.1 MS4 Service Area**

UMW has three campuses: Fredericksburg (main campus), Stafford, and Dahlgren. Analysis of the 2010 US Census Urbanized Areas determined that only the Fredericksburg and Stafford campuses are subject to the MS4 permit. The relation of the Fredericksburg and Stafford campuses to the US Census Urbanized Areas is shown in Appendix A.

The MS4 Permit directs permittees to define the MS4 Service Area as the area within the 2010 US Census Urbanized Area draining to the storm sewer system operated by the permittee. In the case of the UMW, the MS4 Service Area utilized since the first TMDL Action Plan is the area of the parcels owned by UMW which is more conservative approach. This approach was agreed upon by UMW and the City of Fredericksburg and major reductions in the Service Area would result in gaps in the two areas. For this reason, the parcel-based approach is continued to be used. Parcels owned by UMW are shown in Appendix B.

Some isolated UMW owned parcels do not drain to UMW operated storm sewer are excluded from the Service Area as noted in Appendix B. These parcels total approximately 46.3 acres but include only 1.0 acres of impervious area.

For the parcels included in the Service Area, the parcel area was taken from City of Fredericksburg and Stafford County property websites and verified by GIS. The impervious land

cover as of June 30, 2009 was estimated using previous studies and historic aerial photography from Google Earth Pro. In some cases, record plans for projects were also available. The MS4 Guidance Memo directs permittees to exclude forested, wetlands, and open water land covers from the Service Area. Forested areas are defined using a minimum tree density based on the caliper of the tree and are required to be at least 900 meters contiguous area.

Based on the above, the following are the estimated MS4 Service Areas:

**Table 1 – UMW MS4 Service Areas**

<b>Campus</b>	<b>Urban Impervious (Ac)</b>	<b>Urban Pervious (Ac)</b>
Fredericksburg (including Main Campus, Battleground Athletic Campus & selected other parcels)	46.57	73.01
Other Fredericksburg Parcels	2.85	2.44
Stafford Campus	8.60	6.38
<b>TOTALS</b>	<b>64.09</b>	<b>82.81</b>



### 4.2 Estimated Existing Source Loads & Required Reductions

Based on the land cover conditions within the MS4 Service Area, Chesapeake Bay TMDL load and cumulative reduction calculations for the Rappahannock River basin are calculated below in accordance with the Guidance Memo and the MS4 Permit.

**Table 2 – Estimated Existing Source Loads and Reduction Requirements**

Pollutant	Subsource	Loading rate (lb/ac/yr)	Existing Developed Lands as of 6/30/09 served by the MS4 within the 2010 CUA (acres)	Load (lb/yr)	Percentage of MS4 required Chesapeake Bay total L2 loading reduction	100% cumulative reduction required by 10/31/2028 (lb/yr)	Sum of 100% cumulative reduction (lb/yr)
Nitrogen	Regulated Urban Impervious	9.38	64.09	601.16	9%	54.10	80.64
	Regulated Urban Pervious	5.34	82.81	442.21	6%	26.53	
Phosphorus	Regulated Urban Impervious	1.41	64.09	90.37	16%	14.46	16.74
	Regulated Urban Pervious	0.38	82.81	31.47	7.25%	2.28	



## 5.0 MEANS & METHODS TO ACHIEVE NECESSARY REDUCTIONS

The Guidance Memo describes multiple types of projects that can be credited towards compliance. Each appendix in the Guidance Memo contains the requirements to meet the particular project type. Below are the compliance projects and the applicable appendix.

### 5.1 Table 3 - BMPs in Excess of VSMP Requirements (Appendix V.A)

	Type	Impervious Area Treated (Ac)	Pervious Area Treated (Ac)	Nitrogen Removal (lb/yr)	Phosphorus Removal (lb/yr)	Year Implemented
Annex B Parking Lot	Hydrodynamic	0.28	0.38	0.72	0.11	2017
Jepson Science Facilities	Hydrodynamic	1.19	0.75	2.63	0.39	2019
	Hydrodynamic	2.35	0.71	4.82	0.72	2013

### 5.2 Table 4 - Land Conversion (Appendix V.H)

	Impervious Area Converted to Open (Ac)	Nitrogen Removal (lb/yr)	Phosphorus Removal (lb/yr)	Year Implemented
Alvey Hall Demo	0.23	2.51	0.11	2021

### 5.3 Table 5 - Stream Restoration (Appendix V.J)

	Length Restored (LF)	Nitrogen Removal (lb/yr)	Phosphorus Removal (lb/yr)	Year Implemented
SR-1	120	5.94	15.49	2014
SR-2	230	24.97	89.71	2014
SR-3	110	7.95	29.96	2014
SR-4	180	11.22	49.08	2014

**5.4 Table 6 - BMPs Installed After 1/1/2006 and Before 7/1/2009 (Appendix VI)**

	Type	Impervious Area Treated (Ac)	Pervious Area Treated (Ac)	Nitrogen Removal (lb/yr)	Phosphorus Removal (lb/yr)	Year Implemented
Alvey Parking Garage	WQV Vault	0.8	0.0	3.02	0.45	2006
Goolrick Artificial Turf Field	Sand Filter	2.5	0.0	7.04	2.12	2008
Lee Hall	Stormfilter	0.5	0.0	1.89	0.28	2009
Stafford Campus	Bioretention	2.11	3.16	23.47	2.30	2007



## 6.0 MEANS & METHODS TO OFFSET

UMW has achieved compliance with the third cycle required removals for nitrogen and phosphorus.

**Table 7 – Required & Achieved Nitrogen & Phosphorus Removals**

	<b>Required Reduction (lbs/yr)</b>	<b>Reduction Achieved (lbs/yr)</b>	<b>Excess Removal (lb/yr)</b>
Nitrogen	80.64	96.18	15.53
Phosphorus	16.74	190.72	173.98

## 7.0 MEANS AND METHODS TO OFFSET INCREASED LOADS FROM NEW SOURCES INITIATING CONSTRUCTION BETWEEN JULY 1, 2009 AND JUNE 30, 2014

New sources that initiated construction between July 1, 2009 and June 30, 2014 and that disturbed one acre or greater utilized an average impervious land cover condition of 16% for the design of post development storm water management facilities, therefore, no offsets are required.

## 8.0 MEANS AND METHODS TO OFFSET INCREASED LOADS FROM GRANDFATHERED PROJECTS THAT BEGAN CONSTRUCTION AFTER JULY 1, 2014

UMW has no grandfathered projects that began construction after July 1, 2014.

## 9.0 FUTURE PROJECTS AND ASSOCIATED ACREAGE THAT QUALIFY AS GRANDFATHERED

UMW has no future grandfathered projects.

## 10.0 COSTS TO IMPLEMENT NECESSARY REDUCTIONS

As the required reductions have been achieved, there is no future cost to implement required reductions.

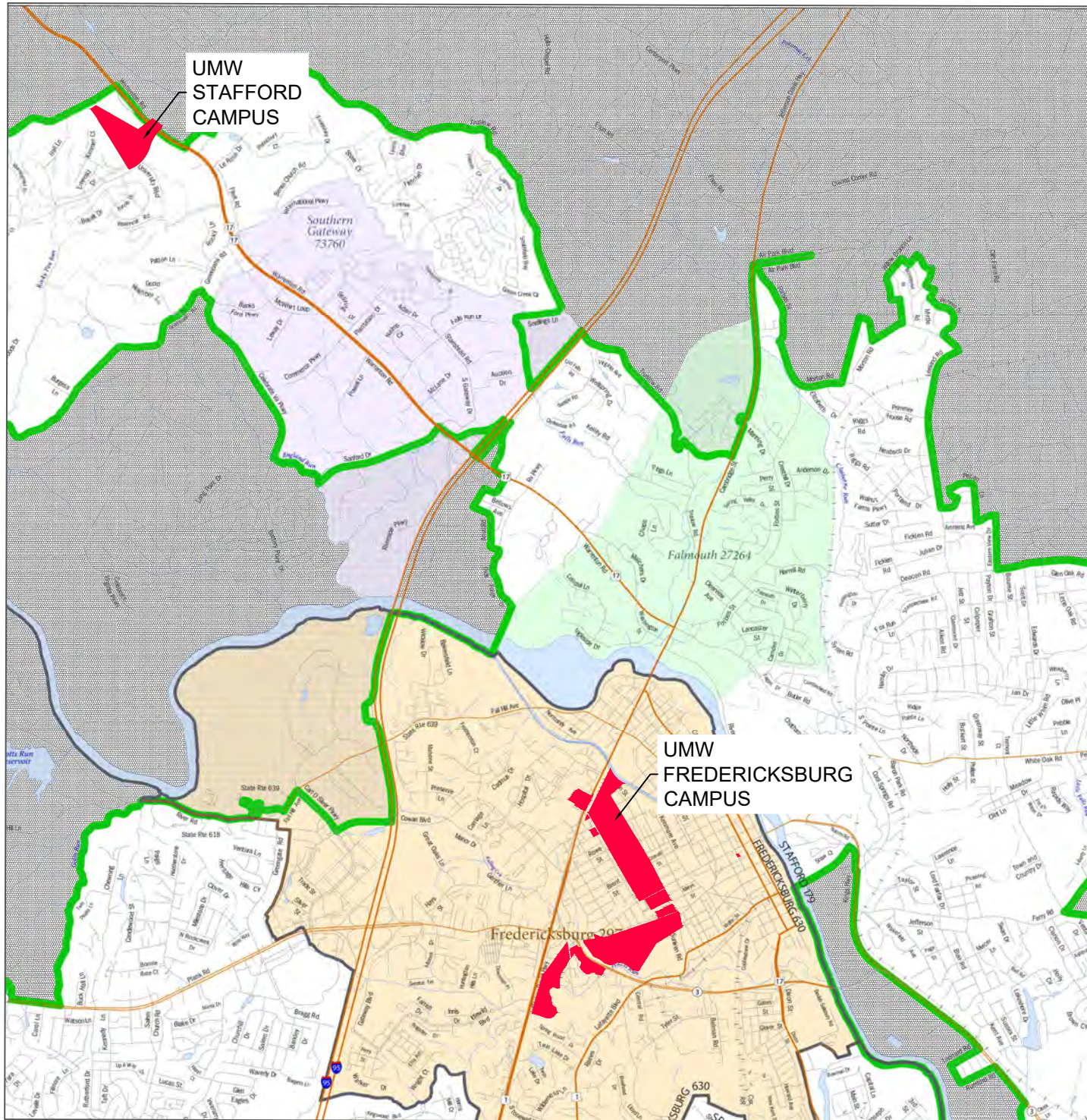
## **11.0 PUBLIC PARTICIPATION**

The second cycle Action Plan has been posted on the UMW website since late 2019. No public comments have been received. This draft third phase Action Plan will be posted on the UMW website and public comments will be solicited for 30 days starting May 1, 2024.

## **APPENDIX A – UMW CAMPUSES WITHIN 2010 US CENSUS AREAS**



# UMW CAMPUSES WITHIN 2010 US CENSUS AREAS



## LEGEND



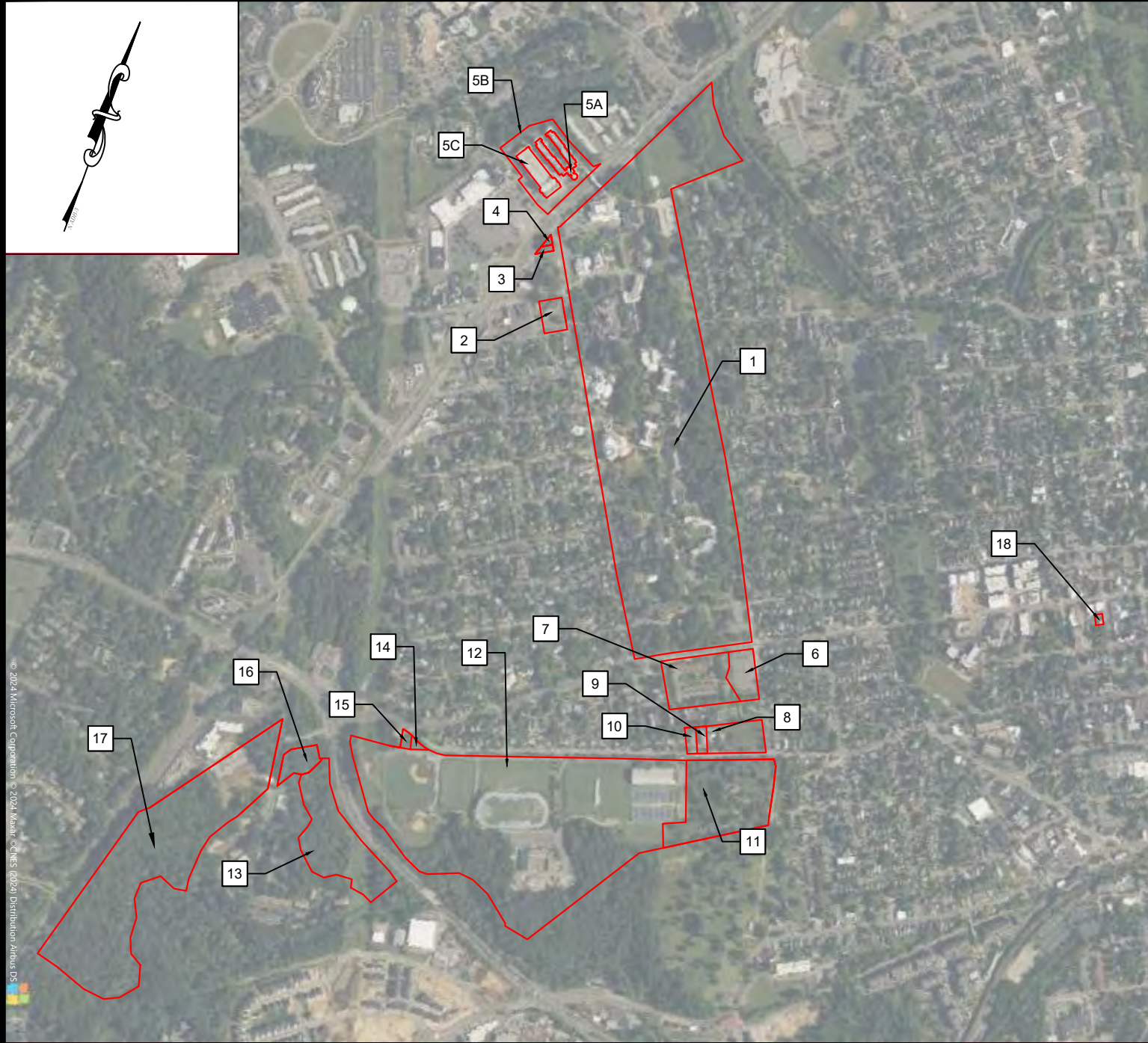
UMW PARCELS OWNED



URBANIZED AREA BOUNDARY



## **APPENDIX B – UMW OWNED PROPERTIES**



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Label	Property Address	GPIN	Area(Ac)	In MS4 (Yes/No)
1	0 COLLEGE AVE	7779-65-8302	93.21	Yes
2	1900 COLLEGE AVE	7779-55-9643	1.10	Yes
3	2100 COLLEGE AVE	7779-56-7105	0.15	No
4	2106 COLLEGE AVE	7779-56-7109	0.08	No
5 (A)	1101 1105 EMANCIPATION HWY	7779-56-5804	1.01	Yes
5 (B)	1125 EMANCIPATION HWY	7779-56-5618	4.73	Yes
5 (C)	1109 1153 EMANCIPATION HWY	7779-56-4880	1.30	Yes
6	1000 WILLIAM ST	7779-83-3458	1.68	Yes
7	1010 WILLIAM ST	7779-83-0351	4.88	Yes
8	1119 HANOVER ST	7779-82-4978	2.59	Yes
9	1121 HANOVER ST	7779-82-2828	0.41	Yes
10	1123 HANOVER ST	7779-82-1835	0.41	Yes
11	710 SUNKEN RD	7779-82-3692	10.00	Yes
12	1204 HANOVER ST (North of Blue Gray Pkwy)	7779-71-5906	58.47	Yes
13	1204 HANOVER ST (South of Blue Gray Pkwy)	7779-71-5906	10.34	No
14	0 HANOVER ST	7779-62-1006	0.17	Yes
15	0 HANOVER ST	7779-52-9097	0.25	Yes
16	0 GREENBRIER DR (North)	7779-40-4661	1.41	No
17	0 GREENBRIER DR (South)	7779-40-4661	33.30	No
18	908 CHARLES ST	7789-04-8888	0.11	No
TOTAL AREA			225.60	

## UMW PROPERTIES - FREDERICKSBURG CAMPUS



1030 Wilmer Avenue, Suite 100  
 Richmond, VA 23227  
 804-264-2228 Fax: 804-264-8773  
 Blacksburg, VA Raleigh, NC  
 Charlottesville, VA Northern Virginia  
 Newport News, VA Virginia Beach, VA





Property Address	PROPERTY ID	Area(Ac)	In MS4 (Yes/No)
121 UNIVERSITY BLVD	44 4J	47.82	Yes

UMW PROPERTIES - STAFFORD CAMPUS



1030 Wilmer Avenue, Suite 100  
 Richmond, VA 23227  
 804-264-2228 Fax: 804-264-8773  
 Blacksburg, VA Raleigh, NC  
 Charlottesville, VA Northern Virginia  
 Newport News, VA Virginia Beach, VA