

**Nutrient Management Plan  
For the  
Woodbridge Campus  
Northern Virginia Community College**

Prepared for:

Northern Virginia Community College  
Facilities Planning Division, Rm. 314 B  
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Annandale, VA 22003

Prepared By:

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| Location Information                 |                               |
|--------------------------------------|-------------------------------|
| Physical Address                     | <i>15200 Neabsco Mills Rd</i> |
| City State Zip                       | <i>Woodbridge, VA 22191</i>   |
| <a href="#">Coordinates</a>          | <i>+38 37' 6.91"</i>          |
| NAD 83<br>Deg Min Sec                | <i>- 77 17' 35.79"</i>        |
| <a href="#">VAHU6 Watershed Code</a> | <i>PL49 – Neabsco Creek</i>   |
| County                               | <i>Prince William</i>         |

| Square Footage of Management Areas |                                             |
|------------------------------------|---------------------------------------------|
| Total                              | <i>11.63 ac (506,486 ft<sup>2</sup>)</i>    |
| Area 1                             | <i>11.63 acres (506,486 ft<sup>2</sup>)</i> |

|                 |                     |
|-----------------|---------------------|
| Plan Start Date | <i>July 1, 2024</i> |
| Plan End Date   | <i>July 1, 2027</i> |

|                   |                     |
|-------------------|---------------------|
| Planner Signature | <i>Sara Shelton</i> |
|-------------------|---------------------|

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## **1.0 INTRODUCTION AND SITE DESCRIPTION**

### **1.1 Introduction**

This Nutrient Management Plan (NMP) is for the Woodbridge Campus of the Northern Virginia Community College (NOVA) located in Prince William County, Virginia just east of I-95 (Figure 1).

This NMP addresses only the nutrient management of turfgrass. Management of other vegetated areas containing trees, flowering ornamentals, small shrubs, and groundcovers, is performed by each facility and their landscape contractor based on very site-specific conditions including but not limited to the type and status of vegetated areas, annual soil testing, and the occurrence of pests and weeds. This NMP is effective for three years through July 1, 2027, or until major renovation or other changes to maintenance practices occur. This NMP includes revisions to add previously inactive turf areas to active nutrient management. This NMP should be used as a resource for planning the quantity and timing of turfgrass nutrient application based on sound agronomic practices.

### **1.2 Site Description**

The 111-acre Woodbridge Campus contains turfgrass in many areas including around campus buildings, along roadways, and around and within parking lots. The Woodbridge Campus contains many turfed medians in the parking lots. All turf areas have been seeded with a tall fescue blend (mix of fine leaved tall fescue and Kentucky bluegrass) and are therefore categorized as cool season turf.

In general, areas with better topsoil and more gently sloping or level terrain have higher quality turf conditions than those areas with strongly sloping conditions and poor topsoil. The campus contains many turf areas with large, denuded areas, thin topsoil, steep slopes, and over-compacted soil. These problem areas, which are addressed in Section 3.2, are generally located in the parking lot medians and the area between the road and the parking lot east of Campus Drive.

Turfgrass areas with irrigation include: the turf circle located to the east of the Arts and Sciences Building, a portion of the field south of the Arts and Sciences Building, a portion of the landscaped median to the north of the Seefeldt Building, and turf and landscaped areas in the immediate vicinity of the Workforce Development Center. The remainder of the turf is not irrigated.

Several environmentally sensitive areas are located at the Woodbridge Campus in addition to the campus has several stormwater management facilities as shown on Figures 2, and 3. Three streams are on campus. Section 4 addresses environmentally sensitive areas.

### **1.3 Current and Future Turf Maintenance**

The campus contracts out some landscape maintenance activities, including herbicide applications, fertilizer applications, liming, aeration, and seeding. Campus staff continue to mow the turf areas. It will be the responsibility of the Landscape Supervisor and the campus Facility Manager to ensure the nutrient management plan is followed.

## **2.0 SOIL SAMPLING AND ANALYSIS**

Although most of the soils in the turf areas have been modified by cut and fill activities, the soils still retain most of the characteristics presented in the U.S. Department of Agriculture (USDA) soil survey and may still be classified as sandy loams to sandy clay loams. Soils in many areas were compacted to very compacted with thin amounts of topsoil.

Soil samples were collected on April 22, 2024, from three (3) different turfgrass areas across the campus and submitted for laboratory analysis including pH, buffer pH, phosphorus and potassium, and other soil properties. Figure 2 shows the locations of the soil sampling areas as well as environmentally sensitive areas and Table 1 presents the laboratory results. Appendix A presents the soil laboratory data. No sampling was performed within wooded or landscaped areas.

Soil laboratory results were converted into nutrient management ratings based on the Virginia Nutrient Management Standards and Criteria (VNMS&C). Soil phosphorous ratings ranged from L- to L. Potassium concentrations were M. Soil pH ranged from 5 to 6.4.

## **3.0 NUTRIENT MANAGEMENT AREAS**

Based on the soil test results, current turf conditions, the intensity of use, and overall visibility and aesthetic considerations, one Nutrient Management Areas (NMA) at the Woodbridge Campus has been established for this NMP. The number of nutrient management areas was kept to a minimum to facilitate effective management and still protect water quality and maintain healthy turf. Figure 3 shows the one nutrient management area and Figure 4 shows the liming areas. Table 2a presents the application schedule for the nutrient management and liming areas, discussed in greater detail in Section 3.1 below.

### **3.1 Nutrient and Liming Applications**

#### **3.1.1 Nitrogen, Phosphorous and Potassium**

Nitrogen, phosphorous (P<sub>2</sub>O<sub>5</sub>) and potassium (K<sub>2</sub>O) are the three macronutrients essential for healthy turf and, along with lime applications, and therefore the central focus of the NMP. Phosphorous and potassium recommendations are based on the soil laboratory results. Nitrogen recommendations are based on the turfgrass needs, not soil test results, which vary based on the type of turfgrass (cool vs. warm season) and level of management (standard vs. intensive). Recommended rates and timing of all three macronutrients are based on the VNMS&C. This NMP uses the most restrictive application rate for each NMA based on individual sample results where multiple sampling areas are part of the same NMA.

The acceptable window for nitrogen application for cool season fescue turf at the Woodbridge Campus is from February 28 until December 6. Although aggressive spring and summer nitrogen fertilization can result in lush, dark green foliage, this occurs at the expense of the turf root system. Turf with an inadequate root system will then struggle in the summer heat and moisture conditions. Additionally, too much nitrogen in spring and summer for cool season turf can result in leaching or runoff to nearby waterbodies. For these reasons, only 0.5 pound of slow-release nitrogen is recommended during April to May to provide a sustained growth response without a flush in shoot growth at the expense of the roots. The bulk of nitrogen should be applied in monthly increments from September through November.

As phosphorous and potassium are not as mobile as nitrogen and generally reside in soil for longer periods of time, the application timing of these two macronutrients is not as critical as nitrogen. Incremental applications of these nutrients from September through November are recommended.

#### **3.1.2 Lime and pH**

Soil acidity is critical to plants because it affects the availability of nutrients in the soil and potential leaching of nutrients from the soil. Cool season fescue prefers a soil pH that is slightly acidic, at a level of approximately 6.2 Standard Units (SU). Periodic lime applications are necessary for many Virginia soils to correct low pH, add buffering capacity, to provide secondary nutrients calcium and magnesium as well as some micronutrients. Liming rates are based on the soil test pH and the buffer indices. Based on the 2024 soil samples, two split lime applications of 34 pounds per 1,000 ft<sup>2</sup> for a total of 68 pounds per 1,000 ft<sup>2</sup> for WO-1 and two applications of 50 pounds per 1,000 ft<sup>2</sup> for a total of 100 pounds per 1,000 ft<sup>2</sup> for WO-2 are recommended for a portion of the campus during the first year of this NMP. Table 2 lists liming schedules and application rates, and Figure 4 shows the areas requiring lime. Liming recommendations are for the first year following soil sampling only. The soil should be tested for soil pH and Buffer pH in the late fall to winter each year to determine if additional annual liming is necessary.

### **3.2 Problem Turfgrass Areas & Temporarily Inactive Nutrient Management Areas**

Poor turfgrass or groundcover conditions are the result of poor soil quality, over-compaction, active erosion, or shading and poor soil moisture conditions caused by nearby trees. These problem areas are generally located in parking areas and the large median and parking medians located east of Campus Drive. Any areas with ineffective groundcover should be temporarily removed from active nutrient management until corrective measures can be applied to improve the turfgrass or groundcover conditions.

Corrective action options will vary by area but may include additional soil amendments (compost/topsoil), aeration or shallow tilling, and the use of mulch, turf mats and blankets. Alternative landscaping such as pavers, and other hardscape treatments may be the best alternative for some areas. If turfgrass is the desired vegetative cover, the soil should be retested for soil and buffer pH and adjusted accordingly with limestone as part of corrective action. Once turfgrass is re-established the areas may be included in the nutrient recommendations.

### **3.3 Permanent Inactive Management Areas**

It is recommended that the Campus dam embankment (See Figures 2, 3, and 4) does not receive any application of fertilizers; and only herbicides approved near waterbodies and only as needed. The Campus dam currently has a fairly dense cover of low growing vegetation consisting of a mixture of grasses and herbaceous plants. The area should be inspected to ensure adequate vegetation coverage and absence of erosion or seepage in accordance with DCR's Dam Safety regulations. Due to the proximity of the dam to the lake and the tributary to Neabsco Creek, no fertilizers should be applied except for turf establishment after a repair. The dam should be mowed less frequently to a height between four to eight inches to discourage woody growth and to facilitate visual inspection for seepage, sloughs, or other signs of stress.

### **3.4 Selection of Fertilizers**

Specific fertilizers have not been selected as a part of this NMP to provide greater flexibility and cost savings. The landscape contractor has the option to select either commonly used fertilizer blends that they may already have in stock or are readily available, or they can use custom blends, a common practice in the commercial landscaping industry. Slow-release nitrogen containing fertilizers are recommended. This NMP will require revision should the landscape contractor and the campus Facility Manager decide to use animal manures or Class B biosolids (not of exceptional quality).

Provided the maximum rate of nitrogen per application and the total annual rates of all three nutrients are not exceeded as detailed in Table 2a, the landscape contractor may use their discretion with the exact ratio of nutrients applied per application.

### **3.5 Pre- and Post-Emergent Herbicides**

Weed control is a necessary requirement for healthy turf and has been implemented in the past at the Woodbridge Campus. In the previous NMP period, pre and post emergent herbicides containing nitrogen fertilizers were applied in spring and early summer months for the campus grounds. As presented in Section 3.1.1, only one application of slow-release nitrogen is recommended in the late spring. Therefore, additional straight application of herbicides without nitrogen additives may be required.

### **3.6 Precautions for Fertilizer Applications**

General precautions for fertilizer application include:

- Avoid applying fertilizers on steep slopes 48-hours prior to a rain event.
- Do not apply fertilizers to frozen or snow-covered ground, nor should they ever be used as ice melt.
- Avoid/minimize application of fertilizers to impervious areas such as parking lots, roads, and sidewalks, and within 25 feet of environmentally sensitive areas and stormwater collection/management facilities.
- Remove any granular materials that land on impervious surfaces by sweeping and collecting, and either put the collected material back in the bag or spread it onto the turf.

## **4.0 ENVIRONMENTALLY SENSITIVE AREAS & RECOMMENDED BUFFERS**

Four environmentally sensitive areas and several stormwater management facilities are located on the Campus as shown on Figures 2, 3, and 4:

- Stream drains to the Retention Pond and then continues towards Neabsco Creek. Both portions of the intermittent stream are in wooded areas.
- Stream runs along the eastern portion of the Campus east of the WM building.
- Stream runs south of the south parking lot.
- Detention basin southwest of the south parking lot.
- Storm Chambers under the easternmost edge of the south parking lot.
- Bioretention basin south of the WFM building.
- Storm Chambers on the southeasternmost edge of parking lot #11.
- Detention basin east of WV1 trailers.
- Two Vegetative Roofs on the WAS building.
- Two areas of permeable pavers west of the WAS building.
- Rainwater Harvesting cistern west of the WAS building.
- Retention basin west of the WAS and WS buildings.
- StormFilter south of the WAC building.
- Continuous Deflective Separator south of the WRC building.
- Rainwater Harvesting cistern south of the WRC building.
- Permeable Pavement northwest of the WRC building.

A no-fertilizer/pesticide application buffer area of at least 25 feet and preferably 50 feet should be established around these sensitive areas. Where practicable, native vegetation may be an alternative to turf in the buffer areas. The area southeast of the retention basin contains virtually no vegetated buffer and two areas near the gazebos are bare with very little ground cover or turf. It is recommended that a vegetated buffer be installed in these areas to improve water quality. Turf in and around the detention basin should be mowed at a greater height.

It is noted that identification of sensitive natural resources areas such as wetlands and streams is based on the publicly available National Hydrologic Dataset and the U.S. Fish & Wildlife Service (USFWS) National Wetland Inventory Maps. Field mapping of other wetlands and streams that may exist on the campus was outside the scope of this NMP.

## **5.0 OTHER TURF MANAGEMENT CONSIDERATIONS**

**Aeration** - Extensive core cultivation/aeration in the late summer to early fall is recommended for the Woodbridge campus. Core aeration is very disruptive to surface smoothness, but it is the best way to relieve the physical effects of soil compaction and increase soil oxygen levels.

**Grass Seed Type** – VCE 2014-2015 - Virginia Turfgrass Variety Recommendations <https://www.sites.ext.vt.edu/newsletter-archive/turfgrass/index.html> - (most recent year) should be referenced when selecting seed mix for over-seeding. The type should be suitable to environmental conditions of the Northern Virginia Transition zone. A general recommendation for the Woodbridge Campus is 90% Tall Fescue possibly blended with 10% Kentucky Bluegrass for turf in primarily sunny locations. Fine fescue blends may be more appropriate for shadier turf areas.

**Iron** - Iron applications (particularly foliar applications) may periodically be used for enhanced greening as an alternative to nitrogen. These applications are most beneficial if applied in late spring through summer for cool season grasses and in late summer/fall applications for warm-season grasses. Since iron is a micronutrient, its application levels are very low. The color response is short-lived (typically two to three weeks) because the iron-induced color response in the leaves is removed by mowing.

**Returning and Management of Grass Clippings** - The recycling of grass clippings on turf should be encouraged as an effective means of recycling nitrogen, phosphorus, and potassium. Where aesthetics allows, all clippings from mowing events should be returned to the turf rather than discharging them onto sidewalks or streets. Clippings should not be blown onto impervious surfaces or surface waters, dumped down stormwater drains, or piled outside where rainwater will leach out the nutrients creating the potential for nutrient loss to the environment.

**Spreader Equipment Calibration** - Spreader equipment calibration is critical to NMP implementation. The landscape contractor should supply equipment calibration records to the campus Facility Manager on a routine basis.

## **6.0 RECORDKEEPING**

Proper NMP implementation requires diligent record keeping of fertilizer, lime and herbicide applications, and turfgrass conditions. Important information to retain with the plan includes soil tests reports; spreader settings; calibration results, dates of fertilizer application and rates applied; seeding or renovation; and unusual stresses caused by disease, drought, and pests. This information will also provide the background needed for future plan revisions.

## **7.0 REFERENCES**

Nutrient Management Training and Certification Regulations 4VAC50-85

<https://www.dcr.virginia.gov/soil-and-water/document/nm-training-certification-regulations-2022.pdf>

Virginia Nutrient Management Standards and Criteria (Revised July 2014):

<https://www.dcr.virginia.gov/document/standardsandcriteria.pdf>

## TABLES

**Table 1: Soil Test Summaries**

| Site:                 |             | Woodbridge Campus – NOVA                                |                |                     |                   |           |                     |                   |           |                        |                     |
|-----------------------|-------------|---------------------------------------------------------|----------------|---------------------|-------------------|-----------|---------------------|-------------------|-----------|------------------------|---------------------|
| Testing Lab:          |             | Waypoint Analytical (Formerly A&L Eastern Laboratories) |                |                     |                   |           |                     |                   |           |                        |                     |
| Sample Date:          |             | 4/22/2024                                               |                |                     |                   |           |                     |                   |           |                        |                     |
| Soil Sampling Area ID | Square Feet | Soil pH (SU)                                            | Buffer pH (SU) | P (Mehlich III) ppm | P (Mehlich I) ppm | P (H/M/L) | K (Mehlich III) ppm | K (Mehlich I) ppm | K (H/M/L) | Soil description       | Turf Species        |
| WO-1                  | 109,807     | 5.5                                                     | 6.88           | 13                  | 3                 | L         | 101                 | 72                | M         | Brown, sandy loam      | Cool season, fescue |
| WO-2                  | 145,372     | 5                                                       | 6.52           | 11                  | 2                 | L-        | 73                  | 52                | M         | Brown, sandy clay loam | Cool season, fescue |
| WO-3                  | 251,307     | 6.4                                                     | 6.87           | 4                   | 0                 | L-        | 102                 | 72                | M         | Dark brown, sandy loam | Cool season, fescue |

Notes: SU = Standard Units; ppm = parts per million; P and K ratings are from Virginia Nutrient Management Standards & Criteria.

**Table 2a: Nutrient Application Worksheet for Nutrient Management Area 1**Site: **Woodbridge Campus – NOVA**Begins: **7/1/2024** Expires: **7/1/2027**Nutrient Management Area: **1**Square Feet: **506,486**Landscape Plants: **Cool Season Turf (Fescue)**

| Annual Nutrient Needs (lbs./1000 ft <sup>2</sup> ) <sup>1</sup> | Application Month/Day <sup>1,2</sup> | Amendment Material Notes                                               | % Slow-Release N | Total N (lbs./1000 ft <sup>2</sup> ) | Total P205 (lbs./1000 ft <sup>2</sup> ) | Total K20 (lbs./1000 ft <sup>2</sup> ) | Lime Recommendation (lbs./1000 ft <sup>2</sup> ) <sup>3</sup> |
|-----------------------------------------------------------------|--------------------------------------|------------------------------------------------------------------------|------------------|--------------------------------------|-----------------------------------------|----------------------------------------|---------------------------------------------------------------|
| <b>3.0 - 2.5 – 1.5</b>                                          | March 1                              | Lime                                                                   |                  |                                      |                                         |                                        | 34 (WO-1)<br>50 (WO-2)                                        |
|                                                                 | April 1                              | N                                                                      | 50% or greater   | 0.50                                 | 0                                       | 0                                      |                                                               |
|                                                                 | Sept 1                               | Aerate, Overseed & N, P <sub>2</sub> O <sub>5</sub> , K <sub>2</sub> O | 50% or greater   | 0.90                                 | 1.00                                    | 0.50                                   |                                                               |
|                                                                 | Oct 1                                | N, P <sub>2</sub> O <sub>5</sub> , K <sub>2</sub> O                    | 50% or greater   | 0.90                                 | 1.00                                    | 0.50                                   |                                                               |
|                                                                 | Nov 1                                | N, P <sub>2</sub> O <sub>5</sub> , K <sub>2</sub> O                    | 50% or greater   | 0.70                                 | 0.50                                    | 0.50                                   |                                                               |
|                                                                 | Dec 1                                | Lime                                                                   |                  |                                      |                                         |                                        | 34 (WO-1)<br>50 (WO-2)                                        |
|                                                                 | <b>Totals:</b>                       |                                                                        |                  | <b>3.0</b>                           | <b>2.5</b>                              | <b>1.5</b>                             |                                                               |

**Notes:**

1. Fertilizer recommendations are flexible provided the following conditions are met: a) no more than 0.7 pounds of Water-Soluble N per 1000 ft<sup>2</sup> is applied within a 30-day period; b) no more than 0.9 pounds of Total N (per 1000 ft<sup>2</sup>) may be applied within a 30-day period; and c) Total annual fertilizer amounts for each nutrient should not exceed the Annual Nutrient Needs listed in column 1.
2. The month and day designations are a general guideline. Apply as close to the month as possible, using the day designation to determine the interval between applications.
3. Two split lime applications of 34 lbs. per 1000 ft<sup>2</sup> totaling 68 lbs. per 1000 ft<sup>2</sup> is recommended for soil sampling area WO-1 and two split lime application of 50 lbs. per 1000 ft<sup>2</sup> totaling 100 lbs. per 1000 ft<sup>2</sup> is recommended for soil sampling area WO-2. Lime applications are for the first year after sampling only. Liming for years 2 and 3 should be based on additional soil pH and Buffer pH testing.
4. Do not apply inorganic fertilizers on frozen or snow-covered ground, or on denuded areas. Any fertilizer that makes its way onto impervious surfaces should be swept or blown back into pervious turfgrass covered areas. Do not use fertilizers as ice melt.
5. Use a drop spreader for application of inorganic fertilizers on turf areas less than 10 feet wide or on slopes greater than 2%.
6. Apply pre and or post emergent herbicides as needed, but do not use fertilizer containing herbicide prior to March 1. Conditions must be met in Note 1.

## FIGURES

**Figure 1: Project Location**

Woodbridge Campus Boundary



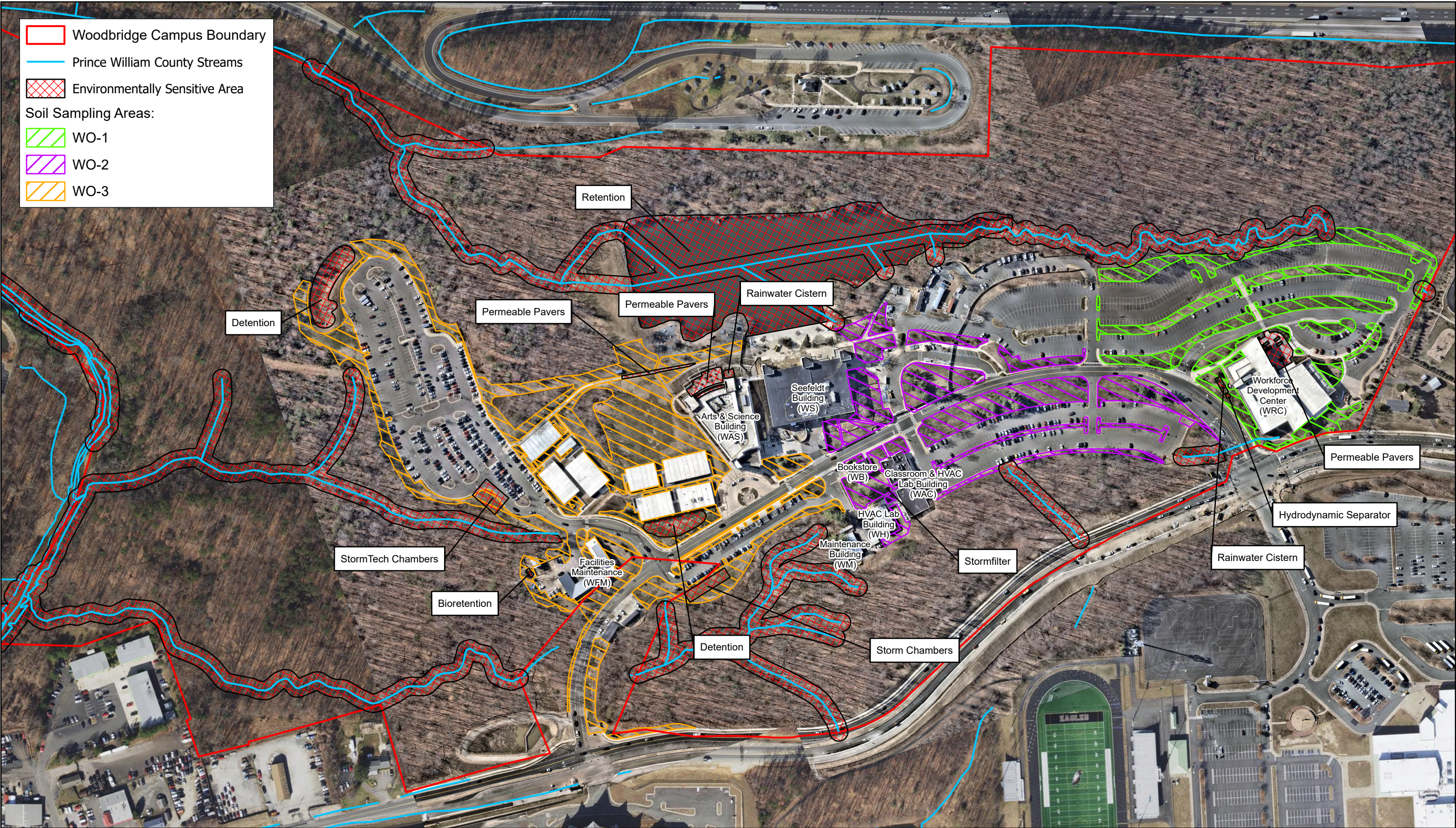
Date: J. Bradley, May 24, 2024  
Source: 2021-2023 VGIN VBMP Orthoimagery  
Projection: NAD 1983 StatePlane Virginia North FIPS 4501 Feet

0 500 1,000 Feet



**Woodbridge Campus**  
**Figure 1: Project Location**  
NVCC NMP

**Figure 2: Soil Sampling Areas**



Woodbridge Campus Boundary

Prince William County Streams

Environmentally Sensitive Area

Soil Sampling Areas:

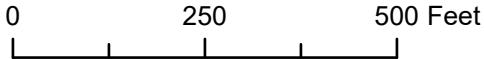
WO-1

WO-2

WO-3

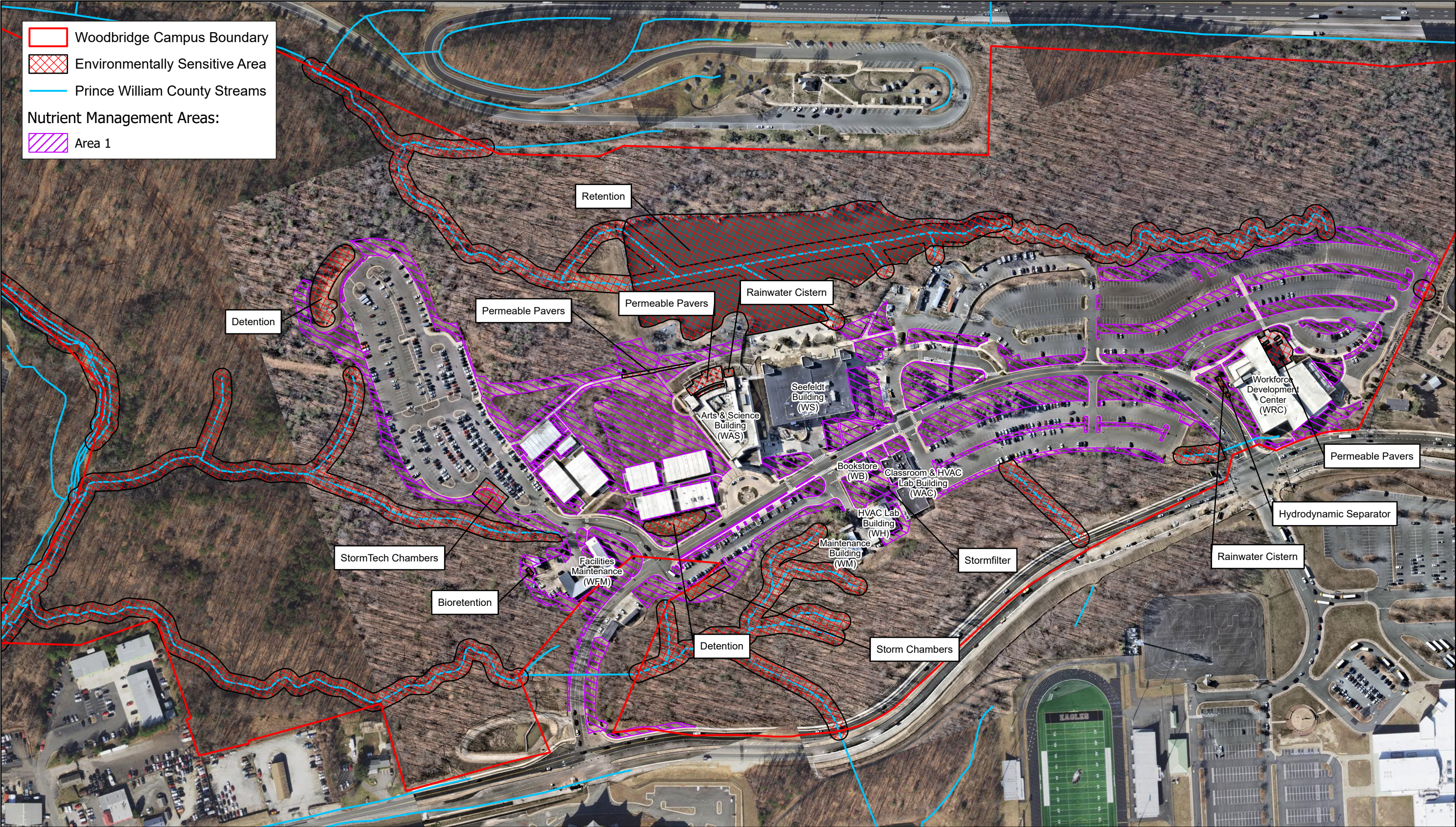


Date: J. Bradley, May 24, 2024  
Source: 2021-2023 VGIN VBMP Orthoimagery,  
Prince William County Digital Data  
Projection: NAD 1983 StatePlane Virginia North FIPS 4501 Feet



**Woodbridge Campus**  
**Figure 2: Soil Sampling Areas**  
NVCC NMP

**Figure 3: Nutrient Management Areas**



Woodbridge Campus Boundary

Environmentally Sensitive Area

Prince William County Streams

Nutrient Management Areas:

Area 1

Retention

Rainwater Cistern

Permeable Pavers

Permeable Pavers

Detention

StormTech Chambers

Bioretention

Storm Chambers

Stormfilter

Hydrodynamic Separator

Rainwater Cistern

Workforce Development Center (WRC)

Classroom & HVAC Lab Building (WAC)

HVAC Lab Building (WH)

Bookstore (WB)

Maintenance Building (WM)

Facilities Maintenance (WFM)

Arts & Science Building (WAS)

Seefeldt Building (WS)



Date: J. Bradley, May 24, 2024  
Source: 2021-2023 VGIN VBMP Orthoimagery,  
Prince William County Digital Data  
Projection: NAD 1983 StatePlane Virginia North FIPS 4501 Feet

0 250 500 Feet



Woodbridge Campus  
Figure 3: Nutrient Management Areas  
NVCC NMP

**Figure 4: Liming Areas**



Date: J. Bradley, May 24, 2024  
Source: 2021-2023 VGIN VBMP Orthoimagery,  
Fairfax County Digital Data  
Projection: NAD 1983 StatePlane Virginia North FIPS 4501 Feet

0 250 500 Feet



**Woodbridge Campus**  
**Figure 4: Liming Areas**  
NVCC NMP

## **APPENDICES**

## **Appendix A: Laboratory Soil Test Results**



7621 Whitepine Road, Richmond, VA 23237  
Main 804-743-9401 ° Fax 804-271-6446  
www.waypointanalytical.com

Send To: Wetlands Studies Solutions  
1620 Brook Road  
Richmond VA 23220

"Every acre...Every year."™

Grower: NVCC Woodbridge NVCC WO  
2645 College Drive  
Woodbridge VA 22191

SOIL ANALYSIS REPORT

Analytical Method(s): SMP Buffer pH Mehlich 3 Loss On Ignition Water pH

Date Received: 04/22/2024 Date Of Analysis: 04/23/2024 Date Of Report: 04/23/2024

| Sample ID<br>Field ID | Lab<br>Number | OM        | W/V           | ENR   | Phosphorus     |          |          | Potassium     | Magnesium      | Calcium        | Sodium         | pH         |                 | Acidity       | C.E.C    |
|-----------------------|---------------|-----------|---------------|-------|----------------|----------|----------|---------------|----------------|----------------|----------------|------------|-----------------|---------------|----------|
|                       |               | %<br>Rate | Soil<br>Class | lbs/A | M3<br>ppm Rate | ppm Rate | ppm Rate | K<br>ppm Rate | Mg<br>ppm Rate | Ca<br>ppm Rate | Na<br>ppm Rate | Soil<br>pH | Buffer<br>Index | H<br>meq/100g | meq/100g |
| WO-1                  | 15054         | 4.2<br>M  |               | 121   | 13 VL          |          |          | 101 M         | 185 H          | 1031 M         |                | 5.5        | 6.69            | 2.4           | 9.4      |
| WO-2                  | 15055         | 4.1<br>M  |               | 118   | 11 VL          |          |          | 73 L          | 226 H          | 774 L          |                | 5.0        | 6.52            | 4.1           | 10.0     |
| WO-3                  | 15056         | 3.2<br>M  |               | 105   | 4 VL           |          |          | 102 M         | 122 H          | 933 H          |                | 6.4        |                 | 0.6           | 6.5      |

| Sample ID<br>Field ID | Percent Base Saturation |         |         |         |        | Nitrate                       | Sulfur        | Zinc           | Manganese      | Iron           | Copper         | Boron         | Soluble Salts    |  |  |
|-----------------------|-------------------------|---------|---------|---------|--------|-------------------------------|---------------|----------------|----------------|----------------|----------------|---------------|------------------|--|--|
|                       | K<br>%                  | Mg<br>% | Ca<br>% | Na<br>% | H<br>% | NO <sub>3</sub> N<br>ppm Rate | S<br>ppm Rate | Zn<br>ppm Rate | Mn<br>ppm Rate | Fe<br>ppm Rate | Cu<br>ppm Rate | B<br>ppm Rate | SS<br>ms/cm Rate |  |  |
| WO-1                  | 2.8                     | 16.4    | 54.8    |         | 25.5   |                               |               |                |                |                |                |               |                  |  |  |
| WO-2                  | 1.9                     | 18.8    | 38.7    |         | 41.0   |                               |               |                |                |                |                |               |                  |  |  |
| WO-3                  | 4.0                     | 15.6    | 71.8    |         | 9.2    |                               |               |                |                |                |                |               |                  |  |  |

Values on this report represent the plant available nutrients in the soil. Rating after each value: VL (Very Low), L (Low), M (Medium), H (High), VH (Very High). ENR - Estimated Nitrogen Release. C.E.C. - Cation Exchange Capacity.

Explanation of symbols: % (percent), ppm (parts per million), lbs/A (pounds per acre), ms/cm (milli-mhos per centimeter), meq/100g (milli-equivalent per 100 grams). Conversions: ppm x 2 = lbs/A, Soluble Salts ms/cm x 640 = ppm.

This report applies to sample(s) tested. Samples are retained a maximum of thirty days after testing.

Analysis prepared by: Waypoint Analytical Virginia, Inc.

by:

Brandi Watson

## **Appendix B: Application Record Forms**

| Fertilizer Application Records                                                                                                                                                                                                                                                                        |                       |                    |            |        |                             |      |                                      |                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------|------------|--------|-----------------------------|------|--------------------------------------|----------------------------|
| Customer Information                                                                                                                                                                                                                                                                                  |                       |                    |            |        | Management Area Information |      |                                      |                            |
| Name:                                                                                                                                                                                                                                                                                                 |                       |                    |            |        | Management Area ID:         |      |                                      |                            |
| Address:                                                                                                                                                                                                                                                                                              |                       |                    |            |        | Management Area Size:       |      |                                      |                            |
|                                                                                                                                                                                                                                                                                                       |                       |                    |            |        | Target Species:             |      |                                      |                            |
|                                                                                                                                                                                                                                                                                                       |                       |                    |            |        | Notes:                      |      |                                      |                            |
| Date                                                                                                                                                                                                                                                                                                  | Supervisor/Applicator | Weather Conditions |            |        | Fertilizer Analysis         | Rate | Amount Fertilizer Used (1000 lbs/AC) | 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 <a href="http://pubs.ext.vt.edu/430/430-350/430-350.html">http://pubs.ext.vt.edu/430/430-350/430-350.html</a> |                       |                    |            |        |                             |      |                                      |                            |

| Herbicide Application Records                                                                                                                                                                                                                                                                         |                       |                    |            |        |                             |      |                       |                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------|------------|--------|-----------------------------|------|-----------------------|----------------------------|
| Customer Information                                                                                                                                                                                                                                                                                  |                       |                    |            |        | Management Area Information |      |                       |                            |
| Name:                                                                                                                                                                                                                                                                                                 |                       |                    |            |        | Management Area ID:         |      |                       |                            |
| Address:                                                                                                                                                                                                                                                                                              |                       |                    |            |        | Management Area Size:       |      |                       |                            |
|                                                                                                                                                                                                                                                                                                       |                       |                    |            |        | Target Species:             |      |                       |                            |
|                                                                                                                                                                                                                                                                                                       |                       |                    |            |        | Notes:                      |      |                       |                            |
| Date                                                                                                                                                                                                                                                                                                  | Supervisor/Applicator | Weather Conditions |            |        | Herbicide Analysis          | Rate | Amount Herbicide 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 <a href="http://pubs.ext.vt.edu/430/430-350/430-350.html">http://pubs.ext.vt.edu/430/430-350/430-350.html</a> |                       |                    |            |        |                             |      |                       |                            |

| Lime Application Records                                                                                                                                                                                                                                                                              |                       |                    |            |        |                             |      |                                   |                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------|------------|--------|-----------------------------|------|-----------------------------------|----------------------------|
| Customer Information                                                                                                                                                                                                                                                                                  |                       |                    |            |        | Management Area Information |      |                                   |                            |
| Name:                                                                                                                                                                                                                                                                                                 |                       |                    |            |        | Management Area ID:         |      |                                   |                            |
| Address:                                                                                                                                                                                                                                                                                              |                       |                    |            |        | Management Area Size:       |      |                                   |                            |
|                                                                                                                                                                                                                                                                                                       |                       |                    |            |        | Notes:                      |      |                                   |                            |
|                                                                                                                                                                                                                                                                                                       |                       |                    |            |        |                             |      |                                   |                            |
| Date                                                                                                                                                                                                                                                                                                  | Supervisor/Applicator | Weather Conditions |            |        | Lime Analysis               | Rate | Amount Lime Used<br>(1000 lbs/AC) | 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 <a href="http://pubs.ext.vt.edu/430/430-350/430-350.html">http://pubs.ext.vt.edu/430/430-350/430-350.html</a> |                       |                    |            |        |                             |      |                                   |                            |

| Pesticide Application Records                                                                                                                                                                                                                                                                                |                       |                    |            |        |                             |      |                       |                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------|------------|--------|-----------------------------|------|-----------------------|----------------------------|
| Customer Information                                                                                                                                                                                                                                                                                         |                       |                    |            |        | Management Area Information |      |                       |                            |
| Name:                                                                                                                                                                                                                                                                                                        |                       |                    |            |        | Management Area ID:         |      |                       |                            |
| Address:                                                                                                                                                                                                                                                                                                     |                       |                    |            |        | Management Area Size:       |      |                       |                            |
|                                                                                                                                                                                                                                                                                                              |                       |                    |            |        | Target Species:             |      |                       |                            |
|                                                                                                                                                                                                                                                                                                              |                       |                    |            |        | Notes:                      |      |                       |                            |
| Date                                                                                                                                                                                                                                                                                                         | Supervisor/Applicator | Weather Conditions |            |        | Pesticide Analysis          | Rate | Amount Pesticide Used | Application Equipment Used |
|                                                                                                                                                                                                                                                                                                              |                       | Temp               | Wind Speed | Precip |                             |      |                       |                            |
|                                                                                                                                                                                                                                                                                                              |                       |                    |            |        |                             |      |                       |                            |
|                                                                                                                                                                                                                                                                                                              |                       |                    |            |        |                             |      |                       |                            |
|                                                                                                                                                                                                                                                                                                              |                       |                    |            |        |                             |      |                       |                            |
| <p>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 <a href="http://pubs.ext.vt.edu/430/430-350/430-350.html">http://pubs.ext.vt.edu/430/430-350/430-350.html</a></p> |                       |                    |            |        |                             |      |                       |                            |