Nutrient Management Plan

Prepared For:

Norfolk State University
Towanda Colquiett
Building Services and Grounds
700 Park Avenue, Suite 101
Norfolk, VA 23504

Prepared By:
Angela C. Whitehead
Soil Horizons, LLC
Certification Code: # 386

Total Plan Acreage: 51.41

City/County: City of Norfolk

Hydrologic Unit Code	JL54

Plan Effective: 04/08/23

Plan Expires: 04/08/26

Planner Signature

The purpose of this Nutrient Management Plan is to ensure minimum movement of nitrogen and phosphorus from the specified area of application to surface and groundwater where they can potentially have a detrimental effect on water quality as well as ensuring that plants have optimum soil nutrient availability for good productivity and quality. By following this soil test based plan you are helping to protect local waters and the Chesapeake Bay.

If you have questions, please contact your plan writer, local Virginia Cooperative Extension Agent, or the Department of Conservation and Recreation Nutrient Management Program.

DCR
Virginia Department of Conservation & Recreation

Nutrient Management Plan for:	
Norfolk State University	
Owner Information	
Project Contact	*Towanda Colquiett*
	Building Services and Grounds Director
Mailing Address	*700 Park Avenue, Suite 101*
City State Zip	*Norfolk, VA 23690*
Phone	*757-823-9545*
Email	*trcolquiett@nsu.edu*
Planner Information	
Planner Name	*Angela C. Whitehead – Soil Horizons, LLC*
Mailing Address	*2 Whittakers Mill Rd*
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Phone	*804-892-6678*
Email	*soilmapper@yahoo.com*
Certification Code	*386*
Location Information	
Physical Address	*700 Park Avenue*
City State Zip	*Norfolk, VA 23504*
VAHU6 Watershed Code	*JL54*
City/County	*City of Norfolk*
Acreage	
Total	*51.41*
Plan Start Date	*04/08/23*
Plan End Date	*04/08/26*

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Norfolk State University (NSU) agrees to comply with all requirements set forth in the Nutrient Management Training and Certification Regulations, 4 VAC 50-85 et seq., 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 the Department of Conservation and Recreation's approved Nutrient Management Plan and maintaining fertilization records. All nutrient applications performed by NSU staff and contractors shall comply with the provisions of this Nutrient Management Plan upon receipt of the approved plan.

Updates and Revisions to Nutrient Management Plans

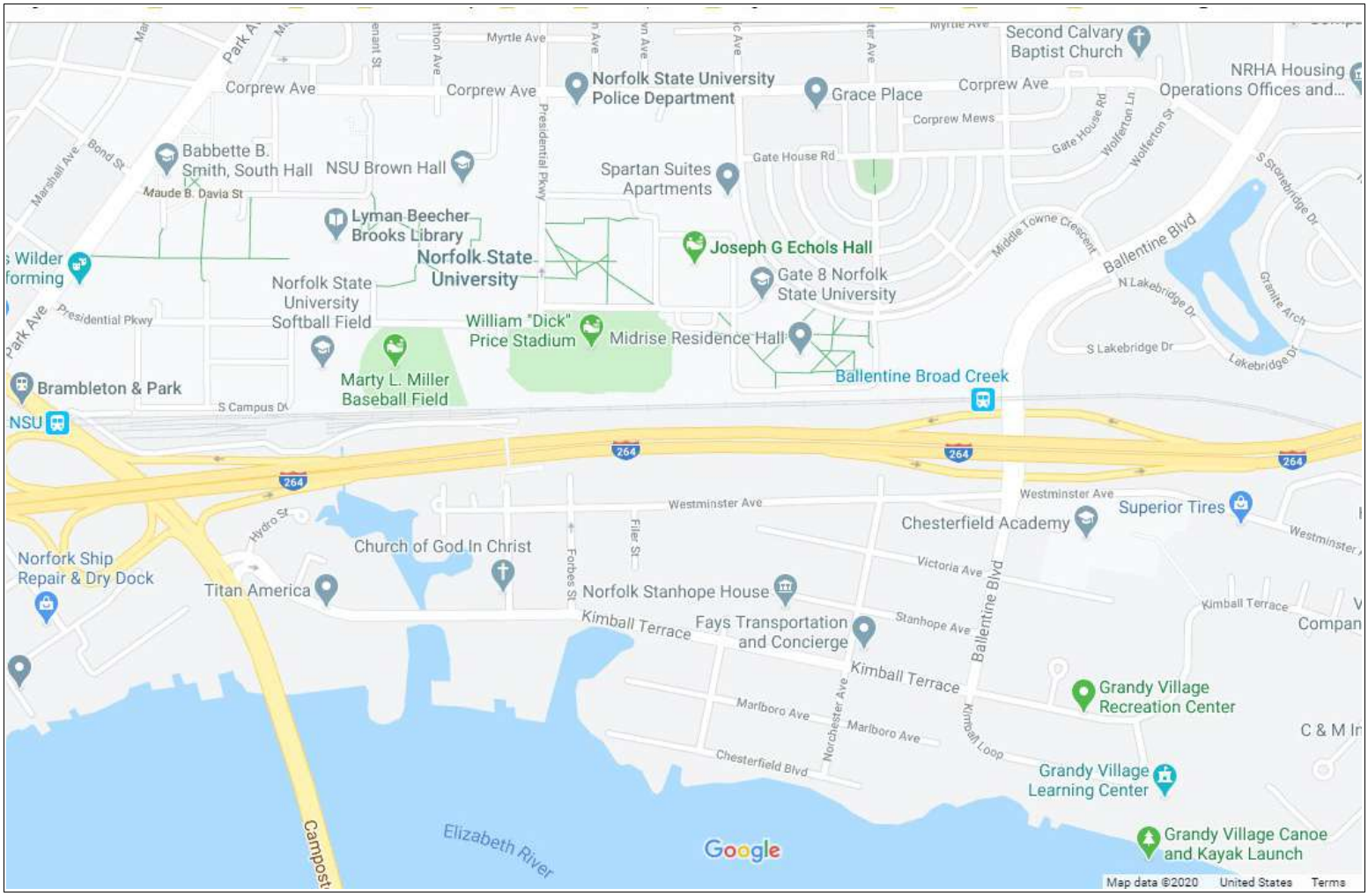
Nutrient Management Plans (NMP) for shall be valid for up to three years. Updated soil sampling and analysis shall be required at least once every three years to determine soil fertility and pH, and to update the NMP or upon a major renovation or redesign of the grounds, whichever occurs sooner. If Class B biosolids or raw manure is applied, the plan must be revised to meet the conditions of the Virginia Department of Environmental Quality permit.

1. Site Description and Supporting Information

Norfolk State University (NSU) is a public historically Black university in Norfolk, Virginia. The campus encompasses approximately 134 acres within the Eastern Branch Elizabeth River watershed. The university recognizes the importance of nutrient management as a fundamental way to protect water quality.

Fertilized grounds turf is predominantly non-overseeded bermudagrass. Areas comprised of a mix of warm season and cool season grasses are managed to encourage warm season growth. Athletic fields are naturally sandy or sand-based, irrigated, and managed for fall overseeded, bermudagrass. Managed fields include: Softball Field, Football Practice Field, and Baseball Field. The football game field was converted to synthetic turf prior to the 2018 season. Landscape beds are located within the common areas, but do not receive any additional nutrients aside from what is applied to the adjacent turf. The primary sources of irrigation water on campus originate from onsite wells and/or municipal water. NSU staff is responsible for the maintenance of all campus turf.

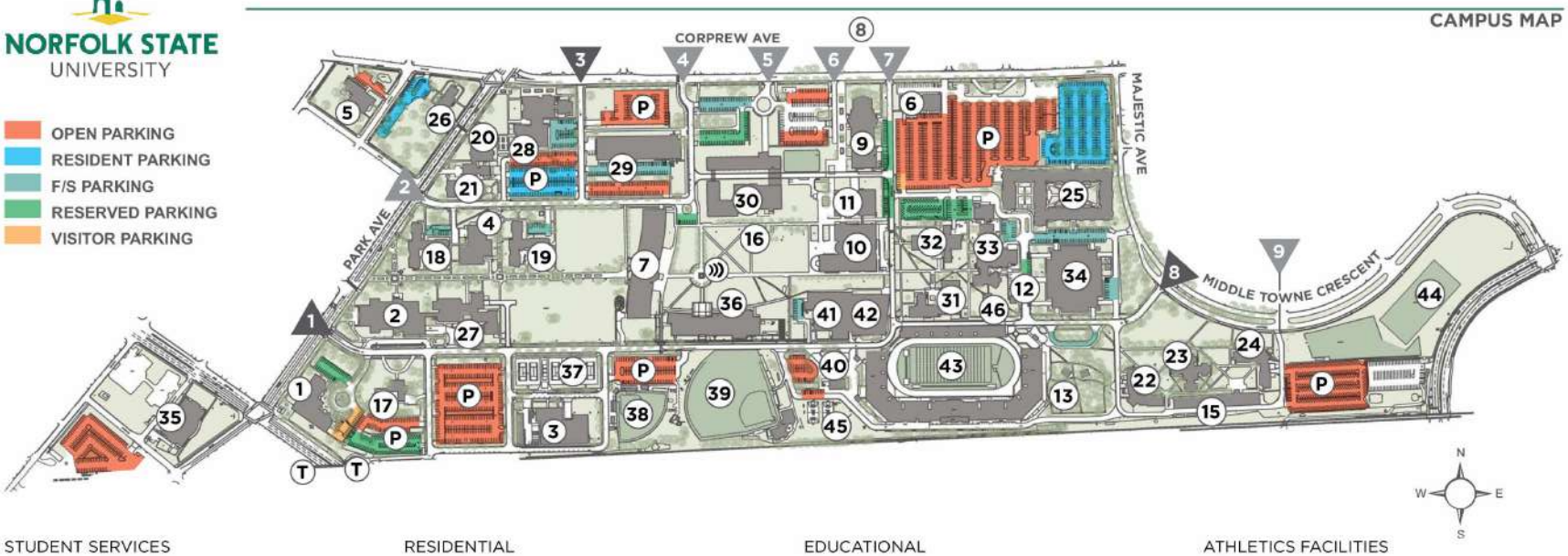
A. Site Location



B1. Campus Map

NORFOLK STATE UNIVERSITY

CAMPUS MAP



STUDENT SERVICES

1. Harrison B. Wilson Hall Administration Building
2. L. Douglas Wilder Performing Arts Center
3. Facilities Management Building
4. West Campus Dining Hall
5. Brambleton Community Outreach Center
6. University Police Building
7. Lyman Beecher Brooks Library
8. The Melvin and Patricia Stith Alumni House
9. Scott/Dozier Dining Hall
10. Student Center
11. Student Services Center
12. Ticket Office
13. Picnic Area
15. Spartan Station
16. White House Memorial Garden

RESIDENTIAL

17. President's House
18. Samuel F. Scott Hall
19. Rosa A. Alexander Hall
20. Babbette B. Smith, North Hall
21. Babbette B. Smith, South Hall
22. Charles H. Smith Hall
23. Honors College - Midrise Residence Hall
24. Lee W. Smith Hall
25. Spartan Suites
26. Phillis Wheatley Hall

EDUCATIONAL

27. E. L. Hamm Fine Arts Building
28. William P. Robinson, Sr. Technology Center
29. James A. Bowser Building
30. G.W.C. Brown Memorial Hall
31. J. Hugo Madison Hall
32. Herman H. Bozeman Hall
33. Roy A. Woods Science Building
34. Joseph G. Echols Memorial Hall
35. Marie V. McDemmond Center for Applied Research
36. Nursing & General Education Building
46. NSU Greenhouse

ATHLETICS FACILITIES

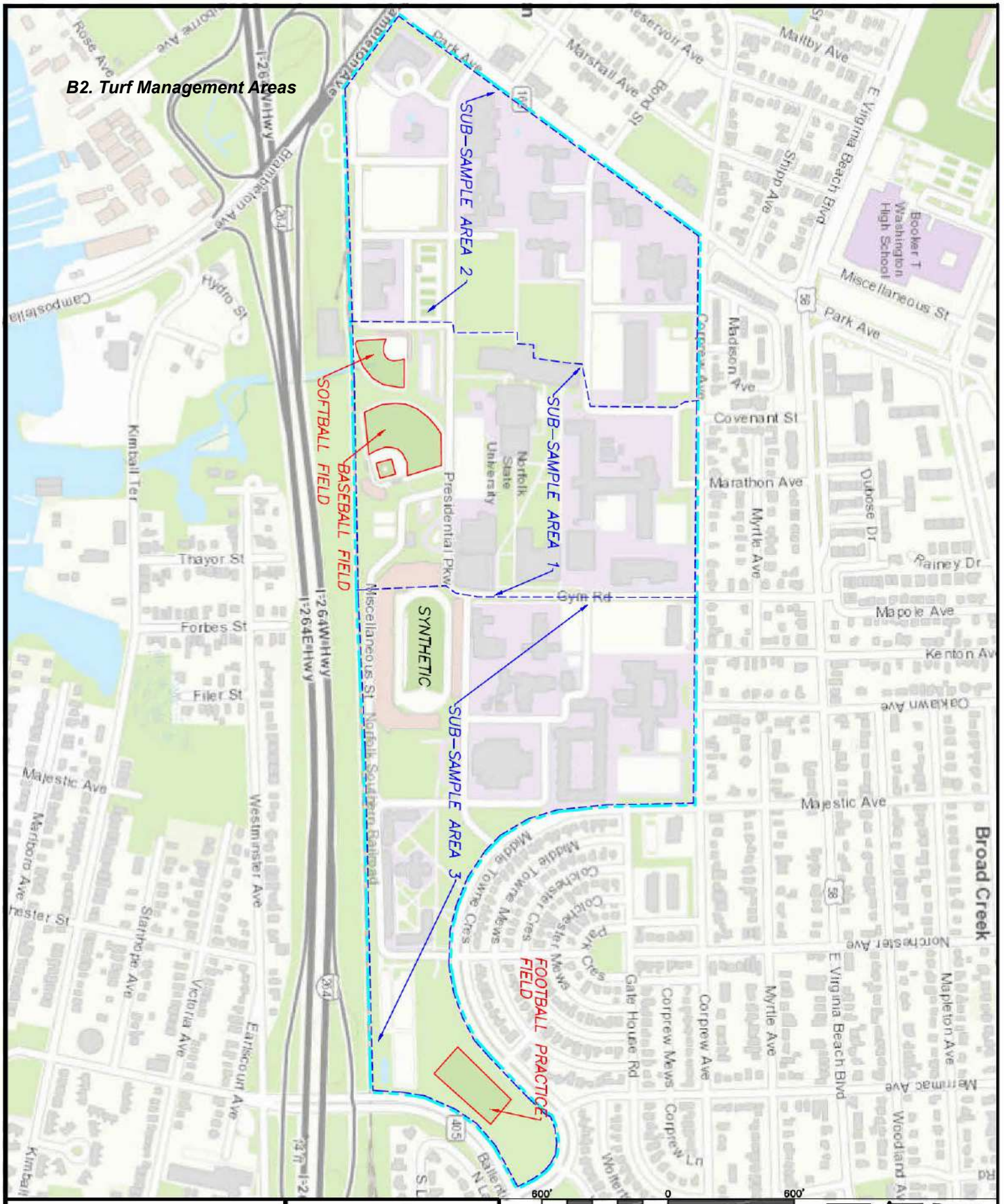
37. Tennis Complex
38. Softball Field
39. Marty Miller Baseball Field
40. Sports Annex
41. James D. Gill Health & Physical Education Bldg
42. Sports Medicine Center
43. William "Dick" Price Football Stadium/Track & Field complex
44. Football Practice Field
45. Basketball Courts

T - The Tide Light Rail Station
▲ - Gate
P - Parking
))) - Communications Tower

For NSU Parking information, please visit: www.nsu.edu/finance/parking or call 757.823.2211

All Visitors/Vendors should obtain a Visitor's Pass from the Parking Office located in the University Police Station (2501 Corprew Ave., Norfolk, VA 23504) prior to parking on campus

B2. Turf Management Areas



PROJECT NAME: NORFOLK STATE UNIVERSITY

CAMPUS MAP

DATE: 3/29/20

SCALE: 1 IN = 600 FT

BASE MAP PROVIDED BY: CITY OF NORFOLK GIS

- WARM SEASON ATHELTIC FIELDS
- WARM SEASON COMMON AREA TURF
- NMP MANAGEMENT BOUNDARY (IMPERVIOUS AREAS EXCLUDED FROM FERTILIZATION)

C. Fertilization Season

The recommended nutrient management 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. 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. **Do not apply nutrients when the ground is frozen/snow-covered. Do not apply nutrients during periods of drought.**

	Killing Frost Dates	**Cool Season Applications**	**Warm Season Applications**
Spring	April 4	February 21	April 4
Fall	November 6	December 18	October 9

D. Environmentally Sensitive Sites

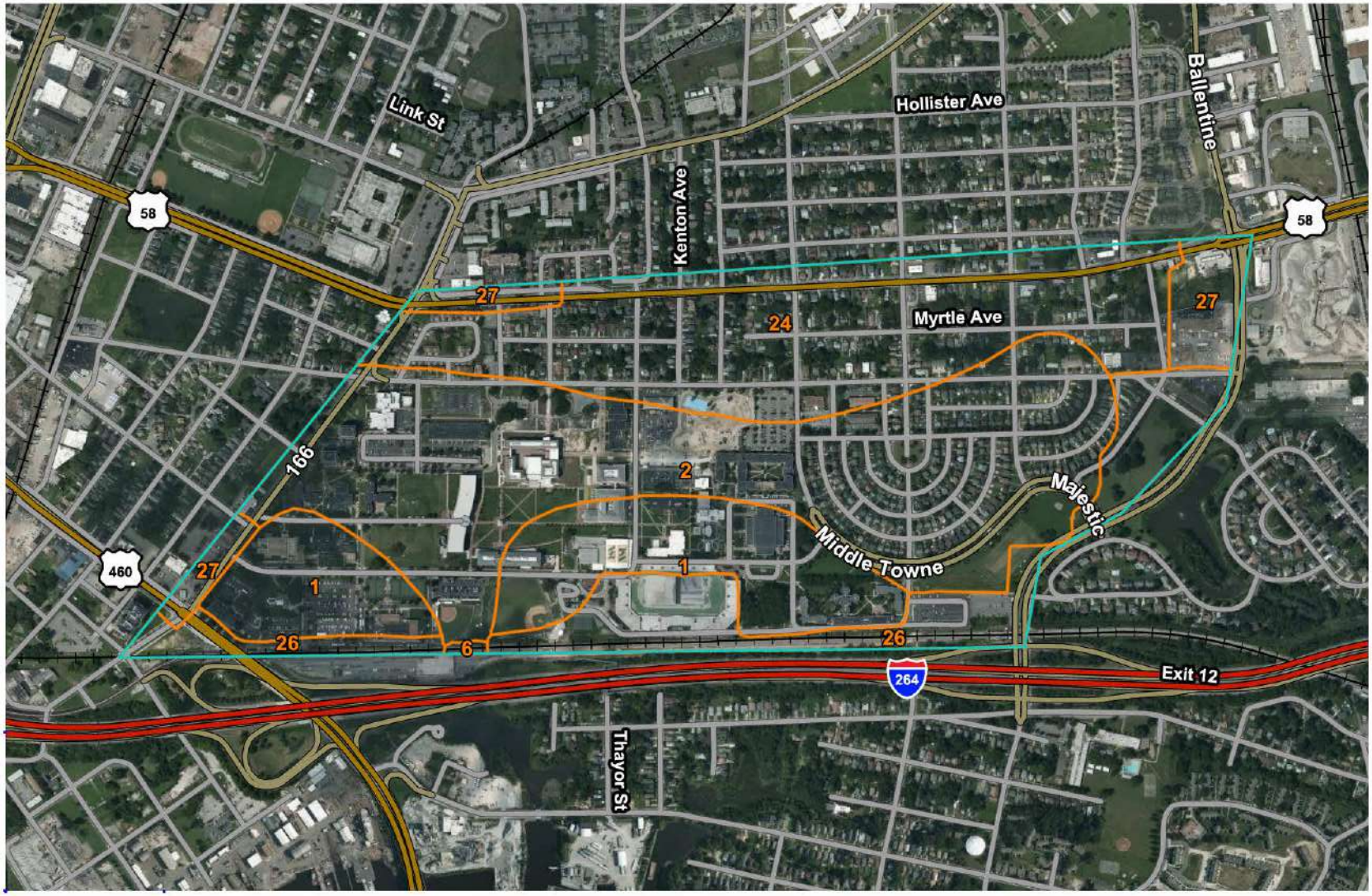
An environmentally sensitive site is any area which is particularly susceptible to nutrient loss to groundwater or surface water since it contains or drains to areas which contain sinkholes, or where at least 33% of the area in a specific management area contains one or any combination of the following features:

1. Soils with high potential for leaching based on soil texture or excessive drainage;
2. Shallow soils less than 41 inches deep likely to be located over fractured or limestone bedrock;
3. Subsurface tile drains; (none reported by NSU facilities management staff)
4. Soils with high potential for subsurface lateral flow based on soil texture and poor drainage;
5. Floodplains as identified by soils prone to frequent flooding in NRCS soil surveys; or
6. Lands with slopes greater than 15%

Soil survey information was obtained from the Tidewater Cities Area Soil Survey:
websoilsurvey.sc.egov.usda.gov

The majority of the management areas occur within disturbed urban soils where the soils have been altered or obscured by construction, excavation/fill and do not exhibit environmentally sensitive conditions. Bohicket (6) and Tomotley (24) are naturally poorly drained soils. Special attention should be given to the timing of fertilizer applications prior to heavy rainfall to avoid nutrient loss due to leaching.

#	**Soil Map Unit**
1	Altavista-Urban land complex
2	Augusta-Urban land complex
6	Bohicket muck very frequently flooded
24	Tomotley-Urban land complex
26	Udorthents-Dumps complex
27	Urban land



76° 16' 27" W

76° 14' 43" W

Map Scale: 1:11,900 if printed on A landscape (11" x 8.5") sheet.

N

0 150 300 600 900 Meters

0 500 1000 2000 3000 Feet

Map projection: Web Mercator Corner coordinates: WGS84

2. Soil Test Summary and Results

Soil samples were taken from fertilized turf areas at each field and/or location. Each composite sample consisted of several sub-samples from the upper four inches of soil. These sub-samples were taken in a random manner to minimize the variability that is present in the sampling area. Sub-samples were thoroughly mixed, breaking apart clumps and removing all foreign matter such as roots, stalks, rocks, etc.

Soil samples were analyzed by Waypoint Analytical. Standard soil test results provide values for pH, Calculated Cation Exchange Capacity, Phosphorous, Calcium, Magnesium, Potassium, Copper, Iron, Boron, Manganese, and Calculated Cation Saturation. The soil samples collected are valid for the life of this plan (three years) or upon a major renovation or redesign of the campus grounds, whichever occurs sooner.

Customer Name:	**Norfolk State University**
Testing Lab:	**Waypoint Analytical**
Sample Date:	**3/14/23**
Planner Name, Cert. #:	**Angela C. Whitehead, #386**

Area	Soil pH	Buffer pH	Lab P (ppm)	VT P (ppm)	VT (H/M/L)	P_2O_5 Needs (lbs/1000ft^2)	Lab K (ppm)	VT K (ppm)	VT (H/M/L)	K_2O Needs (lbs/1000ft^2)
G1	6.7		65	27	H-	1.0	131	93	H-	1.0
G2	6.5		51	20	H-	1.0	114	81	M+	1.0
G3	5.7	6.76	43	16	M+	1.0	102	72	M	1.5
Football Practice	6.3		49	19	H-	1.0	60	43	M-	2.0
Baseball	6.0	6.81	70	29	H	0.75	103	73	M	1.5
Softball	6.2		64	26	H-	1.0	113	80	M+	1.0

- Soil pH ranged from 5.7 – 6.7. Additions of limestone are recommended where pH measures below 6.2 (Grounds Area 3, Baseball). One limestone application is recommended at a rate of 45 lbs/1000 ft^2 during the plan cycle.
- Additional potassium may be added annually to aid in recovery of damaged turf during times of extreme use.
- Phosphorous may be applied at the specified rate, however a plant response is not expected.
- Water soluble nitrogen (WSN) applications may not exceed 3.5 lbs/1000 ft^2 annually to warm season athletic fields. Overseeded warm season turf may receive one additional pound of WSN. In the Fall, 0.5 lb/1000 ft^2 of nitrogen may be applied after perennial ryegrass overseeding is well established. In early Spring, an N application of 0.5 lb/1000 ft^2 may be made to overseeded perennial ryegrass if growth and color indicate need.
- Water soluble nitrogen applications may not exceed 4 lb/1000 ft^2 annually to warm season turf on non-athletic field common areas.

3. Summary of Recommended Annual Lime, Nitrogen, Phosphorous, and Potassium Application

The following tables provide nutrient recommendations that allow managers flexibility in selecting fertilizer products that best fit their management program, weather conditions, and budget levels. Fertilizer products and/or analysis are not specified and doing so may constrain the manager. Monthly fertilization programs are included to demonstrate the frequency and timing of nutrient applications that comply with Virginia Nutrient Management Standards and Criteria, Revised July 2014. Application rates below the rate recommended in the plan are permitted. If Class B biosolids or raw manure is applied, the plan must be revised to meet the conditions of the Virginia Department of Environmental Quality permit.

A. Fertilizer Recommendations Summary: NSU Turf

Site	Management Acres	Annual Lime Needs (lbs/1000ft^2)	Max. Annual N App. (lbs/1000ft^2)[a, b]	Max. Total N Rate per application (lbs/1000ft^2)[b, c, d]	Annual P_2O_5 Needs (lbs/1000ft^2)	Annual K_2O Needs (lbs/1000ft^2)
Grounds	45.49	45 (Area 3)	4.0	0.7 (min. 30 days)	1.0	1.0
Football Practice Field (overseeded)	2.0	--	4.5	0.35 (min. 15 days)	1.0	2.0
Baseball Field (overseeded)	3.03	45	4.5	0.35 (min. 15 days)	0.75	1.5
Softball Field (overseeded)	0.89	--	4.5	0.35 (min. 15 days)	1.0	1.0

[a] Cool Season: Do not apply N between December 19 and February 20 or when the ground is frozen. Warm Season: Do not apply N between October 10 and April 3 or during periods of drought.

[b] 100% Water Soluble N (WSN) Fertilizer.

[c] A maximum application rate of 0.9 lb/1000 ft^2 of total N (cool season) or 1.0 lb/1,000 ft^2 of total N (warm season) may be applied using slowly available forms of N with a minimum of 30 days between applications.

[d] On sand-based fields: WSN must be applied as two applications not to exceed 0.35 lb/1,000 ft^2 each with a minimum of 15 days between applications. Slowly Available N sources may be applied as a split application of 0.5 lb/1,000 ft^2 with a minimum of 15 days between applications.

B. Recommended Monthly Fertilizer Application: NSU Turf

	$N^{a,b,c,e} – P_2O_5 – K_2O$ (lbs/1000ft^2) 2023-2026											
Area	**Mar 4**	**April**	**May**	**June**	**July**	**August**	**Sept**	**Oct**	**Nov**	**Annual Need[d]**		
										$N^{a,b}$	P	K
Grounds (non-irrigated)			0.7 – 0.5 – 0.5				0.7 – 0.5 – 0.5			1.4	1.0	1.0
Football Practice overseeded	0.5 – 0 – 0 (overseeding)		0.7 – 0.2 – 0.4	0.7 – 0.2 – 0.4	0.7 – 0.2 – 0.4	0.7 – 0.2 – 0.4	0.7 – 0.2 – 0.4	0.5 – 0 – 0 (overseeding)		4.5	1.0	2.0
Baseball overseeded	0.5 – 0 – 0 (overseeding)		0.7 – 0.15 – 0.3	0.7 – 0.15 – 0.3	0.7– 0.15 – 0.3	0.7 – 0.15 – 0.3	0.7 – 0.15 – 0.3	0.5 – 0 – 0 (overseeding)		4.5	0.75	1.5
Softball overseeded	0.5 – 0 – 0 (overseeding)		0.7 – 0.2 – 0.2	0.7 – 0.2 – 0.2	0.7– 0.2 – 0.2	0.7 – 0.2 – 0.2	0.7 – 0.2 – 0.2	0.5 – 0 – 0 (overseeding)		4.5	1.0	1.0

[a] See Table 3A and Section 5 for N Rate Guidelines. N applications may not exceed those specified in Table 4A.

[b] A maximum application rate of 0.9 lb/1000 ft^2 of total N (cool season) or 1.0 lb/1,000 ft^2 of total N (warm season) may be applied using slowly available forms of N with a minimum of 30 days between applications.

[c] **Do not apply more than 0.7 pounds of water soluble nitrogen per 1000 ft^2 within a 30 day period.**

[d] P_2O_5 applications may not exceed the Annual Need. Additional K_2O may be made annually to increase plant vigor and relieve traffic stress on damaged turf during times of extreme use.

[e] On sand-based fields: WSN must be applied as two applications not to exceed 0.35 lb/1,000 ft^2 each with a minimum of 15 days between applications. Slowly Available N sources may be applied as a split application of 0.5 lb/1,000 ft^2 with a minimum of 15 days between applications or as a single application up to 1.0 lb/1,000 ft^2 with a minimum of 30 days between applications.

4. Fertilizer Application Record

Customer Information		Management Area Information
Name:	Norfolk State University	Management Area ID:
Address:	700 Park Avenue	Management Area Size:
	Norfolk, VA 23504	Plant Species:
		Notes:
Phone #:	757-823-9545	

Date (M/D/Y)	Supervisor/Applicator	Weather Conditions: Temp/Wind/Precip			Fertilizer Analysis	Rate	Amount Fertilizer Used	Application Equipment Used

5. Virginia Nutrient Management Standards and Criteria, Revised July 2014

VI. Turfgrass Nutrient Recommendations

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

Nitrogen Application Guidelines

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.*** 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 ft^2 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 ft^2 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.

Per Application Rates

Do not apply more than 0.7 pounds of water soluble nitrogen per 1,000 ft^2 within a 30 day period. For cool season grasses, do not apply more than 0.9 pounds of total nitrogen per 1,000 ft^2 within a 30-day period. For warm season grasses, do not apply more than 1.0 pounds of total nitrogen per 1,000 ft^2 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 ft^2 of nitrogen may be applied annually to cool season grass species or up to 4 pounds per 1,000 ft^2 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.

For warm season grasses, up to 0.7 lb/1,000 ft^2 of nitrogen may be applied in the Fall after perennial ryegrass overseeding is well established. An additional N application of 0.5 lb/1,000ft^2 may be made in February-March to overseeded perennial ryegrass if growth and color indicate need. Applications using WSN many not exceed 0.7 lb/1,000ft^2 within a 30 day period.

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 ft^2 may; be applied to cool season grasses within a 30-day period and no more than 1.0 pounds of nitrogen per 1,000 ft^2 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 ft^2 in a 30-day period, no more than 2.5 pounds of nitrogen per 1,000 ft^2 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.

Nitrogen Timing
The beginning and ending dates for application of nitrogen shall be determined using guidance and frost date contained on page 4 of this Nutrient Management Plan.

If the full rate or the highest rate of the recommendation range for a monthly application is applied in a single application, then the interval of application for nitrogen shall be at least 30 days to allow turf to utilize previous nitrogen applications. If several applications are to be made for the monthly nitrogen rate, then the timing of the applications shall be at approximately even intervals, with the rate per application to be evenly divided between each application with the total nitrogen applied not to exceed the maximum monthly rate. Use of Water Insoluble Nitrogen forms of nitrogen is encouraged.

Nitrogen Management on Athletic Fields - Cool Season Grasses

- This program is intended for those fields which are under heavy use.

- Nitrogen recommendations are based on the assumption that there is adequate soil moisture to promote good turf growth at the time of application. If no rainfall has occurred since the last application, further applications should be delayed until significant soil moisture is available.

Cool-Season Grasses Maintenance Program [a]		
	Normal	**Intensive**
Application Timing [b]	**N lb/1000 ft^2**	
After August 15	------	0.5
September	0.7 [c]	0.7 [c]
October	0.7 [c]	0.7 [c]
November	0.5	0.7 [c]
April 15 - May 15	0.5	0.5
June 1 - June 15	----	0.5 [d]

Notes:

- Soluble nitrogen rates of 0.25 pounds per 1,000 ft^2 or less which may be a component of a pesticide or minor element application may be applied any time the turf is actively growing, but must be considered with the total annual nitrogen application rate.
- WSN = water soluble nitrogen; WIN = water insoluble nitrogen

a) Intensive managed areas must be irrigated.
b) The beginning and ending dates for application of nitrogen shall be determined using guidance and frost date contained on page 13 of this Nutrient Management Plan.
c) Rates up to 0.9 pounds per 1,000 ft^2 of total nitrogen can be applied using a material containing slowly available forms of nitrogen, with a minimum of 30 days between applications.
d) Make this application only if turf use warrants additional nitrogen for sustaining desirable growth and /or color.

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. 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.

Warm-Season Grasses Maintenance Program (Silt/Clay based)[a]		
	N lb/1000 ft^2	**First Killing Frost Date [b]**
Application Timing [b]	0.5 – 0.7 [c]	Before October 20
April 15 – May 15	0.7	
June	0.5 – 0.7 [d]	
July	0.5 – 0.7 [d]	
August	0.5 – 0.7 [d]	
September 1 - 15	0.5 – 0.7 [c]	After October 20
If overseeded with perennial ryegrass		
October - November	0.5 [e]	
February - March	0.5 [e]	

Warm-Season Grasses Maintenance Program (Sand based)[a]		
	N lb/1000 ft^2	**First Killing Frost Date [b]**
Application Timing [b]	0.5 – 0.7 [c]	Before October 20
April 15 – May 15	0.7 [c]	
June	0.7 [c]	
July	0.7 [c]	
August	0.7 [c]	
September 1 - 15	0.5 – 0.7 [c]	After October 20
If overseeded with perennial ryegrass		
October - November	0.5 [e]	
February - March	0.5 [e]	

The following notes apply to both of the Warm-Season 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 contained on page 4 of this Nutrient Management Plan.

(c) WSN must be applied as two applications not to exceed 0.35 pounds per 1,000 ft^2 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 ft^2 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 ft^2 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 1,000ft^2 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 ft^2 of nitrogen each, with a minimum of 15 days between applications. Additional WSN application of 0.5 pounds per 1,000 ft^2 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 ft^2 each with a minimum of 15 days between applications may be applied using a material containing slowly available nitrogen sources.

Phosphorus and Potassium Recommendations for <u>Established</u> Turf and <u>Athletic Fields</u>

Apply phosphorus (P_2O_5) and potassium (K_2O) fertilizers as indicated by a soil test using the following guidelines:

Soil Test (VT) Rating	P_2O_5 lb/1000 ft^2	K_2O lb/1000 ft^2
L-	3	3
L	2.5	2.5
L+	2	2
M-	2	2
M	1.5	1.5
M+	1	1
H-	1	1
H	0.75	0.75
H+	0.5	0.5
VH	0	0

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.

For irrigated Athletic Fields grown on Naturally Occurring and Modified Sand Based soils only, up to 0.5 pounds of P_2O_5 per 1,000 ft^2 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.

Establishment/Grow-In Recommendations for Golf Courses, Athletic Fields, and Sod Production

(These rates replace normal maintenance fertilizer applications that would have occurred during these time periods.)

Warm Season Grasses:

Predominantly Silt/Clay Soils

♦ Plant Date - late May -June for sprigs, plugs, sod, or seeding.

♦ Apply P_2O_5 and K_2O as needed based on soil test recommendations, incorporate into the top 2 inches if possible.

♦ At Planting - Up to 1.0 pounds of nitrogen per 1,000 ft^2 using a material containing slowly available forms of nitrogen may be applied as one application or lesser amounts applied at regular intervals, through the first 4 weeks, not to exceed a total of 1.0 pounds of nitrogen per 1,000ft^2.

♦ Four weeks after planting - 0.25 pounds.of WSN per 1,000 ft^2 per week for the next 4 weeks.

Naturally Occurring or Modified Sand Based Soils

♦ Plant Date - late May -June for sprigs, plugs, sod, or seeding.

♦ Apply P_2O_5 and K_2O as needed based on soil test recommendations, incorporate into the top 2 inches if possible.

♦ At Planting - Up to 1.0 pounds of nitrogen per 1,000 ft^2 using a material containing slowly available forms of nitrogen may be applied as one application or lesser amounts at regular intervals through the first 4 weeks, not to exceed a total of 1.0 pounds of nitrogen per 1,000 ft^2.

♦ Four weeks after planting - 0.25 pounds per 1,000 ft^2 using a material containing slowly available forms of nitrogen per week for the next 4 weeks.

Cool Season Grasses:

Predominantly Silt/Clay Soils

♦ Plant Date - August - September (preferred)

♦ Apply P_2O_5 and K_2O as needed based on soil test recommendations, incorporate into the top 2 inches if possible.

♦ At Planting - up to 0.9 pounds of nitrogen per 1,000 ft^2 using a material containing slowly available forms of nitrogen may be applied; 30 days after planting, apply up to 0.5 pounds of nitrogen per 1,000 ft^2 every week for the next 4 weeks.

Naturally Occurring or Modified Sand Based Soils

♦ Plant Date - August -September (preferred)

♦ Apply P_2O_5 and K_2O as needed based on soil test recommendations, incorporate into the top 2 inches if possible.

♦ At Planting - up to 0.9 pounds of nitrogen per 1,000 ft^2 using a material containing slowly available forms of nitrogen may be applied.

♦ Apply up to 0.25 pounds of nitrogen per 1,000 ft^2 per week after germination is complete, for the next 8 weeks. If using a material that contains slowly available forms of nitrogen, up to 0.5 pounds of nitrogen per 1,000 ft^2 every two weeks may be applied after germination is complete for the next 8 weeks.

Recommendations for Establishment of Turf

These recommendations are for timely planted turfgrass, that is, the seed or vegetative material (sod, plugs, and /or sprigs), are planted at a time of the year when temperatures and moisture are adequate to maximize turfgrass establishment. These recommended establishment periods would be late summer to early fall for cool-season turfgrasses and late spring through mid-summer for warm-season turfgrasses.

Phosphorus and Potassium Recommendations for Establishment of Turf

Soil Test (VT) Rating	P_2O_5 lb/1000 ft^2	K_2O lb/1000 ft^2
L-	4	3
L	3.5	2.5
L+	3	2
M-	3	2
M	2.5	1.5
M+	2	1
H-	2	1
H	1.5	0.75
H+	1	0.5
VH	0	0

Nitrogen Application for Establishment of Turf

At the time of establishment, apply no more than 0.9 pounds per 1,000 ft^2 of total nitrogen for cool season grasses or 1.0 pounds per 1,000 ft^2 of total nitrogen for warm season grasses, using a material containing slowly available forms of nitrogen, followed by one or two applications beginning 30 days after planting, not to exceed a total of 1.8 pounds per 1,000 ft^2 total for cool season grasses and 2.0 pounds per 1,000 ft^2 for warm season grasses for the establishment period. Applications of WSN cannot exceed more than 0.7 pounds per 1,000 ft^2 within a 30-day period.

Sod Installations:

Site preparation should include a soil test, which can be done several months before the project begins in order to have time to get test results back. Phosphorus, potassium and lime applications should be based on soil test analysis to increase the likelihood of a successful installation. Shallow incorporation of material into the top 2 inches of the soil is preferred prior to sod installation, especially if lime is required.

No more than 0.7 lb of WSN/1,000 ft^2 should be applied before sod is installed. Alternatively, using a slowly available forms of nitrogen, 0.9 lb N/1000 ft^2 for cool season grasses or 1 lb of N/1000 ft^2 for warm season grasses may be applied before sod installation.

After installation apply adequate amounts of water to maintain sufficient soil moisture (i.e. to prevent visible wilt

symptoms). Excessive water will limit initial root development. After roots begin to establish (as verified by lightly tugging on the sod pieces), shift irrigation strategy to a deep and infrequent program in order to encourage deep root growth. Apply approximately 1 inch of water per week (either by rainfall or irrigation), making sure that the water is being accepted by the soil profile without running off. This will insure thorough wetting of the soil profile.

After sod has completed rooting and is well established, initiate the normal nitrogen management program as described for the appropriate use shall be recommended.

Other Turf Management Considerations

Lime Recommendations
Lime should be recommended based on a soil test to maintain soil pH within an agronomic range for turfgrass.

For new seedings where lime is recommended, incorporate the lime into the topsoil for best results.

Returning Grass Clippings
Recycling of clippings on turf should be encouraged as an effective means of recycling nitrogen, phosphorus, and potassium. Proper mowing practices that ensure no more than 1/3 of the leaf blade is removed in any cutting event will enhance turf appearance and performance when clippings are returned. Return all leaf clippings from mowing events to the turf rather than discharging them onto sidewalks or streets. Rotary mulching mowers can further enhance clipping recycling by reducing the size of clippings being returned to the turfgrass canopy.

Management of Collected Clippings
If clippings are collected they should be disposed of properly. They may be composted or spread uniformly as a thin layer over other turf areas or areas where the nutrient content of the clippings can be recycled through actively growing plants. They 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.

Use of Iron
Foliar iron supplements may be used to stimulate a greening effect on the turfgrass as an alternative to additional applications of nitrogen. These applications are most beneficial if applied in late spring through summer for cool season grasses and in late summer through fall for warm-season grasses.

Impervious Surfaces
Do not apply fertilizers containing nitrogen or phosphorus to impervious surfaces (sidewalks, streets, etc.). DO NOT use urea as an ice melting substance in cold weather. 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 and/or use a leaf blower etc., to return the fertilizer back to the turfgrass canopy.

Environmentally Sensitive Areas
Avoid fertilizer applications within 15 feet of waterways. This setback is reduced to 10 feet if a drop spreader, rotary spreader with deflector or targeted spray liquid is used to apply the fertilizer. The use of fertilizers with slow release nitrogen is greatly encouraged, especially where there is any reason to suspect environmental concerns.

Recordkeeping requirements and reporting for the application of fertilizer (2VAC5-405-100)
State-owned lands subject to this regulation shall maintain records of each application of fertilizer to non-agricultural land for at least three years following the application. These records shall be available for inspection. Each record shall contain the:

1. Name, mailing address of the application site;
2. Name of the person making or supervising the application;
3. Day, month, and year of application;
4. Weather conditions at the start of the application;
5. Acreage, area, square footage, or plants treated;
6. Analysis of fertilizer applied;
7. Amount of fertilizer used, by weight or volume; and
8. Type of application equipment used.

Spreader Calibration
Spreaders and boom sprayers must be properly calibrated if they are to deliver fertilizers and pesticides to turf at correct rates. If calibration is done incorrectly, the product may be misapplied and either too much or too little of the product will reach the turf. Sprayers and spreaders should be calibrated at first use and every fourth application. Spreaders and sprayers be calibrated in several ways. Refer to the following publication for detailed instructions:

www.turfgrass.ncsu.edu/Articles/admin/2008/Calibration_of_Turfgrass_Boom_Sprayers_and_Spreaders_(AG-628).pdf

6. Soil Reports

Report Number: 23-069-1103
Account Number: 06736

Send To: SOIL HORIZONS
2 Whitakers Mill
WILLIAMSBURG VA 23185

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Grower: Norfolk State University

SOIL ANALYSIS REPORT

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

Date Received: 03/10/2023 **Date Of Analysis:** 03/13/2023 **Date Of Report:** 03/13/2023

Sample ID / Field ID	Lab Number	OM	W/V	ENR	Phosphorus			Potassium	Magnesium	Calcium	Sodium	pH		Acidity	C.E.C
		% Rate	Soil Class	lbs/A	M3 ppm Rate	ppm Rate	ppm Rate	K ppm Rate	Mg ppm Rate	Ca ppm Rate	Na ppm Rate	Soil pH	Buffer Index	H meq/100g	meq/100g
SUB1	08808	4.3 M		120	65 H			131 M	111 L	1826 H		6.7		0.5	10.9
SUB2	08809	3.9 M		116	51 H			114 M	107 M	1318 H		6.5		0.6	8.4
SUB3	08810	3.9 M		116	43 M			102 M	116 M	1029 M		5.7	6.76	1.7	8.1
Football	08811	3.4 M		108	49 M			60 L	79 L	1086 H		6.3		0.7	6.9
Baseball	08813	3.6 M		111	70 H			103 M	117 M	1057 M		6.0	6.81	1.2	7.7

Sample ID / Field ID	Percent Base Saturation					Nitrate	Sulfur	Zinc	Manganese	Iron	Copper	Boron	Soluble Salts		
	K %	Mg %	Ca %	Na %	H %	NO_3 N ppm Rate	S ppm Rate	Zn ppm Rate	Mn ppm Rate	Fe ppm Rate	Cu ppm Rate	B ppm Rate	SS ms/cm Rate		
SUB1	3.1	8.5	83.8		4.6										
SUB2	3.5	10.6	78.5		7.1										
SUB3	3.2	11.9	63.5		21.0										
Football	2.2	9.5	78.7		10.1										
Baseball	3.4	12.7	68.6		15.6										

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

Brandi Watson

Report Number: 23-069-1103
Account Number: 06736

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Sample ID / Field ID	Lab Number	OM	W/V	ENR	Phosphorus			Potassium	Magnesium	Calcium	Sodium	pH		Acidity	C.E.C
		% Rate	Soil Class	lbs/A	M3 ppm Rate	ppm Rate	ppm Rate	K ppm Rate	Mg ppm Rate	Ca ppm Rate	Na ppm Rate	Soil pH	Buffer Index	H meq/100g	meq/100g
Softball	08814	4.0 M		119	64 H			113 M	127 M	1119 H		6.2		1.0	7.9

Sample ID / Field ID	Percent Base Saturation					Nitrate	Sulfur	Zinc	Manganese	Iron	Copper	Boron	Soluble Salts		
	K %	Mg %	Ca %	Na %	H %	NO_3 N ppm Rate	S ppm Rate	Zn ppm Rate	Mn ppm Rate	Fe ppm Rate	Cu ppm Rate	B ppm Rate	SS ms/cm Rate		
Softball	3.7	13.4	70.8		12.7										

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.

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