
Thomas Nelson Community College

**Chesapeake Bay
TMDL Action Plan**

Phase II



Effective: November 1, 2019



The Peninsula's Community College

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Executive Summary

Thomas Nelson Community College (TNCC) is permitted to discharge stormwater from the college's municipal separate storm sewer systems (MS4s) by maintaining coverage under the General Virginia Pollutant Discharge Elimination System (VPDES) Permit for Discharges of Stormwater from Small MS4s (MS4 General Permit). In part, the MS4 General Permit requires the college to meet special conditions for the Chesapeake Bay Total Maximum Daily Load (TMDL). Included as a special condition is the development of this Action Plan and the specific information contained herein; most notably, the description of past progress and proposed practices to meet specific pollutant reductions within stormwater discharge from the college's MS4s.

TNCC successfully achieved the pollutant reductions required during the last MS4 General Permit cycle that spanned from 2013 – 2018, achieving a minimum of 5% of the total reductions that are to be achieved by 2028. The best management practices (BMPs) to achieve the pollutant reductions were described in the college's Phase I Action Plan, developed and implemented during the previous permit cycle. As described in the latest annual reporting, reductions were achieved with:

- ✓ Street sweeping at the Hampton campus; and
- ✓ Credits from an historic water quality BMP for the Historic Triangle campus.

Effectiveness and quantification of pollutant reduction from street sweeping was supported with results of a study within which TNCC participated with other MS4s around the state to analyze swept material and characterize the fraction of swept material that removed pollutants from stormwater.

The current MS4 General Permit requires reduction of an additional 35% of the total required pollutant reductions (40% cumulative) be achieved prior to the conclusion of the current permit cycle that expires on October 31, 2023. TNCC plans to achieve the cumulative reductions for each campus as follows:

- ✓ Incremental increase in current street sweeping efforts at the Hampton campus (York River Basin) to include annual sample analysis and documentation of the mass of swept material to quantify reductions and demonstrate effectiveness; and
- ✓ Credits readily available from the historic water quality BMP (wet pond) for the Historic Triangle campus (James River Basin).

Changes to this plan may occur, as necessary, as part of an iterative process to ensure the pollutant reduction targets are achieved.

1.0 Introduction

TNCC has developed, implements and enforces a municipal separate storm sewer system (MS4) program designed to reduce the discharge of pollutants from the college's municipal separate storm sewer systems (MS4s) to the maximum extent practicable (MEP) in accordance with the General Virginia Pollutant Discharge Elimination System (VPDES) Permit for Discharges of Stormwater from Small MS4s (MS4 General Permit). The purpose of the program is to protect water quality and to satisfy the appropriate water quality requirements of the State Water Control Law and its attendant regulations. TNCC utilizes the legal authority provided by the laws and regulations of the Commonwealth of Virginia to control discharges to and from the college MS4s through the MS4 General Permit, college policies and specific contract language, as applicable.

Compliance with the MS4 General Permit is dependent on the implementation of best management practices (BMPs) to address minimum control measures described in the permit and Special Condition requirements associated with applicable total maximum daily loads (TMDLs). The TNCC MS4 program plan describes the BMPs to address each permit requirement, including reference to this action plan, to achieve specific pollutant reductions in accordance with Chesapeake Bay TMDL Special Conditions. This action plan serves as the second phase of a plan to ultimately achieve 100% of the required reductions in three phases by 2028. This second phase of the TNCC action plan, as required by the MS4 General Permit, includes:

- ✓ Loading and cumulative reduction calculations, as specified by the permit;
- ✓ Total pollutant reductions achieved during the last permit cycle that concluded in 2018, along with the BMPs implemented and reductions achieved by each;
- ✓ A description of the BMPs to be implemented as part of the Phase II Action Plan to achieve the reductions required by the MS4 General Permit prior to the expiration of the current permit that expires in 2023; and
- ✓ A description of legal authorities necessary to implement the BMP to be employed to achieve the pollutant reductions required by the permit.

1.1 Chesapeake Bay TMDL

A TMDL is the calculation of the maximum amount of a pollutant allowed to enter a waterbody so that the waterbody will meet and maintain water quality standards for the pollutant(s) impairing the

water body. A TMDL assigns pollutant reduction targets and allocates load reductions necessary to the source of the pollutant(s), including discharges from regulated MS4s.

On December 29, 2010, the U.S. Environmental Protection Agency (EPA) established the Chesapeake Bay TMDL. The TMDL is a historic and comprehensive "pollution diet" to restore clean water in the Chesapeake Bay and the region's streams, creeks, and rivers. The TMDL is the largest ever developed by EPA, encompassing a 64,000-square-mile watershed. The TMDL identifies the necessary pollution reductions from major sources of total nitrogen (TN), total phosphorus (TP) and total suspended solids (TSS) across the Bay jurisdictions. Subsequently, the Bay jurisdictions, that include Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia and the District of Columbia, have developed Watershed Implementation Plans (WIPs) that include detailed steps each of the watershed jurisdictions will take to meet the pollution reduction goals of the Chesapeake Bay TMDL. In part, Virginia's Phase I and Phase II WIPs identify municipal separate storm sewer system (MS4) permits as a mechanism for ensuring nutrient and sediment reductions equivalent to the MS4 General Permit-referenced Level 2 (L2) Scoping Run of the Chesapeake Bay Model 5.3.2.

2.0 MS4 Pollutant Discharge Characterization

Pollutant load and cumulative reduction calculations are provided in this Section for the two Chesapeake Bay river basins within which TNCC MS4 systems discharge. The loading and required reduction calculations are determined using tables provided within the MS4 General Permit and are dependent on the regulated impervious and pervious area draining to the college’s MS4s, as reflected in **Table 2.1** and **Appendix ‘A’** mapping. TNCC has two regulated campuses within the Chesapeake Bay watershed, including the:

- ✓ Hampton campus in the York River Basin and the
- ✓ Historic Triangle campus in the James River Basin.

Table 2.1 Summary of regulated impervious and pervious area for the TNCC campuses.

TNCC Campus	MS4 Regulated Area (acres) ¹	
	Impervious	Pervious
Hampton campus	38.64	28.06
Historic Triangle campus	10.23	8.06

¹ Areas vary from the Phase I plan as a result of refined mapping reflected in Appendix A.

2.1 Pollutant Loadings

Pollutant loading are computed for each campus using the calculation sheets provided in the MS4 General Permit for the respective basin within which each campus resides. The calculation sheets provide the loading rates, as pounds (lbs) per acre (ac) per year (yr), as reflected in **Table 2.2** and **Table 2.3** for computing loads from the Hampton and Historic Triangle campuses, respectively.

Table 2.2 Hampton campus loadings based on the York River Basin calculation sheet provided in the MS4 General Permit.

Pollutant	Subsource	Loading Rate (lbs/ac/yr)	Area (acres) ¹	Load (lbs/yr)	Total Load (lbs/yr)
TN	Impervious	7.31	38.64	282	497
	Pervious	7.65	28.06	215	
TP	Impervious	1.51	38.64	58	73
	Pervious	0.51	28.06	14	
TSS	Impervious	456.68	38.64	17,646	19,688
	Pervious	72.78	28.06	2,042	

¹ Area served by the Hampton campus MS4 within the 2010 Census Urbanized Area.

Table 2.3 Historic Triangle campus loadings based on the James River Basin calculation sheet provided in the MS4 General Permit.

Pollutant	Subsource	Loading Rate (lbs/ac/yr)	Area (acres) ¹	Load (lbs/yr)	Total Load (lbs/yr)
TN	Impervious	9.39	10.23	96	152
	Pervious	6.99	8.06	56	
TP	Impervious	1.76	10.23	18	22
	Pervious	0.50	8.06	4	
TSS	Impervious	676.94	10.23	6,925	7,740
	Pervious	101.08	8.06	815	

¹ Area served by the Historic Triangle campus MS4 within the 2010 Census Urbanized Area.

2.2 Required Cumulative Pollutant Reductions

The required cumulative pollutant reductions at each campus are computed for each campus using the calculation sheets provided in the MS4 General Permit for the respective basin within which each campus resides. The calculation sheets provide the total percentage of the loadings required for the L2 Scoping Run of the Chesapeake Bay Model as reflected in **Table 2.4** and **Table 2.5** for computing required reductions from the Hampton and Historic Triangles campuses, respectively. Additional pollutant reductions as a result of: (1) new sources initiating construction between July 1, 2009, through June 30, 2019 with total phosphorus loadings exceeding 0.45 lbs/acre/yr, or (2) grandfathered projects initiating construction after July 1, 2014, with total phosphorus loadings exceeding 0.45 lbs/acre/yr are not necessary since neither occurred at either regulated campus.

Table 2.4 Hampton campus required load reductions based on the York River Basin calculation sheet provided in the MS4 General Permit.

Pollutant	Subsource	Load (lbs/yr) ¹	Total Load Reduction (%) ²	Required Reduction by 2023 (lbs/yr) ³	Total Load Reduction by 2023 (lbs/yr) ³
TN	Impervious	282	9	10	15
	Pervious	215	6	5.15	
TP	Impervious	58	16	3.73	4.15
	Pervious	14	7.25	0.42	
TSS	Impervious	17,646	20	1412	1,483
	Pervious	2,042	8.75	71.48	

¹ From Table 2.2.

² Percentage of total load reduction per the L2 Scoping Run of the Chesapeake Bay Model.

³ Represents 40% of the total load reduction required for the current permit cycle.

Table 2.5 Historic Triangle campus required load reductions based on the James River Basin calculation sheet provided in the MS4 General Permit.

Pollutant	Subsource	Load (lbs/yr) ¹	Total Load Reduction (%) ²	Required Reduction by 2023 (lbs/yr) ³	Total Load Reduction by 2023 (lbs/yr) ³
TN	Impervious	96	9	3	4.81
	Pervious	56	6	1.35	
TP	Impervious	18	16	1.15	1.27
	Pervious	4	7.25	0.12	
TSS	Impervious	6,925	20	554	583
	Pervious	815	8.75	28.51	

¹ From Table 2.3.

² Percentage of total load reduction per the L2 Scoping Run of the Chesapeake Bay Model.

³ Represents 40% of the total load reduction required for the current permit cycle.

3.0 Pollutant Reduction – Phase I Milestones

TNCC’s Phase I Chesapeake Bay TMDL Action Plan, dated June 30, 2015, identified the means and methods to achieve 5% of the total required reductions by July 1, 2018, as follows:

- ✓ **Hampton campus:** pollutant load reductions achieved with implementation, verification of effectiveness and documentation of street sweeping efforts.
- ✓ **Historic Triangle campus:** pollutant load reductions achieved with historical water quality BMP that treats the entirety of the campus.

The following subsections present the total reductions achieved by July 1, 2018, at each campus and describe the BMPs implemented to achieve reductions.

3.1 Hampton Campus

TNCC implemented street sweeping during the previous permit cycle to achieve at least 5% of the total required reductions, as was required during the previous MS4 General Permit cycle that expired in 2018. TNCC’s Phase I Action Plan specified the total annual weight of material that would be required to be annually collected to achieve the 5% target based on the Mass Loading Approach (MLA), as described in the Virginia Department of Environmental Quality (DEQ) Chesapeake Bay Action Plan Guidance Memo (VDEQ 2015). The MLA method is based on sampling of street particulate matter by Law et al. (2008). Using the MLA computation methods, TNCC’s 2017-2018 MS4 annual report demonstrated that street sweeping far exceeded the 5% target of the total reduction requirement based on a total of 19.7 tons of material collected for the reporting year, as reflected in **Table 3.1**.

Table 3.1 Hampton campus Phase I Chesapeake Bay TMDL Action Plan compliance summary.

Pollutant	Reduction Required for the Phase I Action Plan (5% of total)	Reduction Provided by street sweeping in 2017-2018 ¹
TN	1.75	69.02
TP	0.53	27.61
TSS	191.97	8,282.82

¹ Based on total material swept of 19.7 tons using the MLA. Exceeds Phase I required reduction. Based on computations using the Mass Loading Approach (VDEQ 2015) and provided in 2017-2018 annual reporting.

3.2 Historic Triangle Campus

The TNCC Phase I Chesapeake Bay TMDL Action Plan demonstrates that 5% of the total required reductions were achieved with application of credit from a historic water quality BMP that was:

- Initially installed on or after January 1, 2006 and prior to July 1, 2009, and
- Constructed to address water quality within the permittee’s regulated service area.

The Phase I Action Plan provides detailed information and computations for the historic water quality BMP to determine the available pollutant reduction credit to TNCC’s Historic Triangle campus towards achieving reductions for addressing the Chesapeake Bay TMDL. The available reductions from the historic water quality BMP, a regional stormwater pond known as the Warhill Pond, are provided in **Table 3.2**. As noted, the available pollutant reduction credit from the historic water quality BMP achieved the required reductions described in the Phase I Action Plan.

Table 3.2 Historic Triangle campus Phase I Action Plan compliance summary.

Pollutant	Reductions Required for the Phase I Action Plan (5% of total)	Reduction Provided by the Warhill Pond to TNCC to address the Chesapeake Bay TMDL ¹
TN	0.56	22.89
TP	0.15	13.22
TSS	67.93	5,565

¹ Exceeds Phase I required reductions. Computations provided in the Phase I Action Plan.

4.0 Phase II Pollutant Reduction Practices

TNCC will continue implementation of the BMPs identified in the Phase I Chesapeake Bay TMDL Action Plan towards achieving the cumulative 40% of the total reductions by the 2023 expiration date of the current MS4 General Permit. For each regulated campus, these practices will continue to include:

- ✓ **Hampton campus:** Implementation of a street sweeping program, including: (1) analysis of swept material and collection of variables that impact contents of the material for quantification and verification of effectiveness; and (2) documentation of mass of material annually swept; and
- ✓ **Historic Triangle campus:** Documentation of pollutant load reductions provided by the existing historic water quality BMP that treats the entirety of the developed campus.

Supporting information regarding the implementation of the BMPs to achieve the required reductions at each campus is provided in the following subsections.

4.1 Hampton Campus

TNCC will implement a street sweeping program towards achieving the remainder of cumulative 40% of the total reductions by the expiration date of the current permit cycle. However, past computational methods for quantifying reductions from street sweeping such as the Mass Loading Approach based on a study by Law (2008), and as previously accepted by the Virginia DEQ (VDEQ 2015), will be phased out. The phasing out of previous quantification methods was based on recommendations by an expert panel that concludes data regarding the impact to water quality from street sweeping is sparse and more studies are needed, suggesting challenges to measure impact in receiving waters may prevent the ability to measure effectiveness in receiving streams altogether (Schueler et al. 2016). As an alternative, the expert panel presents pollutant reduction efficiency values generated from a modeling application dependent on sweeping frequency and the type of sweeper employed. The model predicts rigorous sweeping frequency as necessary to achieve appreciable pollutant reductions which is not practicable, nor feasible, for a community college. Further, due to difficulties measuring impacts downstream, the model cannot be calibrated to real world conditions in receiving streams.

In response, TNCC participates in an ongoing study with other MS4 permittees that includes collecting and analyzing swept material samples as a means to assist in quantifying reductions achieved by the practice. Results from the study obtained during the previous permit cycle are presented by Hixon and Dymond (2019) and find association of pollutants within a fraction of swept material that is susceptible to downstream transport and therefore removed from contributing to TMDLs. At this time, approximately 80 samples have been collected. The study includes laboratory analysis of the samples for moisture content, particles size distribution, and TN and TP concentrations. Variables that could potentially impact the contents of swept material are also collected, resulting in insight published in an American Society of Engineers (ASCE) peer-reviewed journal regarding, in part:

- ✓ The fraction of collected material removed from the swept surface as a result of runoff. Specifically, particles < 840 μm are much less abundant in swept material collected within 2 days after a rainfall event compared to those collected after 2 days since rainfall;
- ✓ The association of TP with particles < 250 μm within the range of particles < 840 μm that are washed from the surface;
- ✓ The association of TN with the full range of particles that are < 840 μm washed from the surface; and
- ✓ Variations in the particles washed from the surface and nutrient concentrations dependent on the type of surface swept, whether sweeping parking lots or streets.

Exponential regression of the collected data was used to correlate and extrapolate values for computing pollutant reductions for the mass of swept material susceptible to transport downstream to surface waters, reflected in **Table 4.1**. The values allow for computation of TN, TP and TSS pollutant reduction achieved within the MS4 regulated area based on the total weight of the swept material. Reductions vary dependent on the duration since the last rainfall when sweeping occurs and the type of surface area swept.

Table 4.1 Estimate of pollutant reduction to surface waters per ton of swept materials (Hixon and Dymond 2019).

Surface Type	Days Since Rain	TP (< 250 μm) (lbs/ton) ¹	TN (< 841 μm) (lbs/ton) ¹	TSS (< 841 μm) (lbs/ton) ¹
Streets	≤ 2	0.149	0.335	571
	> 2	0.257	0.585	998
Parking Lots	≤ 2	0.141	0.466	794
	> 2	0.320	0.766	1,307

¹ Adjusted using a moisture content of 2.2% to compute dry weight, the median value measured in samples presented by Hixon and Dymond (2019).

TNCC applied the results of the study summarized in **Table 4.1**, conservatively based on sweeping parking lots within 2 days since rainfall, for quantifying pollutant reductions for the 2018-2019 reporting period as summarized in **Table 4.2**. For comparison, computations that would have resulted from using the phased-out MLA computational methods are also provided in the table. The comparison finds estimates based on the sampling study result in significantly more conservative result for TN and TP. Although TSS reduction are less conservative, it is noted that TN is the limiting pollutant for achieving reductions for all of the pollutants with street sweeping.

Table 4.2 Hampton campus 2018-2019 permit year pollutant reductions from street sweeping.

Pollutant	Study Results ¹	MLA Methods ²
TN	5.97	44.80
TP	1.81	17.92
TSS	10,163	5,376

¹ Based on values from Table 4.1 and provided in 2018-2019 annual reporting. Values based on parking lots swept within 2 days since rain and total of 12.8 tons swept.

² Based on computations using the Mass Loading Approach (VDEQ 2015).

Based on the reductions achieved during the 2018-2019 reporting year, 32.2 tons of material would need to be collected annually to achieve the 40% cumulative required reductions by the expiration of the current MS4 General Permit if sweeping on parking lots within 2 days since rainfall. Since 12.8 tons were collected by sweeping in the 2018-2019 reporting year, TNCC would need to increase sweeping efforts by 152% the current effort over the next 4 years, as reflected in **Table 4.3**. However, it is noted that 19.7 tons were collected during the 2017-2018 reporting year, indicating about a 63% increase in the annual effort would be necessary. On average, the mass of material annually swept with current efforts would need to double by

2023 to achieve the necessary reductions. However, the total swept mass required could fluctuate depending on:

1. Planning associated with sweeping, specifically with scheduling sweeping when rainfall has not occurred for several days thus increasing the presence of the smaller particles susceptible to transport in runoff; and
2. Refinement of the values in Table 4.1 as additional data is obtained, incorporated, and assessed within the initial dataset.

Table 4.3 Summary of street sweeping efforts towards achieving the cumulative required reductions by 2023 for the Hampton campus, conservatively based on sweeping within 2 days since rainfall.

Pollutant	Load Reduction Req'd by 2023 (lbs/yr) ¹	2018-2019 Reduction Achieved (lbs) ²	Percentage of 2023 Req'd Reduction Achieved (%) ³	Swept Material Req'd To Achieve Target Reduction by 2023 (tons) ⁴
TN	15	5.97	39.9	32.2
TP	4.15	1.81	43.6	29.4
TSS	1,483	10,163	>100	1.9

¹ From Table 2.4 for the Hampton campus.

² From Table 4.2 based on 12.8 tons of swept materials for the 2018-2019 reporting year.

³ Fraction of the required reductions by 2023 achieved in the 2018-2019 reporting year.

⁴ Based on sampling study values with sweeping parking lots within 2 days since rainfall.

4.1.1 Implementation and Measures of Effectiveness

The mass of material swept during previous reporting years indicates annual street sweeping of the Hampton campus has potential to achieve the cumulative 40% of the total reductions by the 2023 expiration date of the MS4 General Permit. Further, the sampling study and resulting publication support the results as a measure of effectiveness for quantifying reductions resulting from the practice. As part of an iterative process, TNCC will perform the following annual activities at the Hampton campus respective to the BMP:

1. Continue to perform street sweeping on the Hampton campus's parking lots and streets, with incremental increases towards achieving the target reductions by the expiration date of the MS4 General Permit.

2. Continue to conduct analysis on samples extracted from swept material for continued inclusion into the set of data presented by Hixon and Dymond (2019); specifically for verification and refinement of the exponential regression correlation for quantifying pollutants associated with the fraction of swept material susceptible to transport to receiving waters.
3. Documentation of variables during sweeping instances that impact the contents of swept material to include, at a minimum, duration since the previous rainfall and type of surface swept. Other variables will also be collected so assessment of results can determine other potential impacts, such as time of year and type of sweeper used for sweeping instances. As part of an iterative program, this information will be used to develop a sweeping program that minimizes discharge of pollutants from TNCC MS4 outfalls.
4. Documentation of the total mass of material swept annually.

If subsequent annual assessments indicate that street sweeping alone will not provide the required pollutant reductions for the Hampton campus, TNCC will provide modifications to this plan as part of the annual reporting process.

4.2 Historic Triangle Campus

As described in Section 3.2, pollutant reductions for the Historic Triangle campus are provided by a historic water quality BMP known as the Warhill Pond. As summarized in **Table 4.4**, the Warhill Pond provides reductions that exceed the 40% cumulative reductions required by the current MS4 General Permit to be achieved at the Historic Triangle campus. Therefore, no additional BMPs are necessary for implementation at this campus for inclusion into the Phase II Chesapeake Bay Action Plan.

Table 4.4 Compliance summary for the Historic Triangle campus.

Pollutant	Load Reduction Req'd by 2023 (lbs/yr) ¹	Reduction Achieved by the Warhill Pond (lbs) ²	Percentage of Req'd Reduction Achieved (%)
TN	4.81	22.89	>100
TP	1.27	13.22	>100
TSS	583	5,565	>100

¹ From Table 2.5 for the Historic Triangle campus.

² From Table 3.2 based on computations provided in the Phase I Action Plan for Warhill Pond.

4.3 Legal Authority to Implement BMPs

As a non-traditional MS4 operating on state property, TNCC has operational control of the totality of the regulated MS4 area at both the Hampton and Historic Triangle campuses. Therefore, no new or modified legal authorities are necessary to implement the BMPs proposed to achieve cumulative pollutant reduction requirements described in the current MS4 General Permit for the Chesapeake Bay TMDL. Specifically, the following demonstrate legal authorities are in place:

- ✓ TNCC has the authority to conduct street sweeping at the Hampton campus.
- ✓ An interjurisdictional agreement with James City County was included in the *Thomas Nelson Community College Historic Triangle Campus 2013-2028 Stormwater Master Plan* (SWM Master Plan) to apply available credit from the Warhill Pond towards the Chesapeake Bay TMDL for TNCC. The agreement is also referenced in TNCC's Phase I Chesapeake Bay TMDL Action Plan. The agreement allows TNCC to utilize the pollutant reduction credit the pond provides in excess of the reductions necessary to address the future build-out of the college. Water quality computations for the pond that have been credit to the college are available in the SWM Master Plan that is available upon request.

5.0 References

- Hixon, L. F. and Dymond, R. L. (2018). “State of the Practice: Assessing Water Quality Benefits from Street Sweeping.” *J. Sustainable Water Built Environ*, [10.1061/JSWBAY.0000860](https://doi.org/10.1061/JSWBAY.0000860), 1-11.
- Law, N. L., DiBlasi, K., and Ghosh, U. (2008). “*Deriving reliable pollutant removal rates for municipal street sweeping and storm drain cleanout programs in the Chesapeake Bay basin.*” USEPA Chesapeake Bay Program Grant CB-973222-01. Ellicott City, MD: Center for Watershed Protection.
- Schueler, T., Giese, E., Hanson, J., Wood, D. (2016). “*Recommendations of the expert panel to define removal rates for street and storm drain cleaning practices.*” Chesapeake Bay Program Office. Final report to the Chesapeake Bay Program Management Board.
- Virginia Department of Environmental Quality (VDEQ). (2015). “Guidance memo No. 15-2005.” Commonwealth of Virginia Department of Environmental Quality Water Division.

Appendix A-1

Chesapeake Bay TMDL Action Plan Mapping – Hampton Campus

Chesapeake Bay TMDL Action Plan Mapping

Hampton Campus

Latest Revision: October, 2019



The Peninsula's Community College



Area Summary (as shown)

- Regulated Impervious = 38.64 acres
- Sidewalk = 3.34 acres
- Buildings = 7.95 acres
- Parking Lots and Road = 27.35 acres
- Regulated Pervious = 28.06 acres

Legend

- Previous
- Building
- Road
- Sidewalk
- Water
- Forest / undeveloped
- Flow direction
- Storm sewer
- Storm channel/ditch
- Storm structure

Abbreviations

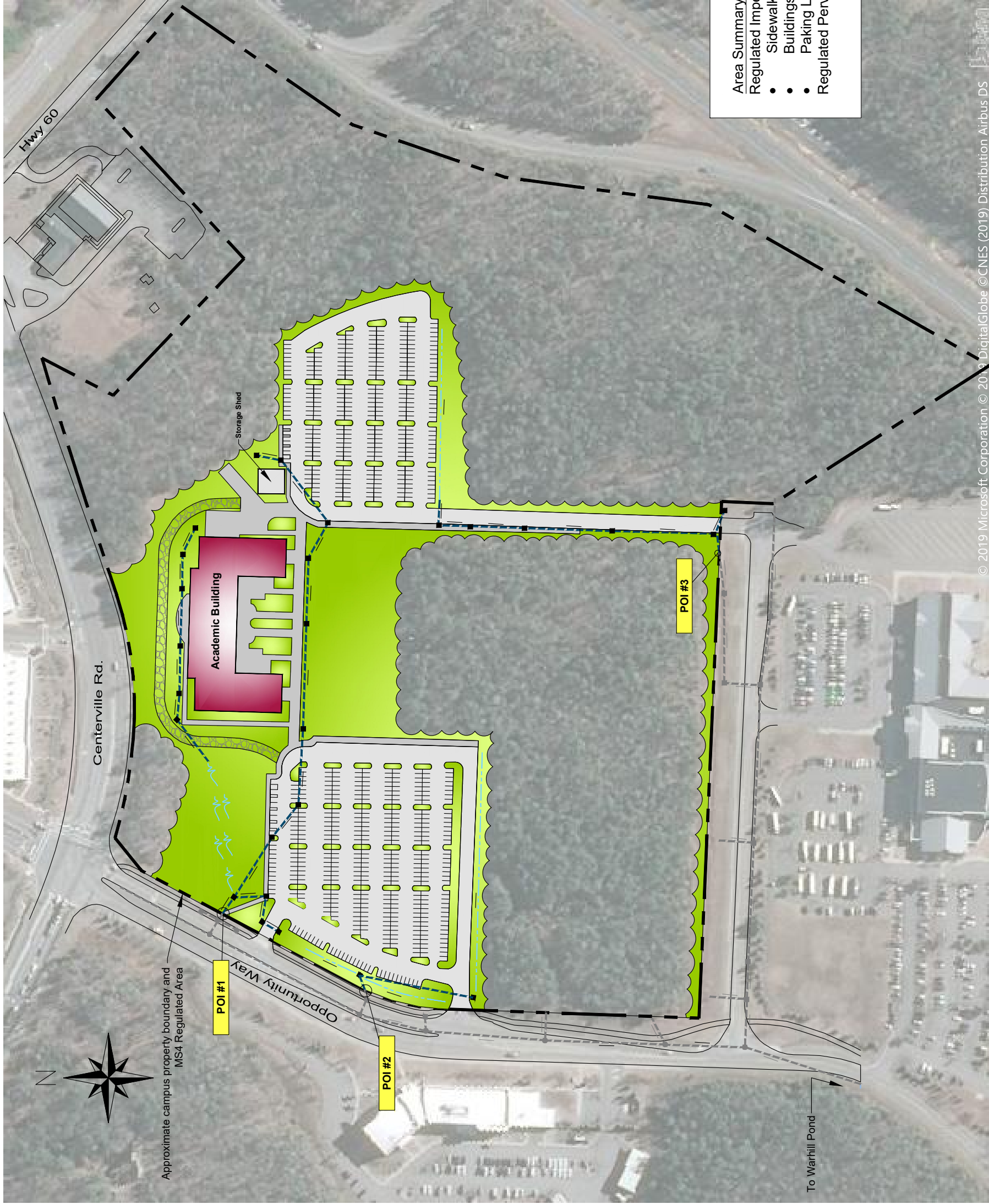
- BMP = Stormwater Facility Best Management Practice
- OF = MS4 Outfall (with unique identification #)
- POI = Point of Interconnection with VDOT

For additional information on BMPs, see TNCC's BMP Database.

Note: This map was developed by H2R Engineering Inc. using readily available information and is not based on a field survey. Information shown is approximate.

Appendix A-2

Chesapeake Bay TMDL Action Plan Mapping – Historic Triangle Campus



- Legend**
- Previous Building
 - Road
 - Sidewalk
 - Water
 - Forest / undeveloped
 - Flow direction
 - Storm sewer
 - Storm channel
 - Storm structure

Abbreviations

POI = Point of Interconnection with James City County MS4

Area Summary (as shown)
 Regulated Impervious = 10.23 acres
 • Sidewalk = 1.47 acres
 • Buildings = 1.01 acres
 • Paving Lots and Road = 7.75 acres
 Regulated Pervious = 8.06 acres



The Peninsula's Community College

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Chesapeake Bay TMDL Action Plan Mapping
HTC Campus

Latest Revision: October 2019

Note: This map was developed by H2R Engineering Inc. using readily available information and is not based on a field survey. Information shown is approximate.

Public Input

TNCC has maintained this Chesapeake Bay TMDL Action Plan with solicitation and means for public comment on the college's [stormwater management webpage](#) since October 15, 2019. The latest version of the action plan will continue to be maintained on the page, along with the solicitation for comment throughout the permit cycle. Prior to submission of the action plan to DEQ, as of October 31, 2019, no public comments have been provided.

TNCC will update this action plan annually as part of the annual reporting process, as applicable and necessary, to include any public comment(s) and plan modifications(s). A summary of any comments received from the public will be provided below with a response from the college. Any changes to this action plan resulting from public comment will also be referenced below.

1. **Comment:** (Pending Comment)

Response: (Pending Comment)

Plan Modification: (Pending Comment)