

BULL RUN BENTHIC TMDL ACTION PLAN

(2018 - 2023 MS4 General Permit)

A Plan for Achieving Sediment Load Reductions to Meet PWCS' TMDL Wasteload Allocation



Prince William County
Public Schools

Permit #: VAR040010

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This document addresses Part II B of the General Virginia Pollution Discharge Elimination System (VPDES) Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4). This document serves as a City-specific Total Maximum Daily Load (TMDL) Action Plan to identify the best management practices and other interim milestone activities to be implemented to address the sediment waste load allocation (WLA) assigned to PWCS' regulated MS4 area in the "Benthic TMDL Development for Bull Run, Virginia" approved by the Environmental Protection Agency on September 26, 2006.



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As a permittee under the Commonwealth of Virginia 2018-2023 General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4), Prince William County Public Schools (PWCS) is required to develop specific Total Maximum Daily Load (TMDL) Action Plans for pollutants identified in TMDL wasteload allocations as updates to the existing MS4 Program Plan.

For TMDLs approved by the Environmental Protection Agency (EPA) prior to July 1, 2013, permittees with associated wasteload allocations shall update the previously approved Local TMDL Action Plan no later than May 1, 2020 according to Section II.B.1.a of the 2018-2023 MS4 General Permit.

This Action Plan contains the required and suggested elements that should be included to ensure the TMDL Action Plan ("Action Plan") is approvable. This Action Plan should allow the Virginia Department of Environmental Quality (VDEQ) to verify that PWCS will be able to meet the requirements of the Local TMDL Special Condition by the end of the second permit cycle.

This Action Plan includes supporting material to show that the permittee has:

- (2013-2018 General Permit Section IB2a) developed a list of legal authorities applicable to reducing sediment;
- (2013-2018 General Permit Section IB2b) developed an updated list of additional management practices, control techniques, system design and engineering methods beyond the Minimum Control Measures included in the Program Plan applicable to reducing sediment;
- (2013-2018 General Permit IB2c) enhanced public education and employee training program to promote reduction of sediment;
- (2018-2023 General Permit IIB3g and IIB4b) included an outreach strategy designed to reduce sediment;
- (2013-2018 General Permit IB2e) assessed significant sources of sediment from facilities of concern;
- (2018-2023 General Permit IIB3b) provided the EPA approval date for the sediment TMDL;
- (2018-2023 General Permit IIB3c) provided the wasteload allocation of sediment, and the corresponding reduction of sediment;
- (2018-2023 General Permit IIB3e-f) assessed and documented the (Best Management Practices) BMPs designed to reduce the sediment; and
- (2018-2023 General Permit IIB3h) developed an updated schedule of anticipated actions to reduce sediment during this permit term.

The submitted Action Plan becomes effective and enforceable 90 days after the date received by the VDEQ unless specifically denied in writing by the Department in accordance with Section I.B.1.c of the 2013-2018 General Permit.

Prince William County Public Schools (PWCS) currently operates under the Virginia MS4 General Permit (#VAR040100) to address stormwater discharges from its regulated properties. The components of this MS4 program, including the methods used to fulfill the six minimum control measures (MCM #1 – 6), are detailed in the PWCS MS4 Program Plan.

The Final Report dated June 2006 for *Benthic TMDL Development for Bull Run, Virginia* assigned an aggregate waste load allocation (WLA), summarized in **Table 1**, to Prince William County Public Schools (Permit No. VAR040100), Prince William County (VA0088595), and Virginia Department of Transportation (VDOT) – Urban Area (VAR040062) for benthic impairment of the Bull Run Watershed. The EPA's TMDL decision rationale is dated September 26, 2006 (*Decision Rationale for the Aquatic Life Use (Benthic) Impairment TMDLs for Bull Run and Popes Head Creek, Virginia*).

WSSI determined the wasteload allocation and required sediment reduction for PWCS by using an area weighted approach. This is an appropriate method of calculating reductions, which is consistent with the TMDL. The Bull Run Benthic TMDL states “Bank erosion resulting from MS4 stormwater runoff and bank erosion resulting from overland runoff were also separated using an area weighted approach, in which the percentage of sediment loading from bank erosion attributed to the MS4 was proportional to the percentage of the Bull Run impaired watershed covered by the MS4 permits. Since 65,456 acres of the 118,951 total acres in the Bull Run impaired watershed are covered by 5MS4 permits, 55% percent of the sediment load from instream erosion was attributed to the MS4s. Sediment from other land sources in the watershed and the remainder of the bank erosion sediment load were attributed to the land-based load.” In addition, the TMDL states “An area-weighted method was used to determine the land-based load attributed to MS4s present in the watershed.”

Prince William County, PWCS, and VDOT Urban Area MS4 permit holders own a total of 6,214.2 acres in the Bull Run watershed (*Benthic TMDL Development for Bull Run, Virginia*), and PWCS operates 540.41 of these acres within the MS4 regulated area. PWCS owns 8.7% of the aggregate WLA (552.9) and is therefore required to achieve a WLA of 48.1 tons/year.

Table 1. Summary of Little Bull Run / Bull Run WLA for PWCS Properties

Aggregate MS4s	Watershed	WLA: Sediment (tons/yr)
Prince William County Public Schools Prince William County VDOT – Urban Area	Little Bull Run / Bull Run	552.9
Prince William County Public Schools	Little Bull Run / Bull Run	48.1

In Table 7-2: Wasteload Allocation by MS4 Areas including General Stormwater Permits of the *Benthic TMDL Development for Bull Run, Virginia*, the existing load (2,418.7 tons/year) and allocated load (552.9 tons/year) is provided for PWCS, Prince William County, and VDOT. These loads have been disaggregated to calculate the resulting required reduction in sediment for PWCS, computed as follows:

$$\text{Required Load Reduction from Aggregate's MS4} = \text{Existing Load} - \text{Allocated Load}$$

$$\text{Required Load Reduction from PWCS' MS4} = \text{Existing Load} - \text{Allocated Load} * \text{PWCS' Percent Land Area}$$

$$\text{Required Load Reduction from PWCS' MS4} = 2,418.7 \frac{\text{tons}}{\text{year}} - 552.9 \frac{\text{tons}}{\text{year}} = 1,865.8 * 0.087 = 162.32 \frac{\text{tons}}{\text{year}}$$

Therefore, PWCS is required to reduce 162.32 tons/year of sediment.

1. Legal Authority

(2013-2018 General Permit Section I.B.2.a.(1)) Develop and maintain a list of legal authorities such as ordinances, state and other permits, orders, specific contract language, and interjurisdictional agreements applicable to reducing the pollutant identified in each applicable WLA.

As a school system, PWCS does not have regulatory authority and must rely on Prince William County to develop and enforce ordinances. Therefore, the primary tool for preventing the discharge of sediment to the storm sewer system within Prince William County is Chapter 23.2 Article 2 of the Prince William County Code of Ordinances.

Section 23.2-4.3 of this ordinance states “If any activity listed in subsection 23.2-4.1(b) of this chapter is found by the director to be a source of pollutants to waters of the United States, the director shall serve a written notice on the party responsible for the activity which orders that the activity be ceased or conducted in a manner that will avoid the discharge of pollutants to the stormwater system. The notice shall state the date by which the activity shall cease or be conducted without pollution. Failure to comply with any such order within the time stated in the notice shall constitute a violation. For any violations of this chapter, the owner must comply with the director's orders within the time specified in the notice. Failure to comply with such order shall constitute a violation of this chapter. In addition to any penalty imposed for each violation, a judge hearing the case may direct the person responsible to remediate or correct, and each day's default in such remediation or correction shall constitute a violation of and a separate offense under this section.”

On September 16, 2015, PWCS formally requested a collaborative effort with Prince William County and VDOT Urban Areas to meet the sediment WLA in the Bull Run watershed but did not receive a response.

2. Significant Source Assessment

(2018-2023 General Permit Section II.B.3.d) Identification of the significant sources of the pollutants of concern discharging to the permittee's MS4 and that are not covered under a separate VPDES permit. For the purposes of this requirement, a significant source of pollutants means a discharge where the expected pollutant loading is greater than the average pollutant loading for the land use identified in the TMDL.

According to the 2006 Final Report, approximately 40% of the impaired Bull Run watershed is developed land. Sediment loading sources on developed land include urban stormwater runoff, stream bank erosion, and sediment loss from construction projects associated with urbanization. Increased urbanization and impervious surfaces reduce riparian vegetation, contributing to stream bank erosion by increasing peak flows.

The most effective means to identify, reduce, and eliminate sediment is to assess significant sources of sediment at PWCS properties in the impacted watershed. The **Table 2** lists the schools within the Bull Run watershed. PWCS owns or operates a total of 558.4 acres within the Bull Run watershed, including 540.41 acres within the MS4 regulated area.

Table 2. PWCS Properties in the Bull Run Watershed

Site	Receiving Water	HU6	Outfall ID	Estimated Drainage Acres
Alvey ES	Little Bull Run	PL43	OUT-322-1	20.17
Battlefield HS	Catharpin Creek	PL43	OUT-529-1	78.34
Bull Run MS	Little Bull Run	PL43	OUT-492-1	12.93
			OUT-492-2	26.42
Ellis ES	Middle Bull Run	PL44	OUT-327-1	20.2
Gravelly ES	Little Bull Run	PL43	OUT-336-1	14.08
			OUT-336-2	3.91
Loch Lomond ES	Middle Bull Run	PL44	OUT-346-1	9.84
			OUT-346-2	0.87
Mountain View ES	Little Bull Run	PL43	OUT-381-1	28.35
New Dominion Alternative	Lower Bull Run	PL46	OUT-210-1	9.45
Osborn Park HS	Lower Bull Run	PL46	OUT-508-1	51.38
Parkside MS	Middle Bull Run	PL44	OUT-450-1	30
Pennington Traditional	Middle Bull Run	PL44	OUT-340-1	15
Ronald Reagan MS	Little Bull Run	PL43	OUT-405-1	30.87
			OUT-405-2	9.92
Signal Hill ES	Lower Bull Run	PL46	OUT-397-1	24.46
Sinclair ES	Middle Bull Run	PL44	OUT-362-1	8.13
			OUT-362-2	15.59
			OUT-362-3	1.68
Unity Reed HS	Middle Bull Run	PL44	OUT-568-1	13.07
			OUT-568-5	6.43
Unity Braxton MS	Middle Bull Run	PL44	OUT-448-1	25.32
			OUT-448-2	3.92
			OUT-448-3	9.34
			OUT-448-4	1.99
			OUT-448-5	7.42
Sudley ES	Bull Run	PL44	OUT-302-1	7.9
			OUT-302-2	5.82
Tyler ES & PACE West Special	Little Bull Run	PL43	OUT-291-1	38.96
West Gate ES	Middle Bull Run	PL44	OUT-354-1	9.12
			OUT-354-2	2.98
Yorkshire ES	Lower Bull Run	PL46	OUT-335-1	12.95
			OUT-335-2	0.36

For the purposes of this assessment, a significant source of pollutant(s) from a facility of concern means a discharge where the expected pollutant loading is greater than the average pollutant loading for the land use identified in the TMDL. Significant sediment sources on PWCS properties may include active construction projects and sediment runoff following winter sand/salt application to paved surfaces.

A. Construction Projects

The largest potential source of sediment is unfiltered stormwater discharged from active construction sites. In 2014, construction activity within the Bull Run watershed included an addition to Parkside MS. In 2015-2016 additions were made to Tyler ES and Stonewall MS. Erosion and sediment control measures are utilized at all PWCS construction sites to reduce the amount of sediment discharged from PWCS construction projects.

B. Sand/Salt Application Sites

Sand and salt are applied to paved surfaces and sidewalks as needed during each winter at all PWCS properties within the Broad Run watershed. Sand and salt are generally stored at maintenance facilities, with minor storage on-site at schools.

C. In-Stream Erosion

Peak flows of stormwater from impervious surfaces during and following rain events are a major contributor to in-stream erosion. PWCS properties within the Bull Run watershed have an average of 29.27% impervious surface. Four properties have particularly high impervious surface ratios – Loch Lomond Elementary (41.55%), Yorkshire Elementary (40.81%), Osbourn Park High School, and the Unity Reed High/Ellis Elementary combined property (41.95%) – and are therefore considered to be potential significant sources of in-stream erosion due to stormwater velocity.

3. Means and Methods to Meet the Wasteload Allocation

(2018-2023 General Permit Section II.3.e) BMPs designed to reduce the pollutant of concern.

A. Implemented Means and Methods

This section describes the management practices that have been implemented thus far.

Riparian Buffers

Riparian buffer zones help to stabilize stream banks from erosion and intercept nutrients and sediment from discharging in the waterbody. From October 2014 to April 2014, Battlefield High School completed a riparian buffer project along Catharpin Creek. An Earth Science class at Battlefield High planted native bushes, trees, and herbaceous plants at the site and along the sanitation utilities easement section of the riparian buffer. An educational sign explaining the riparian buffer project was added to teach students and faculty the benefits of a riparian buffer.

Street Sweeping

Street sweeping of parking lots has been generally performed annually at PWCS properties in the Bull Run watershed, reducing sediment build up on impervious surfaces. As detailed in the PWCS Chesapeake Bay TMDL Action Plan, PWCS contracts street sweeping efforts, initiated in October 2014 through Master Agreement MA 041 R-SJ-14016-01 with Finley Asphalt & Sealing, Inc. The contracted annual sweeping effort targets accumulated sediment and sand applied during snow and ice control efforts in school and facility parking lots.

Sand/Salt Material Storage

PWCS constructed a new sediment storage building to house the majority of sand/salt used for winter application. The material is stored in a covered building with asphalt-coated concrete barriers. Where individual schools keep minor stores of salt for sidewalk application, bags are stored on pallets indoors.

Erosion and Sediment Control Plans

PWCS controls sediment discharge from active construction sites through the development of and adherence to approved erosion and sediment control plans.

Post-Construction Best Management Practices

PWCS installs infiltration and retention basins and other BMPs as required to reduce sediment discharge to the MS4. Post-construction BMPs also aid in reducing peak flow rates, reducing instream bank erosion. At Loch Lomond Elementary, a rain barrel was installed in 2009, diverting rainwater from 0.02 acres of temporary building roof. At Yorkshire Elementary, a dry detention pond was installed in 2009, reducing peak flows from 13.28 acres.

Illicit Discharge Detection and Elimination (IDDE) Inspections

PWCS performs annual IDDE inspections of outfalls and BMPs. Visual detection of suspended solids has been incorporated into the annual inspection form and internal workorder system to prioritize repairs.

Land Use Change

In 2016, Stonewall Middle School converted 4 acres of land use type pervious grass to land use type forest. This type of land use change reduces sediment introduction into the storm sewer system by stabilizing soil and preventing erosion.

B. Planned Means and Methods

This section describes the management practices that will be implemented between November 1, 2018 and October 31, 2023.

Street Sweeping

Street sweeping may be performed as necessary at PWCS properties in the Bull Run watershed, reducing sediment build up on impervious surfaces and preventing total suspended solids from entering waterways with rainwater.

Sand/Salt Material Storage

PWCS will continue to store sand/salt materials indoors, on non-porous surfaces. Custodial staff and snow crews will receive additional training on proper storage and application rates.

Erosion and Sediment Control Plans, BMPs

PWCS will continue to control sediment discharge from active construction sites through the development of and adherence to approved erosion and sediment control plans. Where required, PWCS will install infiltration and retention basins and other BMPs.

Illicit Discharge Detection and Elimination (IDDE) Inspections

PWCS will continue to perform annual IDDE inspections of outfalls and BMPs within the Bull Run watershed.

C. Anticipated Load Reduction Calculations

(2018-2023 General Permit Section II.B.5.c) The permittee shall calculate the anticipated load reduction achieved from each BMP and include the calculations in the action plan (calculations are included in Appendix A).

Street Sweeping

The mass loading approach was used until June 30, 2022, and future sediment reduction calculations, if necessary, for street sweeping will be updated in the following Action Plan from previous Action Plan submittals to match the guidelines in the Recommendations of the Expert Panel to Define Removal Rates for Street and Storm Drain Cleaning Practices final report approved by the CBP dated May 19, 2016 (referred to here as the Expert Panel Report). The Expert Panel Report recommended phasing out the previous methods of calculating sediment reduction from street sweeping in favor of the lane-mile based approach reflected in **Table 3**.

In lieu of the mass loading approach to quantify reductions, PWCS will be using the lane mile approach from the 2016 Expert Panel Report. Additional evaluation is needed to determine the most effective methods to meet the required sediment reduction (162.32 tons/year or 324,640 lbs./year) for future sediment loads to achieve the WLA (see schedule in Table 7).

Table 3. Street Sweeping Using the Lane Mile Approach

PWCS TSS TMDL WLA Reduction Scenarios				
Street Cleaning Practices Available for Credit				Removal Rate
Practice	Description*	Passes/Yr.	TSS	
Advanced Sweeping Technology	SCP-1	2 passes per week	100	0.21
	SCP-2	1 pass per week	50	0.16
	SCP-3	1 pass per 2 weeks	25	0.11
	SCP-4	1 pass every 4 weeks	10	0.06
	SCP-5	1 pass every 8 weeks	6	0.04
	SCP-6	1 pass every 12 weeks	4	0.02
	SCP-7	Seasonal scenario 1 or 2	15	0.07
	SCP-8	Seasonal scenario 3 or 4	20	0.1
Mechanical Broom Technology	SCP-9	2 passes per week	100	0.01
	SCP-10	1 pass per week	50	0.005
	SCP-11	1 pass every 4 weeks	10	0.001

*Seasonal scenarios are defined as follows:

S1: Spring - One pass every week from March to April. Monthly otherwise.

S2: Spring – One pass every other week from March to April. Monthly otherwise.

S3: Spring and fall – One pass every week (March to April, October to November). Monthly otherwise.

S4: Spring and fall – One pass every other week during the season. Monthly otherwise.

Land Use Change

In 2016, Stonewall Middle School converted 4 acres of land use type pervious grass to land use type forest. According to the reduction values found in Table V.H.1 of the 2015 VDEQ Chesapeake Bay Action Plan Guidance Document, this has resulted in a TSS reduction of 531.84 lbs/year.

Retrofit BMPs

PWCS has installed BMPs at Pace West Special, Tyler ES, Sinclair ES, Sudley Elementary School, and West Gate Elementary School. TSS load and reduction calculations are detailed **Appendix A**. Calculations for TSS load were completed using the Pollutant of Concern Load (Potomac) found in the Table 2b. Reductions were calculated using the appropriate methods in Table V.A.1 and Table V.C.1 of the 2015 Guidance Document.

Total TSS Reductions

Total TSS reductions are calculated in **Table 4** below.

Table 4. TSS Reductions in Bull Run Watershed (2021-2022)

BMP type	TSS (lbs/yr)	Total TSS (lbs/yr)	Total TSS (tons/yr)
Non MS4 BMP	437.66	30,105.67	15.05
Retrofit BMPs	8,546.72		
Street Sweeping	20,589.45		
Land Use Change	531.84		

4. Education and Outreach

(2018-2023 General Permit Section II.B.3.g) An outreach strategy to enhance the public’s education (including employees) on methods to eliminate and reduce discharges of the pollutants.

A. Public Education & Outreach

PWCS incorporates education of the effects of human activity on water quality and how we as humans affect it into public science education courses at multiple grade levels. Through the Virginia Standards of Learning (SOLs), students learn the importance of protecting and maintaining our water resources and how it affects their watershed. PWCS implements all Virginia SOLs and specifically incorporates water quality issues into grade 4 and 6 earth science courses.

- Grade One: Curriculum includes identification of natural resources, factors that affect air and water quality, and recycling, reusing, and reducing consumption of natural resources.
- Grade Three: Curriculum includes aquatic ecosystems, the effects of human activity on air/water/habitat quality.
- Grade Four: Curriculum includes Virginia natural resources, watersheds and water resources, ocean environment, and the influences of human activity on ecosystems.
- Grade Five: Curriculum includes the human role in conserving limited resources.
- Grade Six: Curriculum includes the importance of protecting and maintaining water resources, the location and structure of Virginia’s regional watershed systems, conservation/health/safety issues associated with watersheds, wetlands, and estuaries.
- Grade Nine: Earth Science class curriculum includes dependence on freshwater resources and the effects of human usage on water quality, regional Virginia watersheds (including the Bay and its tributaries), economic and public policy issues concerning the oceans and the coastal zone (including the Chesapeake Bay), conservation issues, and watershed monitoring.

PWCS provides a Sewer Science Wastewater Laboratory class for high schools that introduce students to municipal wastewater treatment. Students learn where wastewater comes from and how it impacts the environment if left untreated. Students learn to treat wastewater through these processes: primary sedimentation, biological treatment, secondary sedimentation, filtration, and disinfection. Laboratory classes were provided to approximately 10,550 students over the course of the 2018-2019 school year. Attendance of students in this laboratory class will be included in each corresponding Annual Report.

PWCS offers the Enviroscope Program to Grades K-8 which addresses the SOLs for Science Grade 4 Section 9 (Earth Resources) a) watersheds and water resources, and SOLs for Science Grade 6 Section 5 (Matter) e) the importance of water for agriculture, power generation, and public health and f) the importance of protecting and maintaining water resources, Section 7 (Living Systems) f) major conservation, health, and safety issues associated with watersheds, and Section 9 (Earth Resources) a) management of renewable resources, b) management of nonrenewable resources, c) the mitigation of land-use and environmental hazards through preventive measures, and d) cost/benefit trades in conservation policies. This presentation to students includes discussion of wastewater treatment, water reclamation, watershed management, and water quality on public health. This program specifically includes wastewater treatment from groundwater and septic systems and how these affect water quality. This program was provided to approximately 10,550 students over the course of the 2018-2019 school year. Attendance of students in this program will be included in each corresponding Annual Report.

PWCS also is involved with NOAA's B-WET program that takes students on a field trip to learn about watershed management and environmental protection. NOAA's B-WET Meaningful Watershed Educational Experience (MWEE) also includes discussion of groundwater protection and pollution prevention in their watershed. A total of 15 middle schools participated in the NOAA's B-WET field experience during the 2018-2019 school year. A report of the number of schools that participate in the NOAA's B-WET program each year will be included in each corresponding Annual Report.

B. Employee Training

Sediment loading has been incorporated into annual employee training programs. Training addresses identification, risk factors, and significant sources within the PWCS system. PowerPoint presentations during annual training provide material about the TMDL and the WLA. Custodial staff, snow crews, and operations and maintenance staff receive specific training in the following concepts:

- The consequences of suspended sediment in local waters
- Sand/salt application rates
- Sand/salt storage conditions at individual schools and at storage facilities
- Erosion identification

5. TMDL Action Plan Evaluation

(2013-2018 General Permit Section I.B.2.e) Develop and implement a method to assess TMDL Action Plans for their effectiveness in reducing the pollutants identified in the WLAs.

BMPs and methods detailed in this action plan which do not have an associated load reduction efficiency will be evaluated by annually reviewing the measures outlined in Section 4. TSS reductions were previously evaluated from BMPs installed during or after 2014. BMPs will be researched and evaluated from 2004 to 2014, and the associated TSS reductions will be reported in the following Action Plan.

The subsequent Action Plan will document the additional reductions required to maintain compliance, and street sweeping will be implemented in the following year to achieve full sediment reductions.

Street sweeping efforts will take the following action steps:

1. Coordination with DEQ to be able to take additional credit for the implementation of PWCS' MS4 Program. Evaluate a credit for the reduced land disturbance threshold written in PWCS' ordinance. Determine the lane miles swept potential of PWCS streets. Select a practice to implement from Table 3 of this report.
2. Develop necessary documentation per expert panel report.
3. Develop sweeping training materials and implement training.
4. Assess numerical progress towards meeting the WLA over the permit cycle. Re-evaluate Street Sweeping Program.

The action steps identified above are intended to serve as a defined method that inherently aids as an adaptive iterative approach to achieve the WLA. **Table 5** summarizes the schedule for the implementation of the Action Plan's steps to achieve the required sediment reductions.

Table 5: Schedule for PWCS' TMDL Action Plan Sediment Reduction Program

Step	General Description	Measurable Goal	Completion Date
1	Revise Action Plan to calculate appropriate sediment reduction requirements. Quantify existing BMP reductions from 2014 to 2019.	Quantify sediment reductions. Revise Action Plan to reflect actual required reductions.	October 1, 2022
2	Quantify sediment reductions for all BMPs installed after the Bull Run TMDL model simulation period.	Begin quantifying sediment reductions to take credit for BMPs installed from 2005 to 2014.	June 30, 2023
3	Evaluate additional reductions and schedule required to meet the WLA.	Finalize sediment reductions to take credit for BMPs installed from 2005 to 2014.	June 30, 2024
4	Develop a plan for implementing additional BMPs as necessary. Begin to coordinate with Prince William County and VDOT on credit partnerships to determine if a partnership is feasible. If Street Sweeping is proposed, the lane mile approach will be utilized.	Evaluate additional BMPs.	June 30, 2025
5	Evaluate Street Sweeping program if necessary. Develop documentation. Begin to develop planning documents for additional BMP implementation. This includes any necessary documentation for funding sources.	Develop appropriate documentation.	June 30, 2026
6	Provide a phased approach for BMP implementation, which includes design and construction of BMPs necessary to meet the wasteload allocation.	Design and installation of BMPs.	June 30, 2027 to June 30, 2032
7	Target date to meet wasteload allocation.	Annual reporting of sediment reductions that meet the wasteload allocation.	June 30, 2033

Education and Outreach: A primary goal of this TMDL Action Plan is to provide training to targeted staff to ensure a working understanding of the hazards, potential sources, and internal response actions expected if a sediment source or release is identified. PWCS will conduct and document annual training activities. Training material and sign-in sheets (date of training and list of attending employees) will be maintained for each training event. Annual training will be documented in corresponding MS4 Annual Reports. PWCS will include metrics for attendance and involvement in the educational programs outlined in Section 4 in the Annual Report.

BMPs associated with an assigned load reduction efficiency will be maintained. Structural BMPs will be assessed for functionality annually, and a report documenting their condition can be found in the IDDE report.

PWCS will include sediment load reduction achieved each permit year in the annual reports. Planned BMP installation and anticipated reductions will be included in each annual report.

6. Annual Reporting

(2013-2018 General Permit Section I.B.5 and 2018-2023 General Permit Part I.D.5) Annual reporting requirements.

In proceeding Annual Reports, PWCS will provide a report on the implementation of the TMDL Action Plan and associated evaluation including the results of any monitoring conducted as part of the evaluation.

Appendix A

TSS Reductions

TSS Reductions from Street Sweeping (2021-2022)

School	Date	Start Weight	End Weight	Total Tons
Freedom HS	11/1/2021	30,400	31,250	0.425
Ann Ludwig	11/1/2021	30,400	30,900	0.25
Ellis ES	11/3/2021	30,400	31,100	0.35
Potomac HS	11/3/2021	31,100	32,100	0.5
Potomac MS	11/3/2021	30,400	31,200	0.4
Williams ES	11/4/2021	30,400	30,900	0.25
Lake Ridge MS	11/4/2021	30,900	31,400	0.25
Woodbridge HS	11/4/2021	32,000	32,900	0.45
Old Bridge ES	11/4/2021	31,400	32,000	0.3
Battlefield HS	11/5/2021	30,400	31,900	0.75
Brentsville HS	11/5/2021	31,600	32,500	0.45
Nokesville	11/6/2021	30,400	31,700	0.65
Dumfries ES	11/6/2021	31,700	32,500	0.4
T. Clay Woods ES	11/6/2021	30,400	31,300	0.45
Osborn Park HS	11/8/2021	30,400	31,500	0.55
Patriot HS	11/8/2021	30,400	31,300	0.45
Featherstone ES	11/8/2021	30,400	30,900	0.25
Stonewall HS	11/9/2021	30,400	31,900	0.75
Colgan HS	11/9/2021	30,400	31,900	0.75
Graham MS	11/9/2021	30,400	31,000	0.3
Leesylvania ES	11/10/2021	30,400	31,000	0.3
Porter HS	11/10/2021	31,000	31,700	0.35
Rippon MS	11/10/2021	30,400	30950	0.275
Potomac View MS	11/10/2021	30,955	31,500	0.2725
River Oaks MS	11/10/2021	31,500	32,100	0.3
Swans Creek ES	11/11/2021	30,400	31,000	0.3
Triangle ES	11/11/2021	31,000	31,500	0.25
Covington-Happer ES	11/11/2021	31,500	32,100	0.3
Fred Lynn MS	11/11/2021	30,400	31,100	0.35
Belmont ES	11/11/2021	31,100	31,700	0.3
Kilby ES	11/12/2021	30,400	31,000	0.3
Marumsco Hills ES	11/12/2021	31,000	31,500	0.25
Occoquan ES	11/12/2021	31,500	32,100	0.3
Vaughan ES	11/12/2021	30,400	31,000	0.3
Woodbridge MS	11/12/2021	31,000	31,600	0.3
Antietam ES	11/13/2021	30,400	31,000	0.3
Lake Ridge ES	11/13/2021	31,000	31,600	0.3
Rockledge ES	11/13/2021	31,600	32,100	0.25
Springwoods ES	11/13/2021	30,400	31,000	0.3
Westridge ES	11/13/2021	31,000	31,500	0.25
Ronald Reagan MS	11/15/2021	30,400	31,900	0.75
Garfield HS	11/15/2021	31,900	33,300	0.7

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Saunders MS	11/15/2021	30,400	31,000	0.3
Forest Park HS	11/16/2021	31,000	32,500	0.75
Mountain View ES	11/16/2021	30,400	31,000	0.3
Bull Run MS	11/16/2021	30,400	30,900	0.25
Haymarket ES	11/17/2021	30,400	31,900	0.75
Penn ES	11/17/2021	31,900	33,400	0.75
Piney Branch ES	11/17/2021	30,400	31,000	0.3
Gainseville MS	11/17/2021	31,000	31,300	0.15
Hylton HS	11/18/2021	30,700	31,600	0.45
Gainsville HS	11/18/2021	30,900	31,700	0.4
Albey ES	11/18/2021	30,400	30,700	0.15
Pennington Traditional	11/19/2021	30,400	31,000	0.3
Chrus Yung ES	11/19/2021	30,400	31,100	0.35
Bristow Run ES	11/19/2021	31,100	32,000	0.45
Ashland ES	11/19/2021	30,400	31,000	0.3
Bell Air ES	11/19/2021	31,000	31,900	0.45
Triangle ES	11/20/2021	30,400	30,900	0.25
Henderson ES	11/20/2021	30,900	32,000	0.55
Kelly Leadership	11/20/2021	30,400	32,000	0.8
Bennett ES	11/20/2021	30,400	31,000	0.3
Hampton MS	11/22/2021	30,400	31,500	0.55
Morstellar MS	11/22/2021	31,500	32,100	0.3
Benton MS	11/22/2021	30,400	31,500	0.55
Beville MS	11/22/2021	31,500	33,600	1.05
Unity Bexton MS	11/23/2021	30,400	31,900	0.75
Buckland Mill ES	11/23/2021	31,900	33,700	0.9
Darkside MS	11/23/2021	30,400	31,000	0.3
Potomac Shores MS	11/23/2021	31,000	32,900	0.95
Dale City ES	11/24/2021	30,400	31,400	0.5
Enterprise ES	11/24/2021	31,400	32,600	0.6
Cedar Point ES	11/24/2021	30,400	31,200	0.4
Coles ES	11/24/2021	31,200	32,600	0.7
Independence Nontraditional School	11/24/2021	30,400	32,900	1.25
Pace West School	11/24/2021	32,600	33,900	0.65
Gravelly ES	11/26/2021	30,400	31,000	0.3
Henderson ES (resweep)	11/26/2021	31,000	31,900	0.45
Fitzgerald ES	11/26/2021	30,400	31,100	0.35
Glenkirk ES	11/26/2021	31,100	32,200	0.55
Mary Williams ES	11/27/2021	30,400	31,000	0.3
Marshall ES	11/27/2021	30,400	31,000	0.3
MLK ES	11/27/2021	31,100	32,100	0.5
Kyle R Wilson ES	11/27/2021	32,100	33,200	0.55
Loch Lomond ES	11/27/2021	30,400	31,200	0.4
Jenkins ES	11/26/2021	30,400	31,100	0.35

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Kerrydale ES	11/26/2021	31,100	32,300	0.6
Gainsesville Bus Lot	11/29/2021	30,400	31,000	0.3
Rippon Bus Lot	11/29/2021	31,000	31,500	0.25
Yorkshire ES	11/29/2021	30,400	30,700	0.15
Signal Hill ES	11/29/2021	30,700	31,200	0.25
Brentsville Transportation Lot	11/30/2021	30,400	31,400	0.5
Hylton Bus Lot	11/30/2021	31,400	32,000	0.3
Woodbine Preschool	11/30/2021	32,000	32,500	0.25
Washington Reid Preeschool Center	11/30/2021	32,500	33,000	0.25
Bento MS Bus Lot	12/1/2021	30,400	31,400	0.5
Forest Park Bus Lot	12/1/2021	31,400	32,900	0.75
Victory ES	12/1/2021	30,400	31,300	0.45
McAuliffe ES	12/1/2021	31,300	32,100	0.4
Independent Hill Complex	12/2/2021	30,400	31,500	0.55
Garfield Transportation Lot	12/2/2021	30,400	31,600	0.6
Minnieville ES	12/2/2021	30,400	30,900	0.25
Montclair ES	12/2/2021	30,900	31,300	0.2
Potomac Transportation Lot	12/3/2021	30,400	31,000	0.3
Marshall Bus Lot	12/3/2021	30,400	30,900	0.25
Tyler ES	12/3/2021	30,400	30,700	0.15
Sudley ES	12/3/2021	30,700	31,200	0.25
Mullen ES	12/4/2021	30,400	30,600	0.1
Neabasco ES	12/4/2021	30,600	31,000	0.2
Pattie ES	12/4/2021	31,000	31,200	0.1
Westgare ES	12/4/2021	31,200	31,400	0.1
Sinclair ES	12/4/2021	31,400	31,700	0.15
Rosa Parks ES	12/4/2021	31,700	32,000	0.15
Central Transportation	12/6/2021	30,400	31,800	0.7
Woodbridge Transportation	12/6/2021	30,400	31,900	0.75
McCuin Transportation	12/7/2021	30,400	31,900	0.75
Kyle R Wilson ES (resweep)	12/7/2021	30,400	31,400	0.5

			Total Tons	49.0225
			Total Lbs	98045
			Dry Weight	68631.5
			TN lbs/yr	171.57875
			TP lbs/yr	68.6315
			TSS lbs/yr	20589.45

TSS Reductions from Land Use Changes

Land Use Change				
Property	Land Use From	Land Use To	Acres Converted	TSS Reduction (lbs/year) (Table V.H.1)
Stonewall MS	Pervious Grass	Forest	4	531.84

TSS Reductions from Non-MS4 BMP Installations

Year Non-MS4 Regulated Area Allowed Reductions	Practice Description	Total Acres	Impervious Acres	Pervious Acres	TSS Reduction Requirement (lbs)*	TSS Load Reduction (lbs)
2014-2015	Gravelly HS SWB-336-1	17.9907	4.98	13.0107	1366.68078	437.66

TSS Reductions from Retrofit BMP Installations

Date Installed	Type of Reduction	Practice Description	Total Acres	Impervious Acres	Pervious Acres	Impervious TSS (*1171.32)	Pervious TSS (*175.8)	TSS Load	TSS Load Reduction
7/1/2009	Rain Barrel	Loch Lomond ES Rain Barrel	0.02	0.02	0	23.4264	0	23.4264	0
6/30/2012	Retrofit Dry Detention Pond	PACE West and Tyler ES SWB-291-1	38.96	3.92	35.04	4591.5744	6160.032	10751.61	1075.161
1/1/2013	UGDS	Sinclair ES UGDS	8.13	2.59	5.54	3033.7188	973.932	4007.651	3206.121
1/1/2013	UGDS	Sudley ES UGDS	7.72	2.97	4.75	3478.8204	835.05	4313.87	3451.096
1/1/2013	UGDS	West Gate UGDS	0.89	0.43	0.46	503.6676	80.868	584.5356	467.6285
7/1/2015	Biofilterra	PACE West Special and Tyler ES	0.37	0.37	0	433.3884	0	433.3884	346.7107
								Total Reduction	8546.7172