



Prince William County Schools, Virginia

Municipal Separate Storm Sewer System Annual Report

For

General Permit No. VAR040010

Permit Year

July 1, 2022 through June 30, 2023

This annual report is submitted in accordance with 9VAC25-890-40 as part of the requirement for permit coverage to discharge stormwater to surface waters of the Commonwealth of Virginia consistent with the VAR04 General Permit effective date November 1, 2018.

Submitted: October 1, 2023

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ACRONYMS

BMP	Best Management Practices
DEQ	Virginia Department of Environmental Quality
MCM	Minimum Control Measure
MS4	Municipal Separate Storm Sewer System
POC	Pollutants of Concern
PWCS	Prince William County Schools
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
VESCP	Virginia Erosion and Sediment Control Program
VSMP	Virginia Stormwater Management Program
VPDES	Virginia Pollution Discharge Elimination System

1.0 GENERAL ANNUAL REPORTING REQUIREMENTS

1.1. General Information (Part I.D.2.a)

Permittee Name: Prince William County Schools

Permit Number: VAR040010

1.2. Reporting Period (Part I.D.2.b)

The reporting period for which the annual report is being submitted:

July 1, 2022 through June 30, 2023

1.3. Signed Certification (Part I.D.2.c)

A signed certification as per Part III K:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Printed Name: Heather Diez

Title: Director of Facilities Department

Signature: _____ Date: _____

1.4. Reporting for MCMs #1 - #6 (Part I.D.2.d)

Include information for each annual reporting item specified in Part I.E:

Reporting information for each Minimum Control Measure is provided in Section 2.0.

1.5. Evaluation of the MS4 Program Implementation (Part I.D.2.e)

An evaluation of the MS4 program implementation, including a review of each MCM to determine the MS4 program's effectiveness and whether changes to the MS4 Program Plan are necessary:

An evaluation for each Minimum Control Measure is provided in Section 2.0. Changes that are necessary to be made to the MS4 Program Plan are summarized in Table 1.

Table 1: Summary of MS4 Program Plan Changes

PWCS has updated Bacteria, PCB, Benthic, and Chesapeake Bay TMDL Action Plans and developed the Good Housekeeping Manual, IDDE Manual, and Post-Construction Manual.

2.0 MINIMUM CONTROL MEASURES

2.1. MCM #1: Public Education and Outreach

2.1.1. High Priority Stormwater Issues (Part I.E.1.g(1))

A list of high-priority stormwater issues addressed in the public education and outreach program:

A list of high-priority stormwater issues addressed in public education and outreach program is provided in Table 2.

2.1.2. High Priority Stormwater Issue Communication Strategies (Part I.E. 1.g(2))

A list of strategies used to communicate each high-priority stormwater issue:

A list of strategies used to communicate each high-priority stormwater issue is provided in Table 2. Appendix A includes documentation of the communication efforts described in Table 2.



Table 2: High Priority Stormwater Issues					
#	Stormwater Issue	Strategy	Communication	Metric	Beneficial
1	Chesapeake Water Quality	Watershed Education	Curriculum Materials	Approximately 41,412 students educated.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2	Stormwater Pollution	Meaningful Watershed Educational Experience (MWEE) Training	Speaking Engagements	September 11 th , 2023, March 7 & 9 th 2023; 26 admin, 27 staff, and 23 community members attended.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3	Illicit Discharge from Local Sources	Letters about Stormwater	Traditional Written Materials	Emails sent out to principals, bookkeepers, and custodial managers on 10/22/2022.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
4	Local Waterways	Northern Virginia Clean Waters Partnership	Traditional Written Materials	Quarterly newsletter sent from NVCW.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

2.1.3. MCM #1 Evaluation (Part I.D.2.e)

Review the MCM to determine the MS4 Program’s effectiveness and whether or not changes to the MS4 Program Plan are necessary:

Were all MCM #1 requirements met completed in accordance with the MS4 Program Plan?

Yes No

Are the MS4 Program measurable goals effective?

Yes (Effective) No (Ineffective, necessary changes to the MS4 Program are included in Section 1.5.)

2.2. MCM #2: Public Involvement and Participation

2.2.1. Public Input Summary (Part I.E.2.f(1))

A summary of any public input on the MS4 program received (including stormwater complaints) and responses:

1. Resident complaining of runoff near Occoquan elementary school. Follow-up is still in progress. PWCS does not believe it is school related.
2. Montclair complaint of runoff from grading an eroding hill. Project complete and issue resolved.
3. Woodbridge high school - Excessive runoff from hillside and repairs to baseball field. Issue resolved.

If any MS4 Program inputs or stormwater complaints were received from the public, were responses provided?

Yes No Not Applicable (No input or complaints)

2.2.2. MS4 Program Webpage (Part I.E.2.f(2))

A webpage address to the MS4 program and stormwater website:

The webpage address is:

https://www.pwcs.edu/departments/facilities/facilities_management/environmental_staff_and_services/stormwater_management

2.2.3. Public Involvement Activities Implemented (Part I.E.2.f(3))

A description of the public involvement activities implemented:

A description of the implemented public involvement activities is provided in Table 3.

2.2.4. Public Involvement Activity Metric and Evaluation (Part I.E.2.f(4))

A report of the metric as defined for each activity and an evaluation as to whether or not the activity is beneficial to improving water quality:

A report of the metric as defined for each activity and an evaluation as to whether or not the activity is beneficial to improving water quality is provided in Table 3. Appendix A includes documentation of the public involvement activities.



Table 3: Public Involvement Activities Implemented

#	Activity Description/Date	Category	Metric	Collaboration	Beneficial
1	After The Storm Educational Document	Educational Event	Emails sent out to principals, bookkeepers, and custodial managers on 10/22/2022.	No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2	Dale City Elementary Meaningful Watershed Educational Experience (MWEE)	Educational Event	120 students attended on 05/26/2023.	No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3	Marumscos Hills Elementary Meaningful Watershed Educational Experience (MWEE)	Educational Event	140 students and 26 staff attended on 05/24/2023.	No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
4	Patriot High School Meaningful Watershed Educational Experience (MWEE)	Educational Event	48 students and 6 staff attended on 04/13/2023.	No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5	Freedom High School Meaningful Watershed Educational Experience (MWEE)	Educational Event	90 students attended.	No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6	Belmont Elementary Meaningful Watershed Educational Experience (MWEE)	Educational Event	360 students and 37 staff attended on 04/17/2023 & 04/18/2023.	No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
7	Battlefield High School Meaningful Watershed Educational Experience (MWEE)	Educational Event	26 students and 2 staff.	No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
8	Hylton Tree Planting	Restoration	15 students and 2 staff attended on 12/13/2022.	Yes, 3 community partners	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

9	Benton Tree Planting	Restoration	25 students and 2 staff attended on 12/8/2022.	Yes, 3 community partners	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
10	Marumsco Tree Planting	Restoration	2 staff attended on 12/14/2022.	Yes, 3 community partners	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
11	Conservation Capsules	Educational Event	1,424 students attended from 10/28/2022 – 06/5/2023.	No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

2.2.5. MS4 Collaboration (Part I.E.2.f(5))

The name of other MS4 permittees collaborated with in the public involvement opportunities:

If applicable, the name of other MS4 permittees collaborated with for any of the public involvement opportunities are provided in Table 3.

2.2.6. MS4 Program Plan BMP Measurable Goals

The MS4 Program Plan BMPs measurable goals are provided in Table 4.

Table 4: MS4 Program Plan BMP Measurable Goals for MCM #2		
BMP	Measurable Goal	Completeness Status
2.1	Was documentation of the public input or complaints on the MS4 program and MS4 Program Plan maintained?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable (No input/complaints)
2.1	Is the effective MS4 permit and coverage letter on the webpage?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
2.1	Is the most current MS4 Program Plan on the webpage?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2.1	Is the annual report for each year of the term covered by this permit no later than 30 days after submittal to the department on the webpage?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable

2.1	Is there a mechanism for the public to report potential illicit discharges, improper disposal or spills to the MS4, complaints regarding land disturbing activities or other potential stormwater pollution concerns on the webpage?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2.1	Is there a method for how the public can provide input of the MS4 Program Plan on the webpage?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2.1	Is there a method for responding to public input?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2.1	Is there a method for maintaining public input received and the County's responses?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

2.2.7. MCM #2 Evaluation (Part I.D.2.e)

Review the MCM to determine the MS4 Program's effectiveness and whether or not changes to the MS4 Program Plan are necessary:

Were all MCM #2 requirements met in accordance with the MS4 Program Plan?

Yes No (MS4 Permit needs to be uploaded to website)

Are the MS4 Program measurable goals effective?

Yes (Effective) No (Ineffective, necessary changes to the MS4 Program are included in Section 1.5.)

2.3. MCM #3: Illicit Discharge Detection and Elimination

2.3.1. MS4 Map and Information Table (Part I.E.3.e(1))

A confirmation statement that the MS4 map and information table have been updated to reflect any changes to the MS4 occurring on or before June 30 of the reporting year:

Were the MS4 storm sewer map and outfall information table updated to reflect any changes to the MS4 occurring on or before June 30 of the reporting year?

Yes No Not Applicable (No changes required)

2.3.2. Dry Weather Screening (Part I.E.3.e(2))

The total number of outfalls screened during the reporting period as part of the dry weather screening program:

Were at least 50 outfalls screened during the reporting period? Yes No

The number of outfalls screened during the reporting year as part of the dry weather screening program is 76. This represents 40% of the 191 total outfalls.

2.3.3. Illicit Discharges (Part I.E.3.e(3))

A list of illicit discharges to the MS4 including spills reaching the MS4:

Were there any illicit discharges to the MS4 including spills reaching the MS4?

Yes (Refer to Appendix B) No

2.3.4. MS4 Program Plan BMP Measurable Goals

The MS4 Program Plan BMPs measurable goals are provided in Table 5.

Table 5: MS4 Program Plan BMP Measurable Goals for MCM #3		
BMP	Measurable Goal	Completeness Status
3.1	Was a GIS compatible shapefile submitted to DEQ?	Completed
3.1	Was written notification provided to any downstream adjacent MS4 of any known interconnection established or discovered during the permit reporting year?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Not Applicable (No new or discovered) <input type="checkbox"/> No

3.2	Were all reported or observed non-stormwater discharges eliminated?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3.2	Were inspections, surveillance, monitoring and enforcement procedures in response to reports implemented?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3.3	Were illicit discharge detection and elimination procedures implemented, enforced and documentation maintained of at least 50 outfalls?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

2.3.5. MCM #3 Evaluation (Part I.D.2.e)

Review the MCM to determine the MS4 Program’s effectiveness and whether or not changes to the MS4 Program Plan are necessary:

Were all MCM #3 requirements met in accordance with the MS4 Program Plan?

Yes No

Are the MS4 Program measurable goals effective?

Yes (Effective) No (Ineffective, necessary changes to the MS4 Program are included in Section 1.5.)

2.4. MCM #4: Construction Site Stormwater Runoff Control

2.4.1. Implementation of VESCP and County Ordinance (Part I.E.4.a(1))

The MS4 has adopted a Virginia Erosion and Sediment Control Program (VESCP). The MS4 implements the VESCP consistent with the Virginia Erosion and Sediment Control Law and Virginia Erosion and Sediment Control Regulations.

2.4.1.1. Conforming Land Disturbance Projects (Part I.E.4.d(1)(a))

A confirmation statement that land disturbing projects that occurred during the reporting period have been conducted in accordance with the VESCP consistent with the Virginia Erosion and Sediment Control Law and Virginia Erosion and Sediment Control Regulations:

Were all land disturbing projects that occurred during the reporting period conducted in accordance with the VESCP consistent with the Virginia Erosion and Sediment Control Law and Virginia Erosion and Sediment Control Regulations?

Yes No (Refer to Table 6)

2.4.1.2. Non-Conforming Land Disturbance Projects (Part I.E.4.d(1)(b))

If one or more of the land disturbing projects were not conducted with the VESCP consistent with the Virginia Erosion and Sediment Control Law and Virginia Erosion and Sediment Control Regulations, an explanation as to why the projects did not conform:

If “No” is checked above, an explanation as to why a project did not conform to the VESCP laws and regulations and County ordinance is provided in Table 6.

Table 6: Project(s) Not in Conformance with VESCP

Project Name 1: N/A

Explanation: N/A

2.4.2. Site Stormwater Runoff Inspections (Part I.E.4.d(2))

Total number of inspections conducted:

The total number of site stormwater runoff inspections conducted for regulated land disturbance activities is 202.

2.4.3. Enforcement Actions (Part I.E.4.d(3))

The total number and type of enforcement actions implemented:

The total number of enforcement actions implemented is 0.

The total number of Notices of Violation issued is 0.

The total number of Stop Work Orders issued is 0.

2.4.4. MCM #4 Evaluation (Part I.D.2.e)

Review the MCM to determine the MS Program's effectiveness and whether or not changes to the MS4 Program Plan are necessary:

Were all MCM #4 requirements met in accordance with the MS4 Program Plan?

Yes No

Are the MS4 Program measurable goals effective?

Yes (Effective) No (Ineffective, necessary changes to the MS4 Program are included in Section 1.5.)

2.5. MCM #5: Post-Construction Stormwater Management

2.5.1. Implementation of VSMP and County Ordinance (Part I.E.5.i (1))

PWCS is not a Virginia Stormwater Management Program (VSMP) authority and relies on Prince William County for plan review, however, PWCS does have an inspection and maintenance program consistent with the Virginia Stormwater Management Act and VSMP Regulations Parts I.E.5.b and c.

Permit Requirements (Part I.E.5.i (1)(a)) & (Part I.E.5.i (1)(b))

PWCS is not aware of any private stormwater management facilities located on its MS4-regulated properties. If it becomes apparent that private facilities are present or if they are added, PWCS will develop written procedures for inspection, compliance, and enforcement to ensure maintenance is conducted to ensure long-term operation in accordance with the approved design.

2.5.2. Stormwater Management Facility Inspections (Part I.E.5.i(2))

Total number of inspections conducted on stormwater management facilities owned or operated by the permittee:

Were inspections conducted on stormwater management facilities during the reporting year? Yes No

The total number of inspections conducted on stormwater management facilities, owned or operated by the MS4 is 146.

2.5.3. Stormwater Management Facility Maintenance (Part I.E.5.i(3))

A description of significant maintenance, repair, or retrofit activities performed on the stormwater management facilities owned or operated by the permittee to ensure it continues to perform as designed. This does not include routine activities such as grass mowing or trash collection:

Were significant maintenance, repair, or retrofit activities performed on any stormwater management facilities during the reporting year?

Yes No Not Applicable (No significant maintenance required)

A description of significant maintenance, repair, or retrofit activities performed on the stormwater management facilities owned or operated by the MS4 to ensure it continues to perform as designed is provided in Table 7.

Table 7: Maintenance Activities Performed on Stormwater Management Facilities	
Stormwater Management Facility	Significant Maintenance Activity
Montclair	Outfall repair
Forest Park	Manhole/Inlet repairs
Buckland Mills	Inlet repairs
Battlefield	Replaced gabions, removed snorkel, and installed new LFO
Pennington	Outlet repair
Independent Hill	Outlet repair and grass tank cleaning
Potomac Sr.	LFO cage installation
Rippon	Outfall Repair
Westgate	Stream repair
Fitzgerald	Gabion baskets maintenance
Division Wide	Bioretention Replanting

2.5.4. Virginia Construction Stormwater General Permit Database (Part I.E.5.i(4))

A confirmation statement that the permittee submitted stormwater management facility information through the Virginia Construction Stormwater General Permit database for those land disturbing activities for which the permittee was required to obtain coverage under the General VPDES Permit for Discharges of Stormwater from Construction

Activities in accordance with Part I E 5 f or a statement that the Permittee did not complete any projects requiring coverage under the General VPDES Permit for Discharges of Stormwater from Construction Activities:

Were stormwater management facility information for stormwater facilities installed after July 1, 2014 submitted through the Virginia Construction Stormwater General Permit database for land disturbing activities requiring a General VPDES Permit for Discharges of Stormwater from Construction Activities?

Yes No Not Applicable

2.5.5. DEQ BMP Warehouse (Part I.E.5.i(5))

A confirmation statement that the permittee electronically reported BMPs using the DEQ BMP Warehouse in accordance with Part I E 5 g and the date on which the information was submitted:

No later than October 1 of each year, stormwater management facilities and BMPs implemented to meet a TMDL load reduction between July 1 and June 30 of each year were electronically reported using the DEQ BMP Warehouse for any practices not reported in accordance with Part I.E.5.f (requirement 2.5.4) including stormwater management facilities from land disturbing activities less than one acre in accordance with the Chesapeake Bay Preservation Act regulations and for which a General VPDES Permit for Discharges of Stormwater from Construction Activities was not required?

Yes, Date Submitted: No Not Applicable (No SWM facilities constructed or BMPs implemented that meet the criteria.)

2.5.6. MS4 Program Plan BMP Measurable Goals

The MS4 Program Plan BMPs measurable goals are provided in Table 8.

Table 8: MS4 Program Plan BMP Measurable Goals for MCM #5		
BMP	Measurable Goal	Completeness Status
5.1	Was the inspection and maintenance program on post-construction stormwater management facilities implemented?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5.1	Did all regulated land disturbance activities have a County approved SWM plan?	<input checked="" type="checkbox"/> Yes, all applicable <input type="checkbox"/> No
5.1	Were all stormwater management facilities recorded with inspection and maintenance plans and/or agreements, where applicable?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5.2	Was the stormwater management facility tracking database updated?	<input type="checkbox"/> Yes <input type="checkbox"/> Not Applicable (No new or discovered) <input checked="" type="checkbox"/> No, currently being updated: Pervious, Impervious, Total Acres Treated, and Year Built.

2.5.7. MCM #5 Evaluation (Part I.D.2.e)

Review the MCM to determine the MS4 program’s effectiveness and whether or not changes to the MS4 Program Plan are necessary:

Were all MCM #5 requirements met in accordance with the MS4 Program Plan?

Yes No

Are the MS4 Program measurable goals effective?

Yes (Effective) No (Ineffective, necessary changes to the MS4 Program are included in Section 1.5.)

2.6. MCM #6: Pollution Prevention and Good Housekeeping

2.6.1. Operational Procedures (Part I.E.6.q(1))

A summary of any operational procedures developed or modified in accordance with Part I E 6 a during the reporting period:

Were any operational procedures developed or modified in accordance with Part I E 6 a during the reporting period?

Yes (Refer to Table 9) No Not Applicable (Not necessary)

Table 9: Good Housekeeping Operational Procedures Developed or Modified

PWCS Good Housekeeping Manual, IDDE Manual, and Post-Construction Manual were developed.

2.6.2. Newly Developed SWPPPs (Part I.E.6.q(2))

A summary of any new SWPPPs developed in accordance Part I E 6 c during the reporting period:

Were any new SWPPPs developed in accordance Part I E 6 c during the reporting period?

Yes (Refer to Table 10) No Not Applicable (No new high priority facilities)

Table 10: New SWPPPs Developed

SWPPP Name	SWPPP Address
Western Bus Transportation	5728 Wellington Rd Gainesville, VA 20155
Osborn Park Auto Shop	8909 Euclid Avenue Manassas, VA 20111

2.6.3. Modified or Delisted SWPPPs (Part I.E.6.q(3))

A summary of any new SWPPPs modified in accordance with Part I E 6 f or the rationale of any high priority facilities delisted in accordance with Part I E 6 h during the reporting period:

Were any new SWPPPs modified after an unauthorized discharge, release or spill reported?

Yes (Refer to Table 11) No Not Applicable (Not necessary)

Were any high priority facilities delisted in accordance with Part I E 6 h during the reporting period? Yes (Refer to Table 11) No Not Applicable (No delisted high priority facilities)

If yes, rationale is provided for any high priority facilities delisted in accordance with Part I E 6 h during the reporting period in Table 11.

Table 11: SWPPPs Modified or Delisted	
SWPPPs Modified/Delisted	Rationale for Delisting
N/A	N/A

2.6.4. Newly Developed Nutrient Management Plans (Part I.E.6.q(4))

A summary of new turf and landscape nutrient management plans developed:

Were any new turf and landscape nutrient management plans developed?

- Yes (Refer to Table 12. Updated previously established nutrient management plans)
 No (No new or expired nutrient management plans) Not Applicable (Not required this permit year)

2.6.4.1. Nutrient Management Plan Acreage (Part I.E.6.q(4)(a))

The location and the total acreage of each land area:

If “Yes” is checked above, the location and total acreage of the land area for any newly developed nutrient management plan is provided in Table 12.

2.6.4.2. Nutrient Management Plan Approval Date (Part I.E.6.q(4)(b))

The date of the approved nutrient management plan:

If “Yes” is checked above, the approval date of any newly developed nutrient management plan is provided in Table 12.

Table 12: New Turf and Landscape Nutrient Management Plans		
Location	Total Acreages	Expiration Date
N/A		

Training Events (Part I.E.6.q(5))

A list of the training events conducted in accordance with Part I.E.6.m, including the following information:

Was training conducted?

Yes No, training was only provided to custodial staff. Not Applicable (Not required this permit year.)

If yes is checked above, a list of training events conducted in accordance with Part I.E.6.m is provided in Table 13.

2.6.4.3. Training Dates (Part I.E.6.q(5)(a))

The date of the training event: October 19 – 20, 2022; April 19 – 20, 2023

If yes is checked above, the date of the training event is provided in Table 13.

2.6.4.4. Quantity Trained (Part I.E.6.q(5)(b))

The number of employees who attended the training event: 172

If yes is checked above, the number of employees who attended the training event is provided in Table 13.

2.6.4.5. Training Objective (Part I.E.6.q(5)(c))

The objective of the training event: See below.

If yes is checked above, the objective of the training event is provided in Table 13.

Table 13: Training Events		
Date	# of Attendees	Training Objective
October 19 – 20, 2022; April 19 – 20, 2023	172	Provide Custodial Advisory Training Sessions (CATS) on the impact of dumping chemicals and cleaning solutions on PWCS properties. Make custodial staff aware of the sources and consequences of stormwater pollution. Provide Custodial Staff Training on IDDE and stormwater for detecting and eliminating illicit discharges on school properties. PCB and bacteria education are discussed.

2.6.5. MS4 Program Plan BMP Measurable Goals

The MS4 Program Plan BMPs measurable goals are provided in Table 14.



Table 14: MS4 Program Plan BMP Measurable Goals for MCM #6		
BMP	Measurable Goal	Completeness Status
6.1	Was good housekeeping and pollution prevention biennial training conducted this reporting year?	<input type="checkbox"/> Yes <input type="checkbox"/> Not Applicable (Not required this reporting year) <input checked="" type="checkbox"/> No
6.2	Was the annual comprehensive compliance evaluations conducted?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6.2	Were the SWPPPs reviewed within 30 days after an unauthorized discharge, release or spill reported?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not Applicable (Not required) <input type="checkbox"/> No
6.2	Were the SWPPPs updated within 90 days after an unauthorized discharge?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not Applicable (Not required) <input type="checkbox"/> No
6.2	Were the MS4's properties reviewed this reporting year to determine if the properties meet the criteria of a high priority facility?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6.3	Were the nutrient management plans implemented through completion of application records?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6.5	Did all signed contracts executed for pesticide and herbicide application maintain proof of certifications on file?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Not Applicable <input type="checkbox"/> No
6.5	Did training occur and were proof of certifications maintained on file for employees performing pesticide and herbicide applications?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Not Applicable <input type="checkbox"/> No
6.6	Were all signed contracts executed with contract good housekeeping and pollution prevention language?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

2.6.6. MCM #6 Evaluation (Part I.D.2.e)

Review the MCM to determine the MS4 Program's effectiveness and whether or not changes to the MS4 Program Plan are necessary:

Were all MCM #6 requirements met in accordance with the MS4 Program Plan?

Yes No

Are the MS4 Program measurable goals effective?

Yes (Effective) No (Ineffective, necessary changes to the MS4 Program are included in Section 1.5.)

3.0 TMDL SPECIAL CONDITIONS

3.1. Chesapeake Bay TMDL Action Plan

3.1.1. Chesapeake Bay TMDL Implementation (Part II.B.9)

A summary of actions conducted to implement each local TMDL action plan:

Table 15: Nutrient Requirements and Reductions Summary			
BMP	N Reduction (lbs)	P Reduction (lbs)	TSS Reduction (lbs)
Oversized BMPs	19.88	3.21	0
Land Use Change	102.75	24.66	5,202.38
Non-MS4 NMPs	10.8	0.22	0
Credits Acquired	0	0	0
Reductions Achieved	133.43	28.09	5,202.38
Reductions Required (5%)	88.45	9.92	8,156.23
Reductions Required (40%)	707.59	79.37	65,249.81
Progress toward 40% reduction	133.43	28.09	5,202.38

Were all requirements met in accordance with the Chesapeake Bay TMDL Action Plan?

Yes No

Are the MS4 Program measurable goals effective?

Yes (Effective) No (Additional BMPs needed to achieve the 40% reduction)

3.2. Tidal Potomac and Anacostia Rivers PCB TMDL Action Plan

3.2.1. PCB TMDL Implementation (Part II.B.9)

A summary of actions conducted to implement each local TMDL action plan:

Table 16: PCB TMDL Action Plan Summary of Actions		
BMP	Measurable Goals	Completeness Status
1	Public Education and Outreach for Students	Completed, Ongoing
2	Employee Training	Completed on October 19 – 20, 2022; April 19 – 20, 2023; Ongoing
3	Notification to DEQ in writing within 30 days of discovery, if found	No new sources of PCBs discovered, Ongoing

Were all requirements met in accordance with the Potomac and Anacostia Rivers PCB TMDL Action Plan?

Yes No

Are the MS4 Program measurable goals effective?

Yes (Effective) No (Ineffective, necessary changes to the MS4 Program are included in Section 1.5.)

3.3. Broad Run, Little Bull Run, Bull Run, and Occoquan River Bacteria TMDL Action Plan

3.3.1. Bacteria TMDL Implementation (Part II.B.9)

A summary of actions conducted to implement each local TMDL action plan:

Table 17: Bacteria TMDL Action Plan Summary of Actions		
BMP	Measurable Goal	Completeness Status
1	Dumpster Inspection and Repairs	46 Repairs Completed and Ongoing
2	Facility Assessment	Completed – See Appendix B
3	Education and Outreach	Completed

Were all requirements met in accordance with the Broad Run, Little Bull Run, Bull Run, and Occoquan River Watershed *E.coli* TMDL Action Plan?

Yes No

Are the MS4 Program measurable goals effective?

Yes (Effective) No (Ineffective, necessary changes to the MS4 Program are included in Section 1.5.)

3.4. Neabsco Creek Bacteria TMDL Action Plan

3.4.1. Bacteria TMDL Implementation (Part II.B.9)

A summary of actions conducted to implement each local TMDL action plan:

Table 18: Bacteria TMDL Action Plan Summary of Actions		
BMP	Measurable Goal	Completeness Status
1	Dumpster Inspection and Repairs	46 Repairs Completed and Ongoing
2	Facility Assessment	Completed – See Appendix B
3	Education and Outreach	Completed

Were all requirements met in accordance with the Neabsco Creek Watershed *E.coli* TMDL Action Plan?

Yes No

Are the MS4 Program measurable goals effective?

Yes (Effective) No (Ineffective, necessary changes to the MS4 Program are included in Section 1.5.)

3.5. Cedar Run and Licking Run Bacteria TMDL Action Plan

3.5.1. Bacteria TMDL Implementation (Part II.B.9)

A summary of actions conducted to implement each local TMDL action plan:

Table 19: Bacteria TMDL Action Plan Summary of Actions		
BMP	Measurable Goal	Completeness Status
1	Dumpster Inspection and Repairs	46 Repairs Completed and Ongoing
2	Facility Assessment	Completed – See Appendix B
3	Education and Outreach	Completed

Were all requirements met in accordance with the Cedar and Licking Run Watershed *E.coli* TMDL Action Plan?

Yes No

Are the MS4 Program measurable goals effective?

Yes (Effective) No (Ineffective, necessary changes to the MS4 Program are included in Section 1.5.)

3.6. Potomac River Tributaries in Prince William County and Stafford Counties Bacteria TMDL Action Plan

3.6.1. Bacteria TMDL Implementation (Part II.B.9)

A summary of actions conducted to implement each local TMDL action plan:

Table 20: Bacteria TMDL Action Plan Summary of Actions		
BMP	Measurable Goal	Completeness Status
1	Dumpster Inspection and Repairs	46 Repairs Completed and Ongoing
2	Facility Assessment	Completed – See Appendix B

Were all requirements met in accordance with the Broad Run, Little Bull Run, Bull Run, and Occoquan River Watershed *E.coli* TMDL Action Plan?

Yes No

Are the MS4 Program measurable goals effective?

Yes (Effective) No (Ineffective, necessary changes to the MS4 Program are included in Section 1.5.)

3.7. Bull Run Watershed Sediment TMDL Action Plan

3.7.1. Sediment TMDL Implementation (Part II.B.9)

A summary of actions conducted to implement each local TMDL action plan:

Table 21: Sediment TMDL Action Plan Summary of Actions		
BMP	Measurable Goal	Completeness Status
1	Street Sweeping	Discontinued
2	Sand/Salt Material Storage	Completed
3	Erosion and Sediment Control Plan, BMPs	Completed
4	Illicit Discharge Detection and Elimination (IDDE) Inspections	Completed

A summary of quantifiable pollutant of concern reductions is provided in Table 18.

Table 22: TSS Reductions in Bull Run Watershed (2022-2023)			
BMP type	TSS (lbs/yr)	Total TSS (lbs/yr)	Total TSS (tons/yr)
Land Use Change	531.84	531.84	0.27

3.7.2. Sediment TMDL Evaluation (Part I.D.2.e)

Review the TMDL Special Condition to determine the Local TMDL Action Plan's effectiveness and whether or not changes to the Local TMDL Action Plan are necessary:

Were all requirements met in accordance with the Upper Roanoke River Watershed Sediment TMDL Action Plan?

Yes No (Additional BMPs necessary for implementation)

Are the MS4 Program measurable goals effective?

Yes No (Ineffective, changes are necessary to the TMDL Action Plan)

Appendix A: Prince William County Schools Documentation for MCM #1 and MCM #2

Crosswalk of curricular connections to environmental literacy

Kindergarten- Grade 5

This table identifies where directly related environmental literacy instruction takes place at each elementary grade level. These instances are aligned with the Virginia Standards of Learning (SOLs) and should support the central theme of each grade level subject. In addition, each grade band has suggested projects or learning activities that can occur at that level. These activities are either place-based, outdoors, or use the school building as a teaching tool to address the Commitment 2, Objective 2.3 action item that states that schools will “Incorporate project-based learning across all grade levels through the development of resources designed to utilize the school building as a teaching tool. PWCS commits to creating site-specific outdoor environmental experiences.”

**Note: World Languages Content for elementary is written based on the PWCS World Language pacing guide which supports other content standards in the form of ACTFL “can do” statements.*

As a living document, the content topics will be updated as new VA SOL curriculum frameworks are adopted.

Other content areas provide supporting skills to develop environmental literacy. While a Mathematics or English Language Arts course may not specifically assess skills or content directly related to environmental literacy, the skills gained in those courses directly support its acquisition and are equally important.

Elementary Environmental Literacy Targets:

By the end of grade five, PWCS elementary students will engage in experiences that:

- Address environmental literacy as outlined in the Virginia SOLs grades kindergarten through five.
- Occur in their schoolyards or outdoor learning spaces.
- Are hands-on learning experiences.
- Introduce students to lessons that use the school building as a teaching tool,
- Enable learners to identify ways in which they are responsible for the environmental, social, and economic effects of their actions.
- Engage them in sustainability education and projects led by their sustainability liaison or classroom teachers in their schools.
- Fulfill the opportunity to participate in at least one complete MWEE experience.

Need help with any of these activities? Reach out to the PWCS Energy and Sustainability Team for hands on training, demonstrations, or support.

Content area and topics	VDOE Environmental literacy strands	Suggested Learning Activities
Kindergarten		
Science Force, Motion, and Energy	K.4 The student will investigate and understand that water flows and has properties that can be observed and tested. Key concepts include a. Water occurs in different phases b. Water flows downhill	Predict and then track the flow of water outdoors
Science Life Processes	K.6 The student will investigate and understand that there are differences between living organisms and nonliving objects. Key ideas include a) all things can be classified as living or nonliving; and b) living organisms have certain characteristics that distinguish them from nonliving objects.	Living/Nonliving school yard scavenger hunt

Science Life Processes	K.7 The student will investigate and understand that plants and animals have basic needs and life processes. Key ideas include a) living things need adequate food, water, shelter, air, and space to survive; b) plants and animals have life cycles;	Use your school garden or outdoor plants to observe what plants and animals need to survive. Invite a local farmer to read "Tops and Bottoms" by Janet Stevens.
Science Earth and Space Systems	K.8 The student will investigate and understand that light influences temperature on Earth's surfaces and can cause shadows. Key ideas include a) the sun provides light and warms Earth's surface; b) shadows can be produced when sunlight or artificial light is blocked by an object; and c) objects in shadows and objects in sunlight have different temperatures.	Take students outside to make observations and measure the temperature in the sunlight over grass, in the sunlight over asphalt, and in the shade of the building, and in the shade of a tree.
Science Earth and Space Systems	K.9 The student will investigate and understand that there are patterns in nature. Key patterns include a) daily weather; b) seasonal changes; and c) day and night.	Take local school data observations about daily weather and then compare it to describe patterns over time.
Science Earth Patterns, Cycles, and Change	K.10 The student will investigate and understand that change occurs over time. Key ideas include a) natural and human-made things change over time; b) living and nonliving things change over time; c) changes can be observed and measured; and d) changes may be fast or slow.	Long term repeated observation of same place on school grounds
Science Earth Resources	K.11 The student will investigate and understand that humans use resources. Key ideas include a) some materials and objects can be used repeatedly; b) materials can be recycled; and c) choices we make impact the air, water, land and living things.	Classroom waste audit to identify what should and should not be recycled.
History and Social Science Geography	K.5 The student will use simple maps and globes to a. develop and awareness that a map is a drawing of a place to show where things are located and that a globe is a round model of Earth c. locate land and water features	Provide a printed "footprint" of the school and surrounding areas and identify the locations of outdoor classroom spaces.
History and Social Science Geography	K.7 The student will describe how the location, climate, and physical surroundings of a community affect the way people live, including their food, clothing, shelter, transportation, and recreation.	Discuss our local climate and the trends each season. How does that affect our clothing choices?
Visual Arts Technique and Application	K.17 The student will create artworks inspired by a variety of sources and subjects b) use nature as inspiration	Outdoor art exploration. Use outdoor natural materials as medium for art projects.

		Read the books “Leaf man” by Lois Ehlert and Nature is an artist by Jennifer Lavallee.
Grade 1		
Science Living Systems and Processes	1.4 The student will investigate and understand that plants have basic life needs and functional parts that allow them to survive. Key ideas include a) plants need nutrients, air, water, light, and a place to grow;	Use your school garden or outdoor plants to observe what plants need to survive.
Science Living Systems and Processes	1.5 The student will investigate and understand that animals, including humans, have basic life needs that allow them to survive. Key ideas include a) animals need air, food, water, shelter, and space (habitat); b) animals have different physical characteristics that perform specific functions; and	Observe animals in the schoolyard and describe their physical properties
Science Interrelationships in Earth/Space Systems	1.6 The student will investigate and understand that there is a relationship between the sun and Earth. Key ideas include a) the sun is the source of energy and light that warms the Earth’s land, air, and water; and b) the sun’s relative position changes in the Earth’s sky throughout the day.	With guidance, conduct a simple investigation to show how the sunlight changes the temperature at different times during the day (1.6b).
Science Earth Patterns, Cycles, and Change	1.7 The student will investigate and understand that there are weather and seasonal changes. Key ideas include a) changes in temperature, light, and precipitation occur over time; b) there are relationships between daily weather and the season; and c) changes in temperature, light, and precipitation affect plants and animals, including humans.	Observe and record seasonal changes in plants, including budding, growth, and losing leaves; recognize the seasons during which budding and losing leaves will most likely occur.
Science Earth Resources	1.8 The student will investigate and understand that natural resources can be used responsibly. Key ideas include a) most natural resources are limited; b) human actions can affect the availability of natural resources; and c) reducing, reusing, and recycling are ways to conserve natural resources.	Determine a resource in the school or home that may be conserved, brainstorm solutions, and implement a plan to address the conservation concern (1.8 a, b, c). Conduct a simplified classroom waste audit of your recycling and trash cans to identify what should and should not be recycled while including that recycling saves natural resources. (1.8 b and c)
History and Social Science Geography	1.6 The student will develop a geographic understanding that a. the location of Virginia determines its climate and results in four distinct seasons	Have students note the angle of sun over various seasons of the year and tie to seasonal weather changes.

	b. the landforms of Virginia affect the places people live	
World Languages My Life at School *	I can ask and answer what the weather is like.	Outdoor practice describing characteristics of current weather
Grade 2		
Science Living Systems	2.5 The student will investigate and understand that living things are part of a system. Key ideas include a) plants and animals are interdependent with their living and nonliving surroundings; b) an animal's habitat provides all of its basic needs; and c) habitats change over time due to many influences.	Predict and describe natural changes in habitats and their effects on plants and animals (2.5 c) Track the changes in a school yard habitat over time Describe the changes in the school yard habitat due to various influences (2.5 c).
Science Interrelationships in Earth/Space Systems	2.6 The student will investigate and understand that there are different types of weather on Earth. Key ideas include a) different types of weather have specific characteristics; b) measuring, recording, and interpreting weather data allows for identification of weather patterns; and c) tracking weather allows us to prepare for the weather and storms.	Observe, describe, and record daily weather conditions using weather instruments; graph and analyze data to identify patterns; predict weather based upon identified patterns (2.6 b) Observe and describe seasonal weather patterns and local variations (2.6 c) Use an outdoor rain gauge and outdoor thermometer (see math objective) to record data over time at the school.
Science Earth Patterns, cycles, and change	2.7 The student will investigate and understand that weather patterns and seasonal changes affect plants, animals, and their surroundings. Key ideas include a) weather and seasonal changes affect the growth and behavior of living things; b) wind and weather can change the land; and c) changes can happen quickly or slowly over time.	Take a school yard field trip to identify the growth and behavioral responses of plants and animals to weather and seasonal changes. (2.7a) Include plants that have no above ground growth during winter, those that lose leaves during winter, and those that do not.
Science Earth Resources	2.8 The student will investigate and understand that plants are important natural resources. Key ideas include a) the availability of plant products affects the development of a geographic area; b) plants provide oxygen, homes, and food for many animals; and c) plants can help reduce the impact of wind and water.	Construct and interpret models as to how plants help reduce the impact of wind and water (2.8 c). After the school yard field trip to uncover erosion, propose solutions to erosion which include installation of native plant ground covers.
History and Social Science Geography	2.6 The student will develop map skills by using globes and maps of the world and the United States to locate b. the equator, the prime meridian, and the four hemispheres c. major rivers, mountain ranges, lakes, and other physical features in the United states	Locate the Potomac and Occoquan rivers and their tributaries. Which one is closest to your school?

History and Social Science Economics	2.7 The student will locate and describe the relationship between the environment and culture of a) Powhatan b) Lakota c) Pueblo	In what ways was the relationship of their culture with their environment different than ours?
History and Social Science Economics	2.8 The student will describe natural resources (water, soil, wood, and coal), human resources, and capital resources	Take a school yard field trip to identify natural resources.
History and Social Science Economics	2.1 The student will explain that scarcity (limited resources) requires people to make choices about producing and consuming goods and services	Consider local resources to use as a case study to discuss exhaustible resources and why we should move toward sustainability
Visual Arts Critical Thinking and Communication	2.3 The student will analyze and interpret artwork using art vocabulary a) Categorize works of art both real and imaginary, by subject matter, such as portrait, landscape, still life, and architecture	Utilize landscape artist's work of local sites to enhance students' sense of place.
World Languages My Community *	I can label the two oceans that surround North America and label the parts of a plant.	Go outside and use content vocabulary to create labels for the parts of a plant in the school yard.
Mathematics	2.11 The student will read temperature to the nearest 10 degrees.	Utilize an outdoor thermometer as part of the measurement tools.
Grade 3		
Science Living Systems and Processes	3.4 The student will investigate and understand that adaptations allow organisms to satisfy life needs and respond to the environment. Key ideas include a) populations may adapt over time; b) adaptations may be behavioral or physical; and c) fossils provide evidence about the types of organisms that lived long ago as well as the nature of their environments.	Look at images of local fossils found in Virginia and explain the role that fossils play in making inferences about their environment from long ago and how it has changed to today. (Example: marine organisms found in the Appalachian region)
Science Living Systems and Processes	3.5 The student will investigate and understand that aquatic and terrestrial ecosystems support a diversity of organisms. Key ideas include a) ecosystems are made of living and nonliving components of the environment; and b) relationships exist among organisms in an ecosystem.	Take students on a school yard walk to differentiate among producers, consumers, and decomposers. Explain plant-pollinator-pest interactions in the school yard garden.
Science Earth and Space Systems	3.6 The student will investigate and understand that soil is important in ecosystems. Key ideas include a) soil, with its different components, is important to organisms; and b) soil provides support and nutrients necessary for plant growth.	Take a soil sample in at least 2 different sites on the school grounds to identify soil layers. Use the samples to create soil texture columns for sand, silt, and clay using any straight sided clear container and a drop of detergent. Let it sit for 4 days and measure the layers that form. This will analyze and

		describe the different components of soil (3.6 a)
Science Earth and Space Systems	3.7 The student will investigate and understand that there is a water cycle and water is important to life on Earth. Key ideas include a) there are many reservoirs of water on Earth; b) the energy from the sun drives the water cycle; and c) the water cycle involves specific processes.	Identify and locate major water sources in the local community (3.7 a)
Science Earth resources	3.8 The student will investigate and understand that natural events and humans influence ecosystems. Key ideas include a) human activity affects the quality of air, water, and habitats; b) water is limited and needs to be conserved; c) fire, flood, disease, and erosion affect ecosystems; and d) soil is a natural resource and should be conserved.	Observe and provide evidence of soil erosion around the schoolyard or community; create and implement a plan to reduce erosion (3.8 d)
History and Social Science Geography	3.6 The student will develop map skills by using globes and maps to locate and describe major rivers, mountain ranges, and other geographic features of a-e regions	Find Prince William County and Virginia on a map. Compare the two geographic regions of the coastal plain and piedmont regions.
History and Social Science Geography	3.7 The student will describe how people in ancient world cultures adapted to their environment	Research cultures they are currently studying and compare to their lives. How has technology reduced our need to adapt?
History and Social Science Economics	3.8 The student will demonstrate an understanding of different cultures and the natural, human and capital resources they used in the production of goods and services.	Compare the Eco Footprint of different cultures around the world to their own.
Visual Arts Critical Thinking and Communication	3.3 The student will analyze and interpret artwork using art vocabulary a) Identify distinguishing characteristics of selection of art, such as landscape, portrait, still life, and narrative works.	Utilize local landscape artists' work of PWC sites to divide the landscape into foreground, middleground and background. Invite local landscape artists to your classroom.
World Languages My life at school *	I can ask and answer "what is the weather?"	Take students outside and discuss weather using appropriate academic content language.
World Languages My Community *	I can talk about my favorite artic and desert animal, categorize animals according to their habitat, and label the continents on a map.	Compare their favorite artic or desert animal to an animal living in our local temperate deciduous forest ecosystem.
Mathematics	3.1 The student will read temperature to the nearest degree.	Utilize an outdoor thermometer as part of the measurement tools.
Grade 4		
Science Life Systems and Processes	4.2 The student will investigate and understand that plants and animals have structures that	Utilize existing plants in the school yard to identify adaptations

	distinguish them from one another and play vital roles in their ability to survive. Key ideas include a) the survival of plants and animals depends on photosynthesis; b) plants and animals have different structures and processes for obtaining energy; and c) plants and animals have different structures and processes for creating offspring.	that plants use for attracting pollinators. (4.2c)
Science Living Systems and Processes	4.3 The student will investigate and understand that organisms, including humans, interact with one another and with the nonliving components in the ecosystem. Key ideas include a) interrelationships exist in populations, communities, and ecosystems; b) food webs show the flow of energy within an ecosystem; c) changes in an organism's niche and habitat may occur at various stages in its life cycle; and d) classification can be used to identify organisms.	Students identify a food web on their school property demonstrating energy flow (4.3b). Construct the food web while on your school yard investigation and discuss how changes in one part of the food web would affect other organisms. (4.3c)
Science Earth and Space Systems	4.4 The student will investigate and understand that weather conditions and phenomena affect ecosystems and can be predicted. Key ideas include a) weather measurements create a record that can be used to make weather predictions; b) common and extreme weather events affect ecosystems; and c) long-term seasonal weather trends determine the climate of a region.	Use weather instruments (thermometer, barometer, rain gauge, anemometer) and observations of sky conditions to collect, record, and graph weather data over time; analyze results and determine patterns that may be used to make weather predictions (4.4 a)
Science Earth and Space Systems	4.6 The student will investigate and understand that there are relationships among Earth, the moon, and the sun. Key relationships include a) the motions of Earth, the moon, and the sun; b) the causes for Earth's seasons; c) the causes for the four major phases of the moon and the relationship to the tide cycles; and d) the relative size, position, age and makeup of Earth, the moon, and the sun.	Have students look up the local tide charts and compare those to the moon phases for a month. (4.6 c)
Science Earth and Space Systems	4.7 The student will investigate and understand that the ocean environment has characteristics. Key characteristics include a) geology of the ocean floor; b) physical properties and movement of ocean water; and c) interaction of organisms in the ocean.	Identify the local ocean currents such as the Gulf Stream and then compare the motions of water as related to currents and tides (4.7 b)
Science Earth Resources	4.8 The student will investigate and understand that Virginia has important natural resources. Key resources include a) watersheds and water; b) plants and animals; c) minerals, rocks, and ores; and	Meaningful Watershed Educational Experiences best match this objective. Investigate the school yard or local ecosystem to identify questions, problems or issues that affect a

	d) forests, soil, and land.	natural resource in that area and determine a possible solution to an identified problem. (4.8 a,b,c,d) "We all live downstream." (4.8 a)
History and Social Science Virginia Studies Skills	VS.1 The student will demonstrate skills for historical thinking, geographical analysis, economic decision making, and responsible citizenship by b. analyzing the impact of geographic feature on people, places, and events to support an understanding of events in Virginia history	Look at the Appalachian plateau region, with coal as a resource, and how burning coal has benefited our economy but also harmed human and environmental health. Using the local power company website, identify the fuel sources for most of their energy today.
History and Social Science Virginia Studies Virginia: the physical geography and native peoples	VS.2 The student will demonstrate an understanding of the relationship between physical geography and the lives of the native peoples, past and present, of Virginia by a. locating Virginia and its bordering states on maps of the US b. locating and describing Virginia's coastal plain, piedmont, blue ridge, valley and ridge and Appalachian plateau c. Locating and identifying water features important to the early history of Virginia e. describing how American Indians related to the climate and their environment to secure food, clothing and shelter	Share local images of the coastal plain and its features (ex: Leesylvania State Park) School yard adventure and identify what would change in your clothing and shelter if you had to utilize the natural resources around you and how it would change over the seasons.
History and Social Science Virginia Studies Political growth and western expansion	VS.6 The student will demonstrate an understanding of the role of Virginia in the establishment of the new American nation by c. explaining the influence of geography on the migration of Virginians into other states.	Identify the human health problems related to mosquitos and brackish water and how that influenced the movement of people.
World Languages My Life at School *	I can describe the weather according to the season.	Take students outside and discuss weather using appropriate academic content language.
World Languages My Community *	I can talk about my favorite animal in the rainforest and forest, label the oceans, and categorize animals according to their habitat.	Use local native animals that live in our local temperate deciduous forest ecosystems as a choice list for students to use as their discussion topic.
Grade 5		
Science Earth and Space Systems	5.8 The student will investigate and understand that Earth constantly changes. Key ideas include a) Earth's internal energy causes movement of material within the Earth; b) plate tectonics describe movement of the crust; c) the rock cycle models the transformation of rocks; d) processes such as weathering, erosion, and deposition change the surface of the Earth; and	Locate, chart, and report weathering, erosion, and deposition at home or on the school grounds; create and implement a plan to reduce weathering, erosion, and/or deposition problems that may be found and discuss the results of the experiment (5.8 d)

	e) fossils and geologic patterns provide evidence of Earth's change.	
Science Earth Resources	5.9 The student will investigate and understand that the conservation of energy resources is important. Key ideas include a) some sources of energy are considered renewable and others are not; b) individuals and communities have means of conserving both energy and matter; and c) advances in technology improve the ability to transfer and transform energy.	Given school energy data from the office of Energy and Sustainability in the Facilities Department, create and implement a plan to conserve energy in the school (5.9 b)
History and Social Science North American Geography Map and Globe Skills	NAG 5.1 The student will use maps, globes, photographs, charts, graphs and tables to: c. position and label the seven continents and five oceans to create a world map; d. use the equator and prime meridian to identify the hemispheres; e. use parallels of latitude and meridians of longitude to locate specific places; f. develop an awareness of Global Positioning Systems (GPS) and how people use them.	Locate the Chesapeake Bay. Find the Atlantic Ocean. What is the latitude and longitude of the mouth of the Bay as it enters the Atlantic Ocean?
History and Social Science North American Geography Geographic Concepts	5.2 The student will demonstrate a knowledge and understanding of geography by: a. defining geography; b. identifying and explaining the five themes of geography: Place, Region, Location, Movement, Human/Environment Interaction	Discuss how human interaction with the environment has changed our local environment and geography through roads, housing, and natural resource extraction.
History and Social Science North American Geography Regional Study: The American Northeast	5.3 The student will explore the Northeast region of the United States by: b. explaining the physical and climate characteristics of the Northeast region. c. analyzing the natural resources and economic activity of the Northeast region.	Compare/contrast the climate of the Northeast with our local climate.
History and Social Science North American Geography Regional Study: The American Southeast	5.4 The student will explore the Southeast region of the United States by: b. explaining the physical and climate characteristics of the Southeast region. c. analyzing the natural resources and economic activity of the Southeast region.	Compare/contrast the climate of the Southeast with our local climate.
History and Social Science North American Geography Regional Study: The American Midwest	5.5 The student will explore the Midwest region of the United States by b. explaining the physical and climate characteristics of the Midwest region c. analyzing the natural resources and economic activity of the Midwest region	Compare/contrast the climate of the Midwest with our local climate.
History and Social Science North American Geography Regional Study: The American Southwest	5.6 The student will explore the Southwest region of the United States by b. explaining the physical and climate characteristics of the Southwest region c. analyzing the natural resources and economic activity of the Southwest region	Compare/contrast the climate of the Southwest with our local climate.
History and Social Science	5.7 The student will explore the West by	Compare/contrast the climate of the West with our local climate.

North American Geography Regional Study: The American West	b. explaining the physical and climate characteristics of the West region c. analyzing the natural resources and economic activity of the West region	
History and Social Science North American Geography Neighboring Countries: Canada	5.8 The student will explore Canada by b. explaining the physical and climate characteristics and climate of Canada c. analyzing the natural resources and economic activity of Canada	Compare/contrast the climate of the Midwest with our local climate.
History and Social Science North American Geography Neighboring Countries: Mexico	5.9 The student will explore Mexico by b. explaining the physical and climate characteristics of Mexico c. analyzing the natural resources and economic activity of Mexico	Compare/contrast the climate of the Mexico with our local climate.
History and Social Science North American Geography Neighboring Countries: Central America	5.10 The student will explore Central America by b. explaining the physical and climate characteristics of Central America c. analyzing the natural resources and economic activity of Central America	Compare/contrast the climate of the Central America with our local climate.
History and Social Science North American Geography Neighboring Countries: The Caribbean Islands	5.11 The student will explore the Caribbean Islands by b. explaining the physical and climate characteristics of the Caribbean Islands c. analyzing the natural resources and economic activity of the Caribbean region	Compare/contrast the climate of the Caribbean with our local climate.

Grade 6 - 8

This table identifies where directly related environmental literacy instruction takes place at each middle school grade level. These instances are aligned with the Virginia Standards of Learning (SOLs) or Virginia student competencies. In addition, each grade band has suggested projects or learning activities that can occur at that level. These activities are either place-based, outdoors, or use the school building as a teaching tool to address the Commitment 2, Objective 2.3 action item that states that schools will “Incorporate project-based learning across all grade levels through the development of resources designed to utilize the school building as a teaching tool. PWCS commits to creating site-specific outdoor environmental experiences.”

World Languages Content for middle school and high school is written based on the state described ACTFL Proficiency Level Standards. Language courses are not grade level specific but do follow a pathway of increasing proficiency and expectations. To view the secondary World Language’s Crosswalk of Curricular Connections, [use this link to move to that section of this document](#).

As a living document, the content topics will be updated as new VA SOL curriculum frameworks are adopted.

Other content areas provide supporting skills to develop environmental literacy. While a Mathematics or English Language Arts course may not specifically assess skills or content directly related to environmental literacy, the skills gained in those courses directly support its acquisition and are equally important.

Middle School Environmental Literacy Targets

By the end of grade eight, PWCS middle school students will engage in experiences that:

- Address environmental literacy as outlined in the Virginia SOLs grades six through eight.
- Occur in their schoolyards or outdoor learning spaces.
- Are hands-on learning experiences.
- Engage students with lessons that use the school building as a teaching tool.
- Introduce specific career connections related to environmental literacy skills.
- Enable learners to understand the rights and responsibilities of citizenship and their importance in promoting the resolution of environmental issues.
- Engage them in sustainability education and projects led by their sustainability liaison or classroom teachers in their schools.
- Fulfill the opportunity to participate in at least one complete MWEE experience.

Content area and topics	Environmental literacy strands	Suggested Learning Activities
6th grade		
Science	6.3 The student will investigate and understand that there is a relationship between the sun, Earth, and the moon. Key ideas include a) Earth has unique properties; b) the rotation of Earth in relationship to the sun causes day and night; c) the movement of Earth and the moon in relationship to the sun causes phases of the moon; d) Earth’s tilt as it revolves around the sun causes the seasons; and e) the relationship between Earth and the moon is the primary cause of tides.	Have students look up the local tide charts and compare those to the moon phases for a month. (6.3 e)
Science	6.4 The student will investigate and understand that there are basic sources of energy and that energy can be transformed. Key ideas include	Go outside and utilize passive and active solar energy to investigate how light energy (radiant energy) can be

	<p>a) the sun is important in the formation of most energy sources on Earth;</p> <p>b) Earth's energy budget relates to living systems and Earth's processes;</p> <p>c) radiation, conduction, and convection distribute energy; and</p> <p>d) energy transformations are important in energy usage.</p>	transformed into other forms of energy (e.g., mechanical, chemical, and electrical) (6.4 d).
Science	<p>6.6 The student will investigate and understand that water has unique physical properties and has a role in the natural and human-made environment. Key ideas include</p> <p>a) water is referred to as the universal solvent;</p> <p>b) water has specific properties;</p> <p>c) thermal energy has a role in phase changes;</p> <p>d) water has a role in weathering;</p> <p>e) large bodies of water moderate climate; and</p> <p>f) water is important for agriculture, power generation, and public health.</p>	<p>On a school yard walk, chart, record, and describe evidence of chemical and physical weathering in the local environment (6.6 d)</p> <p>Analyze and explain the difference in average winter temperatures among areas in central and western Virginia and cities and counties along the Chesapeake Bay and Atlantic coast (6.6 e) and compare to their local average temperatures.</p>
Science	<p>6.7 The student will investigate and understand that air has properties and that Earth's atmosphere has structure and is dynamic. Key ideas include</p> <p>a) air is a mixture of gaseous elements and compounds;</p> <p>b) the atmosphere has physical characteristics;</p> <p>c) properties of the atmosphere change with altitude;</p> <p>d) there is a relationship between air movement, thermal energy, and weather conditions;</p> <p>e) atmospheric measures are used to predict weather conditions; and</p> <p>f) weather maps give basic information about fronts, systems, and weather measurements.</p>	Use a school yard weather station to collect local place-based air temperature, air pressure, and humidity, using appropriate units of measurement and tools (6.7 b)
Science	<p>6.8 The student will investigate and understand that land and water have roles in watershed systems. Key ideas include</p> <p>a) a watershed is composed of the land that drains into a body of water;</p> <p>b) Virginia is composed of multiple watershed systems which have specific features;</p> <p>c) the Chesapeake Bay is an estuary that has many important functions; and</p> <p>d) natural processes, human activities, and biotic and abiotic factors influence the health of a watershed system.</p>	<p>Complete a Meaningful Watershed Educational Experience on your school grounds to meet most of the essential knowledge and practices for this objective and for Objective 6.9 as well. Students would identify and describe their local watershed, how it drains into the Chesapeake Bay, and identify human activities, both biotic and abiotic, that affect the health of our watershed.</p>

Science	<p>6.9 The student will investigate and understand that humans impact the environment and individuals can influence public policy decisions related to energy and the environment. Key ideas include</p> <ul style="list-style-type: none"> a) natural resources are important to protect and maintain; b) renewable and nonrenewable resources can be managed; c) major health and safety issues are associated with air and water quality; d) major health and safety issues are related to different forms of energy; e) preventive measures can protect land-use and reduce environmental hazards; and f) there are cost/benefit tradeoffs in conservation policies. 	In order to analyze how renewable and nonrenewable resources are used and managed within the home, school, and community (6.9 b), look at local policy decisions regarding land use. Use portions of the Prince William County comprehensive plan to look at long range land use plans for the area around your school. Investigate practices that can reduce environmental hazards or improve land use (6.9 e)
History/Social Sciences US History to 1865 Geography	<p>US1.2 The student will interpret maps, globes, photographs, pictures, or tables to</p> <ul style="list-style-type: none"> a. locate the seven continents and 5 oceans b. locate and describe the major geographic regions of North American c. locate major water features and explain their importance to the early history of the US. 	Students map the Chesapeake Bay watershed, its tributaries and importance to the history of the region. Tie into environmental health of the waterways and location of development.
CTE Family and Consumer Science Exploratory I	<p>Manage time and resources. Management should include considering resources</p> <ul style="list-style-type: none"> ▪ natural—using responsible and sustainable practices. 	Proper school recycling and waste disposal. Conservation of resources with class materials
CTE Family and Consumer Science Exploratory I	<p>Developing Responsibility for Living Environments (Personal Environments) (Optional) Demonstrate ways to maintain a clean environment. (Optional) Identify ways to conserve natural resources. (Optional) Apply sustainability practices to the individual's personal living environment.</p>	School yard trash pickups and characterization. Methods and rationale for cleaning with biodegradable and organic cleaning materials including a comparison of results.
CTE Technology and Engineering Education Introduction to Technology	<p>Manage time and resources. Management should include considering resources</p> <ul style="list-style-type: none"> ▪ natural—using responsible and sustainable practices. 	Proper school recycling and waste disposal. Conservation of resources with class materials.
CTE Technology and Engineering Education Introduction to Technology	<p>Identify resources used in technology and engineering. Process/Skill Questions:</p> <ul style="list-style-type: none"> • What are examples of each of the resources? • What is a renewable resource? • What is the definition of an exhaustible resource? • What are examples of exhaustible resources? • What is sustainability, and how does it affect resources? 	Outdoor scavenger hunt for natural resources and methods to sustainably manage those resources.

CTE Technology and Engineering Education Introduction to Technology	(Optional) Describe the agricultural and biological technologies contexts of technology and engineering. Process/Skill Questions: <ul style="list-style-type: none"> How has the emergence of biotechnologies affected biodiversity and ecology in the environment? 	Planting school gardens to preserve resources such as water, incorporating crop rotation, utilizing fewer chemicals, and enhancing the use of beneficial insects.
CTE Business and Information Technology STEM/Computer Solutions	Demonstrate big picture thinking by defining your understanding of one's role in fulfilling the mission of the workplace and a consideration of the social, economic, and environmental effects of one's actions	Share company mission and vision statements that include consideration of their effect on the environment. Would this inclusion make you more likely to pursue employment with this company?
CTE Business and Information Technology STEM/Computer Solutions	Manage time and resources: Consider natural resources and how to incorporate responsible and sustainable practices.	Using a local company as an example, identify the natural resources they must manage and how efficiency and productivity can be improved by sustainable resource practices.
CTE Business and Information Technology STEM/Computer Solutions	Demonstrate Workplace Safety by adhering to Occupational Safety and Health Administration (OSHA) standards and instructor and manufacturer guidelines which includes - interpreting safety data sheets (SDS): the physical, health, and environmental health hazards	Look at the SDS for approved cleaning products for our school and identify the guidelines custodial staff must follow in their use.
7th grade		
Science Life Science	LS.5 The student will investigate and understand that biotic and abiotic factors affect an ecosystem. Key ideas include a) matter moves through ecosystems via the carbon, water, and nitrogen cycles; b) energy flow is represented by food webs and energy pyramids; and c) relationships exist among producers, consumers, and decomposers.	On a school yard walk, analyze local aquatic and/or terrestrial ecosystems, identify biotic and abiotic components, and describe their roles in the cycling of matter and flow of energy (LS.5 a). While on the walk, you can also recognize examples of common producers, consumers, and decomposers and explain the role of each in the flow of energy and cycling of matter through an ecosystem (LS.5 c) and provide examples to illustrate the effects of human activity on the activity of producers, consumers, and decomposers in the school yard (LS.5 c) such as mowing, students walking on grass, and presence of invasive species (LS 11c).
Science Life Science	LS.6 The student will investigate and understand that populations in a biological community	Find an example of a community of organisms in the school yard that interact (LS.6 a), predict the

	<p>interact and are interdependent. Key ideas include</p> <ul style="list-style-type: none"> a) relationships exist between predators and prey and these relationships are modeled in food webs; b) the availability and use of resources may lead to competition and cooperation; c) symbiotic relationships support the survival of different species; and d) the niche of each organism supports survival. 	<p>effect of limiting factors on organisms, populations, and/or communities in school yard food web/ecosystem (LS.6 b).</p>
Science Life Science	<p>LS.7 The student will investigate and understand that adaptations support an organism’s survival in an ecosystem. Key ideas include</p> <ul style="list-style-type: none"> a) biotic and abiotic factors define land, marine, and freshwater ecosystems; and b) physical and behavioral characteristics enable organisms to survive within a specific ecosystem. 	<p>Observe and sketch various leaves from the school grounds with a diverse array of adaptations. Investigate how structural adaptations among populations allow organisms to survive with ecosystems (LS.7 b). Examples include thorns, spikes, pointed tips, waxy coatings, etc.</p>
Science Life Science	<p>LS.8 The student will investigate and understand that ecosystems, communities, populations, and organisms are dynamic and change over time. Key ideas include</p> <ul style="list-style-type: none"> a) organisms respond to daily, seasonal, and long-term changes; b) changes in the environment may increase or decrease population size; and c) large-scale changes such as eutrophication, climate changes, and catastrophic disturbances affect ecosystems. 	<p>Utilizing the National Climate report and data from NOAA, students will predict the environmental effects of large-scale changes, such as climate change (including drought) and sea-level rise on our local community (LS.8 c). The links will be updated over time. Check for the most recent version.</p>
Science Life Science	<p>LS 9: The student will investigate and understand that relationships exist between ecosystem dynamics and human activity. Key ideas include</p> <ul style="list-style-type: none"> a) changes in habitat can disturb populations; b) disruptions in ecosystems can change species competition; and c) variations in biotic and abiotic factors can change ecosystems. 	<p>Use evidence from the school yard to describe the impact of human activity on the biotic and abiotic factors within an ecosystem (LS.9 c) Plan an investigation examining relationships between ecosystem dynamics and human activity on school grounds.</p>
Science Life Science	<p>LS 11: The student will investigate and understand that populations of organisms can change over time. Key ideas include</p> <ul style="list-style-type: none"> a) mutation, adaptation, natural selection, and extinction change populations; b) the fossil record, genetic information, and anatomical comparisons provide evidence for evolution; and c) environmental factors and genetic variation, influence survivability and diversity of organisms. 	<p>Spiraling back to LS.8, have students construct an evidence-based explanation about how environmental factors such as climate change and genetic variation can influence a species’ survival, reproduction, and diversity (LS.11 c)</p>
History/Social Sciences US History 1865 to the Present	<p>USII.2 The student will use maps, globes, photographs, pictures or tables for</p>	<p>Discuss how resources, terrain, and climate drove historical development and immigration</p>

Geography and The United States since WWII	<p>a. explaining how physical features and climate influences the movement of people westward</p> <p>b. explaining the relationships among natural resources, transportation, and industrial development after 1865</p> <p>d. evaluating and explaining American foreign policy, immigration, the global environment, and other emerging issues</p>	patterns. Reinforce that many of the same development patterns exist today but are expanding due to technology. What are the environmental implications for sustainability of resources?
CTE Career Connections Career Investigations	<p>Manage time and resources. Management should include considering resources</p> <ul style="list-style-type: none"> ▪ natural—using responsible and sustainable practices. 	<p>Proper school recycling and waste disposal</p> <p>Conservation of resources with class materials</p>
CTE Career Connections Career Investigations	<p>Explore the 17 Career Clusters including</p> <ul style="list-style-type: none"> ▪ Agriculture, Food, and Natural Resources ▪ Energy 	Invite local farmers, entrepreneurs, and state extension office personnel to share career related expertise.
CTE Family and Consumer Science Exploratory II	<p>Manage time and resources. Management should include considering resources</p> <p>natural—using responsible and sustainable practices.</p>	<p>Proper school recycling and waste disposal</p> <p>Conservation of resources with class materials</p>
CTE Family and Consumer Science Exploratory II	<p>Maintaining Living Environments (Personal Environments)</p> <p>(Optional) Demonstrate ways to conserve natural resources within the family.</p> <p>(Optional) Maintain a clean and safe environment.</p>	<p>School yard trash pickups and characterization</p> <p>Methods and rationale for cleaning with biodegradable and organic cleaning materials including a comparison of results.</p>
CTE Technology and Engineering Education Inventions and Innovations	<p>Manage time and resources. Management should include considering resources</p> <p>natural—using responsible and sustainable practices.</p>	<p>Proper school recycling and waste disposal</p> <p>Conservation of resources with class materials</p>
CTE Computer and Information Science Computer Science Discoveries	Demonstrate big picture thinking by defining your understanding of one's role in fulfilling the mission of the workplace and a consideration of the social, economic, and environmental effects of one's actions	Have students identify, research, and present one change they could make in their daily lives at school (their workplace!) that would reduce their impact on the environment.
CTE Computer and Information Science Computer Science Discoveries	<p>Manage time and resources: Consider natural resources and how to incorporate responsible and sustainable practices.</p>	As a class, discuss and then choose one sustainable practice that students and staff could begin that would reduce their impact on the environment and conserve resources. Track that change over time to quantify its effect.
CTE Computer and Information Science Computer Science Discoveries	Demonstrate Workplace Safety by adhering to Occupational Safety and Health Administration (OSHA) standards and instructor and manufacturer guidelines which includes	Have students look at the OSHA requirements for woodworking, automotive, or other CTE courses to identify general categories of federal safety

	- interpreting safety data sheets (SDS): the physical, health, and environmental health hazards	considerations that must be addressed.
8th grade		
History and Social Sciences Civics and Economics	CE.1 The student will demonstrate skills for historical thinking, geographical analysis, economic decision making, and responsible citizenship by g. taking informed action to address school, community, local, state, national, and global issues	Include the idea of externalities into economic decision making and how it impacts natural resources and global ecosystem health.
History and Social Sciences Civics and Economics	CE.13 The student will apply social science skills to understand the role of government in the US economy by d. describing how governments regulate to protect consumers, labor, the environment...	Introduce national, state and local environmental regulations and their layers of protection for the environment and humans.
Health and Physical Education Social and Emotional Development	8.4 h Exercise enhances mood and overall well-being, provides opportunities to connect with family and friends, enjoy the outdoors, unwind, and meet new people with similar interests.	Discuss with students the benefit of being outdoors to mental health and stress reduction.
CTE Family and Consumer Science Exploratory III	Manage time and resources. Management should include considering resources natural—using responsible and sustainable practices.	Proper school recycling and waste disposal Conservation of resources with class materials
CTE Family and Consumer Science Exploratory III	Analyze multiple life roles and responsibilities as a community member. Analysis should include the roles and responsibilities as a student, young adult, parent, employee, volunteer, voter, and neighbor. Process/Skill Questions: Leadership How does volunteering in your community, voting in elections, and participating in other civic activities demonstrate good citizenship? How can you take an active role in encouraging sustainability in your community?	Invite community volunteers and representatives of volunteer organizations to share opportunities for students to become actively engaged in sustainability related volunteerism. Example organizations could include Virginia Master Naturalists, Keep Prince William Beautiful, 4-H, Scouts of America, Virginia Master Gardeners, and local watershed clean up groups.
CTE Family and Consumer Science Exploratory III	Analyzing Living Environments (Personal Environments) (Optional) Examine global concerns related to the community. (Optional) Implement strategies to conserve natural resources in the school and community.	Have students identify a global environmental issue that affects their local community such as food waste. Using school and community resources, students develop a plan to address their identified issue. Implement their plan.
CTE Family and Consumer Science Exploratory III	Repurpose textile products and apparel. Repurposing should include altering, repairing, reconditioning, consignment, donation or recycling. Management How does the use of repurposed textiles and apparel benefit the environment?	Gather materials from the community for students to use in an upcycling project to demonstrate the usefulness of used supplies, ways to reduce their waste footprint, and

		develop a mindset of resource conservation.
CTE Technology and Engineering Education Technological Systems	Manage time and resources. Management should include considering resources natural—using responsible and sustainable practices.	Proper school recycling and waste disposal Conservation of resources with class materials
CTE Technology and Engineering Education Technological Systems	Analyze ethics related to technological systems. Analysis should include a definition of ethics and how it relates to societal and environmental responsibility.	Using case studies such as Electronic waste, solar panels, and Electric Vehicle batteries to complete an environmental cost/benefit analysis.
CTE Technology and Engineering Education Technological Systems	Explain the influences of technology on history. Explanation should include the forces that shape the selection and use of technology the changes it has caused in the development of civilization. Process/Skill Questions: How have advances in technology changed the way resources are gathered, processed, and used?	Using case studies such as fast fashion (NPR T-shirt project), large scale monoculture agriculture, local mining processes, and deforestation to compare/contrast historic vs. modern resource consumption patterns and the sustainability implications.
CTE Technology and Engineering Education Technological Systems	Assess the effect of technological systems on individuals, resources, society, and the environment. Assessment should include collecting performance data on economic, environmental, and social consequences of a technological system.	Using our local landfill as a case study and the electronic waste that is collected there, construct a life cycle analysis of their cell phone or gaming system and the environmental connections.
CTE Business and Information Technology STEM Applications/Digital Technology Foundations	Demonstrate big picture thinking by showing your understanding of one's role in fulfilling the mission of the workplace and a consideration of the social, economic, and environmental effects of one's actions	Students look at the PWCS mission and vision statements related to suitability. Do you think this is important as we look at fiscal and environmental stewardship of community resources?
CTE Business and Information Technology STEM Applications/Digital Technology Foundations	Manage time and resources: Consider natural resources and how to incorporate responsible and sustainable practices. What are examples of responsible and sustainable practices in the workplace?	Investigate our school system's sustainable practices by looking at regulation 495-1 . Have students pick one of the practices to investigate and present about.
CTE Business and Information Technology STEM Applications/Digital Technology Foundations	Demonstrate Workplace Safety by adhering to Occupational Safety and Health Administration (OSHA) standards and instructor and manufacturer guidelines which includes - interpreting safety data sheets (SDS): the physical, health, and environmental health hazards	Bring in a guest speaker or resource documents from science to discuss the requirements for the safe storage of chemicals for science labs in PWCS.
CTE Business and Information Technology STEM Applications/Digital Technology Foundations	Demonstrate leadership skills through participation in student organization activities, such as meetings, programs, and projects. Demonstration should include contributory participation in activities such as meetings, fund-	Provide students with information about school environmental club if present and opportunities for community service projects on

	raising projects, school and community-service projects, and competitive events.	school grounds or in the community.
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Grade 9 - 12

This table identifies courses where directly related environmental literacy instruction takes place at high schools across the division. These instances are aligned with the Virginia Standards of Learning (SOLs) or other curriculum evaluator agencies. There are far too many high school courses offered in PWCS to enumerate each standard or competency that supports environmental literacy development. In addition, courses are not always taken at one particular grade level, and so courses will not be categorized as such but instead by major content area.

World Languages Content for middle school and high school is written based on the state described ACTFL Proficiency Level Standards. Language courses are not grade level specific but do follow a pathway of increasing proficiency and expectations. To view World Language's Crosswalk of Curricular Connections, with more information about how their standards are organized, [use this link to move to that section of this document](#).

Other content areas provide supporting skills to develop environmental literacy. While a Mathematics or English Language Arts course may not specifically assess skills or content directly related to environmental literacy, the skills gained in those courses directly support its acquisition and are equally important.

High School Environmental Literacy Targets

By the end of grade 12, PWCS high school students will engage in experiences that:

- Address environmental literacy as outlined in the Virginia SOLs grades 9-12.
- Occur in their schoolyards or outdoor learning spaces.
- Are hands-on learning experiences.
- Engage students with lessons that use the school building as a teaching tool.
- Explore career connections related to environmental literacy skills.
- Engage in research, service projects, clubs or internship opportunities that promotes environmental stewardship.
- Enable learners to communicate, evaluate, and justify their own views on environmental issues and alternative ways to address them.
- Offer the opportunity to receive the [Board of Education Seal for Excellence in Science and the Environment](#).
- Fulfill the opportunity to participate in at least one complete MWEE experience.

Category	Course Name
Career and Technical Education Courses	
Agricultural Education	Horticulture Landscaping I Landscaping II Turf Grass Establishment and Maintenance
Business and Information Technology	Business Law Business Management Principles of Business and Marketing International Business and Marketing Economics and Personal Finance
Family and Consumer Sciences	Introduction to Culinary Arts Culinary Arts I Culinary Arts II Culinary Arts III Introduction to Fashion Careers Life Planning Nutrition and Wellness

Health and Medical Sciences	Introduction to Health and Medical Services Pharmacy Technician I Pharmacy Technician II Practical Nursing II
Marketing	Fashion Marketing Advanced Advanced Marketing
Technology and Engineering Education	Engineering Analysis and Applications II Graphic Communication Systems Power and Transportation Production Systems Sustainability and Renewable Technologies Technology Foundations Civil Engineering and Architecture Engineering Design and Development Environmental Sustainability
Trade and Industrial Education	Automotive Technology II Automotive Technology III Aviation Maintenance Technology I Building Trades I Building Trades II Cabinetmaking I Cabinetmaking II Computer Networking and Hardware Operations I Electricity I Firefighting I Plumbing I Plumbing II Welding I Welding II Welding III
World Languages	
Modern Roman Alphabet World Languages	French, German, Italian and Spanish I French, German, Italian and Spanish II French, German, Italian and Spanish III French, German, Italian and Spanish IV French and Spanish V
Modern Non-Roman Alphabet World Languages	Arabic, Chinese, Russian, and Korean I Arabic, Russian, and Korean II Arabic, Russian, and Korean III Arabic and Korean IV
American Sign Language	ASL I, II, III, and IV
Advanced Placement World Language Courses	AP French, German, Russian, Spanish and Latin III AP French, German, Russian, Spanish and Latin AP French, German, Russian, Spanish and Latin IV
Spanish for Fluent Speakers	Spanish for fluent speakers I, II, and III
Classical Languages	Latin I, II, III, IV, and V
Cambridge Programme World Language Courses	IGCSE French, Spanish, and Italian III AICE Classical Studies I AICE French and Spanish IV
IB Programme World Language Courses	IB Pre-Diploma Programme French and Spanish II IB Advance Middle Years Program

	<p>French and Spanish III IB AM Initio French and Spanish I IB French and Spanish IV (SL) IB French and Spanish V (SL)</p>
Health, Physical Education, and Driver Training	
Elective Course Sequence for Physical Education	Personal Fitness
Required Course Sequence for Physical Education	Health, Physical Education, and Classroom Driver Education II
History and Social Science	
Standard Social Studies Courses	<p>World History and Geography to 1500 World History and Geography From 1500 U.S. and Virginia History</p>
Advanced Placement Social Studies Courses	<p>Advanced World History and Geography to 1500 AP Human Geography AP U.S. History AP World History AP Government and Politics: U.S. AP Economics</p>
IB Programme Social Studies Courses	<p>Advanced Middle Years Programme—World History and Geography from 1500 IB Geography (SL)</p>
Social Studies Elective Courses	Hands on History: Discovering Prince William County's Past
Social Studies Elective Courses	<p>IGCSE Global Perspectives AICE Global Perspectives World Geography</p>
Science	
Standard First-Year Science Courses	<p>Earth Science I Environmental Science Biology I Chemistry I Physics I</p>
Advanced Placement Science Courses	<p>Advanced Biology I Advanced Earth Science I AP Environmental Science Advanced Chemistry I AP Biology</p>
Cambridge Programme Science Courses	<p>IGCSE Biology AICE Biology (AS Level) AICE Biology (A Level) AICE Environmental Management (AS Level)</p>
IB Programme Science Courses	<p>Advanced Middle Years Programme Earth Science IB Environmental Systems and Societies (SL) Advanced Middle Years Programme Biology I IB Biology I (HL)</p>
Dual Enrollment Science	<p>AP Environmental Science IB Biology II (HL)</p>
Standard Science Electives	<p>Earth Science II: Oceanography Biology II: Ecology Earth Science II: Astronomy Earth Science II: Physical Geology</p>

The Governor's School @ Innovation Park Science Courses

GS Microbiology + Lab

GS Environmental Chemistry + Lab

GS General Biology II + Lab

World Languages Crosswalk of Curricular Connections

The crosswalk for World Languages utilizes [the VDOE Standards of Learning with Progress Indicators for Modern World Languages](#). These include novice, intermediate, and advanced (high) levels for intercultural communication, interpretive communication, interpersonal communication, presentational communication, and communicative literacy. Language courses are not grade level specific but do follow a pathway of increasing proficiency and expectations. These proficiency expectations are divided into those for Levels I and II difficulty ratings, and those for Levels III and IV languages as shown below.

Content standards which support environmental literacy for PWC students are recorded below. Note the proficiency levels as depicted with the letters following the content standard. Where some standards overlapped with the same content, but only with increased facets of mastery, only one instance may have been recorded in the table.

These standards can be assessed in numerous ways, leading to a variety of instructional possibilities in the classroom. Many use the terms “such as” and then suggest several topics, some of which may include environmental literacy related topics. Ecological themes are found throughout all levels of World Language courses.

Each standard also has suggested projects or learning activities that can occur at that level. These activities are either place-based, outdoors, or use the school building as a teaching tool to address the Commitment 2, Objective 2.3 action item that states that schools will “Incorporate project-based learning across all grade levels through the development of resources designed to utilize the school building as a teaching tool. PWCS commits to creating site-specific outdoor environmental experiences.”

Key: N=Novice, I=Intermediate, A=Advanced, L=Low, M=Mid, H=High.

World Language		
Standard	Progress Indicator	Suggested Activities
3.1.NM.b	Recognize items in texts such as a shopping list, food label categories, or information from a weather forecast with symbols.	Use local forecasts to demonstrate target language specific vocabulary and conversation skills.
4.1.NH	Exchange simple oral or signed information about similarities and differences between typical products and practices to help understand perspectives in native and other cultures, such as school schedules, course selection, and the importance of academics; national parks, study of geography, and the importance of natural resources.	Discuss local parks such as Prince William Forest Park or Manassas Battlefield National Park, their natural resources and how to preserve them. How is ecology practiced in various cultures?
6.1.NM	Ask and answer simple questions about the weather when deciding what to wear to an outdoor event.	Using current weather conditions, discuss appropriate clothing for outdoor activities. Compare the climate of our local area to another location where the language is spoken.
9.2.NH	Identify similarities and differences between typical products and practices to help understand perspectives in native and other cultures, such as monuments, architecture, and national pride; national parks, leisure activities, and popular parks.	Identify differences in building materials between different cultures and the school community. How do they differ in natural resource use and energy efficiency? What types of outdoor leisure activities do the target language countries engage

		in and how is that different from our local area?
1.1.IH	Compare and contrast the relationships among familiar and unfamiliar products, practices and perspectives in native and other cultures, such as green products, recycling, and earth friendly beliefs; historical events, social norms, and value of demonstrations; family structures, weddings, and the treatment of elders; obituaries, funerals, and attitudes toward death.	Look at the history of environmental awareness in the United States. How did the pace of environmental awareness differ in the target language countries?
4.2.IM	Exchange written information to compare everyday products, practices and perspectives in native and other cultures, such as reusable bags, recycling, and environmental responsibility; food pyramid, exercise routines, and trends in dieting.	Discuss recycling in your classroom and school. Do you recycle properly? Why is recycling an important part of natural resource conservation?
9.2.IM	Compare everyday products, practices and perspectives in native and other cultures, such as reusable bags, recycling, and environmental responsibility; food pyramid, exercise frequency, and trends in dieting.	Compare recycling behaviors in your community with those from one of your world language global communities.
12.1.IH	Describe the benefits of volunteering for a recent or upcoming community event based on personal experience.	Plan a service-learning project for your school involving school grounds beautification. Have students reflect on that project in a journal entry.
12.2.IL	Create a trip review for an ecotourism website on traveling abroad in an environmentally friendly manner.	Create a sample advertisement in the target language for visitors to come to Prince William County, highlighting outdoor activities and opportunities for ecotourism.
4.1.AM	Exchange oral or signed information to compare the relationships among global products, practices and perspectives in native and other cultures, such as or professional or social schedules, influence of time on scheduling, and cultural concepts of time; environmental problems, solutions to such problems, and respect for such solutions.	Discuss global differences in the approach to issues surrounding global climate change, biodiversity loss, or plastic pollution.
4.2.AM	Exchange written information to compare the relationships among global products, practices and perspectives in native and other cultures, such as globalized products, prevalence of such products, and impact of such products on society and individual lifestyles; environmentally friendly transportation options, use of such options, and priority of such options.	Compare mass transit systems of various target language communities in comparison to our local system. Why did they develop differently and what are the benefits of each?
9.1.AM	Compare the relationships among global products, practices and perspectives in native and other cultures, such as professional or social schedules, influence of time on scheduling, and cultural concepts of time; environmental problems, solutions to such problems, and respect for such solutions.	Identify the practice of greenwashing in advertising globally.
9.2.AL	Compare the relationships among a variety of unfamiliar products, practices and perspectives in native and other cultures, such as material comforts, lifestyles, and	Research and present information about a natural disaster to identify causes and how we can reduce their impacts

	materialism; exports, trade practices, and natural disasters and disaster relief efforts.	in the future. An example could include flooding--building homes away from shorelines or maintaining wetlands to reduce flooding.
9.2.AM	Compare the relationships among global products, practices and perspectives in native and other cultures, such as globalized products, prevalence of such products, and impact of such products on society and individual lifestyles; environmentally friendly transportation options, use of such options, and priority of such options.	Challenge students to reduce their carbon footprint by using mass transit, carpooling, or riding the bus to school. Track it for 2 weeks and measure their successes. Journal or discuss in the target language their experience.
13.2.AL	Create an announcement for a fundraiser for a health care cause, or a human or animal rights cause that has had a personal impact.	Have students identify an environmental cause locally that they can engage in civically to affect change.
HL1.1.AL	Compare the relationships among global products, practices, and perspectives of the heritage culture and the predominant culture, such as ecotourism; environmental problems; impact of contemporary media on society.	What are the environmental justice implications of ecotourism? How can we reduce those impacts by educating our community?
HL1.1.AM	Analyze the relationships among global products, practices, and perspectives of the heritage culture and the predominant culture, such as innovations; ethics and science; effects of technology on self and society.	What products do we import from other countries that perhaps have ethical considerations regarding pollution or natural resource degradation?
DL3.1.NL	Identify and repeat names of items related to content lessons and topics, such as calendar and weather, foods, or plants and wildlife, and compare them to other cultures.	Take students on a target language vocabulary hunt outdoors or within the school building.
DL3.1. NM	Present very simple information related to content topics, such as currency, seasons, habitats, weather forecasts, or healthy food options, and compare them to other cultures.	Compare agricultural food products of local sources to those in a target language country. Explore which fruits and vegetables are "in season" as part of their comparison. Access information about current produce available in local grocery stores and where they were grown. Which target language countries are represented?

MWEE Training

Occoquan Bay NWR March 9, 2023

8:00 am – 4:00 pm

Resources are available through a module in Canvas. You can join this course using

this link: <https://pwcs.instructure.com/enroll/L6RGJX>



TOPIC	Time	Person	DESCRIPTION
Breakfast	8-8:30	Jessica/Aleta	Set up breakfast, check in trainees, provide pre-assessment
Pre-Assessment	8:30-8:35	Jessica	Teachers complete and turn in pre-assessment
Ice Breaker	8:35-8:50	Cindy	Mix and Match Macros—Indicator species impacted by school yard sediment
Word Wall	8:50-8:55	Melinda	Introduce the resource
Watershed Models	8:55-9:40	Jessica	EnviroScape
	9:40-9:55	Jeanne	Paper watershed models
BREAK	9:55-10:10		
Will it Soak In?	10:10-10:30	Cindy introduces	Teachers given instructions and then complete the activity on their own.
Stormwater Walk	10:30-11:30	Cindy	Maps of property, given maps of their school grounds as well. Mark on maps stormwater related areas
Lunch	11:30-12:00	Jessica/Team	
Land use change over time	12:00-12:15	Cindy	Maps out that they can look at as they finish lunch. Then lead discussion on Same/Different, change over time, human effect on landscapes
Macroinvertebrate Sampling	12:15-1:15	Jessica	How to for leaf packs Practice with BMI identification Sites on their school property or nearby they can use for leaf packs Resources on Stroud website
Alternatives to field testing	1:15-1:35	Jessica and Aleta	Jessica teaches elementary teachers about Mock stream sampling and Aleta goes over virtual platform
Food Chain Game	1:35-2:05	Cindy	Do the game if time, otherwise just explain how
BREAK	2:05-2:15		
Who Polluted the Potomac Activity	2:15-2:45	Melinda	Read the activity and then explain extensions
Action Project	2:45-3:30	Jeanne	Using the activities as inspiration, discuss student driven, teacher encouraged and supported stewardship projects. Topics could include erosion control, impervious surfaces, litter control, water quality, behavior changes
Post assessment	3:30-3:35	Jessica	Post assessment is same as pre assessment
Resources and Questions	3:35-4:00	Melinda	Where to find the resources, overview of Canvas module, and who to contact





Northern Virginia Clean Water Partners

Annual Summary of Results

July 1, 2022 - June 30, 2023

This summary was produced by Northern Virginia Regional Commission on behalf of
the 2023 Clean Water Partners.



Stormwater Pollution in Northern Virginia

Water bodies in Northern Virginia, including the region's numerous streams, lakes, and rivers, provide a range of environmental, social, and economic benefits to surrounding communities. However, when waterways are polluted and water quality becomes impaired, their key resources are reduced and result in negative impacts to both humans and the natural environment.

Polluted stormwater runoff is the number one cause of poor water quality in Northern Virginia's waterways. When it rains and snows, water runs off streets, driveways, yards and parking lots and mixes with pollutants, such as litter, fertilizer, pet waste, road salt, and auto fluids. These pollutants then enter storm drains on the street and are discharged directly into nearby streams.

To reduce the impacts of stormwater pollution, the Northern Virginia Clean Water Partners joined together to improve residents' knowledge and behaviors through an ongoing public education campaign.

About the Partnership

The Northern Virginia Clean Water Partners (NVCWP) is composed of a group of local governments, drinking water and sanitation authorities, and businesses that share the common goals to keep Northern Virginia residents healthy and safe by reducing the amount of pollution from stormwater runoff that reaches local creeks and rivers, and empower individuals to take action to reduce pollution.

To meet these goals, the partners work together to:

- Identify high priority water quality issues for the region
- Identify the target audience(s) for outreach
- Educate the region's residents on simple ways to reduce pollution around their homes
- Monitor changes in behavior through surveys and other data collection techniques
- Pilot new cost-effective opportunities for public outreach and education

Membership is voluntary and each member makes an annual contribution to fund the program. By working together, the partners are able to leverage their funds to develop and implement a range of bilingual education and outreach strategies throughout Northern Virginia.



**"Only rain down the storm drain"
- Partnership Motto**

The 2023 campaign helped to satisfy MS4 (Municipal Separate Storm Sewer System) Phase I and Phase II permit requirements for stormwater education and documenting changes in behavior.

For more information visit onlyrain.org

2023 Campaign Overview

The Northern Virginia Clean Water Partners identified the following water quality issues to highlight in their 2023 campaign:

- **Nutrients (Phosphorus and Nitrogen)**
- **Bacteria**
- **Salt**
- **Illicit Discharges (e.g., pesticides, motor oil, etc.)**

Target audiences for these issues include pet owners, winter salt applicators, home mechanics, and residents with a lawn or garden. To reach these audiences, the campaign used a combination of social media, television, printed advertising, and the Only Rain website to distribute messaging that would improve stormwater-related knowledge and behaviors. Partners also participated in local events throughout the year to engage residents and raise campaign awareness.

The 2023 campaign also continued to expand outreach and engagement programming with several new social marketing strategies, including:

- Updated infographics to promote pollution-reduction practices
- New social media content, including monthly partner spotlights
- A new campaign video
- An NVCWP Instagram account

Social Media

The NVCWP have continued to use social media as a key tool to engage their campaign's target audiences.

The partners created Facebook and Twitter accounts as a part of their 2020 campaign strategy. Since July 1, 2022, the Facebook page has gained 115 new followers for a total of 518 current followers. During the campaign year, the page had 387 posts, 20,858 post engagements, and 6,987 post link clicks.

The Twitter account currently has 165 followers, with 34 new followers since July 1, 2022. Over the year, the account had 393 tweets, 1,093 tweet engagements, and 116 link clicks.

As a part of the 2023 campaign, the partners also created an Instagram account to further reach the public. Since it was created in December 2022, the Instagram account has gained 140 followers and created 79 posts.



Top reaching Instagram photo in 2023

Video Advertisements

The campaign continued to reach residents through a series of video advertisements that focused on residential stormwater management actions. In 2023, the campaign aired two public service announcements (one in English and one in Spanish) on a combination of 44 English and Spanish language networks for a total of 865,060 impressions, or views.

Key Facts and Figures for 2023



2,256

visits to OnlyRain.org



596

Stormwater Survey responses



1,128

Clean Water Pledges



865,060

premium digital TV impressions*



825,685

total social media impressions*



22,151

engagements with social media posts

**Impressions are the number of times an ad appeared on a single television or computer screen.*



Annual Stormwater Survey

Survey Goal

The Northern Virginia Clean Water Partners conduct an annual online survey of approximately 500 Northern Virginia residents to better understand their stormwater-related knowledge and behaviors over time. Results help the partners to assess their campaign's effectiveness and direct future education and outreach efforts.

Results

Stormwater and Watershed Knowledge

69% of Northern Virginia residents reported that they are familiar with the term "watershed". When asked which watershed they live in, 45% of residents selected that they live within the Potomac River watershed, which represents a 8% increase in this response from 2022. However, only 30% selected that they live in the Chesapeake Bay watershed.

When asked where stormwater eventually ends up, 62% of residents responded that it goes to the Potomac River or Chesapeake Bay, while 46% also selected that it goes to a wastewater treatment plant. Responses to this question have not significantly changed since 2019.

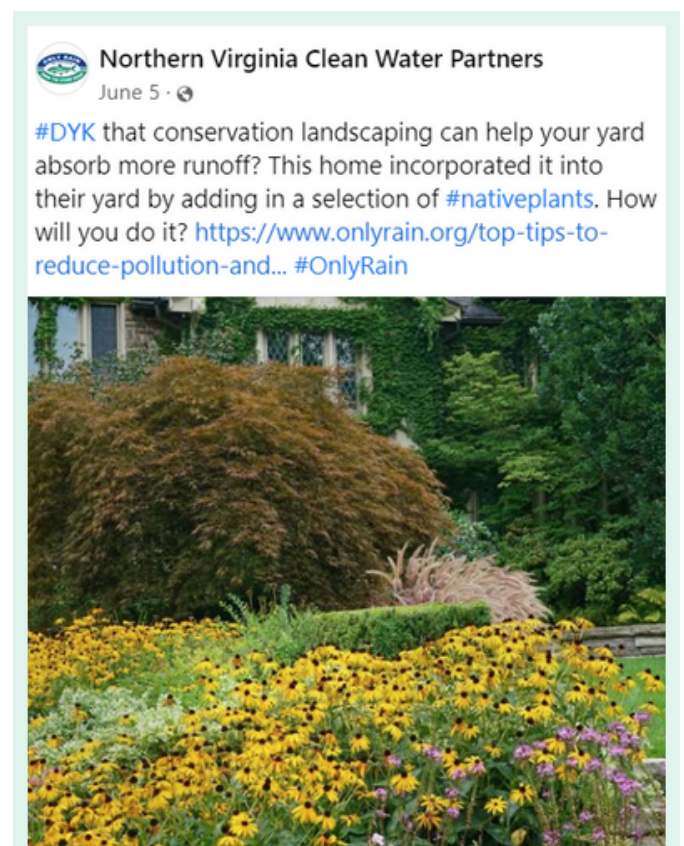
These results indicate that although residents have likely heard of a "watershed", further education is needed to characterize the term in Northern Virginia and explain its relationship to stormwater runoff.

Information and Advertising

Similar to 2022, 34% of residents reported that they have seen or received at least some form of information about reducing water pollution in the past 12 months. Notably, there was a 9% increase (24% in 2022 versus 33% in 2023) in those that had heard of specific opportunities to participate in water quality improvement activities, such as stream clean ups or storm drain stenciling.

42% of survey respondents indicated that they were familiar with the NVCWP prior to the survey. 74% selected that they trust information from the campaign, and 71% would contact the NVCWP if they had questions about water quality.

When shown the "only rain down the storm drain" fish logo, 61% of residents reported seeing the logo prior to the survey. Although this represents a 5% decrease in those that recognize the logo from 2022, responses to this question have remained above 60% since 2019.



Campaign Impact

Residents who have viewed at least one NVCWP ad were asked a series of questions about the impact of the ads, including ways that their behaviors have changed since they first saw the ads. Over 70% of respondents reported that they now have a greater understanding of pet waste, fertilizer, and motor oil impacts on local water quality. 43% of residents stated that they pick up pet waste more often, 50% plan to fertilize less frequently, and 48% now also properly dispose of motor oil. However, over 50% of residents also reported that they were already taking some action to reduce water pollution. These results indicate that NVCWP advertisements likely reinforce positive behaviors in many residents while providing new information to a smaller percentage of ad viewers.

Resident Behaviors

The survey asked specific questions to understand changes in Northern Virginia residents' behaviors around relevant stormwater management and pollution issues, including pet waste, lawn and garden care, car fluids, and household hazardous waste.



In 2023, 51% of residents reported owning at least one dog. Of those that walk their dog, 89% stated that they always or usually pick up their dog's waste during walks, while 3% rarely or never pick up the waste. In comparison, only 61% of residents reported picking up their pet's waste on a daily basis in their own yard.

When asked why they pick up their dog's waste, 25% of residents responded that their actions were due to city or county ordinances, and 20% selected that they "don't want to step in it". Similar to 2022 (17%), only 15% of residents noted picking up their pet's waste because it causes water pollution.

As in previous years, Northern Virginia residents continue to clean up after their pet for a variety of reasons unrelated to local water quality. As such, future messaging could aim to encourage homeowners to pick up waste in their own yard and further describe the connection between dog waste and water quality impacts.



When asked about reporting potential water pollution, 57% of residents reported knowing who to contact, and nearly two-thirds (63%) stated that they would probably or definitely contact someone to report a potential source of water pollution. Of those who were equally likely to call and not to call as well as those who reported that they would not call, 32% selected their reason being that they would prefer not to communicate with officials or authorities, while 23% selected that "it's none of my business".

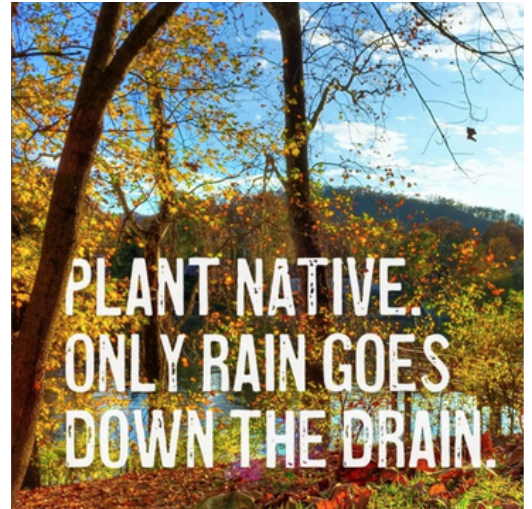




Two-thirds (66%) of residents with a lawn or garden stated that they use a lawn care service at least once a year. Notably, 71% of residents with a lawn or garden reported using fertilizer at least once a year. Similar to 2022, 26% of residents most frequently fertilize twice a year, while 13% never fertilize their lawn.

For those that cut their own grass, 29% of residents keep their grass clippings on their lawn or garden. 56% choose to bag their clippings and either recycle them (32%) or put them in the regular trash (24%).

If grass clippings ended up in the street, only 53% reported sweeping or blowing them back into their lawn, instead choosing to leave them in the street (20%) or to sweep them into the storm drain (15%). These results indicate a need for further outreach to encourage residents to leave clippings or sweep them back into their yard after mowing.



As in 2022, respondents were provided descriptions of a rain barrel, rain garden, and conservation landscaping and asked whether they have heard of these stormwater management features and would be interested in getting one for their property. Compared to prior years, there was a significant increase in residents that not only reported having a feature on their property, but also in those that were familiar and/or interested in installing the features.

In particular, residents are most familiar with rain barrels, and 45% reported an interested in obtaining one for their property. 28% also reported already owning at least one. Over 40% of residents were also interested in installing a rain garden or some form of conservation landscaping on their property.



With growing awareness of their benefits to water quality and conservation, the Clean Water Partners will continue to highlight opportunities and resources for installation and maintenance of stormwater management features, including regional workshops and other education events, throughout the year.



61% of residents reported knowing if their locality has a specific drop-off location for household hazardous waste (HHW). This response represents a slight decrease from 2022 (67%), indicating the need for new tools and resources, such as online maps and fact sheets, to more specifically point out HHW sites across local jurisdictions.



Similar to 2022, the majority of residents who own a car reported going to an auto center for an oil change (70%) or taking their old motor oil to a gas station or hazmat facility for recycling (17%). In addition, approximately 13% of residents continue to store their used motor oil in their garage, place it in the trash, or dump it down the storm drain, sink or onto the ground.

63% of residents reported taking their vehicle to a commercial car wash, while only 21% reported washing their vehicle at home. This represents a significant change in responses from prior years, in which 43% of residents washed their vehicle at home and 36% used a commercial car wash in 2022.

For those that wash their cars or trucks at home, nearly a quarter of residents (26%) most frequently wash their vehicle three to four times a year, although 17% wash their vehicle at home more than 12 times a year. To wash their vehicle, the majority of residents reported using environmentally-friendly detergent (60%) or only water (29%), and 53% wash on pervious surfaces, including grass, gravel, and/or dirt.

These results highlight an increase in water-conscious decisions that residents are making for their automobile care. Future campaign messaging can continue to reinforce these behaviors, including further promotion of commercial car washes to reduce runoff of cleaning detergents.



2024 Campaign Goals

Through a combination of social media, TV advertisements, the Only Rain website, and other regional activities, the 2023 Northern Virginia Clean Water Partners campaign strived to engage Northern Virginia residents around a number of priority stormwater runoff and pollution topics. In particular, new social media platforms, such as Instagram, and messaging strategies helped the campaign to reach new audiences and further advance the campaign's education and outreach goals.

The 2024 campaign will continue to diversify and implement new strategies to most effectively reach Northern Virginia residents and improve their stormwater-related knowledge and behaviors. The next campaign year will include:

- A new campaign video
- New and updated website resources
- Engaging social media content, including "Wednesday Water Tips"
- And more!

Northern Virginia Clean Water Partners 2023 SURVEY AT A GLANCE

The Clean Water Partners conduct an annual survey to better understand Northern Virginia residents' stormwater knowledge and behaviors in order to inform future education and outreach efforts.

WATERSHED KNOWLEDGE

45% of residents believe they live in the Potomac River watershed. 31% were not familiar with the term "watershed" prior to the survey.



STORMWATER RUNOFF

Nearly 2/3 of residents believe that stormwater runoff ends up in the Chesapeake Bay or Potomac River. 46% of residents think that it goes to a wastewater treatment plant.

AUTOMOBILE BEHAVIORS

63% of vehicle owners go to a commercial car wash at least once a year. Of those that clean their car at home, over 60% report only using water or environmentally-friendly detergent.



DOG OWNERS

89%

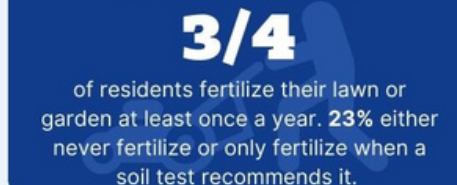
of dog owners report always or usually picking up their pet's waste while on a walk. 15% pick up the waste because it causes water pollution.



LAWN CARE

3/4

of residents fertilize their lawn or garden at least once a year. 23% either never fertilize or only fertilize when a soil test recommends it.



CONSERVATION LANDSCAPING

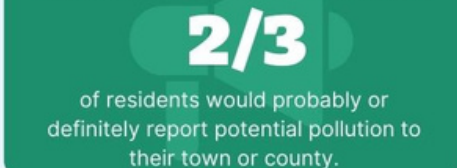
Over 1/2 of residents are familiar with a rain barrel, rain garden, and/or conservation landscaping. Over 40% report an interest in obtaining one or more for their property.



POLLUTION REPORTS

2/3

of residents would probably or definitely report potential pollution to their town or county.



CWP PROMOTION

61%

of residents recognize the Clean Water Partners logo.



ADVERTISING REACH

About 1/4 of residents have viewed a Clean Water Partners ad. When asked about perceptions of the ads, over 75% trust the information conveyed and believe the ads are important.



Additional Information

Contact: Rebecca Murphy

Coastal Program Manager

rmurphy@novaregion.org

703-642-4625

3040 Williams Drive, Suite #200

Fairfax, VA 22031



Website: www.onlyrain.org

Social Media:

- **Facebook:** facebook.com/NVCWP
- **X (Formerly Twitter):** twitter.com/nova_cwp
- **Instagram:** instagram.com/novacwp

2023 Clean Water Partners:

Fairfax County | Arlington County | Loudoun County | Loudoun Water | Fairfax Water | City of Alexandria | City of Fairfax | City of Falls Church | City of Manassas | City of Manassas Park | Stafford County | Town of Leesburg | Town of Dumfries | Town of Herndon | Town of Vienna | Prince William County | Northern Virginia Regional Commission | George Mason University | Virginia Coastal Zone Management Program | Fairfax County Public Schools | Prince William County Public Schools



MCM 2: BMP 2.2 Public Involvement Activities

Date	Event	Metric	Category	Description
10/28/2022 – 06/05/2023	Prince William Soil and Water Conservation Capsules	1,424 students attended	Educational Event	<p>Natural Resources Capsule: Students identify natural resources (plants, animals, water, air, land, minerals, forests, and soil) and observe objects in their environment to determine what resources were used to produce the object.</p> <p>Build an Ecosystem Capsule: Students learn about the basics of species interdependency in a temperate forest ecosystem.</p> <p>Food Chain/Web Capsule: Students play an interactive game to understand the relationships between animals and plants in terrestrial and aquatic food chains to further understand the terms relating to food webs.</p> <p>Soils Capsule: Students rotate through stations to learn about soil types, importance, and layers to construct a soil profile card and be able to discuss soil conservation.</p>
10/22/2023	After The Storm Educational Document	Emails sent out to principals, bookkeepers, and custodial managers	Educational Event	Educational document that informs students and faculty about the causes and effects of stormwater runoff, the impact of their actions on stormwater and PWCS properties, the impact stormwater pollution has on water quality, and solutions for preventing and reducing stormwater pollution.
04/13/2023, 4/17/2023, 4/18/2023, 05/24/2023 & 05/26/2023	School-based MWEEs	784 students and 71 staff members	Educational Event	MWEE (Meaningful Watershed Educational Experience) events are learner-centered experiences that actively engage students in building knowledge and meaning through hands-on investigation of local environmental issues. Students rotate through four stations: soils, pond aquatics, pollinators, and stream buffers with tree planting. By restoring the stream buffer, they become part of the solution to pollution.



12/8/2022, 12/13/2022, & 12/14/2022	Tree Plantings	40 students and 7 staff members	Restoration	Tree planting events bring students and faculty together to plant saplings in a chosen area with the help of community partners. Participants receive tools and guidance, dig holes, and plant trees while learning about their ecological importance. It's a communal effort that promotes environmental awareness and sustainability.
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Appendix B: List of Illicit Discharges



Appendix B: Illicit Discharges						
Illicit Discharge	Part I.E.3.e(3)(a) Source	Part I.E.3.e(3)(b) Date Observed & Date Reported:	Part I.E.3.e(3)(c) Detected during Screening, Reported by Public or Other (Describe):	Part I.E.3.e(3)(d) Investigation Resolution:	Part I.E.3.e(3)(e) Description of Follow-up Activities:	Part I.E.3.e(3)(f) Date Investigation Closed:
Flow observed from upslope inlets that connects to a pipe that leads to the school.	Lake Ridge Middle School	Reported on 04/21/2023	Screening	Yes	Work orders have been submitted to HVAC department to repair cooling tower discharge.	05/31/2023
Flow and poor pool quality observed.	West Ridge Elementary School	Reported on 04/12/2023	Screening	Yes	Investigated flow and followed to drain from AC unit. AC discharge is allowable. Poor quality is due to blockage in channel. Removed and repaired blockage.	05/31/2023
Flow observed from pipe that leads offsite.	Pennington Traditional	Reported on 04/25/2023	Screening	Yes	Off-site basin is owned by PWC, and they have indicated basin is in proper working order and the channel is the outfall for their storm water basin.	08/29/2023