Brightpoint COMMUNITY COLLEGE

Midlothian and Chester Campuses

Municipal Separate Storm Sewer System Annual Report

For

General Permit No. VAR040110

Permit Year

July 1, 2021 through June 30, 2022

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 per letter dated November 1, 2018.

Submitted: September 30, 2022

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APPENDICES

TABLES

ACRONYMS

BMP	Best Management Practices
DEQ	Virginia Department of Environmental Quality
IDDE	Illicit Discharge Detection and Elimination
MCM	Minimum Control Measure
MS4	Municipal Separate Storm Sewer System
POC	Pollutants of Concern
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
VPDES	Virginia Pollution Discharge Elimination System
WLA	Wasteload Allocation

1.0 GENERAL ANNUAL REPORTING REQUIREMENTS

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

Permitee Name: Brightpoint Community College

System Name: Virginia Community College System

Permit Number: VAR040110

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

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

July 1, 2021 through June 30, 2022

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: Arnold Kramer

Title: Director of Facilities and Safety

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
None

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 the 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.

Table 2: High Priority Stormwater Issues

#	Stormwater Issue	Strategy	Communication	Metric	Beneficial
1	Public education of stormwater runoff	Curiculum materials	ENV-121 Course Fall 2021/Spring 2022	201 participants	☒ Yes ☐ No
2	TMDLs and Local Impaired Waters	Speaking Engagements	DEQ James River PCB TMDL Advisory Committee Meeting May 2022	1 participant	☒ Yes ☐ No
3	Pollution Prevention	Signage	Storm Drain Markers No Dumping! Drains to the Swift Creek Reservoir, Redwater & Ashton Creeks	Installed on 100% of stormdrains on both campuses	☒ Yes ☐ 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 measurable goals 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:

Were any MS4 Program inputs or stormwater complaints received from the public?
☐ Yes ☒ No

If yes, were responses provided? ☐ Yes ☐ No

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.brightpoint.edu/index.php?/about/sustainability/

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 B includes documentation of the public involvement activities.

Table 3: Public Involvement Activities Implemented

Activity Description	Category	Metric	Collaboration	Beneficial
Bryan Park Clean-Up October 8 & 29, 2021	Restoration	4 Participants	Friends of Bryan Park	☒ Yes ☐ No
Bryan Park Clean-Up November 19, 2021	Restoration	16 Participants	Friends of Bryan Park	☒ Yes ☐ No

Bryan Park Clean-Up February 19 & 20, 2022	Restoration	4 Participants	Friends of Bryan Park	☒ Yes ☐ No
Bryan Park Clean-Up April 2, 15 & 29, 2022	Restoration	23 Participants	Friends of Bryan Park	☒ Yes ☐ No
Medication Take Back April 30,2022	Disposal & Collection Event	Over 600 lbs of medications collected	Wegmans, Chesterfield County Police & Sheriff's Office & DEA.	☒ Yes ☐ 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?	☐ Yes ☐ No ☒ Not Applicable
2.1	Is the effective MS4 permit and coverage letter on the webpage?	☒ Yes ☐ No
2.1	Is the most current MS4 Program Plan on the webpage?	☒ Yes ☐ 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?	☒ Yes ☐ No ☐ Not Applicable (First permit year)

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?	☒ Yes ☐ No
2.1	Is there a method for how the public can provide input of the MS4 Program Plan on the webpage?	☒ Yes ☐ No
2.1	Is the latest Virginia Community College System Annual Standards and Specifications on the webpage?	☒ Yes ☐ 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 measurable goals 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.)

2.3. 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 outfalls screened during the reporting period? ☒ Yes ☐ No

The number of outfalls screened during the reporting yard as part of the dry weather screening program is 11. This represents 100% of the 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 Table 5) ☒ No

Table 5: 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:

2.3.4. MS4 Program Plan BMP Measurable Goals

The MS4 Program Plan BMPs measurable goals are provided in Table 6.

Table 6: 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?	☐ Yes ☒ Not Applicable (No new or discovered) ☐ No
3.2	Did all students, faculty and staff have access to the Standards of Conduct for Employees and the Student Handbook for Students?	☒ Yes ☐ No
3.3	Were illicit discharge detection and elimination procedures implemented, enforced and documentation maintained?	☒ Yes ☐ 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 measurable goals 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.)

2.4. MCM #4: Construction Site Stormwater Runoff Control

2.4.1. Implementation of Standards and Specifications (Part I.E.4.a(3))

The MS4 implements a construction site stormwater runoff program in accordance with the most recent DEQ approved Standards and Specifications in compliance 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 current department approved standards and specifications for erosion and sediment control:

Were all land disturbing projects that occurred during the reporting period conducted in accordance with the current department approved standards and specifications for erosion and sediment control?

☒ Yes ☐ No (Refer to Table 7) ☐ Not Applicable (No land disturbing projects)

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 department standards and specifications, an explanation as to why the projects did not conform to the approved standards and specifications:

If no is checked above, an explanation as to why a project did not conform to the approved standards and specifications is provided in Table 7.

Table 7: Project(s) Not in Conformance with Approved Standards and Specifications
Project Name:
Explanation:

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 in accordance with the most recent DEQ approved Standards and Specifications are provided in Table 8.

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, Notices to Comply and Stop Work Orders issued are provided in Table 8.

Table 8: Construction Project(s)				
Project Name(s)	Total Inspections	Total Notices to Comply (Red Flags)	Total Stop Work Orders (Black Flags)	Total Enforcement Actions
Bird Hall & Nicholas Center Renovation/ Addition 260-18209-000	1	0	0	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 measurable goals 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.)

2.5. MCM #5: Post-Construction Stormwater Management

2.5.1. Implementation of Standards and Specifications (Part I.E.5.a(3))

The MS4 implements the most recent DEQ approved standards and specifications and a stormwater management facility inspection and maintenance program in accordance with Part I.E.5.b.

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 are 16.

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 (SWM) facilities during the reporting year?

☐ Yes ☒ No (BCC will work towards obtaining engineering assessments and recommendations for BMP maintenance.)

☐ Not Applicable (No significant maintenance required)

If yes, 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 9.

Table 9: Maintenance Activities Performed on Stormwater Management Facilities

Stormwater Management Facility	Significant Maintenance Activity

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 form Construction Activities:

Stormwater management facility information for stormwater facilities installed after July 1, 2014 was 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?

☒ Not Applicable (Not a VSMP Authority)

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 qualifying SWM facilities constructed or structural BMPs implemented.)

2.5.6. MS4 Program Plan BMP Measurable Goals

The MS4 Program Plan BMPs measurable goals are provided in Table 10.

Table 10: MS4 Program Plan BMP Measurable Goals for MCM #5		
BMP	**Measurable Goal**	**Completeness Status**
5.1	Was the post-construction stormwater management inspection and maintenance program implemented in accordance with approved standards and specifications?	☒ Yes ☐ No
5.2	Was the stormwater management facility tracking database updated?	☒ Yes ☐ No

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 measurable goals completed in accordance with the MS4 Program Plan?
☐ Yes ☒ No (2.5.3 BMP Maintenance will be performed in future permit years.)

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 11) ☒ No (No modifications required.)

Table 11: Good Housekeeping Operational Procedures Developed or Modified
Not Applicable

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 12) ☐ No ( ) ☒ Not Applicable (No new high priority facilities)

Table 12: New SWPPPs Developed	
SWPPP Name	**SWPPP Address**
Not Applicable	

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 13) ☐ No ( ) ☒ Not Applicable (No modification required.)

Were any high priority facilities delisted in accordance with Part I.E.6.h during the reporting period?

☐ Yes (Refer to Table 13) ☒ No

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 13.

Table 13: SWPPPs Modified or Delisted	
SWPPPs Modified/Delisted	**Rationale for Delisting**
Not Applicable	

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 14) ☐ No ( ) ☐ Not Applicable (Existing NMPs in place. No new NMPs required this reporting year.)

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

If yes is checked above, 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 14.

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 14.

Table 14: New Turf and Landscape Nutrient Management Plans		
Location	**Total Acreages**	**Date Approved**
13101 Route 1, Chester, VA 23831	17.74	7/25/2022
800 Charter Colony Parkway, Midlothian, VA 23114	20.48	7/25/2022

2.6.5. 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 (Refer to Table 15) ☐ No ( ) ☒ Not Applicable (Not required this reporting year.)

If yes is checked above, a list of training events conducted in accordance with Part I.E.6.m is provided in Table 15.

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

The date of the training event:

If yes is checked above, the date of the training event is provided in Table 15.

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

The number of employees who attended the training event:

If yes is checked above, the number of employees who attended the training event is provided in Table 15.

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

The objective of the training event:

If yes is checked above, the objective of the training event is provided in Table 15.

Table 15: Training Events

Date	# of Attendees	Training Objective

2.6.6. MS4 Program Plan BMP Measurable Goals

The MS4 Program Plan BMPs measurable goals are provided in Table 16.

Table 16: 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?	☐ Yes ☒ Not Applicable (Not required this reporting year) ☐ No
6.2	Was the annual comprehensive compliance evaluation conducted?	☒ Yes ☐ No
6.2	Was the SWPPP reviewed within 30 days after an unauthorized discharge, release or spill reported?	☐ Yes ☒ Not Applicable (Not required) ☐ No
6.2	Was the SWPPP updated within 90 days after an unauthorized discharge?	☐ Yes ☒ Not Applicable (Not required) ☐ 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?	☒ Yes ☐ No
6.3	Was the nutrient management plan implemented through completion of application records?	☐ Yes ☒ Not Applicable (No nutrients applied) ☐ No
6.4	Were all signed contracts executed with contract good housekeeping and pollution prevention language?	☐ Yes ☒ No (BCC to add language.)
6.5	Did all signed contracts executed for pesticide and herbicide application maintain proof of certifications on file?	☐ Yes ☒ Not Applicable (No contracts executed) ☐ No

6.6	Did training occur and were proof of certifications maintained on file for employees performing pesticide and herbicide applications?	☒ Yes ☐ Not Applicable (No employees applied pesticides) ☐ No

2.6.7. 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 measurable goals completed in accordance with the MS4 Program Plan?

☐ Yes ☒ No (BMP 6.4)

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. BMPs Implemented and Estimated POC Reductions (Part II.A.13.a)

A list of BMPs implemented during the reporting period but not reported to the DEQ BMP Warehouse in accordance with Part I E 5 g and the estimated reduction of pollutants of concern achieved by each and reported in pounds per year:

Were any BMPs implemented during the reporting period but not reported to the DEQ BMP Warehouse in accordance with Part I.E.5.g? ☒ Yes (Refer to Table 17) ☐ No ( ) ☐ Not Applicable ( )

The estimated reduction of pollutants of concern achieved by each BMP reported in pounds per year is provided in Table 17.

Table 17: Chesapeake Bay TMDL Action Plan POC Reductions			
BMP #1: Street Sweeping Using the Mass Loading Approach			
Required pounds of material swept	183 lbs.		
Provided pounds of material swept	11,600 lbs.		
	TN (lbs./yr.)	TP (lbs./yr.)	TSS (lbs./yr.)
Required 5% Reduction (lbs.) =	2.73	.60	262.65
Provided Reduction (lbs.) =	20.3	8.12	2,436
Required 40% Reduction (lbs.) =	21.81	4.80	2,101.22
% Achieved towards 40% (%) =	107.44	59.11	86.26

3.1.2. Nutrient Credits (Part II.A.13.b)

If the permitee acquired credits during the reporting period to meet all or a portion of the required reductions in Part II A 3, A 4, or A 5, a statement that credits were acquired:

Were credits acquired during the reporting period to meet all or a portion of the required reductions in Part II A 3, A 4, or A 5? ☐ Yes ☒ No

3.1.3. POC Cumulative Reduction Progress (Part II.A.13.c)

The progress, using the final design efficiency of the BMPs, toward meeting the required cumulative reductions for total nitrogen, total phosphorus, and total suspended solids:

The progress, using the final design efficiency of the BMPs, toward meeting the required 40% reductions for total nitrogen, total phosphorus, and total suspended solids is provided in Table 18.

Table 18: 2019 – 2023 Chesapeake Bay TMDL Action Plan Implementation Schedule

Step	General Description	Measurable Goal	Completion Date
1	5% reduction requirement complete. Evaluate lbs. swept.	Completed tracking documentation?	☒ Yes (July 2019) ☐ No
2	5% reduction requirement complete. Make adjustments to frequency based on 2019 information obtained.	Completed tracking documentation with increase sweeping frequency?	☒ Yes (July 2020) ☐ No
3	5% reduction requirement complete. Determine if 40% can be achieved w/ street sweeping alone. If not, evaluate alternate means to achieve 40% reduction. Secure funding for future implementation of new BMPs. Revise Action Plan accordingly.	Completed tracking documentation. If required, revise Action Plan?	☒ Yes (July 2021) ☐ No
4	Revise Action Plan based on the newly issued DEQ Guidance Memo No. GM-20-2003 (Appendix V.G).	Completed tracking documentation and support documentation from any new BMPs employed to meet 40% reduction?	☒ Yes (July 2022) ☐ No
5	Complete 40% reduction requirement with selected means and methods.	Completed tracking documentation and support documentation from any new BMPs employed to meet 40% reduction?	July 2023
6	Report on Chesapeake Bay TMDL 40% reduction achievement.	Recorded results in Annual Report?	October 2023

3.1.4. Next Reporting Period Planned BMPs (Part II.A.13.d)

A list of BMPs that are planned to be implemented during the next reporting period:

BMPs that are planned to be implemented during the next reporting period is provided in Table 19.

Table 19: Chesapeake Bay TMDL Action Plan BMPs Planned for Next Reporting Year
1. Street Sweeping

3.1.5. Chesapeake Bay TMDL Action Plan Measurable Goals

The Chesapeake Bay TMDL Action Plan measurable goals are provided in Table 20.

Table 20: Chesapeake Bay TMDL Action Plan Measurable Goals		
BMP	**Measurable Goal**	**Completeness Status**
1	Were public comments considered during the required 15-day comment period?	☒ Yes ☐ Not Applicable (Not required this reporting year) ☐ No
2	Were cost effective BMPs selected to support model quantification to achieve the required pollutant reductions?	☒ Yes ☐ Not Applicable (Not required this reporting year) ☐ No
3	Was the required pollutant reduction reached for this reporting year?	☒ Yes ☐ No

3.1.6. Chesapeake Bay TMDL Action Plan Implementation Evaluation (Part I.D.2.e)

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

Were all measurable goals completed in accordance with the Chesapeake Bay 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.)

3.2. Local TMDL Action Plan

3.2.1. James River Tidal Bacteria TMDL Implementation (Part II.B.9)

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

A summary of actions conducted to implement the James River Tidal Bacteria TMDL is provided in Table 21.

Table 21: James River Tidal E.coli TMDL Action Plan Summary of Actions

BMP	Summary of Actions	Progress Status
1	Educate the public on how to reduce food sources accessible to urban wildlife by the distribution of an educational brochure	☐ Yes ☒ No

Were all measurable goals completed in accordance with the James River Tidal Bacteria TMDL Action Plan?

☐ Yes ☒ No (BCC will educate the public next permit year.)

Are the MS4 Program measurable goals effective?

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

Appendix A: Documentation of Public Education and Outreach Activities

High Priority Stormwater Issue #1

Syllabus for ENV121-01A: Spring 2022

Course Information (tab)

Faculty Information

- **Faculty Name and Title:** Paula A. Labieniec, Ph.D., Adjunct Faculty
- **Faculty Email:** plabieniec@jtcc.edu
- **Campus Office:** Moyar 129
- **Phone:** 804-837-5164 (personal cell)
- **Office Hours:** Tuesdays 1:00PM - 2:00PM
- **Communication:**
    - **Canvas Announcements:** I will use Canvas Announcements to provide weekly overviews and important updates. Be sure to have your announcements notifications on.
    - **Canvas Q&A Discussion Board:** If you have a question about anything related to the class, you can post to the Q&A discussion board. I will monitor it and respond within 24 hours on weekdays and 48 hours on the weekend. In addition, feel free to respond to each other's questions if you are able.
    - **Speedgrader:** I will leave comments about your work in the Speedgrader. You will be able to respond to comments there as well.
    - **Email to plabieniec@jtcc.edu:** If you have any questions, feel free to email me using your John Tyler email account or the Canvas Mail Inbox. I will not respond to emails from external email accounts. I will do my best to get back to you within 24 hours on weekdays and 48 hours on the weekend. ALL emails should contain an appropriate subject line that begins with the course identifier, ENV121 followed by your section number. Be sure to sign your name since JTCC student email addresses do not typically contain a name.
    - **Text Message or Phone Call to 804-837-5164:** A call or text message is acceptable only in urgent situations. I will respond as soon as I am able.
    - **Talk to me during Office Hours:** I welcome you to come to my office hours. It is best if you give me a text to let me know you are coming. We can meet on campus on Moyar 129 or by Zoom as conditions allow. If you need to meet at another time, let me know.

Course Materials

- **Textbook:** Cengage Access Card Miller's Environmental Science v2, 16th Edition, 1 Semester Access
    - ISBN: 9780357629406
    - Author: Miller and Spoolman
    - Publisher: Cengage

      Note: This course requires MindTap, which includes the ebook and graded activities. No additional purchase is necessary; you have already paid for these materials through your tuition. A loose-leaf print version is available as an optional purchase at the John Tyler Bookstore.

      Keep in mind that if you are taking other courses using Cengage materials, it may be possible that you can "upgrade" to a full Cengage Unlimited subscription at a reduced fee or no additional cost, and any other Cengage course materials will be part of this subscription. Be sure to launch these and any other IncludEd course materials first from Canvas, then see what the remaining cost would be to "upgrade" to a Cengage Unlimited subscription. Please contact Cengage Rep, Will Schimmels at

William.schimmels@cengage.com if you have any questions at all about accessing or purchasing Cengage materials.

- **Subscription to New York Times** (Free to JTCC Students).
- **Computer, webcam, and regular access to the internet.**
- **Printer and Scanner:** On occasion, students will be required to print a document. Students should have access to a printer. Students should also know how to use their phone as a scanner in order to scan and save a document as a pdf file.
- **Personal Protective Equipment:** Students may choose to purchase goggles for use in the on-campus lab or a pair will be provided to them. When coming to campus for a lab, students must wear shoes that cover the heel and toe as well as long pants or skirts. Failure to do so may result in the student's removal from the lab.

Course Description

Explores fundamental components and interactions that make up the natural systems of the earth. Introduces the basic science concepts in the discipline of biological, chemical, and earth sciences that are necessary to understand and address environmental issues. Part I of II. Lecture: 3 hours. Laboratory: Recitation and Laboratory: 3 hours. Total: 6 hours per week. 4 credits

Prerequisite(s): None. Corequisite(s): None. Co- or Prerequisite(s): None.

Schedule (tab)

To download the course calendar, go to tinyurl.com/SyllENV121. To view the JTCC Academic Calendar, go to https://www.jtcc.edu/academics/academic-calendar/ .

Grading (tab)

Course Learning Outcomes

Given readings in the textbook, supplementary readings, class discussions, and laboratory activities in this course, students will be able to do the following:

1. Examine the role of environmental ethics in decision-making and environmental stewardship.
2. Evaluate different perspectives, opinions, and statements about environmental issues in terms of their logic, content, scientific merit, and biases.
3. Demonstrate the ability to work well in groups and display situationally and culturally appropriate behavior in the classroom.
4. Perform accurate calculations, interpret scientific data and graphs, and use the results to support conclusions.
5. Apply the scientific method to make informed decisions and engage with issues related to environmental science.
6. Develop, convey, and exchange ideas in writing on different topics in environmental science.

Spring 2022 Course Calendar for ENV121-01A (subject to modification)

Module	Week of	Tuesday	Thursday	Assessments
Unit 1: Humans and Sustainability				
1	Jan 17	Ch 1: Environment and Sustainability	Lab 1: Ecological Footprint	Lab safety agreement MindTap Assignments Post-Lab 1 / Wk 1 Quiz
2	Jan 24	Ch 2: Science, Matter, Ecosystems	Lab 2: The Scientific Method	MindTap Assignments Post-Lab 2 / Wk 2 Quiz
3	Jan 31	Ch 3: Ecosystems	Lab 3: Tabletop Biosphere	MindTap Assignments Post-Lab 3 / Wk 3 Quiz
4	Feb 7	Review	Unit 1 Exam	
Unit 2: Evolution, Ecology, and Population				
5	Feb 14	Ch 4: Biodiversity and Evolution	Lab 4: Natural Selection	MindTap Assignments Post-Lab 4 / Wk 5 Quiz
6	Feb 21	Ch 5: Species Interactions	Lab 5: Modeling Populations	MindTap Assignments Post-lab 5 / Wk 6 Quiz
7	Feb 28	Ch 6: The Human Population	Lab 6: Population Paradox	MindTap Assignments Post-lab 6 / Wk 7 Quiz
8	Mar 7	Review	Unit 2 Exam	
Unit 3: Energy and Air Pollution				
------	Mar 14	Spring Break	Spring Break	
9	Mar 21	Ch 12: Geology	Lab 7: Last Mountain Movie	MindTap Assignments Post-lab 7 / Wk 9 Quiz
10	Mar 28	Ch 13: Energy Sources	Lab 8: Energy	MindTap Assignments Post-lab 8 / Wk 10 Quiz
11	Apr 4	Ch 15: Air Pollution, Climate	Lab 9: Air Pollution	MindTap Assignments Post-lab 9 / Wk 11 Quiz
12	Apr 11	Review	Unit 3 Exam	
Unit 4: Water Pollution and Other Environmental Hazards				
13	Apr 18	Ch 11: Water Resources	Lab 10: Water Quality	MindTap Assignments Post-lab 10 / Wk 13 Quiz
14	Apr 25	Ch 14: Env Hazards and Human Health	Lab 11: Zoonotic Virus	MindTap Assignments Post-lab 11/ Unit 4 Exam
Last day of class is Apr 28 - No MindTap Assignments accepted after May 2 at 5:00AM. Unit 4 Exam due date TBD.				
In-Person Comprehensive Final Exam May 10 10:15AM-12:45PM				

View the JTCC Academic Calendar.

High Priority Stormwater Issue #2

James River Tributaries 3rd TAC Meeting Summary

May 9, 2022 10-11:30 am at Clover Hill Library

11 TAC members were in attendance.

Introductions of all in attendance (see sign in sheet).
Role of TAC members was explained.
Agenda was reviewed.
Discussed the DEQ Water Wheel and what phase project is currently in.
Project area map was shown.
Q&A Session 1: TAC members ask questions, DEQ responds

1. Is the VSCI monitoring taking place in the spring?
   Yes the monitoring takes place during the spring and fall seasons.

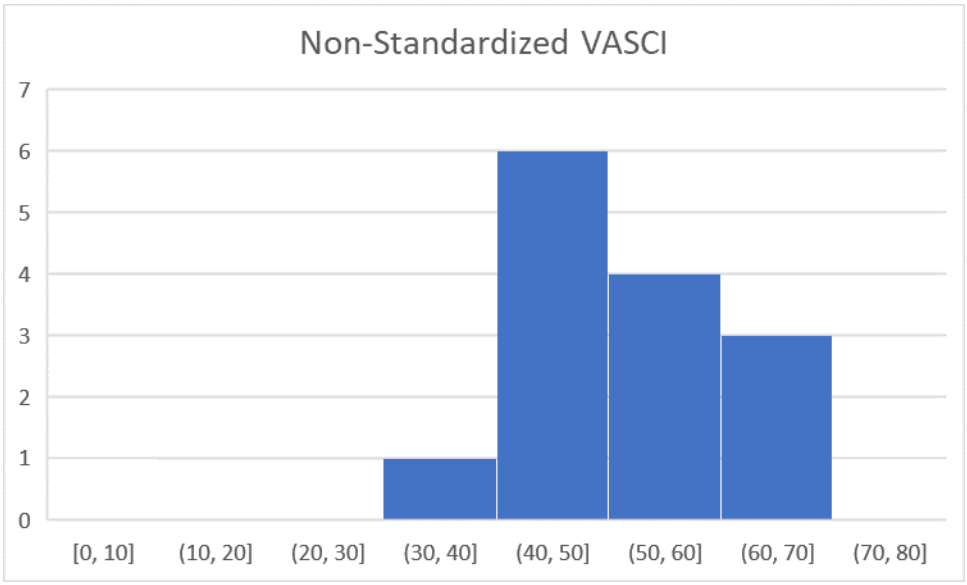
Summary of permitted sources within the watershed was shown.
Typical non-point source contributors were discussed.
Modeling approach (GWLF modeling) and setting targets reviewed.
Sediment and Phosphorus TMDL Endpoint approach- All Forested Load multiplier (ALL for X). All 6 steps for the All for X approach and watershed selection were explained.

Q&A Session 2: TAC members ask questions, DEQ responds

1. Question about regressions in the modeling, were the regressions tested for normality, if not how will that be accounted for? How are you drawing significance based on so few data points? How will DEQ account for variabilities and their threat to validity? Standard normality testing needs to be performed; it will help determine where the outliers are. Which statistical packages were used (R, Strata, SPS, SAS?) If any of these were used normality testing would be included in the analysis.

   The AllForX regression methodology is used to develop targets for pollutants lacking numeric water quality criteria. It is, in most scenarios, an improvement over the previous frequently used methodology of a single reference watershed. The AllForX regression methodology uses multiple comparison watersheds to avoid many of the problems associated with using a single reference watershed, however, it is still limited by the amount and quality of data available within the watersheds. Generally, there are only 15-20 monitoring stations loosely meeting the criteria for inclusion in the AllForX regression for a given TMDL study. This lack of available data limits the applicability of many statistical assessments, including assessing normality of the data. In an otherwise normally distributed data set, assessing a limited number of samples has the potential to lead to a false conclusion that the data set is not normally distributed simply because too few samples were included in the analysis. Due to the limited number of data points generally available for the AllForX regression development, the data are not typically assessed for normality and instead it is assumed that the data are normally distributed based on the nature of the data and the real-world contributing factors.

   With that said, the 15 data points used in developing the AllForX regression were evaluated for normality both visually via histogram comparison to the anticipated normal distribution curve and mathematically using a Chi-Squared goodness-of-fit test as well as a Shapiro-Wilk test for normality, as presented below.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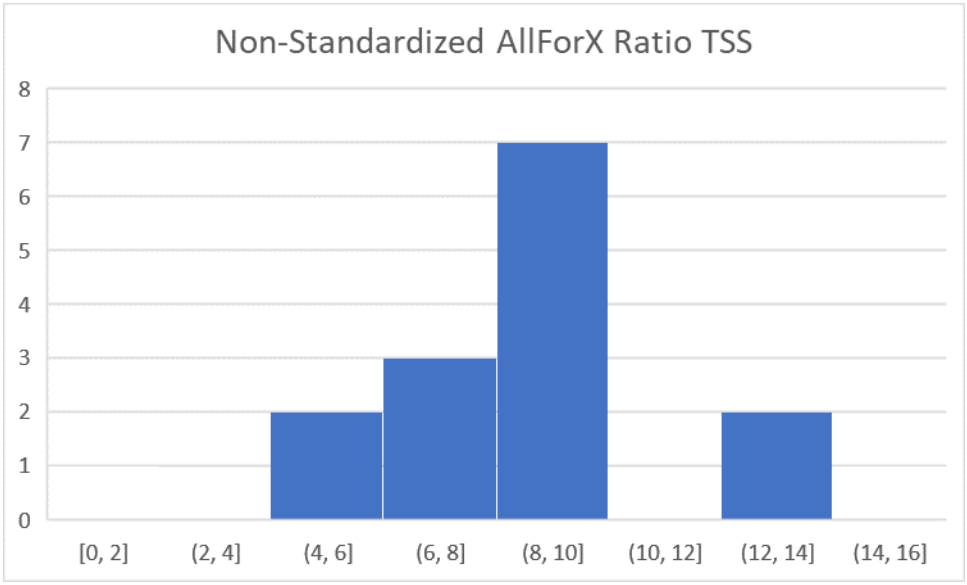
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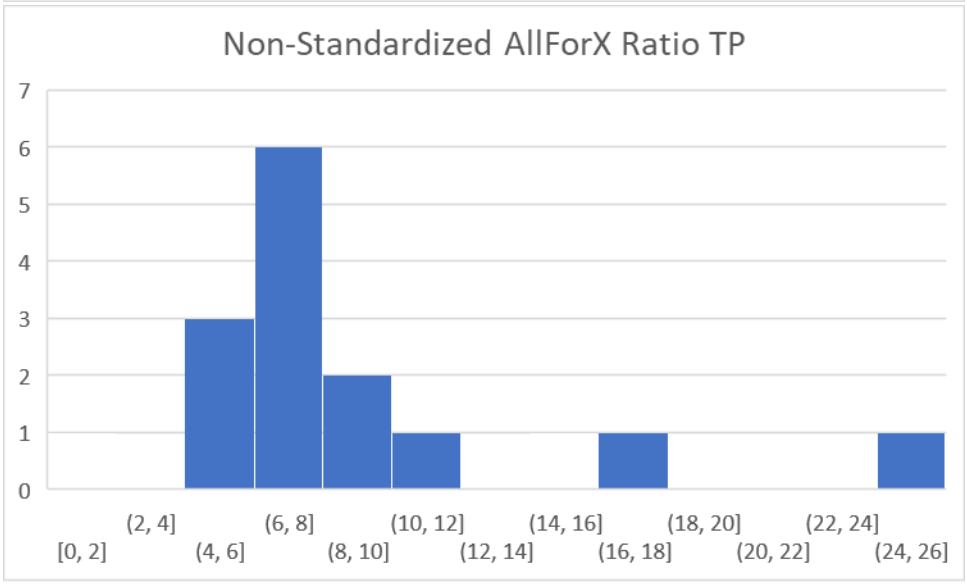
Non-Standardized AllForX Ratio TP
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Data	Visual Normality (histogram)	Chi^2 p-value (assume normality if >0.05)	Shapiro-Wilks W (assume normality if >0.881)
VSCI score	yes	0.949839	0.97257
TSS AllForX ratio	yes	0.388602	0.939049
TP AllForX ratio	possible	0.081738	0.774416

The distribution of VSCI scores and TSS AllForX ratios are clearly identified as normally distributed even with the limited number of samples available. It is possible that the statistical tests would indicate the highest AllForX TP ratio could be classified as an outlier. However, given the complex interactions of factors contributing to stream benthic health, the standard practice for identifying and eliminating data points from use in an AllForX regression is much more reliant on identifying tangible reasoning for elimination associated with various physical parameters. For example, watersheds were eliminated from use in these regressions based on watershed size (far different than study watersheds), land cover distribution (heavy agriculture compared to all the other watersheds), and the presence of additional, largely unrelated, impairments (pH). Using this site specific, physically based reasoning for eliminating a watershed from use in the regression lends greater levels of credibility and utilizes an understanding of watershed health factors in the decision-making process, which provides a more complete explanation to stakeholders than simple elimination via statistical analyses.

Developing a pollutant target for TSS and TP was discussed.
TMDL Equation, Margin of safety and Future growth was reviewed.
Watershed Allocation Scenarios for TSS and TP were shown broken down by pollutant and by watershed.

Q&A Session 3: TAC Member Questions to DEQ:

1. How will these reduction scenarios fit in with the Bay WIP/TMDL? Ex. If a MS4 has reductions in the Chesapeake Bay TMDL are they going to have to make more reductions on top of the reductions they already have to make for the bay TMDL to meet these scenarios?
   TAC members discussed that the overall understanding was that reductions would count for both TMDLs if it was in the watershed, so if you put a BMP in Nuttree it would count towards this TMDL reductions and the Bay TMDL.

2. What was the reason for removing streambank erosion in Nuttree Branch?
   Streambank restoration costs a significant amount per linear foot, so it was not included in the scenario. WSSI will be adding this scenario into each watershed.

3. The proposed streambank erosion reductions vary from each watershed, including Nuttree Branch which has zero reductions. Even in naturally occurring waters streambank erosion occurs, how will that be accounted for?
   The All for X modeling approach compares each watershed to naturally occurring conditions, so the comparison between the two watersheds would account for anything naturally occurring. Streambank restoration costs a significant amount per linear foot, and it was not added in the scenario due to the cost, however we will add this back in to all watersheds.

4. Are any reductions in Nuttree Branch for facilities?
   No reductions are included in scenarios for Nuttree Branch watershed.

5. Reductions are high for Rohoic Creek and the septic is zero which seems low, can that be increased? Also scenario 2 would be the best option for Rohoic Creek.
   We will update the septic allocation to match the reductions to the other phosphorus sources in the watershed.

6. What is the proposed Total Phosphorus (TP) limit for ISW permits for Rohoic Creek? Are the current TP limits based off the Bay TMDL criteria?
   The Industrial Stormwater General Permits (ISWGP) currently do not have effluent limitations for TP. Virginia estimated the loadings from industrial stormwater facilities using actual and estimated facility acreage information and TP, TN, and TSS loading rates from the Northern Virginia Planning District Commission (NVPDC) Guidebook for Screening Urban Nonpoint Pollution Management Strategies (Annandale, VA November 1979), prepared for the Metropolitan Washington Council of Governments. The loading rate for TP in the ISWGP is set at 1.5 lb/ac/yr. Due to characteristics of the watershed, the proposed reductions will be set to 50% of the current loading rate for TP in Rohoic Creek.

7. Rohoic Phosphorus slides - is there a percentage over which DEQ would reduce facilities more to bring down the other percentages that are 90% and might not be achievable?
   ISW facilities in this watershed have a loading rate of Total Phosphorus discharges in their permits of 1.5 lb/ac/yr based on the Chesapeake Bay TMDL. Further reductions are not imposed on facilities through the TMDL process unless reductions above 100% are needed to meet the TMDL. The TP in Rohoic Creek is above that threshold and it's currently proposed to reduce the ISW facilities TP loading rates by 50% more to meet these goals.

8. Some reductions show 80-90%; is that a feasible reduction?
   We want to make sure the TMDL is achievable but also protects water quality. It's not unheard of to have high percent reductions and have work in the watershed performed and still not meet water quality goals. Installed BMPs will improve water quality, and the access of funding to implement those BMPs is the ultimate goal.

9. One TAC member agreed that we should use an even split for all anthropogenic NPS sources, she felt that would be fair.

10. In the Swift Creek watershed the future growth is set at 2%. The county is in the final stages of rezoning 1800 acres of land into industrial that will also include some homes and schools. The future growth should be more along the line of 20%. Contact Steve Hosh, Assistant Director. The planning department has a comprehensive plan and they are currently rezoning; also Powhite Parkway will be extended to Hull Street and that will also bring growth. In addition, the construction permits have increased through the county.
    Chesterfield County has been contacted and DEQ is working with the county and WSSI to determine the proper future growth to apply in this watershed with the information that was provided during the TAC, once this is determined we will share the information with the TAC group.

Timeline was shown and next steps were discussed. Summer of 2022 is the timetable for the report to be completed and for the final meeting to be held.

Benthic TMDL Development for the James River Tributaries Watersheds

Third Technical Advisory Committee Meeting

May 9, 2022

1. Summary of Prior Work

In order to identify the most probable stressors in the James River tributaries watersheds (Bailey Creek, Nuttree Branch, Oldtown Creek, Proctors Creek, Rohoic Creek, and Swift Creek), DEQ used a formal causal analysis approach developed by EPA, known as CADDIS (Causal Analysis Diagnosis Decision Information System). CADDIS results indicate that sediment is the most probable stressor in all watersheds, and Phosphorus is a probable stressor in Oldtown Creek, Rohoic Creek, and Swift Creek. As such, sediment and phosphorus (where applicable) will be a target of the TMDL for each impaired segment.

The computer model selected to develop sediment and phosphorus TMDLs in the James River Tributaries watersheds is the Generalized Watershed Loading Functions (GWLF) model. GWLF is widely used throughout Virginia in developing sediment TMDLs. It is a continuous simulation model operating on a daily timestep for water balance calculations to generate monthly sediment yields for the watershed. The model allows for multiple land cover categories to be incorporated, but spatially it is lumped, meaning that it does not account for the spatial distribution of sources and has no method of spatially routing sources within the watershed. The TMDL study area was divided up into subwatersheds to obtain a more granular assessment of the pollutant loads throughout the watershed. Locations of monitoring stations, junctions of streams, subwatershed size, and broad differences in land cover all guided subwatershed divisions.

2. TMDL Load Inputs

Permitted Sources

There are a variety of permitted sources in the study watersheds, including: VPDES individual permits, VPDES industrial stormwater permits, VPDES concrete permits, domestic sewer permits, MS4 permits, construction general permits, and a vehicle wash permit. **Table 1** through **Table 7** summarizes the different permit types and their allocated loads when applicable.

Table 1. Summary of VPDES Individual Permits in the study area.

Permit No	Receiving Stream	Permitted Discharge (MGD)	Permitted Load (lb/yr TSS)	Permitted Load (lb/yr TP)
VA0006254	Swift Creek	0.5	91,382	10
VA0023426	Swift Creek	0.065	8,910	46

Table 2. Summary of VPDES Industrial Stormwater Permits in study area.

Permit No	Receiving Stream	Allocated Load (lb/yr TSS)	Allocated Load (lb/yr TP)
VAR050594	Bailey Creek	41,743	124.4
VAR050614	Bailey Creek	1,320	4.5
VAR050619	Rohoic Creek	105,160	358.5
VAR051218	Rohoic Creek	3,409	11.6
VAR052059	Rohoic Creek	1,980	6.8
VAR050672	Rohoic Creek	515	1.8
VAR051893	Rohoic Creek	4,532	15.5
VAR050549	Proctors Creek	9,636	32.9
VAR050625	Proctors Creek	8,800	30.0
VAR051023	Proctors Creek	31,108	106.1
VAR051168	Proctors Creek	6,459	22.0
VAR052263	Proctors Creek	1,012	3.5
VAR052314	Proctors Creek	1,320	4.5
VAR050583	Nuttree Branch	6,600	22.5
VAR050666	Nuttree Branch	2,288	7.8
VAR051683	Swift Creek	1,320	4.5
VAR051684	Swift Creek	99,440	339.0
VAR052351	Swift Creek	968	3.3
VAR052185	Proctors Creek	6,424	21.9

Table 3. Summary of VPDES Concrete Permits in study area.

Permit No	Receiving Stream	Load Type	Allocated Load (lb/yr TSS)	Allocated Load (lb/yr TP)
VAG110231	Bailey Creek	Stormwater	1944.8	6.6
VAG110158	Rohoic Creek	Stormwater	1166.0	4.0
VAG110171	Rohoic Creek	Stormwater	1592.8	5.4
		Process Water	5482.9	64.9
VAG110159	Nuttree Branch	Stormwater	325.6	1.1
VAG110157	Proctors Creek	Stormwater	1188.0	4.1

Table 4. Summary of Domestic Sewer Permits in study area.

Permit No	Receiving Stream	Allocated Load (lb/yr TSS)	Allocated Load (lb/yr P)
VAG404286	Swift Creek	91.44	4.30
VAG404275	Swift Creek	91.44	4.30
VAG404357	Swift Creek	91.44	4.30

Table 5. Summary of MS4 Permits in study area.

Permit No	Permitted Entity
VAR040013	City of Petersburg
VAR040009	City of Colonial Heights
VAR040015	City of Hopewell
VA0088609	Chesterfield County
VAR040006	Central State Hospital
VAR040007	Fort Lee
VA0092975	VDOT
VAR040110	John Tyler Community College

While a permitted entity, MS4's are considered a nonpoint source. To assign a load to each MS4, the permit's area and underlying land cover is extracted and the modelled pollutant annual loading rates for each land cover type are used to assign an overall annual loading rate for the MS4's permitted area within each watershed. The MS4 area within each watershed is then removed from general nonpoint source loading calculations to avoid double counting. MS4 loading is detailed for each watershed in **Section 5.**

Table 6. Summary of disturbed area in each watershed from Construction General Permits.

Receiving Stream	Estimated Potential Disturbed Area (ac)
Bailey Creek	16.7
Nuttree Branch	64.4
Oldtown Creek	40.2
Proctors Creek	297.8
Rohoic Creek	64.9
Swift Creek	652.9

All active CGP's within the study watersheds were assessed, and the associated annual disturbed area was calculated. This active annual disturbance is assumed to be representative of typical construction related disturbance on a yearly basis and was used to assign an annual load for all CGP's in each watershed. Additionally, the calculation assumed that erosion and sediment control measures were able to capture 85% of all sediment (and associated phosphorous) leaving the site.

Table 7. Summary of Vehicle Wash Permit in study area.

Permit No	Permitted Discharge (MGD)	Permitted Load (lb/ yr TSS)	Permitted Load (lb/ yr TP)
VAG750205	0.0003	54.8	0.7

Questions:
Do any TAC members have additional input on permitted sources we may have missed?

Does the amount of disturbed area from CGP's seem reasonable, does an 85% removal efficiency seem accurate?

Existing BMPs

To ensure credit is given for prior work completed in the watershed, data on BMPs within the watershed tracked by the Department of Conservation and Recreation has been compiled (**Table 8**) and associated reductions to sediment loading will be subtracted from the existing loads prior to allocation scenario development. BMP reductions were based on Chesapeake Bay TMDL Model guidance documents and appropriate changes in land cover within the model.

Table 8. DCR BMP data within the James River Tributaries watersheds.

Practice Code	Practice	Watershed	Reduction (lb/yr TSS)	Reduction (lb/yr TP)
SL-6	Stream Exclusion With Grazing Land Management	Swift	5,966	26.9
SL-9	Grazing Land Management	Swift	3,757	23.2
FR-1	Afforestation of Crop, Hay and Pasture Land	Swift	716	3.4

Questions:
Do any TAC members know of BMP's we don't have listed?

3. Margin of Safety and Future Growth

To account for uncertainties inherent in model outputs, a margin of safety (MOS) is incorporated into the TMDL development process. The MOS can be implicit, explicit, or a combination of the two. An implicit MOS involves incorporating conservative assumptions into the modeling process to ensure that the final TMDL is protective of water quality in light of the unavoidable uncertainty in the modeling process. A MOS can also be incorporated explicitly into the TMDL development by setting aside a portion of the TMDL.

This TMDL includes both implicit and explicit MOSs. An example of implicit MOS assumptions incorporated into this TMDL are the inclusion of permitted loads at their maximum permitted rates, even when data shows that they are consistently discharging well below that threshold. An explicit MOS of 10% is also included in the TMDLs.

An allocation of 2% of the total load is specifically set aside for future growth within the watersheds. This leaves flexibility in the plan for future permitted loads to be added within the watersheds, as the development of a TMDL looks at a snapshot in time of a dynamic system within the watershed and is not meant to prevent future economic growth.

Questions:
Do the margin of safety and future growth allocations seem appropriate for this watershed?

4. TMDL Pollutant Reduction Targets

TMDL development requires an endpoint or water quality goal to target for the impaired watershed(s). Many pollutants have numeric water quality criteria set in regulatory documentation, and it is assumed that compliance with these numeric criteria will lead the waterbody to achieve support of all designated uses. However, sediment does not have numeric criteria established, as the acceptable levels of sediment is expected to vary from stream to stream based on a range of contributing factors. Therefore, an alternative method must be used to determine the water quality target for sediment TMDLs.

The method proposed to set TMDL endpoint loads for the James River tributaries watersheds is called the "all-forest load multiplier" (AllForX) approach, which has been used in developing many sediment TMDLs in Virginia since 2014. AllForX is the ratio of the simulated pollutant load under existing conditions to the pollutant load from an all-forest simulated condition for the same watershed. In other words, AllForX is an indication of how much higher current sediment loads are above an undeveloped condition. These multipliers were calculated for a total of 15 watersheds of similar size and within the same ecoregion as the TMDL watersheds. These watersheds included both unimpaired and impaired streams to represent a wide distribution of current conditions. Watersheds used in developing the VSCI and AllForX regression should be similar in size and

located near the study watershed to minimize differences in flow regime, soils, and other physiographic properties. Additionally, there must be adequate and recent VSCI data for a watershed to be a useful data point.

A regression was then developed between the Virginia Stream Condition Index (VSCI) scores at monitoring stations and the corresponding AllForX ratio calculated for each station. **Figure 1** and **Figure 2** show the regression developed for James River tributaries watersheds. Based on the regression, a VSCI score of 60 corresponded to a target AllForX ratio of 5.86 for TSS and 3.37 for phosphorus. This means that the TMDL streams are expected to achieve consistently healthy benthic conditions if sediment and phosphorus loads are less than 5.86 and 3.37 times the simulated load of an all-forested watershed, respectively. The AllForX targets were then used to determine the allowable pollutant TMDL loads in the study watersheds (**Table 9** and **Table 10**).

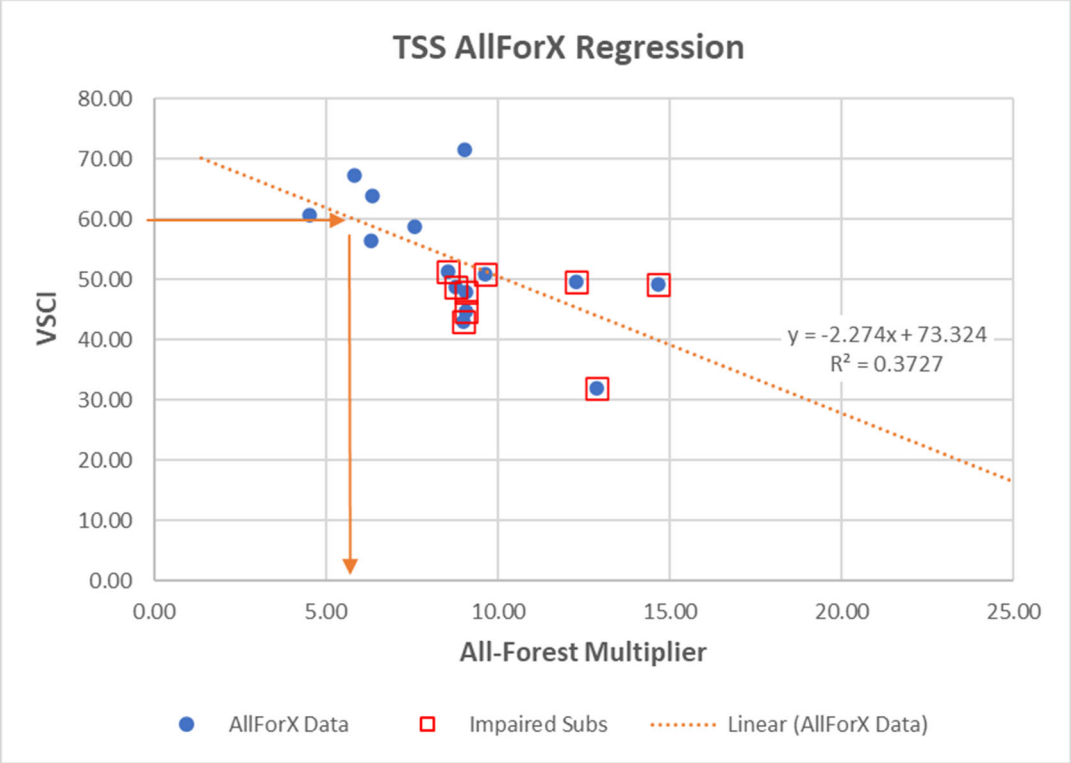


Figure 1. AllforX TSS regression developed for the James River tributaries TMDL.

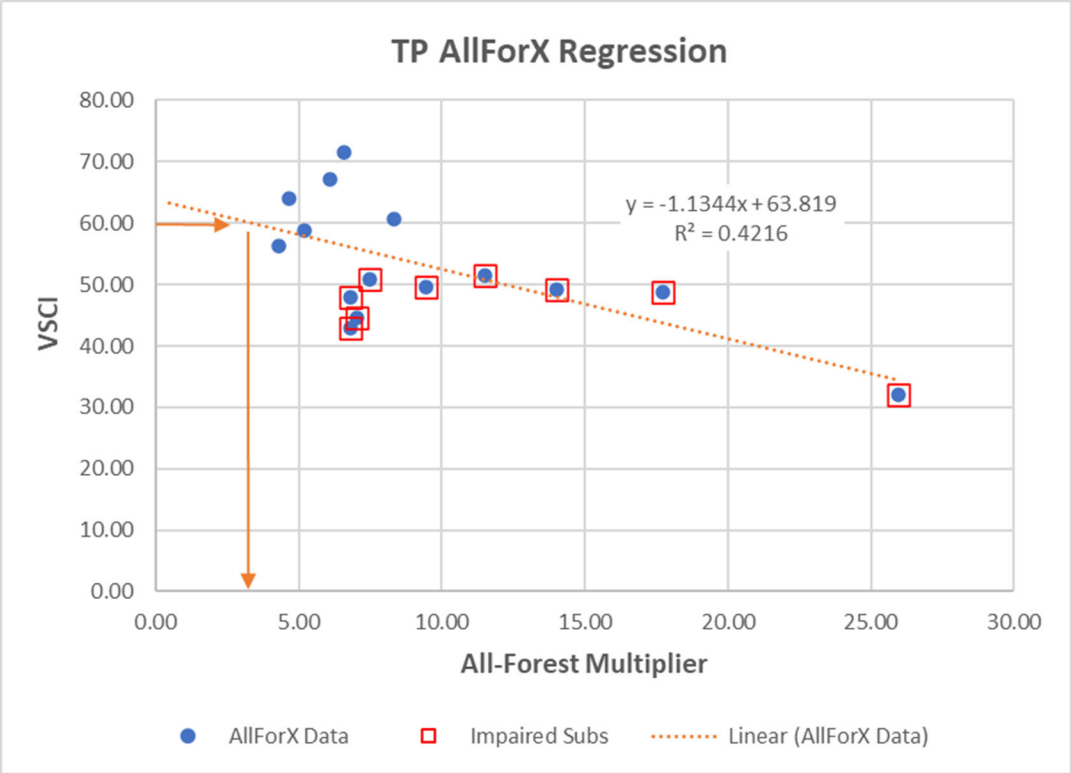


Figure 2. AllforX TP regression developed for the James River tributaries TMDL.

Table 9. Target Sediment loading rates and reductions as determined by AllForX regression for the James River tributaries TMDL. Existing loads incorporate allowable Sediment loads from permits and any BMP's present in the watershed. *Swift creek existing sediment load doesn't include Nuttree Branch.

Impaired Stream	**TSS Existing** (lb/yr)	**TSS AllForest** (lb/yr)	**TSS Target** (lb/yr)	**Estimated % Reduction**
Bailey Creek	2109998	204174	1196315	43.3
Nuttree Branch	642279	90928	532771	17.0
Oldtown Creek	1435574	106696	625162	56.5
Proctors Creek	2871021	174248	1020966	64.4
Rohoic Creek	1150002	110709	648674	43.6
Swift Creek	16898614	1875265	10987699	35.0

Table 10. Target Phosphorus loading rates and reductions as determined by AllForX regression for the James River tributaries TMDL. Existing loads incorporate allowable TP loads from permits and any BMP's present in the watershed.

Impaired Stream	TP Existing (lb/yr)	TP AllForest (lb/yr)	TP Target (lb/yr)	Estimated % Reduction
Oldtown Creek	2,607	269	904	65.3
Rohoic Creek	2,146	194	654	69.5
Swift Creek	18,930	2,594	8,730	53.9

Questions:
Is the general concept applied in developing the AllForX regression and target loads understandable?

Is the range of required reductions reasonable?

5. TMDL Allocation Scenarios

Preliminary sediment allocation scenarios are presented for the impaired streams in **Table 11** through **Table 16** (TSS) and **Table 17** through **Table 19** (TP). Each table presents a range of scenarios, common ones include:

- Even reductions across sources
- Higher reductions on agricultural loads
- Higher reductions on urban loads
- Higher or lower intensity of stream restoration (streambank erosion)

The allocation scenario reductions are higher overall than the predicted reductions from **Table 9** and **Table 10**, which is due to the inclusion of explicit MOS and Future Growth loads.

Questions:

Are there any questions on the reasoning behind the allocation scenarios?

Which allocation scenarios do you prefer? Is a reasonable option presented for each watershed? Are there other scenarios that would be useful to see?

Table 11. Preliminary allocation scenarios for Bailey Creek sediment load.

Bailey Creek Sediment (2-BLY005.73)		**Scenario 1**		**Scenario 2**		**Scenario 3**		**Scenario 4**	
Source	Existing	Red.	Allocation	Red.	Allocation	Red.	Allocation	Red.	Allocation
	TSS (lb/yr)	*%*	*TSS (lb/yr)*	*%*	*TSS (lb/yr)*	*%*	*TSS (lb/yr)*	*%*	*TSS (lb/yr)*
Cropland	26,619	54.2	12,191	39.7	16,051	77.1	6,096	50.0	13,309
Hay	6,796	54.2	3,113	39.7	4,098	77.1	1,556	50.0	3,398
Pasture	6,592	54.2	3,019	39.7	3,975	77.1	1,510	50.0	3,296
Forest	52,787	-	52,787	-	52,787	-	52,787	-	52,787
Trees	65,786	-	65,786	-	65,786	-	65,786	-	65,786
Shrub	15,245	-	15,245	-	15,245	-	15,245	-	15,245
Harvested	38,881	54.2	17,807	39.7	23,445	77.1	8,904	50.0	19,440
Wetland	56,735	-	56,735	-	56,735	-	56,735	-	56,735
Baren	216,716	54.2	99,256	60.0	86,686	45.0	119,194	50.0	108,358
Turfgrass	78,632	54.2	36,014	60.0	31,453	45.0	43,248	50.0	39,316
Developed Pervious	10,935	54.2	5,008	60.0	4,374	45.0	6,014	50.0	5,468
Developed Impervious	219,160	54.2	100,375	60.0	87,664	45.0	120,538	50.0	109,580
Streambank Erosion	410,560	54.2	188,037	39.7	247,568	77.1	94,018	67.5	133,432
Const. Permits	33,496	-	33,496	-	33,496	-	33,496	-	33,496
ISW Permit	43,063	-	43,063	-	43,063	-	43,063	-	43,063
Other Permits	1,945	-	1,945	-	1,945	-	1,945	-	1,945
MS4	695,653	54.2	318,609	60.0	278,261	45.0	382,609	50.0	347,826
MOS (10%)	62,516	-	119,631	-	119,631	-	119,631	-	119,631
Future Growth (2%)	12,503	-	23,926	-	23,926	-	23,926	-	23,926
TOTAL	**2,054,620**		**1,196,043**		**1,196,190**		**1,196,301**		**1,196,038**
	0% red.		**41.8%**		**41.8%**		**41.8%**		**41.8%**

Table 12. Preliminary allocation scenarios for Nuttree Branch sediment load.

Nuttree Branch Sediment (2-NUT000.62)		**Scenario 1**		**Scenario 2**		**Scenario 3**	
Source	Existing	Red.	Allocation	Red.	Allocation	Red.	Allocation
	TSS (lb/yr)	*%*	*TSS (lb/yr)*	*%*	*TSS (lb/yr)*	*%*	*TSS (lb/yr)*
Cropland	0	-	0	-	0	-	0
Hay	0	-	0	-	0	-	0
Pasture	0	-	0	-	0	-	0
Forest	16,414	-	16,414	-	16,414	-	16,414
Trees	32,267	-	32,267	-	32,267	-	32,267
Shrub	10,827	-	10,827	-	10,827	-	10,827
Harvested	0	-	0	-	0	-	0
Wetland	4,520	-	4,520	-	4,520	-	4,520
Barren	0	-	0	-	0	-	0
Turfgrass	44,645	51.6	21,608	58.9	18,349	0.0	44,645
Developed Pervious	3,547	51.6	1,717	58.9	1,458	64.9	1,245
Developed Impervious	164,682	51.6	79,706	58.9	67,684	64.9	57,803
Streambank Erosion	68,125	51.6	32,973	0.0	68,125	0.0	68,125
Const. Permits	129,593	-	129,593	-	129,593	-	129,593
ISW Permits	8,888	-	8,888	-	8,888	-	8,888
Other Permits	326	-	326	-	326	-	326
MS4	267,548	51.6	129,493	58.9	109,962	64.9	93,909
MOS (10%)	53,277	-	53,277	-	53,277	-	53,277
Future Growth (2%)	10,655	-	10,655	-	10,655	-	10,655
TOTAL	**815,314**		**532,264**		**532,346**		**532,495**
	0% red.		**34.7%**		**34.7%**		**34.7%**

Table 13. Preliminary allocation scenarios for Oldtown Creek sediment load.

Oldtown Creek Sediment (2-OTC001.54)		**Scenario 1**		**Scenario 2**		**Scenario 3**	
Source	Existing	Red.	Allocation	Red.	Allocation	Red.	Allocation
	TSS (lb/yr)	*%*	*TSS (lb/yr)*	*%*	*TSS (lb/yr)*	*%*	*TSS (lb/yr)*
Cropland	159,181	72.3	44,093	40.0	95,509	81.5	29,448
Hay	6,105	72.3	1,691	40.0	3,663	81.5	1,129
Pasture	1,690	72.3	468	40.0	1,014	81.5	313
Forest	37,252	-	37,252	-	37,252	-	37,252
Trees	19,723	-	19,723	-	19,723	-	19,723
Shrub	5,024	-	5,024	-	5,024	-	5,024
Harvested	24,671	72.3	6,834	40.0	14,802	81.5	4,564
Wetland	37,547	-	37,547	-	37,547	-	37,547
Barren	11,287	72.3	3,127	77.7	2,517	81.5	2,088
Turfgrass	31,175	72.3	8,635	77.7	6,952	81.5	5,767
Developed Pervious	3,218	72.3	891	77.7	718	81.5	595
Developed Impervious	179,117	72.3	49,615	77.7	39,943	81.5	33,137
Streambank Erosion	337,834	72.3	93,580	77.7	75,337	45.0	185,809
Const. Permits	80,810	-	80,810	-	80,810	-	80,810
MS4	576,586	72.3	159,714	77.7	128,579	81.5	106,668
MOS (10%)	62,516	-	62,516	-	62,516	-	62,516
Future Growth (2%)	12,503	-	12,503	-	12,503	-	12,503
TOTAL	**1,586,239**		**624,024**		**624,408**		**624,894**
	0% red.		**60.7%**		**60.6%**		**60.6%**

Table 14. Preliminary allocation scenarios for Proctors Creek sediment load.

Proctors Creek Sediment (2-PCT002.46)		**Scenario 1**		**Scenario 2**	
Source	Existing	Red.	Allocation	Red.	Allocation
	TSS (lb/yr)	*%*	*TSS (lb/yr)*	*%*	*TSS (lb/yr)*
Cropland	8,824	88.4	1,024	0.0	8,824
Hay	2,111	88.4	245	0.0	2,111
Pasture	3,043	88.4	353	0.0	3,043
Forest	36,463	-	36,463	-	36,463
Trees	45,160	-	45,160	-	45,160
Shrub	8,735	-	8,735	-	8,735
Harvested	0	-	0	-	0
Wetland	68,883	-	68,883	-	68,883
Barren	199,632	88.4	23,157	88.9	22,159
Turfgrass	58,684	88.4	6,807	88.9	6,514
Developed Pervious	4,151	88.4	482	88.9	461
Developed Impervious	361,063	88.4	41,883	88.9	40,078
Streambank Erosion	955,902	88.4	110,885	88.9	106,105
Const. Permits	373,567	-	373,567	-	373,567
ISW Permits	64,759	-	64,759	-	64,759
Other Permits	1,243	-	1,243	-	1,243
MS4	973,087	88.4	112,878	88.9	108,013
MOS (10%)	102,097	-	102,097	-	102,097
Future Growth (2%)	20,419	-	20,419	-	20,419
TOTAL	**3,287,822**		**1,019,039**		**1,018,633**
	0% red.		**69.0%**		**69.0%**

Table 15. Preliminary allocation scenarios for Rohoic Creek sediment load.

Rohoic Creek Sediment (2-RHC000.58)		**Scenario 1**		**Scenario 2**		**Scenario 3**	
Source	Existing	Red.	Allocation	Red.	Allocation	Red.	Allocation
	TSS (lb/yr)	*%*	*TSS (lb/yr)*	*%*	*TSS (lb/yr)*	*%*	*TSS (lb/yr)*
Cropland	52,142	71.0	15,121	32.5	35,196	80.0	10,428
Hay	16,407	71.0	4,758	32.5	11,075	80.0	3,281
Pasture	4,153	71.0	1,204	32.5	2,803	80.0	831
Forest	22,268	-	22,268	-	22,268	-	22,268
Trees	31,909	-	31,909	-	31,909	-	31,909
Shrub	9,145	-	9,145	-	9,145	-	9,145
Harvested	4,129	71.0	1,197	32.5	2,787	80.0	826
Wetland	21,337	-	21,337	-	21,337	-	21,337
Barren	0	-	0	-	0	-	0
Turfgrass	68,255	71.0	19,794	75.0	17,064	80.0	13,651
Developed Pervious	9,356	71.0	2,713	75.0	2,339	80.0	1,871
Developed Impervious	198,801	71.0	57,652	75.0	49,700	80.0	39,760
Streambank Erosion	247,174	71.0	71,681	75.0	61,794	50.3	122,846
Const. Permits	130,544	-	130,544	-	130,544	-	130,544
ISW Permit	115,596	-	115,596	-	115,596	-	115,596
Other Permits	3,371	-	3,371	-	3,371	-	3,371
MS4	215,417	71.0	62,471	75.0	53,854	80.0	43,083
MOS (10%)	64,867	-	64,867	-	64,867	-	64,867
Future Growth (2%)	12,973	-	12,973	-	12,973	-	12,973
TOTAL	**1,227,843**		**648,601**		**648,621**		**648,587**
	0% red.		**47.2%**		**47.2%**		**47.2%**

Table 16. Preliminary allocation scenarios for Swift Creek sediment load.

Swift Creek Sediment (2-SFT012.84)		**Scenario 1**		**Scenario 2**		**Scenario 3**		**Scenario 4**	
Source	Existing	Red.	Allocation	Red.	Allocation	Red.	Allocation	Red.	Allocation
	TSS (lb/yr)	*%*	*TSS (lb/yr)*	*%*	*TSS (lb/yr)*	*%*	*TSS (lb/yr)*	*%*	*TSS (lb/yr)*
Cropland	119,508	56.2	52,345	36.9	75,410	80.5	23,304	0.0	119,508
Hay	26,214	56.2	11,482	36.9	16,541	80.5	5,112	0.0	26,214
Pasture	144,675	56.2	63,368	36.9	91,290	80.5	28,212	0.0	144,675
Forest	305,707	-	305,707	-	305,707	-	305,707	-	305,707
Trees	142,330	-	142,330	-	142,330	-	142,330	-	142,330
Shrub	19,858	-	19,858	-	19,858	-	19,858	-	19,858
Harvested	70,205	56.2	30,750	36.9	44,299	80.5	13,690	0.0	70,205
Wetland	134,260	-	134,260	-	134,260	-	134,260	-	134,260
Barren	668,007	56.2	292,587	36.9	421,513	80.5	130,261	57.5	283,903
Turfgrass	155,485	56.2	68,102	36.9	98,111	80.5	30,320	57.5	66,081
Developed Pervious	20,965	56.2	9,183	36.9	13,229	80.5	4,088	57.5	8,910
Developed Impervious	1,516,621	56.2	664,280	36.9	956,988	80.5	295,741	57.5	644,564
Streambank Erosion	10,969,179	56.2	4,804,500	65.0	3,839,213	45.0	6,033,049	57.5	4,661,901
Const. Permits	1,314,329	-	1,314,329	-	1,314,329	-	1,314,329	-	1,314,329
ISW Permits	101,728	-	101,728	-	101,728	-	101,728	-	101,728
Other Permits	100,566	-	100,566	-	100,566	-	100,566	-	100,566
MS4	2,309,800	56.2	1,011,692	36.9	1,457,484	80.5	450,411	57.5	981,665
Nuttree Branch TMDL Target	532,771	-	532,771	-	532,771	-	532,771	-	532,771
MOS (10%)	1,098,770	-	1,098,770	-	1,098,770	-	1,098,770	-	1,098,770
Future Growth (2%)	219,754	-	219,754	-	219,754	-	219,754	-	219,754
TOTAL	**19,970,732 0.0%**		**10,978,362 45.0%**		**10,984,150 45.0%**		**10,984,260 45.0%**		**10,977,699 45.0%**

Table 17. Preliminary allocation scenarios for Oldtown Creek Phosphorus load.

Oldtown Creek Phosphorous (2-OTC001.54)		**Scenario 1**		**Scenario 2**		**Scenario 3**	
Source	Existing	Red.	Allocation	Red.	Allocation	Red.	Allocation
	TP (lb/yr)	*%*	*TP (lb/yr)*	*%*	*TP (lb/yr)*	*%*	*TP (lb/yr)*
Cropland	102.4	76.8	23.8	50.0	51.2	78.7	21.8
Hay	84.8	76.8	19.7	50.0	42.4	78.7	18.1
Pasture	3.1	76.8	0.7	50.0	1.5	78.7	0.6
Forest	18.0	-	18.0	-	18.0	-	18.0
Trees	13.4	-	13.4	-	13.4	-	13.4
Shrub	0.9	-	0.9	-	0.9	-	0.9
Harvested	7.1	76.8	1.7	50.0	3.6	78.7	1.5
Wetland	4.1	-	4.1	-	4.1	-	4.1
Barren	1.3	76.8	0.3	79.2	0.3	78.7	0.3
Turfgrass	238.6	76.8	55.3	79.2	49.6	78.7	50.8
Developed Pervious	4.7	76.8	1.1	79.2	1.0	78.7	1.0
Developed Impervious	394.1	76.8	91.4	79.2	82.0	78.7	83.9
Streambank Erosion	118.2	76.8	27.4	79.2	24.6	40.0	70.9
Septic	0.9	0.0	0.9	0.0	0.9	0.0	0.9
Groundwater	150.9	-	150.9	-	150.9	-	150.9
Construction Permits	58.2	-	58.2	-	58.2	-	58.2
MS4	1,406.5	76.8	326.3	79.2	292.5	78.7	299.6
MOS (10%)	90.4		90.4		90.4		90.4
Future Growth (2%)	18.1		18.1		18.1		18.1
TOTAL	**2,716**		**903**		**904**		**904**
	0% red.		**66.8%**		**66.7%**		**66.7%**

Table 18. Preliminary allocation scenarios for Swift Creek Phosphorus load.

Swift Creek Sediment (2-SFT012.84)		**Scenario 1**		**Scenario 2**		**Scenario 3**	
Source	Existing	Red.	Allocation	Red.	Allocation	Red.	Allocation
	TP (lb/yr)	*%*	*TP (lb/yr)*	*%*	*TP (lb/yr)*	*%*	*TP (lb/yr)*
Cropland	70.9	71.8	20.0	0.0	70.9	80.2	14.0
Hay	362.6	71.8	102.3	0.0	362.6	80.2	71.8
Pasture	190.9	71.8	53.8	0.0	190.9	80.2	37.8
Forest	143.3	-	143.3	-	143.3	-	143.3
Trees	115.1	-	115.1	-	115.1	-	115.1
Shrub	2.5	-	2.5	-	2.5	-	2.5
Harvested	22.6	71.8	6.4	0.0	22.6	80.2	4.5
Wetland	7.9	-	7.9	-	7.9	-	7.9
Barren	43.7	71.8	12.3	74.9	11.0	80.2	8.6
Turfgrass	1,266.9	71.8	357.3	74.9	318.0	80.2	250.8
Developed Pervious	35.3	71.8	10.0	74.9	8.9	80.2	7.0
Developed Impervious	4,236.7	71.8	1,194.8	74.9	1,063.4	80.2	838.9
Streambank Erosion	4,382.9	71.8	1,236.0	74.9	1,100.1	50.0	2,191.4
Septic	17.4	0.0	17.4	0.0	17.4	0.0	17.4
Groundwater	1,587.9	-	1,587.9	-	1,587.9	-	1,587.9
Construction Permits	946.8	-	946.8	-	946.8	-	946.8
ISW Permits	346.8	-	346.8	-	346.8	-	346.8
Other Permits	78.5	-	78.5	-	78.5	-	78.5
MS4	5,071.3	71.8	1,430.1	74.9	1,272.9	80.2	1,004.1
MOS (10%)	873.0		873.0		873.0		873.0
Future Growth (2%)	174.6		174.6		174.6		174.6
TOTAL	**19,978**		**8,717**		**8,715**		**8,723**
	0% red.		**56.4%**		**56.4%**		**56.3%**

Table 19. Target phosphorus load in Rohoic Creek was unable to be achieved due to existing permitted point-source loading.

Rohoic Creek Sediment (2-RHC000.58)		**Scenario 1**		**Scenario 2**	
Source	Existing	Red.	Allocation	Red.	Allocation
	TP (lb/yr)	*%*	*TP (lb/yr)*	*%*	*TP (lb/yr)*
Cropland	31.3	100	0.0	91.8	2.6
Hay	113.1	100	0.0	91.8	9.3
Pasture	4.1	100	0.0	91.8	0.3
Forest	9.7	-	9.7	-	9.7
Trees	14.3	-	14.3	-	14.3
Shrub	1.5	-	1.5	-	1.5
Harvested	1.2	100	0.0	91.8	0.1
Wetland	2.6	-	2.6	-	2.6
Barren	0.0	100	0.0	91.8	0.0
Turfgrass	290.9	100	0.0	91.8	23.9
Developed Pervious	9.7	100	0.0	91.8	0.8
Developed Impervious	437.4	100	0.0	91.8	35.9
Streambank Erosion	86.5	100	0.0	91.8	7.1
Septic	0.9	0	0.9	0.0	0.9
Groundwater	122.3	-	122.3	-	122.3
Construction Permits	94.0	-	94.0	-	94.0
ISW Permits	394.1	-	394.1	50.0	197.0
Other Permits	9.4	-	9.4	-	9.4
MS4	523.4	100	0.0	91.8	17.9
MOS (10%)	65.4		65.4		65.4
Future Growth (2%)	13.1		13.1		13.1
TOTAL	**2,225**		**727**		**653**
	0% red.		**67.3%**		**70.6%**


DEQ
VIRGINIA DEPARTMENT OF
ENVIRONMENTAL QUALITY

James River Tributaries Watershed Study

Technical Advisory Committee Meeting #3

Kelley West, TMDL Coordinator, Virginia Department of Environmental Quality

Thomas Schubert, EIT, Wetland Studies and Solutions, Inc.

May 9, 2022

Role of TAC Members

- To play an advisory role on technical aspects of the TMDL to:
  - Keep the TMDL:
    - Realistic
    - Reasonable
    - Reflective of local conditions
  - Provide Feedback on
    - Stressors to the benthic community
    - Land use
    - Pollutant sources
    - Key stakeholders and community meetings

- Examples of things TAC members have influence over:
  - Identification of missing sources
  - TMDL watershed endpoint concentrations
  - Allocations of the TMDL to the different sources

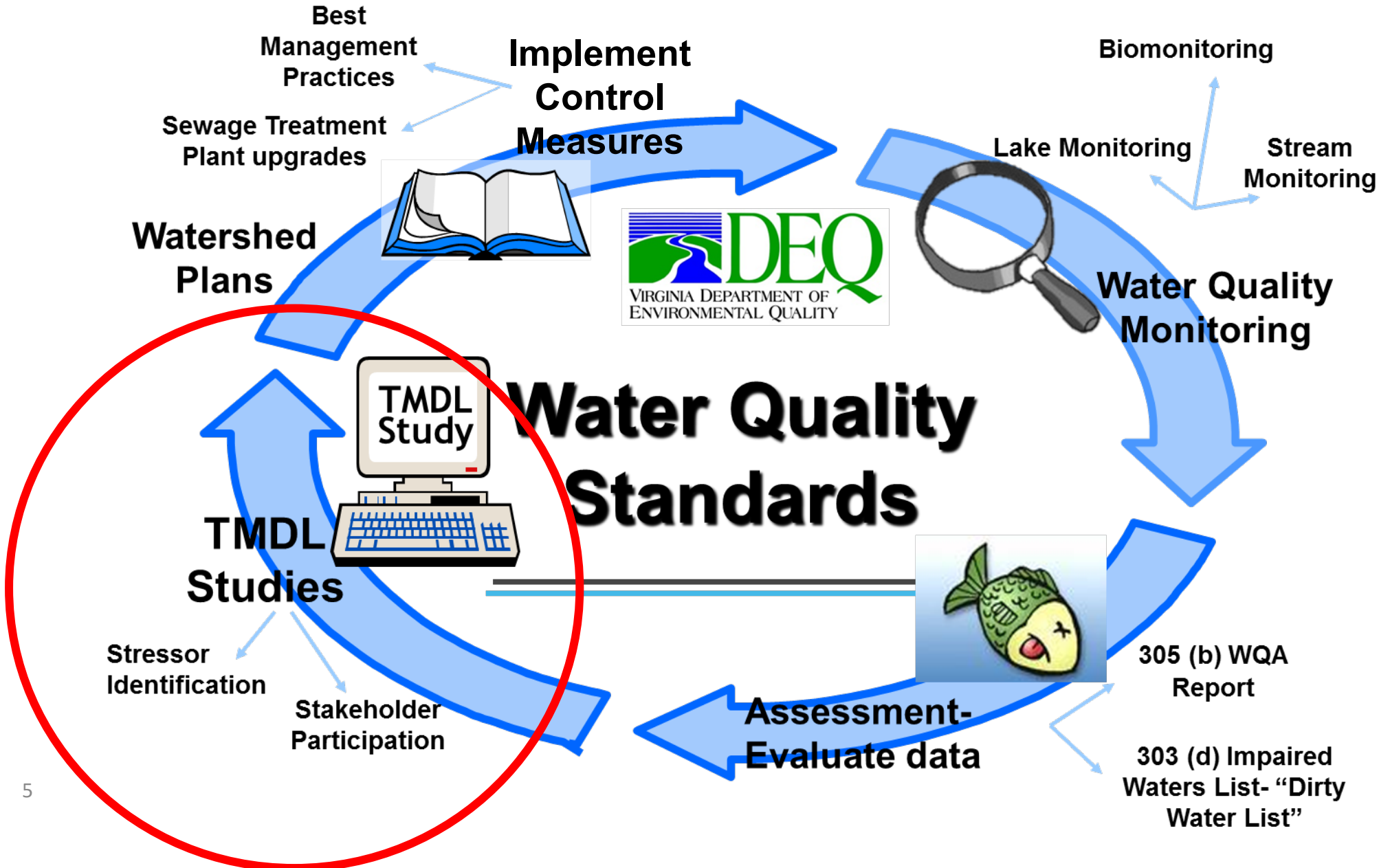
DEQ

Agenda

- Introductions
- Project Review
- TMDL Equation
  - Point Sources
  - Nonpoint Sources
  - Margin of Safety and Future Growth
- Draft Allocation Scenarios
- Next Steps

DEQ

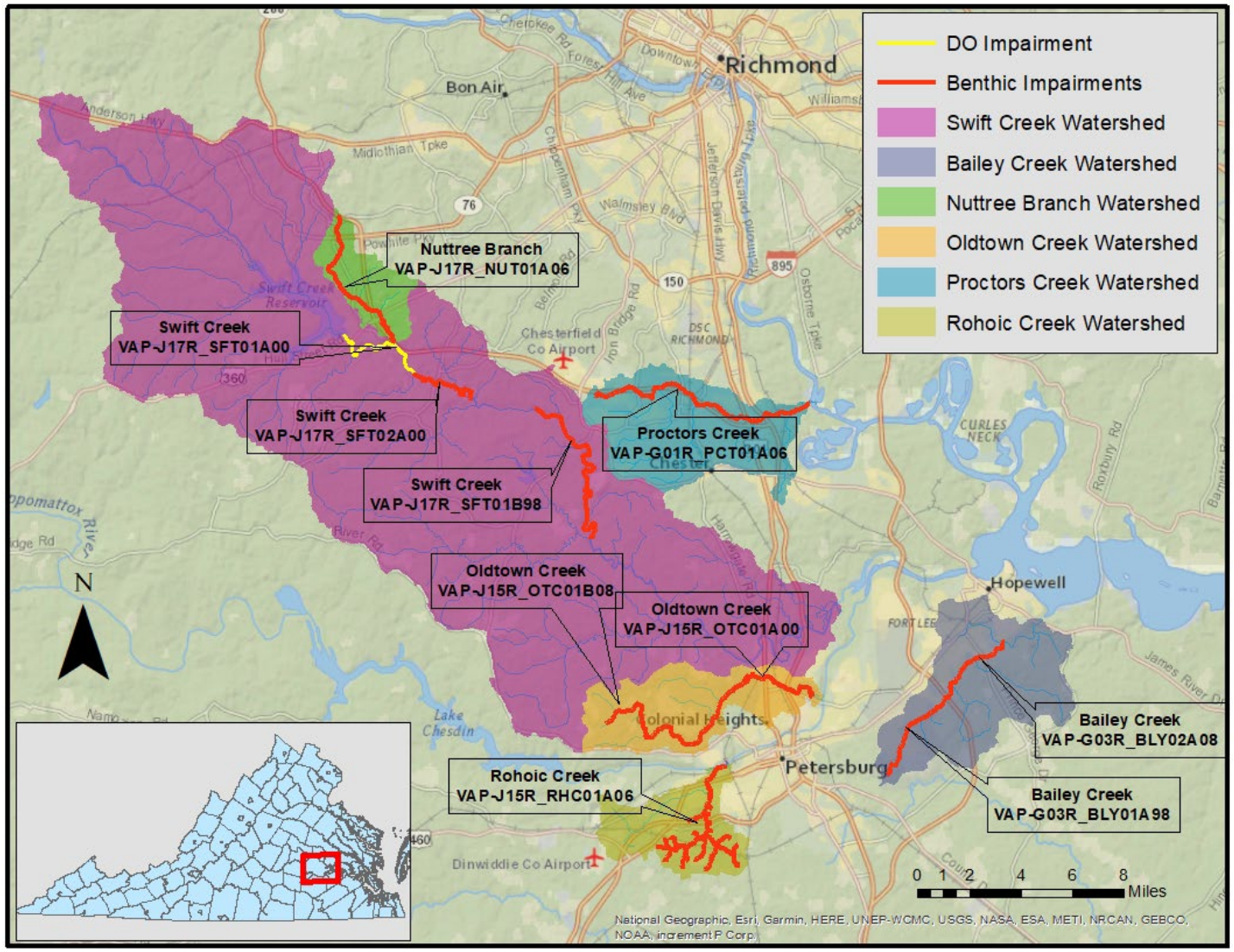
DEQ's Water Wheel



DEQ

James River Tributaries Project Area

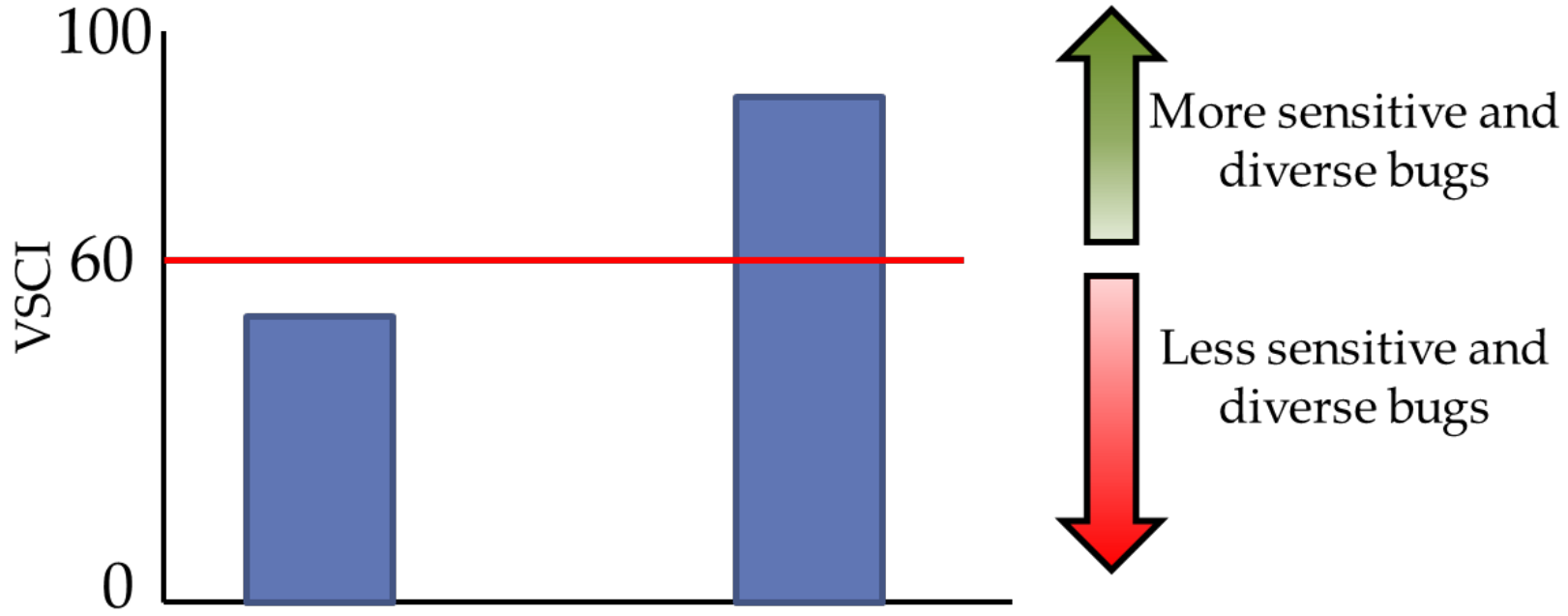
- Chesterfield, Dinwiddie, and Prince George Counties
- Cities of Colonial Heights, Hopewell, and Petersburg
- 6 impaired streams
- 54 miles of impaired streams
- Benthic impairment caused by Sediment and Phosphorus (only Bailey, Oldtown and Swift)
- DO Impairment on Swift Creek



DEQ

Virginia Stream Condition Index

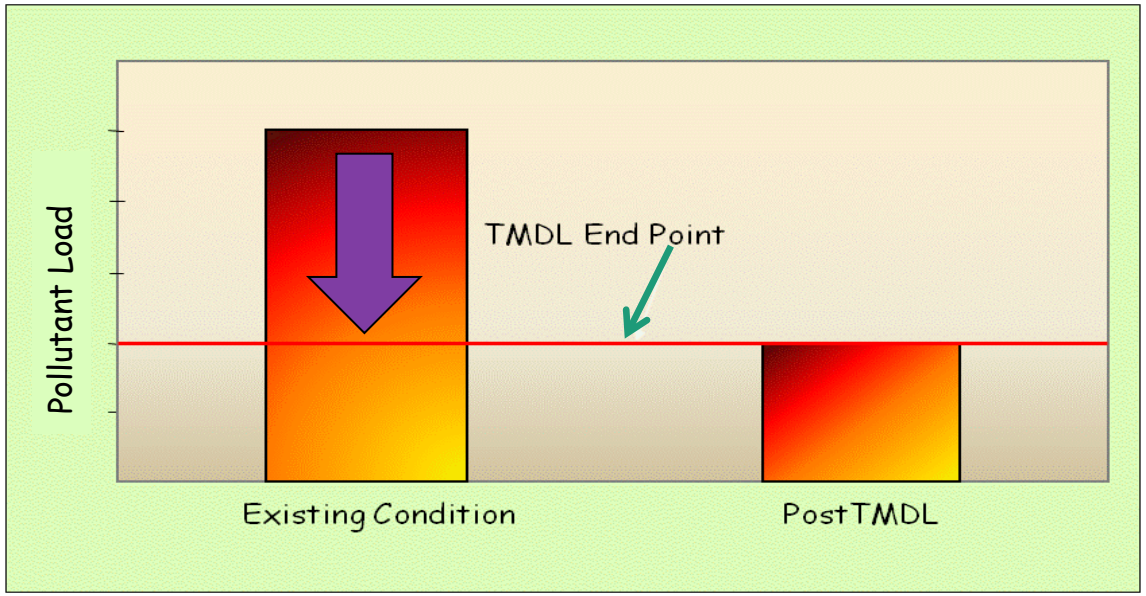
- Multi-metric index
- VSCI scores tell us that there is an impairment but not what the pollutant is…



DEQ

TMDL Study

- The Clean Water Act tasks DEQ to address impaired waters by conducting a Total Maximum Daily Load (TMDL) study.
  - The TMDL is the amount of pollutant that can enter a waterbody and still meet the water quality standard.
    - "Pollution diet"



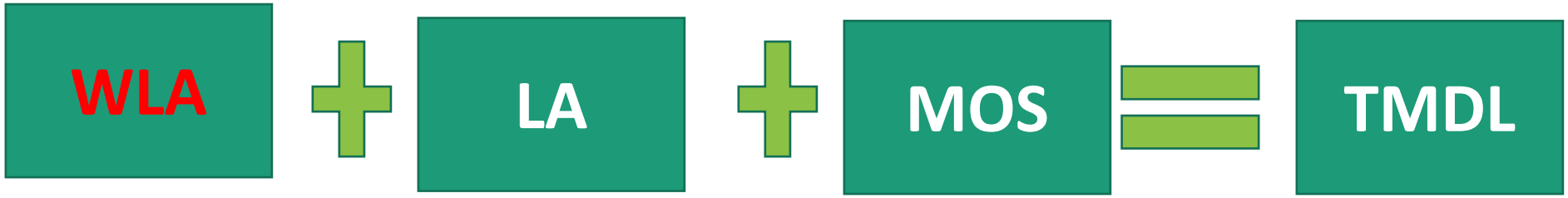
DEQ

Q&A Session #1

- Questions about DEQ's method for listing impaired streams?
- Questions on project background?

DEQ

TMDL Equation



- WLA= Wasteload Allocation
  - Permitted/Point Source
- LA= Load Allocation
  - Nonpoint Source
- MOS= Margin of Safety
  - Extra load to account for uncertainty

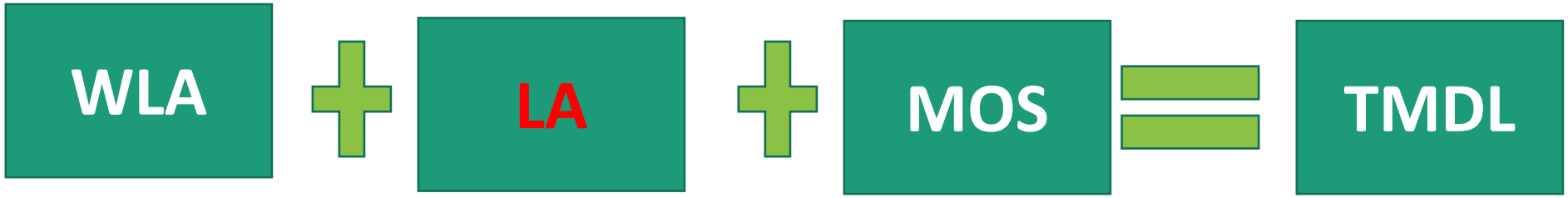
DEQ

Summary of Permitted Sources

Permit Type	Number of Permits	TSS	TP	Watershed
VPDES IP	2	X		Swift Creek
VPDES ISW	19	X	X	Bailey Creek, Nuttree Branch, Proctors Creek, Rohoic Creek, Swift Creek
VPDES Concrete	5	X	X	Bailey, Nuttree, Proctors, Rohoic
Domestic Sewer	3	X	X	Swift Creek
MS4	8	X	X	Bailey Creek, Nuttree Branch, Oldtown Creek, Proctors Creek, Rohoic Creek, Swift Creek
CGP	175	X		Bailey Creek, Nuttree Branch, Oldtown Creek, Proctors Creek, Rohoic Creek, Swift Creek
Vehicle Wash	1	X	X	Proctors Creek

DEQ

TMDL Equation



- WLA= Wasteload Allocation
  - Permitted/Point Source
- LA= Load Allocation
  - Nonpoint Source
- MOS= Margin of Safety
  - Extra load to account for uncertainty and development

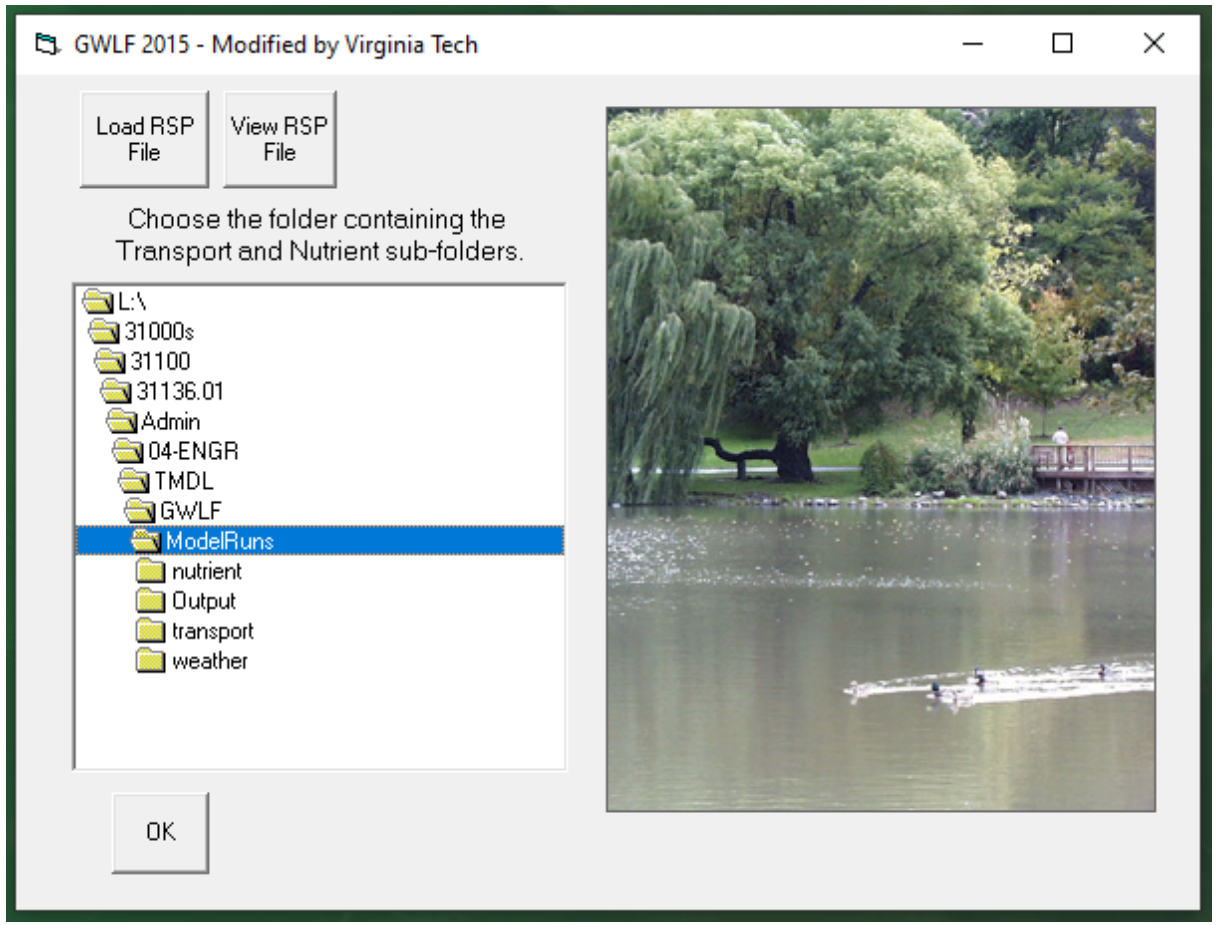
DEQ

Identify nonpoint sources

DEQ

Modeling Approach

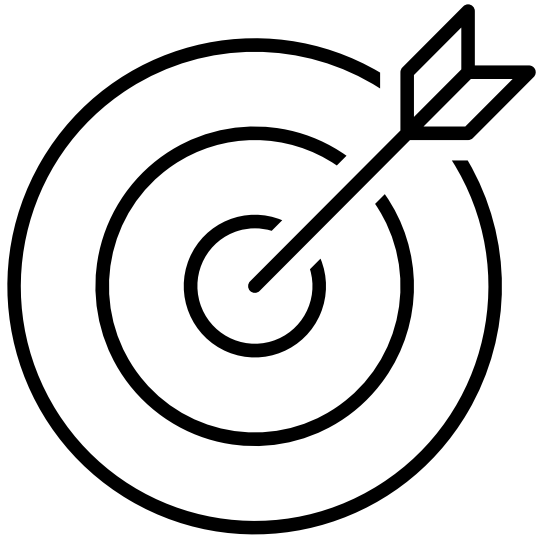
- Selected Model: GWLF
  - Widely used in VA for sediment TMDLs
  - Lumped parameter
  - Point and non-point sources
  - Landscape and streambank/channel erosion
  - Sediment delivery ratio



DEQ

TMDL Reductions Need a Target to Shoot For

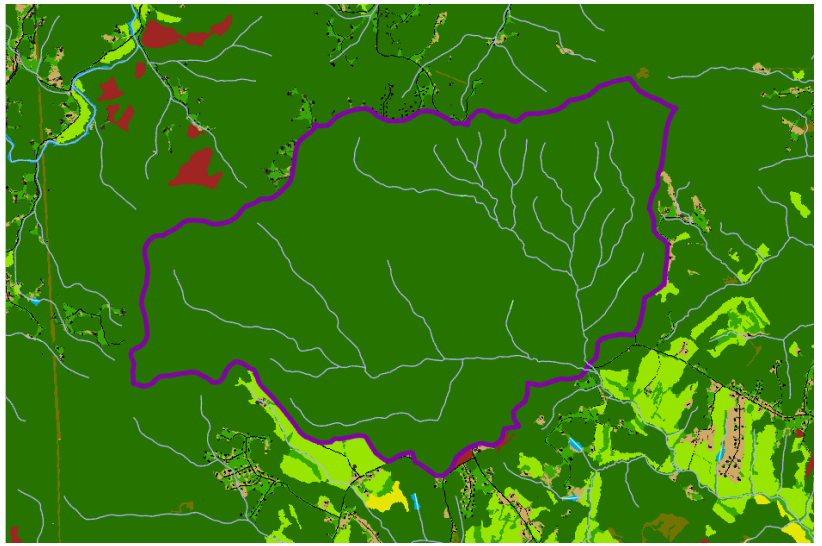
- Some pollutants have numerical criteria in regulations to set acceptable levels (e.g. bacteria counts)
- Other pollutants are expected to vary among ‘healthy’ watersheds, so there is no set regulatory threshold (e.g. sediment)



DEQ

Sediment and Phosphorus TMDL Endpoint Approach

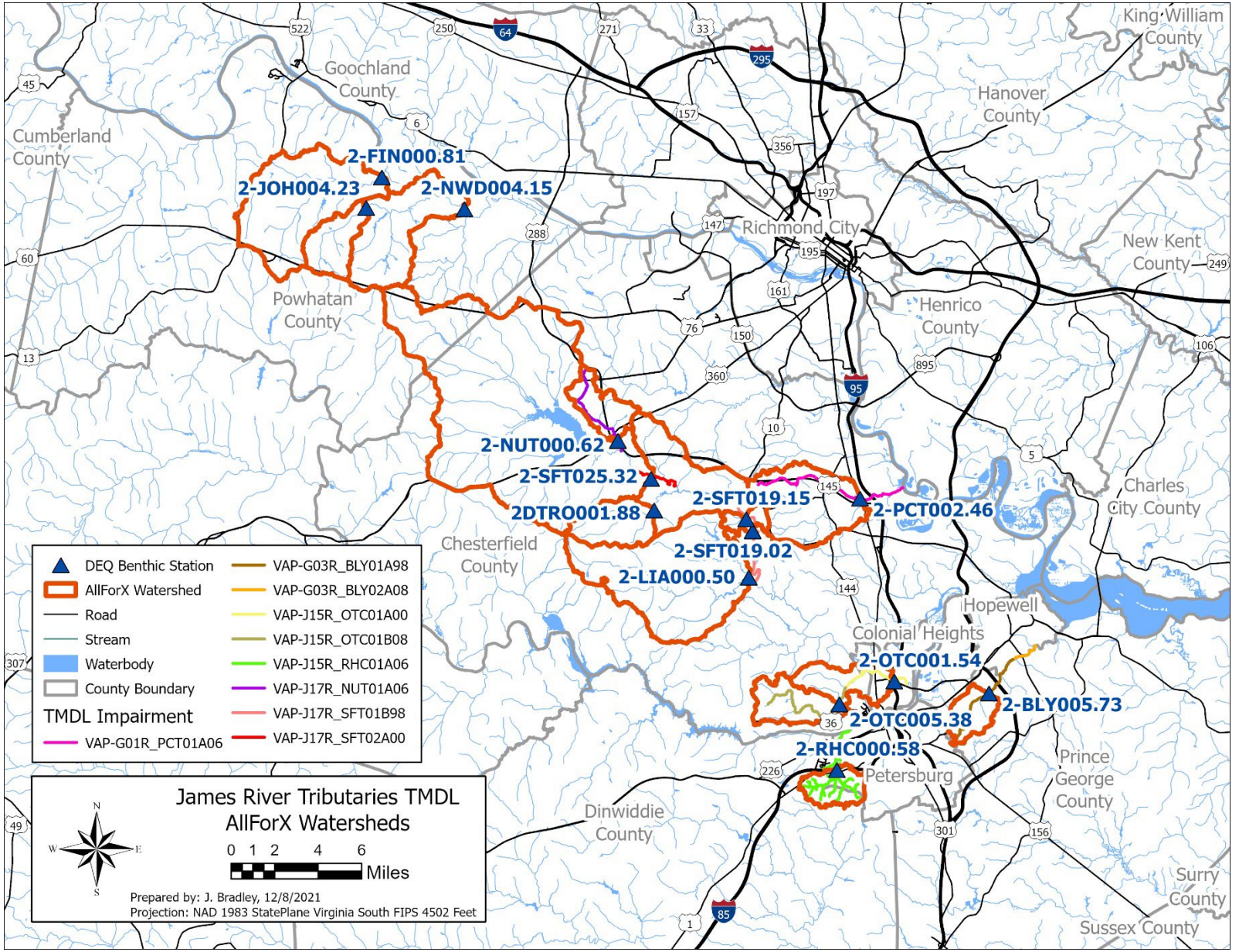
- All-Forested Load Multiplier (AllForX) Approach selected
  - Used widely in Virginia since 2014
  - Doesn't rely on a single reference condition or watershed
  - Robust approach that compares the site to a range of similar watersheds
  - Directly links the TMDL endpoint to the health of aquatic life (VSCI scores)



DEQ

AllForX Approach

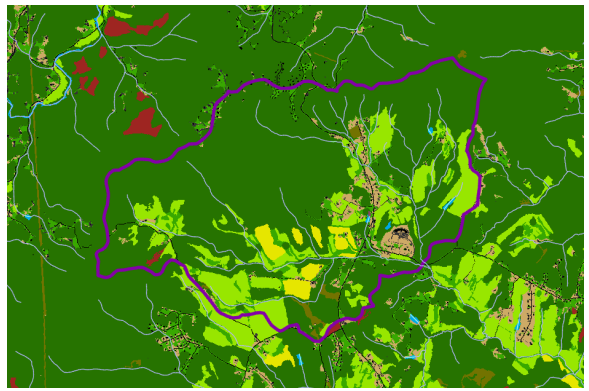
- Step 1: select 15-25 comparison watersheds
  - Within the same ecoregion
  - Of comparable size
  - Within close proximity
  - With available benthic data (impaired or unimpaired)

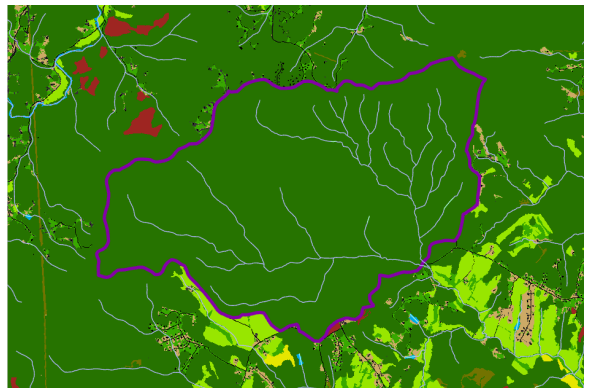


AllForX Approach

- Step 2: model pollutant load in each comparison watershed under two conditions
  - Existing condition
  - All-forested condition
- Step 3: calculate the AllForX multiplier for each comparison watershed

$$\text{AllForX Multiplier} = \frac{\text{Existing Condition Pollutant Load}}{\text{All Forested Pollutant Load}}$$





What Does It Mean?

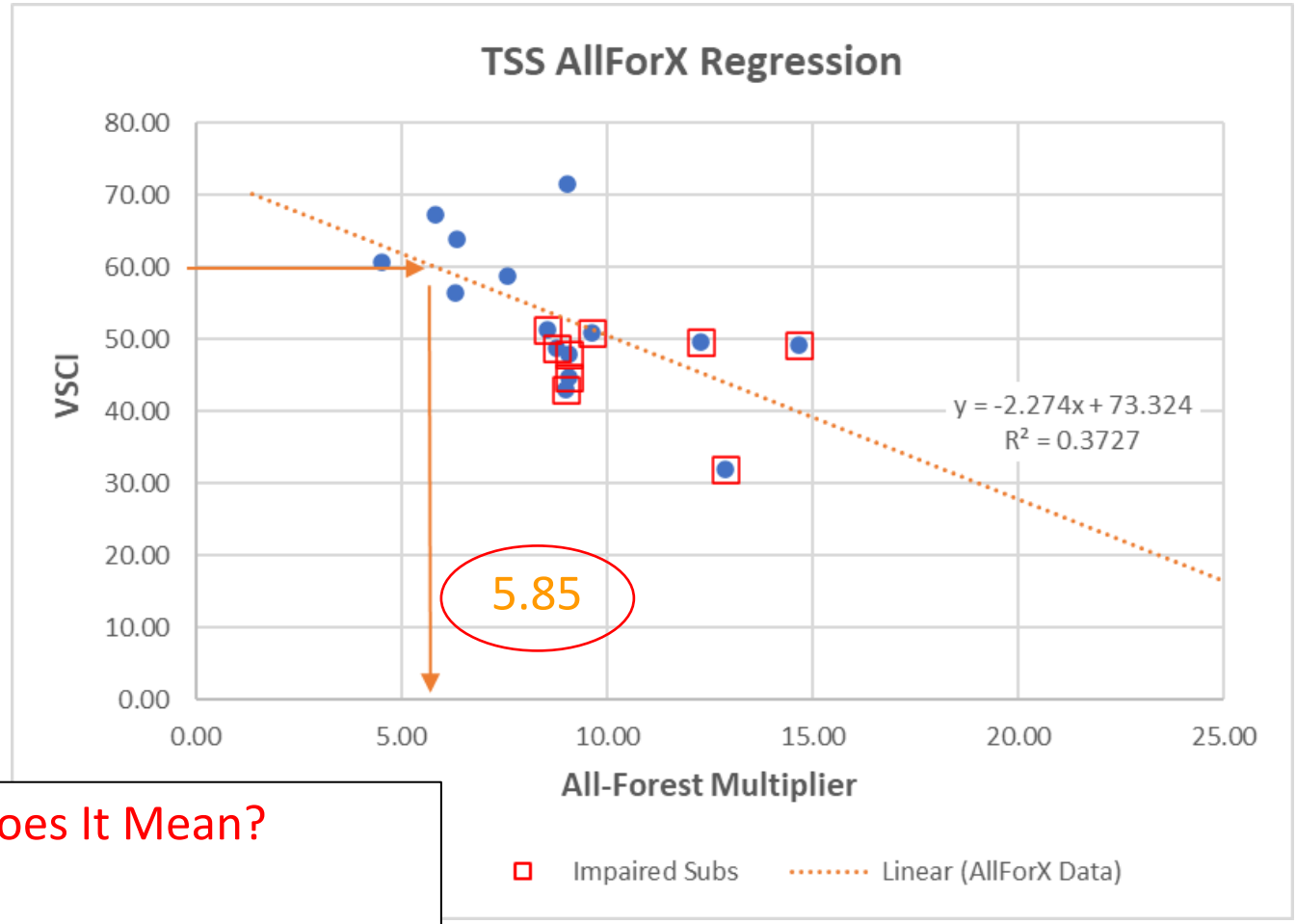
Watershed produces 10 times the pollutant load that it would otherwise produce if it were all forested

$$\frac{50\ \text{T/yr}}{5\ \text{T/yr}} = 10$$

DEQ

AllForX Approach

- Step 4: make a regression of AllForX multipliers versus VSCI scores for each of the comparison watersheds
- Step 5: TMDL target is the AllForX multiplier that corresponds to a VSCI of 60



What Does It Mean?

The impaired watershed can produce up to 5.85 times the all-forested load and still support a healthy benthic community.

DEQ

AllForX Approach

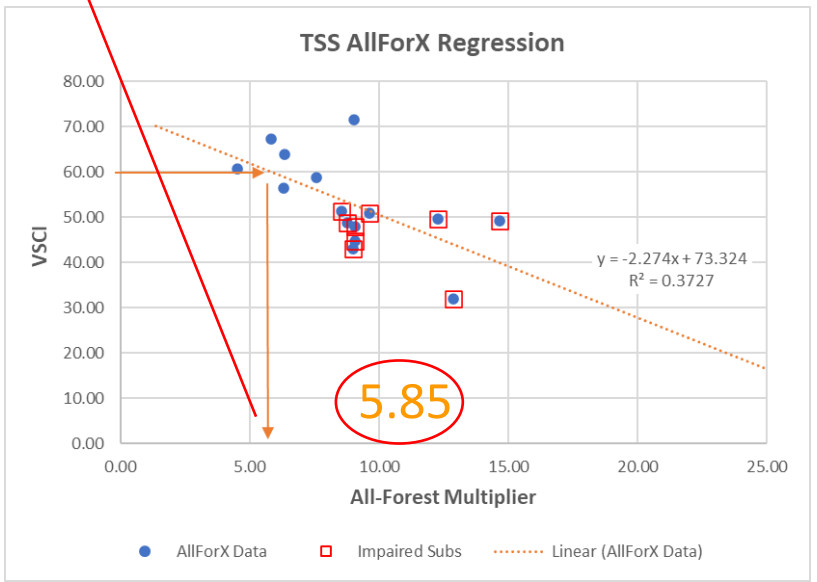
- Step 6: TMDL reductions are set to meet the all-forested load x AllForX multiplier

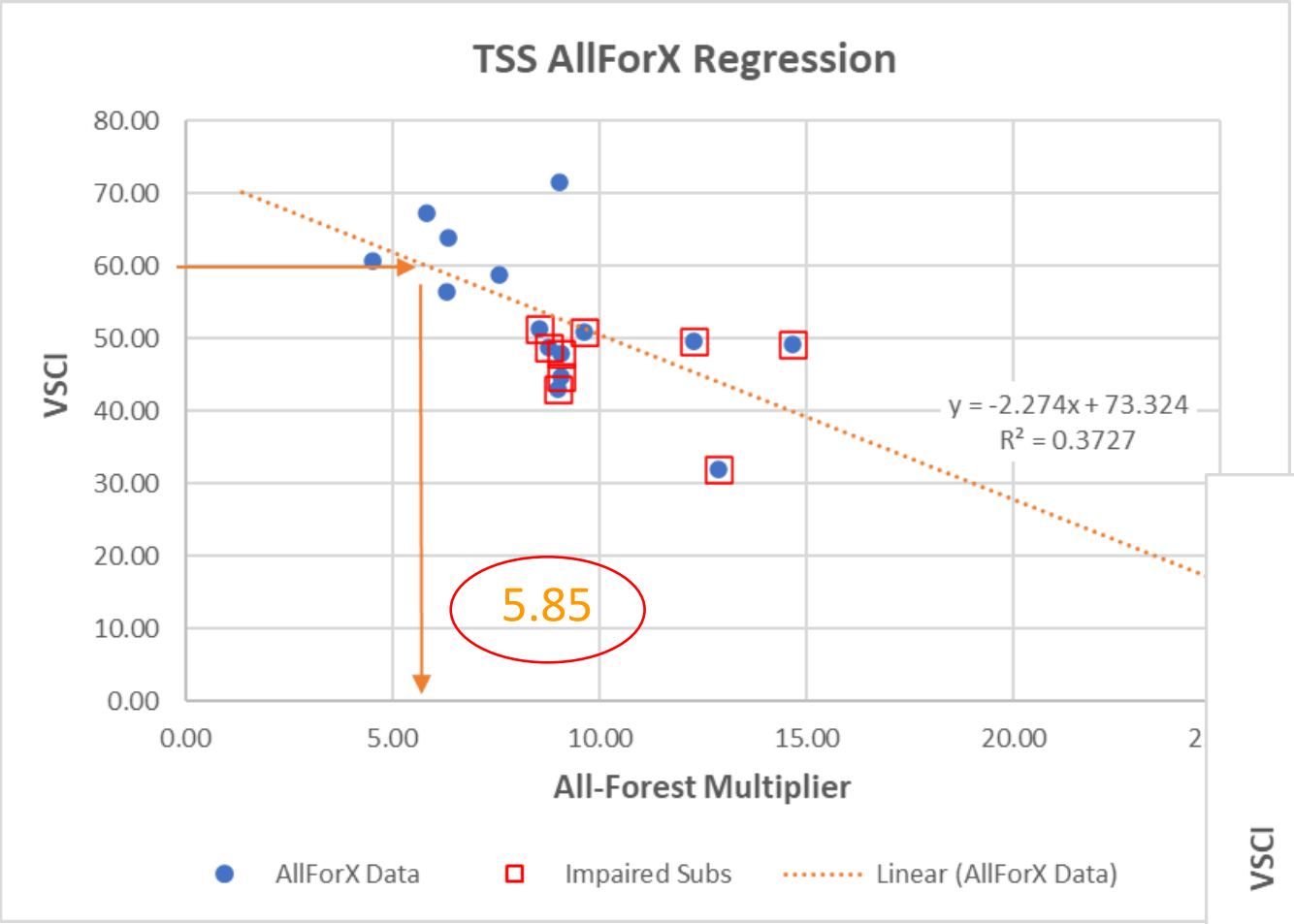
50 T/yr

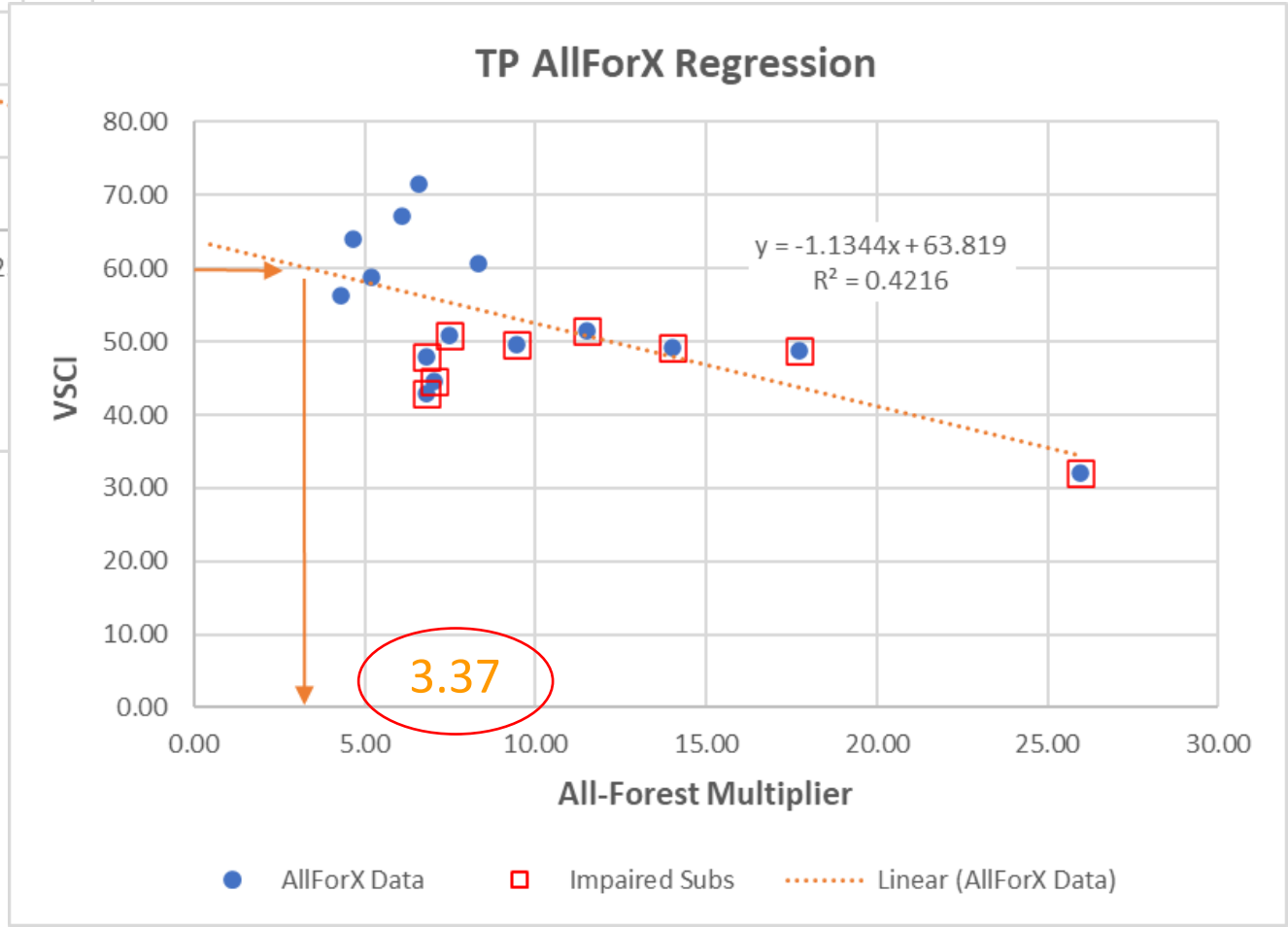
5 T/yr

5 T/yr x 5.85 = 29.25 T/yr

TMDL Endpoint




TSS AllForX Regression
VSCI
All-Forest Multiplier
y = -2.274x + 73.324
R² = 0.3727
5.85
AllForX Data
Impaired Subs
Linear (AllForX Data)


TP AllForX Regression
VSCI
All-Forest Multiplier
y = -1.1344x + 63.819
R² = 0.4216
3.37
AllForX Data
Impaired Subs
Linear (AllForX Data)

Developing a Pollutant Target - TSS

Impaired Stream	TSS Existing (lb/yr)	TSS AllForest (lb/yr)	TSS Target (lb/yr)	Estimated % Reduction
Bailey Creek	1,979,601	204,174	1,196,315	39.6
Nuttree Branch	751,382	90,928	532,771	29.1
Oldtown Creek	1,511,220	106,696	625,162	58.6
Proctors Creek	3,165,307	174,248	1,020,966	67.7
Rohoic Creek	1,150,002	110,709	648,674	43.6
Swift Creek	18,119,437	1,875,265	10,987,699	39.4

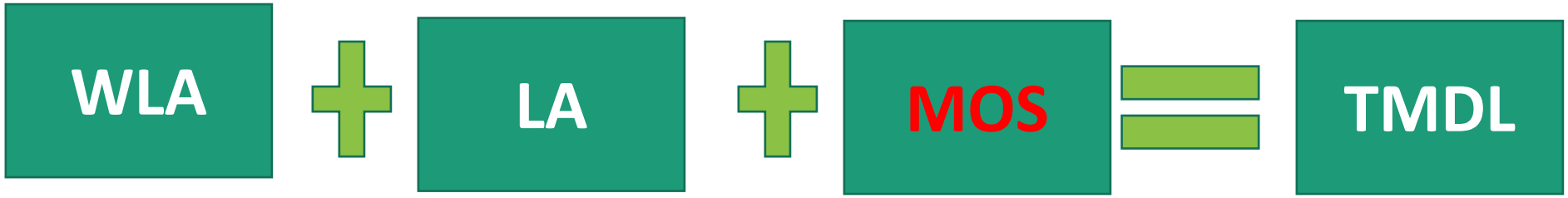
DEQ

Developing a Pollutant Target - TP

Impaired Stream	TP Existing (lb/yr)	TP AllForest (lb/yr)	TP Target (lb/yr)	Estimated % Reduction
Oldtown Creek	2,607	269	904	65.3
Rohoic Creek	2,146	194	654	69.5
Swift Creek	18,930	2,594	8,730	53.9

DEQ

TMDL Equation



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  - Permitted/Point Source
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  - Nonpoint Source
- MOS= Margin of Safety
  - Extra load to account for uncertainty

DEQ

Margin of Safety (MOS)

- No model is perfect
- Set aside to account for this
- Implicit and Explicit MOS
- Selected 10% for this study

Future Growth

- Part of WLA
- Set aside for future permits in the watershed
- Selected 2% for this study

DEQ

Q&A Session #2

- Questions about permitted loads?
- Thoughts or questions about TMDL equation?

DEQ

Watershed Example Allocation Scenarios - TSS

DEQ

Bailey Creek

Bailey Creek Sediment (2-BLY005.73)		Scenario 1		Scenario 2		Scenario 3		Scenario 4	
Source	Existing	Red.	Allocation	Red.	Allocation	Red.	Allocation	Red.	Allocation
	TSS (lb/yr)	*%*	*TSS (lb/yr)*	*%*	*TSS (lb/yr)*	*%*	*TSS (lb/yr)*	*%*	*TSS (lb/yr)*
Cropland	26,619	54.2	12,191	39.7	16,051	77.1	6,096	50.0	13,309
Hay	6,796	54.2	3,113	39.7	4,098	77.1	1,556	50.0	3,398
Pasture	6,592	54.2	3,019	39.7	3,975	77.1	1,510	50.0	3,296
Forest	52,787	-	52,787	-	52,787	-	52,787	-	52,787
Trees	65,786	-	65,786	-	65,786	-	65,786	-	65,786
Shrub	15,245	-	15,245	-	15,245	-	15,245	-	15,245
Harvested	38,881	54.2	17,807	39.7	23,445	77.1	8,904	50.0	19,440
Wetland	56,735	-	56,735	-	56,735	-	56,735	-	56,735
Baren	216,716	54.2	99,256	60.0	86,686	45.0	119,194	50.0	108,358
Turfgrass	78,632	54.2	36,014	60.0	31,453	45.0	43,248	50.0	39,316
Developed Pervious	10,935	54.2	5,008	60.0	4,374	45.0	6,014	50.0	5,468
Developed Impervious	219,160	54.2	100,375	60.0	87,664	45.0	120,538	50.0	109,580
Streambank Erosion	410,560	54.2	188,037	39.7	247,568	77.1	94,018	67.5	133,432
Const. Permits	33,496	-	33,496	-	33,496	-	33,496	-	33,496
ISW Permit	43,063	-	43,063	-	43,063	-	43,063	-	43,063
Other Permits	1,945	-	1,945	-	1,945	-	1,945	-	1,945
MS4	695,653	54.2	318,609	60.0	278,261	45.0	382,609	50.0	347,826
MOS (10%)	62,516	-	119,631	-	119,631	-	119,631	-	119,631
Future Growth (2%)	12,503	-	23,926	-	23,926	-	23,926	-	23,926
TOTAL	**2,054,620**		**1,196,043**		**1,196,190**		**1,196,301**		**1,196,038**
	0% red.		**41.8%**		**41.8%**		**41.8%**		**41.8%**

Target:
1,196,315 lb/yr

DEQ

Nuttree Branch

Nuttree Branch Sediment (2-NUT000.62)		Scenario 1		Scenario 2		Scenario 3	
Source	Existing	Red.	Allocation	Red.	Allocation	Red.	Allocation
	TSS (lb/yr)	*%*	*TSS (lb/yr)*	*%*	*TSS (lb/yr)*	*%*	*TSS (lb/yr)*
Cropland	0	-	0	-	0	-	0
Hay	0	-	0	-	0	-	0
Pasture	0	-	0	-	0	-	0
Forest	16,414	-	16,414	-	16,414	-	16,414
Trees	32,267	-	32,267	-	32,267	-	32,267
Shrub	10,827	-	10,827	-	10,827	-	10,827
Harvested	0	-	0	-	0	-	0
Wetland	4,520	-	4,520	-	4,520	-	4,520
Barren	0	-	0	-	0	-	0
Turfgrass	44,645	51.6	21,608	58.9	18,349	0.0	44,645
Developed Pervious	3,547	51.6	1,717	58.9	1,458	64.9	1,245
Developed Impervious	164,682	51.6	79,706	58.9	67,684	64.9	57,803
Streambank Erosion	68,125	51.6	32,973	0.0	68,125	0.0	68,125
Const. Permits	129,593	-	129,593	-	129,593	-	129,593
ISW Permits	8,888	-	8,888	-	8,888	-	8,888
Other Permits	326	-	326	-	326	-	326
MS4	267,548	51.6	129,493	58.9	109,962	64.9	93,909
MOS (10%)	53,277	-	53,277	-	53,277	-	53,277
Future Growth (2%)	10,655	-	10,655	-	10,655	-	10,655
TOTAL	**815,314**		**532,264**		**532,346**		**532,495**
	0% red.		**34.7%**		**34.7%**		**34.7%**

Target:
532,771 lb/yr

DEQ

Oldtown Creek

Oldtown Creek Sediment (2-OTC001.54)		Scenario 1		Scenario 2		Scenario 3	
Source	Existing	Red.	Allocation	Red.	Allocation	Red.	Allocation
	TSS (lb/yr)	*%*	*TSS (lb/yr)*	*%*	*TSS (lb/yr)*	*%*	*TSS (lb/yr)*
Cropland	159,181	72.3	44,093	40.0	95,509	81.5	29,448
Hay	6,105	72.3	1,691	40.0	3,663	81.5	1,129
Pasture	1,690	72.3	468	40.0	1,014	81.5	313
Forest	37,252	-	37,252	-	37,252	-	37,252
Trees	19,723	-	19,723	-	19,723	-	19,723
Shrub	5,024	-	5,024	-	5,024	-	5,024
Harvested	24,671	72.3	6,834	40.0	14,802	81.5	4,564
Wetland	37,547	-	37,547	-	37,547	-	37,547
Barren	11,287	72.3	3,127	77.7	2,517	81.5	2,088
Turfgrass	31,175	72.3	8,635	77.7	6,952	81.5	5,767
Developed Pervious	3,218	72.3	891	77.7	718	81.5	595
Developed Impervious	179,117	72.3	49,615	77.7	39,943	81.5	33,137
Streambank Erosion	337,834	72.3	93,580	77.7	75,337	45.0	185,809
Const. Permits	80,810	-	80,810	-	80,810	-	80,810
MS4	576,586	72.3	159,714	77.7	128,579	81.5	106,668
MOS (10%)	62,516	-	62,516	-	62,516	-	62,516
Future Growth (2%)	12,503	-	12,503	-	12,503	-	12,503
TOTAL	**1,586,239**		**624,024**		**624,408**		**624,894**
	0% red.		**60.7%**		**60.6%**		**60.6%**

Target:
625,162 lb/yr

DEQ

Proctors Creek

Proctors Creek Sediment (2-PCT002.46)		Scenario 1		Scenario 2	
Source	Existing	Red.	Allocation	Red.	Allocation
	TSS (lb/yr)	*%*	*TSS (lb/yr)*	*%*	*TSS (lb/yr)*
Cropland	8,824	88.4	1,024	0.0	8,824
Hay	2,111	88.4	245	0.0	2,111
Pasture	3,043	88.4	353	0.0	3,043
Forest	36,463	-	36,463	-	36,463
Trees	45,160	-	45,160	-	45,160
Shrub	8,735	-	8,735	-	8,735
Harvested	0	-	0	-	0
Wetland	68,883	-	68,883	-	68,883
Barren	199,632	88.4	23,157	88.9	22,159
Turfgrass	58,684	88.4	6,807	88.9	6,514
Developed Pervious	4,151	88.4	482	88.9	461
Developed Impervious	361,063	88.4	41,883	88.9	40,078
Streambank Erosion	955,902	88.4	110,885	88.9	106,105
Const. Permits	373,567	-	373,567	-	373,567
ISW Permits	64,759	-	64,759	-	64,759
Other Permits	1,243	-	1,243	-	1,243
MS4	973,087	88.4	112,878	88.9	108,013
MOS (10%)	102,097	-	102,097	-	102,097
Future Growth (2%)	20,419	-	20,419	-	20,419
TOTAL	**3,287,822**		**1,019,039**		**1,018,633**
	0% red.		**69.0%**		**69.0%**

Target:
1,020,966 lb/yr

DEQ

Rohoic Creek

Rohoic Creek Sediment (2-RHC000.58)		Scenario 1		Scenario 2		Scenario 3	
Source	Existing	Red.	Allocation	Red.	Allocation	Red.	Allocation
	TSS (lb/yr)	*%*	*TSS (lb/yr)*	*%*	*TSS (lb/yr)*	*%*	*TSS (lb/yr)*
Cropland	52,142	71.0	15,121	32.5	35,196	80.0	10,428
Hay	16,407	71.0	4,758	32.5	11,075	80.0	3,281
Pasture	4,153	71.0	1,204	32.5	2,803	80.0	831
Forest	22,268	-	22,268	-	22,268	-	22,268
Trees	31,909	-	31,909	-	31,909	-	31,909
Shrub	9,145	-	9,145	-	9,145	-	9,145
Harvested	4,129	71.0	1,197	32.5	2,787	80.0	826
Wetland	21,337	-	21,337	-	21,337	-	21,337
Barren	0	-	0	-	0	-	0
Turfgrass	68,255	71.0	19,794	75.0	17,064	80.0	13,651
Developed Pervious	9,356	71.0	2,713	75.0	2,339	80.0	1,871
Developed Impervious	198,801	71.0	57,652	75.0	49,700	80.0	39,760
Streambank Erosion	247,174	71.0	71,681	75.0	61,794	50.3	122,846
Const. Permits	130,544	-	130,544	-	130,544	-	130,544
ISW Permit	115,596	-	115,596	-	115,596	-	115,596
Other Permits	3,371	-	3,371	-	3,371	-	3,371
MS4	215,417	71.0	62,471	75.0	53,854	80.0	43,083
MOS (10%)	64,867	-	64,867	-	64,867	-	64,867
Future Growth (2%)	12,973	-	12,973	-	12,973	-	12,973
TOTAL	**1,227,843**		**648,601**		**648,621**		**648,587**
	0% red.		**47.2%**		**47.2%**		**47.2%**

Target:
648,674 lb/yr

DEQ

Swift Creek

Swift Creek Sediment (2-SFT012.84)	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
Source	Existing	Red.	Allocation	Red.	Allocation	Red.	Allocation	Red.	Allocation
	TSS (lb/yr)	*%*	*TSS (lb/yr)*	*%*	*TSS (lb/yr)*	*%*	*TSS (lb/yr)*	*%*	*TSS (lb/yr)*
Cropland	119,508	56.2	52,345	36.9	75,410	80.5	23,304	0.0	119,508
Hay	26,214	56.2	11,482	36.9	16,541	80.5	5,112	0.0	26,214
Pasture	144,675	56.2	63,368	36.9	91,290	80.5	28,212	0.0	144,675
Forest	305,707	-	305,707	-	305,707	-	305,707	-	305,707
Trees	142,330	-	142,330	-	142,330	-	142,330	-	142,330
Shrub	19,858	-	19,858	-	19,858	-	19,858	-	19,858
Harvested	70,205	56.2	30,750	36.9	44,299	80.5	13,690	0.0	70,205
Wetland	134,260	-	134,260	-	134,260	-	134,260	-	134,260
Barren	668,007	56.2	292,587	36.9	421,513	80.5	130,261	57.5	283,903
Turfgrass	155,485	56.2	68,102	36.9	98,111	80.5	30,320	57.5	66,081
Developed Pervious	20,965	56.2	9,183	36.9	13,229	80.5	4,088	57.5	8,910
Developed Impervious	1,516,621	56.2	664,280	36.9	956,988	80.5	295,741	57.5	644,564
Streambank Erosion	10,969,179	56.2	4,804,500	65.0	3,839,213	45.0	6,033,049	57.5	4,661,901
Const. Permits	1,314,329	-	1,314,329	-	1,314,329	-	1,314,329	-	1,314,329
ISW Permits	101,728	-	101,728	-	101,728	-	101,728	-	101,728
Other Permits	100,566	-	100,566	-	100,566	-	100,566	-	100,566
MS4	2,309,800	56.2	1,011,692	36.9	1,457,484	80.5	450,411	57.5	981,665
Nuttree Branch TMDL Target	532,771	-	532,771	-	532,771	-	532,771	-	532,771
MOS (10%)	1,098,770	-	1,098,770	-	1,098,770	-	1,098,770	-	1,098,770
Future Growth (2%)	219,754	-	219,754	-	219,754	-	219,754	-	219,754
TOTAL	**19,970,732**		**10,978,362**		**10,984,150**		**10,984,260**		**10,977,699**
	0.0%		**45.0%**		**45.0%**		**45.0%**		**45.0%**

Target:
10,987,699 lb/yr

DEQ

Watershed Example Allocation Scenarios - TP

DEQ

Oldtown Creek

Oldtown Creek Phosphorous (2-OTC001.54)		Scenario 1		Scenario 2		Scenario 3	
Source	Existing	Red.	Allocation	Red.	Allocation	Red.	Allocation
	TP (lb/yr)	*%*	*TP (lb/yr)*	*%*	*TP (lb/yr)*	*%*	*TP (lb/yr)*
Cropland	102.4	76.8	23.8	50.0	51.2	78.7	21.8
Hay	84.8	76.8	19.7	50.0	42.4	78.7	18.1
Pasture	3.1	76.8	0.7	50.0	1.5	78.7	0.6
Forest	18.0	-	18.0	-	18.0	-	18.0
Trees	13.4	-	13.4	-	13.4	-	13.4
Shrub	0.9	-	0.9	-	0.9	-	0.9
Harvested	7.1	76.8	1.7	50.0	3.6	78.7	1.5
Wetland	4.1	-	4.1	-	4.1	-	4.1
Barren	1.3	76.8	0.3	79.2	0.3	78.7	0.3
Turfgrass	238.6	76.8	55.3	79.2	49.6	78.7	50.8
Developed Pervious	4.7	76.8	1.1	79.2	1.0	78.7	1.0
Developed Impervious	394.1	76.8	91.4	79.2	82.0	78.7	83.9
Streambank Erosion	118.2	76.8	27.4	79.2	24.6	40.0	70.9
Septic	0.9	0.0	0.9	0.0	0.9	0.0	0.9
Groundwater	150.9	-	150.9	-	150.9	-	150.9
Construction Permits	58.2	-	58.2	-	58.2	-	58.2
MS4	1,406.5	76.8	326.3	79.2	292.5	78.7	299.6
MOS (10%)	90.4		90.4		90.4		90.4
Future Growth (2%)	18.1		18.1		18.1		18.1
TOTAL	**2,716**		**903**		**904**		**904**
	0% red.		**66.8%**		**66.7%**		**66.7%**

Target:
904 lb/yr

DEQ

Rohoic Creek

- Unable to meet the modeled TMDL endpoint for phosphorus at the watershed's current permitted load
- Proposed reduction in ISW phosphorus loads of 50%

Target:
654 lb/yr

Rohoic Creek Sediment (2-RHC000.58)		Scenario 1		Scenario 2	
Source	Existing	Red.	Allocation	Red.	Allocation
	TP (lb/yr)	*%*	*TP (lb/yr)*	*%*	*TP (lb/yr)*
Cropland	31.3	100	0.0	91.8	2.6
Hay	113.1	100	0.0	91.8	9.3
Pasture	4.1	100	0.0	91.8	0.3
Forest	9.7	-	9.7	-	9.7
Trees	14.3	-	14.3	-	14.3
Shrub	1.5	-	1.5	-	1.5
Harvested	1.2	100	0.0	91.8	0.1
Wetland	2.6	-	2.6	-	2.6
Barren	0.0	100	0.0	91.8	0.0
Turfgrass	290.9	100	0.0	91.8	23.9
Developed Pervious	9.7	100	0.0	91.8	0.8
Developed Impervious	437.4	100	0.0	91.8	35.9
Streambank Erosion	86.5	100	0.0	91.8	7.1
Septic	0.9	0	0.9	0.0	0.9
Groundwater	122.3	-	122.3	-	122.3
Construction Permits	94.0	-	94.0	-	94.0
ISW Permits	394.1	-	394.1	50.0	197.0
Other Permits	9.4	-	9.4	-	9.4
MS4	523.4	100	0.0	91.8	17.9
MOS (10%)	65.4		65.4		65.4
Future Growth (2%)	13.1		13.1		13.1
TOTAL	**2,225**		**727**		**653**
	0% red.		**67.3%**		**70.6%**

DEQ

Swift Creek

Swift Creek Sediment (2-SFT012.84)	Scenario 1		Scenario 2		Scenario 3	
Source	Existing	Red.	Allocation	Red.	Allocation	Red.	Allocation
	TP (lb/yr)	*%*	*TP (lb/yr)*	*%*	*TP (lb/yr)*	*%*	*TP (lb/yr)*
Cropland	70.9	71.8	20.0	0.0	70.9	80.2	14.0
Hay	362.6	71.8	102.3	0.0	362.6	80.2	71.8
Pasture	190.9	71.8	53.8	0.0	190.9	80.2	37.8
Forest	143.3	-	143.3	-	143.3	-	143.3
Trees	115.1	-	115.1	-	115.1	-	115.1
Shrub	2.5	-	2.5	-	2.5	-	2.5
Harvested	22.6	71.8	6.4	0.0	22.6	80.2	4.5
Wetland	7.9	-	7.9	-	7.9	-	7.9
Barren	43.7	71.8	12.3	74.9	11.0	80.2	8.6
Turfgrass	1,266.9	71.8	357.3	74.9	318.0	80.2	250.8
Developed Pervious	35.3	71.8	10.0	74.9	8.9	80.2	7.0
Developed Impervious	4,236.7	71.8	1,194.8	74.9	1,063.4	80.2	838.9
Streambank Erosion	4,382.9	71.8	1,236.0	74.9	1,100.1	50.0	2,191.4
Septic	17.4	0.0	17.4	0.0	17.4	0.0	17.4
Groundwater	1,587.9	-	1,587.9	-	1,587.9	-	1,587.9
Construction Permits	946.8	-	946.8	-	946.8	-	946.8
ISW Permits	346.8	-	346.8	-	346.8	-	346.8
Other Permits	78.5	-	78.5	-	78.5	-	78.5
MS4	5,071.3	71.8	1,430.1	74.9	1,272.9	80.2	1,004.1
MOS (10%)	873.0		873.0		873.0		873.0
Future Growth (2%)	174.6		174.6		174.6		174.6
TOTAL	**19,978**		**8,717**		**8,715**		**8,723**
	0% red.		**56.4%**		**56.4%**		**56.3%**

Target:
8,730 lb/yr

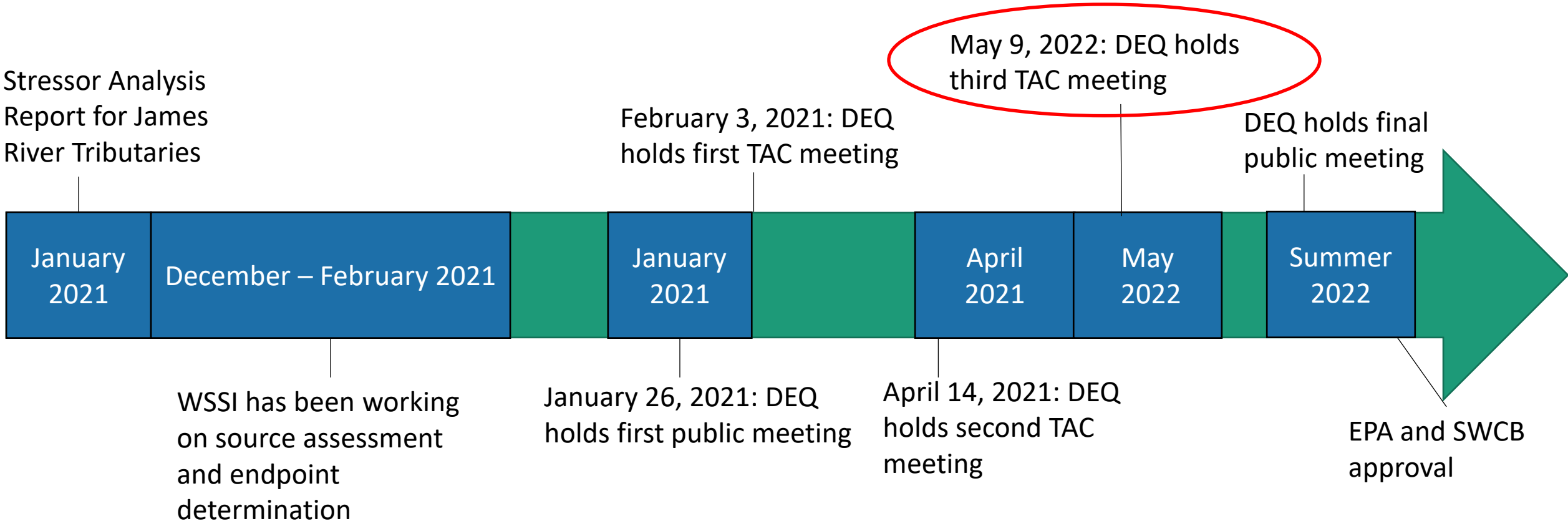
DEQ

Q&A Session #3

- Do the MOS and Future Growth allocations seem reasonable?
- Thoughts on the presented allocation scenarios?
- Other scenarios of interest?

DEQ

Next Steps…


Stressor Analysis Report for James River Tributaries
January 2021
December – February 2021
WSSI has been working on source assessment and endpoint determination
January 2021
February 3, 2021: DEQ holds first TAC meeting
January 26, 2021: DEQ holds first public meeting
April 2021
April 14, 2021: DEQ holds second TAC meeting
May 2022
May 9, 2022: DEQ holds third TAC meeting
Summer 2022
DEQ holds final public meeting
EPA and SWCB approval

High Priority Stormwater Issue #3


No Dumping!
This Drains To Swift Creek Reservoir

Appendix B: Documentation of Public Involvement Activities

Public Involvement Activities #1 - #4

From: Emswiler, Samantha
To: Brown, Tanya
Subject: Re: Bryan Park Water Clean Up - Ethics Club/students
Date: Friday, July 15, 2022 9:36:41 AM
Attachments: image002.png
Watercleanup in water.jpg
Watercleanup JTCCWinter.jpg

Hi,

Yes, all had 1 faculty (me) at least.

October 8th and 29th 2021 both had 3 students for 4 hours

November 19th 14 students with 2 additional faculty 3 hours

February 19th 2 students 2 hours

February 20th 1 students 2 hours

April 2nd 5 students 2 hours

April 15th 7 students 2 hours

April 29th 9 students 2 hours

Hope this helps demonstrate our commitment to cleaning up. I have included a picture of myself in the water this winter when Pathways program came out and a picture of us with some of our trash we collected.

From: Brown, Tanya <Tbrown01@brightpoint.edu>
Sent: Friday, July 15, 2022 9:03 AM
To: Emswiler, Samantha <semswiler@brightpoint.edu>
Subject: RE: Bryan Park Water Clean Up - Ethics Club/students

Hello Samantha,
I hope this msg reaches you doing well. It is that time of the year again!
I am checking to see if your students performed any public outreach or educational events on stormwater mgmt. I am attempting to gather documents for a state audit. If you have any outreach that your students may have conducted from July 1, 2021 to now pls advise.

Thanks,

Tanya N. Brown
Assistant Director of College Safety & Security
Brightpoint Community College
office: 804-638-0577
email: tbrown01@brightpoint.edu
brightpoint.edu

Brightpoint
COMMUNITY COLLEGE


adidas

Public Involvement Activity #5

Medication Take-Back

Saturday, April 30, 2022

10 a.m. - 2 p.m.

Two Locations

Wegmans
12501 Stone Village Way
Midlothian, VA 23113

John Tyler is Becoming Brightpoint
Nicholas Student Center
13101 Jefferson Davis Highway
Chester, VA 23831

Sharps will not be accepted.

Please help prevent drug abuse and protect the environment. Turn in your unused or expired medication for safe disposal at our next Medication Take-Back Event.

Chesterfield County Police Department

Wegmans

Tyler is Becoming Brightpoint

Drug Enforcement Administration

Chesterfield County Sheriff's Office