2011-2012

GWRC's Coastal Zone Technical Assistance Program Report

George Washington Regional Commission

2011-2012

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This project was funded, in part, by the Virginia Coastal Zone Management Program at the Virginia Department of Environmental Quality through Grant # NA11NOS4190122 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended.

GWRC's Coastal Zone Technical Assistance Program FY 2011-2012

Author: George Washington Regional Commission (GWRC)

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Director of Regional Planning and Regional Demographer

Grant: # NA11NOS4190122, Task 47

Acknowledgement: This project was funded, in part, by the Virginia Coastal Zone Management Program at the Virginia Department of Environmental Quality through Grant # NA11NOS4190122 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended.

Executive Summary:

In the FY 11-12 grant year, GWRC's coastal zone management program local technical assistance effort was heavily focused around working with member local governments to respond to the Chesapeake Bay Total Maximum Daily Load (TMDL) water quality program and related Phase II watershed implementation planning work requested of localities by the U.S. Environmental Protection Agency (USEPA) and the Virginia Department of Conservation and Recreation. Additionally, the CZM grant provided limited staffing support to finish implementation and close-out of an EECBG residential energy-efficiency and conservation grant awarded to the Region.

Product deliverables under this grant included:

Product #1: Local Government Coordination and Training Program Report

GWRC staff convened several technical LID/stormwater best management practices webinar training viewing sessions hosted by the Chesapeake Bay Stormwater Network from October 1 through March 31 to support local government interaction on the development of regional response to the DCR TMDL –WIP process. Additionally, several group work sessions with local government environmental planning and stormwater program technical staff were held on the review of TMDL data and evaluation of regional and local WIP strategies. Moreover, on October 17, 2011, GWRC hosted DCR training session for all local government staff in PD 16 (and elsewhere) at the University of Mary Washington (Stafford Co campus) to demonstrate the use of the Virginia Assessment Scenario Tool (VAST) developed by VDCR to solicit local data review and WIP strategies to support Virginia's WIP Phase II response to US EPA. Another VAST training session was held for local government on Dec. 21, 2011.

GWRC staff participated in Coastal PDC meeting (6/19/12) in Hampton Roads and Coastal Policy team meeting (9/17/12) in Richmond. GWRC held meetings with PD 16 local staff on 8/17/12 and 8/30/12 regarding the DCR local stormwater program grant RFP.

Product #2: Enhance Community Conservation Info Inputs to Chesapeake Bay TMDL WIP Phase 2

- **Product 2a: Regional Report to DCR for the Virginia TMDL Phase2 Watershed Implementation Plan**

GWRC staff used a stratified random-sample of land cover at the TMDL riversegment sub-watershed level (by using the free i-Tree canopy land cover classification tool)and aggregated the results for regional review of TMDL land cover estimates at jurisdiction level to determine how jurisdictional land cover estimates in the Ches Bay water quality model may misrepresent local land cover. The results of this analysis was submitted to VDCR, along with a program of locally-endorsed (at the technical staff level) regional WIP-2 strategies to respond to DCR deadline for local and regional input to the TMDL/WIP-2 process.

- **Product 2b: GWRC Grant Application for DCR Stormwater Implementation Grant on Behalf of PD 16 Localities**

GWRC staff worked with localities, Friends of the Rappahannock and various consultants to develop project methodology and grant proposal submitted by GWRC on behalf of seven PD 16 localities in response to DCR Request for Proposals for Local Assistance Grant for Stormwater Program Development. The regional grant application to VDCR for a Local Assistance Grant for Stormwater Program Development was awarded $99,785 in funding to help localities incorporate Virginia stormwater management regulations into their local development ordinances and design local and regional implementation.

GWRC staff also collaborated with Tri-County/City Soil and Water Conservation District (TCC-SWCD) to develop capacity-building NFWF technical assistance grant application for TCC-SWCD's benefit. Unrotunately, this application was not selected for funding.

GWRC staff participated in 3rd Annual "Choose Clean Water" Conference (June 6-8, 2012) in Lancaster, PA to discuss the region's TMDL/WIP coordination response effort and to learn Lancaster's municipal approaches to green infrastructure implementation to reduce urban stormwater flows into combined sewer system. GWRC staff attended Conservation Foundation Green Infrastructure Planning training conference and participated as a speaker in the VIMS workshop on Green Infrastructure Planning.

Product #3: GWRC GW-HELP Home Performance Project Implementation Summary

GWRC staff and consultants worked with homeowners in City of Fredericksburg and Caroline Co to support their participation in the GW-HELP program. Over the first 6 months of the fiscal year, 63 homes had completed home energy audits, 22 home energy-saving retrofit projects were completed and $440,514 dollars of EECBG grant funds encumbered to cover home energy-saving rebate projects. Two public outreach meetings were held on March 31, 2012 to recruit low-income household participants to ensure full utilization of the grant funds..

This ARRA (stimulus)-funded project was completed by the end of July, achieving a total of 133 home energy audits and 104 energy retrofits, as well as investing $150,237 in grant funds for energy-saving appliance, HVAC, lighting, and insulation upgrades for public buildings in City of Fredericksburg, the Towns of Port Royal and Bowling Green and Caroline County.

Product #1: Local Government Coordination and Training Program Report

See Content in Section 1

Product #2: Enhance Community Conservation Info Inputs to Chesapeake Bay TMDL WIP-Phase 2

See Content in Section 2

Product 2a: Regional Report to DCR for the Virginia TMDL Phase-2 Watershed Implementation Plan

Product 2b: GWRC Grant Application for DCR Stormwater Implementation Grant on Behalf of PD 16 Localities

Product #3: GWRC HW-HELP Home Performance Project Implementation Summary

See Content in Section 3

SECTION 1

Product #1:

Local Government Coordination and Training Program Report

A. Training Activities:

1. **October 17, 2011: PD 16 Regional TMDL Live Workshop at UMW**
   Location: University of Mary Washington, Stafford Campus
   Attendance: Kevin Byrnes, GWRC; Sharon Conner & Marion Moody, H-C SWCD; Doug & Ross Pickford, Conservation Concepts LLC; Jesse Maines & Claudia Hamblin Katnik, City of Alexandria; Jack Green & Kyle Conboy, King George Co.; Eldon James, RRBC; Doug Mosley & Rich Brawley, GKY & Assoc.; Gary Switzer & Courtney Lipski, Rappahannock HD/VDH; Richard Street, Spotsylvania Co.; Les Johnson, UMW; Kevin Utt, City of Fredericksburg; Steve Hubble, Stafford Co; Eugene Rivara, MPRP; Jim Tate, H-C SWCD; Roy Mills, VDOT; Richard Stanford, ATR Assoc.; Wynn Davis, Essex Co; Ryan Fletcher, King William Co; Tracey Harman, VDOT;Blaine Delaney, USDA-NRCS; V'lent Lassiter, DCR; James Davis-Martin, DCR, Joan Salvati, DCR.
   Agenda:
   a) DCR Presentation on Chesapeake Bay TMDLs
   b) DCR Demonstration of VAST Tool for Reporting BMPs
   c) Audience Discussion/Feedback

2. **November 2, 2011: Chesapeake Bay Restoration Webinar**
   Webinar Host: APA Regional and Intergovernmental Planning Division
   Location: GWRC Conf. Room
   Attendance: Kevin Byrnes, GWRC; Kevin Utt, City of Fredericksburg; Steve Hubble, Stafford Co.; David Nunnally, Caroline Co.
   Agenda: Panel speakers from Virginia included Anthony Moore, the Assistant Secretary for the Virginia Department of Natural Resources where he is in charge of Chesapeake Bay restoration, and John Carlock, the Deputy Director of the Hampton Roads Planning District Commission. The third speaker was Jeffrey Corbin, Special Advisor to EPA Administrator Jackson for the Chesapeake Bay and Anacostia River. Discussion of clean-up issues and State, regional and local policy and implementation options to achieve the State's TMDL goal.

3. **November 30, 2011: Virginia's Stormwater Regulations Webinar**
   Webinar Host: Virginia Department of Conservation and Recreation
   Location: GWRC Conf. Room
   Attendance: Kevin Byrnes, GWRC; Kevin Utt, City of Fredericksburg; Steve Hubble, Stafford Co.; David Nunnally, Caroline Co.
   Agenda: Presentation on requirements and implementation schedule for local adoption of State stormwater regulations. See: http://www.dcr.virginia.gov/vabaytmdl/documents/vatmdlwip.pdf

4. **September 10-14, 2012: Strategic Conservation Planning Using the Green Infrastructure Approach**
   Location: Shepardstown, WV
   Attendance: Kevin Byrnes, GWRC
   Agenda: This introductory course provided participants with a strategic approach for prioritizing conservation opportunities and a planning framework for conservation and development – integrating the green and the grey. Through hands-on class projects, lectures, and numerous case studies, participants experienced firsthand how the green infrastructure approach can be used to connect environmental, social, and economic health across urban, suburban, and rural settings. Participants also learned how green infrastructure planning can serve as a tool to inform land use decisions and build consensus among diverse interests.
   Outcome: Increased understanding of GI concepts; made important contacts with faculty to support GWRC plan implementation.

5. **September 27, 2012: Blue & Green Infrastructure Planning in Coastal Virginia: Tools and Implementation**
   Location: VIMS, Gloucester Point
   Attendance: Kevin Byrnes, GWRC; Dave Nunnally, Caroline Co.; Jeff Harvey, Stafford County
   Agenda: Overview of state, regional and local case studies of green infrastructure tools, planning and implementation experience; panel discussion on conservation easements and local implementation issues.
   Outcome: Strengthened local understanding of value of this process for comprehensive planning.

B. Coordination Activities:

1. November 29, 2011: PD 16 Regional TMDL/WIP-2 Planning Committee

Location: GWRC Conf. Room
Attendance: Jack Green, King George Co; Chip Rice, FOR; Eldon James, RRBC; Matt Carroll, TCC SWCD; Derek Hanlin, TCC SWCD; David Nunnally, Caroline Co; Kevin Utt, Fredericksburg; Steve Hubble, Stafford Co; Thomas T Thompson, VDH; Mac Saphir, H-C SWCD; Kevin Byrnes, GWRC.

Agenda & Outcomes/Meeting Notes:

A. Discussion of Project Goals

Kevin Byrnes opened the discussion with some background on the 2 funding sources (DEQ-CZM & DCR) anticipated to provide PDC staffing support to local governments. Eldon James elaborated on the negotiations between the PDCs and DCR and how the PDCs had rejected a role proposed by DCR that suggested regional responses would be binding on local governments. DCR backed off that expectation and gave PDCs a commitment to allow more flexibility to the regions to facilitate the process and enable local governments where they are asked to assist locally.

Mr. Byrnes asked the group to discuss what they would like to see as an outcome of these regional meetings…

- Mac Saphir: …make the Bay model more realistic through the incorporation of local government information on BMPs, land cover, demographics, etc.
- Kevin Utt: …develop a regional collaborative approach. Create a "straw man" scenario
- Steve Hubble: …educate local elected officials on this process
- Dave Nunnally: …explain where the TMDL goals come from and how they are derived.

Steve Hubble summarized the 5 outcomes of the TMDL process[1] from a Powerpoint presentation developed by NoVA Regional Commission and discussed on 11/28 with NoVa local governments. He explained that the NoVa communities appeared to be avoiding the use of the VAST model in favor of collecting narrative responses to the TMDL outcomes to be forwarded to DCR for assimilation in the WIP-2 state plan.

Eldon James: Discussed the five outcomes and commented that identifying local government resource constraints to be communicated to the State and Virginia General Assembly was important.

David Nunnally mentioned that resource constraints would also include the lack of enabling authority given to local governments to impose (potentially) environmental controls & BMPs on existing development. Chip Rice contributed that, given the tight schedule, locals may want to prioritize their response to the 5 TMDL outcomes and defer addressing the evaluation of land cover and land use because the Bay model won't be revised to reflect any different land cover information for several years.

B. Discussion of Project Timeline & Holiday Schedule

The Committee then agreed that bi-weekly meetings would be needed to keep making progress. The following meeting schedule was established:

[1] *1. Develop a current BMP inventory; 2. Evaluate land use /land cover information; 3. Review BMP scenarios identified in the Phase I WIP, and develop preferred local scenarios that provide a similar level of treatment; 4. Develop strategies to implement the BMP scenarios; and 5. Identify any resource needs to implement the strategies.*

Date	Time	Location*
Dec 8	1:30 – 3:30 pm	GWRC Conf Room
Dec 22	1:30 – 3:30 pm	GWRC Conf Room*
Jan 4 (following RRBC-NPWG mtg)	3:00 – 5:00 pm	GWRC Conf Room*
Jan 18	1:30 – 3:30 pm	GWRC Conf Room*
Jan 23: GWRC Meeting Briefing	6:00 pm	GWRC Conf Room
Jan 26 ???	1:30 – 3:00 pm?	GWRC Conf Room*
Feb 1	Local/Regional Submittal	*Possible mtg rotation to Spotsylvania venue to accommodate R. Street ?

C. Discussion of Project Elements

1. BMP Inventory
   a) Urban BMPs: Stafford, City & Spotsylvania assumed to be in good shape through the cataloging of BMPs under the MS4 program. King George and Caroline have some BMPs cataloged under Ches. Bay Preservation Act requirements; however, may need PDC assistance to locate and improve documentation.
   b) Rural BMPs: Hanover-Caroline SWCD assumed to have good catalog but need to get H-C SWCD staff engaged in the PD 16 process to assist Caroline reporting. Kevin Byrnes mentioned that he & Matt Carroll (new TCC SWCD District Manager) had spoken the day before and Matt needs to explore how he might be able to aggregate rural BMP info by locality and Bay model watershed (or HUC watershed) to assist local governments accounting for rural BMPs.

   There was general discussion around identifying voluntary BMPs and BMPs still in place (even though no longer in cost-share program) to expand the inventory to be more comprehensive. Matt Carroll agreed to research whether TCC SWCD had any means to identify past BMPs still in operation and whether they could do any aggregation of NCRS database provide summary data useful to the localities in the process.
2. Land Cover Inventory

   Kevin Byrnes explained the GWRC had existing spatial analysis tools and 2009 30-meter imagery that could provide more current land cover inventory that would be generally consistent with Bay model data. Moreover, a new public-domain land cover classification tool is being used to capture current estimated land cover that could be used to respond to King George and Caroline request for assistance on this outcome. Moreover, given the full-year scope of the DEQ-CZM funding and the anticipated release of 2010 C-CAP classified land cover imagery in early 2012, he suggested that some land cover classification work could be done with the new imagery after the more pressing Feb 1st TMDL deadline.

   He also indicated an interest in learning what VDOT may be developing to measure the Department's impervious road, parking and other hard surface areas through their in-house research as an MS4 permit holder.
3. Review of Phase 1 BMP scenarios & preferred local scenarios

   Discussion of this item was deferred to the next meeting
4. Local strategy development to implement BMP scenarios

   Discussion of this item was deferred to the next meeting
5. Identification of resource needs to implement the strategies.

   Discussion of this item was deferred to the next meeting

D. Key Actors & Participation Roles

1. PDC – convenor and facilitator of meetings, provide technical assistance upon local government or SWCD request
2. SWCDs – to assemble current, voluntary and still active rural BMP information and aggregate in ways helpful to localities without violating USDA confidentiality guidelines.

3. Local Governments – assemble MS4 and non-MS4 BMP information, existing local strategies and budget resources. Convene local meetings with military or other federal installations to discuss the planned federal institutional response to the TMDLs and ability to share information with locals.
4. VDOT – provide information on VDOT's MS4 program and inventory of impervious surface area and strategies
5. Military Bases & Federal Facilities – work with local governments to meet 5 outcomes for federal property
6. UMW - provide information on UMW's MS4 program and inventory of impervious surface area and strategies. Does MS4 extend to planned remote campus locations?
7. VDH – provide, in cooperation with local governments, information on permitted septic systems
8. Va Dept of Forestry – coordinate DOF efforts on ecosystem valuation and lan cover modeling with local interests in identifying land cover, gaps in riparian vegetative buffers, etc.

2. December 8, 2011: PD 16 Regional TMDL/WIP-2 Planning Committee

Location: GWRC Conf. Room
Attendance: Jack Green, King George Co; Chip Rice, FOR; Matt Carroll, TCC SWCD; David Nunnally, Caroline Co; Kevin Utt, Fredericksburg; Steve Hubble, Stafford Co; Thomas T Thompson, VDH; Mac Saphir,H-C SWCD; Kevin Byrnes, GWRC; Roy Mills, VDOT; Doug & Ross Pickford, Conservation Concepts.
Agenda:
1. Approval of Minutes of Nov 29, 2011 Mtg
2. Approval of Agenda
3. Briefing on Stafford Co BMP catalog & MS4 program (Steve Hubble)
4. Briefing on land cover analysis tools and methodologies (Kevin Byrnes)
5. Briefing on TCC SWCD's ability to aggregate rural BMP information (Matt Carroll)
6. VDOT update (Roy Mills)
7. Group discussion of appropriate BMP classification for rural localities
8. Local status of outreach to military basis & federal facilities

Outcomes:
1. Stafford Co agreement to share MS4 program database tracking & reporting system for use by rural localities after being customized by GWRC for local application.
2. GWRC commitment to produce river segmentshed estimates of land cover for each locality that are controlled to the total land area of each riversegmentshed and the locality total land and water area.
3. Matt Carroll still inquiring as to what localities need and what his reporting flexibility is under the NCRS program.
4. Roy Mills expressed willingness to explore partnerships with localities to examine the potential use of VDOT drainage road systems as a means of enhancing wetlands for additional BMP credit.
5. Contact made with all three military installations to request land cover and BMP inventories.

3. December 22, 2011: PD 16 Regional TMDL/WIP-2 Planning Committee

Location: GWRC Conf. Room
Attendance: James Davis Martin, DCR; Chip Rice, FOR; Matt Carroll, TCC SWCD; Kevin Byrnes, GWRC; Kevin Utt, City of Fredericksburg; Steve Hubble, Stafford Co.; David Nunnally, Caroline Co.; Robbie Talbert, VDOF; Doug & Ross Pickford and Richard Stanford, Conservation Concepts, LLC
Agenda: Presentation and discussion by James Davis-Martin about use of the Chesapeake Bay VAST model and DCR expectations regarding local government responses to DCR request for WIP-Phase 2 strategies and local commitments.
Outcomes:
1. Local stormwater and environmental planning staff understanding that DCR would accept regional WIP-2 submittal without identifying specific local support or opposition to submitted regional WIP strategies.
2. Local rejection of the use of VAST model to submit BMP data and strategies.

4. January 4, 2012: PD 16 Regional TMDL/WIP-2 Planning Committee

Location: GWRC Conf. Room
Attendance: Jack Green, King George Co.; Chip Rice, FOR; Matt Carroll, TCC SWCD; Kevin Byrnes, GWRC; Kevin Utt, City of Fredericksburg; Steve Hubble, Stafford Co.; David Nunnally, Caroline Co.; Robbie Talbert, VDOF; Ross Pickford & Richard Stanford, Conservation Concepts, LLC; Russ Mills, VDOT.
Agenda:

1. BMP Update – group discussion
2. Land Cover Update – Byrnes
3. 2017 & 2025 BMP Scenarios & Local Scenarios – group discussion
4. Proposed Strategies – Conservation Concepts & group discussion
5. Resource Needs – group discussion

Outcomes:

1. Decision to review Rappahannock River Tributary Strategies & Compare with Ches. Bay TMDL Goal and look at recommendations from HRPDC.
2. Decision to meet in Spotsylvania Co to engage Spotsylvania County staff at next meeting

5. January 18, 2012: PD 16 Regional TMDL/WIP-2 Planning Committee

Location: Spotsylvania County Planning & Development Office
Attendance: Kevin Byrnes & Tim Ware, GWRC; Les Johnson, UMW; Richard Stanford, Doug Pickford, Ross Pickford, Conservation Concepts, LLC; May Sligh, DCR; Marion Moody, Hanover-Caroline SWCD; Steve Hubble, Stafford Co.; Kevin Utt, City of Fredericksburg; Richard Street, Spotsylvania Co.; David Nunnally, Caroline Co., Matt Carroll, TCC SWCD.
Agenda: Presentation & Meeting facilitation by Conservation Concepts to review differences between Rappahannock River Tributary Strategies Pollution and Sediment Reduction Goals and the similar Chesapeake Bay TMDL Goals
Outcomes:

1. Technical group consensus that Trib Strategies provide the framework that DCR should re-apply in the Ches Bay TMDL WIP-2 program.
2. Local option to contribute additional local comment to regional WIP-2 response prepared by GWRC, with assistance from Conservation Concepts.

6. January 30, 2012: PD 16 Regional TMDL/WIP-2 Planning Committee

Location: GWRC Conf. Room
Attendance: Kevin Byrnes & Tim Ware, GWRC;; Richard Stanford, Doug Pickford, Ross Pickford, Conservation Concepts, LLC; Steve Hubble, Stafford Co.; Kevin Utt, City of Fredericksburg; David Nunnally, Caroline Co., Matt Carroll, TCC SWCD.
Agenda: Review and discussion of final submittal draft of regional WIP-2 report
Outcomes: Technical committee acceptance of the draft report and recommendation to submit to DCR on behalf of localities in PD 16.

7. March 5, 2012: Coastal PDC Quarterly Meeting with DEQ-CZM Staff

Location: GWRC Conf. Room
Attendance: Beth Polak & Shep Moon, DEQ-CZM; Kevin Byrnes & Tim Ware, GWRC; Laura Grape, NVRC; Sarah Smith, RRPDC, Stuart Mackenzie, NNPDC, Lewie Lawrence, MPPDC; Ben McFarland, HRPDC, Kirk Smith, A-NPDC; Shereen Hughes, Wetlands Watch
Agenda: CZM Updates & Announcements (Polak & Moon), NOAA Coastal Services Center Social Coast Forum Update (Lawrence), Collaborative TMDL Strategies on BMPs on Private Property (Hughes); PDC reports.
Outcomes: CZM stressed promotion of CZM program value, in light of federal budget cuts; Review past work to report on where CZM work got integrated into other planning efforts; Shoreline management planning requirement being supported by template local ordinance under development at VIMS.

8. July 11, 2012: PD 16 Regional TMDL/WIP-2 Planning Committee

Location: GWRC Conf. Room
Attendance: Kevin Byrnes, GWRC; Steve Hubble, Stafford Co.; Kevin Utt, City of Fredericksburg; Andrew Hopewell, Spotsylvania Co.; David Nunnally, Caroline Co., Stephen Manster, Town of Bowling Green; Alex Long, Town of Port Royal;, Chip Rice, Friends of the Rappahannock; Chris & Dick Folger, Spotsylvania Greenway Initiative; Patrick Coady, Northern Virginia Conservation Trust
Agenda:

1. TCC SWCD NFWF Capacity Building Technical Assistance Grant Application Status
2. Discussion of DCR Request for Local Review Comments on Virginia Outdoor Plan Update
3. Discussion of Conservation Easements & NVCT Support of Regional Conservation Goal – Patrick Coady (Handouts)
4. Local Implementation of Virginia Stormwater Regulations – Doug Pickford (Handouts)

Outcomes:

1. TCC application denied by NFWF & TCC SWCD District Manager has resigned.
2. Consensus that a partnership with a land conservancy trust would help GWRC, localities and general public gain local expertise to educate and promote the benefits of donated conservation easements which could help the Region achieve its voluntary goal of 14,400 acres of land conservation easements.
3. Development of local regulations looks like another opportunity for regional collaboration to assit localities achieve compliance with complicated and evolving State regulatory program.

9. August 11, 2012: PD 16 Regional TMDL/WIP-2 Planning Committee

Location: Stafford County Administration Building
Attendance: Steve Hubble & Rashid Baral, Stafford Co., Eldon James, RRBC; Doug and Ross Pickford, Conservation Concepts, LLC; Jack Greene, King George Co., Kevin Byrnes, GWRC, Kevin Utt, City of Fredericksburg; David Nunnally, Caroline Co.
Agenda: Participation in DCR webcast on RFP for local stormwater program implementation grants and group discussion.
Outcomes: General consensus that GWRC would take the lead in developing proposal response and work with E. James, Conservation Concepts and local government staff to finalize before the submittal deadline.

10. August 30, 2012: PD 16 Regional TMDL/WIP-2 Planning Committee

Location: GWRC Conf. Room
Attendance: Steve Hubble, Stafford Co.; Ross Pickford & Rick Stanford, Conservation Concepts, LLC; Jack Greene, King George Co.; Kevin Byrnes, GWRC, Kevin Utt, City of Fredericksburg; David Nunnally, Caroline Co.; Chris Pomeroy, AquaLaw.
Agenda:

1. Discuss the scope of work and division of responsibilities between GWRC, local government departments, outside consultants, and FOR.
2. Discuss procurement process for outside consultants

Outcomes:

1. General consensus on the revision of Stafford Co. stormwater ordinance as regional template for local consideration and submittal to DCR by the April 1 deadline.
2. Discussed procurement process for engaging outside consultants.

SECTION 2

ENHANCE COMMUNITY CONSERVATION INFO INPUTS TO CHESAPEAKE BAY TMDL WIP-PHASE 2

Products #2a, 2b:

2a: Regional Report to DCR for the Virginia TMDL Phase2 Watershed Implementation Plan

2b: GWRC Application to DCR for Local Stormwater Program Implementation Grant

PD 16 Review Findings & Recommendations for Chesapeake Bay TMDL WIP-2

Reviewed and Approved by
GWRC TMDL/WIP-2 Planning Committee
Prior to Submittal to
Virginia Department of Conservation and Recreation

2/17/2012

Abstract: This report summarizes the findings and recommendations of GWRC's TMDL WIP-2 Technical Committee concerning the review requested by the Virginia Department of Conservation and Recreation of data and environmental policy actions proposed in the Chesapeake Bay Watershed Implementation Plan (Phase 1) and associated TMDL goals derived from the Bay water quality model. The recommendations contained herein are intended to be submitted to the Virginia Department of Conservation and Recreation in support of the Commonwealth's Watershed Implementation Plan - Phase 2 and are not binding on the member local governments or conservation districts in Planning District 16. In most cases, local government and conservation district technical staff recommendations for specific strategies have been merged into a set of consensus regional recommendations. However, specific local technical comments from local staff of the City of Fredericksburg and Stafford County have been incorporated as well.

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REPORT DOCUMENTATION

TITLE: PD 16 Review Findings & Recommendations for Chesapeake Bay TMDL WIP-2

REPORT DATE: February 2012

AUTHOR: Kevin F. Byrnes, AICP
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ABSTRACT:

This report summarizes the findings and recommendations of GWRC's Regional Chesapeake Bay TMDL WIP-2 Planning Committee concerning the review requested by the Virginia Department of Conservation and Recreation of data and environmental policy actions proposed in the Chesapeake Bay Watershed Implementation Plan (Phase 1) and associated TMDL goals derived from the Bay water quality model.

The recommendations contained herein were submitted to the Virginia Department of Conservation and Recreation in support of the Commonwealth's Watershed Implementation Plan - Phase 2 and **are not binding** on the member local governments or conservation districts in Planning District 16. In most cases, local government and conservation district technical staff recommendations for specific strategies have been merged into a set of consensus regional recommendations. However, specific local technical comments from local staff of the City of Fredericksburg and Stafford County have been incorporated as well.

The goal of the regional engagement effort is to provide the Commonwealth with proof of local engagement and to assure the EPA that localities are seriously considering the TMDL requirements. The purpose of this report is to document the efforts of the GW Region and member localities to participate in the development of Virginia's Phase II WIP.

After the initial filing of this report in February 2012, GWRC continued to meet with local stakeholders periodically to advance the development of a regional conservation easement program (per the recommendations of the Regional Green Infrastructure Plan adopted by GWRC) and to assist localities in understanding the requirements of integrating the revised State stormwater program regulations into local development ordinances. This CZM-funded effort will be reported under a companion report to the CZM program.

FUNDING ACKNOWLEDGEMENTS:

This project was funded, in part, by the Virginia Coastal Zone Management Program at the Virginia Department of Environmental Quality through Grant # NA11NOS4190122 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended.

ACKNOWLEDGEMENTS

This document was prepared by the George Washington Regional Commission in cooperation with member localities and other regional stakeholders. GWRC expresses its appreciation to the Hampton Roads Planning District Commission for many of its WIP strategy recommendations incorporated herein.

The George Washington Regional Commission (GWRC) would also like to thank the members of Regional Chesapeake Bay TMDL WIP-2 Planning Committee for their cooperation in developing this document.

George Washington Chesapeake Bay TMDL Phase II Watershed Implementation Planning Committee

1. Kevin Utt, City of Fredericksburg
2. Steven Hubble, Stafford County
3. Richard Street, Spotsylvania County
4. David Nunnally, Caroline County
5. Mac Saphir, Caroline Co. Cooperative Extension Service
6. Jack Green, King George County
7. Stephen Manster, Town of Bowling Green
8. Eldon James, Rappahannock River Basin Commission
9. Les Johnson, University of Mary Washington
10. Matt Carroll, Tri-County/City Soil and Water Conservation District
11. Sharon Connor, Hanover-Caroline Soil and Water Conservation District
12. Marian Moody, Hanover-Caroline Soil and Water Conservation District
13. Robbie Talbert, Virginia Department of Forestry
14. Roy Mills, Virginia Dept. of Transportation
15. Tommy Thompson, Virginia Dept. of Health
16. May Sligh, Virginia Dept. of Conservation and Recreation
17. Brenna White, Environmental Division, Naval Support Facility - Dahlgren
18. Elizabeth A. Kimmerly, Natural Resources & Environmental Affairs, US MCB-Quantico
19. Heather Casey, Directorate of Public Works, Fort A.P. Hill
20. Douglas Pickford, Choose Clean Water Coalition
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22. Ross Pickford, Choose Clean Water Coalition
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PREFACE

This report was prepared by the George Washington Regional Commission (GWRC) in lieu of separate local government strategy submittals in February 2012 to the Virginia Department of Conservation and Recreation (DCR) as input to the Virginia Phase II Watershed Implementation Plan (WIP).

At the request of the Commonwealth of Virginia, GWRC agreed to facilitate the involvement of member localities in Virginia's Phase II WIP development process. GWRC endorsed a two-tiered (regional and local) approach to facilitate and support the planning process and to collect information from PD 16 stakeholders. The goal of this effort is to provide the state with proof of local engagement and assure the EPA that localities are seriously considering the TMDL requirements. Some units of local government opted to prepare and submit information outside of this regional process.

The purpose of this report is to document the efforts of the George Washington Region and its member localities to participate in the development of Virginia's Phase II WIP and convey the concerns and issues expressed by the member localities and other process stakeholders regarding legislative, regulatory and resource needs to help localities address the TMDL challenge.

I. Introduction

The George Washington Regional Commission (GWRC) appreciates the support of the Virginia Coastal Zone Management Program to assist the Commonwealth in identifying appropriate enhancements of the Chesapeake Bay water quality model. Moreover, we are pleased to provide the Commonwealth with updated and more specific information collected from our member local governments and/or compiled by the GWRC staff, working with our soil and water conservation district, federal installation and NGO partners in the Region which will enable the EPA and Commonwealth agencies to target public resources to improve the water quality of the Chesapeake Bay and its tributaries in the most cost-effective way.

Moreover, GWRC appreciates the opportunity to poll its localities and assemble the recommendations of the most appropriate strategies and defined resource needs which can inform the Commonwealth in the better elaboration of the Chesapeake Bay Watershed Implementation Plan (Phase 2) and the development of subsequent programs, regulations and resource allocation to address the needs of the Chesapeake Bay watershed throughout Virginia. The GWRC and its member local governments wish to express to the Commonwealth, the Region's collective and continuing commitment to support the Chesapeake Bay TMDL planning process and common desire to see Bay TMDL implementation process "succeed".

Finally, the information we enclose herein "supports the Virginia WIP". We hope that this submittal, as well as through our continued collaboration, will improve the underlying technical basis for the Bay TMDL and demonstrate our region's "understanding" of the Bay TMDL and WIP, and our collective support for localities' appropriate "role and responsibilities" in WIP implementation. Finally, through our collaboration and support of the process, we hope to help Virginia demonstrate "reasonable assurance" of Bay TMDL compliance.

II. Regional Engagement Process

Prior to October 1, 2011, the George Washington Regional Commission undertook to assist its member localities review the forthcoming TDML goals and planning process by hosting viewing sessions of various technical webinars germane to the TMDL process. Through collaborative viewing and group discussion after the webinars, the local government staffand other participants agreed that the Region should lead the development of a planning response to the TMDL goals. To that end, the Commission hosted local staff for a series of interactive stormwater management training webinars provided by the Stormwater Management Network which were held on:

- July 28, 2011: "Surviving Your Local WIP: A Practical Guide to Nutrient Accounting for the Chesapeake Bay TMDL"
- August 11, 2011: "LID Changes Everything: The New Stormwater Maintenance Paradigm":
- August 18, 2011: "Stormwater Retrofits to Maximize Nutrient Reduction":
- Sept 15, 2011: Increasing the Delivery of Residential Stewardship Practices in Urban Watersheds

In FFY 2012-2013, additional group webinar viewing and training opportunities were held on:

- October 17, 2011: PD 16 Regional TMDL Live Workshop at UMW
- October 19, 2011: Local Government Involvement under the New Bay TMDL Webinar
- November 2, 2011: APA Regional and Intergovernmental Planning Division Chesapeake Bay Restoration Webinar
- November 30, 2011: Virginia's Stormwater Regulations Webinar

At the December 4th meeting, the Regional Committee agreed to meet approximately bi-weekly to accelerate the development of information to be used in the regional response to VDCR's request for regional and local review by February 1, 2012 of BMP, land cover, scenarios and strategies for the WIP-2 process. Consequently, the Committee met again on the following dates:

- December 4, 2011
- December 22, 2011
- January 4, 2012
- January 18, 2012
- January 30. 2012

Additional input was solicited by e-mail from Department of Defense installations (Marine Corps Base-Quantico, Naval Surface Warfare Center – Dahlgren and Fort A.P. Hill) and the National Park Service (Fredericksburg-Spotsylvania National Military Park) regarding how these federal facilities were responding to Virginia's WIP-2 planning process.

The Regional WIP-2 Planning Committee has supported continued collaboration under both GWRC's and the Rappahannock River Basin Commission's (RRBC) leadership to support the coordination of local responses and to foster regional cooperation in the cost-effective implementation of water quality goals for the Region.

III. Regional Summary

Today, the George Washington Region (or Planning District 16), covering 1,419 square miles (or roughly 4% of the Commonwealth's total land area), is one of the fastest growing and most populous areas of Virginia. Significant growth is expected to continue in the future, reaching a population of over 600,000 people by 2040. Anticipated growth will stress existing infrastructure and public facilities, including the regional transportation system, water and sewer infrastructure, fire and police protection, public schools, and the natural environment. The Region, which includes King George, Caroline, Spotsylvania, and Stafford Counties as well as the Cities of Fredericksburg, and Towns of Bowling Green and Port Royal; is divided by three tributary basins (i.e. the Lower Potomac, the Rappahannock and the York Rivers) and sub-divided into coverage by the Tri-County/City and Hanover-Caroline Soil and Water Conservation Districts (SWCDs).

Within the Region, there are a number of MS4 permit holders, including the City of Fredericksburg, Stafford and Spotsylvania Counties, the University of Mary Washington, and the Virginia Department of Transportation, as well as the Stafford County School Board. Additionally, several federal military installations (i.e. Marine Corps Base-Quantico in parts of Stafford, Fauquier and Prince William counties; Naval Surface Warfare Center –Dahlgren in King George Co. and Ft. A.P. Hill in Caroline Co.) and a large, decentralized federal park facility (Fredericksburg-Spotsylvania National Military Park System (with land area in the City of Fredericksburg, Caroline, Spotsylvania and Stafford Counties) add to the complexity of watershed planning and program coordination throughout the Region.

In 2011, the GWRC adopted a Regional Green Infrastructure Plan, developed through a multi-year grant from the Virginia Coastal Zone Management Program. An interim product of this planning process was an analysis of trends in tree canopy loss and impervious surface area growth over the 13 year period from 1996 through 2009. This Urban Ecosystem Analysis (2010) report found that the GW Region (i.e. Planning District 16) lost 4.17% of its tree canopy, while gaining 2.80% of urban bare area, 8.68% of open space, and 43.46% of impervious surface area over the 13 year analysis period. These changes were estimated to have resulted in the loss of the tree canopy's ability to naturally manage 222.98 million cubic feet of stormwater, valued at $1.06 billion (using a conservative local engineering cost of $4.75 per cubic foot for man-made stormwater retention facilities). The Region's "green infrastructure" also lost the ability to remove approximately 2.89 million lbs. of air pollutants annually, valued at $7.74 million per year, 1.24 million lbs. of carbon stored in trees' wood, and 9,616 lbs. of annual carbon sequestration.

Figure 1. Planning District 16 Map

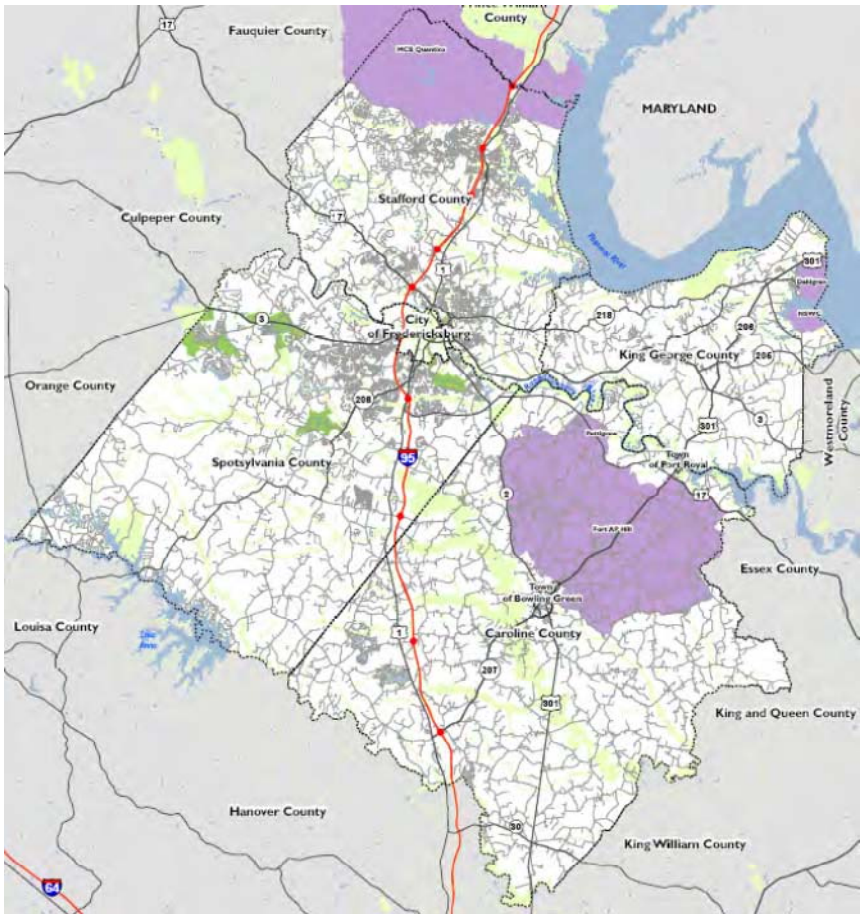


Table 1. Estimated Regional Land Cover, 2009
(30 meter pixel resolution)

Regional Land Cover	Estimated Acreage	Percent of Total Area
Impervious Surfaces	40,247	4.41%
Open Space (Pervious)	191,554	20.97%
Tree Canopy	659,245	72.19%
Bare Land Area	873	0.10%
Water	21,331	2.34%
Total	**913,250**	**100.00%**

Source: GWRC, Urban Ecosytems Analysis, 2010.

With differing levels of tree canopy and urbanization among the Region's local governments, local loss of tree canopy over this 13 year period varied considerably, from a low of 2.36% in King George County to a high of 27.64% in the City of Fredericksburg. At the same time, changes in the amount of impervious surface area over this period reflected the rapid population and development pressure experienced throughout the Region, with the highest increases in Stafford (48.93%) and Spotsylvania (46.78%) Counties, followed by King George Co. (41.91%), Caroline Co (32.85%) and the City of Fredericksburg (25.19 %).

Through this analysis of the Region's tree canopy trends and differing satellite imagery data, GWRC was also able to evaluate the relative amount of land cover classification error associated with the use of 30-meter vs. 1-meter resolution imagery. The results of this comparison (even though not for exactly the

same point in time) is illustrative of the potential for mis-guided public policy and investment based on the 30-meter imagery data used in the Chesapeake Bay watershed land cover change analysis.

Table 2. Comparative Summary: CITYgreen Land Cover Analysis for City of Fredericksburg 30-meter resolution (LANDSAT/CCAP) vs. 1-meter (NAIP)

Land Cover by City Area	Imagery Resolution	Land Cover (Acres)					
		Impervious Surfaces: Buildings & Structures	Impervious Surfaces: Paved	Open Space: Grass & Scattered Trees & Urban Bare	Trees	Water Area	Total
City Total	1-meter (2008)	461.0	1,651.4	1,600.9	2,960.7	53.5	6,727.5
	30-meter (2009)	3,203.7		1,372.5	2,113.6	38.0	6,727.9
	Difference	**-1,091.3**		**228.4**	**847.1**	**15.5**	**-0.4**
	% Difference	**-42.24%**		**14.27%**	**28.61%**	**28.97%**	**-0.01%**

Source: GWRC, City of Fredericksburg Land Cover Study, 2010.

The conclusions drawn from this analysis of 30-meter imagery-based land cover classification compared to 1-meter imagery-based land cover data were:

1. 30-meter based imagery overstates the City's impervious surface area by 1,091.3 acres, or 42.24%.
2. 30-meter based imagery understates the area in "Open Space: Grass, scattered trees and urban bare area" by 228.4 acres or 14.27%
3. 30-meter based imagery understates the tree canopy by 847.1 acres or 28.61%.
4. 30-meter based imagery understates the amount of surface water area by 15.5 acres or 28.97%.

In the final Regional Green Infrastructure Plan developed using the referenced Urban Ecosystem Analysis study, the GWRC Board adopted a voluntary regional goal of restoring 5% of the Region's lost tree canopy (thereby restoring the tree canopy to near 1990 levels) and encouraging the voluntary placement of 14,400 acres of additional land area under conservation easement (thereby adopting the Region's pro-rata share of Governor McDonnell's 400,000 acre conservation easement goal for his 4-year term of office).

The Region's local governments, all under the requirements of the Chesapeake Bay Preservation Act, were found compliant with all Bay Act requirements in their most recent compliance review by the former Chesapeake Bay Local Assistance Department staff. Moreover, three of the localities, as MS4 permittees, have active stormwater management programs and public outreach efforts to control and mitigate the impact of stormwater runoff from area land development.

In the Region's federally-mandated long-range transportation planning program, coordination of land use and transportation planning is being implemented through a Regional Scenario Planning Process which recognizes a variety of economic, environmental, infrastructural and other issues that impact where and how the Region develops, where there is a public interest in discouraging development from occurring and where modified regulations and technology may support development that previously may have been unfeasible. This Scenario Planning process recognizes and takes into account such State and Federal actions as:

- the Chesapeake Bay Preservation Act,
- the Chesapeake Bay TMDL program,
- the State Access Management regulations and Secondary Road Standards,
- the State's Urban Development Area (UDA) regulations,
- the allowance of Alternate Septic Symptoms in rural areas,
- revised State Storm Water Management regulations,
- State voluntary agricultural protection and BMP cost-sharing programs,

- the growth of conservation easements and
- the presence of an historically-significant federal park system.

Through the sharing of this scenario planning tool with each local government to capture development trends and re-inform the regional planning process every four years, a better planning system to anticipate demand for targeted transportation improvements and services is the intended result.

The Regional TMDL/WIP-2 Committee also notes the significant effort of the VDCR over several years in developing the "Chesapeake Bay Nutrient and Sediment Reduction Tributary Strategy for Rappahannock River and Northern Neck Coastal Basins", released in March 2005, and similar basin tributary strategies for the other major river basins flowing to the Chesapeake Bay. This report, based on a multi-year collaborative effort of local, regional, and State government, as well non-profit and private sector interests; sets out seven major strategy areas which were identified at that time as meeting the goals of the Tributary Strategy process. These major strategy areas are:

1. Agricultural Best Management Practices (BMP) Acceleration
2. Expansion of Nutrient Management Planning and Implementation Efforts
3. The Consolidation and Strengthening of the Virginia Stormwater Management Program
4. Enhancing Implementation of the Virginia Erosion and Sediment Control Program
5. Strengthen Implementation of the Chesapeake Bay Preservation Act
6. Enhancement of the NPS Implementation Database Tracking Systems
7. Enhancing outreach, media and education efforts to reduce pollution producing behaviors

The regional TMDL/WIP-2 Committee found that the nitrogen and phosphorus goals for the TMDL and Tributary Strategies development are not too terribly different. The Bay-wide nitrogen goal was 51.4 million pounds/year under the Tributary Strategies and is 53.662 million pounds/year under the TMDL. The Bay-wide phosphorus goal was 6 million pounds/year under the Tributary Strategies and is 5.357 million pounds/year under the TMDL. So the Tributary Strategies plan for nitrogen should meet (and exceed) the reductions needed to meet the TMDL for nitrogen and only a little bit more reduction is needed in the Tributary Strategies plan to meet the TMDL phosphorus reduction goal.

The situation is even better for the Rappahannock basin. Here are the comparisons between the Phase I WIP goals for nitrogen and phosphorus and the Tributary Strategies goals:

This comparisons in Table 2 (or Figures 2 and 3) illustrate that the Tributary Strategies goals for both nitrogen and phosphorus reductions in the Rappahannock Basin exceed the reductions needed to meet the TMDLs. In fact, it may be even better than what is implied above. The Tributary Strategy plan actually exceeds the reductions needed to meet the Tributary Strategies goal. The Rappahannock Tributary Strategy supposedly achieves a total nitrogen release of 4.82 million pounds/year and a total phosphorus release of 595,670 pounds/year!

The GWRC Regional TMDL/WIP-2 Committee, therefore, believes that much of the Tributary Strategy provides an excellent resource of strategies which may be applicable to the Virginia Phase II WIP. There is, however, not a lot of detail in the Tributary Strategy document – but neither is there a lot of detail in the WIP Phase II document. At least the Tributary Strategy document provides cost (2004 $) as related to each BMP. Also, the Tributary Strategy document has a whole series of BMP data and recommendations, some cost figures (which probably need updating), strategies for moving forward, etc. Consequently the Regional TMDL Committee concluded that this document would serve as a great place to start, recognizing that there is a lot of additional information that would need to be collected (e.g. expanded BMP inventory, land cover/use) and updated.

Figure 2. Comparison of 2005 Tributary Strategy with Phase 1 WIP Goals for Nitrogen

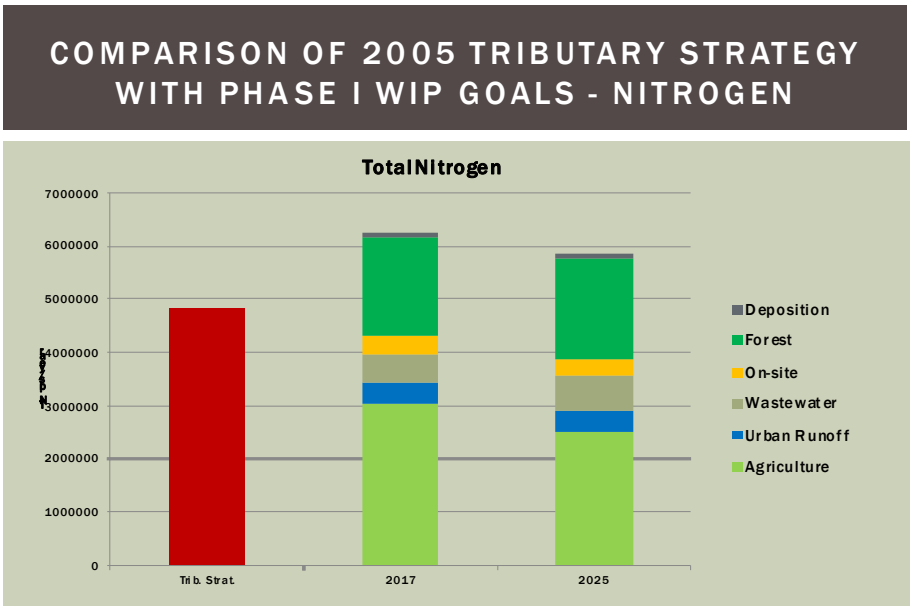
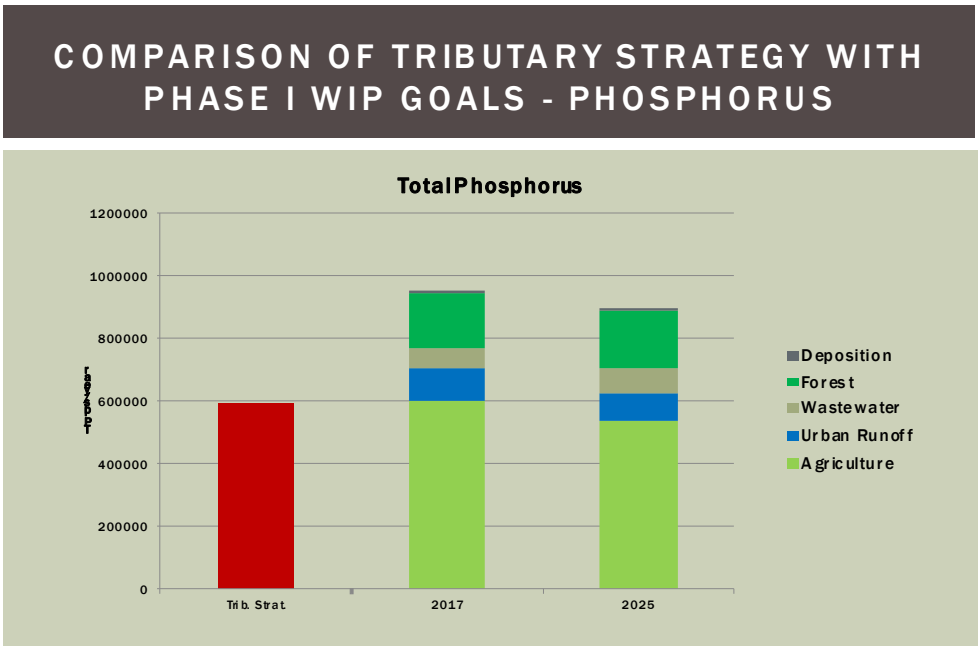


Table 3. Comparative Pollution Reduction Goals, 2005 Tributary Straegies and Phase 1 WIP

Pollutant	Tributary Strategy goal	Phase I WIP (2017 goal)	Phase I WIP (2025 goal)
Nitrogen (million pounds/year)	**5.24**	**6.291**	**5.84**
Phosphorus (pounds/year)	**620,000**	**974,000**	**900,000**

Figure3. Comparison of 2005 Tributary Strategy with Phase 1 WIP Goals for Phosphorus



A. Best Management Practices (BMPs)

1. Urban BMPs

GWRC has been unable to compile a complete summary of all local urban BMPs due to differences in local data formats, BMP classifications and the limitations of the time available prior to the February 1, 2012 submittal deadline. Moreover, some localities have withheld their urban BMP inventory as they update and finalize this information for direct submittal under separate cover to VDCR.

2. Rural/Agricultural BMPs

Table 4. Comparative Summary of VAST and Local Rural BMP Data

Locality	Local Rural Agric. BMPs (2006 - 2011)		TMDL Rural Agric. BMPs		Net Difference: Local - TMDL	
	value	unit	value	unit	value	unit
City of Fredericksburg						
Areal Total	14.70	acres	0.00	acres	14.70	acres
Linear Total	0.00	linear ft	0.00	linear ft	0.00	linear ft
Caroline Co.						
Areal Total	175,789.02	acres	61,615.00	acres	114,174.02	acres
Linear Total	0.00	linear ft	51,778.87	linear ft	-51,778.87	linear ft
King George Co.						
Areal Total	13,626.00	acres	19,914.00	acres	-6,288.00	acres
Linear Total	17,272.10	linear ft	16,437.74	linear ft	834.36	linear ft
Spotsylvania Co.						
Areal Total	27,501.20	acres	25,669	acres	1,832.20	acres
Linear Total	32,518.00	linear ft	144,325.20	linear ft	-111,807.20	linear ft
Stafford Co.						
Areal Total	6,598.80	acres	4,761.00	acres	1,837.80	acres
Linear Total	9,870.00	linear ft	23,012.83	linear ft	-13,142.83	linear ft
PD 16 Total						
Areal Total	**223,529.72**	**acres**	**111,959.00**	**acres**	**111,570.72**	**acres**
Linear Total	**59,660.10**	**linear ft**	**235,554.64**	**linear ft**	**-175,894.54**	**linear ft**

Source: Local Soil and Water Conservation Districts, 2006 – 2011

It is unclear whether this comparison of agricultural BMPs compiled by the SWCDs of PD 16 for the period 2006 – 2011 is directly comparable with the BMPs in the TMDL dataset. The inability of SWCD staff to provide guidance illustrates the need for better coordination of TMDL information among localities, PDCs, SWCDs and VDCR to ensure that there is a common understanding of the data to be reported and used in the Bay model.

B. Land Cover Data

Land cover data for the Region was assembled by locality, aggregated regionally, and compared to the VAST dataset for PD 16. The VAST data and regionally-aggregated local data are compared in the following table.

subsource	GWRC (PD 16) Total Land Cover Comparison			
	VAST: Local TMDL Data 2009 LU/LC (acres)	PD 16 Estimate 2010 LU/LC (acres)	Share of Regional Area	Net Difference (acres)
Regulated Animal Operations	-	-	0.00%	-
Animal Operations	219	2,197	0.24%	1,979
Crop	45,734	51,477	5.73%	5,743
Hay	24,569	27,353	3.04%	2,784
Pasture	25,857	27,475	3.06%	1,617
Nurseries	93	817	0.09%	724
Atmospheric Deposition	1,923	21,843	2.43%	9,920
Unregulated Urban Impervious	15,008	14,187	1.58%	(821)
Unregulated Urban Pervious	39,636	34,048	3.79%	(5,588)
Regulated Urban Impervious	7,159	29,737	3.31%	22,578
Regulated Urban Pervious	28,580	53,981	6.01%	25,401
Construction	1,315	10,230	1.14%	8,915
Combined Sewer System	-	-	0.00%	-
Septic	-	-	0.00%	-
Surface Mine	4,871	2,454	0.27%	(2,417)
Unmanaged Grass	9,716	38,682	4.31%	28,965
Forest	87,836	597,596	66.51%	(90,240)
Water	-	8,777	0.98%	8,777
Land Area Sub-Total	902,516	889,679	99.02%	(12,837)
Grand Total	**902,516**	**898,457**	**100.00%**	**(4,059)**

Source: Aggregation of regional estimates compiled by GWRC. See Appendix B for discussion of methodology and data sources.

GWRC notes that the basic discrepancy in total land area is related to the inclusion of water area in the Potomac River which is legally part of the State of Maryland, but included as part of the river segment watersheds reported for Stafford and King George Counties. While not without its limitation, the land cover methodology used for the counties (after controlling for actual surface water area) shows that for the "unregulated" area (i.e. King George and Caroline Counties), the urban impervious and pervious estimates are reasonably close, while for the regulated communities (i.e. Fredericksburg, Stafford and Spotsylvania) more significant differences may exist.[1]

C. Review of 2017 & 2025 BMP Scenarios and Preferred Local Scenarios

No local scenarios were submitted or developed through the Regional TMDL/WIP-2 Committee process; consequently, the Committee offers no recommendations on alternate BMP scenarios other than a recommendation to VDCR that the recommendations of the 2005 Tributary Strategies developed for the Potomac, Rappahannock and York River basins, respectively, would be a good place to start for meeting the TMDL goals. The Committee did express a desire that the

[1] Due to staffing limitations, all of Stafford and Spotsylvania Counties where classified as falling under the "regulated" area, whereas actually only a small percentage of each of these localities is under the MS4 program. All of the City of Fredericksburg is regulated under the MS4 program. Further research by GWRC intends to provide more detailed analysis of the regulated area in each of these 2 counties later this year, once the 2010 C-CAP land cover data for Virginia's coastal zone is released by NOAA.

Commonwealth restore the tree planting BMP which existed under the Tributary Strategy program and was dropped in the 2012 and 2025 WIP 1. Other local recommendations may be found under the City of Fredericksburg and Stafford County sections that follow the Regional Summary.

D. Implementation Challenges and Recommended Initiatives

In general, Chesapeake Bay TMDL implementation challenges can be characterized in terms of:

- Planning research and model revisions
- Policy support; and
- Funding support.

This section describes the challenges anticipated in implementing nutrient reduction strategies and provides recommended initiatives to address gaps in information and resources. The George Washington region strongly recommends that the state and EPA consider the number and magnitude of these gaps and dedicate more staff and funding resources to the Chesapeake Bay TMDL implementation effort.

The region recognizes that it is unlikely that all of these initiatives can be supported by the limited resources available. George Washington localities have identified the following initiatives as the highest priority:

- Increase the budgets for the Agricultural BMP Cost-share Program and the Conservation Reserve Enhancement Program and double the Soil and Water Conservation District staffing to promote and manage these programs
- Issue a state bond measure sufficient to finance wastewater upgrades, taking advantage of low interest rates
- Expand the Virginia Agricultural BMP Cost-Share Program or establish a new Septic System Cost Share Program to provide 50% of the projected total average annual cost of $114 million to assist required septic system upgrades or replacements, to incentivize denitrifying upgrades to non-failing septic systems, and to allow cost-share funds to be used for connecting septic systems to sanitary sewer systems in sewered areas
- Support expanded nutrient trading mechanisms to facilitate urban and rural partnerships at a regional level
- Expand the Chesapeake Bay Preservation Act to include all localities within the Chesapeake Bay Watershed.

D.1 Initiatives for Planning Research and Model Revisions

Further research and revisions to the Chesapeake Bay model are recommended to improve water quality management programs and guide WIP implementation strategy decisions. GWRC supports the use of EPA and Virginia funding and staff support to pursue the initiatives listed below.

D.1.1 Develop an Improved Framework for BMP Data Collection

Virginia should develop a framework for collecting local data and issuing BMP guidance and updates on the Bay program's modeling efforts. The lack of a framework and clear expectations has frustrated local planning efforts and development of implementation strategies. Specifically, the state should provide:

- Template for tracking BMP data and schedule for submitting the data.
- Frequently asked questions for Urban BMPs.
- Updates describing recently proposed BMPs, approved BMPs or revised modeling assumptions.

- Process for localities to request addition of alternate BMPs to the Chesapeake Bay Watershed Model.
- Assumptions regarding the redistribution of locality target reductions based on the implementation of the fertilizer ban, additional L3 level of reductions on federal lands instead of L2, and changes to air deposition due to the construction or closure of stationary sources.
- Schedule and process for incorporating locality corrections for pre-2006 BMPs.

Continued enhancement by VDCR of the VAST system to support better reporting of BMP implementation and land cover data enhancements to support future improvements of the Chesapeake Bay TMDL water quality model is a possible way to promote this recommendation.

D.1.2. Develop High-Resolution Land Cover Information and Change Detection System

For greater consistency across the entire watershed, improvements to the Bay model need to include high-resolution, highly-accurate vector-format, land cover data that consistently reflects changes in land cover over time as a means of measuring land cover conversion at a subwatershed level. Some areas advocate the use of local land cover data. However, George Washington localities view this approach as impractical toward achieving a standard of consistency and usability on a statewide or Bay watershed level given the great potential for inconsistencies on land cover classification systems, data collection update frequency and differing local legal and political opinion regarding the public domain status of such data.

The Commonwealth should establish a statewide baseline, high resolution (i.e. 1-meter pixel resolution) land cover information detection and change tracking system (modeled after the methodology[2] employed by the Rivanna River Basin Commission) to support local, regional and watershed- level land cover information and change detection to help target cost-effective BMP implementation and measure progress in achieving various BMP implementation strategies, as well as other environmental, economic and community planning benefits.

D.1.3 Support Integrated Water Resources and Water Quality Planning Initiatives

The Region and the Commonwealth should participate in and support the efforts of the Rappahannock River Basin Commission (RRBC) to develop an integrated water resources plan for the Rappahannock River Basin to identify policies, projects and initiatives that provide optimal environmental, economic and fiscal outcomes.

D.1.4 Implement Water Quality Monitoring in Coastal Virginia to Estimate Urban Loads

The Bay Program does not collect and calculate nutrient and sediment loads for the tidal areas of Virginia. The technology and equipment exists to measure the water quality and flow rates but it is expensive and more difficult than gathering data in non-tidal areas. The Bay Program should gather data from tidal zones to validate loading rates and measure the ratio of nitrogen, phosphorus, and sediment in urban runoff from Virginia's Coastal Plain. Virginia should consider partnering with localities to provide financial assistant to expand water quality monitoring in tidal areas.

D.1.5 Evaluate Impact of Extreme Weather Events

This year the impact of major storm events on water quality in the Bay attracted media attention and scientific interest. However, the research remains incomplete and fails to provide assessments on whether extreme weather events have a more significant impact on the long-term water quality in the Bay than the day-to-day nutrient reductions. Given the significant investment

[2] See http://www.rivannariverbasin.org/Rivanna-maps-tools.php for discussion of Rivanna River Basin land cover data and mapping project that serves as a template of the recommended approach Statewide.

of funds required to meet the TMDL by 2025, the Bay Program should focus research on evaluating the potential need for BMPs designed to minimize the impact of extreme storm events.

D.1.6 Revise Segmentsheds in Each Basin to Reflect Hydrodynamics and/or Local Political Geography

While several segmentsheds in the Hampton Roads region may have been incorrectly assigned to drainage basins, other river segmentsheds in the George Washington region are assigned to local jurisdictions beyond their political boundary in the Potomac and Rappahannock Rivers. In some cases, these river segmentsheds assigned to Virginia localities (e.g. King George and Stafford Counties) are legally part of Maryland locality jurisdiction (e.g. Charles County, MD. The George Washington region localities request that the State or Bay modelers provide the justification to support basin and jurisdictional assignments for segmentsheds, and consider model revisions to accommodate all segmentsheds that discharge directly to the Chesapeake Bay.

D.1.7 Designate Wetlands as Land Use Category

The current land use framework tracks wetlands under the forest category. This causes confusion and suspicion that the wetland loading rates do not reflect the capacity of wetlands to reduce the quantity of runoff and reduce nutrient and sediment loads. The Watershed model should be revised to track wetlands as a separate land use category with an appropriate loading rate.

D.1.8 Evaluate BMP Effectiveness to Reduce Bacteria Impairments

In the George Washington region, many waterways are impaired for bacteria. Localities would like to select BMPs that would address bacteria impairments as well as reduce nutrients. The region requests that Virginia's Department of Environmental Quality dedicate funds for development of TMDL implementation plans to provide an assessment of BMPs that provide nutrient and bacteria reductions.

D.1.9 Evaluate BMP Effectiveness to Reduce Flooding

Many localities experience extensive flooding and would like to select BMPs that alleviate flooding as well as reduce nutrients. The region requests that Virginia dedicate funds for flood control and emergency planning to provide an assessment of BMPs that provide nutrient removal and flood control.

D.1.10 Incorporate Lawn Fertilizer Phosphorus Bans in Bay Model

Ensure that the Chesapeake Bay Model adequately reflects results of the phosphorus ban for lawn maintenance fertilizers and that these effects are correctly assigned to localities based on the respective amount of land cover, or numbers of households, etc.

D.1.11 Establish BMP Efficiency Standards and Cost Estimates

The Chesapeake Bay Program needs to establish BMP efficiencies and costs so that localities can develop optimal cost effective suites of BMPs that can be assigned to specific land uses. The Commonwealth of Virginia should develop a GIS optimization of the VAST tool and make it openly available to all interested parties (including private entities) so that everyone can use the system to see how the implementation of various strategies effect nutrient and sediment loadings to various tributary segments.

D.2 Initiatives for Policy Support

The region supports policy efforts to realize cost effective nutrient reductions. The following ten initiatives are discussed in this section:

1. Expand the Nutrient Credit Exchange program;
2. Expand the Chesapeake Bay Preservation Act (CBPA) to the entire Chesapeake Bay watershed;

3. Expand septic system pump-out requirements statewide, require retrofits for failing systems, and grant counties the authority to require sanitary sewer system connections where appropriate.
4. Amend the Virginia Code to allow all Virginia localities to adopt an ordinance containing a set of tree canopy preservation requirements based on development density.
5. Provide permit controls for stormwater runoff from currently unregulated urban lands;
6. Define and encourage redevelopment;
7. Streamline the Resource Protection Area (RPA) process to facilitate BMPs that provide nutrient reductions from urban waterfront or coastal areas;
8. Encourage voluntary stormwater reuse in appropriate areas;
9. Partner with non-governmental organizations (NGOs) to promote private property BMP retrofits; and
10. Extend implementation schedule for TMDL program

D.2.1 Expand Nutrient Credit Exchange Program

The Nutrient Credit Exchange program should be expanded to provide for local government involvement. Program expansion will offer localities greater flexibility in selecting cost-effective nutrient management strategies to meet the required TMDL nutrient reductions. Virginia is advocating that local governments manage nutrient reductions within locality boundaries. Therefore, Virginia should provide localities with greater control in nutrient trading such that locality staff expertise on nutrient management opportunities may be applied toward water quality improvements at the local scale.

The following recommendations are offered regarding program expansion:

- The Nutrient Credit Exchange program framework should allow, but not require, MS4 permit holders to trade with all sectors and also allow credits to be part of MS4 compliance strategies. Allowing localities to trade broadly will help develop and underpin the market, which will benefit all sectors. Allowing credits to be part of MS4 compliance strategies gives even greater purpose to an expanded trading program and thus deepens the market.

- Localities should be provided with the authority to establish local nutrient credit programs and banks, allowing localities to set priorities to improve and protect local water quality.

- Localities should be notified of credits generated and certified on private property within its respective boundaries and, ideally, allowed to purchase the credits before they are offered to other entities in the exchange. Additionally, some details related to an expanded Nutrient Credit Exchange program should be considered as part of legislation or later in the regulatory process:

    - The watershed scale where credit trading may occur should be defined, and localities should be allowed to restrict trades to a smaller scale to meet local water quality goals.

    - The program should, at a minimum, track phosphorus and sediment reductions associated with nitrogen credits and eventually allow phosphorus and sediment credit trading.

    - Localities should be allowed to create and sell credits even if the total TMDL target reductions for the MS4 have not been met. For example, localities might increase street sweeping, sell the credits, and use the payments for credits to build regional BMPs. As MS4 permits are to be dynamic and iterative from one five-year permit

cycle to the next, it would be prudent to include creative ways to capitalize upon progress as such progress is being realized so that additional work and benefits can be sparked.

- The program should allow trades from different sectors at a 1:1 ratio. When the original nutrient credit exchange program was put in place, a 2:1 ratio was instituted to address scientific unknowns at the time. Today, better information exists to support BMP efficiencies and such a ratio is not needed.

The use of this error factor likely has been detrimental to market development. The current 2:1 ratio is so high that agriculture-to- treatment plant trades are not occurring.

• Virginia should be required to review credit certification applications within 60 days of submittal. Efficiency in the credit trading system is important to its market development. Enabling regulations for the program should require the state agency designated to review credit certification applications do so in a reasonably short period of time.

D.2.2 Expand Chesapeake Bay Preservation Act to the Entire Chesapeake Bay Watershed

The CBPA was implemented in 1990 by all of the localities in the region. The restrictions on land development and evaluation of water quality impacts have reduced the nutrients reaching the Bay. The region urges the Commonwealth to expand the CBPA to the entire Chesapeake Bay watershed to provide for locality authority to implement development and stormwater controls to support nutrient reductions. Moreover, extending the CBPA to the balance of the watershed engages all localities in the watershed as stakeholders in the equitable sharing of the burden of TMDL implementation. Within the CBPA, development must meet general performance criteria that are designed to reduce nonpoint source pollution and/or protect sensitive lands from disturbance. These criteria include:

- Preserve natural vegetation
- Minimize the area of land disturbance
- Minimize the installation of impervious cover such as pavement
- Strictly control soil erosion during land clearing and construction
- Control the quantity and quality of stormwater runoff
- Pump out septic tanks once every five years
- Provide a reserve drainfield for septic tanks, which equals the waste treatment capacity of the primary drainfield
- Complete site plan review for all development
- Control stormwater quality in agricultural and forested areas.

D.2.3 Expand Septic System Pump-out Requirements and Provide Local Authority to Require Sanitary Sewer System Connections

George Washington localities support the expansion of existing regulatory authority and the creation of new regulations to address the nutrient reductions from the on-site wastewater/septic system sector. The following recommendations are offered to inform policy making:

- Expand the 5-year septic system pump-out requirement statewide and require retrofits for failing systems. Since most septic system nutrient reductions cannot be enforced through any existing permit programs, Virginia should expand the 5-year septic system pump-out requirement to include all systems in Virginia. Virginia should also enforce requirements for retrofits of failing septic systems.

- Grant localities the authority to require sanitary sewer system connection. Virginia should grant all localities the same authority and address this need with a single policy action that applies universally.

D.2.4 Allow all Localities to Require Tree Canopy Preservation

GWRC's Regional Green Infrastructure Plan supports the amendment of Virginia Code §15.2-961.1 that would enable all Virginia localities to adopt an ordinance containing a set of tree canopy preservation requirements based on development density to meet water quality goals (as well as an ozone non-attainment mitigation measure). §15.2-961.1 was adopted during the 2008 General Assembly session and is currently applicable only to the localities within Planning District Eight. Increasing the urban tree canopy is an inexpensive method to reduce nutrient loading through runoff reduction and will allow localities to reduce the cost of achieving nutrient reductions for urban stormwater. (See D.4.5)

D.2.5 Provide Control Mechanisms for Stormwater Runoff from Unregulated Urban Lands

The George Washington region encourages DCR and EPA to provide a mechanism to credit reduction practices implemented outside of the MS4 service area towards meeting the MS4 waste load allocation (as identified in the DCR Chesapeake Bay TMDL Phase II WIP FAQ) as well as similar TMDL credits for rural reduction practices implemented outside areas locally-protected under the Chesapeake Bay Preservation Act.

D.2.6 Define and Encourage Redevelopment

The revised statewide stormwater management regulations require redevelopment projects to reduce phosphorus loads by twenty percent. The state should provide additional economic incentives for redevelopment, such as development grants, and elevate the priority of redevelopment projects that support Chesapeake Bay TMDL implementation goals to the highest level, facilitating the project approval process.

D.2.7 Streamline the RPA Process to Facilitate BMPs that Provide Nutrient Reductions from Urban Waterfront or Coastal Areas

Coastal and waterfront development tends to be dense, with high land values and construction costs. Installing new stormwater BMPs or retrofits in urban waterfront and coastal areas is difficult and primarily constrained by the lack of available land area and high cost of development, part of which is the result of the arduous permitting process. Nutrient reductions from these developed areas can be addressed by installing BMPs located in adjacent riparian areas, instream sites, or downstream wetland areas, which are typically located in the Resource Protection Areas (RPAs) of the CBPA.

Virginia should revise the permitting process to streamline and prioritize approvals for projects proposed in RPAs when the primary purpose of the project is to provide stormwater sector nutrient reductions from existing development. Stream channels altered for treatment and constructed wetlands are efficient in removing nutrients, sediment, and bacteria, but such BMPs are difficult to implement given the regulations, permitting, and approval process related to development in RPAs. Consideration should be given to projects where the primary scope is to install BMPs to treat stormwater runoff from adjacent developed areas, especially if the project provides for long-term maintenance and is planned in consultation with the locality.

D.2.8 Encourage Voluntary Stormwater Reuse in Appropriate Areas

Virginia's regulations do not aggressively encourage rainwater harvesting and stormwater reuse. If commercial and residential property owners were encouraged to capture rainwater and use it for irrigation or for toilet flushing, the quantity of water reaching the Bay would be reduced and the quality would be improved. The State should revise the building code to support the use of

cisterns and the Health Department should evaluate the advantages of allowing stormwater reuse within residential buildings. State support is needed to advocate for Bay model incorporation and credit for nutrient management from rain barrels other stormwater reuse activities. Lastly, the state should promote and fund the use of harvested rainwater or stormwater reuse instead of potable water consumption for industrial and manufacturing processes.

D.2.9 Partner with Non-Government Organizations to Promote Private Property Retrofits

The George Washington Region promotes the development of a means to evaluate the feasibility of implementing BMPs on private property and estimate the potential nutrient removal of these BMPs. The region requests that the state support a partnering approach by considering what data tracking would be required for localities to include BMPs, especially LID features, on private property as part of their environmental compliance strategies and TMDL implementation. Localities also encourage the Commonwealth and EPA to track and report BMP implementation at a level of detail that would satisfy permit requirements and could be incorporated into the Bay models. The goal of this initiative is to evaluate the feasibility of implementing BMPs on private property and estimate the potential nutrient removal of these BMPs.

As an example, in the Fredericksburg area, the Rappahannock River Basin Commission has partnered with Conserv, Inc. and the non-profit group Friends of the Rappahannock to initiate "The Rappahannock River Friendly Yard" (RFY) program. In 2011, the Commission embarked on a multi-year initiative to test economic approaches to watershed restoration that combine innovation and cost-effectiveness. The River Friendly Yard project is a collaborative effort between city government, landscaping professionals, universities, and non-profit groups in Fredericksburg,VA to create a River Friendly Yard (RFY) Makeover Training and Certification Program.

The project intends to create two types of certifications:

- RFY – Single Family Residential, and
- RFY – Common Areas.

The RFY – Single Family Residential program is a suburban lawn makeover system allowing the user to select proprietary and non-proprietary BMP elements to achieve cost and environmental lift outcomes. The RFY – Common Areas program is a similar system specifically created for institutional areas. A training program for each will be created for four parties capable of affecting lawn to RFY conversion; local governments, homeowners, landscape designers, and landscape contractors. Prototype training workshops will be provided to certify these parties to implement the two types of conversions. Conserv anticipates that the program will raise property values and create jobs and small business opportunities in Fredericksburg. The purpose of RFY is to create public/private incentives that will fund pollution reductions from the largest single land cover in the Chesapeake Bay watershed - lawn.

Another partnership program of the Friends of the Rappahannock is the "**Rainscape Retrofits Program**". Virginia's Watershed Implementation Plan for the Chesapeake Bay TMDL identifies Low Impact Development (LID) as a key tool for reducing the impact of polluted stormwater runoff. The Plan is focused, with regard to the urban pollution sector, on large scale retrofits in the urban environment. FOR believes that pre-existing residential development (homes) remain unaddressed as a major source of urban/suburban nutrient loads and stream instability (altered hydrology). At the same time FOR believes the existing residential market presents an opportunity for low cost, low tech LID implementation.

Barriers to persuading residential homeowners to undertake their own stormwater retrofits include cost, knowledge and time. The FOR approach breaks down these barriers. FOR provides

technical assistance (thus bridging the knowledge gap), shares/operates the equipment necessary for rain garden installation and provides low-cost options for landscaping practices that typically accompany rain gardens (reducing homeowner cost and time).

Rainscape Retrofits utilizes FOR's expertise and equipment, volunteer manpower and home-owner resources to install raingardens and other LID landscaping techniques throughout our community. Natural vegetation and healthy soil catch stormwater and soak it in. Developed landscapes can lose this capacity, impacting our streams. ***Rainscape Retrofits*** can re-establish a component of the natural system through an innovative resource sharing approach.

D.2.10 Extend Implementation Schedule for TMDL

Current economic challenges are stressing implementation of all CWA programs at the local, state and federal level. The Chesapeake Bay TMDL is different from other TMDL's as it contains a prescribed 15-year implementation schedule. EPA should consider options to extend the implementation schedule for the Chesapeake Bay TMDL. EPA should also consider providing federal funding to support implementation activities.

D.3 Agricultural BMP Strategies

D.3.1 Better Coordination of Commonwealth Stormwater Planning and State E&S Program

George Washington localities see the opportunity to achieve better coordination of Chesapeake Bay stormwater planning with Erosion &Sedimaent Control requirements by adopting a local ordinance that combines the requirements to ensure land disturbing activities are managed effectively and efficiently.

D.3.2 Evaluate Inter-Applicability of Urban and Rural BMPs

George Washington localities believe that BMPs should be dually applicable in urban and rural settings based on the conditions of the site and determination of appropriate use by certified engineers, landscape architects, site planners, extension agents, etc.

D.3.3 Promote Greater Collaboration between Planning District Commissions and Conservation Districts

Foster greater collaboration and coordination between GWRC and the Tri-County/City and Hanover-Caroline Soil and Water Conservation Districts (SWCDs) to improve coordination of urban and rural water quality and watershed implementation strategies.

D.3.4 Evaluate and Promote New Technologies which Show Promise for Cost-Effective Reductions

George Washington localities believe that the Commonwealth should Identify and evaluate innovative agricultural (e.g. "Green Seeker" for automated fertilizer application management) and stormwater management approaches; and improve incentives for increased use of such technologies (e.g. tax credits, etc.).

D.4. Alternate BMPs

The localities in George Washington Region have identified numerous strategies and practices that will reduce nutrient loads that are not included in the Bay Program's models. In some instances, the Chesapeake Bay Program and Maryland have initiated studies to define and approve these alternate BMPs. However, there are a few alternate BMPs that have not been adequately studied and additional research must be conducted to quantify their effectiveness. Also, nutrient source reductions, such as eliminating air pollutants and boat discharges, should be accounted for in the Bay models and guidance on how to track and report those efforts should be established by the state and Bay Program. Virginia and the EPA should lead efforts to research and approve the following alternate BMPs.

D.4.1 Air Deposition

The Chesapeake Bay Program Water Quality Implementation Team approved revisions to the atmospheric deposition credit decision rules at the May 23, 2011 meeting. The revisions aimed to allow "additional nitrogen credits realized through more stringent controls at the jurisdictional level, beyond minimal federal requirements". Localities should be allowed to apply for credits that are implemented at a local scale instead of state-wide. EPA should improve monitoring programs to measure nitrogen from vehicles and quantify the nitrogen reductions associated with reducing miles traveled or switching to electric or natural gas vehicles. Localities should be allowed to take credit for programs that reduce air emissions that are the source of nitrogen loads on urban lands.

D.4.2 Terminal Reservoirs

Spotsylvania County hosts the Motts Run Reservoir, a City & County drinking water reservoir which drains portions of the Chesapeake Bay watershed, while Stafford County is developing the Rocky Pen Reservoir, which will divert and impound water from the Rappahannock River during high flow periods to fill the reservoir. These reservoirs are (or will be) terminal reservoirs from which water is withdrawn and pumped to a water treatment plant. Generally-speaking, little water is ever discharged from the terminal reservoir dams so the runoff collected by the reservoir drainage areas does not reach the Bay or its tributaries. The Bay models include the impact of large dams on nutrient transport; however, the documentation is not extensive. The Bay Program should provide additional analysis to help localities evaluate whether the models sufficiently simulate the nutrient and sediment captured by existing reservoirs. Localities may also consider how dam releases could be managed to minimize the nutrients and sediment released in extreme storm events.

D.4.3 Floating Wetlands

The George Washington localities support the use of floating wetlands as an alternate BMP for compliance planning purposes, as well as the eventual approval of this BMP. This BMP would primarily be used to enhance treatment in existing wet ponds and retention basins. When compared to BMPs like construction of detention or retention basins, floating wetlands can be rapidly implemented and provide more cost-effective stormwater treatment with additional environmental benefits. There is significant existing research describing the efficiencies of treatment wetlands; localities are interested in more studies for specific application in Virginia. Future studies, along with existing research, should inform decisions regarding the BMP efficiencies of floating wetlands.

D.4.4 Wetland Restoration

There are many opportunities in the region to restore different types of wetlands. George Washington region localities recommend that the Chesapeake Bay Program evaluate the nutrient and sediment removal efficiencies of forested wetlands, freshwater emergent wetlands, and tidal marshes and establish credits for their restoration. In order to acknowledge and protect the water quality contributions of existing wetlands, the Watershed model should track wetlands as a separate land use, instead of categorizing them as forest.

D.4.5 Urban Tree Canopy

The City of Fredericksburg has established programs to increase the urban tree canopy and all localities in the Region are interested in expanded authority to promote the conservation of existing trees in the site plan review process as Northern Virginia localities are allowed to do under §15.2-961.1 of the Code of Virginia for ozone non-attainment mitigation. The Bay Program should approve its own Forestry workgroup's proposal to allow urban tree planting to be modeled as planting 100 trees is equivalent to converting one acre of urban pervious land to forest. Moreover, the Bay Program should examine the merits of expanding the enabling

authority under §15.2-961.1 to extend to improving water quality as well as the existing air quality context. (See D.2.4)

D.4.6 Street Sweeping

Credit for Street Sweeping has been approved by the Bay Program. However, there are two methods of reporting street sweeping: mass loading approach and qualifying street lanes method. The mass loading approach includes a calculation to estimate the nitrogen and phosphorus contained in the solids removed. Virginia recommended that localities use the qualifying street lanes method. Most George Washington localities do not sweep streets bi-weekly so the miles swept do not qualify for nutrient reduction credits under the qualifying street lanes method. Localities do track the weight of sweeping solids collected during sweeping, and the Bay Program Street Sweeping memo lists the mass loading approach as the preferred option.

However, the VAST tool does not allow localities to take credit for the nutrient removal associated with the sweeping solids. George Washington localities recommend that Virginia nutrient removal credits for street sweeping activities be applied in accordance with their guidance and allow for the mass loading approach.

D.4.7 Catch Basin Cleaning and Storm Drain Vacuuming

Maryland has proposed "Catch Basin Cleaning" and "Storm Drain Vacuuming" as alternate BMPs. The proposed removal rates for both BMPs are 1.5 lbs TN, 0.6 lbs TP, and 600 lbs TSS per ton of collected dry material. The George Washington localities recommend that Virginia request the same alternate BMPs.

D.4.8 Trash Removal, Yard Waste Collection, Leaf Recycling

Many localities implement programs to remove trash, collect yard waste or recycle leaves. These programs reduce the organic material available to contribute nitrogen and phosphorus in stormwater runoff. The Bay Program should evaluate these programs, similar to the catch basin cleaning and storm drain vacuuming, to estimate the nutrient removal associated with tons of material collected.

D.4.9 Pesticide Management

The application of pesticides contributes to the amount of nutrients reaching the Bay and its tributaries. Localities should be credited with nutrient reductions by quantifying reductions in pesticide application on public lands or by documenting the effectiveness of public outreach campaigns to minimize pesticide usage. The state should consider the need to track pesticide sales and their impact on water quality.

D.4.10 Education Programs (especially pet waste)

The George Washington localities support the use of education programs as an alternate BMP for compliance planning purposes, as well as the eventual approval of this BMP. MS4 localities and other MS4 permitees in the George Washington region have been conducting public education and outreach programs for several years to reduce stormwater runoff and improve local water quality. Reducing the amount of pet waste reaching the stormwater system has been a long-term objective of the program. Reducing pet waste as a source of nutrients should be an approved nutrient management strategy.

Localities could document the effectiveness of local educational campaigns by surveying public participation and understanding of its messages or reporting the number of pet waste disposal bags distributed (for example).

D.4.11 Shoreline Erosion Control, Offshore Stabilization, and Outfall Stabilization

Shoreline Erosion Control, Offshore Stabilization, and Outfall Stabilization are viable opportunities for localities to reduce nutrients and sediment reaching the Bay and its tributaries. The state has suggested that localities track and report these activities as Stream Restoration in the Stream Restoration BMP. The guidance for the Stream Restoration BMP should be more detailed and provide additional examples of equivalent practices especially in tidal waters. The Bay Program should evaluate the efficiencies of different types of shore stabilization, particularly living shorelines, which the state is advocating through the wetlands regulatory program. Also, the state should request that the Stream Restoration efficiencies be updated as soon as the BMP panel issues its findings.

D.4.12 BMP Retrofits

Since portions of some localities in the George Washington region are developed urban areas, some structural BMPs will need to be built on properties that are already developed. These BMP Retrofits may be constrained by site conditions and buildings so the BMPs cannot be built to the same specifications as BMPs designed in conjunction with new development. The Bay Program has acknowledged the need for guidance and established a panel workgroup to develop a methodology for determining credit for BMP Retrofits. The region supports this initiative and urges the state to advocate for flexibility for this type of BMP.

D.4.13 BMP Enhancements and Restoration

The Bay Program has established a panel workgroup to define types and removal efficiencies for BMP enhancements. George Washington localities see opportunities to repair and improve many existing BMPs, particularly stormwater management facilities. These improvements would increase the function of the BMPs and should be credited with additional nutrient and sediment removal.

BMP facilities that were constructed prior to 2006 were included in the Watershed model calibration. It is generally believed that older facilities do not function as well as new ones due to deterioration and lack of maintenance. Their deteriorated condition would be accounted for in the calibration. Any restoration to BMPs to improve their ability to remove sediment or nutrients should be eligible for credit as a reduction strategy. The following scheme for this treatment is proposed.

For facilities that were constructed prior to 2006, there should be three classifications of restoration:

1. Sediment Removal – Removal of sediment, slimes or non-vegetative debris that is equal to or greater than 1/10 the volume of the facility. For wet pond, the volume of the facility would be where the water was at the normal water elevation or invert of the outfall pipe. For dry ponds or enhanced extended detention facilities, the volume would include the volume of any forebays, to their overflows, and ½ the height of the dewatering structure.

2. Vegetative Harvesting – Removal of excessive, non-planned vegetative growth with offsite sequestration or composting. In cases where the growth of material or its harvesting causes a denuded condition, appropriate plant species shall be restored.

3. Filter Media Enhancements – Removal and sequestration of contaminated material and replacement with a media that is superior to those originally proposed in the design specification (i.e. replacing sand with a sand/organic or sand/zeolite mixture). For BMP restorations meeting these requirements, the difference, in pounds as a result of pollutant removal efficiency, between the older style BMP and the newer style BMP should be an approved reduction credit.

D.4.14 BMP Conversion

The Bay Program has established a panel workgroup to define types of BMP conversions and their removal efficiencies. The region encourages the panel to consider a wide variety of conversions to provide flexibility and cost effective options for converting existing BMPs into more effective BMPs. Innovations in the treatment of urban stormwater continue to provide new solutions and the Bay program should provide a framework to encourage new technology. If new BMPs and conversions cannot be credited in the model, localities will be reluctant to invest in them.

D.5 Nutrient Management Strategies

D.5.1 Targeting Impaired Stream Segments

George Washington localities believe that TMDL strategies need a priority system for targeting impaired stream segments.

D.5.2 Consider Sub-Regional Nutrient Management Planning as a Guiding Framework for Urban Nutrient Management Plans

George Washington localities believe that there may be great benefit in developing a program to prepare urban nutrient management plans – perhaps on a regional or sub-regional basis – and encourage offering grants for technical assistance in this activity.

D.5.3 Encourage Innovate Nutrient Trading Partnerships

The George Washington Region supports the recommendations of the Rappahannock River Basin Commission and its Technical Committee in "*RRBC Technical Committee Report Committee Process To Date And The Nutrient Trading Expansion Study* (September 14, 2011)" with respect to the encouragement of an expanded examination and consideration of innovative nutrient trading partnerships that promote more cost-effective and collaborative achievement of TMDL goals within PD 16, as well as across the Chesapeake Bay watershed of Virginia.

D.5.4 Promote Nutrient Recycling and Reuse Strategies that Promote Reduced Water Demand

The George Washington Region supports programs to mandate or encourage organic nutrient recycling (e.g. use of leaf wastes as compost soil amendment) to reduce irrigation and fertilizer requirements on managed grass lands (e.g., commercial golf courses, suburban lawns, recreational fields, etc.). Such programs would help stimulate the market for urban organic compost material and improve the profitability of leaf composting recycling programs.

D.5.5 Promote Wastewater Treatment Plant Efficiency Optimization

George Washington localities should require periodic wastewater treatment plant efficiency-optimization studies to ensure that the plants continue to operate at their maximum efficiency.

D.6 Stormwater/Erosion and Sediment Program Strategies

D.6.1 Regional Coordination of Local Stormwater Programs

On-going regional coordination of local stormwater management initiatives to help rural areas prepare for the impacts of urbanization by sharing the stormwater management expertise of the Region's urban communities and to identify and foster collaboration in the implementation of management practices and public policy that calls for consistent requirements, where warranted, across the Region. (see Strategy D.6.5)

D.6.2. Targeting Urban BMPs on Redevelopment

Targetted urban BMP implementation through conversion of existing impervious surface area may be necessary to achieve targeted TMDL pollution reduction goals. Adding requirements for urban redevelopment proposals and special or conditional use permit projects involving

conversions of existing land uses offers the most feasible opportunities to promote achieving expansion of BMP inventory in areas of existing development.

D.6.3 Statewide or Regional Coordination of BMP Tracking

Have DCR develop a statewide BMP tracking system and regional collaboration process on BMP tracking efforts. In the absence of a statewide functional BMP tracking system, explore potential use of a common regional BMP database (e.g. Stafford County system) to support consistent reporting of BMPs across multi-jurisdictional watersheds and coordinated inter-governmental actions to mitigate impaired stream segments.

D.6.4 DCR Program Administration Improvements for Greater Efficiency

George Washington localities encourage VDCR to consider internal efforts to improve environmental program regulatory efficiency, such as:

- Use of "e-plans" (electronic document submission and BMP design info),
- Use of early warning systems (anticipated heavy rain events/construction site preparedness),
- Use of e-inspection reports to reduce the lag time before an inspection report is released,
- Establishing 'no fail' rainfall event standards (utilizing local automated rainfall stations), and
- Development of enhanced construction site runoff measures in proportion to anticipated rain events and erosion potential.

D.6.5 Stormwater Management Regulatory Support for "Regional and Watershed Approaches"

George Washington localities note that §10.1-603.4 of the Code of Virginia stipulates that:
"*The Board is authorized to adopt regulations that specify minimum technical criteria and administrative procedures for stormwater management programs in Virginia. The regulations* **shall…:**

> *8. Encourage low impact development designs,* ***regional and watershed approaches****, and nonstructural means for controlling stormwater*;" (emphasis added)

The final stormwater management regulations promulgated and adopted by the State under this authorization fail to comply with legislative direction to provide explicit encouragement for regional and watershed approaches. Such mechanisms embodied in State regulation are viewed as beneficial to foster a long-term regional environment of local collaboration and cooperation that may help achieve more consistent and complimentary action within a region or common multi-jurisdictional watershed.

D.6.6 Continued Promotion of LID & Smart Growth Development Practices

Continue to promote the use of LID/ESD/Smart Growth, etc. measures.

D.6.7 Expanding BMP Eligibility for Undeveloped and Undevelopable Lands

Evaluate the possibility of getting nutrient reduction credits from establishing easements, open areas, HOA common areas, etc.

D.6.8 Encouraging Conservation Easements by Providing BMP Credit

The Northern Virginia Conservation Trust (NVCT) has indicated interest in promoting more conservation easements in PD 16. However, any holder of a conservation easement has a permanent obligation to enforce an easement through monitoring the condition of the property to ensure that no development use encroaches on the land. GWRC staff suggested to NVCT that it would be useful if the Bay program offered alternate BMP credit to urban jurisdictions that could receive financial donations from private developers unable to achieve full on-site compliance with

stormwater management regulatory requirements but through their financial contribution support the implementation of off-site BMPs that enhance water quality in the Bay watershed. This scenario could provide localities the financial means to partially compensate NVCT (and/or other holders of conservation easements) for the overhead cost of protecting and enforcing the easement and its ecological integrity.

D.7 Local Strategies (see further comments under City of Fredericksburg and Stafford County)

D.7.1 Localities will continue pump-out notification and certification program within the Chesapeake Bay Preservation Areas or as required under regulations promulgated under the Cheapeake Bay Preservation Act.

D.7.2 Localities will work with DMME to enforce surface mining regulations through the requirements imposed by the locality in local special use permitting or other development codes.

D.7.3 Nutrient reductions from Non-MS4Urban areas can only be accomplished on new development and redevelopment through the water quality standards implemented through the locality's Chesapeake Bay Preservation Area RMA Overlay District under the local Zoning Ordinance. Moreover, localities have no legal authority to force nutrient reductions for existing residential and commercial properties except through the redevelopment process.

D.7.4 Chesapeake Bay localities will continue to submit their annual BMP inventory to VDCR (or CBLAD's successor entity). Each BMP is maintained through an agreement between the landowner and the locality. Inspections for each BMP are conducted periodically.

D.7.5 Reductions from construction activities are provided through the local Erosion and Sediment Control Ordinances of each locality. In some instances, the local E&S program, which applies countywide to any land disturbance activity greater than 2,500 sq. ft. vs. the 10,000 sq ft standard required by State E&S law has been found by the Department of Conservation and Recreation to be consistent with the State Regulations in that it greatly exceeds the State E&S definition of regulated "land disturbance".

D.7.6 Rural localities' ability to require water quality BMPs is limited to the enabling authority provided through the Chesapeake Bay Preservation Act which limits the enabling authority to only apply to the portion of the locality which lies within the locally-designated RMA. In such cases, expansion of the locality's authority to implement urban water quality BMPs would come through the local adoption of the State's stormwater management program. George Washington localities see a gap between the broader program requirements that apply in MS4 urban communities and what environmental programs can be undertaken under the new stormwater management regulations.

D.7.7 Reductions from agriculture are provided through cost share, nutrient management planning programs and other assistance provided by the local Soil and Water Conservation Districts.

D.7.8 Strategies to implement preferred agricultural BMP scenarios.

a. Soil and Water Conservation Districts will continue to work with agricultural producers to improve participation in the Virginia Agricultural BMP Program.
b. Additional funding for staff to carry out educational programs and other strategies on water quality issues with farm producers.
c. Continue to recruit new producers to utilize the Virginia Agricultural BMP Program to install conservation farming practices.

d. Work with livestock producers to exclude animals from water resources and establish vegetative buffers in high priority watersheds.
e. Encourage utilization of cover crops to producers through agriculture technologies (i.e. aerial seeding).
f. Work with livestock producers to implement waste storage management and better utilization of livestock waste.
g. Implement farm assessment programs to help farmers better manage their farming operations in a manner that is supportive of Chesapeake Bay WIP-2 goals and TMDL compliance.

IV. Regional and Local Resource Needs

A. Funding Needs

The November 18, 2011 Senate Finance Committee Report, "Chesapeake Bay TMDL Watershed Implementation Plan: What will it cost to meet Virginia's goals?" estimates the total cost to implement the Chesapeake Bay TMDL in Virginia at $13.6 to $15.7 billion, but identifies only $3.2 billion of that cost as the portion to be funded by the state. The report asserts that the remaining implementation costs will be borne by local governments, utility rate payers, farmers, and private property owners. PD 16 localities anticipate the need for significant financial and regulatory support from the federal government and Commonwealth of Virginia to fulfill their TMDL reduction goals. The following initiatives for state funding are supported by the Region:

1. Provide state funding for agriculture sector nutrient reductions.
2. Provide state funding for onsite wastewater/septic sector nutrient reductions.
3. Provide state funding for urban/suburban stormwater sector nutrient reductions.
4. Provide state funding for wastewater sector nutrient reductions.
5. Provide state funding for Transportation-related Urban Sector Nutrient Reductions.
6. Provide state funding and staff to address initiatives for research and model revisions and initiatives for policy support.
7. Provide adequate federal and state funding for partner organizations
8. Local consideration of alternate funding and financing mechanisms
9. Provide state funding support for Rappahannock River Basin integrated water resources plan

1. Provide State Funding for Agriculture Sector Nutrient Reductions

The agriculture sector is a significant source of nonpoint source pollution in Virginia. Therefore, expanded use of agricultural BMPs could realize significant water quality benefits. Agricultural producers and farmers are interested in land practices that protect water quality and have the additional benefits of soil conservation and efficient use of farm resources. It is critical that Virginia continues to fund and provide adequate staff to develop the following programs to robust levels with the capacity to meet the demand for program participation:

- The Virginia Agricultural BMP Cost-share Program and Conservation Reserve Enhancement Program; and
- The Virginia BMP Tax Credit Program.

These programs, administered by the local SWCDs, facilitate the implementation of agricultural BMPs by offering financial and technical assistance as incentives to carry out construction or implementation of selected BMPs. The cost-share program's BMPs can often be funded by a combination of state and federal funds.

Adequate funding and staff resources should be provided to the Agricultural BMP Cost-share Program and Conservation Reserve Enhancement Program, considering SWCD administration

of the program. Currently, the demand for cost-share assistance is greater than the program's capacity to meet assistance requests. With no dedicated funding source, the potential for nutrient reductions from Virginia's agricultural areas is limited by the program's resource constraints. According to the November 18, 2011 Senate Finance Committee Report, there is currently no base funding for the required technical assistance provided by the local SWCDs, and the funding need is estimated to increase significantly from FY 2013 to 2018. Also, as the program is currently structured, the out-of-pocket cost to a farmer to implement a BMP project may make the project infeasible. Program changes that apply means testing and allow for hardship exemptions will likely enable a larger group of farmers to implement voluntary BMPs.

The BMP Tax Credit Program supports voluntary installation of agricultural BMPs by allowing producers with an approved conservation plan to take a credit against state income tax. This program and other state tax credit programs that encourage the use of conservation equipment must be maintained and strengthened to encourage more voluntary nutrient management on agricultural lands.

Agricultural BMPs provide inexpensive means of reducing pollutant loads. The cost-per-pound of nutrients removed is generally one to two orders of magnitude less than the cost of nutrients removed from wastewater and stormwater. Virginia should support existing agriculture BMP incentive programs and seek additional opportunities to optimize BMP implementation in this sector. Virginia should double the SWCD staffing to promote and manage these programs.

2. Provide State Funding for Onsite Wastewater/Septic Sector Nutrient Reductions

The Chesapeake Bay TMDL requires nitrogen reductions in the onsite wastewater/septic system sector. Tools are needed to incentivize septic system upgrades that provide for denitrification of treated effluent. Many septic systems are non-failing, but are not operating efficiently. Because upgrading these systems would provide nutrient reductions for the sector, Virginia should support and fund the following:

- Expand the Virginia Agricultural BMP Cost-Share Program or establish a new septic system cost- share program, to assist with the cost of required upgrades or replacements and to incentivize upgrades of non-failing septic systems to denitrifying systems and allow cost-share funds to be used for connecting septic systems to sanitary sewer systems in sewered areas. The November 18, 2011 Senate Finance Committee Report estimates the total average annual cost of $114 million for septic system retrofits and annual system maintenance; cost share funds should be provided equal to 50% of the projected costs.

- Establish tax credits for the upgrade or replacement of existing conventional systems with nitrogen reducing systems, or for the connection of septic systems to existing sanitary sewer systems.

3. Provide State Funding for Urban/Suburban Stormwater Sector Nutrient Reductions

Achieving nutrient reductions from urban/suburban stormwater sector sources is significantly more expensive than achieving the same reductions in other sectors. The cost-per-pound of nutrients removed is generally one to two orders of magnitude greater than the cost of nutrient removal at wastewater treatment plants and agricultural BMPs. Furthermore, the cost to implement stormwater retrofits in existing developed areas is much higher than the cost to install stormwater management practices for new development. For most urban localities, Phase II WIP strategies include stormwater retrofits on public property. However, the costs to implement

stormwater retrofits are principally borne by local governments, and effectively, individual rate payers.

Currently, there are no dedicated funds for stormwater retrofit cost-share or grant programs; the surplus-funded Virginia Water Quality Improvement Fund (WQIF) is the only existing mechanism to provide state cost-share and grant funds for stormwater sector projects. Virginia should dedicate funds to support urban/suburban stormwater sector nutrient reductions. The purpose of WQIF is to provide water quality improvement grants to local governments, SWCDs, and individuals for point and nonpoint source pollution prevention, reduction and control programs. If this program is to be employed in any state strategy to address urban/suburban stormwater sector nutrient reductions, the following key issues need to be addressed:

- The WQIF does not have adequate funding. The surplus money used to fund the program limits the projects implemented through the program.

- The WQIF guidelines favor prioritization of projects that provide point source pollution reductions from the wastewater sector and nonpoint source pollution reductions mainly from the agriculture sector. Only a small amount of funds benefit the urban/suburban stormwater sector.

- Increased frequency of urban (and rural) BMPs inspection could be done to maintain BMP efficiency. However, localities lack staffing for this more labor-intensive effort and financial support through grants from the WQIF could help ensure the maintenance of the efficiencies of the installed BMP inventor. Localities (and their respective SWCDs) need greater funding support to expand frequency of urban and rural BMP inspections and assessments to ensure sustained high efficiency of BMPs. Alternatively, the regulatory environment needs to set enforceable standards that allow for the expertise of professional engineers, and site and landscape planners to address site-specific issues with creative and practical solutions which meet or exceed the performance standards set by State regulation.

- Virginia should consider the appropriate regulatory and administrative actions to address urban/suburban stormwater sector nutrient reductions using the WQIF. Options to strengthen program capabilities include:

    - Increasing the total amount of funding to the WQIF program;

    - Provide a dedicated funding source that does not rely on surplus funding; and

    - Revise the program guidelines to give some priority to projects that support coastal community networking to engage multiple local governments in projects such as shoreline restoration and stream restoration.

    - Revise the program guidelines to give some priority to projects for urban/suburban sector nutrient reductions.

    - If Virginia intends the WQIF to remain focused on point source pollution reductions from the wastewater sector and nonpoint source pollution reduction from the agriculture sector, the state is urged to develop new options to fund urban/suburban sector nutrient reductions.

4. Provide State Funding for Wastewater Sector Nutrient Reductions

According to the November 18, 2011 Senate Finance Committee Report, the estimated costs of wastewater sector upgrades necessary to achieve compliance with the Chesapeake Bay TMDL are more than $586 million. Additionally, the current shortfall in the state's existing obligations to localities for cooperatively-funded projects is over $104.4 million. The Virginia Water Quality Improvement Fund will not be sufficient to address the cost of required improvements. To address this need, Virginia should consider the following options:

- Increase funding to the WQIF for wastewater sector projects; and
- Issue a state bond measure sufficient to finance wastewater upgrades, taking advantage of low interest rates.

If Virginia does not pursue the above options or other means of providing increased state financing for wastewater upgrades, local wastewater utility rates will increase, and the financial burden to implement wastewater sector upgrades will be borne by local rate payers.

5. Provide State Funding for Transportation-related Urban Sector Nutrient Reductions

The Bay Program's Science and Technical Advisory Committee (STAC) published a summary of its "Workshop on Atmospheric Deposition of Nitrogen" (STAC Publication 09-001). The major findings suggest that vehicle exhaust is the largest source of fossil-fuel derived nitrogen pollution. Data was presented that indicated that:

> "the rate of deposition of nitrogen in the immediate vicinity of roads and highways can be very high, with much of this occurring as the direct deposition of nitrogen gases to surfaces such as roads, tree, and buildings rather than falling in precipitation".

The key recommendation from the workshop is that "there (should) be much greater emphasis on treating urban and highway stormwater runoff to help reduce the nitrogen pollution that is deposited onto these surfaces". The George Washington localities recommend that Virginia provide the funding and staff required for VDOT to treat stormwater runoff from state-owned roads to the L2 implementation level or higher.

6. Provide State Funding and Staff to Address Initiatives for Research and Model Revisions and Initiatives for Policy Support

Earlier sections of this report provide recommended initiatives for:

- Further research and revisions to the Chesapeake Bay model; and
- Policy efforts to realize cost effective nutrient reductions.

Virginia requested that localities identify gaps in information and resources. The research and model revision initiatives and the policy initiatives described earlier in this section were formulated to address these gaps and must be adequately funded to support Virginia's compliance with the Chesapeake Bay TMDL.

7. Provide Adequate Federal and State Funding for Partner Organizations

Increased and consistent State-level financial support for PDCs and SWCDs to recruit and sustain professional staff to support and assist local WIP-2 efforts across the Commonwealth. Moreover, additional state and/or federal funding for DMME, DOF, and SWCDs is needed so that these State and regional agencies can better carry-out their planning, regulatory, public outreach and education missions.

8. George Washington Localities May Need to Consider Alternate Finance Mechanisms
Consider establishing stormwater utility fees, service districts, or pro-rata fee programs to address sediment and nutrient load reduction strategies associated with stormwater runoff.

9. State Funding Support for Rappahannock River Basin Integrated Water Resources Plan
Commonwealth financial support for the efforts of the Rappahannock River Basin Commission (RRBC) to develop an integrated water resources plan for the Rappahannock River Basin to identify policies, projects and initiatives that provide optimal environmental, economic and fiscal outcomes.

B. State or Local Planning &/or Programmatic Needs

1. A statewide baseline, high resolution land cover information detection and tracking system to support local, regional and watershed level land cover information and change detection to help target cost-effective BMP implementation and measure progress in achieving various BMP implementation strategies, as well as other environmental, economic and community planning benefits.

2. Continued improvement of the Commonwealth's BMP Tracking Program to provide reliable data aggregation to be utilized to assess progress toward achievement of defined goals and strategies.

3. The Commonwealth, SWCDs, PDCs, and local governments must overcome technological gaps in the development of accurate land use and BMP databases. Every Region, District and/or local government must have access to GIS technologies and software to successfully track BMP implementation at the local level and monitor land cover changes.

4. Localities in PD 16 are examining the recent Virginia Code revision requiring adoption of living shoreline management plan element of local comprehensive plan. Local environmental planning staff see merit in applying such shoreline protection strategy to all shorelines and streams as a recommended practice.

5. Localities in PD 16 will adopt the State stormwater management program by the State-mandated schedule (2013-2014) to extend water quality BMPs to the balance of their jurisdiction's land area outside of designated RMAs which would also have the effect of strengthening the local water quality protection efforts in the existing RMA areas.

6. PD 16 localities propose to work with VDOT to develop complementary stormwater management programs to support cost-effective achievement of local and State TMDL goals.

7. The Chesapeake Bay water quality model should accurately reflect the political geography associated with river segment watersheds. GWRC notes that the river segment sub-watershed areas assigned to King George County extend into the Potomac River. These segments should be re-assigned to Charles Co., MD as its political jurisdiction extends to the northern shoreline of the Potomac River in King George County.

8. Enhancement of the VAST tool or provision of a Virginia version of the Bay model that is openly available to all interested parties to see how the implementation of various strategies effect nutrient and sediment loadings to various tributary segments.

9. Tree planting was recognized as an urban BMP in the 2005 Tributary Strategy, but was dropped from the Chesapeake Bay TMDL program. This historic BMP should be restored for use by local governments.

10. Data Sharing - The opportunity to influence agricultural land management practices is greater through SWCDs located across Virginia as opposed to local governments. However, privacy and security concerns limit the sharing of data between SWCDs, NRCS, PDCs, and local governments. This creates limitations in the development of accurate land use and BMP databases useful for better plan implementation.

11. Urban BMP agreements are supposed to be recorded in order to run with the land and transfer to successor property owners; however, where property owners want to change land uses (and amend the corresponding site plan) a plan amendment process ensures maintenance of the effect of the original BMP. Some localities need to establish local mechanisms to ensure that agreement recordation is a routine procedure.

12. The Chesapeake Bay Program needs to establish BMP efficiencies and costs so that localities can develop optimal cost effective suites of BMPs that can be assigned to specific land uses.

13. The Chesapeake Bay Program should support local governments' implementation of wastewater treatment plant efficiency and/or optimization studies to ensure the maximum effectiveness of these point-source treatment facilities.

C. Legislative and Regulatory Needs (i.e. enabling authority)

1. Silviculture activities should be required by the State regulating authority to conform to comparable performance standards as would apply to any other land disturbance activity under local land use authority.

2. PD 16 localities see need for and the benefits accruing from better coordination of local, State and private developer efforts in a development's environmental compliance project design and project implementation to achieve more efficient compliance with local and State regulations, while achieving more efficient utilization of staffing resources at all levels. As a practical matter, better environmental management coordination and a system of regulatory oversight that incentivizes the private developer to maintain a high level of compliance while minimizing land disturbance (and the negative impacts thereof) can indirectly support the localities' achievement of TMDL goals more cost-effectively.

3. Local authority under Chesapeake Bay Act does not allow the locality to supercede the water quality standards of the Virginia stormwater management regulations. As a result, the burden of water quality improvement compliance is transferred to the locality for developments which have lesser water quality standards due to their "grandfathered" status under the State stormwater regulations. PD 16 localities would like to see water quality standards between the Chesapeake Bay Preservation Act and the new State stormwater management regulations synchronized so that the localities may use the Chesapeake Bay Preservation Act as enabling authority to require land developers to treat water quality to the higher standard of the full stormwater regulations within the locally-designated RMA areas of the locality.

4. PD 16 localities recognize provisions and encouragement in State stormwater management law for regional stormwater management entities and the allowance for nutrient trading as a mechanism to achieve improved water quality. State law needs to be broadened so that either local (or regional) stormwater management entities may offer opportunities for "grandfathered" urban developments to contribute financially to local (or regional) stormwater management solutions in consideration for the value of the discounted on-site stormwater compliance investments provided for through their "grandfathered" status. Such solutions may include enhancement of existing wetlands through the support of the

contributing urban developments that achieve higher water quality compliance through their support of off-site local (and regional) stormwater management program solutions.

Without enabling authority to apply a higher local water quality standard to protect Chesapeake Bay RMA areas (and the Bay itself), localities bear the brunt of the cost to mitigate the on-site water quality impacts of such "grandfathered" developments. Moreover, such a mechanism could foster greater support to rural BMP implementation, wetlands and open space preservation.

5. Local governments' have no ability to affect targeted sediment pollution reductions from State-regulated mining activities controlled by DMME, given the exemption from the definition of "land disturbance" activities under State E&S law. Consequently, the State needs to address how localities can affect such reductions, under local site plan review or other mechanisms, without the enabling authority under the Chesapeake Bay Preservation Act, Erosion and Sediment Control, or stormwater management laws.

6. PD 16 localities believes that there may be a gap in enabling authority for localities to use taxation or other regulatory programs on private property to finance or implement shoreline stabilization and/or preservation projects that assist localities' in achieving their sediment and nutrient reduction goals.

7. Localities in PD 16 have concerns about not having adequate enabling authority under the Code of Virginia to require land cover conversions (e.g. impervious parking lots to pervious parking surfaces) to achieve the BMP reductions goals suggested in the TMDL goals advanced by EPA and VDCR. Reliance on the pace of redevelopment proposals may not be adequate to achieve the targeted reductions of the WIP Phase 2.

8. Virginia has not adopted any authority to require de-nitrification of septic systems. De-nitrification of septic systems may be cost prohibitive to home owners and is not supported by County Staff as a TMDL BMP.

9. The opportunity to influence agricultural land management practices is greater through SWCDs located across Virginia as opposed to local governments. However, privacy and security concerns limit the sharing of data between SWCDs, NRCS, and local governments (or other public entities, such as PDCs). This constrains the development of accurate land use and BMP databases for targeting appropriate planning and implementation efforts. Virginia needs to seek federal and state legislation that allows for the sharing of these data among appropriate public entities under a FOI exemption to protect the confidentiality of this information.

10. George Washington localities note that the Commonwealth is relying heavily on the new stormwater management regulations to help the Commonwealth meet the Chesapeake Bay TMDL goals. Our localities ask how assured the Commonwealth is that the new regulations will actually meet the TMDL goals?

V. Overview of PD 16 Local Governments and Other Stakeholders

A. Locality Lands

For the purposes of this report, "locality lands" are identified as the remaining lands within a locality's jurisdiction that are not federal or state lands, and therefore include both locality-owned property, private property (including lands under private conservation easements), and public and private properties subject to VPDES permit requirements negotiated with Virginia. It is estimated that these

"locality lands" make up 84.6% of the region's total land area, and regionally comprise ____% of the Potomac Basin, ___% of the Rappahannock Basin and ___% of the York River Basin[3]. Private property includes residential, commercial, and industrial areas where the locality's authority to implement stormwater BMPs or retrofits is limited to the land use approval process for development and redevelopment. Properties subject to VPDES permit requirements include public facilities and other sites that host permitted dischargers; permit conditions are negotiated with Virginia and compliance is demonstrated through state-administered programs, and locality authority is limited to the land use approval process.

Table 5. Summary of Federal, State and "Locality Lands" in PD 16

	Total Square Miles	US MCB - Quantico	NSWC-Dahlgren	Ft AP Hill	National Park Service	VA DCR & DGIF	Nat'l Wildlife Refuge	US Dept of Interior	**Federal & State Sub-Total**	**"Locality Lands"** (sq. miles)	**Pct of Total Area**
Caroline Co	**538.512**			116.312	0.080	5.403	0.193		**121.988**	**416.524**	**77.3**
City of Fredericksburg	**10.515**				0.631				**0.631**	**9.884**	**94.0**
King George Co	**184.308**		6.800			4.020	0.768		**11.588**	**172.720**	**93.7**
Spotsylvania Co	**411.975**				23.029	4.576			**27.604**	**384.371**	**93.3**
Stafford Co	**273.709**	50.670			0.141	1.835		3.560	**56.206**	**217.503**	**79.5**
PD 16	**1,419.020**	**50.670**	**6.800**	**116.312**	**23.881**	**15.834**	**0.961**	**3.560**	**218.018**	**1,201.002**	**84.6**

Source: Compiled by GWRC from various GIS sources, including Census Bureau TIGER files, USGS shp files, and statistics on Virginia DGIF and DCR websites..

B. Other VPDES Permitted Facilities

Other operations and facilities, besides permitted public facilities, are subject to VPDES permits administered by Virginia. Permit conditions are negotiated with DEQ and compliance is demonstrated through state-administered programs. Examples include industrial facilities and school sites. These sites may discharge directly to waters of the United States or to MS4s. Permittees must comply with current discharge permit limits, and like public permitted facilities, it is anticipated that future VPDES permit renewals will be consistent with the Phase I WIP.

C. Evolving Planning Issues

Controlling nutrient and sediment loads from the urban sector, agriculture sector, and onsite septic systems will require extensive land-based controls on private property to achieve the nutrient reductions required by the Chesapeake Bay TMDL. EPA, Virginia, and local governments cannot force private land owners to install controls in the absence of direct regulatory authority over land owners (in the case of EPA and the Virginia) or redevelopment requiring local approvals (in the case of the localities). EPA recognizes the limits of the localities' authority over non-point source agriculture and on-site septic systems. It is critical that EPA and Virginia also recognize the limits of local governments' authority over existing development. Several areas related to the development of local-level strategies continue to evolve. It is anticipated that local strategies will be adapted as new information and guidance emerges to address the areas described below.

1. Private Property

Localities have very limited ability to require retrofits on private property. Local governments own a small percentage of the urban lands within their respective jurisdictional boundaries. The majority of urban lands are privately owned. Treatment of significant portions of these private lands may be necessary to achieve nutrient reductions from the urban runoff sector at levels identified in the Chesapeake Bay TMDL.

[3] This analysis could not be completed in time to be included here and will be provided in an amended submittal within a few weeks.

There are significant obstacles associated with controlling nutrient and sediment loads in runoff from private property, as well as concerns regarding how private property retrofits would be have to acquire extensive easements through negotiation and condemnation for the installation and maintenance of treatment measures. Easement acquisition would unreasonably increase costs and extend the implementation schedule. To pursue implementation by property owners, incentive programs, maintenance agreements, and long-term program administration mechanisms would need to be developed; concerns regarding property rights would need to be addressed, and critical levels of land owner participation and implementation would need to be attained. Given the multitude of unresolved issues related to private property, it is anticipated that local strategies will focus on treatment of locality-owned lands until the TMDL process affords more practicable options for treatment of private property.

2. Unregulated Urban Lands

Some localities, such as in Stafford and Spotsylvania Counties, have urban areas that are not regulated under the VPDES permit for the locality MS4. Many of the issues associated with controlling nutrient and sediment loads from private lands also apply to unregulated urban lands. Localities do not have authority to require retrofits on unregulated urban lands, but Virginia has attributed a significant portion of the urban load to these areas.

Most unregulated urban lands are located within localities with significant rural areas. Local nutrient reduction strategies for these lands will likely be limited to retrofits of schools, community centers, and municipal center sites that are located outside the MS4 permit or Chesapeake Bay Preservation area boundaries.

3. Agricultural and Forested Lands

Agricultural and forested lands exist in some portions of George Washington region. Localities with such lands conducted outreach to multiple sectors to collaborate on strategies. Coordination efforts varied by locality, but primarily included SWCDs and the Virginia Department of Forestry. For localities with agriculture and forest lands, local strategies may prioritize the implementation of nutrient reductions from rural sources. Such opportunities may be more cost-effective than seeking nutrient reductions from urban sources. However, local governments have no authority over activities on agriculture lands and do not regulate or control the implementation of agricultural or forestry best management practices. It is expected that State support will continue for existing SWCD educational programs and cost share assistance to agricultural producers who install conservation practices on their farms.

D. Local Governments

In the George Washington Region, localities have existing authority, programs, and mechanisms to implement water quality management strategies on lands as follows:

- Locality-owned lands and facilities (examples include municipal centers, parks, recreation centers, locality maintenance base yards, fire and police facilities, and other general public facilities);
- Areas that drain to the local Municipal Separate Storm Sewer Systems (MS4s) and/or are designated lands covered under Chesapeake Bay Preservation Act guidelines; and
- Areas that may be developed or redeveloped subject to land use approvals (erosion and sediment control programs, statewide stormwater management regulations, and Bay Act regulations).

The regional planning framework herein provides guidance to the Commonwealth of those strategies which have garnered technical support from the participating localities on the regional TMDL committee and are recommended to local governments to work together with the Commonwealth, but still are non-

binding on local governments. Additional comments from the City of Fredericksburg and Stafford County are provided below to supplement the regional response.

1. City of Fredericksburg Summary

Please accept our thanks for the time and effort you have given in the development of Virginia's Watershed Implementation Plan to date. As we all know this has been a challenging effort conducted within a difficult timeframe. We have done our best to produce a plan that fits the parameters established by the EPA and State. We hope to work closely with our neighboring local governments, Planning District Commissions (PDC), Soil and Water Conservation Districts and watershed groups in this process so that together, we can identify pollution reduction strategies that can be maintained over time. The approach the State is using is one that facilitates the development of a plan that contains strategies that are both cost effective and locally appropriate. Our City has been committed to supporting the Chesapeake Bay and the Bay cleanup process and continues to strive for a better environment locally and basin wide, while expressing the desire to see the Bay TMDL implementation process succeeds.

We acknowledge the opportunity to provide more specific information at this time with the understanding that it is difficult to develop a comprehensive plan that may have an impact through 2025. As well, it is important to emphasize that this plan is being developed during the worst economy in a generation and in these austere times, we cannot guarantee additional funding will be provided by our General Assembly. The success of the WIP may be largely subject to the provision of sufficient federal funding to assist in covering these massive costs.

This information we are enclosing supports the Virginia WIP, by improving the underlying technical basis for the Bay TMDL and by demonstrating our understanding of the Bay TMDL and WIP for our locality's roles and responsibilities in implementation, this document also supports Virginia's demonstration of reasonable assurance of Bay TMDL compliance.

City Overview

The City of Fredericksburg was established in 1728 as a port for Spotsylvania County. It was incorporated as a town in 1781, and became an independent city in 1879. The City is bounded to the north and east by the Rappahannock River, to the south and west by Spotsylvania County. The City, situated at the center of the Rappahannock River's "Middle Basin" covers 10.44 square miles of land area and is predominantly developed, with a 2010 Census population of 24,286 (2,326.2 persons per sq mile). The City holds an MS4 permit and environmental compliance programs are managed under the Department of Building and Development Services and the Department of Public Works.

The City is a Phase II MS4 permit holder and has implemented Phase II permit requirements since their commencement in 2003. The City is currently operating in Year Three of our current permit. The University of Mary Washington holds a VPDES MS4 permit within our locality as well. In addition to these MS4 permittees, the Virginia Department of Environmental Quality also regulates several industrial operations that discharge regulated stormwater. VDOT's (Interstate 95) road system dissects a portion of the City, and there is Federal property as well located within the City limits.

Fredericksburg has two completed community-wide planning documents, The City of Fredericksburg's Comprehensive Plan, developed in 2007, projects 20 years into the future, and delivers a blueprint for the community's development as it approaches its 300th anniversary. This Plan builds upon the 2003 "Jump Start Fredericksburg 2010" report, which identifies realistic development recommendations for multiple commercial corridors. These two documents provide goals for transportation and public facility improvements, community appearance, environmental protection, economic development, and historic preservation as well as delineation of corridors and specific areas in need of revitalization and redevelopment.

Because of the City's age, historic character, and size, very little "greenfield" space is available in Fredericksburg that isn't encumbered by either historic or ecological conservation easements. With the City's high population density, the City must redevelop existing infrastructure to preserve open space. As a result, redevelopment is not only a part of the Comprehensive Plan, it is imperative to Fredericksburg's growth.

Ecological Setting

The Rappahannock River flows for 185 miles from the Blue Ridge Mountains, southeast to the fall line at Fredericksburg and ends as a wide estuarine river that connects with the Chesapeake Bay. The river serves as the northern and eastern boundaries of the City, consisting of approximately eight (8) miles of shoreline and serves the as the primary drinking water source for the City and adjoining localities. The Rappahannock River is on the Virginia Department of Environmental Quality Impaired Waters List, beginning at the fall line at Route 1 and continuing downstream until the confluence with Deep Run Creek. Hazel Run Creek is also on the impaired list, this tributary flows through the City with the head waters formation in the adjoining County of Spotsylvania. Both water sources are contaminated with escherichia coli, have a low pH, contain fish contaminated with PCB, and have dissolved oxygen (VDEQ 2008 Fact Sheet).

As a City lying within the Chesapeake Bay Act Overlay, the Rappahannock River is a critical environmental resource with public health significance and a resource that must be protected from degradation and pollution. Objectives for river front development and environmental sustainability include protecting water quality, preserving/enhancing vistas, and developing trails. With this in mind the City has River Goals, Policies and Initiatives established such as to preserve the Rappahannock River.

As well, the City provides the full range of basic public facilities and services needed for modern urban life, such as a quality educational system, public safety services, provision of water and sewer, refuse collection and disposal, parks and recreation, and others, which requires the management of growth population of public facilities as efficiently as possible in consideration of community values and policies.

The City has a long standing history of environmental protection and has implemented effective environmental protection programs for many years. More specifically, the City has operated an Erosion and Sediment control program in accordance with Virginia's requirements since the enactment of our ordinance around 1975 and the City is in compliance with this program. The City adopted the Chesapeake Bay Preservation Act Ordinance around 1992 and criteria for the Stormwater Management program.

The City has developed and implemented a LID (Low Impact Development) Ordinance, requiring development to infiltrate, evaporate or reuse the first ½ inch of storm water runoff from new impervious surfaces for development and redevelopment projects.

The City partners with many local organizations for education and outreach of stormwater and related topics, such as The Friends of the Rappahannock, Clean and Green Commission, Wetlands Board, Tree Fredericksburg, George Washington Regional Commission, Tri City/County Soil and Water Conservation District, and the Rappahannock River Basin Commission to name a few.

The City of Fredericksburg owns a corridor of forested riparian lands along 32 miles of the Rappahannock and Rapidan Rivers and more than 30 additional miles of property along many of their tributary streams. In 2006, the City placed 4,232 acres of this ecologically significant land into a Conservation Easement, referred to as the Fredericksburg Watershed Property. The Property's Conservation Easement provides a high level of protection from development, vegetation removal, and other major alterations. The City of Fredericksburg regards the Watershed Property as an exceptional natural resource that plays a significant role in the region's quality of life. The City's riparian property was acquired to protect the

City's water supply. Protecting the natural ecosystem has tangible benefits for water quality, while also providing an exceptional resource for recreation.

WIP Development Process

The City has participated in several planning efforts to support the development of the Phase II WIP. We have participated with our locality partners at the George Washington Regional Commission (GWRC). City staff participated in conference calls with the Virginia Municipal Stormwater Association (VAMSA) and the City has actively been engaged with many local stakeholders such as: George Washington Regional Commission (GWRC), Rappahannock River Basin Commission (RRBC), RRBC Technical Committee, Department of Forestry (DOF), Virginia Department of Game and Inland Fisheries (VDIGF), University of Mary Washington (UMW), Virginia Municipal Stormwater Association (VAMSA), United States Army Corps of Engineers (USCOE), Department of Environmental Quality (DEQ) to mention a few and we have also attended various local and State meeting's, Webinars, and conferences, such as the VA Lakes & Water, and the Center for Watershed Protection (CWP).

Additionally, staff serves on the technical committee for the Rappahannock River Basin Commission (RRBC) which has discussed the WIP Planning as part of the group's larger discussions concerning cost-effective, market-based solutions to water quality/pollution issues.

Best Management Practices (BMPs)

Urban BMPs:

With the continued evolution of the Bay Model, updating the data is critical and appreciated for the implementation of the Bay TMDL and in meeting the goals. Our action of ensuring accurate data and information will contribute to an important refinement of the Bay model. Currently the Bay model lacks the reporting data of the City's BMP inventory. Our current list of inventoried BMP's for the City is provided as Appendix D. At this time we request that these BMP's be reported, which are all approved practices on the ground, but not yet reported in the model. Consequently, these BMPs should be included and counted toward the City's efforts to meet the local Bay goals. We are and will continue to participate in providing further BMP inventory updates and in the future to the extent not yet reflected in the Bay model, that they would be incorporated.

The City would like to recommend allowing credit for urban BMP's installed or planned, as required for wetland impacts, such as bank stabilization and buffer enhancement, to name a few and urban tree planting. We believe that these mitigation projects are providing a nutrient reduction benefit and other environmental benefits and should be able to be included in the inventory of BMP's (as some were in the past under the Tributary Strategies project). Another recommendation for further analysis for the model would be for allowing credit for conservation easements, which provide environmental benefits.

Rural BMPs: See TCC-SWCD Section (beginning on page 53) & summary in Regional section

Land Cover Data

We wish to acknowledge your efforts in updating the Bay model with more accurate land cover/use data. We believe that more accurate land cover/use data exist than what was used for in the bay model.

We would like to take this opportunity to share other data that has been gathered and analyzed producing different outcomes with regards to land cover and land use than those used in the model utilizing 30 meter imagery. An analysis of the City of Fredericksburg's urban tree canopy (UTC) was carried out by the Virginia Department of Forestry. Assistance was provided by the Virginia Geospatial Extension Program (VGEP) at Virginia Tech's Department of Forestry and by the Spatial Analysis Laboratory (SAL) of the University of Vermont. The goal of the project was to apply the USDA Forest Service's UTC assessment

protocols to the City of Fredericksburg. This analysis was conducted based on year 2008 data using high-resolution (1 meter) National Agriculture Imagery Program (NAIP) imagery. The final City Tree Canopy project report is included herein as Appendix G.

subsource	2009 LU/LC (acres)	2010 LU/LC* (acres)	Difference (acres)
Regulated Animal Operations	-	-	-
Animal Operations	-	-	-
Crop	-	-	-
Hay	-	-	-
Pasture	-	-	-
Nurseries	-	-	-
Atmospheric Deposition	0	55.0	-55.0
Unregulated Urban Impervious	98	0	98.0
Unregulated Urban Pervious	391	0	391.0
Regulated Urban Impervious	1,309	2,112.4	-803.4
Regulated Urban Pervious	2,663	1609.0	1,054.0
Construction	50		50.0
Combined Sewer System	-	-	-
Septic	-	-	-
Surface Mine	-	-	-
Unmanaged Grass	-		
Forest	2,179	2,979.0	-800.0
Grand Total	**6,690**	**6,764.0**	**-74.0**

* Based on 2008 high-resolution land cover classification performed by Virginia Dept. of Forestry.

Review of 2017 & 2025 BMP Scenarios and Preferred Local Scenarios

We welcome the opportunity that you have offered to localities to provide for preferred local BMP scenarios. At this time we have not had ample time to disseminate the material to devise a plan of scenarios to address compliance with the WIP and TMDL's based on the limitations in, delays associated with, or time required to address, the existing modeling tools such as inventories of existing BMP's or land use/land cover. We have engaged in ongoing efforts and time needed to determine at the local level a preferred scenario with the many contributing sources of which some are not under the authority and control of the locality. It is understood that as a "placeholder" DCR intends to use the "default" BMP scenarios developed as part of the Phase I WIP process in 2010 for our locality.

At the time that our locality chooses to make a BMP scenario submittal, the submittal would be simply a demonstration of a seemingly technically viable way based on limited information of how targets might be met. Note that this demonstration has not been selected or adopted by our locality at this time and is simply a technical analysis of one theoretical option that may not be viable as a practical matter due to a variety of reasons. When submitted, we expressly reserve the right to change this analysis at any time for any reason at our locality's sole determination.

As a MS4 permittee, we reserve the right to review the Phase I WIP default scenario as part of any TMDL implementation planning that may be required or be performed pursuant to the permit. We understand that as an MS4 permittee our implementation of the water quality goals of the Bay TMDL and other TMDL's is governed by the "maximum extent practicable" standard.

We understand and commend DCR and the EPA for working on a mechanism to credit reduction practices implemented outside the MS4 service area towards meeting the MS4 waste load allocations and request

looking into credit being established for MS4 permittee's currently implementing practices and request that an efficient and workable mechanism be established in 2012.

Proposed Strategies

We have not had ample time to disseminate the material to devise a plan of scenarios to address compliance with the WIP and TMDL's based on the limitations in, delays associated with, or time required to address, the existing modeling tools. At the time that our locality chooses to make implementation strategies for BMP scenario submittal, the submittal would be simply a demonstration of a seemingly technically-viable way, based on limited information of how targets might be met. Note that this demonstration has not been selected or adopted by our locality at this time and is simply a technical analysis of one theoretical option that may not be viable as a practical matter due to a variety of reasons. When submitted, we expressly reserve the right to change this analysis at any time for any reason at our locality's sole determination. It is understood that as a "placeholder" DCR intends to use the "default" BMP scenarios developed as part of the Phase I WIP process in 2010 for our locality.

The full suite of actions needed are extremely expensive if not cost-prohibitive, and neither the actions nor the costs are available for approval by the local governing body at this time. Our locality will investigate the preferred local funding mechanism (s) to support the implementation of urban practices to advance WIP implementation.

We support the State's concept of expanding nutrient credit trading to MS4 and other sectors as a means of reducing costs for WIP implementation. We will be examining the recent Virginia Code revision requiring adoption of a living shoreline management plan element of the local Comprehensive Plan.

Resource Needs

At this time we have not had ample time to disseminate the material to devise a plan of scenarios to address compliance with the WIP and TMDL's based on the limitations in, delays associated with, or time required to address, the existing modeling tools. Thus, we are uncertain at this time as to what our resource needs may be.

We would like to express concerns about the magnitude of the cost estimates catalogued in the November 2011 report of the Virginia Senate Finance committee and stress the importance of Federal and State financial support for WIP implementation.

We would like to note that for urban areas, the artificial 2025 deadline, which is atypical of other TMDL's, is an impediment to allowing the normal redevelopment process to provide nutrient reductions over time at the developers' expense (by meeting the redevelopment standards under the VSMP regulation), and instead may have the result of requiring pre-development retrofits at exceptionally high costs.

Again, nutrient trading may be a viable option for decreasing overall implementation costs and that the State's nutrient credit trading program should be expanded appropriately to take advantage of this opportunity. We anticipate the need for significant financial and regulatory support from the State to fulfill its TMDL reduction goals.

General Provisions

At this time we have not had ample time to disseminate the material to devise a plan of scenarios to address compliance with the WIP and TMDL's based on the limitations in, delays associated with, or time required to address, the existing modeling tools. When submission of this material is made, our scenarios and strategies may be changed substantially by us in the future as part of our locality's adaptive management process, considering any factor that we find relevant such as local preferences, cost estimates, new technical information, new or enhanced technologies, etc. We reserve the right to reconsider and amend any of the above information now and any future submittals, for or in any future

regulatory proceeding such as MS4 permit re-issuance of compliance under such a permit or other regulatory proceeding.

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2. Caroline County Summary

Caroline County, located on the southern edge of the Region, is part of the Richmond, VA Metropolitan Statistical Area and is the largest locality in the Region in terms of land area, with 527.51 square miles and a 2010 Census population of 28,545 persons (54.1 persons per square mile). The County is sub-divided into 10 river segment sub-watersheds, with 22% of the County land area in the Rappahannock River watershed and the remainder in the York River watershed. Fort A.P. Hill, operated by the U.S. Army, covers 116.51 square miles (22% of County land area). Unlike the other localities in the Region (served by Tri-County/City SWCD), Caroline County is served by the Hanover-Caroline Soil and Water Conservation District.

Best Management Practices (BMPs)

Urban BMPs:

A list of urban BMPs, compiled under the County's Chesapeake Bay Preservation Act program, has been supplied to VDCR under separate cover and is included on CD with this report which is located at Appendix H.

Rural BMPs: See Hanover-Caroline SWCD Section (beginning on page 50)

Land Cover Data

	CAROLINE COUNTY				
	VAST: Local	COUNTY TOTAL			
	TMDL Data	(Local Estimate, GWRC, 2011)			
subsource	2009 LU/LC (acres)	Pct of Total Area	Sq. Miles	ACRES	Difference (Acres)
Regulated Animal Operations	-	0.00%	0.00	0.00	-
Animal Operations	45	0.08%	0.41	265.10	(219.87)
Crop	28,825	9.79%	52.72	33,737.70	(4,912.35)
Hay	4,142	1.41%	7.57	4,847.51	(705.82)
Pasture	6,222	2.11%	11.38	7,282.83	(1,060.41)
Nurseries	17	0.08%	0.44	284.01	(267.08)
Atmospheric Deposition	2,270	1.10%	5.93	3,796.28	(1,526.36)
Unregulated Urban Impervious	4,012	3.22%	17.33	11,089.54	(7,077.36)
Unregulated Urban Pervious	8,475	6.56%	35.35	22,622.71	(14,147.86)
Regulated Urban Impervious	-	0.00%	0.00	0.00	-
Regulated Urban Pervious	-	0.00%	0.00	0.00	-
Construction	54	1.30%	7.01	4,484.42	(4,430.03)
Combined Sewer System	-	0.00%	0.00	0.00	-
Septic	-	0.00%	0.00	0.00	-
Surface Mine	1,026	0.35%	1.90	1,213.00	(187.47)
Unmanaged Grass	1,247	2.19%	11.81	7,561.56	(6,314.41)
Forest	286,536	70.06%	377.29	241,464.97	45,071.00
*Water**	-	0.91%	4.92	3,151.72	(3,151.72)
Land Area Sub-Total	340,602	99.09%	533.57	341,481.88	(880.19)
Grand Total	**342,872**	**100.00%**	**538.49**	**344,633.60****	**1,761.99)**

*Water areas identified in TIGER line files include inland lakes and ponds.
**Total area based on 2011 TIGER line files.

Review of 2017 & 2025 BMP Scenarios and Preferred Local Scenarios

See Regional Scenarios section.

Proposed Strategies

See Regional Strategies section.

Resource Needs

See Regional and Local Resource Needs section

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3. King George County Summary

King George County, located on the eastern side of the Region, is currently designated a non-metro county with 184.31 square miles of land area and a 2010 Census population of 23,584 persons (131.3 persons per square mile). The County is sub-divided into 14 river segment sub-watersheds[4]. Two 2 sub-watersheds of the Rappahannock River watershed cover 37% of the County land area and the remainder of the County lies in the Lower Potomac River watershed. Naval Surface Warfare Center-Dahlgren, operated by the U.S. Navy, covers 6.72 square miles (3.6 % of County land area).

Best Management Practices (BMPs)

Urban BMPs: See Appendix C for map of local BMP inventory

A list of urban BMPs, compiled under the County's Chesapeake Bay Preservation Act program, has been supplied to VDCR under separate cover and is included on CD with this report at Appendix H.

Rural BMPs: See TCC-SWCD Section (beginning on page 53)

Land Cover Data

	KING GEORGE CO TOTALS				
	VAST: Local	**COUNTY TOTAL**			
	TMDL Data	(Local Estimate, GWRC, 2011)			
subsource	2009 LU/LC (acres)	Pct of Total Area	Sq. Miles	ACRES	Difference (Acres)
Regulated Animal Operations	0.00	0.00%	0.000	0.00	-
Animal Operations	32.39	0.43%	0.778	497.72	(465.33)
Crop	6,104.20	5.49%	9.895	6,333.11	(228.91)
Hay	5,300.86	4.77%	8.593	5,499.65	(198.79)
Pasture	6,618.32	5.95%	10.729	6,866.51	(248.19)
Nurseries	63.93	0.02%	0.028	18.10	45.83
Atmospheric Deposition	1,066.32	3.33%	6.005	3,843.24	(2,776.92)
Unregulated Urban Impervious	2,358.09	2.68%	4.840	3,097.46	(739.37)
Unregulated Urban Pervious	6,469.35	9.90%	17.852	11,425.29	(4,955.94)
Regulated Urban Impervious	0.00	0.00%	0.000	0.00	-
Regulated Urban Pervious	0.00	0.00%	0.000	0.00	-
Construction	15.85	0.60%	1.074	687.24	(671.39)

[4] Two (2) sub-watersheds cover portions of the Potomac River and lie outside King George County's political jurisdiction in Charles County, Maryland.

subsource	KING GEORGE CO TOTALS				
	VAST: Local	COUNTY TOTAL			
	TMDL Data	(Local Estimate, GWRC, 2011)			
	2009 LU/LC (acres)	Pct of Total Area	Sq. Miles	ACRES	Difference (Acres)
Combined Sewer System	0.00	0.00%	0.000	0.00	-
Septic	0.00	0.00%	0.000	0.00	-
Surface Mine	1,637.37	0.55%	0.986	630.84	1,006.53
Unmanaged Grass	2,601.69	5.79%	10.446	6,685.39	(4,083.70)
Forest	82,732.85	60.08%	108.304	69,314.42	13,418.43
Water*		0.41%	0.734	469.46	(469.46)
Land Area Sub-Total	115,001.22	99.59%	179.530	114,898.96	102.26
Grand Total	115,001.22	100.00%	180.263	115,368.42**	(367.20)

*Water areas identified in TIGER line files include inland lakes and ponds.
**Total area based on 2011 TIGER line files.

Review of 2017 & 2025 BMP Scenarios and Preferred Local Scenarios

See Regional Scenarios section.

Proposed Strategies

See Regional Strategies section.

Resource Needs

See Regional and Local Resource Needs section

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4. Spotsylvania County Summary

Spotsylvania County, covers 412 square miles of land area, with an urban development pattern in the northeast portion of the County extending west from the City of Fredericksburg. The County's 2010 Census population of 122,397 (304.9 persons per sq mile) places it 2nd in the Region in total population behind Stafford County. The County holds an MS4 permit and the Environmental Engineering Office of Code Compliance Department ensures that development and construction occurring in the County meets all applicable Federal, State and local environmental engineering laws.

The County environmental staff are working with County GIS staff to develop an expanded BMP inventory and related maps which will be supplied to VDCR under separate cover.

Best Management Practices (BMPs)

Urban BMPs: See Folder on CD under Appendix H.

Rural BMPs: See TCC-SWCD Section (beginning on page 53)

Land Cover Data

subsource	SPOTSYLVANIA CO TOTALS				
	VAST: Local	COUNTY TOTAL			
	TMDL Data	(Local Estimate, GWRC, 2011)			
	2009 LU/LC (acres)	Pct of Total Area	Sq. Miles	ACRES	Difference (Acres)
Regulated Animal Operations	0.00	0.00%	0.00	0.00	0.00
Animal Operations	87.64	0.25%	1.00	640.44	552.80
Crop	7,963.47	2.34%	9.51	6,085.64	-1,877.83
Hay	10,213.45	3.00%	12.20	7,805.06	-2,408.39
Pasture	9,969.21	2.92%	11.90	7,618.41	-2,350.80
Nurseries	5.95	0.12%	0.51	323.61	317.66
Atmospheric Deposition	6,766.50	4.64%	18.88	12,083.17	5,316.67
Unregulated Urban Impervious	4,783.89	0.00%	0.00	0.00	-4,783.89
Unregulated Urban Pervious	12,245.90	0.00%	0.00	0.00	-12,245.90
Regulated Urban Impervious	3,062.10	5.69%	23.15	14,814.23	11,752.13
Regulated Urban Pervious	12,581.99	11.73%	47.74	30,556.20	17,974.21
Construction	766.81	1.51%	6.16	3,941.55	3,174.74
Combined Sewer System	0.00	0.00%	0.00	0.00	0.00
Septic	0.00	0.00%	0.00	0.00	0.00
Surface Mine	1,253.75	0.18%	0.75	481.22	-772.53
Unmanaged Grass	3,966.81	2.04%	8.32	5,324.66	1,357.85
Forest	190,181.22	65.36%	265.77	170,094.88	-20,086.34
Water		1.22%	5.03	3,218.47	3,218.47
Land Area Sub-Total	263,848.69	98.78%	406.97	260,461.53	-3,387.16
Grand Total	**263,848.69**	**100.00%**	**412.00**	263,680.00	-168.69

*Land cover analysis for non-MS4 areas of County incomplete at time of report submittal deadline.
**Water areas identified in TIGER line files include inland lakes and ponds.
***Total area based on 2011 TIGER line files.

Review of 2017 & 2025 BMP Scenarios and Preferred Local Scenarios

See Regional Scenarios section.

Proposed Strategies

See Regional Strategies section.

Resource Needs

See Regional and Local Resource Needs section

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5. Stafford County Summary

Stafford County is located along the I-95 corridor between the City of Fredericksburg and Prince William County. The County's is approximately 237.7 square miles (177,280 acres) in land area with approximately 1/5 of that land area being owned by the Federal Government at Marine Corps Base-Quantico. The County's 2010 Census population of 128,961 (479.5 persons per sq mile) leads the Region in total population. The County's population had doubled since 1990.

Stafford County is split by two of Virginia's major watersheds. The Northern and Central portions of the County (with 70 percent of the County's land area) primarily drain in an easterly direction to the Potomac River through five significant tributaries: Accokeek Creek, Aquia Creek, Austin Run, Chopawamsic Creek and Potomac Creek. The Southern portions of the County (with 30 percent of the County land area) drain in a southerly direction to the Rappahannock River through 10 significant tributaries: Deep Run, Richland Run, Horsepen Run, Rocky Pen Run, England Run, Falls Run, Claiborne Run, Little Falls Run, White Oak Run, and Muddy Creek. The primary land cover/use in Stafford County is forest, followed by urban/suburban development and agriculture.

Stafford County is a Phase II Municipal Separate Storm Sewer System (MS4) permit holder and has implemented Phase II permit requirements since their commencement in 2003. The County is currently operating in Year Four of our current permit, which expires on July 8, 2013. In addition to Stafford County, there are several other MS4 permittees in Stafford County including: the Stafford County School Board, the Virginia Department of Transportation, and the Marine Corps Base-Quantico. In addition to these MS4 permittees, the Virginia Department of Environmental Quality also regulates several industrial operations that discharge regulated stormwater. Finally, the mining and mineral extraction sites located in Stafford County are regulated by the Virginia Department of Mines, Minerals, and Energy.

Stafford County has a long standing history of environmental protection and has implemented effective environmental protection programs for many years. More specifically, the County has operated an Erosion and Sediment Control program in accordance with Virginia's requirements since the enactment of our ordinance in 1982. The County's Erosion and Sediment Control program was found compliant during our last program review in 2006 and contains many provisions that exceed State minimum performance criteria. Additionally, the County adopted a Chesapeake Bay Preservation Act Ordinance in 1990 in accordance with State criteria. The County has operated a successful Bay Act program since that time and most notably was one of the first Bay Act localities to implement an effective Septic Tank Pump-out program. Finally, Stafford County has been a leader in the area of stormwater management in the Commonwealth. Since the adoption of our Stormwater Management Ordinance in 1994, the County has been on the "cutting edge" of stormwater both in the 1990's with Regional Stormwater Management Plans or in the 2000's with the advent of Low Impact Development and Green Infrastructure practices for stormwater management.

Best Management Practices (BMPs)

Urban BMPs

Stafford County appreciates the opportunity to review and update current information on the extent of installed urban Best Management Practices (BMPs). It appears that the data provided by DCR via the Chesapeake Bay Model is inaccurate and under-reports the number and extent of urban BMPs in Stafford County. We believe that this is due to a group of newer BMPs for which treatment information has not yet been provided to DCR and better information on the extent of "acreage treated" for our existing stormwater management BMPS. See Appendix E for the revised urban BMP information.

The County requests that these BMPs be fully included in the model now and counted towards meeting the Commonwealth's Chesapeake Bay TMDL goals.

The County would also like to take the opportunity to point out that significant efforts have been made in the County in the context of the Urban BMPs such as stream restoration and buffer enhancement through wetland mitigation opportunities. Wetland mitigation/restoration requirements are generally at a ratio of two to three times the amount of actual impact and we believe that at least a portion of the nutrient reductions associated with these activities should be counted as a part of our BMP inventory. However, during various discussions with DCR staff in the WIP Phase II planning process we were repeatedly told that the County could not take credit

for any urban BMPs installed as required mitigation for wetland impacts. We believe that these mitigation projects are providing a nutrient reduction benefit and should be included in the inventory of existing BMPs. We have identified the additional reductions that could be provided by counting wetland mitigation projects in the BMP information provided in Appendix E.

Rural BMPs: See TCC-SWCD Section (beginning on page 53)

Land Cover Data

	STAFFORD CO TOTAL*				
	VAST: Local	COUNTY TOTAL			
	TMDL Data	(Local Estimate, GWRC, 2011)			
subsource	2009 LU/LC (acres)	Pct of Area	Sq. Miles	ACRES	Difference (Acres)
Regulated Animal Operations	-	0.00%	0.00	0.00	-
Animal Operations	53	0.45%	1.24	794.21	(740.92)
Crop	2,841	3.04%	8.31	5,321.00	(2,479.86)
Hay	4,913	5.26%	14.38	9,200.81	(4,287.83)
Pasture	3,047	3.27%	8.92	5,706.87	(2,659.56)
Nurseries	6	0.11%	0.30	191.33	(185.37)
Atmospheric Deposition	1,734	1.18%	3.23	2,066.42	(332.27)
Unregulated Urban Impervious	3,756	0.00%	0.00	0.00	3,755.93
Unregulated Urban Pervious	12,055	0.00%	0.00	0.00	12,055.07
Regulated Urban Impervious	2,788	7.33%	20.02	12,810.44	(10,022.65)
Regulated Urban Pervious	13,335	12.48%	34.09	21,816.25	(8,481.45)
Construction	428	0.64%	1.74	1,116.67	(688.58)
Combined Sewer System	-	0.00%	0.00	0.00	-
Septic	-	0.00%	0.00	0.00	-
Surface Mine	954	0.07%	0.20	129.11	825.10
Unmanaged Grass	1,901	10.93%	29.86	19,110.24	(17,209.50)
Forest	126,207	65.08%	177.72	113,742.70	12,464.20
*Water***		*1.11%*	*3.03*	*1,937.83*	*(1,937.83)*
Land Area Sub-Total		*98.89%*	*270.06*	*172,837.09*	
Grand Total	**174,018**	**100.00%**	**273.085815**	**174,774.92*** **	**(756.57)**

*Land cover analysis for non-MS4 areas of County uncompleted by initial report submittal deadline.
**Water areas identified in 2011 TIGER line files include inland lakes and ponds.
***Total area based on 2011 TIGER line files.

Stafford County appreciates the interest of DCR in making corrections to the land use/land cover information contained in the Chesapeake Bay Model to provide a more accurate representation of current land use land cover.

Unfortunately, Stafford County did not have adequate land cover data available to make a relevant review in advance of the February 1st deadline. However, within the bounds of available staff time and resources, we will pursue efforts to assess that data as time permits moving forward and will consider providing the results of our review to DCR upon completion.

Review of 2017 & 2025 BMP Scenarios and Preferred Local Scenarios

Stafford County welcomes the opportunity to review the proposed scenario provided in the Phase I WIP and the opportunity to provide a preferred local BMP scenario. At this time, Stafford County will not be providing an alternative local BMP scenario. We are unable to provide this product at this time as we have not completed the necessary watershed planning efforts necessary to make educated and responsible decisions towards an alternative BMP scenario.

While we will not be providing an alternative local scenario, we will provide comments on the existing Phase I scenario as it is our understanding that this scenario will be used as a "placeholder" until such time that a more detailed local scenario can be provided.

Our comments on the existing Phase I BMP scenario are listed below:

1. The Phase I BMP scenario for Stafford County specifies that 219 septic systems will need to connect to public sewer by 2025. Based on historic connection rates, we believe that it will be difficult to connect this amount of systems in the specified timeframe.

2. The Phase I BMP scenario for Stafford County specifies that Street Sweeping will be completed on 238 acres of regulated urban land. Please remember that in the context of Stafford County, the Virginia Department of Transportation maintains all public roadways and would thus be required to perform street sweeping on 238 acres of roadways in regulated urban areas. This requirement could be specified in future VDOT MS4 permits as well as addressed through voluntary property management actions by VDOT in the maintenance of 4 VDOT-operated park and ride lots in the County which comprise approximately 26 acres of paved area.

3. The Phase I BMP scenario proposes over 11,000 acres of Nutrient Management on regulated and un-regulated urban lands. This goal substantially exceeds the acreage of locality-owned lands and therefore the majority of nutrient management practices to be implemented would need to occur on private land.

4. Please be advised that for lands contained within the County's MS4 boundary, we reserve the right to review and revise the Phase I BMP default scenario as part of any TMDL implementation planning that may be required or performed pursuant to future permit requirements. It is the County's understanding that as an MS4 permittee, our implementation of water quality goals of the Bay TMDL or other TMDLs is governed by the "maximum extent practicable" standard and not by other schedules identified in the TMDL or WIPs. For non-MS4 lands, the County may develop a preferred BMP scenario if and when the technical information and financial resources to do so become available.

5. Finally, we would like to express our appreciation to DCR and EPA for working on a mechanism to credit reduction practices implemented outside of the MS4 service area towards meeting the MS4 waste load allocation (as identified in the DCR Chesapeake Bay TMDL Phase II WIP FAQ). We request that these efforts be continued and that an efficient and workable mechanism be established in 2012.

Proposed Strategies

Stafford County will utilize the following existing regulatory programs to support implementation of the WIP goals:

1. The County will continue the implementation of our Chesapeake Bay Preservation Act Ordinance and program. The Bay Act provides the enabling legislation to continue the operation of our septic tank pump-out program which we have implemented since 1999.

2. The County will continue the implementation of our Erosion and Sediment Control program which meets or exceeds current DCR Minimum Standards. Our implementation of this program should help to address the reduction goals for "Construction".

3. The County will continue the implementation of our Stormwater Management program to address runoff from new development and redevelopment activities. The County shall incorporate the requirements of the revised Virginia Stormwater Management regulations prior to the implementation deadline.

4. The County will continue the implementation of the requirements of our current Municipal Separate Storm Sewer System (MS4) permit.

5. The County may consider the development of watershed management plans to support future nutrient reduction planning efforts.

In addition, we generally support the proposed implementation strategies contained in GWRC's regional response.

Resource Needs

Stafford County is very concerned about the magnitude of the costs of the Chesapeake Bay TMDL identified in the recent Virginia Senate Finance Committee report. The County strongly believes that direct Federal or State funding should be provided to localities to assist with the cost of TMDL compliance.

In addition, we generally support the regional and local resource needs identified in the regional response.

CAVEATS AND CONCLUSIONS

Stafford County reserves the right to reconsider and amend any of the above information in any future regulatory proceeding such as an MS4 permit reissuance or compliance under such a permit.

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6. Federal Installations

A. Military Installations

1. Marine Corps Base-Quantico

"DoD is currently working on a unified approach to respond to the TMDL request, but the working group does not yet have a deliverable product or narrative that I can forward to you in time to meet your 16 Jan deadline. ……My water program manager is Mr. Clark, cc'd above, and he works for the Environmental Compliance Section Chief, Ms. Rosenquist; I'll ask Mr. Clark to follow up with you when he is back in the office."

Contact: Elizabeth A. (Betsey) Kimmerly
Head, Natural Resources & Environmental Affairs
3049 Bordelon St.
Quantico, VA 22134

elizabeth.kimmerly@usmc.mil
Phone: 703-784-4030 Fax: 703-784-4953

MCBQ provided GIS data layers for roadways, buildings, driveways, landing strips and other impervious surface areas on the Base. Using GIS, those features physically located in Stafford County were selected, assigned to the corresponding river segment subwatershed and then the aggregate amount of impervious area was summed for all impervious data layers. Other comments and data from MCB-Quantico have been submitted through the Dept of Defense submittal to VDCR.

2. Naval Surface Warfare Center – Dahlgren

Yes, NSF Dahlgren is engaged in the TMDL process and you may expect a coordinated base response from our Installation Environmental Program Manager, Jeffrey Bossart. NSF Dahlgren Environmental is data gathering/checking the BMP and GIS information, upon completion of these efforts we will assist you with the process to request GIS data.

NSWC-Dahlgren staff are working to update their GIS coverages to respond to the Department of Defense request to prepare the DOD TMDL response. These data will be supplied to GWRC upon completion of this update.

Other comments and data from NSWC-Dahlgren have been submitted through the Dept of Defense submittal to VDCR.

3. Fort A.P. Hill

AP Hill GIS staff provided GIS data layers for roadways, buildings, driveways, landing strips and other impervious surface areas on the Base. Using GIS, those features were assigned to the corresponding river segment subwatershed and then the aggregate amount of impervious area was summed for all impervious data layers.

Other comments and data from Fort A.P. Hill have been submitted through the Dept of Defense submittal to VDCR.

B. Fredericksburg-Spotsylvania National Military Park

1. Current BMPs (Since 2005) - none for the park
2. LU/LC - accurate acreage numbers for the park to be determined
3. 2017 / 2025 BMP Scenarios - planned for the future? Buffer strips for the farms.
4. Strategies to implement - force farmers in the park to create buffers - no planting / no land disturbance zones.
5. This park is located in 5 different jurisdictions (Spotsylvania, Stafford, Caroline, Orange, and the City of Fredericksburg)

   Based on the (TMDL) spreadsheet's numbers, it looks like the park is the only federal facility in the city of Fredericksburg, Spotsylvania County, and Orange County - however, we have 47 acres in Caroline County (Where Fort AP Hill is located), and about 50 acres in Stafford County (Where Quantico is located).

Source: Gregg Kneipp, Natural Resources Manager, Park FMO
National Park Service, Fredericksburg and Spotsylvania National Military Park
120 Chatham Lane, Fredericksburg, VA 22405
540-654-5331, Fax: 540-891-5169

VII. Soil and Water Conservation Districts

A. Tri-County/City SWCD (City of Fredericksburg; King George, Spotsylvania & Stafford Counties)

Tri-County/City SWCD serves the Commonwealth of Virginia Counties of King George, Spotsylvania, and Stafford and the City of Fredericksburg. We are a political subdivision of the Commonwealth of Virginia, focusing on natural resource problems and solutions. Like other conservation districts, Tri-County/City SWCD is self-governed, non-profit and establishes priorities, sets policy, and administers programs to conserve soil and water resources.

Tri-County/City SWCD is not a regulatory agency. Instead, the agency provides technical assistance, information, educational programs, volunteer opportunities, and newsletters to citizens on many aspects of water quality, nonpoint source pollution, and stream health.

Tri-County/City SWCD Note: Some data for reported practices in the following tables may contain errors in the Department of Conservation and Recreation's Virginia Agricultural BMP Database during the 2006-2011 time period.

Rural/Agricultural BMPs

City of Fredericksburg Summary:

BMP Name	Extent Installed	Installed Units
Nutrient Management Plan Writing and Revision	14.7	Acres

Source: TCC SWCD, 2006 – 2011 BMP summary

TMDL 2009 existing BMP Data summary = No Agricultural BMPs were reported in 2009 for Fredericksburg

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King George Co Summary:

BMP Name	Extent Installed	Installed Units
Continuous No-Till System Total	**412.5**	**Acres**
CREP Riparian Forest Buffer Planting Total	**53.3**	**Acres**
Grass Filter Strip Rent Total	**4.5**	**Acres**
Harvestable Cover Crop Total	**1,652.7**	**Acres**
Legume cover crop Total	**177.4**	**Acres**
Nutrient Management Plan Implementation and Record Keeping Total	**6,296.8**	**Acres**
Nutrient Management Plan Writing and Revision Total	**2,919.5**	**Acres**
Permanent vegetative cover on critical areas Total	**2.0**	**Acres**
Permanent Vegetative Cover on Cropland Total	**256.2**	**Acres**
Protective cover for specialty crops Total	**62.7**	**Acres**
Reforestation of erodible crop and pastureland Total	**14.0**	**Acres**
Riparian Buffer Rent Total	**54.3**	**Acres**
Small Grain cover crop for Nutrient Management Total	**1,404.9**	**Acres**
Three Year Small Grain Cover Crop Total	**315.2**	**Acres**
CREP Grazing land protection Total	**4,139.0**	**Lin. Feet**

Stream Exclusion With Grazing Land Management Total	**7,124.0**	**Lin. Feet**
Streambank protection (fencing) Total	**6,009.1**	**Lin. Feet**
CREP Grass filter strips Total	**0.0**	**Lin. Feet**
Nutrient Management Plan Writing and Revision Total	0.0	unspecified
Reforestation of erodible crop and pastureland Total	0.0	unspecified
Small Grain cover crop for Nutrient Management Total	0.0	unspecified
Three Year Small Grain Cover Crop Total	0.0	unspecified
Areal Total	**13,626.00**	**acres**
Linear Total	**17,272.1**	**linear ft**

Source: TCC SWCD, 2006 – 2011 BMP summary

TMDL 2009 existing BMP Data summary = **19,914** acres of Crop, Hay & Pasture BMPs in 2009 and **16,437.74** linear feet of pasture fencing.

Spotsylvania Co Summary:

BMP Name	**Extent Installed**	**Installed Units**
Continuous No-Till Forage Production System Total	39.8	Acres
Continuous No-Till System Total	750.0	Acres
CREP Riparian Forest Buffer Planting Total	77.7	Acres
Harvestable Cover Crop Total	3,808.8	Acres
Legume cover crop Total	114.4	Acres
Nutrient Management Plan Implementation and Record Keeping Total	9,084.7	Acres
Nutrient Management Plan Writing and Revision Total	10,365.2	Acres
Permanent vegetative cover on critical areas Total	4.9	Acres
Permanent Vegetative Cover on Cropland Total	730.1	Acres
Reforestation of erodible crop and pastureland Total	44.9	Acres
Riparian Buffer Rent Total	83.1	Acres
Small Grain cover crop for Nutrient Management Total	2,129.4	Acres
Woodland erosion stabilization Total	4.2	Acres
Three Year Small Grain Cover Crop Total	264.0	Acres
Animal waste control facilities Total	1.0	Count
Loafing lot management system Total	1.0	Count
CREP Grazing land protection Total	7,705.0	Lin. Feet
Stream Exclusion With Grazing Land Management Total	9,214.0	Lin. Feet
Streambank protection (fencing) Total	15,082.0	Lin. Feet
Streambank Stabilization Total	517.0	Lin. Feet
Small Grain cover crop for Nutrient Management Total	0.0	unspecified
Areal Total	**27,501.20**	**Acres**
Linear Total	**32,518.0**	**linear feet**

Source: TCC SWCD, 2006 – 2011 BMP summary.

TMDL 2009 existing BMP Data summary = **25,669** acres of Crop, Hay & Pasture BMPs and **144,325.2** linear feet of pasture fencing.

Stafford Co Summary:

BMP Name	Extent Installed	Installed Units
Riparian Buffer Rent Total	18.5	Acres
CREP Riparian Forest Buffer Planting Total	5.7	Acres
Woodland buffer filter area Total	0.0	Acres
Nutrient Management Plan Writing and Revision Total	3,035.4	Acres
Nutrient Management Plan Implementation and Record Keeping Total	1,958.6	Acres
Permanent Vegetative Cover on Cropland Total	848.4	Acres
Permanent vegetative cover on critical areas Total	3.0	Acres
Small Grain cover crop for Nutrient Management Total	335.8	Acres
Harvestable Cover Crop Total	338.3	Acres
Three Year Small Grain Cover Crop Total	55.1	Acres
CREP Grazing land protection Total	1,458.0	Lin. Feet
Stream Exclusion With Grazing Land Management Total	1,056.0	Lin. Feet
Streambank protection (fencing) Total	5,582.0	Lin. Feet
Grand Total	8,096.0	Lin. Feet
Streambank protection (fencing) Total	895.0	Lin. Feet
Sod waterway Total	879.0	Lin. Feet
CREP Grass filter strips Total		unspecified
Small Grain cover crop for Nutrient Management Total		unspecified
Three Year Small Grain Cover Crop Total		unspecified
Grand Total		unspecified
Areal Sub-Total	**6,598.80**	**Acres**
Linear Sub-Total	**9,870.0**	**Lin. Feet**

Source: TCC SWCD, 2006 – 2011 BMP summary.

TMDL 2009 existing BMP Data summary = **4,761** acres of Crop, Hay & Pasture BMPs and **23,012.83** linear feet of pasture fencing.

Review of 2017 & 2025 BMP Scenarios and Preferred Local Scenarios

See Regional Scenarios section.

Proposed Strategies

See Regional Strategies section.

Resource Needs

See Regional Resource Needs section

B. Hanover-Caroline SWCD (Caroline Co. only)

Soil and Water Conservation District (SWCDs) are self-governed subdivisions of state government whose main purpose is to coordinate assistance from all available sources—public and private, local, state and federal—in an effort to develop locally-driven solutions to natural resource concerns. Today, Virginia's forty-seven districts serve as resources in nearly all Virginia localities helping citizens to address local land-use and water quality issues.

- Virginia Agricultural BMP Cost-Share Program: Districts provide up to $20 million in financial assistance to address significant agricultural water quality problems in targeted watersheds and impaired stream segments (TMDLs).
- Conservation planning assistance: Districts develop and oversee implementation of comprehensive conservation plans and services that support county ordinances including agricultural provisions of local Chesapeake Bay Preservation Act and Virginia's Agricultural Stewardship Act.
- Technical Assistance: Districts help landowners to identify local pollution problems and provide technical expertise for the voluntary installation of Best Management Practices (BMPs) to address those concerns.
- Environmental Education: Virginia's Soil and Water Conservation Districts provide and promote leadership in the conservation of natural resources through outreach education programs including field days, public forums, and school programs."

Agricultural Strategies (draft) that we are working on with Hanover (& Caroline):

1. Capacity Building - Locality will partner with SWCD to develop land use and BMP data on agriculture lands.
2. BMP Implementation - Locality will cooperate with partners (SWCD, NRCS, PDC, DCR, etc) to assist in identify and enrolling farmers in cost-share to implement agricultural conservation practices to advance WIP progress.
3. BMP Implementation - Locality will work with partners (SWCD, NRCS, DCR, Agri-business, Farm Bureau, etc) to investigate opportunities to provide additional incentives to farmers to increase participation in cost-share programs and voluntary implementation of BMP to advance WIP progress.

Rural/Agricultural BMPs (for Caroline County only)

FY2011[5]: 35,148.34 acres

- **Nutrient Management Planning** (NM-1) with 20,841.29 acres in Caroline County.
- **Nutrient Management Recordkeeping** (NM-2) with 11,659.35 acres in Caroline County.
- **Small Grain Cover Crop for Nutrient Management and Residue Management** (SL-8B) with 2,602.65 acres planted in Caroline County.
- **Cover Crop on Specialty Cropland** (SL-8) with 45.05 acres planted in Caroline County.

FY2010: 39,279.36 acres

- **Nutrient Management Planning** (NM-1) with 15,545.51 acres in Caroline County.
- **Nutrient Management Recordkeeping** (NM-2) with 17,410.85 acres in Caroline County.
- **Small Grain Cover Crop for Nutrient Management and Residue Management** (SL-8B) with 5257.7 acres planted in Caroline County.
- **Harvestable Cover Crop** (SL-8H) with 988.3 acres planted in Caroline County.
- **Continuous No-Tillage** (SL-15A) with 77 acres in Caroline County.

[5] Source: E-Mail communication from Sharon Connor, District Manager, Hanover-Caroline Soli & Water Conservation District, Jan 5th and 20th, 2011. Note: Transmittal edited by GWRC to delete references to Hanover County BMPs.

FY2009: 37,026.40 acres

- **Nutrient Management Planning** (NM-1) with 16,979.8 acres in Caroline County.
- **Nutrient Management Recordkeeping** (NM-2) with 15,138.4 acres in Caroline County.
- **Cropland Conversions** (SL-1) with 9.6 acres installed in Caroline County.
- **Protective Cover for Specialty Crops** (SL-8) with 22.4 acres planted in Caroline County.
- **Small Grain Cover Crop for Nutrient Management and Residue Management** (SL-8B and SL-8C) with 1906.1 acres planted in Caroline County.
- **Continuous No-Tillage** (SL-15A and SL-15B) with 2,970.1 acres in Caroline County.

FY2008: 37,700.11 acres

- **Cropland Conversions** (SL-1) with 44.2 acres installed in Caroline County.
- **Nutrient Management Planning** (NM-1) with 15,477.62 acres in Caroline County.
- **Nutrient Management Recordkeeping** (NM-2) with 17,082.04 acres in Caroline County.
- **Small Grain Cover Crop for Nutrient Management and Residue Management** (SL-8B and SL-8C) with 1,951.8 acres planted in Caroline County.
- **Harvestable Cover Crop** (SL-8H) with 2,385.1 acres in Caroline County.
- **Continuous No-Tillage** (SL-15A and SL-15B) with 759.35 acres in Caroline County.

FY2007: 22,319.69 acres

- **Cropland Conversions** (SL-1) with 10.0 acres installed in Caroline County.
- **Nutrient Management Planning** (NM-1) with 9102.24 acres in Caroline County.
- **Nutrient Management Recordkeeping** (NM-2) with 10,230.19 acres in Caroline County.
- **3-Year Contractual Small Grain Cover Crop for Nutrient Management and Residue Management** (SL-8C) with 2,248.12 acres in Caroline County.
- **Continuous No-Tillage** (SL-15A) with 729.14 acres in Caroline County.

FY2006: 4,315.12 acres

- **Nutrient Management Planning** (WP-4D) with 2,590.77 acres in Caroline County.
- **Small Grain Cover Crop for Nutrient Management and Residue Management** (SL-8B) with 1,734.15 acres in Caroline County.
- **Critical Area Stabilizations** (SL-11) .2 acres, gullies stabilized in Caroline County as a result of damage from Hurricane Gaston.

TMDL 2009 existing BMP Data summary = **61,615** acres of Crop, Hay & Pasture BMPs and **51,778.87** linear feet of pasture fencing.

Review of 2017 & 2025 BMP Scenarios and Preferred Local Scenarios

See Regional Scenarios section.

Proposed Strategies

See Regional Strategies section.

Resource Needs

See Regional and Local Resource Needs section

APPENDIX A: GWRC Endorsement of Regional WIP Strategies Submittal

George Washington Regional Commission
406 Princess Anne Street
Fredericksburg, Virginia 22401
(540) 373-2890
Fax (540) 899-4808
www.gwregion.org

Tim Ware
Executive Director

RESOLUTION NO. 12-16

ENDORSING THE COMMISSION'S SUBMITTAL OF REGIONAL STRATEGIES, IDENTIFIED RESOURCE NEEDS AND TECHNICAL COMMENTS FOR 2012 VIRGINIA CHESAPEAKE BAY TMDL IMPLEMENTATION PROGRAM

WHEREAS, the George Washington Regional Commission ("the Commission") is the Planning District Commission serving the City of Fredericksburg and Caroline, King George, Spotsylvania and Stafford counties, known together as Planning District 16, and;

WHEREAS, the Commission received a presentation by Deputy Secretary of Natural Resources Anthony Moore on May 16, 2011 on the Commonwealth's Chesapeake Bay Watershed Implementation Planning (WIP) process and the Deputy Secretary urged the Commission to assist the Commonwealth in compiling and synthesizing local government responses to the Virginia Department of Conservation and Recreation (VDCR), and;

WHEREAS, WHEREAS, on December 1, 2011, the VDCR awarded the Middle Peninsula Planning District Commission the amount of $206,800.00, of which $11,500 (based on full participation of all five member localities of the Commission and delivery by the Commission of required deliverables) is to be paid to the Commission through a sub-grantee agreement between the Commission and the MPPDC to reimburse the Commission for staff effort working with and assisting local governments' response to the WIP process; and;

WHEREAS, the Commission staff has been working with local government staff and other stakeholder interests in assisting with the preparation of local and regional responses to the information requested by VDCR to develop the Virginia Watershed Implementation Plan – Phase II and said sub-grant funding will help compensate the Commission for the value of staff effort, and:

WHEREAS, VDCR, by letter dated August 12, 2011, issued a revised request to Planning District Commissions, Soil and Water Conservation Districts and units of local government for Chesapeake Bay Watershed Implementation Plan (Phase 2) assistance, specifying five specific deliverables (i.e. namely: 1) update BMP inventory, 2) evaluate the land use/land cover information in the EPA model, 3) review the 2017 and 2025 BMP scenarios and develop local BMP scenarios, 4) develop strategies to implement the local BMP scenarios and 5) identify resource needs to support implementation of BMP and strategy scenarios) as input to the refinement of Virginia's Phase 2 Chesapeake Bay Watershed Implementation Plan, requesting local and regional responses no later than February 1, 2012, and;

WHEREAS, on December 22, 2011 the Commission's Regional WIP/TMDL technical committee, comprised of local government stormwater management and environmental planning staff and soil and water conservation district personnel, met with James Davis-Martin, Chesapeake Bay TMDL Phase II Project Manager for the Virginia Department of Conservation and Recreation (VDCR) and Mr. Davis-Martin explained that VDCR intends to merge local and regional responses to VDCR's request for local and regional WIP-2 input into the State Plan, removing the source identification of the local and/or regional entities that submitted any TMDL strategy recommendations, and

WHEREAS, at the same WIP/TMDL technical committee meeting, Mr. Davis-Martin expressed a prioritization for the five requested deliverables, emphasizing local and regional existing and proposed TMDL response strategies as the highest priority response to enhance the State's draft WIP-2 submittal to the US Environmental Protection Agency, which document was submitted on December 15, 2011 to meet the required federal submittal deadline, and;

WHEREAS, the Commission's Regional TMDL technical committee identified the difficulty for localities to generate a set of TMDL program strategies for consideration and approval by the respective local governing bodies before the State's February 1, 2012 submittal deadline and agreed to accept the free consulting assistance offered by Conservation Concepts L.L.C. (an environmental planning consulting firm engaged by the Virginia Conservation Network to support local TMDL responses), to develop regional strategies and resource needs for PD 16 to recommend to the Commission for its consideration on January 23, 2012, and;

WHEREAS, the Commission's Regional TMDL technical committee believes the identified strategies and resource needs presented, given the extremely limited response time to develop and analyze many options, to be the most practical and reasonable strategies and support requests that can be developed and recommended by the Commission for inclusion by VDCR in revisions to the Virginia Chesapeake Bay Watershed Implementation Plan- Phase 2 with the understanding that these recommendations from the Commission are non-binding on local governments and will be considered and merged by VDCR with other recommendations received from throughout the Commonwealth.

NOW, THEREFORE, BE IT RESOLVED by the George Washington Regional Commission that it hereby accepts the recommendations of the Regional WIP/TMDL technical committee as presented in the report given to the Commission on January 23, 2012 which is hereby incorporated by reference in this Resolution, and;

BE IT FURTHER RESOLVED, that the Commission authorizes the Commission's Executive Director to forward a copy of this Resolution and said recommendations to the member localities of Planning District 16 and VDCR to fulfill the Commission's obligations to VDCR by virtue of the Commission's December 19, 2011 approval of the Memorandum of Understanding with MPPDC to participate in the multi-regional response to VDCR's TMDL Implementation Program in return for funding support provided by VDCR for the Commission's participation in the WIP-2 planning process.

Adopted by the George Washington Regional Commission at its duly called meeting of January 23, 2012, in the City of Fredericksburg, Virginia, a quorum being present.

Joseph W. Grzeika, Secretary

January 23, 2012

APPENDIX B: GWRC Land Cover Estimation Methodology

City of Fredericksburg

Land cover data for the City was based on 2008 1-meter pixel resolution National Agricultural Imagery Program (NAIP) data classified by the Virginia Department of Forestry. One meter imagery has been demonstrated by GWRC in CZM-supported research to be much more accurate than the 30-meter resolution imagery used in the Chesapeake Bay land use model. The analysis of the City of Fredericksburg's urban tree canopy (UTC) was carried out by the Virginia Department of Forestry. Assistance was provided by the Virginia Geospatial Extension Program (VGEP) at Virginia Tech's Department of Forestry and by the Spatial Analysis Laboratory (SAL) of the University of Vermont. The goal of the project was to apply the USDA Forest Service's UTC assessment protocols to the City of Fredericksburg. Using high-resolution (1 meter) National Agriculture Imagery Program (NAIP) imagery acquired in the summer of 2008 in combination with remote sensing techniques, land cover data for the city was generated. An accuracy assessment was conducted. Single trees (tree canopies larger than 16 square meters) were detected with a 93% accuracy.

Caroline Co., King George Co., Spotsylvania Co., Stafford Co.

Land cover for the other counties was estimated based on the use of the i-Tree tree canopy on-line estimator[6] which allows the user to define the land cover classification and use recent Google Earth color photographic imagery to classify random points within defined study areas. This tool is designed to allow users to easily and accurately estimate the percentage distribution of tree and other cover classes (e.g. grass, buildings, roads, etc.) within the Chesapeake Bay model river segment watersheds.

This tool randomly lays points (number determined by the user) onto Google Earth imagery and the user then classifies what cover class each point falls upon. The user can define any cover classes that they like and the program will show estimation results throughout the interpretation process. Point data and results can be exported for use in other programs if desired. For purposes of this project, the land cover classes used in the VAST tool were applied to classify land cover for each riversegment sub-watershed.

The estimated acreage of each class in each sub-watershed study area was based on multiplying the class share of the total by the total acreage of the study area. Additional accuracy of the estimate was based on aggregations of local, State and federal military GIS data describing building square footages and other impervious area (e.g. public or military road rights of way, landing strips, paved recreation surfaces, etc). This aggregate area was recorded for each river segment watershed, and the allocation of other land uses based on an adjusted percentage distribution after directly accounting for impervious areas. The distribution was further adjusted by accounting for surface water area available in Water Area layer provided in the Census Bureau's TIGER line files[7]. The resulting allocation of other land cover classes would use the net land area of the study area after deducting land area accounted for by impervious surface layer and water area acreage.

<u>There are three steps to this analysis:</u>

1) Import a file that delimits the boundary of your area of analysis (e.g., city boundary). For purposes of this project, the river segment sub-watershed polygons were used as sub-locality study areas.

2) Name the cover classes you want to classify (e.g., tree, grass, building). Tree and Non-Tree are the default classes given, but can be easily changed. For purposes of this project, the land cover classes used in the VAST tool were applied to classify land cover for each riversegment sub-watershed.

3) Start classifying each point: points will be located randomly within your boundary file. For each point, the user selects from a dropdown list the class from step 2 that the point falls upon. *The more points that are interpreted, the more accurate the estimate.* The following table summarizes the total number of data points collected in each jurisdiction to develop land cover estimates at the subwatershed level.

[6] Found at: http://www.itreetools.org/canopy/index.php
[7] Source: http://www.census.gov/geo/www/tiger/tgrshp2011/tgrshp2011.html

Jurisdiction	Number of River Segment Subwatersheds	Minimum & Maximum Points per Subwatershed	Total Data Points for Locality
Caroline Co	10	25 – 750	4,075
King George Co	14	100 - 400	2,750
Spotsylvania Co*	7	150 - 1000	3,750
Stafford Co	12	50 - 1000	3,500

*Not completed at the time of report submittal

The percentage distribution results of each sub-watershed land cover classification was entered into a spreadsheet to calculate the estimate of acreage of each land cover in the sub-watershed. Once all sub-watersheds were processed, the sum of estimates for all sub-watersheds was computed for comparison with the Chesapeake Bay TMDL land cover data (see example table below for Stafford County). This comparison is presented in this report under the review of the TMDL data for each locality.

	STAFFORD CO TOTAL*				
	VAST: Local	COUNTY TOTAL			
	TMDL Data	(Local Estimate, GWRC, 2011)			
subsource	2009 LU/LC (acres)	Pct of Area	Sq. Miles	ACRES	Difference (Acres)
Regulated Animal Operations	-	0.00%	0.00	0.00	-
Animal Operations	53	0.45%	1.24	794.21	(740.92)
Crop	2,841	3.04%	8.31	5,321.00	(2,479.86)
Hay	4,913	5.26%	14.38	9,200.81	(4,287.83)
Pasture	3,047	3.27%	8.92	5,706.87	(2,659.56)
Nurseries	6	0.11%	0.30	191.33	(185.37)
Atmospheric Deposition	1,734	1.18%	3.23	2,066.42	(332.27)
Unregulated Urban Impervious	3,756	0.00%	0.00	0.00	3,755.93
Unregulated Urban Pervious	12,055	0.00%	0.00	0.00	12,055.07
Regulated Urban Impervious	2,788	7.33%	20.02	12,810.44	(10,022.65)
Regulated Urban Pervious	13,335	12.48%	34.09	21,816.25	(8,481.45)
Construction	428	0.64%	1.74	1,116.67	(688.58)
Combined Sewer System	-	0.00%	0.00	0.00	-
Septic	-	0.00%	0.00	0.00	-
Surface Mine	954	0.07%	0.20	129.11	825.10
Unmanaged Grass	1,901	10.93%	29.86	19,110.24	(17,209.50)
Forest	126,207	65.08%	177.72	113,742.70	12,464.20
*Water***		*1.11%*	*3.03*	*1,937.83*	*(1,937.83)*
Land Area Sub-Total		*98.89%*	*270.06*	*172,837.09*	
Grand Total	**174,018**	**100.00%**	**273.085815**	**174,774.92*** **	**(756.57)**

*Land cover analysis for non-MS4 areas of County uncompleted by initial report submittal deadline.
**Water areas identified in 2011 TIGER line files include inland lakes and ponds.
***Total area based on 2011 TIGER line files.

Limitations

The accuracy of this methodology depends upon the ability of the user to correctly classify each point into its correct class and the extent of additional information to supplement the data collected through the imagery sampling process. Thus the classes that are chosen for analysis must be able to be interpreted from an aerial image. As the number of points increase, the precision of the estimate will increase as the standard error of the estimate will decrease. If too few points are classified, the standard error will be too high to have any real certainty of the estimate. Information on calculating standard errors can be found below.

Another limitation of this process is that the Google imagery may be difficult to interpret in all areas due to relatively poor image resolution (e.g., image pixel size), environmental factors, or poor image quality. GWRC found that in many areas of analysis the Google Earth imagery was supplied by the Virginia Aerial Base Mapping program with 2010 images.

Calculating Standard Error and Confidence Intervals from Photo-Interpreted Estimates of Tree Cover

In photo-interpretation, randomly selected points are laid over aerial imagery and an interpreter classifies each point into a cover class (e.g., tree, building, water). From this classification of points, a statistical estimate of the amount or percent cover in each cover class can be calculated along with an estimate of uncertainty of the estimate (standard error (SE)). To illustrate how this is done, let us assume 1,000 points have been interpreted and classified within a city as either "tree" or "non-tree" as a means to ascertain the tree cover within that city, and 330 points were classified as "tree".

To calculate the percent tree cover and SE, let:

N = total number of sampled points (i.e, 1,000)
n = total number of points classified as tree (i.e., 330), and
p = n/N (i.e., 330/1,000 = 0.33)
q = 1 – p (i.e., 1 - 0.33 = 0.67)
SE = √ (pq/N) (i.e., √ (0.33 x 0.67 / 1,000) = 0.0149)

Thus in this example, tree cover in this example is estimated at 33% with a SE of 1.5%. Based on the SE formula, SE is greatest when p=0.5 and least when p is very small or very large (Table 1).

Table 1. Estimate of SE (N = 1000) with varying p.

p	SE
0.01	0.0031
0.1	0.0095
0.3	0.0145
0.5	0.0158
0.7	0.0145
0.9	0.0095
0.99	0.0031

Confidence Interval

In the case above, a 95% confidence interval can be calculated. "Under simple random sampling, a 95% confidence interval procedure has the interpretation that for 95% of the possible samples of size *n*, the interval covers the true value of the population mean" (Thompson 2002). To calculate a 95% confidence interval (if N>=30) the SE x 1.96 (i.e., 0.0149 x 1.96 = 0.029) is added to and subtracted from the estimate (i.e., 0.33). The result is a 95% confidence interval between 30.1% and 35.9%.

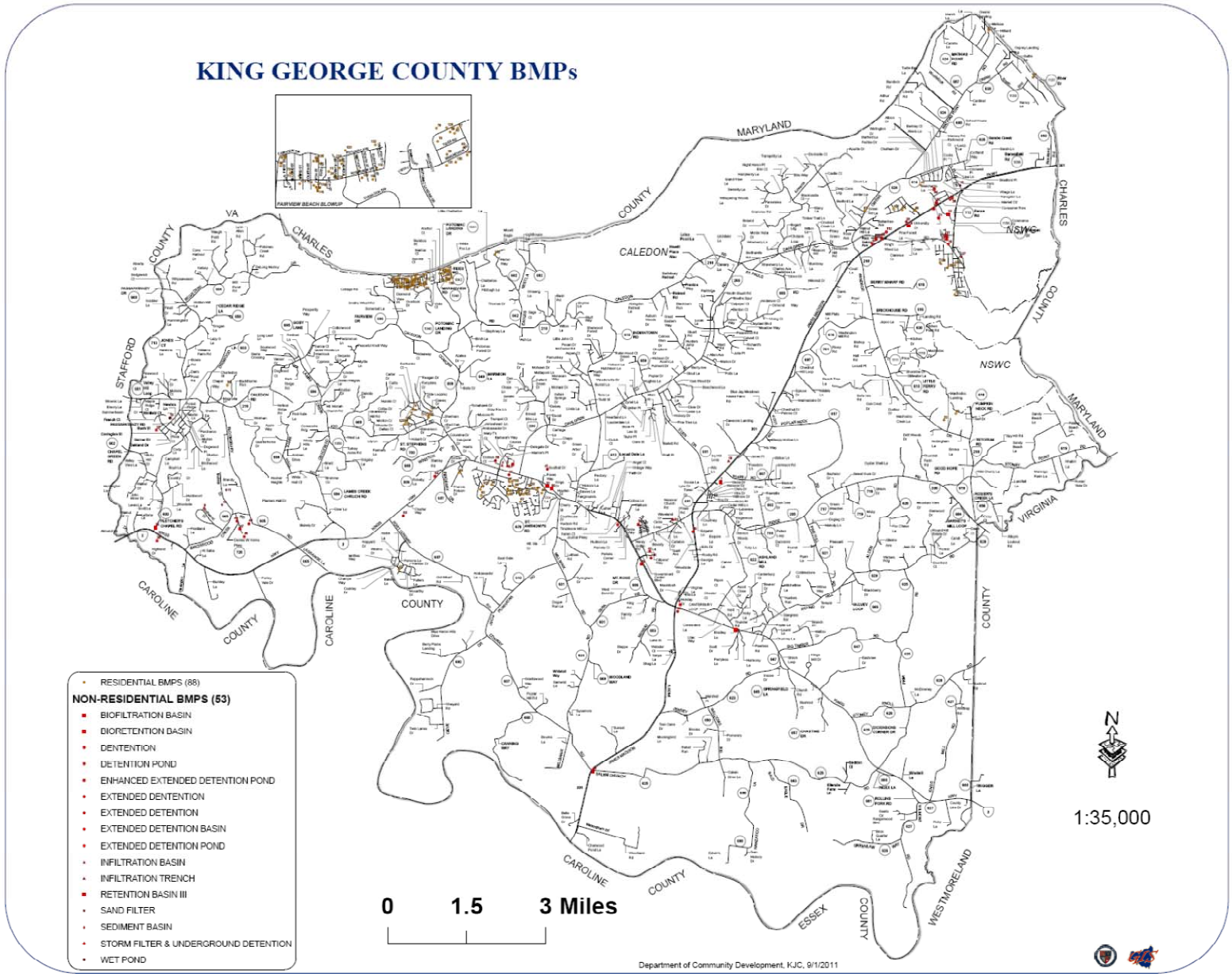
SE if n < 10

If the number of points classified in a category (n) is less than 10, a different SE formula (Poisson) should be used as the normal approximation cannot be relied upon with a small sample size (<10) (Hodges and Lehmann, 1964). In this case:

SE = (√n) / N

For example, if n = 5 and N = 1000, p = n/N (i.e., 5/1,000 = 0.005) and SE = √5 / 1000 = 0.0022. Thus the tree cover estimate would be 0.5% with a SE of 0.22%.

APPENDIX C: King George County BMPs



See King George County Urban BMP data file on enclosed CD.

APPENDIX D: City of Fredericksburg Urban BMP Inventory

See City of Fredericksburg Urban BMP data file
on enclosed CD under Appendix H.

APPENDIX E: Stafford Co Urban BMP Inventory

		VAST Data	Local Data
Septic	Septic Connections (systems)	-	-
	Septic Denitrification (systems)	-	-
	Septic Pumpouts (systems) (Annual)	1,973	1,897*
Construction	EandS (Acres) (Annual)	428	352**
Unregulated Urban	StreetSweep (Acres) (Annual)	-	-
	UrbanNutMan (Acres) (Annual)	35	35
	Impervious Urban Surface Reduction (Acres)	-	-
	UrbStrmRest (lin ft)	-	***1,845******
	ExtDryPonds (Acres Treated)	495	503
	DryPonds (Acres Treated)	1,022	1,817
	WetPondWetland (Acres Treated)	2,605	3,305
	Infiltration (Acres Treated)	7	199
	Filter (Acres Treated)	149	287
Regulated Urban	StreetSweep (Acres) (Annual)	-	-
	UrbanNutMan (Acres) (Annual)	38	38
	Impervious Urban Surface Reduction (Acres)	-	-
	ExtDryPonds (Acres Treated)	505	339
	DryPonds (Acres Treated)	1,042	2,587
	WetPondWetland (Acres Treated)	2,656	1,062
	Infiltration (Acres Treated)	7	213
	Filter (Acres Treated)	151	235
*** Average # of systems complying with pump-out requirements per year for five years **Acreage based on 5 year average land disturbance size for all issued grading permits for development projects**			
*****Amount of stream restoration linear feet that could be counted if wetland mitigation projects were allowed to count towards compliance ****Assumes that the boundary between "regulated" and "unregulated" urban areas is the urbanized area boundaries as defined by the 2000 U.S. Census**			
Combined Sewer System	StreetSweep (Acres) (Annual)	-	*
	UrbanNutMan (Acres) (Annual)	-	*
	EandS (Acres) (Annual)	-	*
	Impervious Urban Surface Reduction (Acres)	-	*
	ExtDryPonds (Acres Treated)	-	*
	DryPonds (Acres Treated)	-	*
	WetPondWetland (Acres Treated)	-	*
	Infiltration (Acres Treated)	-	*
	Filter (Acres Treated)	-	*

***Stafford County does not have any Combined Sewer System areas**

A Report on Fredericksburg's Existing and Possible Urban Tree Canopy

Project Background

The analysis of the City of Fredericksburg's urban tree canopy (UTC) was carried out by the Virginia Department of Forestry. Assistance was provided by the Virginia Geospatial Extension Program (VGEP) at Virginia Tech's Department of Forestry and by the Spatial Analysis Laboratory (SAL) of the University of Vermont.

The goal of the project was to apply the USDA Forest Service's UTC assessment protocols to the City of Fredericksburg. This analysis was conducted based on year 2008 data.

Why is Tree Canopy Important?

Urban tree canopy (UTC) is the layer of leaves, branches, and stems of trees that cover the ground when viewed from above. Urban tree canopy provides many benefits to communities including improving water quality, conserving energy, lowering city temperatures, reducing air pollution, enhancing property values, providing wildlife habitat, facilitating social and educational opportunities, and providing aesthetic benefits.

Key Terms

UTC: Urban tree canopy (UTC) is the layer of leaves, branches, and stems of trees that cover the ground when viewed from above.
Land Cover: Physical features on the earth mapped from satellite or aerial imagery such as trees, or water.
Existing UTC: The amount of UTC present within the city boundary..
Possible UTC: The amount of land that is theoretically available for the establishment of tree canopy within the city boundary. Possible UTC excludes areas covered by tree canopy, roads, buildings, and water. It is the combination of Possible UTC - Vegetation and Possible UTC - Impervious.
Possible UTC - Vegetation: The amount of land that is theoretically available for the establishment of tree canopy in non-tree vegetation areas within the city boundary. This excludes areas covered by tree canopy, impervious surfaces, and water.
Possible UTC - Impervious: The amount of land that is theoretically available for the establishment of tree canopy in impervious areas. This excludes areas covered by tree canopy, non-tree vegetation, roads, buildings, and water.

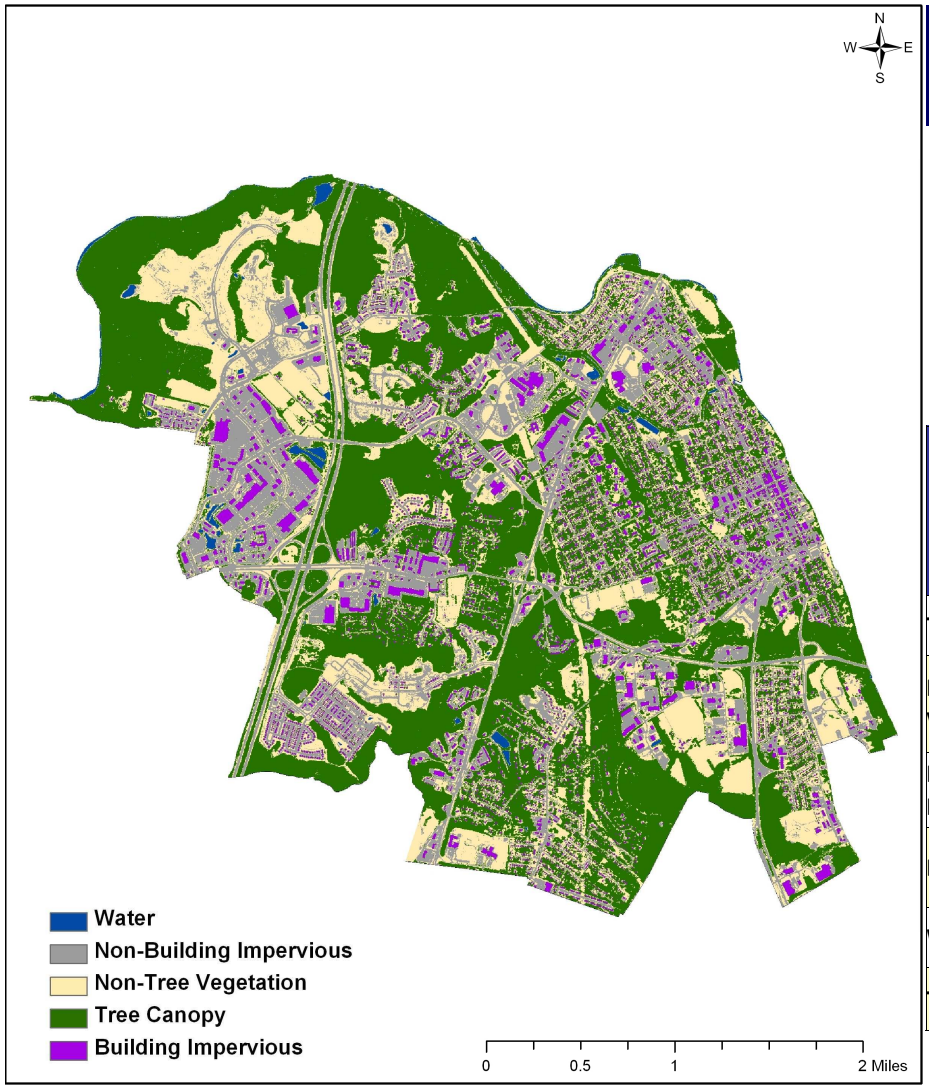


Figure 1: Land cover for the City of Fredericksburg.

How Much Tree Canopy Does Fredericksburg Have?

Figure 1 shows the urban tree canopy (UTC) analysis for Fredericksburg, which is derived from high resolution aerial imagery. 2979 acres of Fredericksburg is covered by tree canopy (termed Existing UTC). This corresponds to 44.4% of all land area within the city (Table 1). An additional 1603 acres of the city could theoretically be improved to support urban tree canopy (termed Possible UTC), Table 2.

UTC Classes	Existing UTC		
	Acres	% Total Area	% Land Area
Tree Canopy	2979	44.0%	44.4%
Non-Tree Vegetation	1609	23.8%	24.0%
Non-Building Impervious	1658	24.5%	24.7%
Buildings	463	6.8%	6.9%
Water	55	0.8%	0.0%
Total Area	6764	100.0%	100.0%

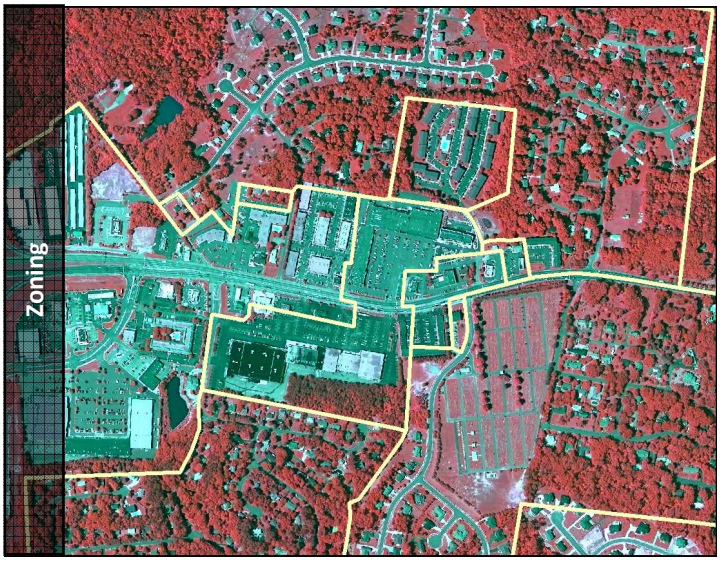
*Table 1: Existing UTC area and percentages for the City * % Total Area includes area covered by water.*

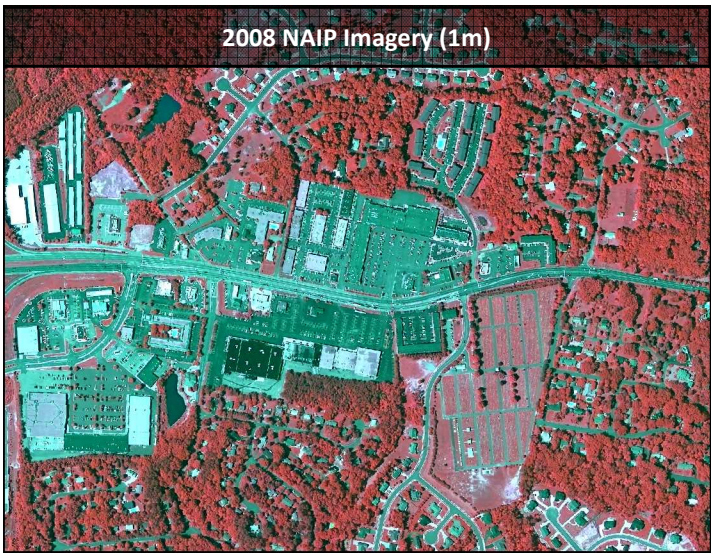
Mapping Fredericksburg's Trees

Using high-resolution (1 meter) National Agriculture Imagery Program (NAIP) imagery acquired in the summer of 2008 (Figure 2a) in combination with remote sensing techniques, land cover data for the city was generated (Figure 2b). An accuracy assessment was conducted. Single trees (tree canopies larger than 16 square meters) were detected with a 93% accuracy.

Who "Owns" Fredericksburg's Trees?

The detailed land cover mapping conducted as part of this assessment allowed the percentage of Existing and Possible UTC to be calculated for each category of land (Figure 3). Using this data, ownership patterns for Existing UTC and Possible UTC (Figure 4) can be examined.





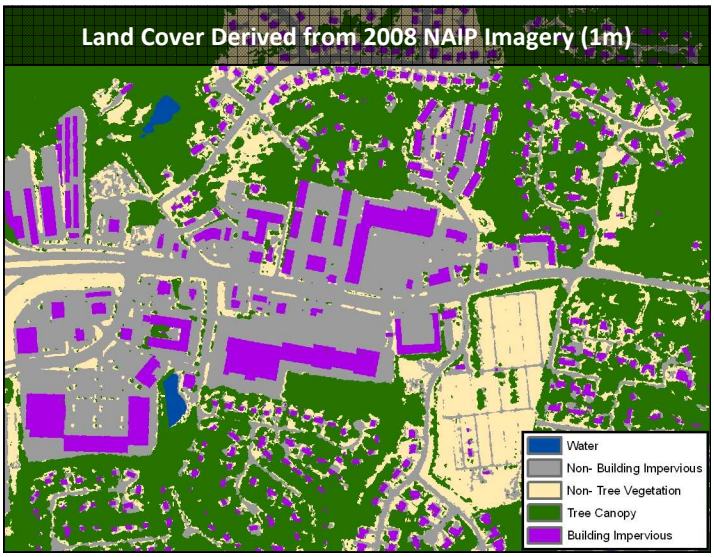
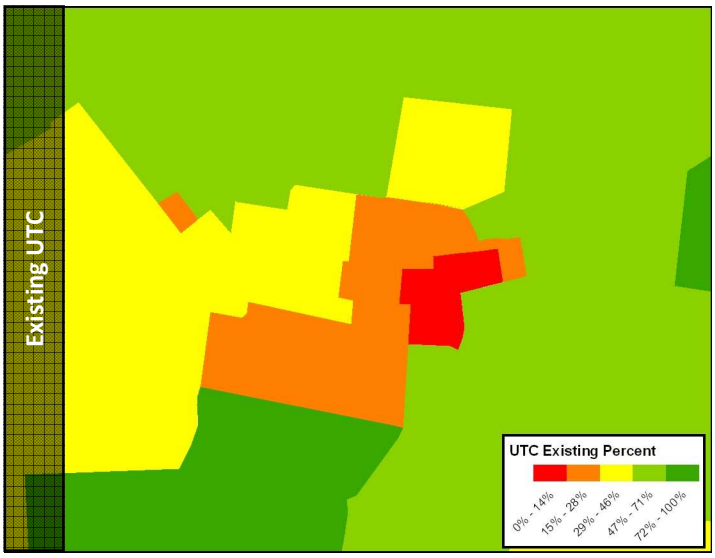


Figure 2a, 2b: Comparison of 2008 NAIP imagery to the resulting high-resolution land cover.



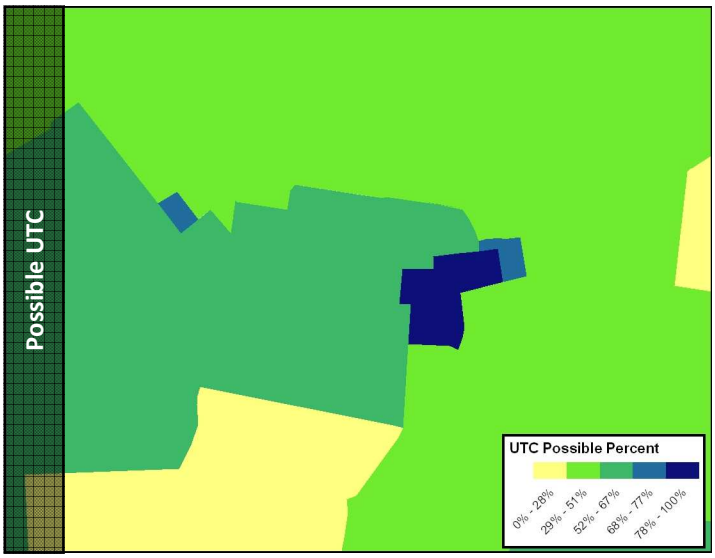
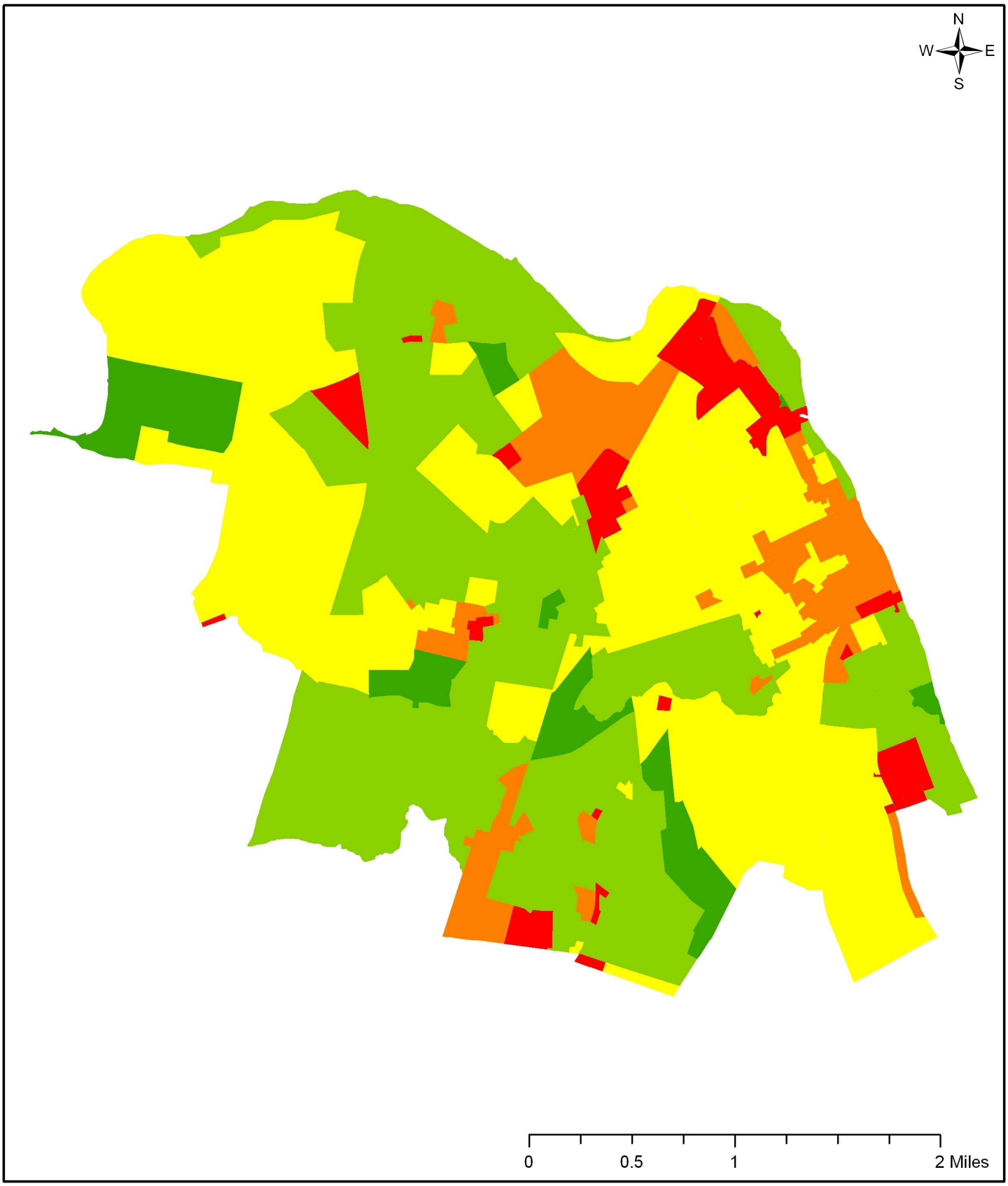


Figure 3: UTC metrics summarized at the property parcel level

Urban Tree Canopy Analysis Summarized by Zoning - Fredericksburg, VA



UTC Existing Percent

- 0% - 14%
- 15% - 28%
- 29% - 46%
- 47% - 71%
- 72% - 100%

Virginia Cooperative Extension

Figure 4: UTC metrics summarized by Zoning Category.

Urban Tree Canopy Summarized by Zoning

Using data provided by the City of Fredericksburg, Existing and Possible UTC were summarized by zoning category. This summary excludes any area outside of zoning boundaries and areas covered by water. Based on this analysis Fredericksburg has 44.3% (2953 acres) Existing UTC and 24.0% (1603 acres) Possible UTC (Figure 5). Possible UTC has two components, Possible UTC - Vegetation and Possible UTC - Impervious. 24.0% (1603 acres) of zoning land area is associated with Possible UTC - Vegetation. Possible UTC - Impervious figures are not available due to the lack of Right-of-Way data. Figure 4 shows Existing UTC throughout the City of Fredericksburg.

Using the zoning data provided by the City of Fredericksburg, Existing and Possible UTC were summarized by zoning category (page 5). The zoning category R4 has the largest amount of land area with 1338 acres (Table 3). Zoning Category R1 contains the most existing UTC (24.3%) followed by R4 and R2 with 21.4% and 15.1% Existing UTC respectively. Figure 6 compares zoning categories by the amount of land area within each category. Figure 7 shows the spatial distribution of Possible UTC by zoning category for the City.

UTC Zoning Metrics	Acres	% Zoning Land Area
Parcel Land Area	6671	100.00%
Existing UTC	2953	44.3%
Possible UTC - Vegetation	1603	24.0%
Not Suitable for UTC	443	6.6%

*Table 2: Acres and percent land area from UTC metrics summarized by zoning category. *Not Suitable for UTC includes all water areas some of which may lay outside of zoning boundaries.*

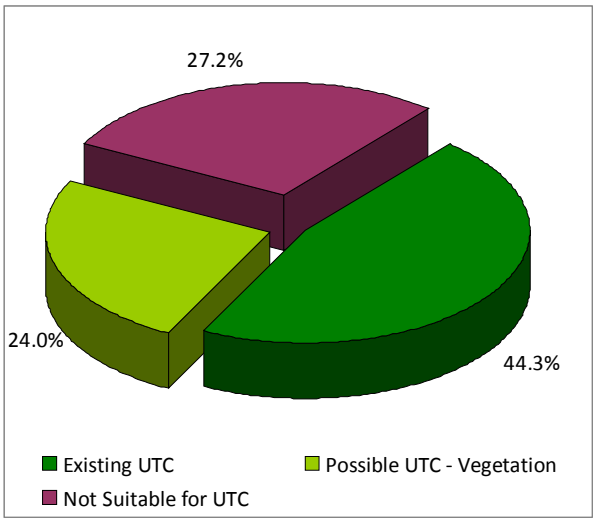


Figure 5: Pie chart showing Fredericksburg UTC distribution.

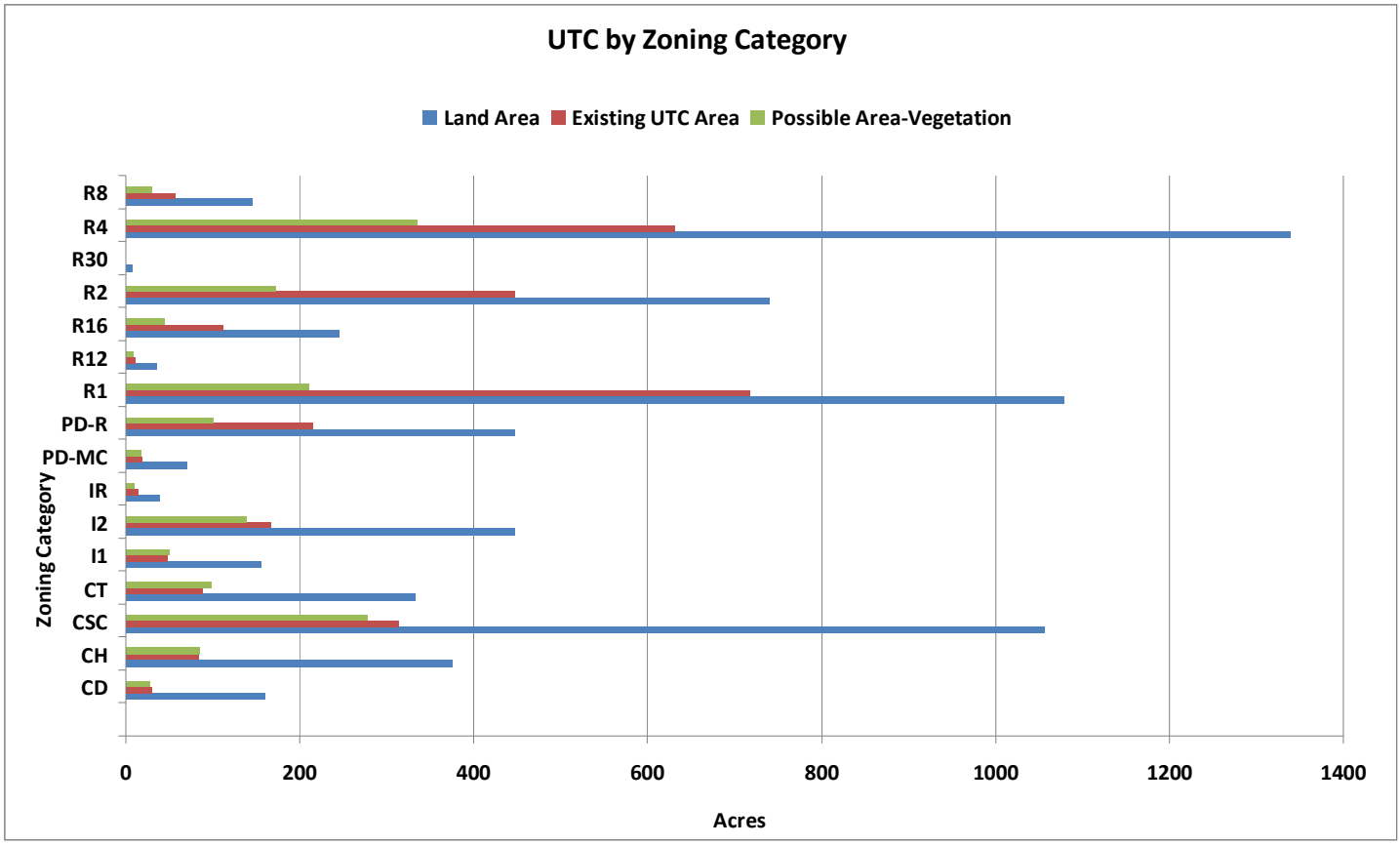


Figure 6: UTC metrics for zoning categories (not including water).

Urban Tree Canopy Summarized by Zoning Category

Zoning Category	Land Area (Acres)	Existing UTC			Possible UTC Vegetation		
		% Land Area	% Zoning Category	% UTC Type	% Land Area	% Zoning Category	% UTC Type
CD	159	0.5%	18.9%	1.0%	0.4%	17.1%	1.7%
CH	376	1.3%	22.3%	2.8%	1.3%	22.6%	5.3%
CSC	1057	4.7%	29.7%	10.6%	4.2%	26.3%	17.3%
CT	333	1.3%	26.3%	3.0%	1.5%	29.3%	6.1%
I1	156	0.7%	30.1%	1.6%	0.7%	31.7%	3.1%
I2	447	2.5%	37.4%	5.7%	2.1%	31.0%	8.7%
IR	38	0.2%	36.4%	0.5%	0.1%	24.1%	0.6%
PD-MC	70	0.3%	26.8%	0.6%	0.3%	24.8%	1.1%
PD-R	447	3.2%	47.9%	7.2%	1.5%	22.4%	6.2%
R1	1078	10.8%	66.7%	24.3%	3.2%	19.6%	13.2%
R12	35	0.2%	32.6%	0.4%	0.1%	20.6%	0.4%
R16	245	1.7%	45.6%	3.8%	0.7%	17.7%	2.7%
R2	741	6.7%	60.3%	15.1%	2.6%	23.3%	10.8%
R30	7	0.0%	22.8%	0.1%	0.0%	17.4%	0.1%
R4	1338	9.5%	47.1%	21.4%	5.0%	25.0%	20.9%
R8	145	0.8%	39.0%	1.9%	0.4%	20.5%	1.9%

$$\text{\% Land} = \frac{\text{Area of UTC type for specified land use}}{\text{Area of all land}}$$

The % Land Use value indicates that 0.8% of "R8" land is covered by tree canopy.

$$\text{\% Category} = \frac{\text{Area of UTC type for specified land use}}{\text{Area of all land for specified land use}}$$

The % Category value indicates that 39.0% of Fredericksburg's land area is tree canopy in areas where the land use is "R8".

$$\text{\% UTC Type} = \frac{\text{Area of UTC type for specified land use}}{\text{Area of all UTC type}}$$

The % UTC Type value of 1.9% indicates that 1.9% of all Existing UTC lies in areas of "R8" land use.

Table 3: UTC metrics by type, summarized by zoning categories. For each category UTC metrics were computed as a percent of all zoned land in the city (% Land Area), as a percent of land area by zoning categories (% Zoning Category) and as a percent of the area for the UTC type (% UTC Type).

Possible Urban Tree Canopy Summarized by Zoning - Fredericksburg, VA

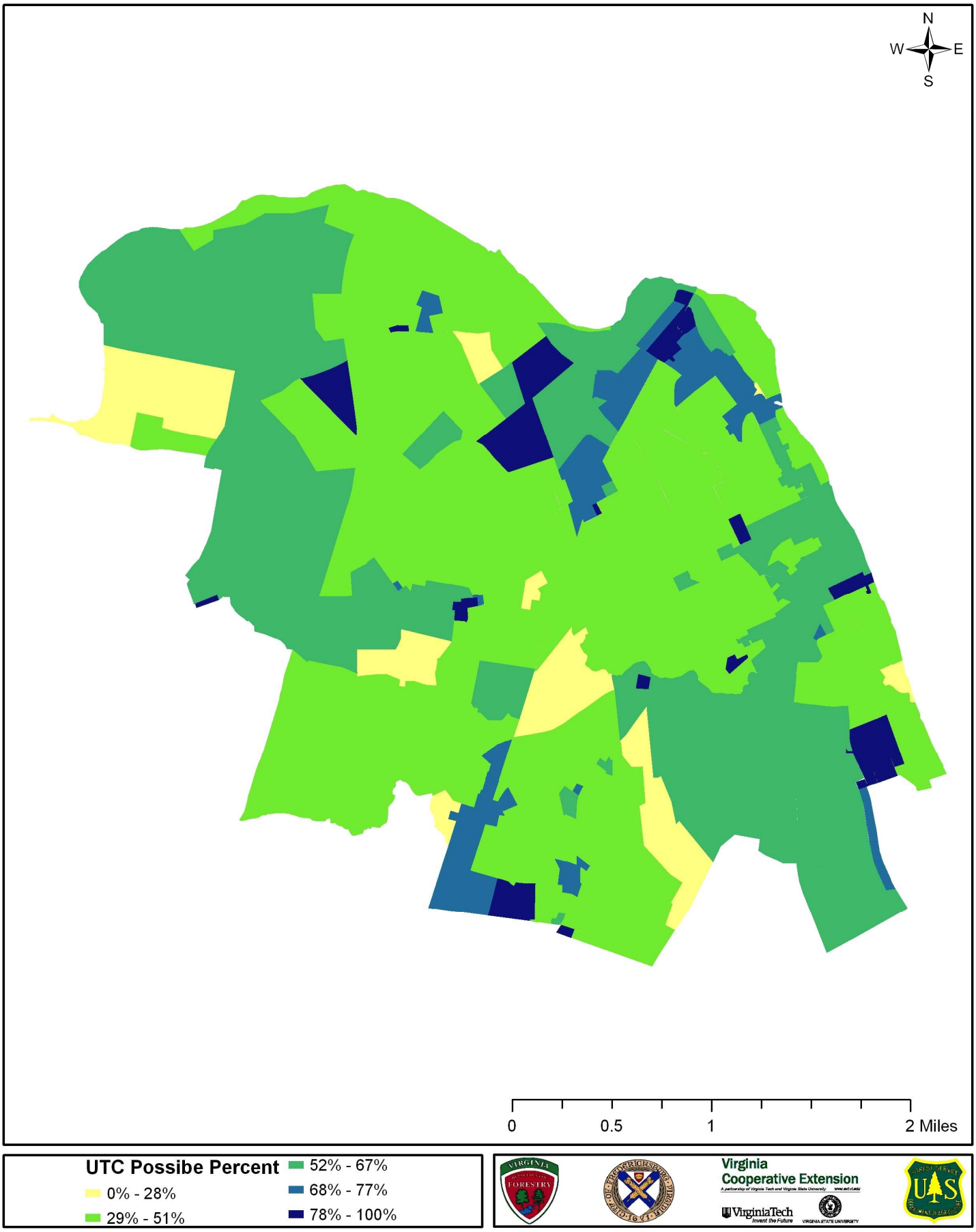


Figure 7: Possible percentage increase of UTC by zoning category .

Where to Plant Trees?

Decision makers can use GIS to find out specific UTC metrics for a parcel or set of parcels. This information can be used to estimate the amount of tree loss in a planned development or set UTC improvement goals for an individual property.

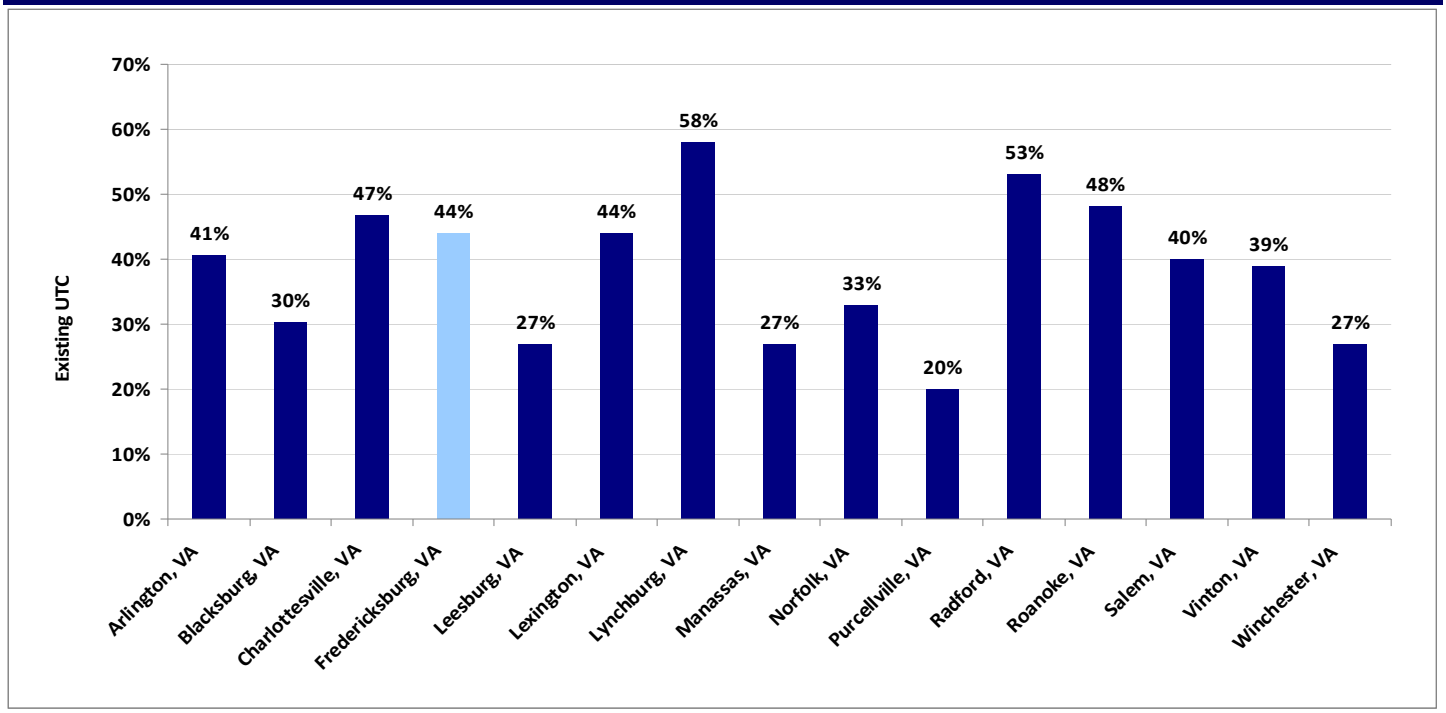
Attribute	Value
Land Use	Exempt Commercial
Owner	St Peter & Paul Catholic Church
Address	320 Cathedral Street
Existing UTC	5%
Possible UTC	72%
Possible UTC—Vegetation	47%
Possible UTC—Impervious	25%

Figure 8: Parcel-based UTC metrics can be used to support targeted UTC.

Conclusions

- Fredericksburg's urban tree canopy is a vital community asset, reducing storm water runoff, improving air quality, reducing the city's carbon footprint, enhancing quality of life, contributing to savings on energy bills, and serving as habitat for wildlife.
- With 44% tree canopy cover, Fredericksburg has similar coverage to Lexington and slightly less than Charlottesville. Figure 9 shows how Fredericksburg compares to other Virginia localities participating in Urban Tree Canopy Assessments.
- The Zoning Categories with the highest percentage of Possible UTC are R4 and CSC with 20.9% and 17.3% respectively.

Urban Tree Canopy Comparison



Prepared by:

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Suite 800
Charlottesville, VA 22903
(434) 220-9062
jim.pugh@dof.virginia.gov

Additional Information

The study was conducted with funding from the Virginia Department of Forestry. More information on the UTC assessment project can be found at the following web sites:
http://www.cnr.vt.edu/gep/VA_UTC.html
http://nrs.fs.fed.us/urban/utc/

APPENDIX H: Data CD with Local Government Urban BMP Inventories

GEORGE WASHINGTON
REGIONAL COMMISSION

2012

GWRC Application for DCR Local Stormwater Program Development Grant

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NOAA
U.S. DEPARTMENT OF COMMERCE

Virginia Coastal Zone
MANAGEMENT PROGRAM

Kevin Byrnes
George Washington Regional Commission
9/10/2012

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This project was funded, in part, by the Virginia Coastal Zone Management Program at the Virginia Department of Environmental Quality through Grant # NA11NOS4190122 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended.

I. Applicant Information

1. Name of Organization: **George Washington Regional Commission**
2. Mailing Address: **406 Princess Anne St, Fredericksburg VA 22401**
3. Federal ID **# 54-0715969**
4. DUNS # (Duns & Bradstreet): **112966858**
5. Contact Person: **Tim Ware**
6. Title: **Executive Director**
7. Phone Number: **540-373-2890**
8. Email: **ware@gwregion.org**
9. Fax Number: **540-899-4808**
10. Type of Organization (PDC, SWCD, Local Government): **PDC (#16)**

II. Project Information Summary

1. Name of Project: **GW Regional Stormwater Development Program**
2. Project Start Date: **Dec. 1, 2012**
3. Project End Date (NLT 06/30/14): **June 30, 2014**
4. Amount of Funding Requested: **$99,785**
5. Describe any other applicable funding that has/is being used toward work related to this project: **$118,373**

   - GWRC foregone indirect costs: **$11,835**.
   - GWRC: DEQ – CZM Technical Assistance Grant: **$30,000** (NOAA).
   - Friends of the Rappahannock: NFWF Grant to Conservation Concepts, L.L.C.: **$15,000**
   - Eldon James & Associates: legislative liaison program and RRBC funding support from local governments of the "Middle Basin": **$4,000.**
   - Foregone consulting fees by project consultants: **$7,165**
   - Local government technical staff in-kind participation, working with project partners and GWRC: **$50,414**
   - Local government donated training venues for in-house and public outreach meetings to reach community stakeholders.

III. Programmatic Project Information

1. Does your jurisdiction lie within the boundaries of the Chesapeake Bay drainage? **Yes**/No

a) Does your jurisdiction currently have an established stormwater program? **Yes & No**

- Yes: MS-4: City of Fredericksburg, Spotsylvania County, Stafford County
- No: Non-MS4: Towns of Port Royal & Bowling Green, Caroline County, King George Co.

b) If yes, are you requesting funds to enhance your program? **Yes**/No

- MS-4: City of Fredericksburg, Spotsylvania County, Stafford Co

c) If no, are you requesting funds to establish a stormwater program? **Yes**/No

- Non-MS4: Towns of Port Royal & Bowling Green, Caroline County King George County

2. Is your jurisdiction currently an MS4 (phase I or **Phase 2**)? **Yes & No**
- Yes: Phase 2 MS4s: City of Fredericksburg, Spotsylvania County, Stafford County
- No: Non-MS4: Towns of Port Royal & Bowling Green, Caroline County King George County

3. Who is the contact person for the development of your local stormwater program?

- GWRC: Kevin F. Byrnes, Director of Regional Planning
  - City of Fredericksburg: Kevin Utt, Site Development Manager, Bldg & Development Services
  - Spotsylvania County: Richard Street, Senior Environmental Engineer, Chesapeake Bay Division
  - Stafford County: Steven Hubble, Director of Environmental Programs
  - Caroline County: David Nunnally, Senior Environmental Planner
    - Town of Bowling Green: Stephen Manster, Town Planner & Manager
    - Town of Port Royal: Alex Long, Chair, Town Planning Commission
  - King George County: Jack Green, Director of Community Development

IV. Project Partners and Participating Jurisdictions

A. Project Partners

See GWRC and partner accomplishments under Appendix B and resumes of GWRC project manager and partner principals under Appendix C.

1. GWRC (Project Management, Fiscal Agent, Local legislative and administrative communications, technical planning assistance in ordinance reviews and amendments)

2. Eldon James & Associates, Inc. (Policy, Communication, Outreach),

3. AquaLaw PLC (Model Ordinance Development & Review, Response to Local Government Legal Review Comments),

4. Conservation Concepts, LLC - (Technical Aspects of Stormwater Engineering, Design, Ordinance Review, Ordinance Development, Training, and Education)

5. Friends of the Rappahannock - (Communication, Outreach)

B. Participating Jurisdictions

1. Caroline County

a. Name of Organization: Caroline County
b. Role: Participating Jurisdiction
c. Contact Person:
David S. Nunnally
Senior Environmental Planner
Caroline County Planning & Community Development
P.O Box 424
Bowling Green, VA 22427
Office: (804) 633-4303 Fax: (804) 633-1766
E-Mail: dnunnally@co.caroline.va.us
d. Funding Allocation, if provided: $0.00

2. **Town of Bowling Green**
   a. Name of Organization: Town of Bowling Green
   b. Role: Participating Jurisdiction
   c. Contact Person:
      Stephen Manster, Town Manager & Town Planner
      Town of Bowling Green
      117 Butler St (PO Box 468)
      Bowling Green, VA 22546
      Ph (804) 633-6212 E-Mail: townmanager@townofbowlinggreen.com
   d. Funding Allocation, if provided: $0.00

3. **Town of Port Royal:**
   a. Name of Organization: Town of Port Royal
   b. Role: Participating Jurisdiction
   c. Contact Person:
      Alex Long, AICP
      Chairman, Town Planning Commission
      Town of Port Royal
      419 King St
      PO Box 29
      Port Royal, VA 22535
      Ph (804) 742-5331 E-Mail: along@infionline.net
   d. Funding Allocation, if provided: $0.00

3. **King George County**
   a. Name of Organization: King George County
   b. Role: Participating Jurisdiction
   c. Contact Person:
      Jack Green, AICP
      Director of Community Development
      10459 Courthouse Drive, Suite 104
      King George, Virginia 22485
      Ph. (540) 775 - 8556 E-mail: jgreen@co.kinggeorge.state.va.us
   d. Funding Allocation, if provided: $0.00

4. **City of Fredericksburg:**
   a. Name of Organization: City of Fredericksburg
   b. Role: Participating Jurisdiction
   c. Contact Person:
      Kevin Utt, Site Development Manager
      Bldg & Development Services
      Dept of Public Works
      City of Fredericksburg
      715 Princess Anne Street
      Fredericksburg, VA 22404-7447
      Ph 540.372.1080 E-Mail: kwutt@fredericksburgva.gov
   d. Funding Allocation, if provided: $0.00

5. **Spotsylvania County**
   a. Name of Organization: Spotsylvania County
   b. Role: Participating Jurisdiction
   c. Contact Person:
      Richard A. Street
      Sr. Environmental Engineer
      Zoning Department, Chesapeake Bay Division
      Spotsylvania County
      9019 Old Battlefield Blvd Suite 300
      Spotsylvania VA. 22553

Ph (540) 507-7426 E-mail: rstreet@spotsylvania.va.us

d. Funding Allocation, if provided: $0.00

6. Stafford County

a. Name of Organization: Stafford County
b. Role: Participating Jurisdiction
c. Contact Person:
Steven Hubble, Assistant Director
Department of Public Works
County of Stafford
P.O. Box 339
Stafford, VA 22555
Ph. 540-658-4559 E-Mail: shubble@co.stafford.va.us
d. Funding Allocation, if provided: $0.00

V. Work Plan/Proposal Narrative

Describe the scope and methodology of the planned work.

A. Targets and Priority Goals: (30 pts)

1. Does the proposal address any of the Funding Targets listed on Page 1 of the RFP?

Yes. GWRC is applying on behalf and at the request of the 7 participating jurisdictions and has organized a consulting team well-versed in the State's expectations for local stormwater program development and successful implementation. GWRC will provide a coordinating framework for the consultant team and local jurisdictions' technical staff representatives to engage in the review of the State's draft model unified stormwater ordinance to develop **a regional stormwater model ordinance** (with particular consideration to Stafford County's existing stormwater and related ordinances), with optional program elements identified so that participating localities can select those optional program elements that suit their urban or rural (i.e. the rural, non-MS4 communities (Caroline and King George Counties and the Towns of Bowling Green and Port Royal) and the urban MS4 communities (City of Fredericksburg, Spotsylvania and Stafford Counties)) setting, as well as local physiographic and hydrological conditions. Moreover, GWRC anticipates developing a **stormwater program staffing requirements profile and cost calculator** which will assist localities in developing better estimates of the cost of program implementation, as well as provide a means to explore cost efficiencies which may be achieved through some combination of regionalization, privatization and incentivization (e.g. market- or performance-based) models to program implementation. These tools will enable the participating localities and the region to develop a **staffing plan** to support program implementation.

With the development of the model regional/local stormwater program, ordinance and staffing plan; participating localities will be provided **a catalog of available funding options** to support final design and implementation of individual locality programs by July 2014, and offered assistance in exploring and determining an optimal mix of local and/or regional funding mechanisms necessary to support program implementation, resulting in **recommended program funding plan.**

To ensure effective program design and implementation, the local governments have asked for **technical training assistance** in understanding the State stormwater regulations and how they affect the existing development review and approval process. Moreover, the participating localities see great value in developing and offering a **regional outreach and communication program** to inform stakeholders (environmental and development interests, landowners, engineers, site

planners, landscape architects, etc.) of the changing site plan development requirements resulting from the local implementation of the State stormwater regulations.

2. *Is the proposed work in line with meeting specific eligible activities, tasks or goals for any of the target areas?*

Yes. Building on the standing working relationships between the partner organizations, local governments and both the GWRC and the Rappahannock River Basin Commission (RRBC), GWRC anticipates that this process will help participating local governments refine and apply innovative market-based solutions to manage stormwater, improve water quality and support local stormwater management objectives. Moreover, GWRC anticipates that this regional process may help define cost-effective intergovernmental approaches to implement local stormwater programs, reflecting DCR's integration of its multiple stormwater regulatory programs, in a manner supportive of local government compliance with Chesapeake Bay and impaired stream TMDLs, enhanced local compliance with Chesapeake Bay Preservation Act and MS4 program requirements.

B. Narrative: (10 pts)

1. *Does the project narrative provide enough detail to describe the project need, project steps, project staff and roles, and project results?*

Yes. Our proposal submission has been designed to address each of the RFP requirements with a well-organized presentation of the proposed regional project, the proposed participating jurisdictions, proposed staffing (and the roles of each partner) and expected project results. Participating localities have a clear understanding that the Code of Virginia requires local adoption of a local stormwater management program ordinance by June 30, 2014. We believe our proposal is designed to facilitate local governments' stormwater program development in the most cost-effective and efficient manner resulting ultimately in the anticipated adoption of local ordinances that meet the State Code requirements. Without the assistance provided through the proposed grant, it will be particularly difficult for both the rural, non-MS4 as well as the MS4 localities to design and implement a compliant program given the staffing and budget cuts which have occurred over the last several years that severely constrain their individual capacity to meet the stormwater legislation and regulation mandates. Moreover, given the short timeline to complete this work and severely limited local staffing complement to undertake this work, the opportunities to explore and develop coordinated regional approaches are less likely to occur absent a regional framework to develop such cooperative approaches.

C. Project Objectives, Timeline and Milestones: (10 pts)

1. *Project list of objectives?*

a) To provide participating jurisdictions with a regional model ordinance which fulfills State requirements and reflects plans for intergovernmental collaboration within PD 16 in program development, training, public outreach and implementation.

b) To integrate innovative and cost-effective market-based, performance-oriented mechanisms into local stormwater requirements.

c) Develop a cooperative stormwater program in the region to reduce the aggregate cost of stormwater program implementation by local governments.

d) Increase public awareness of the efforts to improve water quality of local impaired streams and to help meet the Chesapeake Bay TMDL goals assigned to local governments.

e) Foster support from and cooperation of the development community by providing greater project design flexibility through the development of performance-based stormwater management and water quality standards.

2. *Does it provide the project's anticipated deliverables (ordinances, policies; procedures; funding & staffing plan) and outcomes (impacts, consequences, or results)?*

Anticipated Deliverables:

a) A model stormwater ordinance that incorporates both mandatory and elective program options appropriate for current MS4 as well as rural, non-MS4 communities so that each community can select the program elements best suited to their locality and, to the extent they desire to do so, compliment actions required in adjoining localities where consistent intergovernmental policy within a common watershed offers mutual advantage.

b) A conceptual local and regional staffing plan, based on local use of a staffing requirements profile and accompanying staffing cost calculator to reflect work effort impact of recent (2012) development activity and localized staffing costs to estimate the full cost of local program implementation and to provide a framework to explore cost-efficiencies and savings resulting from possible regionalization, privatization or market-based incentives to motivate voluntary actions by developers.

c) A conceptual local and regional funding plan that reflects legal and practical funding options available to local governments and a technical consensus of the reasonable mix of funding options to support program implementation.

d) Development of technical training modules for local government staff on stormwater regulations under the developed model regional stormwater program ordinance.

e) Development and execution of a major community outreach education forum to engage and inform stakeholders on the proposed regional model ordinance and how this ordinance will be amended by local governments to fit into local development code.

3. *Does it include a schedule for completion of the minimum requirements?*

Yes, see Timeline chart shown in Table 1 for a comprehensive schedule.

4. *How well does the timeline and milestones convey that the project will be completed successfully?*

We believe our detailed timeline set forth in Table 1 and coordinated regional planning process will ensure timely and successful completion of the project.

D. Project Design and Methodology: (10 pts)

1. *How well is the overall project designed to meet the goals and expectations identified in the RFP or for meeting the proposed non-point source program objectives including the specific plans or methodology to be used to achieve the project objectives?*

GWRC believes the proposed project fully meets the goals and expectations of the RFP by developing a regional program that engages local governments in a thoughtful and deliberate process and supports their efforts to apply a regional ordinance model to their local development

codes and assists them in defining a cost-effective staffing plan and funding schemes to ensure viable program implementation.

E. Cost Effectiveness: (10 pts)

1. *How cost- effective is the project in achieving measurable results?*

The GWRC proposal is designed to leverage the experience gained through prior and on-going regional and local stormwater management and environmental planning work done by participating Phase 2 MS4 local governments, GWRC and its partners (i.e. Conservation Concepts L.L.C., Friends of the Rappahannock, Eldon James & Associates, Inc., AquaLaw, P.L.C.). As a result, the proposed scope of work "dove-tails" with existing planning efforts and provides a coordinating framework to assemble all the pieces of environmental regulation into a coherent and straight-forward local ordinance to direct local compliance in a manner compatible with the many related programs (e.g. MS4, Chesapeake Bay Preservation Act regulations, soil erosion and sediment control regulations, Chesapeake Bay and impaired water TMDLs, etc.). GWRC recognizes the RFP's eligible activity restrictions (on page 3 of the RFP) and has carefully constructed a project scope of work that directs State funding into new eligible work effort and honors the prohibition against funding indirect costs.

2. *In evaluating the cost-effectiveness, consideration will be given to the availability of other funding for the project, the leveraging of public and private matching funds and the interaction of the proposed project in relation to other associated projects or programs.*

As noted above, the cost-effectiveness of the proposed grant can be evaluated in the context of the other funds leveraged to perform complimentary work, including (See Budget Detail in Section VII):

a. The value of GWRC's foregone indirect rate for grant-supported staff time: **$11,835**

b. The value of local governments' dedicated in-kind staffing to the project: Estimated value: **$50,414**

c. An additional anticipated allocation of a NFWF grant awarded to Friends of the Rappahannock to support development of land use ordinance provisions (zoning and/or subdivision ordinances) that eliminate impediments for the use of such runoff reduction techniques as impervious cover reduction and promote or require environmental site design and integration of the regional model ordinance (based on Stafford County's urban MS4 program) into Caroline County's development codes, reflecting Caroline County's current non-MS4 status and a Chesapeake Bay locality. Estimated value: **$15,000**

d. The foregone value of negotiated discount consulting rates from market pricing, the value of donated consulting time and mileage to travel to GWRC committee meetings on a pro-bono basis; to refine the proposed regional model ordinance, applying and integrating it with the local development codes; and the development of detailed staffing and funding plans to support program implementation. Estimated value: **$7,165**.

e. The value of additional consulting time provided by Eldon James and Associates supported by legislative liaison and public policy analysis support from RRBC and GWRC. Estimated value: **$4,000**

f. Related financial support from NOAA CZM funds awarded to GWRC in FFY 2012-2013 to support local government development of watershed implementation plans to promote

local compliance with Chesapeake Bay TMDL goals (along with the related $30,000 in-kind match of local government staff time and other matching resources). These funds would be spent supporting the local review and integration of the regional model ordinance into local ordinances in King George and Spotsylvania Counties, as well as the City of Fredericksburg and the Towns of Port Royal and Bowling Green (to the extent these Towns adopt local-specific ordinances rather than relying on the County program and ordinance).

Value: **$30,000**

g. **Total estimated leveraged value: $118,373**
(leveraged ratio: 1.18 : 1 for full grant award)

Moreover, by building on the momentum of previous LID-friendly green infrastructure planning efforts by GWRC, market-based solutions research and preliminary program design by the Rappahannock River Basin Commission and its technical advisory committee and the on-going program and public outreach efforts of the Friends of the Rappahannock, the GWRC team has the capacity to develop and complete the preliminary and final deliverables without delay.

F. Dissemination and Transferability of Results: (5 pts.)

1. *Does the project describe how the results will be (a) transferred to other parts of Virginia or (b) integrated into broader policies and programs to protect or restore the waters of Virginia?*

Yes, as to both.

a. Several of the deliverables would have direct relevance to other communities in Virginia, namely:
   i. A regional model ordinance that integrates DCR's draft unified model ordinance with an established Phase 2 MS4 community's existing stormwater and related ordinances in a fashion that allows other communities (both MS4 and non-MS4) to choose from a menu of elective program elements to tailor a program to local circumstances. This electronic document would be posted on GWRC's website for public access.

   ii. The proposed local stormwater program staffing requirements profile would provide a description of staff roles needed to implement a stormwater program. The proposed stormwater program staffing cost calculator would be applicable to other communities' analysis of staffing needs, local labor market cost (and pay scales) and development volume inputs and provide a basis for the consideration of various efficiency or cost-saving scenarios to design the most affordable, but compliant, stormwater staffing plan. This spreadsheet tool (with user instructions) would also be available through GWRC's website for use by any other communities interested in its application to their own program development.

   iii. The report on feasible and legal funding options to support program implementation would be another deliverable of value to other communities trying to decide how to achieve compliance with a financially-viable program. Moreover, the regional consensus funding plan recommended to GWRC's local governments would offer other communities an example of a practical mix of funding options that would be considered technically feasible and adequate to cover program costs.

b. GWRC's proposal reflects recognition of the importance of finding compatible and cost-effective program integration of several related local government programs (e.g. MS4, Chesapeake Bay Preservation Act regulations, soil erosion and sediment control regulations, Chesapeake Bay and impaired water TMDLs, etc.). It is the intent of the articipating local governments to achieve a streamlining of program requirements across this regulatory

spectrum in a fashion that is easier for the community of stakeholders to follow and more cost-effective for local governments to implement, thereby enhancing local compliance across the broader environmental program and policy spectrum.

2. *Does the proposal adequately describe how (a) results will be communicated or (b) what methods or techniques will be developed that can be used by others?*

   a. RE: Communication of Results: YES. Interim and final project results would be internally communicated among participating governments and community stakeholders through e-mail and postings on GWRC's public website, and periodic news releases (as deemed appropriate by the project management team). Moreover, training materials developed for local government technical staff as well as for the later proposed stakeholder public forum can be posted on the website for those in the GWRC community and beyond.

   b. RE: Methods or Techniques Useful to Others: Yes. See response above under Section F.1.a.i – iii.

G. Technical Expertise: (5 pts.)

1. *Does the proposal demonstrate that the project will engage appropriate technical expertise and assistance throughout planning, design and implementation to ensure projects are technically sound and feasible?*

   Yes. The project team is led by a regional planning career professional with considerable experience meeting both DCR's and other State grant management, program reporting and financial reporting requirements. Moreover, the assembled project partners draw upon all of the areas of specialized expertise (ranging from local government administration, legal counsel, project management and technical skills) required for this effort involving well-recognized professionals in their respective fields. See Partner Accomplishments in Appendix B and related resumes under Appendix C.

   - Policy, Communication, Outreach: Eldon James & Associates, Inc.
   - Communication, Outreach: Friends of the Rappahannock
   - Ordinance Development & Review, and Local Government Legal Comment Response: AquaLaw, PLC
   - Technical Aspects of Stormwater Engineering, Design, Ordinance Review, Ordinance Development, Training, and Education: Conservation Concepts, LLC

H. Partnerships: (5 pts.)

1. *Does the project include communication of stormwater management program elements with local partners, stakeholders and elected officials?*

   Yes. Undertaking this project under the umbrella of a regional planning agency provides, arguably, a greater level of stakeholder participation than if implemented by individual localities because intergovernmental, watershed-level questions may come up that call for neighboring community input and intergovernmental discussion that otherwise most likely would not be considered at the local level (e.g. between up-stream and down-stream impacts of proposed programs and policy). Also, sometimes local government staff capacity to entertain a restructuring of duties and taking on new responsibilities is constrained by existing workload and organizational structures that limit their ability to advocate alternative staffing schemes. Moreover, through GWRC's leadership of the project, the Commission can foster more

communication among stakeholders with one another, between localities and State and federal regulatory agencies and elevate the issue of how the region responds to the State mandate as a topic of regional interest to local news media (e.g. through news and Op Ed coverage in regional newspaper such as the Fredericksburg Free Lance Star).

I. Experience and Past Grant Work of Applicant: (5 pts)

1. *Does the applicant have experience and capacity to manage and administer grants and similar projects?*

   Yes. GWRC has managed several similar and related grants and sub-grants from DCR, DCR grantees and other State agencies, including DEQ, DOF, VDACS, VDEM, VDOT, VDRPT, DMME, DHCD and others. GWRC has routinely received positive findings and management letter comments from annual external audits under the federal Single Audit Act guidelines.

2. *If not, does the project engage partners who will be able to complete tracking tasks?*

   The progress of the proposed consultant team will be closely monitored by GWRC staff to ensure on-time completion within the budget provided under the contract terms with each.

3. *Does the proposal demonstrate the capability of the project sponsor and partners in providing for the successful completion of the project (e.g. qualifications and expertise)?*

   Yes. GWRC has assembled a strong partner team with national, regional and local expertise with a wealth of knowledge in public policy analysis and development, as well as technical water quality and environmental planning and engineering expertise and a track record of accomplishments with local governments in PD 16 and beyond. The experience of our legal consultant, AquaLaw, is second to none in the area of water resources and water quality law. See Appendix B for a summary of Applicant and Partner Accomplishments and Appendix C for lead staff resumes for GWRC's project manager and the partner organizations.

J. Locality and Community Engagement: (5 pts)

1. *How well will the project engage local stakeholders?*

   A regional SW technical advisory/management committee, growing out of an existing GWRC regional environmental committee, will meet regularly as a group and individually, as needed, with consulting partners, to provide local input and feedback. Monthly progress reports to the local government chief administrative officers (CAOs) and the 10 local elected officials that serve on GWRC's Board of Directors will help keep local officials abreast of the project evolution and emerging program policy issues and prospective program recommendations. Development and environmental conservation and water quality protection interests will be supplied with regular communications from Friends of the Rappahannock, the Sierra Club (Rappahannock Chapter), the Fredericksburg Regional, Caroline and King George Chambers of Commerce and such builder groups as the Fredericksburg Area Builders' Association (FABA).

2. *How will the benefits of the stormwater management program to water quality be communicated to the general public?*

   The program will develop content for dedicated project page(s) on GWRC's website, with affiliated referral links on local government websites, to explain the water quality benefits of the stormwater proigram. Press releases will be issued at appropriate times to inform and engage the public in the importance of the emerging regional/local stormwater program.

Moreover, working with FOR's program and education managers, program messages will be communicated through FOR newsletters, website and e-mail circulation to its large and diverse list of subscribers within and beyond PD 16 in the Rappahannock River Basin.

Additionally, GWRC can share program information through the Potomac River Watershed Roundtable, York River Roundtable, and across the Commonwealth through local government membership in the Virginia Municipal Stormwater Association (VAMSA), Virginia Municipal League (VML), Virginia Association of Counties (VACO) and through GWRC's own affiliation with the Virginia Association of Planning District Commissions.

3. *Will the project result in a high-level of public engagement and interaction?*

Yes. For a regional project of this nature to be considered successful in the eyes of the participating jurisdictions, the products of this effort must be found useful to and ultimately be adopted by local governments. To achieve this, broad community awareness has to be generated and an effective job of identifying areas of public concern and opposition must be done so that these issues can be addressed in the design of the program implementation and public outreach programs to support program implementation by the governing bodies.

K. Education and Outreach: (5 pts)

1. *Do the education and outreach activities listed in the proposal clearly support the outcomes?*

Yes. The education and outreach effort appropriately targets front-line program staff and their managers to help them understand the new stormwater regulations and adapt the model regional ordinance to local circumstances; while also planning on reaching regional community stakeholders (e.g. civil engineers, site planners, landscape architects, developers, consulting planners, chamber of commerce and builder association groups) to explain the state requirements and the draft regional and local program and ordinance responses.

L. Non-MS4 and Non-Chesapeake Bay Act Communities (20 bonus pts.)

Proposals from localities that are not subject to the Chesapeake Bay Preservation Act or are not currently designated as an MS4.

Yes, the bonus is applicable because GWRC's proposal directly targets the development of stormwater programs in 4 non-MS4 communities (i.e. Towns of Port Royal and Bowling Green, Caroline County and King George County).

In addition, this project approach leverages the existing experience of 3 MS4 communities in the region (i.e. City of Fredericksburg, Stafford County and Spotsylvania County) to share regional expertise to build an on-going cooperative regional stormwater program management framework where the program experience of the established MS4 communities can be enhanced and mutually beneficial program components serving all the localities can be designed and delivered more cost-effectively and efficiently on a regional basis. Moreover, through the development of a regional model program and related ordinance, the community at large can be more efficiently informed on the reasons for and the benefits of the recommended approaches developed through this regional process. A regional model ordinance would help achieve program consistency at the local level and make compliance easier for land developers and their site planners and engineers.

A. Required Activities: (Delivery Deadline: April 1, 2013)

1) *Submission to DCR of a **primary contact name and contact information** for the development of the local stormwater management program by April 1, 2013.*

   GWRC and the participating jurisdictions understand that a required deliverable from any project awarded under this RFP will be the designation by each locality of a primary staff contact with each locality in the final products submission to DCR.

2) ***Preliminary Draft Ordinance***
   GWRC and the participating jurisdictions understand that the project deliverables resulting from the award of funding under the DCR RFP must include a development of a preliminary draft ordinance (does not have to be approved by local elected body) by April 1, 2013.

	MS4 / Urban Communities		**Non-MS4 Rural Communities**
Yes	City of Fredericksburg	Yes	King George County
Yes	Spotsylvania County	Yes	Caroline County
Yes	Stafford County	Yes	Town of Bowling Green
		Yes	Town of Port Royal
Yes	GWRC: Regional Model	Yes	GWRC: Regional Model

   Specifically, GWRC proposes to develop a regional model ordinance, reflecting the integration of DCR's draft unified model ordinance with Stafford County's existing stormwater ordinance (Chapter 21.5); erosion and sediment control ordinance (Chapter 11), and the County's zoning ordinance (Chapter 28) provisions pertaining to Chesapeake Bay Preservation Act (Sec. 28-62. - Chesapeake Bay Preservation Area Overlay District) compliance. This template would reflect an example of the significant variation in local programs; provide local governments examples of optional program elements that they could select for incorporation into their local program (and ordinance) as well as highlight regional program elements which could compliment all local programs and improve intergovernmental coordination of program implementation.

3) ***Draft Staffing Plan***
   GWRC and the participating jurisdictions understand that the project deliverables resulting from the award of funding under the DCR RFP must include the development of a draft staffing plan that includes, at a minimum:

   a) a description of staff roles, and
   b) estimated numbers of staff personnel by locality department by April 1, 2013.

	MS4 / Urban Communities		**Non-MS4 Rural Communities**
Yes	City of Fredericksburg	Yes	King George County
Yes	Spotsylvania County	Yes	Caroline County
Yes	Stafford County	Yes	Town of Bowling Green
		Yes	Town of Port Royal
Yes	GWRC	Yes	GWRC

4) ***Draft Funding Plan***
GWRC and the participating jurisdictions understand that the project deliverables resulting from the award of funding under the DCR RFP must include the development of a draft funding plan that includes, at a minimum:

a) a list of program funding sources,

	MS4 / Urban Communities		Non-MS4 Rural Communities
Yes	City of Fredericksburg	Yes	King George County
Yes	Spotsylvania County	Yes	Caroline County
Yes	Stafford County	Yes	Town of Bowling Green
		Yes	Town of Port Royal
Yes	GWRC	Yes	GWRC

B. Eligible/Optional Activities: (Delivery Deadline: June 30, 2014)

Detail how the eligible/optional activities will be carried out.

1) ***Training & Education*** *of staff on the new technical regulations governing water quality and quantity criteria, the runoff reduction method, and/or energy balance equation;*

GWRC proposes to develop and conduct two 1-day training sessions for local government staff on the new technical regulations governing water quality and quantity criteria, the runoff reduction method, and/or energy balance equation and the application of these regulations within the context of developing local stormwater programs pursuant to the Virginia stormwater regulations. GWRC will task the partner consulting team to work with the regional SW technical advisory/management committee in defining the best time for the delivery of these training sessions, the nature and appropriate balance of technical and policy content to best meet the needs of local government staff. The venue for these training sessions will be donated by local governments as an in-kind contribution in support of the DCR grant award. This training will developed and delivered through a collaboration of Conservation Concepts, AquaLaw, Eldon James & Associates and GWRC.

	MS4 / Urban Communities		Non-MS4 Rural Communities
Yes	City of Fredericksburg	Yes	King George County
Yes	Spotsylvania County	Yes	Caroline County
Yes	Stafford County	Yes	Town of Bowling Green
		Yes	Town of Port Royal
Yes	GWRC	YEs	GWRC

2) ***Communication & Outreach*** *to the public and interested stakeholder groups;*

GWRC proposes to develop and conduct a major public outreach forum intended to reach regional community stakeholders (e.g. civil engineers, site planners, landscape architects, developers, consulting planners, chambers of commerce, realtor and builder association groups) to explain the state requirements regarding the new technical regulations governing water quality and quantity criteria, the use of the runoff reduction method, and/or energy balance equation and the effect of these regulations in driving local governments to develop local stormwater programs.

	MS4 / Urban Communities		Non-MS4 Rural Communities
Yes	City of Fredericksburg	Yes	King George County
Yes	Spotsylvania County	Yes	Caroline County
Yes	Stafford County	Yes	Town of Bowling Green
		Yes	Town of Port Royal
Yes	GWRC	Yes	GWRC

Moreover, by posting interim products for stakeholder and public review and comment on the project website, and providing a general information e-mail address for stakeholders to submit questions or suggestions, the planned process provides opportunity for stakeholder and public comment and input which will enhance the final products.

3) ***Program & Policy Development*** *(e.g., development of ordinance provisions, and depending on resources, considerationof market-based approaches to assist with local compliance, establishing BMP data collection and tracking policies and procedures to report implementation; development of land use ordinance provisions (zoning and/or subdivision ordinance) that eliminate impediments for the use of such runoff reduction techniques such as impervious cover reduction and promote or require environmental site design.*

a) GWRC proposes to work with its partner consultants to compare and contrast existing local urban stormwater BMP inventories and tracking systems with one another and the separate requirements under State stormwater and Phase 2 MS4 program criteria to recommend a consistent regional BMP tracking and reporting system which may better serve localities in reporting these inventories to the State for use in Chesapeake Bay water quality model updates and other applications.

b) Review Land Use Ordinance Provisions (zoning and/or subdivision ordinance) to identify and suggest ways to eliminate impediments to the use of low impact designs, or innovative environmental site design.

c) From the results of above-named task 3a and 3b, develop recommendations for local and regional stormwater programs by drawing on the research in support of and the formulation of new regional model stormwater ordinance, examine new regional and local stormwater programs that may create incentives for developer compliance and voluntary initiatives that offer higher levels of environmental compliance.

	MS4 / Urban Communities		**Non-MS4 Rural Communities**
Yes	City of Fredericksburg	Yes	King George County
Yes	Spotsylvania County	Yes	Caroline County
Yes	Stafford County	Yes	Town of Bowling Green
		Yes	Town of Port Royal
Yes	GWRC	Yes	GWRC

Basic Eligibility (Pre-Screening) Criteria **All of these criteria must be met in order for a full review to be completed.**	**Potential Points**	**Points Awarded**
1. Eligible Applicant: The applicant is eligible according to those listed in Section B of the RFP	1	
2. Non-Eligible Activities: The project does not include any of the non-eligible activities outlined in Section D of the RFP	1	
3. Partnerships: The proposal contains the required letter of support from any planned and/or named project partners	1	
4. Submission Requirements: The proposal meets all submission requirements as outlined in the RFP [e.g. deadline, application materials, etc.]	1	
5. Other Submission Restraints: The proposal does not violate any special submission requirements outlined in the RFP [i.e., RFP require partnerships to be]	1	
6. Meet the Minimum Funding Requirements	1	
Basic Eligibility (Pre-Screening) Criteria Required Points	**6**	

C. Explanation of Partner Involvement

1. George Washington Regional Commission (GWRC)

GWRC is the applicant/respondent to DCR's RFP and, if selected for a grant award, would function as grant administrator and fiscal agent. Moreover, GWRC would provide project leadership, management oversight and program coordination, including the negotiation and management of the partner consultant scopes of work and final work products. GWRC would also provide overall coordination of training and public outreach activities and the communication of project progress and final results to the GWRC Board of Directors, local government chief administrative oficers and outside stakeholders. Under funding support from the DEQ-CZM program, GWRC anticipates providing technical assistance to local governments, upon request, in the integration of the developed regional model ordinance with the local development ordinances.

2. Local Governments

The participating localities that have endorsed this application on their behalf would provide regular staff or community representation to the regional stormwater technical advisory/management committee ("the Committee"). Local governments are committed to:

- provide in-kind staff support in serving on the Committee and performing related staff work required to help the Committee produce the product deliverables required under this Proposal,
- provide venues for technical training and public outreach meetings, and ultimately
- take under advisement the finished products developed in response to the RFP as defined herein to be used in the final development of a local stormwater program and related ordinance for adoption consideration by the local governing body.

3. Partner Consulting Team

The partner consultants have specific skillsets to be used to support the production of work products proposed herein. Generally-speaking, these partners and their respective roles are:

- Eldon James & Associates, Inc. (Policy, Communication, Outreach),
- AquaLaw PLC (Ordinance Development, Review, and Local Legal Comment Response),
- Conservation Concepts, LLC - (Technical Aspects of Stormwater Engineering, Design, Ordinance Review, Ordinance Development, Training, and Education)
- Friends of the Rappahannock – (Communication, Outreach)

D. Timeline of Pertinent Activities

See Table 1 on the next fold-out pages for the detailed time line for work scheduled through April 1, 2012 and other deliverables to be produced by June 14, 2014, as well as consultant task-specific budget allocation.

D. Timeline of Pertinent Activities

GWRC anticipates completing all pertinent activities and program elements by either the April 1, 2013 or the June 30, 2014 grant deadlines. The timeline below is an approximation of the timing and duration of activities and **is subject to change should the notice to proceed * be delayed**. The activities outlined hereunder represent the projects and deliverables that would be funded under the current grant award. Where other funding is available, additional activities may be added to the program. If funding received is less than budgeted, programmatic activities will altered under consideration of the partners involved.

GWRC Proposed DCR Stormwater Grant Program
Timeline of Pertinent Activities

					2012	2013												2014					
TASK #	**Task Description**	**Deliverable(s)**	**Principal Actor(s)**	**Approximate Duration**	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
	Issuance of Notice To Proceed		DCR		*																		
1	**Develop Preliminary GW Stormwater Program Ordinance**																						
1a	Working with local and GWRC staff, information will be gathered on existing orrdinances, staffing and funding.	Matrix of existing ordinances, staffing and funding programs.	Local Staff, GWRC and Cons Concepts	3 weeks																			
1b	Review a selected local ordinance for compatibility with Virginia's newly integrated stormwater and erosion & sediment control regulations.	Summary of incompatibilities and recommendations for new or improved ordinance language.	Conservation Concepts & E.James & Assoc	8 weeks					On-going monitoring of State legislative and regulatory reform for changes necessary in local and regional implementation plans and ordinance(s).														
1c	Development of draft stormwater ordinance building on integration of model unified ordinance with selected local stormwater	Draft ordinance template	AquaLaw & E.James & Assoc & GWRC	5 weeks																			
1d	Local government review and comment on preliminary stormwater ordinance.	Delivery of preliminary stormwater ordinance for submittal to Va DCR.	Local Govts, GWRC, E.James & Assoc.	3 weeks																			
1e	Local review, detailed revisions, public hearings, and local governing body	Refined stormwater ordinance readied for adoption by local government bodies.		15 months																			
2	**Program & Policy Development**																						
2a	Review Land Use Ordinance Provisions (zoning and/or subdivision ordinance) to eliminate impediments for the use of low impact designs, or innovative environmental site design.	Recommendations for local consideration in revising zoning or subdivision ordinances.	Conservation Concepts, FOR & GWRC, consulting with LGs	15 months																			
2b	Compare & contrast local urban BMP data collection with DCR & MS4 data requirements, develop regional tracking policies and procedures to standardize implementation.	Recommendations for a regional BMP tracking framework.	Conservation Concepts	15 months																			
2c	Develop Recommendations for Local and Regional Stormwater Programs. Based on research and the formulation of new ordinances, examine new regional and local stormwater programs that may create incentives for developer compliance and participation.	Recommendations for local and regional agency programs to facilitate the implementation of stormwater programs and ensure the compatibility with Chesapeake Bay TMDL milestones/objectives.	Conservation Concepts, GWRC & SW Program Committee	15 months																			
2d	**Placeholder for MS4 Locality work**																						
2d.1	City of Fredericksburg		LGs & GWRC	15 months																			
2d.2	Stafford County		LGs & GWRC	15 months																			
2d.3	Spotsylvania County		LGs & GWRC	15 months																			
2e	**Placeholder for non-MS4 locality work**																						
2e.1	Caroline County		LGs & GWRC	15 months																			
2e.2	Town of Port Royal		LGs & GWRC	15 months																			
2e.3	Town of Bowling Green		LGs & GWRC	15 months																			
2e.4	King George County		LGs & GWRC																				
3	**Develop Staffing Plans**																						
3a	Develop staffing plan calculator to support ordinance-based SW program implementation	Provide tool for calculating local implementation for all participating localities	Conservation Concepts & GWRC	2-3 weeks																			
3b	Local utilization of staffing plan calculator to determine cost based on 2012 development	Local inputs to staffing plan calculator to estimate local cost to comply	LGs & GWRC	2-3 weeks																			
3c	Aggregation of local staffing cost estimates	Aggregate local staffing plans & associated cost estimate	GWRC & Cons. Concepts	2 weeks																			
3d	Develop regional staff support option	Alternative regional and/or local staffing plan with cost- and position-sharing or on-call consultant roles	Cons Concepts, E.James & Assoc. & GWRC	2 weeks					Refine staffing plan, initiate local and/or regional recruitment or procurement of staff or consulting support.														
3e	Develop final staffing plan option	Consensus staffing plan for local/regional start-up implementation	SW Program Committee & LG CAOs	2 weeks																			
4	**Develop Funding Plan(s)**																						
4a	Develop local program funding option alternatives	Report on available funding tools for local program implementation	Conservation Concepts & E.James & Assoc.	1 month																			
4b	Develop regional program funding option(s)	Report on program funding options best implemented on regional basis	Cons Concepts, E.James & Assoc. &	1 month																			
4c	Local selection of preferred funding options	Consensus funding plan	SW Program Committee & LG CAOs	1 month					Continued work to refine funding scenarios, work with LGs to reach local and regional consensus.														
5	**Local Staff Training and Education**																						
5a	Train LG staff on the new technical regulations governing water quality and quantity criteria, the runoff reducation method, and/or energy balance equation.	Two 1-day training workshop	Conservation Concepts & GWRC & SW Program Committee	2 days								**1**								**1**			
6	**Communication and Outreach**																						
6a	Develop regional SW program webpage to communicate project developments	Completed dedicated pages deicated to SW program at www.gwregion.org	GWRC & SW Program Committee	2 weeks & on-going																			
6b	Develop community outreach program to inform stakeholders of local/regional SW effort and program..	Provide periodic project updates website progress reports, press releases. Hold a regional public input forum to ascertain public input and comments.	Cons. Concepts, SW Program Committee & GWRC	Ongoing**																★			
7	**Regional Stormwater Committee Meetings***	Technical Input/Review		Frequency:	**1**	**1**	**2**	**2**	**1**		**1**		**1**		**1**		**1**		**1**		**1**		**1**

*Regional Stormwater Committee will meet as shown.
**Projected March 2014 public forum for local and regional stakeholders ★

Coordination of Funding Resources:

GWRC anticipates completing all pertinent activities and program elements by the June 30, 2014 grant deadline. The timeline below is an approximation of the timing and duration of activities and **is subject to change should the notice to proceed be delayed**. The activities outlined hereunder represent the projects and deliverables that would be funded under the current grant award. Where other funding is available, additional activities may be added to the program. If funding received is less than budgeted, programmatic activities will altered under consideration of the partners involved.

GWRC Proposed DCR Stormwater Grant Program

Timeline of Pertinent Activities

				DCR Cost Portion				
TASK #	**Task Description**	**Deliverable(s)**	**Funding Source & Leverage**	AquaLaw	Conservation Concepts	E. James & Assoc	FOR	GWRC
	Issuance of Notice To Proceed							
1	**Develop Preliminary Ordinance**							
1a	Working with local and GWRC staff, information will be gathered on existing ordinances	Matrix of existing ordinances, staffing and funding programs.	DCR Grant to support Cons. Concepts' development of model	$0	$4,500	$0	$266	$2,069
1b	Review & revise a selected local ordinance for compatibility with Virginia's new draft unified stormwater and erosion & sediment control regulations.	Summary of incompatibilities and recommendations for new or improved ordinance language.	DCR Grant to support Cons. Concepts' development of model	$20,100	$6,700	$0	$266	$2,069
1c	Revise stormwater ordinance based on local staff and County attorney comments	Draft ordinance template	DCR Grant	$6,700	$0	$0	$266	$2,069
1d	Local government review and comment on preliminary stormwater ordinance.	Delivery of preliminary stormwater ordinance for submittal to Va	DCR Grant	$0	$0	$0	$300	$0
1e	Local review, detailed revisions, public hearings, and local governing body consideration.	Refined stormwater ordinance readied for adoption by local government bodies.	DCR Grant	$0	$0	$0		$0
1e.1	Caroline County Ordinance Development and Code Revisions	Integration of regional model ordinance into local county Code	**FOR NFWF Grant: $15,000 to Conservation**	$0	$0	$0	$2,230	$0
1e.2	King George County Ordinance Development and Code Revisions	Integration of regional model ordinance into local county Code	Local Staff In-Kind & **GWRC's $30K CZM grant**	$0	$0	$0		$0
1e.3	Stafford County Ordinance Development and Code Revisions	Integration of regional model ordinance into local county Code		$0	$0	$0		$0
1e.4	Spotsylvania Co Ordinance Development and Code Revisions	Integration of regional model ordinance into local county Code		$0	$0	$0		$0
1e.5	Fredericksburg City Ordinance Development and Code Revisions	Integration of regional model ordinance into City Code		$0	$0	$0		$0
2	**Program & Policy Development**							
2a	Review Land Use Ordinance Provisions (zoning and/or subdivision ordinance) to eliminate impediments for the use of low impact designs, or innovative environmental site design.	Recommendations for local consideration in revising zoning or subdivision ordinances.	DCR Grant for Conservation Concepts assistance; LG in-kind work to highlight impediments	$0	$2,000	$0		$2,759
2b	Compare & contrast local urban BMP data collection with DCR & MS4 data requirements, develop regional tracking policies and procedures to standardize implementation.	Recommendations for a regional BMP tracking framework.	DCR Grant for Conservation Concepts assistance; LG in-kind work with GWRC to develop regional BMP	$0	$2,000	$0		$2,759
2c	Develop Recommendations for Local and Regional Stormwater Programs. Based on research and the formulation of new ordinances, examine new regional and local stormwater programs that may create incentives for developer compliance and participation.	Recommendations for local and regional agency programs to facilitate the implementation of stormwater programs and ensure the compatibility with Chesapeake Bay TMDL milestones/objectives.	DCR Grant to E. James & Assoc, Aqualaw, Cons Concepts & FOR & GWRC	$0	$1,600	$1,500		$2,759
2d	**Placeholder for MS4 Locality work**							
2d.1	City of Fredericksburg		LG staff In-Kind					$0
2d.2	Stafford County		LG staff In-Kind					$0
2d.3	Spotsylvania County		LG staff In-Kind					$0
2e	**Placeholder for non-MS4 locality work**							
2e.1	Caroline County		LG staff In-Kind					$0
2e.2	Town of Port Royal		LG staff In-Kind					$0
2e.3	Town of Bowling Green		LG staff In-Kind					$0
2e.4	King George County		LG staff In-Kind					$0
3	**Develop Staffing Plans**							
3a	Develop staffing plan calculator to support ordinance-based SW program implementation	Provide tool for calculating local implementation for all participating localities	DCR Grant to support Cons. Concepts' development of staffing		$2,000	$0		$690
3b	Local utilization of staffing plan calculator to determine cost based on 2012 development level	Local inputs to staffing plan calculator to estimate local cost to comply	DCR Grant; leveraged by LG in-kind staff participation		$1,600	$0		$0
3c	Aggregation of local staffing cost estimates	Aggregate local staffing plans & associated cost estimate	DEQ-CZM TA Grant to GWRC			$0		$690
3d	Develop regional staff support option	Alternative regional/local staffing plan with cost- and position-sharing or on-call consultant roles	DCR Grant; leveraged by LG in-kind staff participation		$2,000	$1,500		$1,035
3e	Develop final staffing plan option	Consensus staffing plan for local/regional start-up implementation	DCR Grant; leveraged by LG in-kind staff participation			$1,500		$345
4	**Develop Funding Plan(s)**							
4a	Develop local program funding option alternatives	Report on available funding tools for local program implementation	DCR Grant; leveraged by LG in-kind staff	$0	$2,000	$0		$690
4b	Develop regional program funding option(s)	Report on program funding options best implemented on	DCR Grant; leveraged by LG in-kind staff	$0	$2,000	$2,500		$1,035
4c	Local selection of preferred funding options	Concensus funding plan	DCR Grant; leveraged by LG in-kind staff	$0		$0		$0
5	**Local Staff Training and Education**							
5a	Train LG staff on the new technical regulations governing water quality and quantity criteria, the runoff reducation method, and/or energy balance equation.	Two 1-day training workshop	DCR grant; local in-kind donation of training venue	$0	$1,600	$1,500		$0
6	**Communication and Outreach**							
6a	Develop regional SW program webpage to communicate project developments	Completed dedicated pages deicated to SW program at www.gwregion.org	DEQ-CZM TA Grant to GWRC			$0		$2,069
6b	Develop community outreach program to inform stakeholders of local/regional SW effort and program..	Provide periodic project updates website progress reports, press releases. Hold a regional public input forum to ascertain public input and comments.	DCR Grant; leveraged by LG in-kind staff participation		$2,000	$1,500		$2,414
7	**Regional Stormwater Committee Meetings***	Technical Input/Review		$0		$0		$6,207
	*Regional Stormwater Committee will meet as shown.							
	**Projected March 2014 public forum for local and regional stakeholders		TOTAL	$26,800	$30,000	$10,000	$3,328	$29,657

VI. Products/Outcomes

A. Preliminary Deliverables and Outcomes.

List and describe the final outcomes planned:

1. Required Preliminary Deliverables by April 1, 2013

a) Local Government Staff Contacts: see RFP response on pages 6-7, 16
b) Preliminary Draft Regional Model Ordinance: see RFP response on pages 16
c) Draft Staffing Plan: see RFP response on page 16
d) Draft Funding Plan: see RFP response on page 16

2. Reporting and delivery plans

GWRC understands that projects selected for funding will be required to provide quarterly progress reports and a final report to the assigned DCR Project Manager. GWRC is familiar with DCR reporting guidelines as included in DCR's standard grant agreement under Section (5) SCOPE OF SERVICE. Administrative and programmatic guidelines for projects awarded funding are available in the DCR Grant Project Management Manual available at: **www.dcr.virginia.gov/stormwater_management/grants.shtml**.

Expected project output will be required of each partner on a schedule laid out in a general service agreement to be executed with all partners. All work product will be submitted to GWRC in either Word (.doc), Powerppoint (.ppt), or Excel (.xls) electronic document format, as appropriate to the task.

B. Optional Products and Outcomes

1. Optional Deliverables by June 30, 2014

a) 2 Technical Training Sessions for Local Government Staff
b) Public Outreach Education Forum for Regional Stakeholders
c) Regional urban BMP tracking policy report
d) Report identifying the local ordinance impediments to low impact development or innovative environmental site design and recommended ways to eliminate these identified impediments.
e) Final report recommending elements for local and regional stormwater programs that can create or offer market-based incentives for developer compliance and voluntary initiatives that offer higher voluntary levels of environmental compliance.

2. Reporting and delivery plans

Expected project output will be required of each partner on a schedule laid out in a general service agreement to be executed with all partners. All work product will be submitted to GWRC in either Word (.doc), Excel (.xls) or Powerpoint (.ppt) electronic document format.

VII. BUDGET DETAIL

See Table 2 for complete budget detail and breakdown of leveraged matching funds.

PERSONNEL[1] COSTS

Name	Title	Hourly Rate			Total Hours	Total Cost
Tim Ware	Exec. Director	$ 61.79			20	$1,236
Kevin Byrnes	Dir. , Rgnl Plng	$ 41.75			390	$16,283
Barbara Bigelow	Accounting Mngr	$ 25.81			20	$516
Personnel Sub-Total		**$ -**			**430**	**$ 18,034**
FRINGE[2] BENEFITS:						
Name	Title	Fringe Rate			N. of Hours	Total Cost
Tim Ware	Exec. Director	$ 39.25			20	$785
Kevin Byrnes	Dir. , Rgnl Plng	$ 26.52			390	$10,343
Barbara Bigelow	Accounting Mngr	$ 16.39			20	$328
Fringe Benefit Sub-Total					430	**$11,455**

TRAVEL[3] COSTS

Traveler Name	Miles	Mileage Rate ($0.555)	Mileage Reimbursement	Lodging	Meals	Total
Kevin Byrnes	300	$ 0.555	$ 167.00	$ -	$ -	$ 167.00
Travel Sub-Total	**0.00**	**$ 0.555**	**$ 167.00**	**$ -**	**$ -**	**$ 167.00**

SUPPLIES[4]

Number of Items	Item Description	Unit Cost	Total Cost
	None anticipated	$ -	$ -
Supplies Sub-Total			**$ -**

Continued on next page

[1] **Personnel:** Grant funds for personnel charges should only be for staff within the project sponsors organization and for staff members who are directly involved in the project. This category does not include contractual staff. In-kind personnel contributions from project partners may be listed as personnel under the Match funds section of the budget narrative. Use the actual annual salary or hourly wage of project staff to determine expenditures and/or match amounts based on estimated time to be spent working on the project.

[2] **Fringe Benefits:** In the budget narrative please provide the percentage used for fringe benefits, the basis for its computation, and the types of benefits included.

[3] **Travel:** Mileage traveled and other costs for travel including lodging and meals. Travel reimbursements are for actual costs based on organization policies, and is not to exceed those included in the *Commonwealth of Virginia Policies & Procedures, Topic No. 20335, State Travel Regulations.* A maximum vehicle mileage rate of $0.555/mile should be used (2011 IRS rate).

[4] **Supplies:** This category includes tangible property items with a per unit cost value of less than $5,000. Supplies must be itemized in the budget narrative.

CONTRACTUAL[5]

Vendor	Task Activity	Estimated Cost
Friends of the Rappahannock	Work with Cons. Concepts to integrate regional model ordinance into Caroline Co Code	$3,329
Eldon James & Associates, Inc.	Legislative liaison/policy review, funding options report, community outreach forum	$10,000
AquaLaw, P.L.C.	Review & revision of 1st draft regional model performance-based stormwater ordinance, respond to local attorney comments	$26,800
Conservation Concepts, L.L.C.	Review of local development codes, crosswalk table with model ordinance, 1st draft of regional model ordinance, Staffing Plan Calculator, funding options report, technical training design & delivery, community outreach forum, local ordinance LID impediment review	$30,000
Contractual Sub-Total		**$ 70, 129**

OTHER DIRECT[6]

Item Number	Description	Unit Cost	Total Cost
	Non-anticipated	$ -	$ -
Other Direct Sub-Total			**$ -**

TOTAL BUDGET COST	**$ 99, 785**

INDIRECT[7] **COSTS (eligible for match)**			
Name	Indirect Rate/Cost Description	No. of Hours	Total Cost
GWRC Staff Indirect Costs	**63.52% of total labor and fringe costs combined**	**430**	**$ 11,834**
City of Fredericksburg Staff Time	In-kind value of technical and local legal staff involved with project, plus mileage costs and travel time to attend regional project meetings. See local detailed assumptions in page 2 of Table 1	142	$5,755
Stafford County Staff Time		290	$16,145
Spotsylvania County Staff Time		177	$7,676
King George County Staff Time		157	$9,884
Caroline County Staff Time		167	$9,205
Bowling Green Staff Time		10	$637
Port Royal Representative Time		10	$1,111
Local Govt Staff Sub-Total		**1,373**	**50,414**
Conservation Concepts. LLC	NFWF Grant pass-thru from FOR dedicated to support ordinance adoption in Caroline County	150	**$15,000**
Conservation Concepts, LLC	Value of foregone consulting rate for consulting time, plus pro-bono meeting attendance and travel	300	**$7,165**
Eldon James & Associates, Inc.	Supporting funds from other locally-funded water quality and legislative liaison work of RRBC, GWRC	40	**$4,000**
GWRC	Value of NOAA CZM grant dedicated to supporting local government environmental program enhancement, particularly stormwater program.	312	**$30,000**
Contractor Sub-Total		**802**	**$56,124**
Leveraged Benefits Total		**1,922**	**$118,373**

[5] **Contractual:** Contractual costs include subcontracted work to be completed by those other than the project sponsor such as design and engineering services, legal contracts, easement surveys, and analysis of water samples.

[6] **Other Direct:** Miscellaneous items. These items must be listed in the budget narrative, in sufficient detail to determine if they are reasonable and allowable.

[7] **Indirect:** **No indirect costs will be funded**. Indirect charges may be used as project Match. The indirect cost rate must be documented in the match narrative.

Table 1. GWRC STORMWATER MANAGEMENT PROGRAM GRANT BUDGET PLANNING WORKSHEET

= calculated amount

PERSONNEL[1] COSTS (For Persons paid from the Grant)

Name	Agency	Title	Hourly Rate	N. of Hours	Total Cost	Cost: Phase 1	Cost: Phase 2
Tim Ware	GWRC	Exec. Director	$ 61.79	20	$1,236	$309	$927
Kevin Byrnes	GWRC	Director, Rgnl Plng	$ 41.75	390	$16,283	$6,513	$9,770
Barbara Bigelow	GWRC	Accounting Manager	$ 25.81	20	$516	$129	$387
					$0		
Personnel Sub-Total				**430**	**$18,034**	$6,951	$11,083

FRINGE[2] BENEFITS: (For Persons paid from the Grant)

Name	Agency	Title	Fringe Rate	N. of Hours	Total Cost	Cost: Phase 1	Cost: Phase 2
Tim Ware	GWRC	Exec. Director	$ 39.25	20	$785	$196	$589
Kevin Byrnes	GWRC	Director, Rgnl Plng	$ 26.52	390	$10,343	$4,137	$6,206
Barbara Bigelow	GWRC	Accounting Manager	$ 16.39	20	$328	$82	$246
					$0		
Fringe Benefit Sub-Total					**$11,455**	$4,415	$7,040

TRAVEL[3] COSTS

Traveler Name	Miles	Mileage Rate ($0.555)	Mileage Reimbursement	Lodging	Meals	Total
Byrnes, Kevin F.	300	$0.555	$167	$0	$0	$167
Ware, Tim		$0.555	$0	$0	$0	$0
		$0.555	$0	$0	$0	$0
Travel Sub-Total	**300**	**$0.555**	**$167**	**$0**	**$0**	**$167**

SUPPLIES[4]

Item Description	Number of Items	Item Unit Cost	Total Cost
		$ -	$ -
		$ -	$ -
		$ -	$ -
Supplies Sub-Total			**$ -**

$29,656

CONTRACTUAL[5]

Vendor	Task / Activity	Est. Cost: Phase 1	Est. Cost: Phase 2	Total Cost	Hours: Phase 1	Hours: Phase 2	FOR NFWF Grant
Friends of Rappahannock	Work with Cons. Concepts to integrate regional model ordinance into Caroline Co Code	$1,109	$2,219	$3,329	33	67	
E. James & Assoc	Legislative liaison/policy review, funding options report, community outreach forum	$3,300	$6,700	$10,000	60	40	
Aqualaw	Support development of regional model performance-based stormwater ordinance, respond to local attorney comments	$16,080	$10,720	$26,800	60	20	
Conservation Concepts	Staffing Plan Calculator, funding options report, technical training design & delivery, community outreach forum, local ordinance LID impediment review	$18,798	$11,202	$30,000	188	112	150
Contractual Sub-Total		**$39,287**	**$30,841**	**$70,129**	**341**	**239**	

OTHER DIRECT[6]

Item Number	Description	Unit Cost	Total Cost
		$ -	$ -
		$ -	$ -
		$ -	$ -
Other Direct Sub-Total			**$ -**

	TOTAL Grant Request	**Total Project Cost**
TOTAL BUDGET COST	**$ 99,785**	**$ 218,158**

Balance from $100K: $ 215.04

[1] Personnel: Grant funds for personnel charges should only be for staff within the project sponsors organization and for staff members who are directly involved in the project. This category does not include contractual staff. In-kind personnel contributions from project partners may be listed as personnel under the Match funds section of the budget narrative. Use the actual annual salary or

[2] Fringe Benefits: In the budget narrative please provide the percentage used for fringe benefits, the basis for its computation, and the types of benefits included.

[3] Travel: Mileage traveled and other costs for travel including lodging and meals. Travel reimbursements are for actual costs based on organization policies, and is not to exceed those included in the Commonwealth of Virginia Policies & Procedures, Topic No. 20335, State Travel Regulations. A maximum vehicle mileage rate of $0.555/mile should be used (2011 IRS rate).

[4] Supplies: This category includes tangible property items with a per unit cost value of less than $5,000. Supplies must be itemized in the budget narrative.

[5] Contractual: Contractual costs include subcontracted work to be completed by those other than the project sponsor such as design and engineering services, legal contracts, easement surveys, and analysis of water samples.

[6] Other Direct: Miscellaneous items. These items must be listed in the budget narrative, in sufficient detail to determine if they are reasonable and allowable.

GWRC & Local Government & Other Staff for "Soft Match"

LOCAL IN-KIND & INDIRECT[1] COSTS (eligible for match)

Name	Title	Organization	Hourly Rate	No. of Hours	Total Hourly Costs (Hours x Hourly Rate)	Hourly Fringe Rate	Fringe Costs (Hours x Fringe Cost Rate)	Indirect Rate	Indirect Costs Indirect Rate X (Col E + Col F)	Miles Traveled	Mileage Reimbursement @ $0.555 per mile	Total Local Soft Match Value
Tim Ware	Executive Director	GWRC	$ 61.79	20		$ 39.25		$40.55	$ 810.92		$ -	$ 810.92
Kevin Byrnes	Director, Rgnl Plng	GWRC	$ 41.75	390		$ 26.52		$27.40	$ 10,684.67		$ -	$ 10,684.67
Barbara Bigelow	Accounting Manager	GWRC	$ 25.81	20		$ 16.39		$16.94	$ 338.73		$ -	$ 338.73
GWRC Staff Sub-Total		**GWRC**		**430**					**$ 11,834.32**	**0**	**$ -**	**$ 11,834.32**
Kevin Utt	Site Development Mgr	City	$ 28.14	132	$ 3,722.92	$ 12.30	$ 1,627.29				$ -	$ 5,350.21
	Deputy City Attorney	City	$ 28.16	10	$ 281.60	$ 12.30	$ 123.00				$ -	$ 404.60
City Personnel Sub-Total		City		**142**	**$ 4,004.52**		**$ 1,750.29**			**0**	$ -	**$ 5,754.81**
Mike Finchum	Planning Director	Caroline	$ 56.57	10	$ 565.70	$ 14.14	$ 141.43			80	$ 44.40	$ 751.53
David Nunnally	Sr Environmental Planner	Caroline	$ 26.60	147	$ 3,910.20	$ 6.65	$ 2,078.95			840	$ 466.20	$ 6,455.35
	Co. Attorney	Caroline	$ 275.00	10	$ 2,750.00		$ -				$ -	$ 2,750.00
Caroline Co Staff Sub-Total		Caroline		**157**	**$ 6,660.20**		**$ 2,078.95**			**840**	**$ 466.20**	**$ 9,205.35**
Stephen Manster	Town Planner & Manager	BG	$ 38.52	10	$ 385.20	$ 11.83	$ 118.30			240	$ 133.20	$ 636.70
Bowling Green Staff Sub-Total		Bowlng Grn		**10**	**$ 385.20**		**$ 118.30**			**240**	$ 133.20	**$ 636.70**
Alex Long	Town Plng Comm Chair	PR	$ 100.00	10	$ 1,000.00		$ -			200	$ 111.00	$ 1,111.00
Port Royal Sub-Total		PR		10	$ 1,000.00		$ -			**200**	$ 111.00	**$ 1,111.00**
Jack Green	Comm Dev Director	KG	$ 43.27	147	$ 6,360.58	$ 14.28	$ 2,098.99			840	$ 466.20	$ 8,925.77
	Co Attorney	KG	$ 72.12	10	$ 721.15	$ 23.80	$ 237.98				$ -	$ 959.13
King George Staff Sub-Total		King George		157	$ 7,081.73		$ 2,336.97			**840**	$ 466.20	**$ 9,884.90**
Richard Street	Sr Environmental Eng	Spotsy	$ 28.85	147	$ 4,240.38	$ 9.52	$ 1,399.33			840	$ 466.20	$ 6,105.91
Troy Tignor	Director, Code Compliance	Spotsy	$ 43.27	20	$ 865.38	$ 14.28	$ 285.58			80	$ 44.40	$ 1,195.36
	Asst. Co Attorney	Spotsy	$ 28.16	10	$ 281.60	$ 9.29	$ 92.93				$ -	$ 374.53
Spotsylvania Co Staff Sub-Total		**Spotsylvania**		**177**	**$ 5,387.37**		**$ 1,777.83**			**920**	**$ 510.60**	**$ 7,675.80**
Steve Hubble	Asst. Dir, Public Works	Stafford	$ 46.44	100	$ 4,644.00	$ 15.33	$ 1,532.52			400	$ 222.00	$ 6,398.52
Rishi Baral	Senior Engineer	Stafford	$ 42.80	100	$ 4,280.00	$ 14.12	$ 1,412.40			400	$ 222.00	$ 5,914.40
Robert Waslov	Civil Engineer	Stafford	$ 41.27	15	$ 619.05	$ 13.62	$ 204.29				$ -	$ 823.34
James Rakestraw	Stormwater Engineer	Stafford	$ 34.34	15	$ 515.10	$ 11.33	$ 169.98				$ -	$ 685.08
Paul Santay	Environmental Planner	Stafford	$ 25.66	50	$ 1,283.00	$ 8.47	$ 423.39				$ -	$ 1,706.39
Asst. County Attorney	Asst. Co Attorney	Stafford	$ 46.44	10	$ 464.40	$ 15.33	$ 153.25				$ -	$ 617.65
Stafford Co Staff Sub-Total		**Stafford**		**290**	**$ 11,805.55**		**$ 3,895.83**			**800**	**$ 444.00**	**$ 16,145.38**
LOCAL GOVT SUB-TOTAL		**PD 16**		**1,373**	**$ 36,324.57**		**$ 11,958.17**		**$ 11,834.32**	**3840**	**$ 2,131.20**	**$ 50,413.94**
Conservation Concepts	Sub-Consultant to:	FOR		150	$ -		$ -		$ -		$ -	$ 15,000.00
Conservation Concepts			$ 20.00	300	$ 6,000.00		$ -		$ -	2100	$ 1,165.50	$ 7,165.50
Eldon James	Consultant	EJ & Assoc	$ 100.00	40	$ 4,000.00		$ -		$ -		$ -	$ 4,000.00
Kevin Byrnes	Rgnl Planning Director	GWRC	$ 41.75	312	$ 13,026.00	$ 26.52	$ 8,274.12	$ 27.40	$ 8,547.74	200	$ 111.00	$ 29,958.85
Other Sub-Total		**Other**		**802**	**$ 23,026.00**		**$ -**		**$ 8,547.74**	**2300**	**$ 1,276.50**	**$ 56,124.35**
Soft Match Sub-Total				**2,175**	**$ 59,350.57**		**$ 11,958.17**	**0**	**$ 20,382.06**	**6,140**	**$ 3,407.70**	**$ 118,372.62**

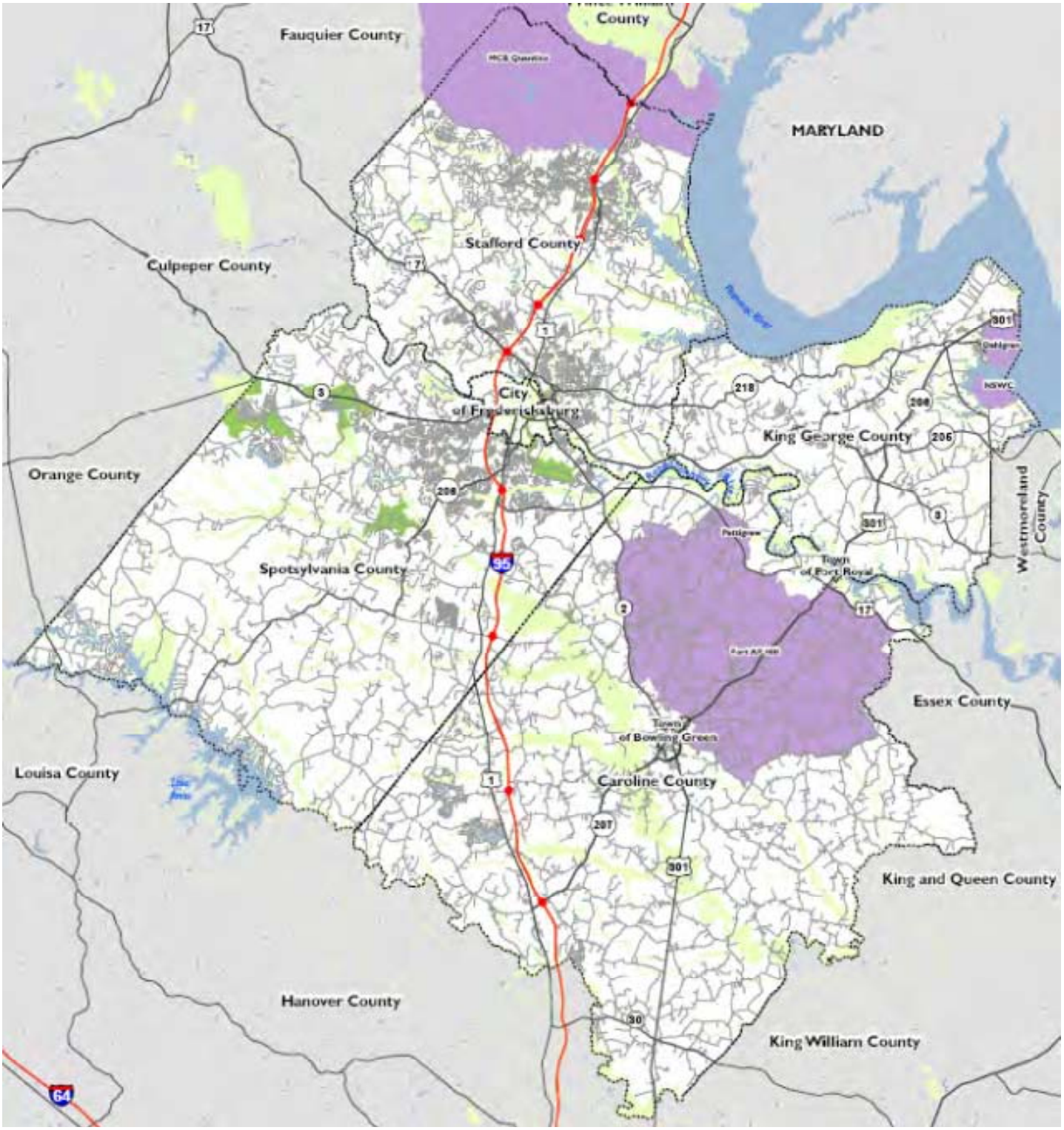
[1] Indirect: No indirect costs will be funded. Indirect charges may be used as project Match. The indirect cost rate must be documented in the match narrative.

VII. APPLICATION CHECKLIST

APPLICATION PACKAGE DOCUMENTS		
All components must be in an electronic format (PDF or Microsoft Word)	YES	NO
Proposal Narrative/Scope of Work (See Guidelines) – ***required (section K)***	X	
Budget Detail (See Guidelines) – ***required (Section L)***	X	
Letters of Support from partners –***required***	X	
Vicinity Map: 8 ½ x 11 inch (limited to 1 page) - *optional*	X	
A minimum requirement is the development of a draft package to be submitted for review by DCR by April 1, 2013; specific requirements for the draft package are detailed in this RFP. - ***required***	X	
Photos (limited to 2 pages, PDF or word) – *optional*		X
Description of previous accomplishments (limited to 1 page, PDF or Word): Description of other successful and related projects for which your organization has been the lead. – *optional*	X	

VIII. APPENDICES

Appendix A: Regional Program Area Map



PD 16 represents approximately 3.5% of the land area of the Commonwealth of Virginia and 4.1% of the State's population (2011), and has experienced the highest regional population growth rate of any region in the State for more than the last 20 years.

Appendix B: Description of GWRC & Partner Accomplishments

- **George Washington Regional Commission**: (http://www.gwregion.org/)

  1. Coordinated sub-state grant award for PDCs' and local governments' review of Chesapeake Bay water quality model input data for land cover and land cover change, population and employment trends (2008); and performed PD 16 review tasks as well under the grant.

  2. Sub-grantee (2011) under sub-state regional planning grant awarded to Middle Peninsula Planning District Commission to coordinate and update local land cover and bmp inventories, develop local WIP strategies and recommend legislative, regulatory and financial resources needed to build capacity to meet Chesapeake Bay TMDL goals.

  3. Coordinated local review of Chesapeake Bay Phase III checklist and organized interactive database of local development codes to document local government compliance with Chesapeake Bay Act requirements. Project became a model for State development of on-line local ordinance search tool found at: http://www.dcr.virginia.gov/stormwater_management/requirements_search.cfm#interface

- **Eldon James & Associates, Inc.** (http://www.eldonjamesassociates.com/)

  1. Principal and owner, Eldon James, serves as legislative liaison for GWRC and many local government clients.

  2. Mr. James serves as the Coordinator of the Rappahannock River Basin Commission, actively working with State and local-elected officials, PDC and local government technical staffs in the Rappahannock River Basin on water quality issues of the River, its tributaries and the Chesapeake Bay. The Commission's efforts have developed significant information and public policy related to water supply, water quality and market-based solutions to achieve local, regional and state water quality goals.

  3. Mr. James is the former County Administrator for King George County, and before that the County Planning Director and Parks and Recreation Director.

- **Aqualaw, P.L.C.** (http://www.aqualaw.com/)

  1. AquaLaw is a specialty law firm that enjoys one of the broadest water practices of any U.S. law firm. The firm stays on the cutting edge as General Counsel to several national and statewide trade associations for whom we address the full gamut of legislative, regulatory and litigation issues affecting members' operations. AquaLaw PLC was founded in 2002. Over the past 10 years, AquaLaw has grown to one of the largest, best-known water law practices in the United States, including broad experience in 5 eastern states (VA, MD, WV, NC and SC). This firm represents localities on water-related projects, such as regulatory, permitting, compliance, enforcement defense, local ordinance development and enforcement, contract negotiation, nutrient trading, funding and other various utility matters.

  2. President and co-founder Chris Pomeroy serves as General Counsel to the Virginia Municipal Stormwater Association (VAMSA), and a similar local government organization in Maryland, the Stormwater Association of Maryland. In this capacity, Mr. Pomeroy has represented localities in cutting edge legislative and regulatory environmental legal and policy issues associated with stormwater management, including DCR's new VSMP Regulations.

- **Conservation Concepts, L.L.C.**

  1. Founded by Doug Pickford, Conservation Concepts worked with GWRC and local governments to help formulate the regional response to DCR's request for local government input on the Chesapeake Bay TMDL Phase -2 WIP.

  2. The firm, as a member of the Clean Water Coalition, has provided other consulting support to local governments in the design and implementation of various water quality program initiatives.

- **Friends of the Rappahannock (FOR)** (http://riverfriends.org/)

  1. John Tippett, FOR Executive Director, has worked with the City of Fredericksburg and Stafford County in the review and revision of local development codes to enhance water quality. Moreover, Mr. Tippett served on the technical advisory committee for the development of the revised State stormwater management regulations.

  2. FOR continues to work with local governments throughout the Rappahannock River Basin to promote water quality protection and enhancement, restoration of natural habitat, etc. In partnership with the James River Association and the Potomac Conservancy, FOR recently completed a review of all non-tidal Rappahannock Basin locality development codes and ordinance with respect to LID performance.

3. FOR Programs Director Chip Rice is currently working with localities in the Rappahannock Basin to identify opportunities to improve development-related code language with respect to LID and working with residential land owners to mitigate stormwater runoff on-site through the FOR's "Rainscape Retrofit" program. Prior to working with FOR, Chip worked with Virginia's Department of Conservation and Recreation and VCU Center for Environmental Studies focusing on Chesapeake Bay water quality policy and restoration activities including the Chesapeake Bay TMDL.

Appendix C: Partner Organizations: Resumes

1. **George Washington Regional Commission** (1 page)
2. **Eldon James & Associates, Inc.** (1 page)
3. **Aqualaw, P.L.C.** (1 page)
4. **Conservation Concepts, L.L.C.** (9 pages)
5. **Friends of the Rappahannock (FOR)** (3 pages)

George Washington Regional Commission: Kevin F. Byrnes, Project Manager

Summary of Professional Experience

August, 2006 to Present:
Director of Regional Planning and Regional Demographer
George Washington Regional Commission (GWRC)
Regional public policy, program and project management for local governments in Virginia's Planning District 16. Grant writing and grant administration. Demographic research and analysis. Drafting legislative and regulatory program review comments.
Samples of Current or Recent Projects:

- Secured and implemented $1 million grant project to provide home energy-efficiency retrofit improvements in Fredericksburg City and Caroline County
- Managed the update of regional All-Hazards Mitigation Planning Grant
- Co-author of $6.2 million Neighborhood Stabilization grants supporting regional program to buy, rehab and re-sell foreclosed residences.
- Coordinated regional and small area demographic and economic estimates forecasting work for 2 cycles of long-range transportation plan update
- Coordinated local responses to Chesapeake Bay Preservation Act Phase 3 and TMDL Watershed Implementation Plan – Phase 2 efforts.

August 1999 - July 2006:
Aging Demographer, *Virginia Department for the Aging*
Produced estimates and projections of the demographic and health characteristics of older Virginian population; monitored current number and supply of and developed forecasts for long-term care providers, facilities and client populations. Compiled demographic statistics on Virginia's aging population, developed and maintained geographic information system (GIS) on aging-related facilities and demographics, used Internet to research demographic and programmatic data sources and methodologies. Developed written reports, multi-media presentations, maps and other graphics describing the aging trends of Virginia's population. Provided demographic and technical planning support to statewide network of 25 local agencies on aging, serving as adjunct staff for facility siting and service delivery studies.

October 1995 to August 1999:
Manager, Office of Recycling and Waste Management Services
Virginia Commonwealth University
Organized integrated waste management and recycling program for VCU and the Medical College of Virginia at VCU. Hired and supervised recycling collection crews and foremen, coordinated procurement of and managed University waste collection and disposal contracts.

January, 1995 to present:
Regional Decision Systems, Owner
Established sole proprietorship consulting practice, providing regional planning, demographic and market research and geographic information systems (GIS) applications development services.

February, 1991 to September, 1994:
Executive Director, *Central Virginia Waste Management Authority*
First chief executive officer of public service authority serving 13 local governments with FY '94-'95 operating budget of $7 million. Responsible for strategic planning, work program development and implementation, personnel management, procurement and purchasing, contract negotiation and administration, intergovernmental liaison with Federal, State and local government officials (elected and appointed) and agencies. Supervised a staff of 5, worked with Authority Board of 20 representatives.

November, 1981 to February, 1991
Principal Planner
Richmond Regional Planning District Commission

February, 1979 - November, 1981
Development of Regional Impact Coordinator
South Florida Regional Planning Council

May, 1976 - January, 1979
Associate Systems Analyst
Tri-County Regional Planning Commission

September, 1975 - May, 1976
Information Systems Specialist
Clinton County Planning Department

Education:

MASTER OF ARTS, Geography, 1977
Michigan State University

BACHELOR OF ARTS, 1973
Michigan State University
Major: Geography
Minor: Economics, Sociology

ADDITIONAL COURSES:

- Real Estate Feasibility Analysis, VCU, 1988
- Traffic Impact Analysis, Northwestern University
- Economic Development Certification, Virginia Tech University, 1988.

Areas of Expertise:

- *Demographic research, analysis and forecasting*
- *Application of GIS technology to diverse planning projects*
- *State, regional and local waste management and recycling policies and programs*
- *Grant writing and research/ Legislative liaison and tracking*
- *Regional program, project & organization management*
- *Facilitating discussions between groups representing diverse points of view*
- *Staff support for large and diverse boards of directors*

Activities:

- *Member, American Planning Association (APA) & American Institute of Certified Planners (AICP)*
- *Chairman (2011) and Member (2009-2011), Virginia Recycling Markets Development Council*
- *Secretary/Treasurer, Intergovernmental and Regional Planning Division, American Planning Association, 2008-2010.*
- *Regional Agencies Co-Chair, Solid Waste Association of North America (SWANA), 1993-1994*
- *Regional Agencies Co-Chair, Urban and Regional Information Systems Association (URISA), 1986-1988*
- *Member, Virginia Shaggers Hall of Fame, 2010.*
- *Member, Competitive Shaggers Association*
- *Shag dance instructor*
- *Past Vice President, Secretary, and Treasurer and Current Webmaster, Richmond Shag Club*

Eldon James & Associates, Inc.

ELDON JAMES & Associates, Inc.
CONSULTANTS

L. ELDON JAMES, JR.

Summary of Professional Experience

December 16, 1994 to Present:
PRESIDENT, Eldon James & Associates, Inc.
Public policy, program and project management consulting for local governments and human service non-profits. Represents public and private sector clients in dealings with regulatory agencies, elected or appointed officials and community groups or activists. Specializing in: project and program funding, analysis of the fiscal impacts of major projects, advocacy and efforts requiring active public and stakeholder participation.
Representative Samples of Current or Recent Projects:

- Legislative and Public Policy Consultant for Virginia Goodwill Industries, American Planning Association-Virginia Chapter, Virginia Recreation and Park Society, Virginia Network for Victims and Witnesses of Crime, Western Virginia Regional Jail and twelve Virginia localities.
- Association Manager, Virginia Association of Area Agencies on Aging.
- Project Manager/Funding Consultant for Caroline County - Dawn Decentralized Wastewater Treatment System and Housing Rehabilitation Project (One of three projects recognized by the National Civic League in Caroline County's 2009 All American City Award).
- Staff Director, Rappahannock River Basin Commission.
- Interim Executive Director, George Washington Regional Commission.

December 1, 1989 to December 15, 1994:
COUNTY ADMINISTRATOR, King George County, Virginia
Responsible to the Board of Supervisors as chief executive officer. Administered various functions of county government including budget and finance, utilities, solid waste, economic development, and community development. Lead staff for major projects including: creation of a public service corporation to consolidate public and private water and sewer systems, analysis of the long-term impacts of changing solid waste management regulations, the site selection of a public-private regional landfill and the negotiation of the landfill host agreement, development of a fiscal impact assessment tool to support cash proffers, the location of over $400 million in new industrial investment.

July 1, 1988 to November 30, 1989:
DIRECTOR, Planning & Community Services, King George County

November 12, 1985 to June 30, 1988:
DIRECTOR, Parks & Recreation, King George County

August 1, 1984 to November 1, 1985:
MANAGER/ASSISTANT DIRECTOR, Northern Virginia 4-H Center

July 1, 1979 to August 1, 1984:
GRANTS ADMINISTRATOR and RECREATION CONSULTANT, Virginia Commission of Outdoor Recreation

Education

MASTERS OF URBAN AND REGIONAL PLANNING, *1979*
Virginia Commonwealth University,

BACHELOR OF SCIENCE
1977, Virginia Commonwealth University,
Major: *Recreation Resource Management*
Supportive Course*: Business Administration, Economics, Statistics*

ADDITIONAL COURSES:
"Governmental Financial Management", Virginia Commonwealth University,
Department of Public Administration

Areas of Expertise:

- *Legislative and administrative approvals*
- *Representation of human service, natural resources and local government issues before state administrative and legislative bodies*
- *Program, project & organization management*
- *Facilitating discussions between groups representing diverse points of view*
- *Staff support for large and diverse boards of directors*

Activities:

- *Chair of the Board of Directors, Rappahannock Goodwill Industries*
- *Board of Directors, Virginia Interfaith Center for Public Policy*
- *Virginia Economic Developers Assoc*
- *Member, King George County Chamber of Commerce, President 1995 and 1996*
- *Member, Fredericksburg Regional Chamber of Commerce, Board of Directors 1995 and 1996*
- *Board of Directors, Foundation for the Virginia Recreation and Park Society.*

Aqualaw, P.L.C.

Background

AquaLaw PLC was founded in 2002. Over the past 10 years, AquaLaw has grown to one of the largest, best known water law practices in the United States, including a substantial client base in five eastern states (VA, MD, WV, NC and SC).

Christopher D. Pomeroy, Esq. President

AquaLaw co-founder and President, Christopher D. Pomeroy, has represented numerous individual localities on water-related projects, such as regulatory permitting, compliance, enforcement defense, ordinances, contracts, nutrient trading, funding and various utility matters.

In addition, Mr. Pomeroy serves as General Counsel to the Virginia Municipal Stormwater Association and a similar local government organization in Maryland, the Stormwater Association of Maryland. In this capacity, Mr. Pomeroy has represented localities in most cutting-edge legislative and regulatory environmental policy issues associated with stormwater management, including development of DCR's new VSMP Regulations and the agency's effort to "roll out" the new regulations at the locality level through local ordinances.

Mr. Pomeroy's local government service also includes his long-time role as General Counsel to the Virginia Association of Municipal Wastewater Agencies and the Maryland Association of Municipal Wastewater Agencies. These roles involved many of the same types of water quality-related legal issues associated with local wastewater infrastructure that now pertain to stormwater management. Beginning in 2005, Mr. Pomeroy organized and counseled the Virginia Nutrient Credit Exchange and its Board of Governors in the start-up and ongoing operations of the largest point source nutrient trading program in the U.S. He is actively engaged in Virginia's trading program expansion to improve the economic feasibility of the Chesapeake Bay cleanup and prospects for success, including cost mitigation for urban stormwater management.

Mr. Pomeroy is a long-time member of the Chesapeake Bay Program's Water Quality Goal Implementation Team and its predecessor committees and, in this capacity, has helped to improve various aspects of Chesapeake Bay-related policies. He has been appointed to numerous state and federal advisory committees, and he is a frequent speaker on emerging legal issues concerning water law and utilities.

Mr. Pomeroy earned his J.D from the George Washington University Law School (Washington D.C.) and his B.S. in Biology from Fairfield University (Conn.)

D. Cabell Vest, Esq.

Attorney Cabell Vest joined AquaLaw in 2009. His prior experience in environmental planning, land use, and real estate transactions with a national law firm is applied throughout AquaLaw's water quality practice and especially in stormwater management policy, local planning and implementation, and on site-level projects.

In addition to a J.D. from the University of Richmond, Mr. Vest earned an M.S. in Urban and Regional Planning and a B.A. in Architectural history from the University of Virginia. He previously worked as a Land Use Planner in a leading real estate law practice in Northern Virginia, and is a LEED (Leadership in Energy and Environmental Design)- Accredited Professional.

Conservation Concepts, L.L.C.

DOUGLAS A. PICKFORD, President/CEO: Conservation Concepts, LLC

Background

Mr. Pickford has worked in the public and private sectors practicing land use and environmental planning for over 26 years. For eight of those years he served as the Director of Planning and Environmental Services at the Northern Virginia Regional Commission. In 2006 Mr. Pickford established Conservation Concepts, LLC, a private, independent consulting practice based in Fairfax County, Virginia.

Expertise

- Stormwater Management Planning
- Low Impact Development Watershed Planning
- Project Management
- Environmental Policy Transportation and Land Use Planning
- Economic Development and Community Preservation
- Proposal Development/Project Estimation

Recent Work/Accomplishments

- Developed E^3Calc – A greenhouse gas emissions calculator designed to measure the effectiveness that transportation demand management strategies have on reducing businesses carbon footprint.
- Developed a management plan for the Potomac Heritage National Scenic Trail that included 14 local governments and over 200 miles of trail corridor.
- Served as Director of Environmental and Planning Services for Northern Virginia Regional Commission (NVRC) 1998 – 2006.
- Managed NVRC's Occoquan Watershed Management Program.
- Oversaw NVRC's Four Mile Run Program.
- Managed the Northern Virginia Water Supply Study (Legislative Mandate).
- Chaired and Managed the Development of the Northern Virginia Low Impact Development Guidelines (Supplement to the Northern Virginia Stormwater BMP Handbook).
- Developed and Implemented the Know Toxics Campaign for the Northern Virginia Waste Management Board.
- Developed a program (Cool Schools) that paralleled the Cool Counties and Cool City programs that looked to reduce the carbon footprints of public school systems across America.
- Represented local governments on a U.S. delegation that briefed senior federal officials of the German Government in preparation of the impending 2007 G-8 Summit In Heiligendamm, Germany.
- Currently developing a long-range transportation demand management plan for the Dulles region.
- Staffed the Northern Virginia Waste Management Board.
- Staffed NVRC's Energy and Environmental Policy Committee.
- Managed numerous federal, state and non-profit grant programs.

Education

George Mason University, 1986. Bachelor of Science in Public Administration.

RICHARD L. STANFORD, P.E., BCEE, Principal Associate

Background

Mr. Stanford has over 35 years of environmental engineering experience which enables him to combine hands-on management with a thorough knowledge of regulatory compliance requirements and technical expertise in watershed and stormwater management.

Mr. Stanford has worked as a consultant and for the USEPA in Washington, D.C. While at the EPA, Mr. Stanford oversaw the activities of the CWA 208 planning group, the Criteria and Standards Division, the Monitoring and Data Support Division, and various effluent guidelines. Over the past 20 years, Mr. Stanford has participated in and directed numerous studies to develop watershed management plans, stormwater management programs, wastewater treatment facility evaluations and environmental compliance surveys.

Expertise

Stormwater Management Planning
Low Impact Development
Watershed Planning
Project Management
Environmental Policy

Recent Work/Accomplishments:

WETLANDS AND WATERSHEDS

- Developing a comprehensive watershed management, stormwater management and stream restoration plan for a 2,400-acre watershed at Ft. Lee, Virginia.
- Evaluated, designed and oversaw construction of a 300' natural design stream reach that was eroding its bed and banks – endangering a pedestrian bridge and encroaching into an Army water treatment training area.
- Developed the plans and permit application (banking instrument) for a 60-acre wetland bank in Orange County, NY
- Performed wetlands delineations for two 100-acre areas in southern Virginia.
- Developed the conceptual plan for an entrepreneurial wetland bank in Isle of Wight County, Virginia.
- Developed an integrated watershed model that allows three types of precipitation input, four abstraction alternatives, three runoff procedures, and three flood routing techniques. It also will simulate the effects of detention ponds and grassy swales as best management practices on a subwatershed basis.
- Developing an integrated hydraulic water quality model of a bioretention area to be used to better design best management practices.

STORMWATER MANAGEMENT PROJECTS

- Providing general engineering design and monitoring assistance for Low Impact Development projects undertaken by the Fairfax County Stormwater Planning Division throughout Fairfax County, Virginia
- Assisted the Choose Clean Water Coalition with providing primary support to the George Washington Regional Commission and their regional local government partners, with developing their regional Phase 2 WIP submittal
- Participating in research and development studies of Low-Impact Development (LID) stormwater management practices in China:
  - bioretention for nutrient removal (Chinese Academy of Sciences – Beijing),
  - bioretention hydrology and hydraulics (Beijing Normal University – Beijing),
  - stormwater wetlands (Nanchang University – Nanchang), and
  - green roof studies (Sichuan University – Chengdu)
- Evaluated LID opportunities for an infill neighborhood in Fairfax County, Virginia to address yard flooding and stream erosion problems. Prepared the design for infiltration swales, rain gardens and other LID units.

- Evaluated the feasibility of various LID units, prepared the designs and oversaw construction of the units at Ft. Lee, Virginia
  - Bioretention unit to manage runoff from a 1.5-acre parking lot
  - Plunge pool and natural channel to convey water discharged from a large storm water
  - management pond
  - Series of infiltration swales, rain gardens and level spreaders to manage runoff from a training area
  - Natural channel to convey water away from a stormwater dry pond.
  - Porous pavement and infiltration swale to manage runoff from a 1-acre parking lot
- As a member of the Technical Workgroup, provided input toward the development of the Northern Virginia Low Impact Development Guidelines (Supplement to the Northern Virginia Stormwater BMP Handbook).
- Obtained Stormwater Permits and Prepared Storm Water Pollution Prevention Plans for five Maryland Transportation Authority facilities near Baltimore, MD.
- Prepared and delivered a Low-Impact Development short-course for the Department of Public Works at Ft. Lee, Virginia.
- Designed and obtained construction permits for Low-Impact Development (LID) stormwater management practices at several facilities in Northern Virginia.
- Designed Low-Impact Development stormwater retrofit practices, including infiltration trenches and bioretention units ('rain gardens') for the refurbishing of a street in Takoma Park, Maryland.
- Evaluated the feasibility of implementing Low-Impact Development (LID) approach to stormwater management and preparing the initial design of stormwater management facilities for a portion of the former Lorton Reformatory in Fairfax County, Virginia. Prepared preliminary designs for parking lot bioretention facilities, building bioretention facilities, infiltration galleries, porous pavement areas and porous paver areas.
- Revised the Virginia Department of Transportation's Stormwater Manual of Practice – included the use of LID at transportation projects, and a section on the use of natural stream protection principles in the design of highway culverts.
- Designed bioretention areas to capture and treat stormwater runoff in Southwest Washington, D.C. for the Interstate Commission for the Potomac River Basin.
- Designed bioretention units ('rain gardens') for the redevelopment of a portion of the Lorton Reformatory in Fairfax County, VA under a grant from the Virginia Department of Conservation and Recreation (DCR).
- Designed stormwater management facilities for a reservoir and administration building complex in Shenzhen, China.
- Evaluating the performance of an 'ultra urban' bioretention best management practice (BMP) according to the procedures set forth by the Technology Acceptance Reciprocity Partnership (TARP).
- Designed the cover for an industrial waste landfill at a plastics manufacturing facility in Virginia. The design included determining potential stormwater volumes and durations and the design of facilities (culverts, drains, discharge pipes) to prevent stormwater from adversely affecting the landfill cover.
- Prepared the stormwater management plan for stormwater holding lagoons at a major oil refinery in Ohio. The stormwater management plan included sampling and analysis of stormwater, monitoring the lagoon volume, evaluation and maintenance of the lagoon dikes and a stormwater discharge strategy to be instituted during and following storm events.
- Prepared the backwater analysis of a river segment in Ohio to determine the effect of proposed construction activities and ground/stormwater management activities in the river on stormwater and flood stages. The runoff portions of the project were modeled using TR-55; the river reach was modeled using HEC-2.
- Prepared Spill Prevention Control and Countermeasures (SPCC) Plans for facilities throughout the United States.

STREAMS

- Prepared the backwater analysis of a river segment in Ohio to determine the effect of proposed construction activities and ground/stormwater management activities in the river on stormwater and flood stages. The runoff portions of the project were modeled using TR-55; the river reach was modeled using HEC-2.
- Performed a natural channel assessment of an incised and eroding stream segment in Fairfax County, Virginia. Designed bank stabilization measures. Performed floodplain analyses and obtained construction permits from the County.

- Performed a natural channel assessment of a segment of Bailey Creek at a Water Training Area of Ft. Lee, Virginia. Designed new stream cross-sections, plan and profile for the stream segment using natural channel design principles. Oversaw construction.
- Evaluating the designation of a stream segment in Fairfax County as 'perennial'.

Education

PhD, Environmental Sciences, University of Virginia, (pending)
MS, Engineering, Harvard University, 1977
MS, Environmental Engineering Sciences, University of Florida, 1976
BS, Marine Sciences, University of West Florida, 1972

Registrations/Certification

- Professional Engineer -Virginia, Maryland, Pennsylvania, Delaware, North Carolina and Georgia
- Board Certification -American Academy of Environmental Engineers
- Certified Senior Ecologist – Ecological Society of America
- Registered Site Manager - North Carolina
- Sediment & Erosion Control -Virginia (Combined Administrator No. 331)
- Maryland Sediment & Erosion Control Certification (No. 1682)
- EM 385-1-1 Construction Hazard Recognition (required for U.S. Army Corps of Engineers projects)
- OSHA 30-hour Construction Safety Certification

Other Professional Activities

Associate Director – Lord Fairfax Soil & Water Conservation District
Member – Shenandoah County Dam Safety Committee
Member – Erosion & Sediment Control Committee
Former Co-Chair – Shenandoah County Integrated (TMDL) Implementation Committee
Member – Virginia ASCE Stormwater Technical Advisory Committee
Past Member – Shenandoah County Water Resources Advisory Committee
Past Member – Northern Virginia Regional Commission Committee to Revise the Northern VA BMP Manual
Master Stormwater Practitioner – Chesapeake Bay Stormwater Training Partnership.

Other Professional Training

- Computer Aided Design for Stream Restoration (NCSU Course RC-221)
- USDA-NRCS Short Course on Stream Stabilization (NEH Part 654)
- USU Geomorphology Short Course (co-taught by Dr. Jack Schmidt, USU and Dr. Peter Wilcox, Johns Hopkins)
- Natural Stream Restoration Short Course (co-taught by Dr. Margaret Palmer, UMd and Dr. Peter Wilcox, Johns Hopkins)
- Applied Fluvial Geomorphology (Rosgen Level I)
- River Morphology and Applications (Rosgen Level II)
- River Assessment and Monitoring (Rosgen Level III)
- River Restoration and Natural Channel Design (Rosgen Level IV)
- Basic Sediment and Erosion Control in Virginia
- Sediment and Erosion Control for Plan Reviewers (Virginia)
- Sediment and Erosion Control for Inspectors (Virginia)
- Groundwater Contaminant Transport - Princeton Associates (Princeton, New Jersey)
- Groundwater Principles - University of Waterloo (Ontario, Canada)
- AHERA Asbestos Project Design
- 40-hour Hazardous Materials Health & Safety Training
- Hazardous Materials Supervisor Training
- Various other Short-courses

ROSS D. PICKFORD, Principal Associate

Background
Mr. Pickford has 34 years of experience in the field of environmental science and engineering including over 20 years of project management and business development experience. Mr. Pickford has worked for and with both private industry as well as federal, state and local governments. He has extensive knowledge and experience in Low-impact Development (LID) stormwater management. He has developed detailed LID studies on extensive military facilities as well as for private entities. Mr. Pickford participated with local government officials and other interested parties in the Northern Virginia Regional Commission Workgroup developing the Low-Impact Development Supplement to the Northern Virginia BMP Handbook.

Expertise
- LID Stormwater Management Planning
- Watershed Assessment
- NEPA Environmental Assessments and Impact Statements
- Environmental Baseline Studies
- Wetland Delineations
- Environmental Compliance Assessments
- Phase I/II/III Environmental Site Assessments
- Cost Analysis
- Public Outreach and Technical Assistance
- Water Quality Assessment

Recent Work/Accomplishments
- Technical Consultant for the RiverSmart Communities program contract tasked with installing LID technologies at multi-family residential, houses of worship, or small businesses in Washington, D.C.
- Assisted the Choose Clean Water Coalition with providing primary support to the George Washington Regional Commission and their regional local government partners, with developing their regional Phase 2 WIP submittal.
- Completed a Low-Impact Development Stormwater Management Design Plan for the 174 acre Defense Supply Center Richmond.
- As a member of the Technical Workgroup, provided input toward the development of the Northern Virginia Low Impact Development Guidelines (Supplement to the Northern Virginia Stormwater BMP Handbook).
- Constructed 2 green roof stormwater management BMPs for a private concern.
- Developed a detailed LID Stormwater Management Plan with conceptual BMP designs for Crossfield Elementary School in Fairfax County, VA.
- Assisted in developing stormwater management BMP designs based on LID principals for Fort Lee.
- Assisted with establishing a Low-Impact Development Stormwater Management Plan for the redevelopment of the minimum security facility at the former Lorton Correctional Institution.
- Evaluated numerous industrial stormwater runoff control systems for both pollutant reduction and cost effectiveness and developed Stormwater Pollution Prevention Plans for six bus and rail maintenance facilities in Baltimore, MD.
- Participated in the Northern Virginia Regional Commission Workgroup tasked with developing the Draft Low Impact Development Supplement to the Northern Virginia BMP Handbook.
- Evaluated both urban and rural settings for non-point and point source runoff contributions and pollutant loadings including soil erosion and sediment transport and the use of best management practices for their mitigation.

Education
B.S., Environmental Health, Old Dominion University, VA, 1979
Graduate Studies, Environmental Science and Engineering, Virginia Tech University, Blacksburg, VA, 1984-1990

Registrations/Certifications

- Certified Hazardous Materials Manager (CHMM), Institute of Hazardous Materials Management, Bethesda, Maryland, January 1986 (not active)
- OSHA Certified Hazardous Waste Operations and Emergency Response, 29 CFR 1910.120(E)(2), 40 hours of training in health and safety, Versar, Inc., June 1987 (Current)
- Certified Environmental Compliance Assessment System (ECAS), Department of the Army, U.S. Army Toxic and Hazardous Materials Agency, January 1992
- Certified Basic Urban Erosion and Sediment Control in Virginia, Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, July 1988
- NRCS Streambank Stabilization and Restoration, New River-Highlands RC&D Council, October 2007
- US EPA Stormwater Program, BMP Performance course February, 2008.

DAVID E. LILLARD, Principal Associate

Background
Mr. Lillard has 25 years experience in building capacity and leadership among nonprofit organizations and in developing and implementing public involvement campaigns for federal, state, and local governments. As a private-sector consultant and nonprofit executive and director, he has led the founding and growth of several nonprofit conservation organizations and green infrastructure coalitions uniting nonprofits, businesses, and government agencies—with an emphasis on strategic planning that helps organizations build the capacity to sustain their work.

Expertise
- Culture change, change management, and succession planning
- Strategic planning
- Volunteer and membership recruitment and retention
- Information and technology
- Communications research and development, strategy, planning, and media relations
- Board and staff development
- Leadership development
- Fundraising planning, coaching, research, and implementation
- Cultural competency and cross-cultural communications

Recent Work/Accomplishments
- Currently, as a consultant to the Dulles Area Transportation Association, managing brand development of a program to change cultural perceptions of commuting habits in Northern Virginia.
- As staff director of an operating foundation, created a 900-acre environmental preserve and education center in Loudoun County, Va., developing strategic plan and programs, then lead the transition of the organization into a self-sustaining, volunteer-driven nonprofit organization. This work included all aspects of nonprofit formation, fundraising planning, board development, and guiding the succession of leadership.
- Led start-up of a nationwide commentary service distributed to more than 3,000 newspapers featuring well-known science writers and journalists, conducting extensive funding research and securing more than $300,000 funding, to launch.
- Led creation of nonprofit start-up of an 81-acre environmental and arts education center in West Virginia whose public programs are designed to build financial capacity to preserve and steward a rare Shenandoah Wet Prairie marl marsh containing 18 West Virginia rare and threatened plant species.
- Developed technology infrastructure for a regional nonprofit to support fundraising, donor relations, volunteer recruitment, communications and program registrations.
- As a consultant to the National Park Service and Northern Virginia Regional Commission, developed implementation concept plan and strategies, communications, and interpretive media to assist a five-county region of Virginia's Tidal Potomac in qualifying for federal program funding in the Potomac Heritage Trail program.
- As a consultant to the National Park Service, collaborated on creation of a communications network of nonprofits, businesses, and public agencies to support development and conservation of the Potomac Heritage Trail corridor.
- Other relevant experience: Mr. Lillard also has served on the board of a local Virginia Main Street program focused on revitalizing a historic downtown while retaining its historic and cultural characteristics, is a founder of the Land Trust of the Eastern Panhandle and of the American Conservation Film Festival.

Education
M.F.A., Emerson College of Communications, Boston, Mass., 1989.
Bachelor of Arts in Liberal Studies, University of Delaware, Newark, Del., 1983.

AUNDREA HUMPHREYS, Principal Associate

Background
Ms. Humphreys has 15 years experience in marketing, management, communications and membership development in the private and nonprofit sectors. Her work in communications ranges from website concept development to graphics and logo design, communications research, media relations, and social media. Ms. Humphreys is an expert in utilizing social media and internet strategies to build internal and external capacity in small businesses and nonprofit organizations. Ms. Humprheys also is a professional photographer and photojournalist.

Expertise
Volunteer and membership recruitment and retention
Information and technology
Communications research and development, strategy, planning, and media relations

Recent Work/Accomplishments

- Currently, as a consultant to the Dulles Area Transportation Association, developing graphic identity, web and video content, and social network strategies to brand development of a program to change cultural perceptions of commuting habits in Northern Virginia.
- Developed graphic identity and designed/implemented all communications and media strategies for a nonprofit, 81-acre environmental and arts education center in West Virginia with special emphasis on low-cost communications utilizing the internet and social media. This work included extensive media research, media familiarization tours, media events programs, and press relations.
- Developed and implemented mission-critical public events for a collaboration of local nonprofits designed to raise funds, increase institutional capacity, and raise public awareness of environmental education programming.
- Serving as COO of a local nonprofit, created all management and operations policies and procedures to deliver mission-related programs, and developed education programs for youth and adults that connect the arts with environmental education.
- In the private sector, developed all internal policies and procedures, managed membership retention and marketing programs for a for-profit country club.

Education
Bachelors Degree in Business Administration, Marketing; Minor in Communications. Shepherd University, Shepherdstown, W.Va., 2000.

KATHRYN S. MATHEWS, Principal Associate

Background

Ms. Mathews has over 25 years' experience working with not-for-profit environmental and wildlife conservation firms. She develops, plans, and executes strategies to build non-profit brand, increase market share, retain members/donors and supporters, engage partners, achieve financial goals, and communicate mission, vision, and values.

Expertise

Program Leadership, Multi-Channel Strategy and Implementation, Creative Execution
Contracts and Developing Partner Relationships
Fiscal Accountability
Database Maintenance and Management
Customer Service
Legal and Financial Compliance

Recent Work/Accomplishments

- Developed creative strategy, recommended messaging and wrote copy for a variety of nonprofits. Recent clients include The Sierra Club, 600 Million Stray Dogs Need You, the American Forest Foundation, and Divine Word Ministries.
- Planned and executed donor fundraising for a non-profit dedicated to protecting feral cats. Program included acquisition, special appeals, renewals, monthly giving, a quarterly newsletter, coordinated online appeals, and fulfillment. Established strategic and financial goals for annual fund; managed campaign schedule; contracted creative and production for mail; tracked performance; oversaw cashiering. *Achievements included*:
    - Created strategy and budget projections for FY2012, including plan for major donors
    - Revised existing new member acquisition control and tested two new promotions
    - Directed creative and production for 6 special appeals and integrated email campaigns
    - Revised source coding to optimize performance tracking and analysis
- Directed full member fundraising program for an international non-profit, without outside counsel for 4.5 years. Set financial goals, strategy and schedule; directed copy and design; managed production vendors; prepared campaign analytics; managed member services. *Achievements included*:
    - Increased membership by 365% (from 19,800 to 92,000) reducing cost per donor 7.4%
    - Increased net annual income from all sources by 155%
    - Revamped list strategy; directed creation of multiple (4) co-control packages
    - Created a mid-level donor program that doubled $1,000+ donors in a year
    - Increased planned giving recruitment by more than 65% in 12 months
    - Revamped renewal program to reduce cost and improve retention
    - Launched on-line giving program; income doubled in each of its first four years
    - Crafted messaging for direct-response donors in public phase of capital campaign
- Proposed, planned and executed multi-channel membership fundraising program for an advocacy-based U.S. wildlife conservation organization. Managed agency of record, service bureau, and caging, cashiering, and fulfillment. Supervised staff of four. Responsible for financial management and interactions with Accounting and Operations staff. *Achievements included:*
    - Increased membership by 556% (from 62,500 to 410,000)
    - Increased gross annual revenues by 700% from $2 million to $16 million
    - Implemented online Rapid Response Network and built online constituency of 190,000
    - Created a monthly giving program and grew it to 20,000 participants, $2 million annually
    - Directed telemarketing to recruit sustainers, retain existing donors, solicit additional contributions
    - Wrote copy, coordinated building micro sites to increase traffic to Defenders' website
    - Directed door-to-door canvass operation to generate support for wolf reintroduction
    - Implemented a premium-based fundraising program that upgraded donors joining below the introductory dues level to "regular" contributor levels within 15-18 months
    - Managed creation and testing of television infomercial
    - Worked with Sr. Vice-President to design and implement affinity credit card program

Education

Coursework, Business Administration, Northern Virginia Community College
B.A. in English & American Literature, College of William and Mary

Friends of the Rappahannock (FOR)

John Tippett
Executive Director

John has served as Executive Director of Friends of the Rappahannock since 1995. John's professional interests include the design and implementation of Low Impact Development practices, watershed assessment and planning, and integrating the science of watershed management into the local land-use planning process. He cites the removal of the Embrey Dam, the Fredericksburg River Conservation Easement, and the Stafford County Low Impact Development code amendments as some of the organization's recent major achievements.

Prior to joining Friends, John was an Environmental Scientist with Research Triangle Institute in North Carolina. There he developed software models of nutrient and sediment loading for the Tar-Pamlico estuary. He was also lead author on a study of the cost-effectiveness of agricultural BMPs for nutrient trading in the Tar-Pamlico estuary.

A former Kellogg Foundation fellow through Partners of the Americas, John has worked as a consultant on environmental projects in Eastern Europe, the Philippines, and South America. Highlights include development of custom software and the training of government officials on its use for basin wide pollution management for the Danube River basin. In the Philippines, he taught advocacy and fundraising to leaders of local non-profit river conservation groups.

John holds a BS degree in Environmental Science from Allegheny College and a Master's Degree in Environmental Resource Management from Duke University (1990).

Russell (Chip) A. Rice

chip.rice@riverfriends.org
Phone: 540 373 3448 ext: 112

Work Experience

Friends of the Rappahannock
Progams Manager, October 2011 – Present

- Provide oversight and management of restoration programs and advocacy related projects including:
  - Rainscapes Retrofits - residential stormwater management program
  - Rappahannock Restore Corp - volunteer involvement and stewardship development program
  - Promoting LID in Vulnerable Virginia Watersheds - Advocacy project conducting code review and affecting code change to incorporate LID principles in Virginia localities
- Co-manage organizational operations (facilities management, financial oversight, administration oversight)
- Contribute to developing and implementing organizational development goals (capacity building, strategic planning, fundraising)

Environmental Specialist II, July 2007 – October 2011
Center for Environmental Studies, Virginia Commonwealth University

- Serve as Watershed Implementation Coordinator for Virginia Department of Conservation and Recreation, Division of Stormwater Management (DCR)
- Support development, implementation and reporting of Chesapeake Bay policy and programs
- Provide planning and facilitation assistance to communities linking land use and its impact on natural resources and community character
- Support DCR in the development of southern rivers protection programs
- Support DCR in the development and implementation of Virginia's Chesapeake Bay TMDL Phase II Watershed Implementation Plan
- Lead DCR in reporting to Virginia's Secretary of Natural Resources on the Chesapeake Bay and Virginia Waters Clean-Up Plan
- Lead VCU Center for Environmental Studies in project development, grant proposals, contract development, and the identification and development of partnership opportunities
- Provide facilitation and meeting leadership to partner organization: IEN - Virginia Beach sea-level rise listening sessions, Richmond County Comprehensive Plan review committee and community engagement process, Dan River Basin Coalition strategic planning, Middle James Roundtable strategic planning, Southside SPCA strategic planning

Environmental Specialist II, March 2005 – June 2007,
Environmental Services Department, El Paso County, Colorado Springs, Colorado

- Conducted technical review of environmental regulations with respect to County operations (Clean Water Act, Resource Conservation and Recovery Act, Colorado State Hazardous Waste Regulations)
- Developed service requirements and prepared scoping documents for environmental projects
- Conducted environmental investigations and remedial activities
- Managed County environmental databases
- Responsible for environmental regulatory compliance aspects of County operations
  - Colorado Petroleum Storage Tank regulations
  - Hazardous waste management and disposal as regulated under Colorado Hazardous Waste Regulations
  - US EPA Oil Program (SPCC programs)
  - Phase II stormwater program

Environmental Project Manager, April 2004 - January 2005
Institute for Local Government Administration & Rural Development, Ohio Univ., Athens, Ohio

- Responsible for grant proposal, project management and reporting for contract and grant funded projects
- Project management/Principal investigator/Co-Author: Moxahala Creek Acid Mine Drainage Abatement and Treatment (AMDAT) Plan and the Black Fork AMDAT Plan
- Co-author: *Field Methods for Watershed Characterization*, December 2004
- Project Management/Author: Preliminary Assessment and Site Investigation (PASI) for the removal from CERCLA for the Monkey Hollow sub-basin, September 2004
- Lead trainings in water quality sample collection and stream discharge measurement

Raccoon Creek Watershed Coordinator, October 2000 to April 2004,
Institute for Local Government Administration & Rural Development, Ohio Univ., Athens, Ohio

- Developed funding proposals and provided project manahegement to state and federal grant programs
- Coordinated watershed planning
- Project Manager/Co-author: Raccoon Creek Watershed Management Plan, Little Raccoon Creek Acid Mine Drainage Abatement and Treatment (AMDAT) Plan, Headwaters of Raccoon Creek AMDAT Plan, Raccoon Creek Middle Basin AMDAT Plan and the Monday Creek AMDAT Plan.
- Assisted Southeast District of the Ohio EPA with data collection and modeling for the Upper Raccoon Creek Total Maximum Daily Load report and co-authored restoration plan.
- Conducted water quality data collection, stream discharge measurements and data analysis
- Trained and supervised citizen volunteers and university students in surface water sample collection and stream discharge measurement
- Liaison between community and state and federal watershed project partners
- Served on development committees for the Moonville Rail-Trail and the Raccoon Creek Water Trail Projects.

Watershed Coordinator, June 1997-September 2000,
Vinton County Soil and Water Conservation District, McArthur, Ohio

- Coordinator and point of contact for the Raccoon Creek Improvement Committee
- Facilitated monthly community meetings focused on watershed health and restoration awareness
- Implemented Clean Water Act Section 319 grant funded non-point source water quality work plan
- Developed funding for acid mine drainage remediation in the Raccoon Creek Watershed
- Responsible for project administration, budget management, grant writing and grant reporting

Education

- **Masters Degree, Ohio University, Athens, Ohio: Geography – 1997**
    - Major Fields of Study: Natural Resource Management, Physical Geography, and GIS.
- **Bachelors Degree, Kent State University, Kent, Ohio: Business Administration – 1991**
    - Major Fields of Study: Marketing

Appendix D: Participating Jurisdictions: Letters of Support

1. **City of Fredericksburg (2 pages)**
2. **Caroline County (2 pages)**
3. **Town of Bowling Green (2 pages)**
4. **Town of Port Royal (2 pages)**
5. **King George County (2 pages)**
6. **Spotsylvania County (2 pages)**
7. **Stafford County (2 pages)**

Beverly R. Cameron
City Manager

City of Fredericksburg
P.O. Box 7447
Fredericksburg, VA 22404-7447
Telephone: 540 372-1010
Fax: 540 372-1201

September 5, 2012

Mr. Robbie Gariulo, Programs Manager
Division of Stormwater Management
Virginia Department of Conservation and Recreation
203 Governor Street, Suite 206
Richmond, VA 23219

Subject: Locality Endorsement of GWRC Application for DCR Stormwater Program Development Grant

Dear Mr. Gargiulo:

I am writing to convey support for the regional grant application by the George Washington Regional Commission on behalf of the City of Fredericksburg. We believe a collaborative effort by all seven localities in the Region led by the GWRC, and supported by local government technical staff and the selected technical, policy, and legal consultant partners; will best enable our locality to build appropriate local government stormwater programs and capacity with DCR's new Virginia Stormwater Management Regulations to be administered by our locality.

We understand that those project applications selected in this grant competition must complete development by April 1, 2013 of (1) a ***Preliminary Draft Ordinance*** and (2) a ***Draft Funding & Staffing Plan***. We further understand that we must designate a principal staff contact to work with GWRC and DCR in the development and implementation of the local stormwater management program. We also note that other grant-funded activities may continue through June 30, 2014 (e.g., related technical training and/or finalization of the local ordinance(s) and public outreach efforts to prepare the regional and local community for the changes brought about by the program developed through this grant, should GWRC be awarded funding through this competition).

Through the collaboration of urban, suburban and rural localities in this regional program development effort, we believe we can build on the leadership provided through the GWRC in developing and adopting a regional Green Infrastructure Plan (2011) and providing a regional response earlier this year to Virginia's Chesapeake Bay TMDL WIP-2 planning effort. Morever, the on-going work of the Rappahannock River Basin Commission to find cost-effective, market-based water quality solutions will further support the development of practical and efficient mechanisms to better manage stormwater in Planning District 16.

We urge your favorable consideration of GWRC's grant proposal which will support our region's collective efforts to adopt the newly revised Virginia stormwater management local program requirements.

If you have any questions concerning this letter or our stormwater program, please contact Kevin Utt, Site Development Manager with Building and Development Services at (540) 372-1080.

Sincerely,

Beverly R. Cameron
City Manager

cc: Kevin Byrnes, GWRC
Kevin Utt, Building and Development Services

Caroline County, Virginia
Board of Supervisors

Wayne A. Acors
Madison District

Jeff Black
Western Caroline District

Jeff Sili
Bowling Green District

Calvin B. Taylor, Sr.
Port Royal District

Floyd W. Thomas
Mattaponi District

Reginald L. Underwood
Reedy Church District

Charles M. Culley, Jr.
County Administrator

Caroline County, VA
All-America City
2009

August 23, 2012

Mr. Robbie Gargiulo, Programs Manager
Division of Stormwater Management
Virginia Department of Conservation and Recreation
203 Governor Street, Suite 206
Richmond, Virginia 23219

RE: Locality Endorsement of GWRC Application for DCR Stormwater Program Development Grant

Dear Mr. Gargiulo:

I am writing to convey Caroline County's support for the regional stormwater program grant application by the George Washington Regional Commission on behalf of Caroline County. We believe a collaborative effort by all seven localities in the Region led by the GWRC and supported by local government technical staff and the selected technical, policy, and legal partners; will best enable our locality to build appropriate local government stormwater programs and capacity consistent with DCR's new Virginia Stormwater Management Regulations to be administered by localities (and/or other regional partners).

We understand that those project applications selected in this grant competition must complete development by April 1, 2013 of (1) a ***Preliminary Draft Ordinance*** and (2) a ***Draft Funding & Staffing Plan***. We further understand that we must designate a principal staff contact to work with the GWRC and DCR in the development and implementation of the local stormwater management program. We also note that other grant-funded activities may continue through June 30, 2014 (e.g., related technical training and/or finalization of the local ordinance(s) and public outreach efforts to prepare the regional and local community for the changes brought about by the program developed through this grant, should GWRC be awarded funding through this competition).

Through the collaboration of urban, suburban and rural localities in this regional program development effort, we believe we can build on the leadership provided through the GWRC in developing and adopting a regional Green Infrastructure Plan (2011) and providing a regional response earlier this year to Virginia's Chesapeake Bay TMDL WIP-2 planning effort. Moreover, the on-going work of the Rappahannock River Basin Commission to find cost-effective, market-based water quality solutions will further support the development of practical and efficient mechanisms to better manage stormwater in Planning District 16.

We urge your favorable consideration of GWRC's proposal to support our region's collective efforts to help clean up the Chesapeake Bay and its tributaries that traverse our region.

Sincerely,

Charles M. Culley, Jr.
County Administrator
Caroline County

The Historic Town of

BOWLING GREEN

VIRGINIA

September 7, 2012

Mr. Robbie Gargiulo, Programs Manager
Division of Stormwater Management
Virginia Department of Conservation and Recreation
203 Governor Street, Suite 206
Richmond, Virginia 23219

RE: Locality Endorsement of GWRC Application for DCR Stormwater Program Development Grant

Dear Mr. Gargiulo:

I am writing to convey the Town of Bowling Green's support for the regional grant application by the George Washington Regional Commission on behalf of Bowling Green. We believe a collaborative effort by all seven localities in the Region led by the GWRC, and supported by local government technical staff and the selected technical, policy, and legal partners; will best enable our locality to build appropriate local government stormwater programs and capacity consistent with DCR's new Virginia Stormwater Management Regulations to be administered by localities with possible assistance from other regional partners.

We understand that those project applications selected in this grant competition must complete development by April 1, 2013 of (1) a ***Preliminary Draft Ordinance*** and (2) a ***Draft Funding & Staffing Plan***. We further understand that we must designate a principal staff contact to work with the GWRC and DCR in the development and implementation of the local stormwater management program. We also note that other grant-funded activities may continue through June 30, 2014 (e.g., related technical training and/or finalization of the local ordinance(s) and public outreach efforts to prepare the regional and local community for the changes brought about by the program developed through this grant, should GWRC be awarded funding through this competition).

Through the collaboration of urban, suburban and rural localities in this regional program development effort, we believe we can build on the leadership provided through the GWRC in developing and adopting a regional Green Infrastructure Plan (2011) and providing a regional response earlier this year to Virginia's Chesapeake Bay TMDL WIP-2 planning effort. Moreover, the on-going work of the Rappahannock River Basin Commission to find cost-effective, market-based water quality solutions will further support the development of practical and efficient mechanisms to better manage stormwater in Planning District 16.

We urge your favorable consideration of GWRC's proposal to support our region's collective efforts to help clean up the Chesapeake Bay and its tributaries that traverse our region.

Sincerely,

Stephen Manster
Town Manager
Town of Bowling Green

Town of Port Royal

Established 1744

"Behold Us Rising"

August 23, 2012

Mr. Robbie Gargiulo, Programs Manager
Division of Stormwater Management
Virginia Department of Conservation and Recreation
203 Governor Street, Suite 206
Richmond, Virginia 23219

RE: Locality Endorsement of GWRC Application for DCR Stormwater Program Development Grant

Dear Mr. Gargiulo:

The Port Royal Town Council, by motion unanimously adopted at its August 21, 2012 meeting, supports the regional grant application by the George Washington Regional Commission on behalf of the Town of Port Royal. We believe a collaborative effort by all seven localities in the Region led by the GWRC, and supported by local government technical staff and selected technical, policy, and legal partners will best enable our locality to build local government stormwater programs consistent with DCR's new Virginia Stormwater Management Regulations to be administered by localities (and/or other regional partners).

We understand that those project applications selected in this grant competition must complete development by April 1, 2013 of (1) a ***Preliminary Draft Ordinance*** and (2) a ***Draft Funding & Staffing Plan***. We note that towns are exempt from the mandatory adoption of the stormwater regulations; however, we intend to designate a community representative to work with the GWRC and DCR in the development and implementation of the local stormwater management program. We also note that other grant-funded activities may continue through June 30, 2014 (e.g., related technical training and/or finalization of the local ordinance(s) and public outreach efforts to prepare the regional and local community for the changes brought about by the program developed through this grant, provided GWRC is chosen.

Through the collaboration of urban, suburban and rural localities in this regional program development effort, we believe we can build on the leadership provided through the GWRC in developing and adopting a regional Green Infrastructure Plan (2011) and providing a regional response earlier this year to Virginia's Chesapeake Bay TMDL WIP-2 planning effort. Moreover, the on-going work of the Rappahannock River Basin Commission to find cost-effective, market-based water quality solutions will further support the development of practical and efficient mechanisms to better manage stormwater in Planning District 16 and the Town of Port Royal.

We urge your favorable consideration of GWRC's proposal to support our region's collective efforts to help clean up the Chesapeake Bay and its tributaries that traverse our region.

Sincerely,

Nancy Long, Mayor
Town of Port Royal, Va

Nancy Long
Mayor, Town Council
Town of Port Royal, Virginia

Cc: Kevin F. Byrnes, GWRC

Town of Port Royal ~ 419 King Street ~ P.O. Box 29 ~ Port Royal, Virginia 22535 ~ (804) 742-5331

RUBY A. BRABO
Dahlgren Election District

CEDELL BROOKS, JR.
Shiloh Election District

JOSEPH W. GRZEIKA
James Madison Election District

JOHN P. LoBUGLIO
James Monroe Election District

DALE W. SISSON, JR.
At-Large Election District

King George County, Virginia

COUNTY ADMINISTRATOR
A. TRAVIS QUESENBERRY, P.E.
10459 Courthouse Drive, Suite 200
King George, VA 22485
Telephone: (540)775-9181
FAX: (540)775-5248
Website: www.king-george.va.us

August 22, 2012

Mr. Robbie Gargiulo, Programs Manager
Division of Stormwater Management
Virginia Department of Conservation and Recreation
203 Governor Street, Suite 206
Richmond, Virginia 23219

RE: Locality Endorsement of GWRC Application for DCR Stormwater Program Development Grant

Dear Mr. Gargiulo:

I am writing to convey King George's support for the regional stormwater program grant application by the George Washington Regional Commission on behalf of King George County. We believe a collaborative effort by all seven localities in the Region led by the GWRC and supported by local government technical staff and the selected technical, policy, and legal partners; will best enable our locality to build appropriate local government stormwater programs and capacity consistent with DCR's new Virginia Stormwater Management Regulations to be administered by localities (and/or other regional partners).

We understand that those project applications selected in this grant competition must complete development by April 1, 2013 of (1) a ***Preliminary Draft Ordinance*** and (2) a ***Draft Funding & Staffing Plan***. We further understand that we must designate a principal staff contact to work with the GWRC and DCR in the development and implementation of the local stormwater management program. We also note that other grant-funded activities may continue through June 30, 2014 (e.g., related technical training and/or finalization of the local ordinance(s) and public outreach efforts to prepare the regional and local community for the changes brought about by the program developed through this grant, should GWRC be awarded funding through this competition).

Through the collaboration of urban, suburban and rural localities in this regional program development effort, we believe we can build on the leadership provided through the GWRC in developing and adopting a regional Green Infrastructure Plan (2011) and providing a regional response earlier this year to Virginia's Chesapeake Bay TMDL WIP-2 planning effort. Moreover, the on-going work of the Rappahannock River Basin Commission to find cost-effective, market-based water quality solutions will further support the development of practical and efficient mechanisms to better manage stormwater in Planning District 16.

We urge your favorable consideration of GWRC's proposal to support our region's collective efforts to help clean up the Chesapeake Bay and its tributaries that traverse our region.

Respectfully,

A. Travis Quesenberry, P.E.
County Administrator

County of Spotsylvania
Founded 1721

Board of Supervisors
ANN L. HEIDIG
EMMITT B. MARSHALL
TIMOTHY J. McLAUGHLIN
BENJAMIN T. PITTS
DAVID ROSS
GARY F. SKINNER
PAUL D. TRAMPE

Service, Integrity, Pride

County Administrator
C. DOUGLAS BARNES
Deputy County Administrator
ERNEST L. PENNINGTON
P.O. BOX 99
SPOTSYLVANIA, VIRGINIA 22553
Voice: (540) 507-7010
Fax: (540) 507-7019

September 6, 2012

Mr. Robbie Gargiulo, Programs Manager
Division of Stormwater Management
Virginia Department of Conservation and Recreation
203 Governor Street, Suite 206
Richmond, Virginia 23219

RE: Locality Endorsement of GWRC Application for DCR Stormwater Program Development Grant

Dear Mr. Gargiulo:

Due to the Virginia Department of Conversation and Recreation's codified mandate requiring local governments to adopt new Virginia Storm Water regulations, and for localities to manage the Virginia Stormwater Management Permit program, VSMP, I am writing to convey Spotsylvania's support for the regional grant application filed by the George Washington Regional Commission on behalf of Spotsylvania and Planning District 16 counties. This is a grant only program not requiring a local match of any kind other than in-kind work hours of staff. Application is designed to off-set the costs of local VSMP implementation; however, Spotsylvania's status as a MS-4 locality and Chesapeake Bay Ordinance jurisdiction constitutes a 20 point disadvantage in grant rankings. Therefore, we believe a collaborative effort by all seven localities in the Region led by the GWRC, and supported by local government technical staff and the selected technical, policy, and legal partners; will best enable our locality to build appropriate local government stormwater programs, and capacity consistent with DCR's new mandated Virginia Stormwater Management Regulations.

We understand that those project applications selected in this grant competition must complete development by April 1, 2013 of (1) a ***Preliminary Draft Ordinance*** and (2) a ***Draft Funding & Staffing Plan***. We further understand that we must designate a principal staff contact to work with the GWRC and DCR in the development and implementation of the local stormwater

management program. We also note that other grant-funded activities may continue through June 30, 2014, if extension beyond July 1, 2013 is granted by the Virginia Soil Water Conservation Board, (e.g., related technical training and/or finalization of the local ordinance(s) and public outreach efforts to prepare the regional and local community for the changes brought about by the program developed through this grant, should GWRC be awarded funding through this competition).

Through the collaboration of urban, suburban and rural localities in this regional program development effort, we believe Planning District 16 has a better competitive advantage of a Virginia Department of Conservation and Recreation grant award.

We urge your favorable consideration of GWRC's proposal to support our region's collective efforts to help clean up the Chesapeake Bay and its tributaries that traverse our region.

Sincerely,

C. Douglas Barnes

C. Douglas Barnes
County Administrator

STAFFORD
Virginia

Board of Supervisors
Susan B. Stimpson, Chairman
Cord A. Sterling, Vice Chairman
Jack R. Cavalier
Paul V. Milde, III
Ty A. Schieber
Gary F. Snellings
Robert "Bob" Thomas, Jr.

Anthony J. Romanello, ICMA-CM
County Administrator

August 28, 2012

Mr. Robbie Gargiulo, Programs Manager
Division of Stormwater Management
Virginia Department of Conservation and Recreation
203 Governor Street, Suite 206
Richmond, Virginia 23219

SUBJECT: Locality Endorsement of GWRC Application for DCR Stormwater Program Development Grant

Dear Mr. Gargiulo:

I am writing to convey support for the regional grant application by the George Washington Regional Commission on behalf of Stafford County. We believe a collaborative effort by all seven localities in the Region led by the GWRC, and supported by local government technical staff and the selected technical, policy, and legal consultant partners; will best enable our locality to build appropriate local government stormwater programs and capacity consistent with DCR's new Virginia Stormwater Management Regulations to be administered by our locality.

We understand that those project applications selected in this grant competition must complete development by April 1, 2013 of (1) a ***Preliminary Draft Ordinance*** and (2) a ***Draft Funding & Staffing Plan***. We further understand that we must designate a principal staff contact to work with the GWRC and DCR in the development and implementation of the local stormwater management program. We also note that other grant-funded activities may continue through June 30, 2014 (e.g., related technical training and/or finalization of the local ordinance(s) and public outreach efforts to prepare the regional and local community for the changes brought about by the program developed through this grant, should GWRC be awarded funding through this competition).

Through the collaboration of urban, suburban and rural localities in this regional program development effort, we believe we can build on the leadership provided through the GWRC in developing and adopting a regional Green Infrastructure Plan (2011) and providing a regional response earlier this year to Virginia's Chesapeake Bay TMDL WIP-2 planning effort. Moreover, the on-going work of the Rappahannock River Basin Commission to find cost-effective, market-based water quality solutions will further support the development of practical and efficient mechanisms to better manage stormwater in Planning District 16.

1300 Courthouse Road, Stafford, VA 22555-0339 Phone: (540) 658.8603 Fax: (540) 658.7643 www.staffordcountyva.gov

We urge your favorable consideration of GWRC's grant proposal which will support our region's collective efforts to adopt the newly revised Virginia stormwater management local program requirements.

If you have any questions concerning this letter or our stormwater program, please contact Steven Hubble, Assistant Director of Public Works at 540-658-4559.

Sincerely,

Anthony J. Romanello, ICMA-CM
County Administrator

AJR:MJS:slh

cc: Kevin Byrnes, GWRC
Jeff Harvey/Rishi Baral, Department of Planning and Zoning
Mike Smith/Steve Hubble, Department of Public Works

Appendix E: Sample Proposal Scoring Matrix

Evaluation Criteria /Proposal Narrative	Potential Points	Awarded Points
A. Targets and Priority Goals: 1. Does the proposal address any of the Funding Targets listed on Page 1 of the RFP? 2. Is the proposed work in line with meeting specific eligible activities, tasks or goals for any of the target areas?	30	
B. Narrative: 1. Does the project narrative provide enough detail to describe the project need, project steps, project staff and roles, and project results?	10	
C. Project Objectives, Timeline and Milestones: 1. Does the project narrative provide a detailed list of objectives? 2. Does it provide the project's anticipated deliverables (ordinances, policies; procedures; funding & staffing plan) and outcomes (impacts, consequences, or results)? 3. Does it include a schedule for completion of the minimum requirements? 4. How well does the timeline and milestones convey that the project will be completed successfully?	10	
D. Project Design and Methodology: 1. How well is the overall project designed to meet the goals and expectations identified in the RFP or for meeting the proposed nonpoint source program objectives including the specific plans or methodology to be used to achieve the project objectives?	10	
E. Cost Effectiveness: 1. How cost effective is the project in achieving measurable results? 2. In evaluating the cost-effectiveness, consideration will be given to the availability of other funding for the project, the leveraging of public and private matching funds and the interaction of the proposed project in relation to other associated projects or programs.	10	
F. Dissemination and Transferability of Results: 1. Does the project describe how the results will be transferred to other parts of Virginia or integrated into broader policies and programs to protect or restore the waters of Virginia? 2. Does the proposal adequately describe how results will be communicated or what methods or techniques will be developed that can be used by others?	5	
G. Technical Expertise: 1. Does the proposal demonstrate that the project will engage appropriate technical expertise and assistance throughout planning, design and implementation to ensure projects are technically sound and feasible?	5	
H. Partnerships: 1. Does the project include communication of stormwater management program elements with local partners, stakeholders and elected officials?	5	
I. Experience and Past Grant Work of Applicant: 1. Does the applicant have experience and capacity to manage and administer grants and similar projects? 2. If not, does the project engage partners who will be able to complete tracking tasks? 3. Does the proposal demonstrate the capability of the project sponsor and partners in providing for the successful completion of the project (e.g. qualifications and expertise)?	5	
J. Locality and Community Engagement: 1. How well will the project engage local stakeholders?	5	

Evaluation Criteria /Proposal Narrative	Potential Points	Awarded Points
2. How will the benefits of the stormwater management program to water quality be communicated to the general public? 3. Will the project result in a high-level of public engagement and interaction?		
K. Education and Outreach: 1. Do the education and outreach activities listed in the proposal clearly support the outcomes?	5	
Evaluation Criteria Maximum Points	**100**	
L. Bonus Criteria: RFP bonus points will be given to those proposal that meet any of the criteria below		
Proposals from localities that are not subject to the Chesapeake Bay Preservation Act or are not currently designated as an MS4.	**20**	
TOTAL MAXIMUM POINTS ALLOWED	**120**	

SECTION 3

Product #3:

GWRC GW-HELP Home Performance Project Implementation Summary

George Washington Regional Commission

GW-HELP Home Performance with Energy Star Program

Program Summary

This project was funded, in part, by the Virginia Coastal Zone Management Program at the Virginia Department of Environmental Quality through Grant # NA11NOS4190122 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended.

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GW-HELP Program Summary

Introduction

The GW- Home Energy Loss Prevention Program (HELP) was developed as a result of the award of an Energy-Efficiency and Conservation Block Grant (EECBG) from the Virginia Department of Mines, Minerals and Energy (DMME) with funds provided to the State Energy Office from the U.S Department of Energy through an allocation from the American Recovery and Reinvestment Act of 2009. GWRC applied to and was approved by the USEPA as a Home Performance with Energy Star program sponsor, with the goal of creating jobs in the recession-wrecked home construction trades by stimulating demand for home energy audits and related retrofit work to install energy-saving improvements (e.g. air sealing, thermal insulation, more efficient heating and cooling equipment, energy-efficient windows and doors, etc.). The goal of the program was to develop highly-skilled home energy auditors, raise public awareness of this available expertise and incentivize middle- and upper-middle income homeowners to make prudent, energy-saving improvements to their homes.

Under the regional program proposal, the primary eligible communities were the City of Fredericksburg, the Towns of Port Royal and Bowling Green and the Counties of King George and Caroline. The program included limited benefits to higher income homeowners in Spotsylvania and Stafford Counties that would receive a rebate for the cost of their home energy audit if they invested in qualifying home improvements.

Near the end of the grant performance period, GWRC staff identified the need to expand the program to lower-income homeowners in order to utilize a greater portion of the original $1 million grant. This shift in the target market allowed the program to extend the benefits of the grant to many more needy households that received fully-subsidized home energy audits and energy retrofit projects which they could not have otherwise been able to afford.

Finally, as the program was running out of qualified applicants, the program was able to divert most of the remaining grant funds to assist eligible local governments make energy-saving improvements to public buildings and lower the cost of their operation and maintenance for years to come.

CZM funds were used to cover a limited amount of HELP program staffing support in order to comply with limitations under the EECBG grant with the amount of ARRA-EECBG funds that could be used for administrative support.

Program Impact: Primary & Secondary Program Areas

Program Proposal: Goal of 110 retrofits in primary project area, 18 in secondary area
Retrofit Result: 104 in primary, 1 in secondary
Percent of Goal Achieved: 95% in primary & 5% in secondary areas

Table 1. Program Client and Expenditure Summary by Locality

Political Jurisdiction	HELP Applications		Home Energy Audits	Home Energy Retrofits	HELP $ Assistance	Percent of HELP Funds
	Total	Eligible				
City of Fredericksburg	92	91	81	66	$400,934.73	67.9%
Caroline Co. (unincorporated area)	55	53	44	31	$166,461.51	28.2%
Town of Port Royal	4	4	4	4	$16,362.25	2.8%
Town of Bowling Green	2	2	2	2	$6,000.00	1.0%
Primary Area Sub-Total	**153**	**150**	**131**	**103**	**$589,758.49**	**99.8%**
Spotsylvania Co.	12	1	2	1	$950.00	0.2%
Stafford Co.	6	0	0	0	$0.00	0.0%
Secondary Area Sub-Total	**18**	**1**	**2**	**1**	**$950.00**	**0.2%**
King George Co.	(not participating)					
Program Total	**171**	**151**	**133**	**104**	**$590,708.49**	**100.0%**

Distribution of HELP Program Funds by Income Group and Locality

Table 2. Summary of Grant Distribution by Locality and Resident Income Group

Political Jurisdiction	Group A	Group B	Group C	Group D	Group E
	Below 50% of AMI*	50 – 75% of AMI	75 – 100% of AMI	100 – 120% of AMI	Over 120% of AMI
City of Fredericksburg	$208,981.00	$70,897.91	$65,453.55	$14,702.27	$500.00
Caroline Co. (unincorporated area)	$112,558.60	$35,589.16	$22,506.50	$17,869.50	$300.00
Town of Port Royal	$12,632.00	$0.00	$4,000.25	$0.00	$0.00
Town of Bowling Green	$0.00	$6,000.00	$0.00	$0.00	$0.00
Primary Area Sub-Total	**$334,171.60**	**$112,487.07**	**$91,960.30**	**$32,571.77**	**$800.00**
Spotsylvania Co.	N/A	N/A	N/A	N/A	$500.00
Stafford Co.	N/A	N/A	N/A	N/A	$0.00
Secondary Area Sub-Total	**N/A**	**N/A**	**N/A**	**N/A**	**$500.00**
Program Total	**$334,171.60**	**$112,487.07**	**$91,960.30**	**$32,571.77**	**$1,300.00**

*AMI = Area Median Income, as reported by the US. Dept of Housing and Urban Development

Residential Retrofit Program Impact: Leveraging Private Capital Investment

Table 3. Comparison of Public and Private Funds Invested in Home Energy Improvements

Political Jurisdiction	HELP $ Assistance	Aggregate Homeowner Investment	Aggregate Project Cost
City of Fredericksburg	$360,534.73	$86,985.96	$447,420.69
Caroline Co. (unincorporated area)	$188,823.76	$47,111.10	$235,934.86
Town of Port Royal	$16,362.25	$1,412.75	$17,775.00
Town of Bowling Green	$6,000.00	$7,419.00	$13,419.00
Primary Area Sub-Total	**$571,720.74**	**$142,928.81**	**$714,549.55**
Spotsylvania Co.	$950.00	$7,000.00	**$7,950.00**
Stafford Co.	$0.00	$0.00	**$0.00**
Secondary Area Sub-Total	**$950.00**	**$7,000.00**	**$7,950.00**
Program Total	**$572,670.74**	**$149,928.81**	**$722,499.55**

HELP Assistance to Local Governments

Table 4. Summary of Local Government HELP Assistance Project Expenditures

Locality	Project	Project Cost	Percent of LG Project Funds
City of Fredericksburg	Wastewater Treatment Plant Lighting Upgrades	**$74,677**	**49.7%**
Caroline Co (unincorporated)	Energy Star Appliance Upgrades	$6,430	4.3%
	Energy Star Thru-Wall AC Upgrades	$3,916	2.6%
	HVAC Upgrade: Sheriff's Office	$5,600	3.7%
Town of Port Royal	Town Hall HVAC Upgrade	$15,885	10.6%
	Vol. Fire Dept Energy Star Appliance Upgrades	$3,086	2.1%
Town of Bowling Green	Town Public Works Bldg. HVAC Upgrade	$16,485	11.0%
	Town Hall HVAC Upgrades	$22,850	15.2%
	Town Hall Energy Star Appliance Upgrades*	$1,308	0.9%
Caroline Co (combined)		**$75,560**	**50.3%**
Total Local Govt. HELP Assistance		**$150,237**	**100.0%**

* Plus a commercial ice maker for Town Hall kitchen donated by HELP contractor

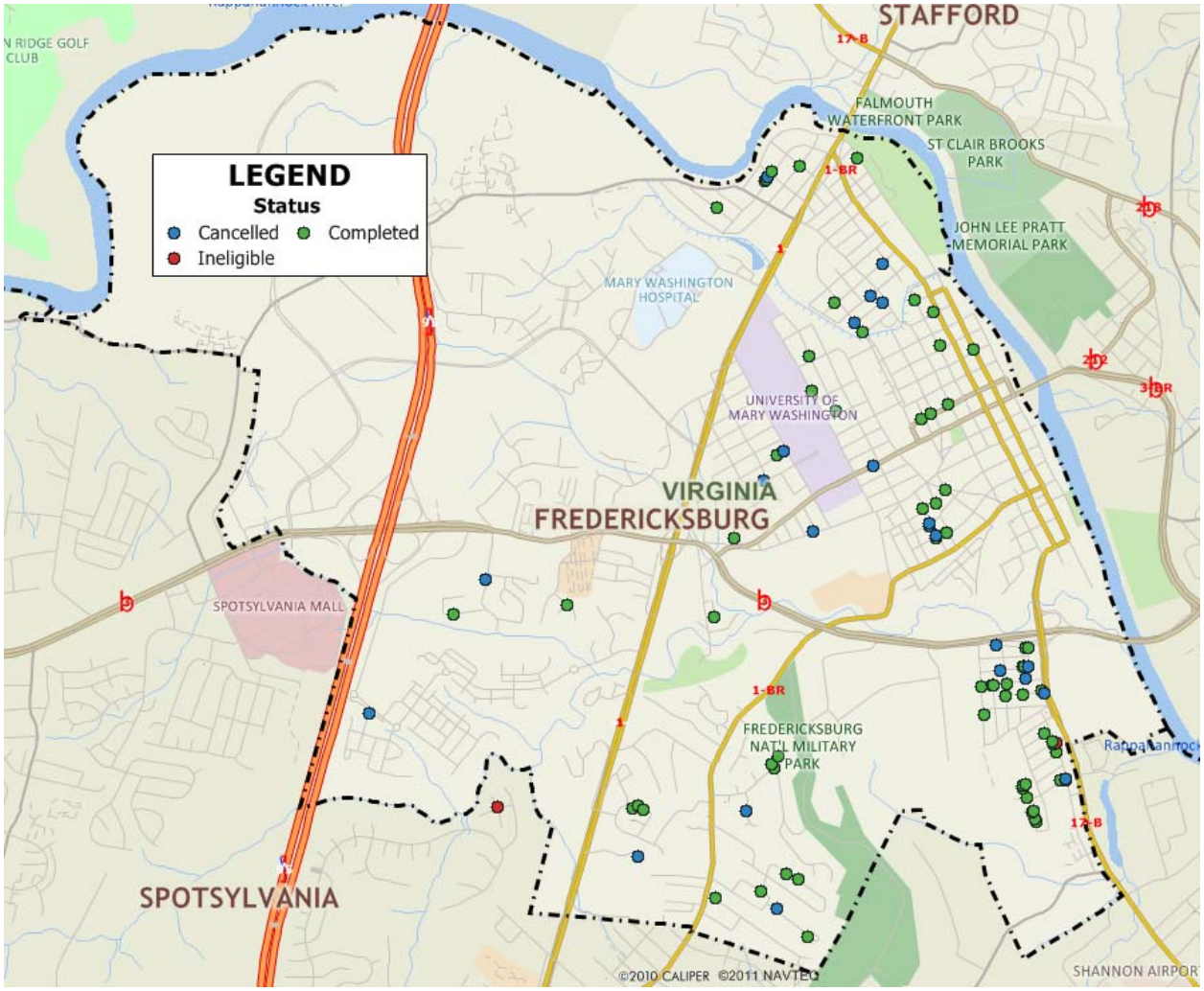
GW-HELP Program Benefit Summary

Table 5. Total HELP Program Impact by Eligible Locality

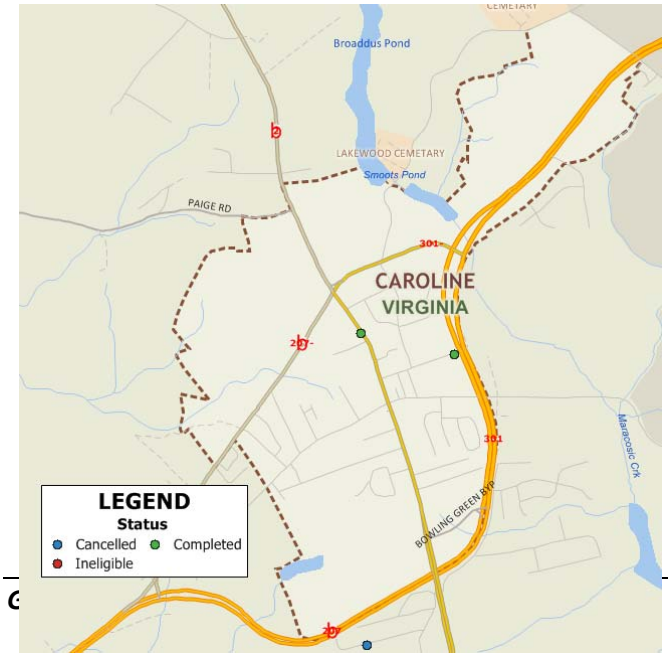
	Applications		Home Energy Audits	Home Energy Retrofits	HELP $ Homeowner Assistance	Percent of HELP Residential Funds	HELP $ Local Govt. Assistance	Total HELP Funds	Percent of HELP Funds
	Total	Eligible							
City of Fredericksburg	92	91	81	66	$401,034.73	67.9%	$74,677.00	$475,711.73	64.2%
Caroline Co. (uninc.)	55	53	44	31	$166,461.51	28.2%	$15,946.00	$182,407.51	24.6%
Town of Port Royal	4	4	4	4	$16,362.25	2.8%	$18,971.00	$35,333.25	4.8%
Town of Bowling Green	2	2	2	2	$6,000.00	1.0%	$40,643.00	$46,643.00	6.3%
Primary Area Sub-Total	**153**	**150**	**131**	**103**	**$589,858.49**	**99.8%**	**$150,237.00**	**$740,095.49**	**99.9%**
Spotsylvania Co.	12	1	2	1	$950.00	0.2%	0	$950.00	0.1%
Stafford Co.	6	0	0	0	$0.00	0.0%	0	$0.00	0.0%
Secondary Area Sub-Total	**18**	**1**	**2**	**1**	**$950.00**	**0.2%**	0	**$950.00**	**0.1%**
King George Co.	(not participating)								
Program Total	**171**	**151**	**133**	**104**	**$590,808.49**	**100.0%**	**$150,237.00**	**$741,045.49**	**100.0%**

Maps of HELP Program Participation

City of Fredericksburg



Bowling Green



Port Royal

Caroline County

Financial Summary

Project Summary	Projected Close-out Balance			
GWRC EECBG Invoice	Expenses - Invoice Amount	Cumulative Expenditure	Remaining Grant Balance	Total Grant
1	$1,703.23	$1,703.23	$998,296.77	$1,000,000
2	$6,853.90	$8,557.13	$991,442.87	$1,000,000
3	$17,196.56	$25,753.69	$974,246.31	$1,000,000
4	$13,350.17	$39,103.86	$960,896.14	$1,000,000
5	$60,244.94	$99,348.80	$900,651.20	$1,000,000
6	$18,457.39	$117,806.19	$882,193.81	$1,000,000
7	$18,695.26	$136,501.45	$863,498.55	$1,000,000
8	$14,225.79	$150,727.24	$849,272.76	$1,000,000
9	$9,407.40	$160,134.64	$839,865.36	$1,000,000
10	$844.77	$160,979.41	$839,020.59	$1,000,000
11	$8,112.91	**$169,092.32**	$830,907.68	$1,000,000
Sub-Total	**$169,092.32**			
	Advance Drawdowns	**Advance Expenditures**	**Carry-Over**	
Advance #1 ($155,000.00)	$155,000.00	$160,490.21	-$5,490.21	
Advance #2 ($194,557.63)	$194,557.63	$174,295.56	$20,262.07	
Advance #3 ($479,622.88)	$479,622.88	$501,096.90	-$21,474.02	
Advance Sub-Total	**$829,180.51**	**$835,882.67**	**-$6,702.16**	
Grant Income	**$998,272.83**			
Program Income	**$7,388.84**			
Total Program Revenues	**$1,005,661.67**			
- Program Expenses	**$1,004,974.99**			
Net Program Revenue	$686.68			
Account Balance	**$686.68**	**Refund to: Treasurer of Virginia**		
Net Difference	**$0.00**			