Chesapeake Bay and Virginia Waters Clean-Up Plan

Submitted by
The Honorable L. Preston Bryant, Jr.
Secretary of Natural Resources
Commonwealth of Virginia

To
House Committee on Agriculture, Chesapeake and Natural Resources
House Appropriations Committee
Senate Committee on Agriculture, Conservation and Natural Resources
Senate Finance Committee

July 2009

COMMONWEALTH of VIRGINIA

Office of the Governor

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July 15, 2009

TO: Chairman and Members, House Committee on Agriculture, Chesapeake and Natural Resources

Chairman and Members, House Appropriations Committee

Chairman and Members, Senate Committee on Agriculture, Conservation and Natural Resources

Chairman and Members, Senate Finance Committee

FROM: L. Preston Bryant, Jr., Secretary of Natural Resources

SUBJECT: Report on the Chesapeake Bay and Virginia Waters Clean-up Plan (House Bill 1150; 2006)

I am pleased to present to you the third edition of my office's annual report of the Chesapeake Bay and Virginia Waters Clean-Up Plan. This report is submitted per Chapter 204 of the 2006 Acts of Assembly. So as to provide predictable updates to the legislature and Virginia's citizens, we are updating the content of the plan every spring – this being our second update since the original plan was submitted in January, 2007 – with progress reports detailing the status of implementation provided in the fall of each year.

We look forward to continuing to work with your committees, other interested legislators, and all Virginia citizens who understand the need for us to do all that is practicable to prevent pollution from entering our Commonwealth's streams, rivers, lakes, and estuaries.

You may view an electronic version of this document on the website of the Office of the Secretary of Natural Resources, at www.naturalresources.virginia.gov/Initiatives/WaterCleanupPlan. Should you have questions or desire additional information, please let me know.

LPBJr/cbd
Enclosure

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I. CLEAN-UP OBJECTIVES

A successful clean-up plan must address restoring impaired waters and protecting high quality waters by documenting the following:

- Measurable Environmental Outcomes
- Quantifiable Pollution Reductions

a. Measurable Environmental Outcomes include the following:

- Restoring water quality to fully meet all water quality standards

The measure used to track progress will be the number of waters removed from the Impaired Waters List, reported for the following types of waterbodies:

  - Free-Flowing Streams and Rivers – measured in miles
  - Lakes and Reservoirs – measured in acres
  - Estuaries (tidal waters) – measured in square miles

- Restoring water quality to meet certain, but not all, water quality standards

Some waters are impaired for multiple reasons, and while removing one impairment may still represent progress, it does not fully restore the targeted waterbody. For example, reducing bacteria levels in a specific waterway may restore the full recreational (swimming) use of that water, but elevated sediment levels may still impair the aquatic life, requiring further efforts to reduce sediment pollution.

Partial restoration of water bodies will be tracked and reported in the same manner as noted above for fully restored waters.

- Maintaining and protecting high-quality waters that exceed water quality standards

Waters that meet and exceed water quality standards are protected by the Commonwealth's antidegradation policy. The measures used to track success will be the status and trend in water quality that document either maintenance or improvement of these high-quality waters. In addition, strategies that are developed under the Healthy Waters section of this plan speak directly to the preservation of high quality streams.

b. Quantifiable Pollution Reductions will include the following:

- For measurements in the Chesapeake Bay reductions will be expressed as the total reduction (pounds or tons) of nitrogen, phosphorus and sediment from point and

non-point sources within the Chesapeake Bay watershed compared to Virginia's clean-up goals

- For measurements in all other impaired waters (not Chesapeake Bay) reduction in pollution will be expressed as decreases in in-stream pollution levels and decreases in the frequency with which the clean-up standard is violated

Annual pollution reductions will be tracked using:

- The annual status report from the Chesapeake Bay watershed model (Virginia data entered into the model is based on monitoring data from point source dischargers and the number of Best Management Practices installed)
- Virginia's bi-annual Water Quality Report ("305(b)/303(d) Water Quality Assessment Integrated Report")

II. STATUS OF IMPAIRED WATERS IN VIRGINIA

The 2008 Virginia Water Quality Assessment designates a significant portion of the Commonwealth's rivers, lakes and bays as impaired because they do not meet water quality standards. The water quality standards are established to protect drinking water supplies, aquatic life, production of edible and marketable fish and shellfish, wildlife and recreational uses of state waters, including swimming, boating, fishing and shellfish harvesting. The impaired waters in Virginia from the 2008 final Assessment are detailed in Table II-1.

Table II-1 Impaired Waters in Virginia

Virginia Waters - Types and Dimensions	Impaired Waters Assessment		Top Reasons for Impairments	Uses Lost or Impaired
	2006	2008		
Rivers - 50,016 miles	9,002	10,543	High Bacteria Levels	Recreational
Lakes - 115,835 acres	109,201	94,044	Low dissolved oxygen and high PCB levels in fish tissue	Aquatic Life and Edible Fish
Estuaries - 2,305 sq. miles	2,212	2,182	Low dissolved oxygen (nutrient pollution) and high PCB levels in fish tissue	Aquatic Life and Edible Fish and Shellfish

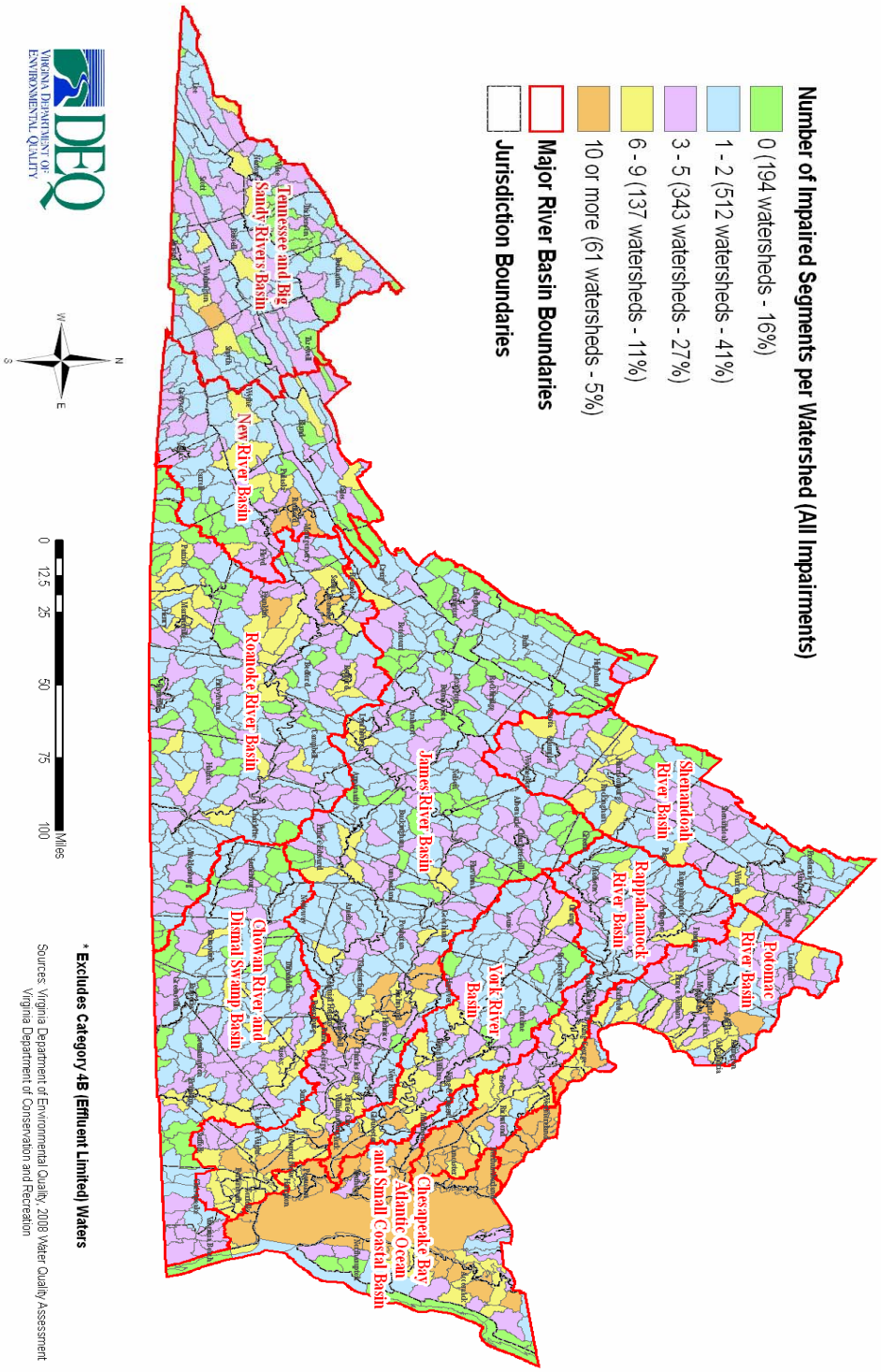
New impairments were identified in 2008, primarily due to DEQ's assessment of waters which had not previously been monitored, or due to the adoption of more stringent water quality criteria. While there was a net addition of 1,541 impaired river miles to the 2008 list, the good news is that 331 river miles were removed from the list because the 2008 assessment showed that these waters, previously listed as impaired, were now

meeting water quality standards. In addition, another 400 river miles, while remaining on the 2008 list for other pollutants, have shown partial improvement by meeting standards they failed to meet previously. The 2008 results also show a significant reduction in the acreage of impaired lakes due mainly to verification that these previously documented impairments were due to natural causes.

The map on the following page shows the distribution of impaired waters throughout the Commonwealth.

The report and supporting information is available on the DEQ website at www.deq.virginia.gov/wqa/. In addition, access to a searchable, electronic map of the Commonwealth showing the results of the assessment is available by going to http://gisweb.deq.virginia.gov/ and clicking on the "2008 Assessment Database & Impaired Waters GIS Application" link.

Figure 1. Distribution of Impaired Waters in Virginia



III. Restoring Impaired Waters

Virginia's strategy to restore impaired waters focuses on Chesapeake Bay Restoration and Total Maximum Daily Load (TMDL) program implementation which is a watershed-based regulatory program described in the federal Clean Water Act and the Virginia Water Quality Monitoring, Information, and Restoration Act (WQMIRA) of 1997. WQMIRA designates the Department of Environmental Quality as the lead agency for developing TMDLs and implementation plans for all additional impaired waters in the Commonwealth.

Chesapeake Bay restoration targets nutrient (nitrogen and phosphorus) and sediment pollution reduction within the Chesapeake Bay watershed. The Commonwealth of Virginia along with Chesapeake Bay Program (CBP) partners has pursued a cooperative approach over the past several decades, resulting in the development of Virginia's Tributary Strategies. These strategies seek to reduce nutrient and sediment pollution into the Bay and its tributary rivers. These strategies have helped advance pollution reduction in Virginia but they do not meet legislative mandates for developing a TMDL for impaired segments of the Chesapeake Bay. The Chesapeake Bay TMDL will be led by the U.S. Environmental Protection Agency and the Commonwealth of Virginia will develop an implementation plan that will serve as supporting documentation for this process.

a. Chesapeake Bay Strategy

Virginia faces a very complex challenge in the restoration of the Chesapeake Bay. Slightly over half of the Commonwealth's land area is located within the 64,000 square mile Chesapeake Bay watershed. However, only 35% of the area within the Bay watershed is comprised of Virginia lands, with the remaining lands lying within Maryland, Pennsylvania, West Virginia, Delaware, New York and the District of Columbia. While rehabilitation of the Bay will require an enormous effort by the Commonwealth and its citizens, Virginians alone cannot achieve a clean Bay without a similar level of effort by the citizens of our neighboring states.

In 2005, Virginia finalized "tributary strategies" for each of the Chesapeake Bay's major river basins that defined the magnitude of actions necessary to achieve our water quality goals. These management strategies were designed to achieve the nutrient (nitrogen and phosphorus) and sediment pollution targets by identifying the type and quantity of best management practices (BMPs) required for implementation in each major river basins that drain Virginia's portion of the Chesapeake Bay watershed. Copies of the strategies are located at the Secretary of Natural Resources' website at www.naturalresources.virginia.gov/Initiatives/WaterQuality/.

In the summer of 2008, it was reported that results in tracking of pollution reduction practice implementation, BMPs and monitoring of water quality standards and

living resource criteria made it evident that the Bay and pertinent reaches of the tidal rivers will remain on the list of impaired waters in 2010. As a result, and pursuant to the court agreement, the U.S. EPA is now required to produce a TMDL for the Chesapeake Bay.

Success in developing a TMDL for the Chesapeake Bay requires extensive up-front planning, data development, and public input at a scale that has not been approached in the past. Working committees of the U.S. EPA's Chesapeake Bay Program as well as the partnership's Executive Council (EC) have been developing a protocol for the TMDL since mid-2008 (the time of the most recent publishing of Virginia's 303(d) impaired waters list). It is anticipated that this planning will culminate in the summer or early fall of 2009 along with a number of other important tasks, including:

- Calibration by the Bay Program staff of the Chesapeake Bay Watershed Model Phase 5.2, allowing staff to target pollution allocation loads to meet main-stem dissolved oxygen parameters in section CB3, CB4 and CB 5 (by September 2009)
- Establishment of two-year milestones that accelerate nutrient pollution reductions (adopted by the Executive Council in May 2009)
- Finalization of the protocol for completing the development of the TMDL plan by December 2010 (the Bay Program's Principal Staff Committee adopted this more aggressive deadline as opposed to the May 2011 deadline as established by court agreement)
- Finalization of the protocol for developing the TMDL Implementation Plan (IP) (currently planning for draft IP completion by May 2010)
- Calibration by the Bay Program staff of the Chesapeake Bay Watershed Model Phase 5.3 by January 2010 allowing for the reallocation of pollution loads among the Bay jurisdictions for incorporation into the TMDL

The partners agree that a shared urgency remains to restore waters of the Bay and the development of a Chesapeake Bay TMDL and an associated implementation plan is going to be a multi-year effort. Success will undoubtedly require enhancing current programs, developing new programs, engaging locality and other local stakeholders in a manner that is beyond any relationship that as been developed to date, and employing techniques such as market based solutions that have yet to even be defined. The commonwealth is committed to supporting the U.S. EPA in the development of the Bay TMDL and, at the same time, remains open to supporting initiatives that may lead to tools and techniques that down the road may enhance restoration efforts. Virginia will continue to foster local efforts, partnerships and pilot projects that could provide insight to improving the condition of the Bay through the protection and improvement of water quality within the bounds of local jurisdictions.

i. Establish jurisdictional nutrient pollution reduction goals in the Chesapeake Bay watershed

Objective:

Establish jurisdictional nutrient reduction goals utilizing a collaborative process, involving the U.S. EPA's multi-jurisdictional Chesapeake Bay Program, local governments within the Chesapeake Bay watershed and other public and private agencies and institutions.

Rationale:

The establishment of nutrient reduction goals (maximum annual amounts of nutrient allowed to enter waterways) is a tool currently used under Virginia's point source regulations. Expanding the concept to assign "jurisdictional nutrient reduction goals" will give localities a better understanding of the contributions their jurisdictions make to overall nutrient pollution loads and allow them to better incorporate water quality concerns into local land use decisions. Jurisdictional goals could set the stage for nutrient trading and other market based approaches to pollution control.

Strategy/Timeframe:

- DCR has established the Richmond County Tributary Strategy Pilot Project. Working with Richmond County Staff, Northern Neck PDC staff, Northern Neck SWCD staff and other stakeholders the group is examining ambient water quality and biological conditions, current land use and cover, the extent of best management practice implementation (urban and agriculture), in an effort to determine the feasibility of institutionalizing these aspects in a GIS based decision tool that supports planning for the protection of healthy waters and improvement of compromised water quality, development of BMP installation scenarios that meet water quality targets, and assist the County in managing resources into the future.
- DCR conducted, through the Planning District Commissions, a Bay land area wide review of jurisdiction-specific data regarding nutrient and sediment loads and land use information contained in the revised Chesapeake Bay Program watershed model. The result was that not many localities had faith in the data used in the watershed model, with the population projections made through 2030 and used in the Chesapeake Bay Land Change Model (CBLCM), or with the projected locations and rate of growth that were produced by the CBLCM.
- DCR has worked with project partners to develop a Virginia Networked Education for Municipal Official project (VA NEMO) to assist with the review and revision of the County's comprehensive plan. As a part of the review process partners will look for opportunities to strengthen planning elements of the comprehensive plan to consider avoidance of water quality degradation during land use related decisions. As well, the project will work to review codes and

ordinances to identify contradictions that may prevent improving and protecting water quality.

- DCR will continue the pilot study that will examine pollutant loads and land use patterns in a chosen jurisdiction to examine how land management practices can be used to meet and maintain an apportioned nutrient load.
- DCR, in cooperation with the Chesapeake Bay Program and local government partners, will assess the success of the pilot study to determine if it is feasible to transfer this approach to other localities.
- By September 2009, DCR, in consultation with the Chesapeake Bay Program and local governments, will determine the resources necessary for state agencies and local governments to implement nutrient goal-based local programs. Additional anticipated resources include:
    - Access to complete and spatially accurate agriculture BMP data implementation data
    - Software development and data tracking ($3.0 million needed over 2 years)
    - Implementation grants to either regional commissions/Planning District Commissions or local governments to develop and operate GIS-based land management systems for identifying and tracking land use changes and pollutant loads ($5.0 million annually)
    - DCR support staff ($450,000 and 6 full time employees)

Potential Problem Areas:

- Reluctance by local governments to commit to a goal that may have the potential to influence growth and development decisions
- Insufficient/unpredictable state funding to assist local governments in evaluating land use options under the goal
- Insufficient data, capacity and knowledge at both the state and local level to implement jurisdictional goal program
- Insufficient outreach and promotion to engage and educate local governments of the details of the program and the benefits to be achieved
- Potential for the jurisdictional goals to prove technologically infeasible to implement

Performance Measurement:

Performance measures will be developed as this process moves forward.

b. Chesapeake Bay Presidential Order

On May 12, 2009 President Obama issued Executive Order 13508 – *Chesapeake Bay Protection and Restoration*. The order describes the Bay as a "national treasure" and calls for the development and implementation of a strategy to coordinate, expand and bring greater accountability to Bay clean-up efforts and to help speed recovery. The

strategy will be managed by a high-level Federal Leadership Committee for the Chesapeake Bay, to be chaired by the U.S. EPA Administrator Lisa Jackson.

In the words of Administrator Jackson, "This order begins a new era of shared federal leadership, in close collaboration with state partners, for protecting and restoring the health, heritage, natural resources, and social and economic value of the Chesapeake Bay."

As directed by the Executive Order, the U.S. EPA and other federal agencies have 120 days (by September 12, 2009) to submit draft reports to the newly formed Federal Leadership Committee that detail how to advance restoration and protection of the Chesapeake Bay. Final reports must then be provided within 180 days (by November 12, 2009) for integration into a coordinated strategy for protecting and restoring the Chesapeake Bay.

The final reports must include recommendations to address key challenges and accomplish the following steps:

- Define the next generation of tools and actions to restore water quality in the Chesapeake Bay and describe changes to be made to regulations, programs and policies to implement these actions
- Target resources to better protect the Chesapeake Bay and its rivers
- Strengthen storm water management practices at federal facilities and on federal lands within the Chesapeake Bay watershed and develop storm water best practices guidance
- Assess the impacts of climate change and develop a strategy for adapting to those impacts on water quality and living resources
- Expand public access to waters and open spaces of the Chesapeake Bay and its tributaries and conserve landscapes and ecosystems of the Chesapeake Bay watershed
- Strengthen monitoring and decision support for ecosystem management.
- Focus and coordinate habitat and research activities that protect and restore living resources and water quality

The U.S. EPA is designated as the lead federal agency for developing the report on water pollution control strategies. In that report, the U.S. EPA will examine how to make full use of its authorities under the Clean Water Act and revise guidance and regulations as necessary to protect and restore the Bay and its tributaries.

Strategies and actions identified by the U.S. EPA will include:

- Using Clean Water Act tools, including strengthening existing permit programs and extending coverage where appropriate
- Establishing new, minimum standards of performance where appropriate
- Describing a schedule for the implementation of key actions in cooperation with states, local governments and others

- Constructing watershed-based frameworks that clearly assign pollution reduction responsibilities while maximizing reliability and cost-effectiveness
- Implementing a compliance and enforcement strategy

Extensive consultation with the Bay states will occur during the development phase of the federal plans. In Virginia, the Office of the Secretary of Natural Resources and key staff from numerous natural resource agencies will be deeply involved in the development of the plans. In addition, the draft plans will be subject to extensive public review and comment.

Progress on implementing the requirements of the Presidential Executive Order will be provided in future updates to this plan.

c. Virginia's TMDL Program

Virginia's TMDL program provides the management strategy for restoring water quality in Virginia's impaired streams, rivers, lakes and estuaries. The major steps under the TMDL program include, as required under §62.1-44.19:4, et seq.:

- Development of Total Maximum Daily Loads
- Development of TMDL Implementation Plans
- Implementation of TMDL Implementation Plan
- Monitoring Towards Water Quality Standard Attainment

Each of these steps is initiated sequentially and further discussed below, including status, outlook and recommended future strategies. The latest progress report for Virginia's TMDL program is located on the DEQ website at https://www.deq.virginia.gov/TMDLDataSearch/ReportSearch.jspx.

i. Development of Total Maximum Daily Loads

For each impaired waterbody a TMDL study must be conducted that identifies the pollutant load cap (the level to which each pollutant must be reduced) sufficient to meet water quality standards. Each TMDL must be submitted to the U.S. EPA for approval.

Virginia's TMDL program operates under a schedule included in a federal court Consent Decree for all waters listed as impaired in 1998. In 1998, the American Canoe Association and the American Littoral Society filed a complaint against the U.S. EPA for failure to comply with the provisions of §303(d) of the Clean Water Act in Virginia. As a result, U.S. EPA signed a Consent Decree with the plaintiffs in 1999 that contains Virginia's TMDL development schedule through 2010. Also under the Consent Decree, U.S. EPA agrees to develop TMDLs on these impaired waters to meet the schedule if Virginia fails to do so. Under the Consent Decree schedule, Virginia has to develop TMDLs for 644 segments of impaired waters by May 1, 2010. According to U.S. EPA, the schedule will be replaced by a Memorandum of Agreement and schedule after the Consent Decree expires to address the timeframe for TMDL development for additional

impaired waters identified since 1998. Currently, for waters listed after 1998, U.S. EPA guidance requires TMDLs to be completed within 12 years of the initial listing date.

Status:

As of 2008, Virginia has developed TMDLs to address 546 impairments (Table VIII-2). Of those, 110 impairments were not included on the Consent Decree but TMDLs were developed because they were located in the same watershed as a Consent Decree impairment. The Consent Decree cycle will end in 2010, and a new agreement will be needed to plan for the next 10 to 12 years. Virginia is using the 2008 303b listing to project beyond 2010. Preliminary estimates indicate that an additional 1188 TMDLs will be needed over the next decade (Table III-1).

Table III-1 - Total Impairments Needing TMDL Development

TMDL Due Date	Number of Impairments
2000	12
2002	27
2004	98
2006	207
2008	202
2010	214
Total impairments with TMDLs developed by 2010	760
Total Impairments requiring TMDL development (2012-2022)	1188
2012	198
2014	198
2016	198
2018	198
2020	198
2022	198

Changes from previous listing:

- **2010** – 38 additional impairments are scheduled for a category change from impaired needing a TMDL (5A) to impaired due to natural conditions (4C): no TMDL needed
- 443 impairments were delisted on the 2008 Integrated Report
- 242 impairments are considered "nested" within an existing TMDL watershed
- 24 Chloride impairments will be delisted on the 2010 Integrated Report

Outlook:

Table III-1 shows the projected schedule for TMDL development for each biennium through 2020, following U.S. EPA's guidance for TMDL development. The table is based on the identified impaired waters as of 2008.

Funding for the TMDL program from federal and state sources in recent years has been approximately $2 million/year. Average costs to develop a TMDL are $19,000 (based on current program efficiencies). With those resources DEQ can develop an additional 214 TMDLs by May 1, 2010. This would address all impairments shown in Table VIII-2 for 2010 and fulfill Virginia's schedule under the Consent Decree.

For the years beyond 2010, increased funding will be necessary to meet the accelerated TMDL development schedule. Additionally, there are a number of other issues to consider as Virginia moves beyond the Consent Decree:

- The number of impairments will decrease due to standards changes under the recent triennial review
- Many impairments resulting from nutrient pollution in the tidal portion of Virginia's rivers also are being addressed as part of the Chesapeake Bay Program clean-up process (discussed in more detail in the next section) resulting in a certain degree of "overlap" between the two programs which may significantly reduce the total TMDL development funding needs
- Ongoing pollution control initiatives (both point source and nonpoint source) unrelated to the TMDL process also will assist in restoring impaired waters which could reduce the total cost for TMDL development and implementation
- Costs for development of some future TMDLs may be significantly higher than historical costs, especially for impairments that have been identified as high priority due to human health impacts (primarily fish consumption advisories due to PCBs)

Proposed Strategies:

- Progress with TMDL development in accordance with the Consent Decree and as outlined in Table III-1, adding high priority TMDLs as needed and as resources permit
- Assign priorities to TMDLs with post-2010 due dates, taking into consideration human health, threatened and endangered species, geographic coverage and stakeholder interest
- Ensure that this process supports the negotiations with U.S. EPA for developing a post-Consent Decree Memorandum of Agreement addressing TMDLs not included in the 1998 Consent Decree

ii. Development of TMDL Implementation Plans

TMDL Implementation Plans (IPs) identify the on-the-ground corrective actions necessary to meet the pollution allocations identified in the TMDL. The IP also includes estimated costs, completion dates and date of expected achievement of water quality standards.

Table III-2 Total Impairments Needing TMDL Implementation Plan Development

Completion Date	Number
2001	12
2004	7
2005	20
2006	26
2007	**11**
2008	**26**
2009	**14**
Total impairments with completed IPs to date	**116**
Additional impairments scheduled for IP development with current available funds	**29**
Total impairments with TMDLs already completed, but still needing IP development	731
Remaining impairments (TMDLs not yet completed) still needing IP development	1188
Total impairments still requiring IP development	*** 1919**

***** These numbers reflect the Final 2008 Water Quality Assessment Integrated Report.

Status:

Development of TMDL implementation plans has not progressed nearly as quickly as development of the TMDLs themselves – largely due to lack of funding. Over the last seven years, funds appropriated for developing the implementation plans have equaled less than 10% of the funds available for development of the TMDLs themselves. This imbalance has resulted in a backlog of completed TMDLs without implementation plans, or on-the-ground implementation. **This situation must be remedied to increase the pace of actual water quality improvement**. As of 2009, Virginia has completed 116 IPs since 2007 (Table III-2). Contractual expenditures for IP development through May 1, 2008 have averaged $20,000 per impairment.

Proposed Strategies:

- Increase the resource shift to IP development beyond 2010
- Defer the development of TMDLs for low-priority waters beyond the 12-year schedule until all necessary high priority implementation plans have been developed

iii. TMDL Implementation Projects

Virginia uses a staged approach to implement TMDLs that provides opportunities for periodic evaluation of the effectiveness of the implementation actions and allows for adjustment of efforts to achieve water quality objectives in a timely and cost-effective

manner. As can be seen on figure 2, the approach for targeting TMDL implementation is quite aggressive.

Status:

The Virginia Department of Conservation and Recreation has specifically targeted funding for TMDL implementation through the use of WQIF funds of $5.7 million from FY 06 funds. In addition, implementation efforts have relied upon federal funds from U.S. EPA's 319 Nonpoint Source Management Program. This Clean Water Act program provides grant money to states in support of a wide variety of activities including technical assistance, financial assistance, education, training, technology transfer, demonstration projects, and monitoring to assess the success of specific nonpoint source implementation projects. Virginia currently uses such funding to help pay for agricultural BMPs, residential BMPs such as failing on-site septic systems and pet waste management, urban BMPs, technical assistance and outreach.

Outlook:

In the previous section ("Development of TMDL Implementation Plans") it was shown (Table III-2) that TMDL implementation plans have been developed, or will be shortly using currently available funds, to address 145 identified impairments. The locations of these 145 impairments are shown on the map below. Forty-three of these impairments will receive funding to implement clean-up actions as a result of recently appropriated state funds for agricultural BMPs. Of these 43 impairments, 30 have completed implementation plans and 11 are covered by implementation plans currently under development. Using a targeted approach, eight Soil and Water Conservation Districts will receive $5.7 million in combined cost-share funds for 2007- 2008 and $1 million in technical assistance. These funds were carried forward for 2009-2010. An additional 29 impairments are receiving federal funds through the previously described federal 319 program. There are 32 impairments for which there is insufficient funding and staffing to begin implementation projects.

The significant gap between funding needs and currently available funding highlights the critical need for on-going, increased funding for agricultural BMP programs and on-site septic remediation.

In addition, there are other issues to be considered with respect to TMDL implementation efforts, including:

- DCR's state funds are only targeted toward agricultural BMPs. Additional funds must be identified to address other nonpoint source pollution sources such as mining issues, on-site septic systems, and urban stormwater
- Current implementation efforts are based on voluntary, incentive-based programs and some regulatory requirements (e.g., on-site sewage disposal) that are not adequately enforced

- Implementation is generally based on the assumption that the conservation practices will be implemented within five to ten years and actively maintained for the life of the practice; this approach has not resulted in full water quality attainment of the bacteria standard, but it has resulted in partial delisting of impaired stream segments and significant reductions in the violation rate of the bacteria standard

Proposed Strategies:

- Apply approximately 10% ($1.7 million) of the Southern River watershed funds (appropriated during the 2006 legislative session) toward TMDL implementation in the proposed targeted areas
- Significantly accelerate removal of waters in the Southern Rivers watersheds from the impaired waters list by conducting the following:
    - Target Soil and Water Conservation Districts (SWCD) and local governments within which the impaired water bodies exist and engage them to support the clean-up efforts
    - As funding is available, DCR will develop written agreements with the local SWCD to provide staff support and deliver the agricultural BMPs with the farming community as appropriate to address the specific impairments
    - Provide summary reports of progress in the installation of conservation practices and water quality monitoring results (as available from DEQ) to assess linkages that may demonstrate measurable improvements in water quality
    - Depending on the amount of funds appropriated and the collective capabilities to effectively administer multiple projects, direct additional funds to targeted TMDL clean up activities in the Southern Rivers watersheds under contracts with Soil and Water Conservation districts
    - DCR will evaluate, on an ongoing basis, agricultural BMP adoption in TMDL watersheds and the extent to which current programs can be relied upon to meet TMDL implementation plan requirements and identifying enhancements needed when water quality standards are not met
- Of the $20 million WQIF Ag BMP monies appropriated for FY09, $1,675,000 will be targeted for use in implementing agricultural BMPs in the Southern Rivers and $550,000 will be targeted for local TMDLs in the Chesapeake Bay
- Explore opportunities to increase participation levels in two key programs; stream fencing (livestock exclusion and repair/replacement of failing septic systems and illegal straight pipes
- Collaborate between DEQ, DCR and DMME to identify stream mitigation projects as tools to restore impaired waters
- Adequately enforce on-site sewage disposal regulations and prescribe time limits for corrective actions
- Seek revised, or new, regulatory tools to ensure adequate implementation of conservation practices, such as livestock exclusion, as a back-up approach where incentive based approaches fail

- Explore the possibility of amending the Agricultural Stewardship Act to include pathogens in the definition of pollution
- Where appropriate, for specific waters, evaluate the validity of the designated uses and water quality standards that are driving the clean-up requirements

Potential Problem Areas:

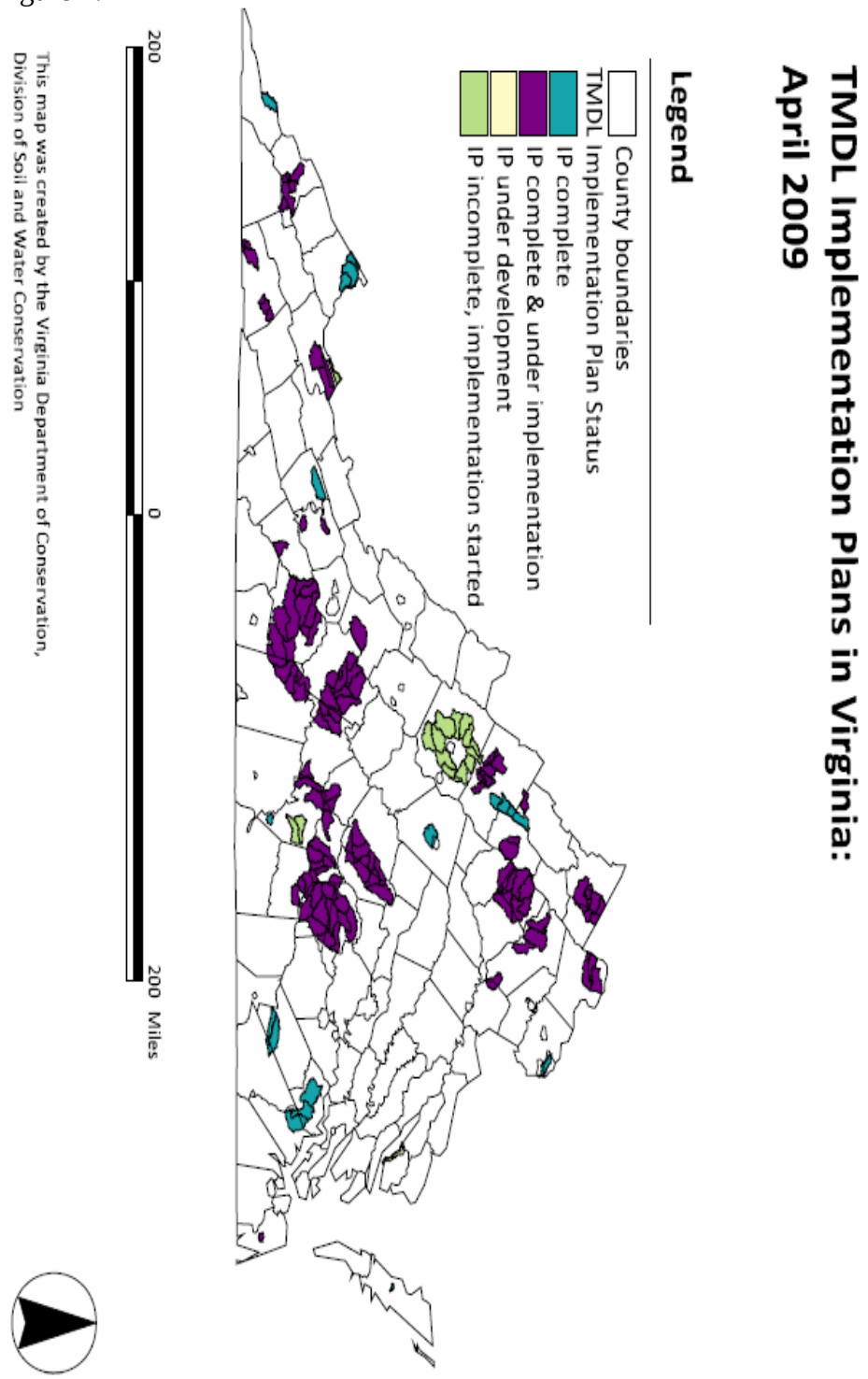
- Lack of continued federal implementation funding for agricultural practices and supporting technical service delivery staff
- Farmer participation in voluntary agricultural BMP programs may be insufficient to eliminate impairments in Southern River watersheds
- Virginia may need to develop a new approach to improve participation in voluntary agricultural BMP programs including additional incentives and possibly additional measures for those that remain unwilling to participate

Performance Measurement:

- Number of water bodies removed from the list of impaired waters
- Incremental measurable improvements in waters not removed from the impaired waters list as demonstrated from available monitoring data performed by DEQ

This information is compiled every two years and released for public review in DEQ's Water Quality Assessment Integrated Report. In addition, future editions of the Clean-Up Plan will incorporate interim information as available.

Figure 2.


TMDL Implementation Plans in Virginia:
April 2009
Legend
County boundaries
TMDL Implementation Plan Status
IP complete
IP complete & under implementation
IP under development
IP incomplete, implementation started
200
0
200 Miles
This map was created by the Virginia Department of Conservation,
Division of Soil and Water Conservation

IV. CLEAN-UP STRATEGY COMPONENTS

The Clean-Up Plan has been organized by pollution source category. The major pollution source categories include wastewater, agricultural and forested lands, developed and developing lands, and air.

a. Wastewater Category

i. Wastewater dischargers of nutrient pollution into the Chesapeake Bay

Objective:

By January 1, 2011, upgrade sufficient wastewater treatment facilities to meet the Commonwealth's nutrient reduction goal for point sources – a reduction of 3 million pounds of nitrogen and 125,000 pounds of phosphorus from 2005 – levels and fully utilize the Commonwealth's recently adopted nutrient trading program to expedite the process and maximize cost-efficiency. After January 1, 2011, a combination of nutrient trading and other recently adopted regulations limiting the annual loading and concentrations of nutrient pollution allowed from wastewater treatment plants will ensure that the nutrient reduction goals are maintained into the future.

Rationale:

Nutrient pollution into the Bay comes from many sources - runoff from agricultural fields, stormwater from developed lands, air deposition, and discharges of treated wastewater. The single largest source of nitrogen to the Bay in Virginia is treated wastewater from point sources, although the portion of the total load coming from wastewater discharges is steadily decreasing as more facilities install nutrient reduction technology. Wastewater treatment is also the most assured and reliable means of nutrient reduction since it is measurable, regulated, utilizes tested and available technologies, and operated by professional staff around the clock at the larger facilities. Within this context, wastewater treatment is also among the most cost-effective means of achieving and maintaining nutrient reduction goals.

Strategy:

Component #1 - Implementation of Virginia's Watershed General Permit

The Virginia Pollutant Discharge Elimination System (VPDES) General Watershed Permit, which became effective on January 1, 2008, authorizes the discharge of nutrients from wastewater facilities within the Chesapeake Bay watershed. All 125 significant dischargers required to register for coverage under the Watershed General

Permit have done so. Several smaller, non-significant dischargers also have registered, either because of a planned expansion or to be included as part of an owner's "bubbled" allocation.

The permit sets a deadline of January 1, 2011, for achieving the total nitrogen and phosphorus waste load allocations assigned to the 125 individual significant dischargers within each of the Chesapeake Bay's major watersheds. DEQ reevaluates the basin compliance schedules as required by state law after each annual submittal of Compliance Plan updates by the affected dischargers. These compliance plans were first due by August 1, 2007, and addressed the factors listed in *Code of Virginia* §62.1-44.19:14.C.2. Annual updates are required by February 1 of each year.

The compliance plans identify how each discharger plans to meet the assigned nutrient allocations, whether by installing nutrient removal technologies, purchasing nutrient credits under the Nutrient Credit Exchange Program, or a combination of the two. The plans also describe all capital projects and implementation schedules. The Nutrient Credit Exchange Association (the Exchange) has submitted a joint compliance plan for its 105 member facilities. The Exchange Compliance Plan includes expected nutrient credit trades through the year 2013.

DEQ's review of the annual compliance plan updates reaffirms that the January 1, 2011, compliance date will be met for the aggregate annual point source nutrient waste load allocations in all Bay tributaries. Projections indicate that the Eastern Shore facilities may run short of nutrient credits in future years due to the small size of the trading market (only 5 facilities). Legislation is expected in the 2010 session of the General Assembly that would allow Eastern Shore dischargers to purchase credits from Rappahannock and Potomac Basin facilities.

Component #2 - Share the Cost with Localities Utilizing Virginia's Water Quality Improvement Fund

Of the 125 significant dischargers of nutrients in the Bay watershed, 92 are eligible for grant funds from the Virginia Water Quality Improvement Fund (WQIF). Recent estimates place the total cost of installing technologies to meet the point source nutrient allocations within the range of $1.5 to $2.0 billion. **The estimated cost to the state for providing grants from the WQIF is between $750 million to $1 billion**. Fortunately, as a result of Virginia's nutrient trading program, these costs can be spread out over time, with approximately 60-70% of the funds needed through 2010. The remainder of the future funding needs will support additional wastewater facility upgrades to maintain compliance with the nutrient waste load allocation "caps" as population and wastewater flows increase.

To date, grant requests for the design and installation of nutrient reduction technology (NRT) have been received and are being processed from 79 eligible applicants. Following is a status summary of the grant projects:

- There are now 42 active, signed grant agreements (up from 32 last June), committing a total of nearly $555 million in cost-share funds
- Of the 42 projects with signed agreements, 4 have completed NRT construction and the grant has been fully expended
- 19 projects are "ready-to-proceed" (Preliminary Engineering Report [PER] submitted) and agreement negotiations are underway. Estimated cost-share for these 19 projects is approximately $150 million
- 18 applications are pending PER submittal; the total grant amount requested for these projects is about $127 million
- For details on processing WQIF point source grant agreements, see the web link www.deq.virginia.gov/bay/ReadytoProceed.pdf

As a combined result of past appropriations, interest earned and other significant funding provided by the 2006 General Assembly, the WQIF has received approximately $387 million to provide as cost-share assistance to localities for installing nutrient removal technologies at wastewater facilities in the Chesapeake Bay watershed. Table IV-1 provides a summary of deposits to the WQIF for point source projects and available funds.

Table IV-1. Chesapeake Bay NRT Projects - WQIF Appropriations

Period	WQIF Reserve (Million Dollars)	WQIF Funds for Bay Point Source Projects (Million Dollars)
FY 1998	$0.00	$10.00
FY 1999	$0.00	$37.10
FY 2000	$0.00	$25.24
FY 2001	$0.00	$10.30
Interest earned (through FY04)	NA	$11.71
FY 2005	$0.68	$13.25
Interest earned (FY05)	NA	$0.29
FY 2006	$3.91	$67.21
Interest earned (FY06)	$0.08	$1.57
FY 2007	$0.09	$197.33
Interest earned (FY07)	$0.23	$8.46
FY 2008	$0.00	$5.00
Totals =	**$4.99**	**$387.46**

In 2007, legislation was passed that authorized bonds up to $250 million to be issued through the Virginia Public Building Authority after July 1, 2008, for ongoing WQIF grant reimbursements. Using owner-furnished data and construction schedules for the signed grant agreements, it is estimated that available WQIF funds (not counting bond proceeds) will be expended in the first quarter of FY2010 (July – October, 2009).

Therefore, DEQ notified the 2009 General Assembly that bond proceeds are needed (the current estimated amount is about $176 million) to cover expected grant reimbursement requests through FY2010. Budget amendments were recently passed that make the entire $250 million in bonds available to capitalize the WQIF, and proceeds

will be added to the Fund as needed. However, as additional applications are processed and grant agreements signed the WQIF is being over-obligated beyond the amount provided by the bonds. This is due to the fact that the DEQ Director is mandated to sign an agreement with all eligible applicants, except if the project is deferred based on the cost-effectiveness and viability of nutrient trading in lieu of NRT installation. The bond proceeds are projected to be fully expended by the end of FY 2011, and the funding shortfall is currently estimated to be about $103 million by the end of FY2014.

In addition to the existing 125 significant discharges currently covered by the General VPDES Watershed Permit Regulation, continued population growth within the Chesapeake Bay watershed will necessitate the construction of new wastewater treatment facilities or the expansion of existing "non-significant" treatment facilities. The nutrient discharge control regulations adopted in 2005 require that new and expanded facilities install state-of-the-art nutrient removal technologies and completely offset any additional nutrient discharge beyond the loads assigned to them as of July 1, 2005. Currently, three eligible non-significant facilities have been awarded WQIF grants (Middletown, Boyce and Craigsville), and four others have applied for approximately $9.7 million in cost-share to install needed nutrient removal technologies. They include Hampton Roads Sanitation District, Town of Washington and two Louisa County plants.

Component # 3 - Aggressively Leverage the Virginia Clean Water Revolving Loan Fund

The Virginia Clean Water Revolving Loan Fund (VCWRLF), previously known as the Virginia Revolving Loan Fund, was created in 1987 and is used extensively by localities to finance the portion of wastewater treatment facility upgrades that is not eligible for the state WQIF cost-share program.

Loans are provided to Virginia local governments to assist with wastewater treatment plant and/or collection system improvements. Localities may apply for a loan from the VCWRLF for any expansion, upgrade, extension, replacement, repair, rehabilitation, and/or addition to a publicly-owned wastewater collection and treatment facility; construction of any needed new facility or new conveyance system; and any planning and/or design costs associated with the above improvements.

DEQ, on behalf of the State Water Control Board (SWCB), manages the VCWRLF, administers the policy aspects of the Fund, receives applications and provides funding recommendations to the SWCB. The Virginia Resources Authority (VRA) serves as the financial manager of the Fund. In the 22 years since its inception, the VCWRLF has provided approximately $2 billion in low interest loans for more than 600 clean water projects in Virginia.

Historically, the VCWRLF has made available about $120 million per year for financing wastewater treatment and collection system upgrades. The majority of the available funds have been from repayments on outstanding loans, but a portion also comes from federal appropriations. Unfortunately, these federal fund appropriations have

been declining and may be discontinued in the future. **The DEQ and VRA initiated an aggressive leveraging program starting in FY 2007 to help meet the significantly increased need for financial assistance for nutrient removal.** Through aggressive leveraging, the VCWRLF has been financing wastewater upgrades at about $285 million per year for the last several years in order to address the large need for loan funds as previously discussed. More than 80% of the VCWRLF funding authorization has been for projects addressing TMDL implementation. **VRA estimates that, with the continued use of leveraging, they could finance approximately $150-200 million for the next two years through the VCWRLF.**

This year, approximately $77 million in additional FY 2009 funding was provided through the VCWRLF from the federal stimulus package. The SWCB approved the project list for this funding at their meeting on April 27 and many of these projects have already advertised for bids. The VCWRLF has issued a request for FY 2010 applications with an application deadline of July 17, 2009.

Timeframe:

A sufficient number of wastewater treatment facilities must be upgraded with nutrient removal technologies by January 1, 2011, in order to meet the Commonwealth's nutrient reduction goals for each river basin. As noted previously, DEQ's review of the Compliance Plans (and updates) submitted by dischargers subject to the Watershed General Permit Regulation has confirmed that the January 1, 2011 compliance deadline can be met. Plants applying for WQIF funds can view a schedule for facility upgrades at the following weblink: www.deq.virginia.gov/bay/ReadytoProceed.pdf.

Potential Problem Areas:

- Escalating Costs and Project Delays - Higher costs and project delays may result due to the high volume of engineering design and construction work needed during the next five years to install nutrient removal facilities at the hundreds of significant dischargers across the inter-state Chesapeake Bay watershed. The potential for delays in upgrading these facilities is due to shortages of professional services, skilled labor, and materials and equipment. This demand could escalate project costs and jeopardize the affordability of projects to localities.
- Insufficient State Funding - Currently, there are insufficient funds in the WQIF to support construction of needed nutrient removal facilities during the next five years, even with the addition of $250 million in approved bond proceeds. As noted previously, the WQIF is currently over-obligated, and unless additional funds are appropriated this figure will grow as more agreements are signed. Regardless of the availability of funds, the Virginia Water Quality Improvement Act (§10.1-2131.B.) requires the DEQ Director to enter into a grant agreement with all eligible facilities that apply, unless a project is deferred due to the cost-effectiveness and availability of using nutrient credit exchange instead of installing nutrient reduction technology. However, the *Code of Virginia* also

establishes that the agreements shall contain provisions noting that the payments are subject to the availability of funds.

These upgrades entail significant, complex engineering and construction projects and require significant financial commitments from local governments. The ability to demonstrate sufficient available grant funds in the WQIF is vital in helping localities secure construction contracts and obtain additional financing for their share of the project costs.

Risk Mitigation Strategy:

- Nutrient Trading - Full implementation of the Chesapeake Bay Watershed Nutrient Credit Exchange Program offers the greatest opportunity for the Commonwealth to achieve its nutrient reduction goals from wastewater dischargers in both a cost-effective and timely manner. Owners of municipal and industrial dischargers should take full advantage of the benefits the program offers, such as prioritizing construction of cost-effective projects and postpone other, less cost-effective projects, until additional population growth necessitates such upgrades; optimizing operation of existing nutrient removal technologies to achieve the greatest nutrient reduction possible; and installing nutrient removal technologies in the earliest possible phases of multi-year construction projects to expedite nutrient reductions. DEQ will review each discharger's compliance plan (updates due by February 1 each year) to determine whether they are fully utilizing the advantages of the nutrient credit exchange program.
- Consistent and Sufficient State Funding – Consistent funding of the WQIF is critical to ensure uninterrupted progress with wastewater treatment facility upgrades. **It is anticipated that use of the $250 million in approved bonds will provide sufficient funding for construction projects to meet the Commonwealth's 2010 point source nutrient reduction goals.** However, additional funds will be necessary for future facility upgrades to offset the effects of continued population growth.
- Cost Containment - Several cost containment methods were approved by the DEQ Director in October 2007 in order to maximize the purchasing power of available state funds. These measures are more fully described in Section VI - Cost Containment Mechanisms.

Performance Measurement:

Continuous tracking of upgrades is underway at municipal and industrial wastewater facilities, with annual compilations of the nutrient reductions achieved.

Table IV-2 Estimated Nutrient Reductions from WQIF-Funded Projects

Facility	Delivered Total Nitrogen Load (lbs/yr)			Delivered Total Phosphorus Load (lbs/yr)		
	2008	WLA	2011	2008	WLA	2011
Onancock STP	3,288	9,137	6,944	886	685	521
Chesterfield - Falling Creek	428,945	153,801	153,801	30,149	15,380	15,380
Chesterfield - Proctors Creek	405,488	411,151	388,004	56,063	41,115	29,846
Farmville STP	4,120	16,665	16,665	4,917	1,572	1,572
HRSD-Army Base STP	837,408	610,000	917,058	20,672	54,820	55,024
HRSD-Nansemond STP	644,533	750,000	471,843	58,123	91,367	56,470
Lex-Rockbridge Reg. STP	11,981	16,446	9,356	15,406	4,568	8,576
Richmond STP	1,958,363	1,096,402	1,096,402	104,502	68,525	65,480
RWSA-Moores Crk. STP	268,126	167,201	151,702	114,785	22,842	21,538
Culpeper WWTP	40,692	33,440	24,300	6,404	4,112	3,984
Orange STP	24,214	22,293	8,174	4,465	2,741	1,005
Tappahannock STP	12,391	9,746	6,091	835	731	457
Warrenton STP	63,496	18,578	18,578	3,311	2,284	2,284
Warsaw STP	9,017	3,655	1,827	2,836	274	244
ACSA-Fishersville STP	19,416	21,441	11,846	9,178	2,814	1,555
ACSA-Middle River STP	30,914	36,449	26,855	8,592	4,784	3,525
Arlington Co. WPCF	502,377	365,467	365,292	4,663	21,928	7,306
Berryville STP	20,261	5,713	14,088	4,305	492	2,032
Broadway STP	52,933	19,752	17,140	11,362	1,703	1,674
Colonial Beach STP	35,943	18,273	18,273	7,187	1,827	1,827
Dale Service Corp. #1 STP	31,096	42,029	34,719	952	2,522	2,083
Dale Service Corp. #8 STP	24,651	42,029	34,719	928	2,522	2,083
FCW&SA-Vint Hill STP	2,057	3,180	1,325	161	241	104
FWSA-Opequon STP	71,091	75,724	113,390	3,595	5,910	9,439
FWSA-Parkins Mill STP	67,936	45,074	26,594	26,869	3,517	2,767
HRRSA-North River STP	78,519	111,492	71,826	11,447	14,633	9,427
K. Geo. Co-Dahlgren STP	4,913	9,137	7,675	275	914	672
K. Geo. Co-Fairview Beach	534	1,827	822	104	183	82
LCSA-Broad Run STP	15543	101,113	44,085	301	2,345	1,022
Luray STP	9,467	8,576	8,576	2,478	1,126	1,126
Mt. Jackson STP	5,162	5,713	4,081	206	493	352
Pr. Wm. Co.-Mooney STP	263,289	219,280	150,755	3,351	13,157	9,045
Purcellville STP	7,673	15,167	10,617	250	1,055	591
Stafford Co.–Aquia STP	82,899	73,093	57,470	1,464	4,386	3,448
Waynesboro STP	57,288	21,441	16,643	25,548	2,814	2,718
Woodstock STP	14,520	16,324	16,324	3,528	1,407	1,407
HRSD-York STP	556,513	274,100	260,210	19,450	31,978	24,286
Totals =	6,667,057	4,850,909	4,584,070	569,548	433,767	350,952

Table IV-2 shows estimated pollution reductions resulting from 37 projects with signed WQIF grant agreements (three grant projects not shown are non-significant dischargers that must only maintain their “permitted design capacity”, not achieve reductions from existing loads). It illustrates the nutrient load each facility delivered to the Bay and tidal rivers in 2008, compared to the maximum nutrient load they are allowed to deliver (WLA), and what they are projected to deliver in 2011. As can be seen, in 2011 these projects will reduce the amount of nitrogen and phosphorus being

delivered to the Bay and tidal rivers by almost 2.1 million pounds and 218,000 pounds respectively, compared to the 2008 loads.

Table IV-3 summarizes the 2008 delivered nitrogen and phosphorus loads from point sources within each of Virginia's Bay tributary basins, compared to the total point source Waste Load Allocations (WLA) to be achieved beginning January 1, 2011.

Table IV-3 Delivered Point Source Nutrient Loads – 2007 vs. Waste Load Allocations

River Basin	Total Nitrogen Delivered Load (lbs/yr)		Total Phosphorus Delivered Load (lbs/yr)	
	2008	WLA	2008	WLA
Shenandoah-Potomac*	3,395,496	3,407,870	252,070	187,948
Rappahannock	449,576	497,721	44,414	42,706
York	1,116,057	963,875	113,682	161,536
James	13,812,762	13,898,522	979,357	1,351,858
Eastern Shore	146,089	31,370	3,159	1,780
TOTALS =	18,919,980	18,799,358	1,392,682	1,745,828

*Note: figures do not include Virginia portion of Blue Plains.

ii. Other wastewater dischargers and sources

Aside from dischargers of nutrient pollution into waters draining to the Chesapeake Bay, there are numerous other sources of wastewater that contribute various types of pollution to impaired waters throughout Virginia. These pollution sources are identified during Virginia's TMDL process. Sources of wastewater discharges into impaired waters include the following:

- municipal sewerage systems (treatment plants and collection pipes)
- industrial wastewater treatment systems
- mining operations
- industrial storm water (**Note: municipal storm water is addressed in the Developed and Developing Lands Category of this report)
- discharges from boats
- discharges or releases of toxic chemicals (such as PCBs and mercury) from contaminated industrial sites
- failing on-site septic systems and illegal straight pipe (untreated) discharges

The first four sources listed above are permitted through Virginia's Pollution Discharge Elimination System (VPDES) permit process and allowable levels of pollution discharge ("waste load allocations") are included as an integral component of any specific water's TMDL clean-up plan. Implementing this component of the clean-up is done through the VPDES permit process, whereby U.S. EPA regulations require that discharge permits must be consistent with TMDL waste load allocations.

While discharges from permitted wastewater treatment facilities are rarely identified as the cause of the water quality impairment, there are some exceptions, such as:

- For some impaired waters, non-compliance with permit limits has been identified as the source of impairment and are being addressed through enforcement actions that should result in attainment of water quality standards in the near future
- Mining operations have been identified as contributing, in part, to several impairments in southwest Virginia and their contributions are being evaluated by Virginia's Department of Mines, Minerals and Energy which has the authority for issuing permits to mining operations
- In two waters impaired due to elevated phosphorus levels (Unnamed Tributary to the Chickahominy River, and Spring Branch), TMDL clean-up plans are requiring that permitted facilities reduce their annual phosphorus discharge by up to 60%

iii. Permitted Discharges

This category includes municipal sewerage systems, industrial wastewater treatment systems, mining operations and industrial storm water.

Objective:

Utilize the VPDES permitting process and impaired waters identification and clean-up process in conjunction with strict enforcement of discharge permits to remedy any permitted sources of wastewater discharge that are contributing to water quality impairments.

Rationale:

Virginia's process and programs for identifying sources of pollution to impaired waters – and remedying those impairments – are already well established. The pace at which clean-up plans are implemented, however, must be significantly increased.

Strategy:

Adhere to an expedited process for developing and implementing TMDL clean-up plans for all impaired waters throughout the Commonwealth – revising permits for wastewater dischargers and pursuing enforcement actions where necessary.

Potential Problem Areas:

- In some cases, necessary levels of pollution reduction may be economically and/or technologically unachievable
- Water quality standards (designated safe levels) may be inappropriate for some specific waters

Risk Mitigation Strategy:

- Low interest loans (Virginia Clean Water Revolving Loan Fund) are available to offset additional capital costs for upgrading and expanding needed wastewater treatment facilities
- In addition, it is possible that during implementation of TMDL clean-up plans, continued water quality monitoring may indicate attainment of clean-up standards prior to full implementation of the plan, thereby reducing the projected clean-up costs
- All of Virginia's water quality standards are re-evaluated every three years to determine if they remain appropriate and reflect recent scientific findings
- The *Code of Virginia* (§62.1-44.19:7) allows for an aggrieved party to present to the State Water Control Board reasonable grounds that attainment of any water quality standard is not feasible; in cases such as this Board may allow the party to conduct a Use Attainability Analysis, in accordance with federal and state law, that could result in an adjustment of the water quality standard

Performance Measurement:

Report semi-annually on the following:

- The amount of loans and grants used to address TMDL implementation
- The permitting and compliance actions taken in accordance with TMDL Implementation Plans

iv. Discharges from Boats

Objective:

Reduce the adverse impact of sanitary waste discharge from boats.

Rationale:

Wastewater discharges from boats are regulated by U.S. Coast Guard. However, these permitted discharges continue to contribute nutrient pollution and bacteria that may result in shellfish harvesting restrictions. Boat discharges are identified as potential sources of human bacteria in all TMDL clean-up plans for shellfish waters.

Strategy:

The strategy is to designate specific waters as "No Discharge Zones" (NDZ), thereby prohibiting the discharge of sanitary waste from boats. The 2009 Virginia General Assembly adopted HB 1774 which designates Virginia tidal creeks as NDZs. Vessels operating in these designated areas would be prohibited from discharging treated and untreated waste into the waters. A NDZ would only be established on those tidal creeks where the U.S. Environmental Protection Agency has determined that sufficient

facilities exist for the removal of sewage. **DEQ plans to pursue NDZ designations in response either to petitions received or to implement TMDLs that identify the need for such designations for the affected waters.**

Currently underway is an NDZ application for shellfish growing areas in Broad Creek, a tributary to the Rappahannock River, Jackson Creek and Fishing Bay, tributaries to the Piankatank River in Middlesex County, Virginia, has been submitted to U.S. EPA. The formal designation is expected mid-summer 2009.

Virginia Beach is currently developing a NDZ application for Owl Creek /Rudee Inlet. The data collection is complete and DEQ is assisting with the public outreach component. The completed application should be submitted to U.S. EPA for designation by late summer 2009.

Under Consideration: DEQ is negotiating with the Northern Neck PDC to prepare NDZ applications for a contiguous set of 42 tidal creeks/rivers spanning much of Virginia's Northern Neck in Lancaster, Northumberland, and Westmoreland Counties. The PDC is undertaking the entire effort under DEQ oversight, including data collection, document assembly, and public outreach, providing DEQ with "turnkey" products ready for submission to U.S. EPA. Assuming a successful negotiation and flow of federal stimulus funds, data collection will begin with this summer's boating season. The last of the applications is projected for completion in fall, 2010, reflecting a quick and effective action by DEQ on the geographic scale envisioned by HB 1774.

Potential Problem Areas:

While NDZ designation is being increasingly explored as a potential restoration tool, there are significant roadblocks to successful implementation, including:

- Lack of adequate number of boat pump-out facilities at marinas for recreational and commercial vessels
- Insufficient state or local resources for enforcement of NDZs
- Possible resistance to NDZ designation by local government and boat owners due to lack of understanding of the benefits

Risk Mitigation Strategy:

- Currently there is a federal 75% cost share program administered by the Virginia Department of Health, Marina Program, for establishing pump-out facilities
- If federal cost share funding is insufficient, future state grant funding or low-cost loans may be needed to meet the demand for increasing numbers of boat pump-out facilities for recreational and commercial vessels

- Additional state and local staff may be needed to assure adequate enforcement of NDZs
- Mitigation of local government and boat owner resistance to NDZ designations may be possible through extensive boater and marina educational efforts promoting the water quality benefits of NDZ designation.

Performance Measurement:

Report semi-annually on outreach efforts and NDZ designations will be included in future Plan updates.

V. Discharges of toxic substances

Objective:

Utilize the TMDL clean-up process to identify areas of toxic contamination, identify sources and implement remediation measures.

Rationale:

Discharges of toxic substances, particularly those categorized as "persistent and bioaccumulative," such as PCBs and mercury, have resulted in impaired waters and fish consumption advisories issued by the Virginia Department of Health. These pollutants can enter the water in run-off or leaching from contaminated sites, in discharges from wastewater or stormwater treatment facilities, or from air deposition (see details in Air section). As of December 2007, there are 54 waters throughout the Commonwealth with fish consumption advisories due to toxic contamination.

Strategy:

To address impairments from toxic contamination, DEQ is currently developing TMDL clean-up plans for the following problems areas:

- Potomac River PCB TMDL – completed September 2007
- Bluestone River PCB TMDL – expected completion date fall 2009
- Roanoke River PCB TMDL – expected completion date summer 2009
- South River mercury TMDL – expected completion date summer 2009
- North Fork Holston mercury TMDL – expected completion date December 2009
- Levisa Fork PCB TMDL – expected completion date March 2010

PCB monitoring plans in support of TMDL development are underway for James and Elizabeth Rivers with actual ambient water quality monitoring to begin as early as mid-2009.

The PCB Point Source Monitoring Guidance (GM09-2001) has been approved and is currently being used by regional staff in support of PCB source assessments.

Several watersheds have begun to implement "pollutant minimization plans" as an approach to reduce PCB loads being discharged to impaired water. Other clean-up plans will be scheduled at a later date.

Potential Problem Areas:

- Sources of toxic contamination may be widely dispersed throughout the watershed, making source identification very difficult and labor intensive and the need to significantly increase data collection will require additional staff resources
- Lack of adequate funding for timely implementation of clean-up plans
- Increased toxic monitoring requirements for some smaller wastewater facilities may create financial hardships
- Technical guidance for pollutant minimization plans is lacking

Risk Mitigation Strategy:

- Technical guidance on collecting low-level PCB data using low-level detection methods is now available
- Where responsible parties can be identified, their resources will be utilized to the fullest possible extent to characterize the sources of contamination, this still requires additional state funding to expand monitoring and identification of contamination sources
- Additional state funding or revisions to the WQIF could be used to offset increased toxic monitoring costs at permitted facilities experiencing financial hardship
- Additional state funding is necessary to enable timely, targeted, cost-effective remediation of sources of toxic contamination identified through development of TMDL clean-up plans

Performance Measurement:

Report semi-annually on TMDL clean-up plan development and implementation for waters impacted by toxic contamination.

vi. Failing on-site septic systems and illegal straight pipe (untreated) discharges

Objective:

Significantly increase the number of failing on-site sewage systems that are repaired or replaced and identify and remove remaining straight pipe discharges.

Rationale:

The Commonwealth has approximately one million residential on-site sewage disposal systems ("septic systems"). Estimates by U.S. EPA indicate that 10% to 20% of

on-site systems are failing and releasing pollutants to the environment. The Virginia Department of Health estimates that the number of substandard systems (i.e., straight pipes, systems in need of repair) is 4.4% of the existing systems.

TMDL clean-up studies in Virginia confirm that failing on-site systems are commonly identified as a source of pollution. For example, a survey of homes within the Guest River watershed in 2001 revealed that 55% of respondents reported that their sewage disposal system was over 20 years old. This age range is likely common in more rural areas of the state. Systems over thirty years old are often considered to be reaching their performance limit. Currently, only limited restoration of on-site systems is occurring through the TMDL implementation process. More fiscal and staff resources, as well as effective inter-agency cooperation, are needed to increase the pace of repair or replacement of these failing or substandard systems.

Strategy:

- The Virginia Department of Health is in the process of promulgating regulations that require the following:
  - Operation and maintenance
  - Performance standards for all onsite sewage systems including the control of nitrogen contamination
  - Establish a uniform schedule of civil penalties for violations of the operation permit of non-conventional onsite sewage systems
- Explore the possibility of increasing cost-share funds for property owners to repair or replace failing septic systems, replace straight pipes and to pump out tanks (currently available for a limited number of TMDL implementation projects and WQIF grants); this funding is currently not sufficient to meet the statewide need
- The 2006 General Assembly appropriated $17 million to the WQIF for areas outside of the Chesapeake Bay watershed, known as the "Southern Rivers" targeted to assist local governments with on-site septic remediation programs, including connections to central sewerage systems, and are being used as follows follows:
  - Of the $17 million available, the Southern Rivers Watershed Enhancement Program has awarded over $15.4 million
  - These awards were announced by Governor Kaine on October 11, 2007, May 13, 2008, and August 8, 2008
  - Most of the funds were awarded as wastewater treatment (WWT) system construction grants to localities in 16 counties outside the Chesapeake Bay watershed
  - The combined projects will connect over 700 households to public wastewater services and will install more than 45,000 linear feet of sewer line; thus reducing the amount of sewage flowing into impaired water bodies

Potential Problem Areas:

- Multi-agency responsibilities and different agency restoration priorities make a concentrated focus on the issue of failing septic systems challenging
- Lack of local government awareness of the extent of the problem
- Lack of a "watershed approach" in situations where state boundaries complicate the management of natural resources; examples of situations where political boundaries can be an impediment to success if not properly addressed include:
    - The Upper Tennessee River Restoration group
    - The Big Sandy River Restoration group
- The costs associated with hiring an Onsite Sewage Evaluator (OSE) and/or Professional Engineer (PE) when the repair requires treatment beyond primary or a dispersal system other than a standard (gravel trench type) drain field currently are not eligible for cost-share funds
- Lack of a concerted effort and available staff/funding to identify where straight pipes and failing sewage disposal systems are in order to better apply cost-share funding
- Lack of funding for watershed coordinators whose job it would be to seek funding, track spending, and monitor success
- High cost of repair/replacement of failing septic systems or installation/extension of sewer service
- Inadequate levels of available cost share funding for onsite sewage system remediation
- Impediments to enforcement by the Virginia Department of Health's Sewage Handling and Disposal Regulations, such as lack of staff, lack of emphasis on enforcement, and lack of options for affected homeowners to fix the problem
- The potential impact of continued shoreline residential development that result in closures of shellfish areas

Risk Mitigation Strategy:

- Develop a Memorandum of Agreement (MOA) among DEQ, DCR and VDH to mitigate multi-agency responsibilities and different priorities on restoration efforts providing an integrated strategy to prioritize and accelerate the pace of remediation of pollutants from illegal straight pipe discharges and failing septic systems
- Provide incentives to foster local government participation in the TMDL clean-up process
- Initiate a local government education process to highlight the benefits of impaired water restoration
- Promote and encourage the inclusion of restoration and proactive pollutant reduction measures in locality Comprehensive Master Plans
- Work with local governments to identify potential TMDL implementation funding sources
- Explore the possibility of enhancing the use of loans from the Virginia Clean Water Revolving Loan Fund and WQIF grants to finance the cost of

replacing/repairing failing septic systems allowing Soil and Water Conservation Districts and Planning District Commissions to administer these funds (precedent and success can be found using this approach in the Guest River, the Indian Creek and the Wallen Creek watersheds

- Assure local health department staff are utilizing civil penalties enforcement tools which commences July 1, 2009 to address failing septic systems and illegal straight pipes
- Partnering to Eliminate Environmental Threats – HB 2646 (2009) - Establishes a market-based betterment loan program to address failing sewage systems in order to reduce threats to public health and ground and surface waters by assisting with homeowner and business efforts to eliminate their negative impacts on Virginia's waters through private financing of system upgrades and improvements

Performance Measurement:

Report semi-annually on the amount of funds appropriated to local governments and property owners, with estimates of the number of failing systems or straight pipes that have been addressed.

b. Agriculture and Forestry Category

i. Widespread adoption of cost-effective agricultural best management practices ("Five Priority Practices")

Objective:

Implement to the maximum extent practicable, the five priority agricultural best management practices in the Chesapeake Bay watershed in order to significantly advance the Commonwealth's nutrient and sediment pollution reduction goals by 2013.

Rationale:

Water quality restoration goals will not be achieved without widespread implementation of agricultural best management practices (BMP). Estimates from Virginia's tributary strategies are that 92% of agricultural acreage must be "treated" with a BMP or suite of BMPs to achieve nutrient and sediment reductions assigned to the agricultural sector. If fully implemented, the "priority" practices outlined in this strategy will achieve an estimated 60% (**approximately 11.8 million pounds of nitrogen and 1.8 million pounds of phosphorus**) of the needed nonpoint source nutrient reductions. The "priority practices" were chosen because of their proven ability to reduce pollution, cost-effectiveness, and acceptance by the agricultural community.

Strategy:

- Through expanded outreach and cost share support, focus on the following "Priority Practices:"
  - Nutrient management plan preparation and implementation
  - Conservation tillage
  - Cover crops
  - Riparian buffers (including those established under the Conservation Reserve Enhancement Program (CREP)
  - Livestock exclusion
- It should be noted that not all practices may be applicable to every farm operation
- The General Assembly may wish to review the statutorily required 60%/40% split of WQIF funds between the Bay and Southern Rivers watersheds to determine if sufficient nonpoint source funds are made available each year to meet the Chesapeake Bay goals established under the regional multi-state compact
- Provide funding to Virginia's 47 Soil and Water Conservation Districts (SWCD or district) for additional on-the-ground technical staff to deliver the increased agricultural cost-share program; the level of funding needed is dependent on the amount appropriated to the WQIF and the Natural Resources Commitment Fund for implementing the non-point source BMPs (current estimates are that one local district technical employee is needed for every increment of roughly $370,000 they receive in BMP cost-share funds)
- With sufficient funding, DCR will provide the necessary technical training, financial management assistance and administrative support necessary to assist the 47 SWCDs in managing larger financial obligations, new staff and reporting and auditing responsibilities; estimated staff requirements for this function at DCR are 3.5 FTEs and approximately $260,000
- A special appropriation of up to $500,000 of nonpoint WQIF interest was committed by the 2008 General Assembly towards development and contracting of phase 2 of the BMP Tracking Program modernization project (the computer reporting system that documents BMP implementation)
- With sufficient funding, DCR will be able to provide local soil and water districts with specific engineering training and certification for the delivery of priority BMPs that require such expertise; estimated DCR staff requirements for this function are 4 FTEs and $400,000 (out-sourcing also will be evaluated)
- Continue to work collaboratively with the Natural Resources Conservation Service (NRCS), SWCDs and others to provide training for new technical staff
- Extend engineering training agreement with NRCS to perform this service on an ongoing basis
- DCR, in consultation with Soil and Water Conservation Districts and agricultural producers, have explored ways to boost levels of farmer participation in agricultural cost-share programs through additional voluntary, financial incentives, certifications and recognition programs as well as other promotional activities including expanding media outreach efforts statewide
- Plans for the expenditure of the $20 million deposit in the VNRDF for FY 2010 through an action of the 2009 General Assembly were presented to the Virginia

Soil and Water Conservation Board (Board) at the May 28, 2009 meeting; the Board supports DCR's plans and offered no recommendations or request for change

- Work to implement an MOU with commodity groups for stream exclusion
- Coordinate conservation efforts with NRCS and FSA programs to assure federal and state conservation programs are not competing for participants and are promoting effective conservation communications to local producers and NGOs
- Explore new and innovative methods of maintaining the conservation benefits of BMPs that have been implemented but the agreed upon maintenance period associated with the original cost share contract is about to expire
- Develop methods for identifying and quantifying voluntarily installed BMPs and methods for keeping them functional

Potential Problem Areas:

- Inadequate BMP cost-share funding or the technical staff support funding needed to deliver the BMPs at local and state level
- Some farmers, for a variety of reasons, prefer not to participate in government programs which make accounting for their efforts difficult and others may choose not to implement conservation priority practices
- Extremely aggressive implementation of agricultural conservation practices will be necessary to meet the Commonwealth's nonpoint source nutrient and sediment pollution reduction goals by 2013 – one or more BMPs needed on approximately 92% of all available agricultural land; it is estimated that only 30% to 40% of all available lands have implemented BMPs
- Budgetary shortfalls have resulted in a reduction of operational funds to SWCDs in each of the last two years

Performance Measurement:

Pounds of nitrogen and phosphorus reduced through the implementation of priority practices as reported annually to the U.S. EPA's Chesapeake Bay Program.

ii. Implement nutrient management on lands receiving poultry litter

Objective:

Revise the current poultry litter management program to assure that all land application of poultry litter will be done in accordance with prescribed nutrient management planning practices.

Rationale:

Given the need for widespread implementation of nutrient management planning to meet the Commonwealth's nutrient and sediment pollution reduction goals, it is critical

for Virginia to better address the issue of off-site application of poultry litter. Poultry litter can be a significant source of nitrogen and phosphorus pollution where runoff results from improper application, management or storage. Under current state regulations, nutrient management plans are only required where poultry litter is applied on the same land that is owned or controlled by the poultry grower. When litter is transferred to another farm, there is no such requirement. The Department of Conservation and Recreation estimates that as much as 85% of poultry litter is transferred from regulated poultry growing operations to farms with no nutrient management planning requirement. The State Water Control Board has issued a NOIRA to develop an end user regulatory program to result in proper utilization of poultry litter that is transferred to end-users of litter.

Strategy/Timeframe:

- DCR will work with the Virginia Poultry Federation (VPF), poultry integrators, and poultry growers to better organize poultry litter supply and demand by:
  - Maximizing the effectiveness of the "market maker," hired with partial funding from the Virginia Poultry Federation, to facilitate the transfer of poultry litter between buyers and sellers
  - Expanding the market for poultry litter by using the "market maker" to promote the benefits of land application in agricultural areas that currently use little
  - providing assistance and guidance to these efforts and work with the parties involved to evaluate their effectiveness
- Continue implementation of a targeted Virginia litter transport program established in the fall of 2007, to provide incentives for the movement of surplus poultry litter to areas of the state that can better utilize the nutrient content; DCR has committed $300,000 in WGIF funds and the VPF has matched that amount with $100,000 per year for the next three years
- Evaluate the existing federal U.S. Department of Agriculture / Natural Resources Conservation Service's (USDA/NRCS) poultry litter transport program
- Revise the poultry waste management regulations by the end of 2009 to require implementation of nutrient management plans and/or proper nutrient management practices by end users of poultry litter and require improved tracking of poultry litter transfers from growers to brokers and end users

Potential Problem Areas:

- Lack of funds beyond three years to support the continuation of a litter transport system
- Lack of development of longer-term alternative uses for poultry litter to complement transport programs

Performance Measurement:

Number of acres of nutrient management plans written and implemented and tons of litter and nutrients transferred.

iii. Significantly reduce the phosphorous content of poultry, swine and dairy manures through aggressive diet and feed management

Objective:

Reduce the phosphorus content in poultry litter and swine manure by 30% through wide-spread adoption of feed supplements throughout Virginia's poultry and swine industries and achieve a 10% phosphorous content reduction in dairy manure through improved diet and feed management.

Rationale:

Feed supplements such as the enzyme Phytase have a proven record of reducing the phosphorus content in poultry litter and swine manure. Poultry and swine integrators throughout Virginia have achieved significant nutrient reductions while at the same time protecting animal health and productivity. Virginia has previously assisted the poultry and swine industries in the use of this feed alternative through grants from the Water Quality Improvement Fund. For most poultry and swine operations in Virginia, feed management is handled by a few large integrators that control the feed supply to hundreds of contract growers, whereas most dairies (more than 800 operations) are fully independent operations.

Strategy:

- Implement the Memorandum of Agreements with six poultry integrators to achieve a goal of a 30% reduction level in phosphorus excreted in broiler and turkey litter by December 31, 2010
- Develop Memorandum of Agreements with the major swine integrators in Virginia
- Provide on-going monitoring of manure analyses to track progress in meeting the reduction targets and insure the reductions are maintained once met
- Develop and implement outreach program in conjunction with Virginia Tech for Virginia dairy operators to insure they are informed of the economic and environmental benefits associated with diet and feed modifications to reduce phosphorus content in manure
- Continue implementation of a pilot incentive program for Virginia dairies within the Chesapeake Bay to help operators implement and sustain diet and feed management practices in their operations with the goal of achieving a 10% phosphorous reduction in dairy manure

Timeframe:

- Monitor progress of each poultry integrator annually beginning on July 1, 2008 by reviewing progress with each company's manure analyses and determine the need for adjustment to achieve full compliance of the 30% reduction goal
- The Secretary of Natural Resources will convene a meeting of swine integrators by December 31, 2009 to seek integrator commitment to the application of phosphorous reduction strategies
- By 2010, achieve a 10% reduction in phosphorous levels in manure in one-third of the dairy animals in Virginia's part of the Chesapeake Bay

Potential Problem Areas:

- Possible reluctance of swine integrators to commit to a phosphorus reduction goal and to entering into an agreement with the Department of Conservation and Recreation
- Inability for one or more integrators to achieve the 30% reduction target
- Insufficient resources to carry out the required outreach and incentive program needed to convince the majority of Virginia's 800 dairy operators that diet and feed management can help their operation and provide environmental benefits

Performance Measurement:

- Percentage reduction in phosphorus content of sampled poultry litter and swine manure
- Percentage of dairy animals in the Chesapeake Bay in dairy operations utilizing diet and feed modification technology

iv. Protect surface water resources through the implementation of silvicultural regulation and Department of Forestry programs

Objective:

The Virginia Department of Forestry (DOF) plays a significant role in maintaining water quality in Virginia. Activities include:

- Inspecting timber harvest sites to ensure that sediment is not eroding into streams and waterways
- Monitoring streams for sediment deposition, and conducting field audits
- Assisting citizens and landowners to create rain gardens and riparian forest buffers on their property

Rationale:

Soil disturbed on timber harvest sites can add sediment to streams; DOF implements water quality inspections of logging sites as well as other programs to assist loggers in following environmentally safe best management practices to keep streams free of sediments. If loggers do not follow "best management practices" on harvest sites, sediment deposition may occur, and may result in civil penalties for violation of the Silvicultural Water Quality Law.

In addition, maintaining forest buffers along streams is one of the most effective ways to prevent both nutrient and sediment pollution from entering the stream channel and compromising the ecological integrity of the stream. This is done through an active riparian buffer establishment program as well as passively through retention of existing forest buffers during timber harvest operations utilizing the Riparian Forest Buffer Tax Credit Program administered by the DOF.

Strategy:

- Enforce Virginia's Silvicultural Water Quality Law by:
  - Requiring silvicultural activities to be conducted without contributing sediment to the waters of the Commonwealth and addressing violations through a civil action according to the Administrative Processes Act
- Work with the Department of Conservation and Recreation to fund and administer the timber harvest operator cost share program to:
  - Provide incentives to logging contractors to properly install best management practices (BMPs)
- Monitor silvicultural BMP implementation in Virginia for proper installation according to the Southern Group of State Foresters protocol which provides data for an annual reporting of Virginia's progress in BMP Implementation for forestry operations to U.S. EPA (supported by the US Forest Service Region 8 office)
- Cooperate with Virginia Tech to educate loggers through the SHARP (Sustainable Harvesting and Resource Professional) logger program through the Sustainable Forestry Initiative (SFI) Program
  - This program certifies loggers who have completed a core curriculum relating to proper harvesting techniques, business skills, environmental protection, and safety
  - Most wood using facilities require their suppliers to be SHARP certified
- Pursue federal funding to expand logger cost share programs
- Continue with providing landowner cost-share assistance for establishment of Riparian Forest Buffers utilizing Conservation Reserve Enhancement Program (CREP) funds

Timeframe: Ongoing

Potential Problem Areas:

Most of the barriers to implementation of the strategies listed directly relate to the ability to acquire cost-share funding for utilization of the harvesting contractors and landowners. Several sources are currently in place such as Water Quality Improvement Act funds through DCR as well as CREP funding through NRCS. Additional sources of funding for cost-share are being sought through U.S. Forest Service Economic Stimulus funding. Water Quality Law Enforcement and BMP monitoring will continue but possibly in a modified format if reductions in agency operating budgets continue.

Performance Measurement:

Best Management Practices for forestry water quality protection have been developed, refined and studied over the past 40 years and are proven methods of preventing pollution from forestry operations. The Virginia Department of Forestry has been monitoring the implementation of Forestry BMPs since 1993 and has recently implemented a protocol in 2008 that further refines the monitoring process. This monitoring process allows the DOF to target specific areas for operator education and provides a comparison of how Virginia is doing relative to the rest of the Southern States in BMP implementation. One of our DOF State Agency Reporting measures for the Governor is directly related to control of active sedimentation from logging activity. Currently, that standard is set at a level of 98% of timber harvesting operations having no active sedimentation originating from their operations.

C. Developed and Developing Lands Category

i. Improvement toward full implementation and compliance of erosion and sediment control programs statewide

Objective:

By the end of 2010, 90% of the 164 local erosion and sediment programs will be consistent with the requirements of the Virginia Erosion and Sediment Control Law.

Rationale:

The control of erosion and resulting sediment loss from construction sites is a foundational nonpoint source control program. As of the March 2009 meeting of the Virginia Soil and Water Conservation Board, approximately 83% of the 149 local programs reviewed since July 1, 2005 have been found consistent with the Erosion and Sediment Control Law and Regulations. Compliant local programs protect Virginia's soils and water resources.

Strategy:

- Continue the current five year program review cycle to increase or maintain the 90% consistent local erosion and sediment control programs
- Local programs found not consistent with the law will be required to complete a Corrective Action Agreement (CAA) outlining measures/timeframes necessary for compliance
- DCR staff will refer chronic non-compliance issues to the Soil and Water Conservation Board for enforcement action and possible civil penalties
- DCR staff will revise current erosion and sediment control courses and develop additional training and educational material to provide more current and applicable information to local program staff, developers, contractors and the general public
- DCR staff will coordinate general permit inspections with local program staff erosion and sediment control inspections to increase compliance on-site and to provide additional education to local program staff related to erosion and sediment control and stormwater management

Time Frame: Begin next five year review cycle in 2010.

Potential Problem Areas:

- Localities must be willing partners in improved compliance
- Localities must be willing to adequately staff their program
- Localities must be willing to increase local permit fees and assess civil penalties sufficient to provide adequate funding for program implementation and ensure full compliance with the program

Risk Mitigation Strategy:

- Increase course and exam cost to enable DCR to deliver sufficient program education and information delivery through classroom training, operation and management of an interactive website, development of informational brochures and other guidance documents, on-site inspections and assistance visits and other technical meetings (estimated cost approximately $150,000 per year)
- Provide state funding or grant funding assistance for local program implementation
- Review the need to initiate legislative action authorizing local governments to charge additional fees for site-specific non-compliance; **l**ocalities are restricted by state law on the size of penalties they can impose significant compliance issues and current penalties are at such a level that they provide little incentive to undertake corrective actions
- Require localities to initiate efforts such as charging permit fees and assessing civil penalties that are supportive of the cost of implementing the local program

Performance Measurement:

Number of local program reviews completed annually and percentage of programs reviewed in compliance with state standards.

ii. Implement a revised stormwater management program statewide

Objective:

Complete the revision of Virginia's stormwater management regulations and implement the regulations statewide with maximum local government adoption.

Rationale:

The Virginia Soil and Water Conservation Board is the regulatory authority for the National Pollutant Discharge Elimination System (NPDES) programs related to municipal separate storm sewer systems (MS4) and construction activities. The DCR is responsible for the issuance, denial, revocation, termination and enforcement of the stormwater permits for the control of stormwater discharges from MS4s and construction activities under the Virginia Stormwater Management Program (VSMP) Permit Regulations.

The Virginia Stormwater Management Program seeks to maintain, protect, or improve the physical, chemical, biological and hydrologic characteristics and the water quality and quantity of receiving state waters, as well as, protect properties from damages caused by increased volume, frequency and peak rate of stormwater runoff. A regulatory revision is underway that seeks to establish specific requirements for stormwater quality and quantity controls for development. The proposed regulations also define what is required for a local government to be approved to operate a local stormwater management program. The regulations also will include an updated fee schedule for MS4 and construction general permits with the goal of providing the local government and DCR the necessary resources to operate a stormwater program.

Strategy/Timeframe:

- Provide draft regulatory revisions for public comment by June 2009
- Obtain U.S. EPA approval of state permit program delegation to the qualified local governments by December 31, 2009
- Increase the level of registration of construction sites that require the stormwater general permit to 75% by December 31, 2009
- Increase DCR inspection of all permitted sites to at least 50% by December 31, 2009
- Delegate the state stormwater general permit program to qualifying local governments that are in MS4 areas or in the Chesapeake Bay Preservation Act area beginning July 1, 2010

- By January 1, 2011, at least 25% of local governments not required by law to adopt the stormwater program will qualify and will voluntarily adopt the program
- DCR will administer the stormwater program in localities without an approved program on an approved schedule of adoption by the Virginia Soil and Water Conservation Board; the Board approved schedule would allow for at least 50% of the stormwater programs to be administered by DCR to be adopted by January 1, 2011

Potential Problem Areas:

- U.S. EPA may not approve a program that enables local delegation and, therefore, may require additional regulatory efforts by DCR
- New regulatory requirements may require additional time for local governments to comply resulting in the need for DCR to operate local programs for a period of time
- Additional state resources could be significant if adequate permit fees to run a program are not adopted in the regulations

Local/State Coordination:

- Significant coordination between DCR and local governments will be needed:
  - To develop the process for local governments that adopt the local program to collect and share permit fees between the state and locality
  - To develop the working relationship that allows, localities not adopting a local program not currently adopting the program locally, DCR to efficiently operate the program in each of these localities and conduct plan review and approval, permit issuance, site inspection and enforcement, tracking and monitoring of stormwater BMPS and BMP maintenance (estimated to require to 25 FTEs and $2.0 to $2.5 million annually)
- Training for local governments to familiarize them with new program requirements will be necessary and will take additional resources to accomplish (estimated to require an additional 4 FTEs and approximately $500,000 annually)
- DCR will be required to operate the local stormwater program in localities that have not been approved for adoption by the Soil and Water Conservation Board

Performance Measurement:

Upon completion of the regulatory revision process, progress will be tracked semi-annually through future revisions to the Clean-Up plan as follows:

- Number of localities with a Board approved stormwater program
- Number of stormwater programs operated by DCR
- Number of construction sites that require the stormwater general permit have obtained permit coverage
- Number of DCR and locality inspection of permitted sites

iii. Fully achieve local government compliance with septic maintenance and pump-out requirements and BMP maintenance and inspection requirements of the Chesapeake Bay Preservation Act

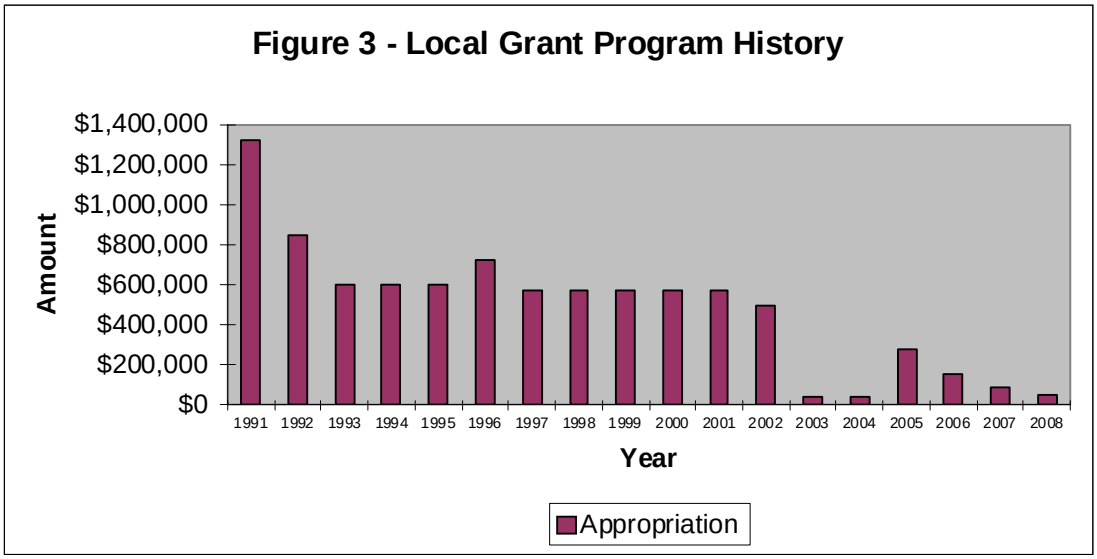
Objective:

- Achieve 100% compliance by Tidewater localities with septic pump-out requirements of the Chesapeake Bay Preservation Act by 2010 in order to reduce impairments caused by high levels of fecal coliform or e-coli bacteria
- Achieve 100% compliance by Tidewater localities with the urban best management practice (BMP) maintenance requirements of the Chesapeake Bay Preservation Act by 2010 in order to reduce impairments caused by high levels of nutrients
- Establish voluntary septic tank pump-out maintenance programs in localities outside the Chesapeake Bay Preservation Act area, both within the Chesapeake Bay Watershed, and Southern Rivers portion of the Commonwealth, and in the remaining portion of Tidewater localities not designated as Chesapeake Bay Preservation Areas

Rationale:

Improperly maintained septic systems can be a source of excess nutrients and bacteria both to ground and surface waters. Elevated levels of e-coli bacteria are the cause of a significant percentage of Virginia's waters being listed as impaired, particularly in developed areas where a predominant source of the bacteria is improperly maintained septic systems. Because of this concern, for nearly 20 years the Chesapeake Bay Preservation Act regulations have contained a requirement, to be implemented by Tidewater localities, for the periodic pump-out of septic systems.

Currently, 69 of 84 (80%) of localities in Tidewater Virginia with on-site septic systems are meeting this septic pump-out requirement. This represents an increase of 18% from 2008. Compliance has improved as a result of a compliance evaluation process that was initiated by DCR's Division of Chesapeake Bay Local Assistance in late 2003. While there has been significant improvement in their implementation of the septic pump out requirements, many of these localities lack the staff and funding resources necessary to implement the program on a continuous basis and have relied heavily upon various grant funds for assistance. In particular, grant funds have been sought and actively utilized by localities and Planning District Commissions to provide financial assistance to low to moderate income individuals for septic system pump outs. During the last six years, however, such funds have been insufficient, inconsistent and have significantly declined (as shown in Figure 3). Further, there is no requirement for a periodic septic pump-out and maintenance program outside of the Chesapeake Bay Preservation Act area, or outside the designated Chesapeake Bay Preservation Areas within Tidewater localities.



The Chesapeake Bay Preservation Act also requires pollutant loadings from new development and redevelopment activities be reduced. This requirement has been implemented by all Tidewater localities since the mid-1990s typically through the use of BMP facilities such as wet ponds, extended detention (dry) ponds, bioretention facilities and created wetlands. The Bay Act Regulations further require that these facilities be maintained, a requirement that necessitates tracking and periodic inspection. Currently, 75 of 84 (89%) of the Tidewater localities have compliant BMP maintenance programs. Although compliance with this element of the Bay Act program has improved significantly since the initiation of the compliance evaluation process, as these localities face growth and development, they will need additional technical and financial resources and assistance to continue to implement BMP inspections. Adequate inspection and maintenance programs are critical for the Commonwealth to accurately measure how effectively localities are controlling pollutants from newly developed and redeveloped land. Moreover, such information will allow the state to identify where improvements are needed.

Strategy:

- Secure a consistent funding source to assist localities, Planning District Commissions or private entities in carrying out septic tank pump-out programs
    - These funds will enable the PDCs, localities or other groups to notify septic owners of the need to pump their systems out, develop and disseminate educational materials to homeowners on the benefits of maintaining septic systems, and provide financial assistance to low and moderate income individuals to pump out septic systems (estimated that full local implementation of the septic pump-out program within the

Chesapeake Bay Preservation Act area would achieve 36% of the needed pollutant reductions from septic systems
    - The remaining pollution reductions would be achieved through replacement of failing systems (It is proposed that $150,000 in funds be made available to achieve this goal)
- Dedicate new funds to DCR, as available, to support local establishment of BMP inspection, maintenance and tracking programs (estimated amount would be $100,000 awarded to localities annually through a competitive grants process with requirements for reporting on numbers and types of BMPs tracked and acres of land treated by those BMPs)
- Develop tool kit of information for localities to use to help facilitate implementation of such program
- Monitor compliance and obtain data from localities on the number of systems pumped and report this information to the Chesapeake Bay Program so that the pollutant load reductions resulting from local septic pump out programs can be accounted for in the Chesapeake Bay model

Timeframe:

By 2010 - Full compliance for all Tidewater (Chesapeake Bay Preservation Act) localities.

Potential Problem Areas:

- Several localities do not have adequate facilities to accept the septage resulting from the septic pump-out programs in those areas; high transportation costs to available facilities raise the risk of illegal dumping
- The Virginia Department of Health has confirmed that there has been a reduction in wastewater treatment plant capacity in the Northern Neck to accommodate the septage being generated through this program; there will be a need to make State funds available to increase wastewater treatment plant capacity in this area
- An interagency workgroup representing the Department of Health, Department of Environmental Quality, and Department of Conservation & Recreation reviewed the capacity issue and reported its findings to several members of the General Assembly in June of 2008 recommending that:
    - DCR's Division of Chesapeake Bay Local Assistance should encourage localities to allow as an alternative to septic pump outs the installation of effluent filters (the Department has already followed up on this recommendation)
    - The State make funds available for waste water treatment plant upgrades in the area, as funds become available
- Lack of automation of existing records and additional database tools to track BMPs and septic pump-out status

Performance Measurement:

- Number of localities in compliance with local septic pump-out programs
- Number of localities in compliance with BMP maintenance requirements
- Number of systems pumped with estimated resulting nutrient reductions
- Numbers of BMPs installed along with pollutants removed and acres treated

iv. Revise local codes and ordinances so as not to conflict with water quality protection measures

Objective:

Consistent with Phase III of the Chesapeake Bay Preservation Act Regulations, complete code and ordinances review process by DCR Division of Chesapeake Bay Local Assistance Division staff by December 2010 to determine the extent to which the Tidewater localities are implementing measures to protect water quality, particularly requirements to reduce impervious cover, minimize land disturbance and maintain indigenous vegetation. Based on this code and ordinance review process, identify level of planning and financial assistance is needed to help localities amend their codes to address water quality protection.

Rationale:

For 16 years, Chesapeake Bay Preservation Act localities in Tidewater Virginia have been implementing a variety of water quality performance criteria to protect important water resources such as wetlands and streams, but such criteria are typically contained in local ordinances and codes that are separate from or overlays within other local land development codes and requirements. As a result, the basic provisions of local zoning and subdivision codes often contain requirements that are in direct conflict with local Chesapeake Bay Preservation Act ordinances in particular and the protection of water quality in general.

The third implementation phase of the Chesapeake Bay Preservation Area Designation and Management Regulations requires local governments to review their land development regulations and revise them as necessary to ensure they are consistent in requiring development to reduce impervious cover, minimize land disturbance, maintain indigenous vegetation, achieving the protection of state waters and resolving any conflicts among the components of the local programs. Ordinance reviews will focus on zoning and subdivision codes, local plans of development processes and other local requirements. Completion of Phase III will ensure that water quality protection is incorporated into all steps of the land use approval process, from comprehensive plans to final plan approvals. Removal of these conflicts will be a key tool, along with other DCR nonpoint source initiatives, to significantly reducing nonpoint source pollution from land development activities.

In addition, as a result of the significant water quality benefits that could be achieved, the state also should promote such code and ordinance revisions in localities outside of the Chesapeake Bay Preservation Act area.

Undertaking a review of all development codes and ordinances is a very time-consuming and resource extensive process, typically within the capacity and a priority of only the largest jurisdictions. Direct involvement of the DCR Division of Chesapeake Bay Local Assistance will be necessary in order to ensure localities are able to complete this important task.

Strategy:

- Implement the Phase III ordinance review of all 84 Bay Act localities, either by requiring self-assessments and reporting, or conducting reviews on behalf of localities
- Seek and utilize federal Chesapeake Bay Implementation grant funds or other sources of federal grants to assist Tidewater localities with the development and adoption of specific local code amendments that address water quality protection and comply with the Chesapeake Bay Preservation Act Phase III requirements
    - As defined in the Bay Act Designation and Management Regulations, these provisions specifically require localities to adopt local code amendments that minimize impervious cover, minimize land disturbance and preserve indigenous vegetation
    - $11,000 in grant money has been provided to the Friends of the Rappahannock to conduct a code and ordinance review and amendment process with Caroline and Lancaster counties
- Provide additional financial assistance to localities in the amount of $100,000 for compliance with Phase III of the Bay Act through a competitive grant program to support development and adoption of specific local code amendments that address water quality protection
- Collect codes and ordinances, as they are developed to meet Phase III requirements, to develop an ordinance review and revision "tool box" for use by other Bay Act localities

Timeframe:

By December 2010, completion by DCR Chesapeake Bay Local Assistance staff of code and ordinance reviews of all 84 Tidewater localities. By 2014, full compliance with local code revisions by Chesapeake Bay Preservation Act localities.

Potential Problem Areas:

- Resistance by some localities to recommended changes to ordinances
- Lack of trained staff with adequate planning experience and expertise to undertake needed analysis, particularly in smaller, rural jurisdictions
- Inadequate dedicated funds to assist local staff in amending local codes to be compliant with the Phase III requirements

Performance Measurement:

- Number of local governments with compliant with BMP maintenance, septic pump-out and Phase III requirements
- Nitrogen reductions resulting from active septic tank pump-out programs
- Acres treated through the use of urban BMPs in Tidewater localities

v. Accelerate land conservation efforts

Objective:

The Commonwealth will, in conjunction with private and public partners, preserve for conservation purposes 400,000 acres of land statewide by 2010.

Rationale:

In April of 2006, Governor Kaine announced an ambitious land conservation goal, to preserve an additional 400,000 acres in Virginia by the end of the decade. Those additional acres encompass and extend a commitment made by Virginia and its Bay partner states in 2000 to protect 20% of the lands in the Chesapeake Bay watershed by 2010. At the end of 2008 the Commonwealth reported, as a part of the Chesapeake 2000 Agreement annual update, that the current status of land preservation of Bay land area stood at 18.32% (with 232,918 acres remaining to meet the goal). The 400,000-acre goal is based on both achieving the Chesapeake Bay commitment and in advancing important preservation in Virginia's southern river watersheds. In addition to meeting water quality objectives, protecting land helps meet goals related to outdoor recreation and quality of life.

Of all the development that has occurred in the last 400 years, more than a quarter of it has taken place in the last 15 years. Protecting land, particularly riparian lands, is a critical element of Virginia's Chesapeake Bay Tributary Strategies and will help restore and protect waters statewide. Permanently preserving land not only benefits water quality, but it also protects Virginia's natural, historic, recreational, scenic, and cultural resources. Statewide between 2001 and 2005, an average of 56,000 acres per year was protected in Virginia through the combined efforts of both private and public organizations and agencies. Between 2006 and 2009, the annual average of protected acres in Virginia has accelerated to 84,500 acres per year. As of May 2009, more than

332,000 acres of the goal had been met, leaving slightly less than 68,000 acres to meet the goal by December 31, 2009.

Strategy:

- Maximize the use of existing state land conservation tools and incentives including the Virginia Land Conservation Foundation, the Virginia Outdoors Foundation, the Virginia Land Preservation Tax Credit program, the Virginia Coastal Program, Farmland Preservation and the Clean Water Revolving Loan Fund
- Identify opportunities of additional state land holding for parks, natural areas, wildlife management areas and state forests
- Continue coordination among state agencies and private, federal and local partners on land conservation priorities
- Support currently established local purchase of development rights programs and encourage the creation of new programs where they currently do not exist
- Employ geographic information based systems to identify lands with multiple conservation values to maximize water quality and other benefits
- Work with the Virginia Liaison Office and Virginia's Congressional Delegation in securing federal funding for land conservation in the Commonwealth
- Work with Virginia Conservation Coalition to secure state funding for land conservation

Potential Problem Areas:

- Lack of consistent and dedicated source of funds for PDR, matching grants and acquisition programs
- Inflated land prices in some areas of the Commonwealth make preservation difficult
- While programs and tax incentives that promote conservation easements are important tools in Virginia, they do not meet the increasing public demand for parks, natural areas, wildlife management, forests, trails, and water access
- Additional agency staffing capacity to handle expanded land preservation and stewardship activities is greatly needed

Risk Mitigation Strategy:

- Work to secure a dedicated source of funding for land conservation;
- Increase targeting of conservation lands based on a competitive review of grants and enhanced data analysis and mapping
- Working with Virginia's congressional delegation, the enhanced federal land preservation income tax deduction that was set to expire at the end of the 2007 tax year was extended through 2009 as part of the federal farm bill
- Encourage local review of the 2007 Virginia Outdoors Plan and Virginia's Wildlife Action plan to promote local efforts to address land conservation and outdoor recreation needs
- Continue efforts through the biennial budget to secure necessary staff resources

Performance Measurement:

- Number of acres conserved by 2010 as reported monthly and annually by the Department of Conservation and Recreation within the Chesapeake Bay and Southern Rivers watersheds (www.dcr.virginia.gov/land_conservation/index.shtml)
- Percentage of land preserved towards the 20% Chesapeake Bay watershed goal

d. Air Category

Objective:

Fully implement the many state and federal programs to reduce the impacts of airborne pollutants on water quality throughout Virginia.

Rationale:

Several specific air pollutants have been identified and linked to contamination of Virginia waters, including:

- ***Sulfur Dioxide (SO_2)*** – Water acidification has long been linked to air emissions of SO_2
- ***Nitrogen Oxides (NO_X)*** – Air emissions of Nitrous Oxides, predominantly nitrate, are partially responsible for the significant nitrogen pollution entering the Chesapeake Bay and rivers
- ***Mercury (Hg)*** – Airborne mercury emissions (with subsequent water deposition) have been linked to water and fish contamination

Historically, efforts to reduce these pollutants have focused on improving air quality, such as compliance with air quality standards and adoption of more stringent criteria governing emissions of hazardous air pollutants. However, some programs, such as Title IV of the Clean Air Act and the Clean Air Mercury Rule (CAMR), are specifically designed to reduce the impact of air pollutants on water quality.

Strategy:

The following strategy summarizes numerous programs to reduce future emissions of air pollutants. Table IV-4 presents the current and predicted emission levels and the anticipated reductions that will result from implementation of the programs. Table IV-4 contains updates to the data included in the 2007 Clean-Up Plan on air emissions of oxides of nitrogen and sulfur dioxide for 2002, 2009, and 2018. The main change involves additional sulfur dioxide emission reductions expected in the future due to additional source control requirements. Additional information on all of these programs can be obtained from the air quality page on the DEQ website at (www.deq.virginia.gov/air).

Air Quality Standards: The Clean Air Act requires the U.S. EPA to establish National Ambient Air Quality Standards (NAAQS) for wide-spread pollutants that are considered to be harmful to public health and the environment. Currently there are standards for seven air pollutants: ozone, particulate matter (both PM_{10} and $PM_{2.5}$), carbon monoxide, sulfur dioxide, nitrogen oxides, and lead. These standards must be reviewed periodically to determine if updated science requires revision to these standards.

Attainment Plans: Attainment plans must be developed for areas that do not meet one or more NAAQS. In Virginia, this has historically involved violation of the ozone standard in Northern Virginia, Richmond, and Hampton Roads. As a result, these areas have been required to develop and implement emission reduction plans to come into compliance with the ozone standard. These plans have produced emission reductions of deposition-related pollutants (mostly NO_X) as part of these plans.

Motor Vehicle Emissions Standards: The U.S. EPA also establishes vehicle engine emissions and other standards aimed at reducing air pollution from this significant source category. As a result, emissions from vehicles have dropped dramatically over the last 40 years. These reductions will continue in the future as new standards are implemented.

Non-Road Engine Emissions Standards: More recently, the U.S. EPA has turned its attention toward regulation of non-road vehicles and equipment, which is also a significant source of air pollution. Several programs are now in place that will continue to reduce emissions from this source category.

NO_X Emissions Budget Rule (SIPCALL): In order to reduce the transport of ozone from one area to another and to assist areas in complying with the standard, the U.S. EPA and states have implemented a program to reduce NO_X emissions from the electrical power generation sector. This program began in 2004 and has resulted in substantial reductions of both NO_X emissions and transported ozone levels.

Clean Air Interstate Rule (CAIR): To further reduce pollutant transport, the U.S. EPA has adopted the CAIR rule, requiring additional pollution reductions from the electric power generation sector. This rule covers most Eastern U.S. states, requiring each state to adopt a corresponding rule to implement this program. A key component of the CAIR program is a large reduction of SO_2 emissions, leading to a significant reduction in fine particulate pollution and improved regional visibility. It also will produce further reductions of NO_X emissions. Virginia has adopted and implemented a state rule to achieve the CAIR emissions reduction requirements and caps.

On July 11, 2008, the U.S. Court of Appeals for the D.C. Circuit vacated the U.S. EPA's CAIR rule. However, in a subsequent reversal of this decision, the Court remanded the CAIR rule in place to U.S. EPA on December 23, 2008. In essence, this means that the CAIR reduction requirements and caps remain in effect until the U.S. EPA corrects the deficiencies in the rule that were identified by the Court. A more stringent CAIR rule is expected from the U.S. EPA by 2011.

Clean Air Mercury Rule (CAMR): The U.S. EPA has adopted the national CAMR rule to reduce mercury air emissions from the electric power generation sector. In response, Virginia adopted a state rule to implement the CAMR emission reduction requirements and caps. However, another decision by the U.S. Court of Appeals for the D.C. Circuit vacated the federal CAMR rule on February 8, 2008. The U.S. EPA initially appealed this decision, but recently dropped this appeal. The U.S. EPA now plans to regulate power plant emission of mercury under Section 112 of the Clean Air Act. Please note that Table III-5 entitled "Mercury Base & Future Predicted Air Emissions" that appeared in prior versions of this report has been removed since it is no longer valid.

Pursuant to this decision, the DEQ issued a Maximum Achievable Control Technology (MACT) permit to the Dominion Virginia Power's Virginia City Hybrid Energy Center in Wise County, Virginia. This permit required state-of-the-art mercury controls and stringent emissions limits.

Virginia Mercury Rule: The 2006 Virginia General Assembly passed legislation to reduce mercury emissions from coal-fired power plants by placing restrictions on the participation of these sources in a federal mercury emissions trading program. While a draft regulation was developed by DEQ to implement a state program, the process was put on hold until the completion of a study on the sources and impacts of mercury deposition in Virginia.

Virginia Mercury Study: The study assessed mercury emissions and local deposition from Virginia sources, examined the mercury reductions expected to occur as a result of the CAIR and CAMR regulations, the requirements of the state specific regulations, the costs of available controls, public health impacts, and if Virginia would benefit from additional controls on Electric Generating Units (EGUs).

The issue of additional controls on EGUs beyond the CAMR became irrelevant when the US Court of Appeals of the District of Columbia Circuit vacated CAMR on February 8, 2008 in response to a legal challenge by a group of states and environmental organizations. As a result, U.S. EPA decided to "develop appropriate standards" that would regulate power plant emissions under Section 112 of the Clean Air Act. The U.S.EPA also has recently issued mercury standards for cement kilns.

Though the rule was vacated the study was completed in October of 2008 and the final report can be obtained at www.deq.virginia.gov/regulations/reports.html. The data strongly suggest that the vast majority of mercury deposition in Virginia is due to the global emissions component. The report concludes that Virginia would benefit from reduced mercury deposition as a result of implementation of pollution controls required by CAIR and CAMR but made no recommendations.

TABLE IV-4: Air Deposition Pollutant Base & Future Predicted Emissions

Source Categories	2002 (Tons/Year) NO_X	2002 (Tons/Year) SO_2	2009 (Tons/Year) NO_X	2009 (Tons/Year) SO_2	2009 (Tons/Year) Diff. NO_X	2009 (Tons/Year) Diff. SO_2	2018 (Tons/Year) NO_X	2018 (Tons/Year) SO_2	2018 (Tons/Year) Diff. NO_X	2018 (Tons/Year) Diff. SO_2
Electric Utilities [1]	86,886	241,204	64,358	174,777	**-22,528**	**-66,427**	64,344	98,988	**-22,542**	**-142,216**
Large Industries	75,831	137,451	67,263	131,459	**-8,566**	**-5,992**	70,132	134,790	**-5,699**	**-2,661**
Other Fuel Consumption	15,648	5,508	15,920	5,118	272	**-390**	17,852	5,230	2,204	**-278**
Chemical Manufacturing	8,062	2,126	7,790	1,996	**-272**	**-130**	9,211	1,297	1,149	**-829**
Metals Processing	937	5,251	827	4,813	**-110**	**-438**	1,017	5,374	80	123
Petroleum Industries	182	170	197	187	15	17	228	217	46	47
Other Ind. Processes	9,279	17,702	9,425	18,643	146	941	10,836	18,088	1,557	386
Solvent Utilization	0	2	0	3	0	1	0	3	0	1
Storage & Transport	11	0	12	0	1	0	15	0	4	0
Waste Disposal	1,866	1,581	2,174	1,805	308	224	2,595	2,170	729	589
Miscellaneous Area	350	92	464	124	114	32	584	158	234	66
Highway Vehicles [2]	222,374	8,294	134,232	1,079	**-88,142**	**-7,215**	63,342	1,043	**-159,032**	**-7,251**
Nonroad Vehicles [3]	63,219	8,663	54,993	1,707	**-8,226**	**-6,956**	40,393	507	**-22,826**	**-8,156**
Totals:	484,646	428,046	357,655	341,710	**-126,991**	**-86,336**	280,549	267,867	**-204,097**	**-160,179**

[1] Electric utility emission reductions are the combined result of the State NO_X Budget and Clean Air Interstate Rule programs.

[2] Highway vehicle emission reductions are the result of federal Motor Vehicle emissions and fuel standards.

[3] Nonroad vehicle/equipment emission reductions are the result of federal nonroad engine and fuel standards.

Potential problem areas:

- The federal electric utilities control programs allow for emissions trading of all three pollutants of concern between sources and states; this may impact the amount of reductions achieved in Virginia under these programs
- The predicted emission reductions in Table IV-4 are based on a number of assumptions that may change in the future; this, in turn, may impact the ultimate level of these reductions in Virginia
- The U.S. EPA periodically reviews and revises the national air quality standards which could impact the geographic extent of areas in Virginia that do not meet these standards; however, any near-term changes to these standards would likely increase the areas of non-compliance and require additional control strategies and emission reductions

Risk mitigation strategy:

The DEQ will continue to implement all the programs relevant to air deposition as required by federal and state mandates.

Performance Measurement:

The DEQ will report annually on the implementation and progress of the programs related to air deposition.

e. Resource Extraction

On active mining sites, all water discharges (including surface and groundwater discharges) must flow through a National Pollutant Discharge Elimination System (NPDES) permitted discharge point, and are by definition a "point source." No point source discharges are allowed from gas or oil well sites in Virginia. Operators of active mines are required by state law to implement management practices that control the release of sediment from the site and meet current state and federal effluent standards for point source discharges. These active sites also must be reclaimed to a stable condition once the resource extraction activity is complete. However, many resource extraction sites ceased operation before laws requiring reclamation existed and water discharging from these sites with sediment or other pollutant loads fall into the realm of NPS pollution.

Abandoned mined lands are defined as coal mines abandoned prior to the Surface Mining Control and Reclamation Act (SMCRA) of 1977. Orphaned mineral mines are defined as those areas disturbed by the mining of minerals, not including coal, which were not required by law to be reclaimed or have not been reclaimed. Orphaned wells are those gas or oil wells that were abandoned prior to the enactment of current laws requiring reclamation.

Objective:

It is the goal of the Department of Mines Minerals and Energy (DMME) and other federal and state partners to:

- Reduce water quality impacts associated with former resource extraction activities by proper site planning and best management practice implementation
- Reduce erosion on abandoned or orphaned mined land
- Include water quality goals in prioritization of areas for reclamation activities.

Rationale:

The potential for NPS pollution impacts of abandoned and orphaned mines on state waters is significant. DMME has identified approximately 50,000 acres of abandoned coal mined land in Virginia. An additional 10,000 acres of orphaned mined land has been identified by the DMME and Natural Resources Conservation Service (NRCS). Erosion and sedimentation from these sites can destroy aquatic habitat and ruin stream channels. Acid mine drainage (low pH), and the corresponding heavy metal contamination, can significantly impair the ability of a stream to support biota that cannot withstand low pH levels. Ground water contamination from abandoned and orphaned mines and wells is also a concern due to fracturing creating pathways for pollutants to enter aquifers.

Strategy:

DMME - an agency within the jurisdiction of the Secretary of Commerce and Trade - is the primary state agency involved with the regulation of resource extraction activities in Virginia. The Natural Resources Conservation Service (NRCS) is actively involved in Virginia to mitigate nonpoint source pollution from resource extraction through the Watershed Protection and Flood Prevention Act of 1954 (Public Law 83-566) and supports DMME activities through implementation of BMPs that abate NPS pollution affecting water quality, coordinating their activities with landowners and Virginia's NPS pollution focused agencies and by providing funding and technical assistance to reclaim sites in Virginia. Specifically, DMME works to implement the following strategies:

- DMME will interpret and enforce the Virginia Mining Laws and Gas and Oil laws consistently and review mining and gas/oil extraction permits, taking appropriate action to ensure compliance
- DMME investigates reported occurrences of environmental pollution including nonpoint source pollution and, when appropriate, take jurisdictional action to eliminate, abate, or prevent water resource degradation
- DMME solicits funding for reclamation of approximately 25 such sites/year
- DMME pursues the re-mining of abandoned mine sites during or in association with active mining operations

- DMME will inventory, monitor, and report areas contributing significant sediments, and mine water discharge, to the water resources of Virginia and consider the pollution as part of the selection process for determining which sites will be reclaimed
- To enhance the scope of the NPS Program, DMME seeks partnerships and leveraged funding opportunities with The U.S. Environmental Protection Agency, U.S. Forest Service, U.S. Geological Survey, Virginia Department of Conservation and Recreation, Virginia Department of Game and Inland Fisheries, and other federal, state, and local agencies, and private entities and citizens

In addition to DMME and the NRCS efforts other agencies have programs focused on resource extraction based NPS pollution issues.

Virginia's Cooperative Extension Service (CES) is involved in a project in the Powell River Basin to increase awareness of the groundwater hydrology and critical groundwater zones in the counties of Buchanan, Wise, Dickenson, Lee, Russell, Scott, and Tazewell. CES is working to raise the awareness of the possible effects of underground mining and working with stakeholders to provide information on surface mine reclamation techniques to control the landscape's rate of water and sediment release and reduce downstream flooding potentials.

The Tennessee Valley Authority (TVA) has involvement with the DMME efforts to mitigate resource extraction nonpoint source pollution. TVA often provides funding assistance for mine land reclamation and coalfield stream restoration projects initiated by DMME. TVA also participates in cooperative financial efforts with DMME, other agencies, and private landowners to alleviate NPS impacts in southwest Virginia from a variety of non-coal mining land use problems.

V. State and Local Government Coordination

In addition to coordination activities highlighted throughout the Clean-Up Plan, additional opportunities to improve coordination between state agencies and local governments will include the following initiatives.

a. Networked Education for Municipal Officials – NEMO

Objective:

Develop a networked approach to delivering technical assistance to requesting localities as it relates to land conservation, water quality protection and community development in the context of protecting the Commonwealth's natural resources for future generations.

Rationale:

Over the past two decades, the state has seen its highest growth in population. This period of growth and development has contributed to the unprecedented loss of farm and forestland. Water quality in many streams and rivers has deteriorated due to increased impervious surfaces and loss of natural buffers, resulting in significant impacts on aquatic life and outdoor recreation, as well as increased costs for water treatment. The lack of adequately integrated sound land use and transportation planning has fragmented natural resources, as well as local communities, requiring people to use their automobile for nearly every aspect of their lives. (*Virginia Outdoors Plan*, 2007).

Communities are faced with increased pressures and reduced staff resources to address the demands placed upon them. Many local planners would accept outside assistance, provided that it was at their request. The Commonwealth has numerous entities to provide assistance to localities facing the challenges of growth, but to date locality assistance has occurred in an uncoordinated and competitive manner, often with conflicting messages.

The use of a coordinated, conservation-based, local land use decision-making technical assistance program could be used as a mechanism to conserve healthy lands and waters and restore water quality. Through request-based technical assistance to local governments, this initiative would provide land use planning tools and conservation information to help take a holistic view of natural resource management.

Strategies:

The Virginia Department of Conservation and Recreation's Division of Soil and Water will develop and lead a coordinated, collaborative approach to delivering technical assistance to localities. This approach, called the Networked Education for Municipal Officials (VA NEMO), is a request-based program to provide local decision-makers with the information, tools and capacity to make informed local land use decisions. Through the network approach, the VA NEMO Program will help focus and prioritize limited resources, take advantage of a wide range of expertise available, and increase the reach of messaging. It also will help reduce duplicative services and minimize conflicting messages. Network partners include:

- Virginia Tech and the Virginia Cooperative Extension Community Viability Program
- Chesapeake Networked Education for Municipal Officials
- Virginia Department of Conservation and Recreation Divisions of
    - Soil and Water
    - Chesapeake Bay Local Assistance
    - Natural Heritage
- Virginia Department of Forestry
- Virginia Department of Transportation
- Virginia Department of Historic Resources

- Planning District Commissions
- Soil and Water Conservation Districts
- Watershed Groups

The VA NEMO Program provides assistance in three broad areas of expertise:

- Developing community vision and goals
- Assessing and inventorying natural resources
- Developing and implementing natural resource and land use management tools

VA NEMO partners have developed (with several still in development) a number of outreach/education based materials that can be used in a number of scenarios and localities across the Commonwealth. These resources are available for any network partner or locality to use as a part of their project or planning process.

VA NEMO Resources:

- Linking Land, Water and Growth presentation
- Planning the Direction of your Community presentation
- Forest Resources presentation
- Economics of LID presentation (in development)
- Climate Change Adaptation presentation (in development)
- Subcontracted Service Provider Pool (support from the National Fish and Wildlife Foundation - NFWF)

As a result of outreach efforts from network partners a number of localities have requested assistance from VA NEMO.

Time Frame: Ongoing

Potential Problem Areas:

- Requests are exceeding the capacity to respond and provide assistance
- Current funding provided by the Virginia Coastal Zone Program limits assistance delivery to only those localities in the Coastal Zone
- Current staffing cannot meet the demands of the localities due to the geographic distribution of requests
- Current staffing cannot meet the technical requests for services

Risk Mitigation Strategy:

- Seek additional funding to support program expansion to fully meet the number of requests for assistance
- Seek additional funding to further implement the VA NEMO Program

- Actively recruit new partners into the VA NEMO Program
- Provide direction to enable the various agencies to implement a coordinated, collaborative approach to assisting localities and maximize the capabilities of VA NEMO partners by utilizing Web 2.0 tools to manage the implementation of local assistance (i.e., www.Chesapeakenetwork.org)

Near-term Outputs:

The number of communities requesting NEMO education/assistance

NEMO provides education and assistance on an "invitation/request" basis. Local government representatives must make a request to NEMO coordinators for assistance or an initial scoping session. NEMO coordinators follow-up with the requestor and conduct a scoping session to determine community needs which may, or may not, result in a further assistance project.

The number of communities which received NEMO education/assistance

Following a request and a scoping session, NEMO coordinators work with the requestor to plan the appropriate education or assistance for local needs. Once agreement is reached on the scope and form of assistance, this constitutes a NEMO assistance project. Assistance may take the form of a single, short term event such as a single presentation or workshop, or a longer on-going project, involving multiple events.

Priority categories of NEMO assistance projects include:

- Directly or indirectly contribute to reducing or preventing water quality degradation (includes restoration, conservation, and sound planning and development initiatives)
- Prepare communities for addressing potential effects of climate change
- Improve community viability (e.g., Mathews County aquaculture type projects)

The number of hours of contact with local officials and community stakeholders in communities receiving NEMO assistance

Direct contact with local officials and community stakeholders is the key delivery mechanism for NEMO education and assistance. This contact takes place in initial assistance scoping sessions, project team meetings, and workshops. Through these contacts, NEMO education and assistance moves communities towards longer-term outcomes.

Longer-term Outcomes (typically 12-24 months following project starts):

The number of plan, code, or ordinance changes adopted that are designed to:

- Directly or indirectly contribute to reducing or preventing water quality degradation (includes restoration, conservation, and sound planning and development policy changes)

- Prepare communities for addressing potential effects of climate change
- Improve community viability (e.g., Mathews County aquaculture type projects)

Plan, code, and ordinance changes are a core means for communities to influence land use and its resulting impacts on water quality and natural resources. Adoption of a plan, code, or ordinance change is technically an output of a local government. However, NEMO education/assistance is primarily intended to stimulate plan, code, and ordinance changes as a principle outcome.

b. Department of Conservation and Recreation Local Assistance Network

Objective:

Finalize development of the DCR Local Assistance Network (LAN) initiated in 2008. The purpose of the network is to establish a coordinated, collaborative, inter-divisional approach that fosters natural resource-based planning. Participants in the LAN include the DCR Divisions of Natural Heritage, Soil & Water Conservation, Recreation Planning, Land Conservation and Chesapeake Bay Local Assistance. Once the DCR LAN is operational, it is the goal of the Department to identify opportunities to expand the Network to other interested agencies within the Natural Resource secretariat.

Rationale:

For many years, the various Divisions within DCR have provided specific local assistance to local government staff on a variety of subject areas within their given areas of expertise and regulatory authorities. In many instances, provision of the assistance and guidance has been duplicative and, in some cases conflicting. The aim of the Local Assistance Network is to:

- Provide integrated tools and resources to promote natural resource planning
- Maximize efficiency and share resources to better serve localities
- Seek and support other partners beyond DCR to complement their efforts to conserve and enhance natural resources

Strategies:

The DCR LAN will be working to consolidate DCR services, expertise and information that the various divisions provide to localities in web-based and other formats. It is intended that these tools be established in an accessible and user-friendly format. An important element of the Network is to ensure that DCR staff members who provide assistance to local governments are aware of the services and expertise provided by their peers. By better understanding the services and assistance being provided the Department can identify ways to eliminate duplication of effort, coordinate approaches and developed unified messages. This web-based tool is intended to be a “one stop” shop

for information related to DCR services as well as information related to the Department's various regulatory programs including the Chesapeake Bay Preservation Act, Erosion & Sediment Control Law and the Stormwater Management Regulations currently under review.

c. Local Assistance, Coordination and Partnership

On a daily basis, various state agency staff are involved with local planning projects whether it is for voluntary projects, as a part of regulatory compliance, or just in the interest of information exchange. These activities include:

DCR Division of Chesapeake Bay Local Assistance staff work on a daily basis with local government staff on implementation of the various components of the Chesapeake Bay Preservation Act. The Bay Act requires localities to incorporate specific water quality protection provisions into their zoning and subdivision ordinances and comprehensive plans. The Bay Act further provides that CBLA staff assist localities in implementing these water quality provisions. This Division's local assistance takes the form of providing direct assistance and guidance on land use techniques to improve water quality, reviewing and/or drafting local ordinance and comprehensive plan language, providing training to Boards of Supervisors and Zoning Appeals as well as Chesapeake Bay and Wetlands Boards. Staff also provides technical assistance regarding wetland and perennial flow determinations and riparian buffer management. Further, Division staff also interacts on a regular basis with Planning District Commissions.

The DCR Divisions of Natural Heritage and Chesapeake Bay Local Assistance staffs routinely assist localities by providing them with natural resource tools to identify important natural resource areas, assistance with the incorporation of water and natural resource protection into local comprehensive plans, local codes and ordinances and general education and outreach.

DEQ has worked with some Tidewater localities to incorporate TMDL implementation planning into their Comprehensive Master Plans. DEQ is building upon these successes and encouraging adjacent or neighboring local governments to do the same. DEQ plans to encourage this on a statewide basis. As well, DEQ and DCR have formed partnerships with a number of Planning District Commissions for TMDL Implementation Plan development and implementation.

DEQ, DCR and Secretary of Natural Resources staff interact frequently with local government representatives through the Local Government Advisory Committee of the Chesapeake Bay Program as well as representatives of other local government organizations such as the Virginia Municipal League and Virginia Association of Counties. We will continue to look for opportunities to better utilize these avenues of communication as well as opportunities with the Commonwealths Planning District and Regional Commissions to foster communication and coordination with local governments.

d. Virginia Department of Defense Eagle Awards

In cooperation with Department of Defense (DOD), the Commonwealth has established the Defense Eagle Award. The DOD manages over 20 military installations in Virginia covering more than 275,000 acres. All sites are eligible for recognition under this environmental partnership program. Each participating military installation will be evaluated by DOD personnel and staff from Virginia's natural resource agencies on seven performance measures: biological resources, habitat protection and restoration, watershed protection and restoration, land use, environmental stewardship, conservation plans and environmental compliance. The Virginia Department of Conservation and Recreation and the Virginia Department of Environmental Quality worked with DOD to develop this program. Virginia is one of only two states in the nation to have at least one installation from each branch of the military located within its boundaries.

Military installations will begin gathering data and planning initiatives for the initial environmental scorecard in the next few months. The first DOD Eagle Awards are expected to be awarded by the end of 2009.

VI. Cost Containment Mechanisms

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a. WQIF Point Source Program

The following is a list of existing tools to keep the costs of sewage treatment facility upgrades funded by the Water Quality Improvement Fund (WQIF) at reasonable levels and ensure the efficient use of available funds.

i. Variable WQIF Grant Percentages

State law provides for a range of grant percentages, from 35% to 75%, based upon how existing sewer rates in a locality compare to "reasonable sewer rates." Localities charging a sewer rate that approaches a calculated "reasonable rate", which is based on a percentage of median household income devoted to this user fee, are eligible to receive a higher cost-share percentage. Use of a sliding scale provides more support for grantees that have a relatively higher fiscal strain, while localities with more "ability to pay" receive lower cost-share.

ii. Efficient Use of WQIF Grant Funds

DEQ staff, through intensive project review, ensure that only those costs related to nutrient reduction are eligible for reimbursement through a WQIF grant as required by § 10.1-2131.C. To guide this review, Guidance Memorandum #06-2012 (available at www.deq.virginia.gov/bay/ApplicationReviewProceduresWQIF.pdf) has been developed to:

- Assure use of a consistent and equitable decision making process in reviewing applications and prioritizing grant agreement drafting/negotiation
- Standardize methodologies used to determine the eligible scope of work and appropriate cost-share percentages for units comprising the nutrient reduction technology being designed and installed

In response to direction from the Virginia General Assembly, a key section was developed within GM #06-2012 - Item 6, Cost Control Measures - to make Efficient Use of WQIF Grants. In summary, the measures cover the following and will be applied to every grant agreement signed after October 1, 2007:

- Require compliance with the Virginia Public Procurement Act for purchase of all goods and services funded to provide the greatest assurance that costs are fair and competitive
- Analyze and compare estimated project costs to prevailing, actual bid costs for similar project types
- Consult industry indices for anticipated unit costs of basic construction materials
- Support owner-selected alternative procurement methods, such as "Design-Build" and public-private partnerships to reduce capital costs and expedite construction schedules
- Require Value Engineering (VE) Analysis when the capital cost estimate for the nutrient reduction technology (NRT) portion of a project is $10 million or more
- Perform Life-Cycle Cost Evaluations of the feasible NRT options, to determine if alternatives are available that may reduce the size of a unit, or cost of equipment or construction, without sacrificing performance or reliability
- Review preliminary engineering reports to ensure accurate design assumptions
- Receive up-front justification from applicants and negotiate cost-share to curtail overly-conservative design practices
- Closely review proposed expansion projects to ensure that the additional capacity is reasonable and necessary

Project elements that frequently yield opportunities for cost-effectiveness include:

- Sizing, safety factors and redundancy of treatment units
- Future flow projections that are reasonable and necessary for a 20 year design life
- Reuse of existing facilities as much as possible instead of new construction

To date, one grantee has utilized the Design-Build procurement approach, seeing very positive results from this process with proven time and cost savings. The use of Value Engineering (VE) has yielded savings for another grantee on the order of 22 or 24 to 1 in terms of savings per VE dollar spent. However, grantees are not barred from selecting and constructing more costly alternatives. If a lower cost alternative is viable then cost share may be prorated or reduced. Cost control measures are difficult to quantify exactly, since they typically result in "cost-avoidance" and are applied to estimated figures, rather than actual reductions to an "as-bid" amount.

b. Voluntary Market-Based Point Source Nutrient Credit Trading

Virginia's Nutrient Credit Exchange Program and Watershed General Permit implement a market-based nutrient trading program to help minimize the costs of achieving our nutrient reduction goals. Credit exchange provides localities the option, in lieu of installing nutrient removal technologies, to purchase nutrient credits from other facilities that can more cost-effectively upgrade. As a basis for introducing the nutrient trading law in 2005, the Virginia Association of Municipal Wastewater Agencies estimated that a robust trading program could reduce the cost of meeting Virginia's nutrient reduction goals by at least 20%. More buyers entering the market in future years will result in a more robust market.

c. WQIF Nonpoint Source Program

A key component of Virginia's Nutrient Credit Exchange Program is allowing point sources the option to purchase nutrient reductions from nonpoint sources to offset new or increased nutrient discharges in excess of established load caps. This approach has multiple benefits. It provides Virginia's growing communities with cost-effective options for meeting their nutrient loading caps. It also compensates landowners for the costs of installing additional best management practices and may provide a financial profit for prudent use of these conservation practices on their lands.

DEQ has published guidance to help landowners navigate the process on generating and selling offsets to point sources. The guidance focuses on agricultural offsets generated through best management practice enhancements. The guidance can be accessed online at www.deq.virginia.gov/vpdes/nutrienttrade.html.

Separate guidance will be developed to cover the sale of nonpoint source offsets from redeveloped lands and urban lands as authorized by HB2646 passed during the 2009 legislative session.

VII. Alternative Funding Mechanisms

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a. Alternative Financing for Wastewater Treatment Facility Upgrades

Needs:

The total capital cost for the nutrient reduction upgrades required of the public wastewater treatment plants is estimated to be in the range of $1.5 to $2.0 billion through 2030. The Water Quality Improvement Fund (WQIF) is anticipated to cover 50 percent of the cost for nutrient upgrades – or approximately $750 million to $1.0 billion. Recent estimates by the Virginia Nutrient Credit Exchange Association indicate that approximately two-thirds of these total costs will be needed to support construction

during the peak period between 2007 and 2011. The local share of the nutrient reduction costs would be a similar amount to be funded by loans and bond issuances. In addition, it is anticipated that many local governments will take this opportunity to also expand the capacity of their wastewater treatment plants and/or undertake other improvements not related to nutrient removal. This additional cost unrelated to nutrient removal would not be eligible for WQIF funding.

The Chesapeake Bay Watershed Nutrient Credit Exchange Program provides a key mechanism for meeting the nutrient cap load allocations cost-effectively and as soon as possible. Under the Watershed General Permit, Virginia dischargers submit updates to their compliance plans to DEQ in February of each year. These plans provide a comprehensive picture of the overall costs and schedule for achieving the cap load allocations in each river basin. This information provided the DEQ funding programs with a much better understanding of the timing/cost of projects which will assist them in evaluating the adequacy of available funding capacity as well as matching loan/grant resources to cash flow funding needs. For example, based on this information DEQ estimates that approximately $176 million in bond proceeds will be needed to cover expected grant reimbursement requests in FY2010.

In addition, these plans indicate that the dischargers are utilizing the benefits of the credit exchange program to minimize costs by staging construction of the nutrient control projects.

Financing:

The financing vehicles available to address the costs that cannot be funded by the WQIF will fall under three categories:

- Use of the Virginia Clean Water Revolving Loan Fund (VCWRLF) administered by DEQ and the Virginia Resources Authority (VRA)
- Pooled bond issuances administered by the VRA
- Localities going directly to the bond market for financing

Through aggressive leveraging, the VCWRLF has been financing wastewater upgrades at about $285 million per year for the last several years in order to address the large need for loan funds as previously discussed. **VRA projects that with the continued use of leveraging they could finance $150-200 million for the next two years through the VCWRLF. This aggressive level of increased financing capacity is contingent upon several key assumptions, including:**

- Continued $14 million annual federal grant contributions *plus* $2.8 million state match ($14.8 million total annual contributions)
- Loan interest rates and maturities similar to loans currently made under VCWRLF program

The $150-200 million annual capacity under the VCWRLF will have demands on it from the WQIF match as well as the WQIF-ineligible portion (the portion of the upgrades/expansions that would not be eligible for WQIF funding) and financing needed for work outside of the Bay watershed. These demands may well exceed the $150-200 million annual capacity of the VCWRLF. This capacity could be increased significantly with additional GA appropriations to the VCWRLF that could, in turn, be leveraged to create more funding.

b. Clean Fuels Project

The Commonwealth is currently in discussion with private parties to explore the possibility of using proceeds generated from sales of alternative fuels (ethanol and biodiesel) to fund the installation of agricultural best management practices. Funding could be significant if the generation of alternative fuels in Virginia is increased considerably as the result of future incentive programs.

Details of this initiative remain proprietary at this time but interest remains high among both public and private stakeholders. It is evident that a stable source of funding for the implementation of agricultural BMPs would greatly enhance the State's ability to meet water quality improvement and protection goals.

Additionally, there are numerous economic development incentives in place to encourage the development of private-sector alternative fuel facilities in Virginia.

c. Alternative Financing of Failing Septic System Repair/Replacement

The Commonwealth is currently exploring innovative financing strategies with private investment companies to generate significant funding for replacement or repair of failing septic systems throughout the Commonwealth.

House Bill 2646 (Poindexter, R-9th District) was passed during the 2009 legislative session which directs the Board of Health and the Director of the Department of Environmental Quality to develop procedures for qualifying the owners of failing septic tanks, underground storage tanks, and contaminated dry cleaning stores for betterment loans to be provided by private lenders.

Future updates of this plan will report on the progress of implementing this legislation.

VIII. Healthy Waters Initiative

The Commonwealth is concerned about the widening gap between impaired and restored waters. During implementation of this Plan the trend has become increasingly clear that new reaches of impaired waters are being identified faster than the rate of

restoration of impaired waters. In 2008 a net increase of 1,541 impaired stream miles occurred as 1,872 miles of streams were added to the impaired waters list while only 331 miles of streams were removed.

This concern also has been expressed by the U.S. EPA Healthy Watersheds Initiative which takes a proactive, holistic aquatic ecosystem conservation and protection approach to watershed implementation and by U.S. EPA Region III through its Healthy Waters priority which seeks to accelerate restoration of impaired waters and to advance preventative approaches to protect existing healthy waters.

Although the increase in impaired waters does not necessarily imply that our waters are getting dirtier, it does indicate that there continue to be significant water quality problems and that we are doing a better job of monitoring and identifying impaired waters. However, the fact remains that the rate of restoring impaired waters is very slow. In some cases, the waters removed from the impaired waters list are not the direct result of successful clean-up activities, but rather, are the results of new information confirming that the original impairments were caused by natural conditions, thereby negating the need for restoration activities. The TMDL section in the Virginia Clean-Up Plan confirms that while implementation actions have resulted in improvements in water quality, only a few waters have been delisted due directly to TMDL restoration activities.

The Commonwealth is committed to the restoration of impaired waters and many sections of this plan identify and recognize these long-term challenges. This Healthy Waters section explores opportunities to improve program efficiencies, enhance preventive approaches, protect streams that maintain ecological integrity and exceptional waters, and promote these resources and their value to localities.

The following sections identify elements of a Healthy Waters Strategy and the initial implementation steps being taken throughout the Commonwealth.

a. U.S. EPA – Healthy Waters Initiative

The Commonwealth's natural resource agencies are not alone in recognizing the widening gap between impaired waters and restored waters. The U.S. EPA Region III office in Philadelphia shares this concern and has used Virginia's 2007 Clean-up Plan as a model for taking a new strategic approach. The U.S. EPA has initiated a new, regional Healthy Waters Priority that incorporates the following concepts and approaches:

- Significant restoration progress has been made, but the challenges of water protection continually evolve and water protection tools must evolve in parallel
- A strategic refocusing of resources is needed to accelerate the pace of restoration and protection
- Wholesale approaches need to be employed that include policy innovations and systems-level changes that are both efficient and can yield across-the-board results

- An increased focus is needed to keep "healthy waters healthy"
- Components of the healthy waters initiative will include the following:
    - State and interstate healthy waters plans (using Virginia's Chesapeake Bay and Virginia Waters Clean-Up Plan as a working model)
    - Implementation plans for identified priority sectors that include agriculture, mining, development/developed lands and transportation
    - Water policy innovations and data support
- Funds will be provided to states for pilot projects that can demonstrate new approaches and build capacity for water quality protection and restoration(See description below of Healthy Waters projects funded in Virginia)
- An alternative approach to the "All or Nothing" process for reporting restoration progress must be developed; currently a waterbody can not be delisted until all impairments are removed, providing no opportunity to demonstrate interim restoration progress

Virginia agencies are partnering with EPA to explore means of re-focusing efforts to implement a Healthy Waters Strategy within the Commonwealth.

b. Virginia Healthy Waters Initiatives

Virginia DCR and DEQ are implementing a number of pilot initiatives to begin a comprehensive healthy waters strategy, utilizing $100,000 in federal grant funds.

This effort has three main components beginning with **building capacity for healthy streams** by communicating to the public and local decision makers the location of ecologically healthy streams and the relative threat posed by growth and changing patterns of land use. The goal of this element of the project is to combine the INteractive STream Assessment Resource (INSTAR) application developed by experts at Virginia Commonwealth University with other ecological assessment data, such as DEQ water quality monitoring data and Department of Game and Inland Fisheries (DGIF) fisheries data, to communicate the importance of protecting high quality or ecologically rich streams that are increasingly at risk.

As part of this project, the Commonwealth is developing an outreach campaign to communicate the location of Healthy Waters and the basic tools available to help conserve these resources. This outreach effort will be released in summer of 2009. It will include a publication that identifies the location of these streams along with a website and communication tools that can be used to encourage conservation of these resources. To date, nearly 200 streams with healthy ecological integrity have been identified. Working in collaboration with EPA, the Commonwealth will encourage local conservation of these healthy waters.

The second main component is **developing integrated watershed management planning.** This effort is focused on the Smith Creek watershed which includes part of four local jurisdictions – Rockingham and Shenandoah Counties, the City of Harrisonburg, and the Town of New Market. Each of the four local government

comprehensive plans contain strong goals and objectives that give priority to water quality improvements and land conservation in areas that overlap with the Smith Creek watershed. Using innovative outreach techniques in the TMDL Implementation Plan process, the talents of a multi-disciplined resource team, and the strength and support of local pre-existing water quality protection programs, significant inroads were made into an insular, rural community and great interest has been generated to improve water quality in Smith Creek. This project has been a complete success.

The third component is to **enhance watershed protection planning** by developing a pilot watershed protection plan for a specific healthy water body. The watershed protection planning process would involve extensive citizen and stakeholder participation; assessment of existing land use and build-out analysis for the watershed based on existing conditions; review of codes and ordinances; development of a watershed plan along with watershed protection measures (including recommended code and ordinance changes needed to protect water quality); and development of presentation material for local officials.

An additional **Healthy Waters Initiative** project has been funded by EPA, Region III. The Accotink Watershed demonstration Implementation Plan will address urban restoration issues.

c. Anti-Degradation Policy

High quality waters in the Commonwealth are protected under the Anti-Degradation Policy contained in the Virginia Water Quality Standards. The Policy protects waters at three levels, or "tiers:"

Tier 1 – Existing instream water uses and the level of water quality to protect the existing uses are maintained and protected. This means that as a minimum, all waters should meet appropriate water quality standards.

Impaired waters fail to meet Tier 1 standards.

Tier 2 – Water quality that is better than specified water quality standards is protected. Only in limited circumstances may water quality be lowered in these waters.

Tier 3 – Special protection for waters that provide exceptional environmental settings, exceptional aquatic communities, or exceptional recreational opportunities. For waters designated as Tier 3, no new, additional, or increased discharge of sewage, industrial wastes, or other pollution are allowed. These waters are specifically listed in the standards regulation.

Currently, the Commonwealth has designated 27 waters as Tier 3 waters, including 25 streams covering approximately 128 miles and one lake and one estuary

covering about 6.1 square miles. Almost all of these waters were designated during an initiative within the past five years. Citizens may petition the State Water Control Board to extend this additional protection to other waters in the Commonwealth.

d. Initiative to Protect Aquaculture Waters

The seaside inlets and bays of Virginia's Eastern Shore are among the highest quality waters on the East Coast. The quality of these waters makes them especially suitable for shellfish aquaculture operations. Aquaculture (i.e. the farming of fish or shellfish for food) is one of the area's most important economic drivers. In 2003, Virginia aquaculture operations grossed more than $32.5 million.

Growth and changing land uses on the Eastern Shore are requiring the Commonwealth to question the sustainability of shellfish aquaculture in Virginia. Governor Kaine's administration is helping address this issue by proposing additional water quality protection in areas suitable for aquaculture harvesting on the Eastern Shore. Future regulations will provide additional protection to water quality in Virginia.

While the Commonwealth's water quality standards currently ensure the protection of waters used for harvesting food, additional protection of aquaculture areas is necessary to maintain water quality as more people place increasing demands on the area's natural resources.

DEQ has begun a rulemaking process and plans to develop a proposal with input from interested stakeholders that may include a method to designate "aquaculture enhancement zones" on the Eastern Shore. This process will include ample opportunities for public comment.

One option under consideration during the rulemaking process involves a requirement that an evaluation of alternative treatment technologies be performed for all proposed wastewater discharges into aquaculture enhancement zones. The outcome of the evaluation would allow for a comparison of various treatment and disposal options to assist the State Water Control Board in determining which alternatives have the least impact on water quality.

This effort builds upon the collaboration that the Virginia Coastal Zone Management (CZM) program at DEQ has established with Eastern Shore communities. Utilizing federal grant money, CZM staff has worked for years to protect and raise awareness about the shore's seaside natural resources through voluntary efforts.

The future regulation will help ensure that the wastewater treatment choices made on the Eastern Shore will have minimal effects on water quality. Protecting water quality will help sustain the economic viability of the shellfish aquaculture industry and other sectors such as ecotourism that depend on the availability of high quality natural resources. DEQ is working with universities to develop cost-benefit information to be used during the rulemaking process.

e. Enhancing Water Monitoring and Assessment Tools

The results of trend analyses reported in Virginia's 2006 Water Quality Assessment report revealed that between 1995 and 2004 roughly 20% of applicable stations showed improvements for some water quality parameters. However, since many of these waters are impaired for numerous parameters, they retain their "impaired" status until all impairments are corrected. This protocol, unfortunately, makes it difficult to report incremental progress. Recently however, EPA introduced a new interim water quality classification - termed "partial delisting." This classification will apply to waters that can not be fully delisted due to multiple impairments, but demonstrate improvements in one or more parameters. Through December 2008, Virginia was credited with 579 partial delistings.

The U.S. EPA Region III office hosted a meeting in March 2007, to solicit additional ideas from its member states for ways of measuring and tracking improvements in water quality. Since that time, DEQ has been working closely with a Region 3 workgroup to develop a statistical methodology for identifying and illustrating Interim Water Quality Measures that will document the fact that investments in the evaluation, restoration and protection of the Nation's waters are resulting in measurable improvements in water quality, even in some waters that are still considered impaired. The general concept proposed is to identify classes of "higher," "moderate," and "lower" water quality based upon the distribution of a few keystone pollutants during a ten-year reference period. When summarized graphically, subsequent annual changes among the three classes reveal incremental, easily perceived changes in water quality. The methodology being evaluated permits the integration of data across multiple program designs, agencies, and political jurisdictions, as well as allowing regional characterizations based on drainage basins, or other geographical or ecological confines, independent of political boundaries. EPA intended to adopt this and other measures in its next Strategic Plan update (2009-2014) but as of April 2009 work in still ongoing by all of the related workgroups.