REPORT OF THE
SECRETARY OF NATURAL RESOURCES

Report on the Chesapeake Bay and Virginia Waters Clean-Up Plan

TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA

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COMMONWEALTH of VIRGINIA

Office of the Governor

L. Preston Bryant, Jr.
Secretary of Natural Resources

February 12, 2007

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 first edition of my office's semi-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.

The directive for the construction of this Plan – and its update every six months – resulted from House Bill 1150 (2006), which was sponsored by Delegate L. Scott Lingamfelter of Prince William County and signed into law by Governor Timothy M. Kaine on April 3, 2006.

The law, in short, requires my office to develop a comprehensive plan to address all sources of pollution to Virginia's waters. This plan to clean our waters must lay out clear objectives, well-developed strategies, predictable time frames, realistic funding needs, common-sense mitigation strategies, and straightforward recommendations to the General Assembly for its consideration.

The need and utility of this legislative directive is clear. At a time when the General Assembly is investing hundreds of millions of dollars in partnership with local governments and the private sector to upgrade sewage treatment plants and deploy agricultural best management

practices, we must be certain that we are doing so in a way that spends these dollars wisely, meets commonly understood objectives, and is measurable in terms of water-quality improvement.

This report, therefore, represents a single-source document, where anyone can turn to understand the magnitude of the water-quality challenges before us, what we are doing to address them, how much it is costing, and what accountability measures are being applied.

This report has not been easy to assemble. It has been time-consuming. Assistant Secretary of Natural Resources Jeffrey M. Corbin has coordinated all efforts, and he has been ably supported by very dedicated staff at the Department of Environmental Quality and the Department of Conservation and Recreation. He also has received valuable input from private-sector stakeholders in the environmental and business communities.

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 Office of the Secretary of Natural Resources' Web site: www.naturalresources.virginia.gov/Initiatives/WaterCleanupPlan. Should you have questions or desire additional information, please let me know.

LPBJr/cbd

Enclosure

2007 Clean-Up Plan Highlights

Wastewater

- Implement Virginia's Watershed General Permit for Nutrient Trading.
- Share the cost with localities utilizing Virginia's Water Quality Improvement Fund.
- Aggressively leverage the Virginia Clean Water Revolving Loan Fund.
- Expedite the process for developing and implementing TMDL clean-up plans throughout the Commonwealth – revising permits for wastewater dischargers and pursuing enforcement actions where necessary.
- Pursue designation of specific waters as "No Discharge Zones" (NDZ) - prohibiting the discharge of sanitary waste from boats.
- Maximize our ability to implement TMDL clean-up measures in waters impacted from toxic contamination.
- Significantly decrease the number of failing on-site septic systems and illegal straight pipe discharges, through regulatory revisions, redirecting existing funds and exploring new funding opportunities.

Agriculture and Forestry

- Widespread adoption of cost-effective agricultural best management practices ("Priority Practices").
- Implement nutrient management on lands receiving poultry litter and biosolids.
- Significantly reduce the phosphorous content of poultry, swine and dairy manures through aggressive diet and feed management.
- Significantly accelerate removal of waters in the Southern Rivers watersheds from the impaired waters list.
- Accelerate Land Conservation Efforts.

Developed and Developing Lands Category

- Achieve measurable improvement toward full implementation and compliance of erosion and sediment control programs statewide.
- Begin to establish jurisdictional nutrient pollution caps in the Chesapeake Bay watershed.
- Fully achieve local government compliance with septic maintenance and pump-out requirements and BMP monitoring and inspection requirements of the Chesapeake Bay Preservation Act.
- Work with local governments to revise local codes and ordinances so as not to conflict with water quality protection measures.
- Implement a revised stormwater management program statewide.

Air Category

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

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I. Status of Impaired Waters in Virginia

The 2006 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 include the following:

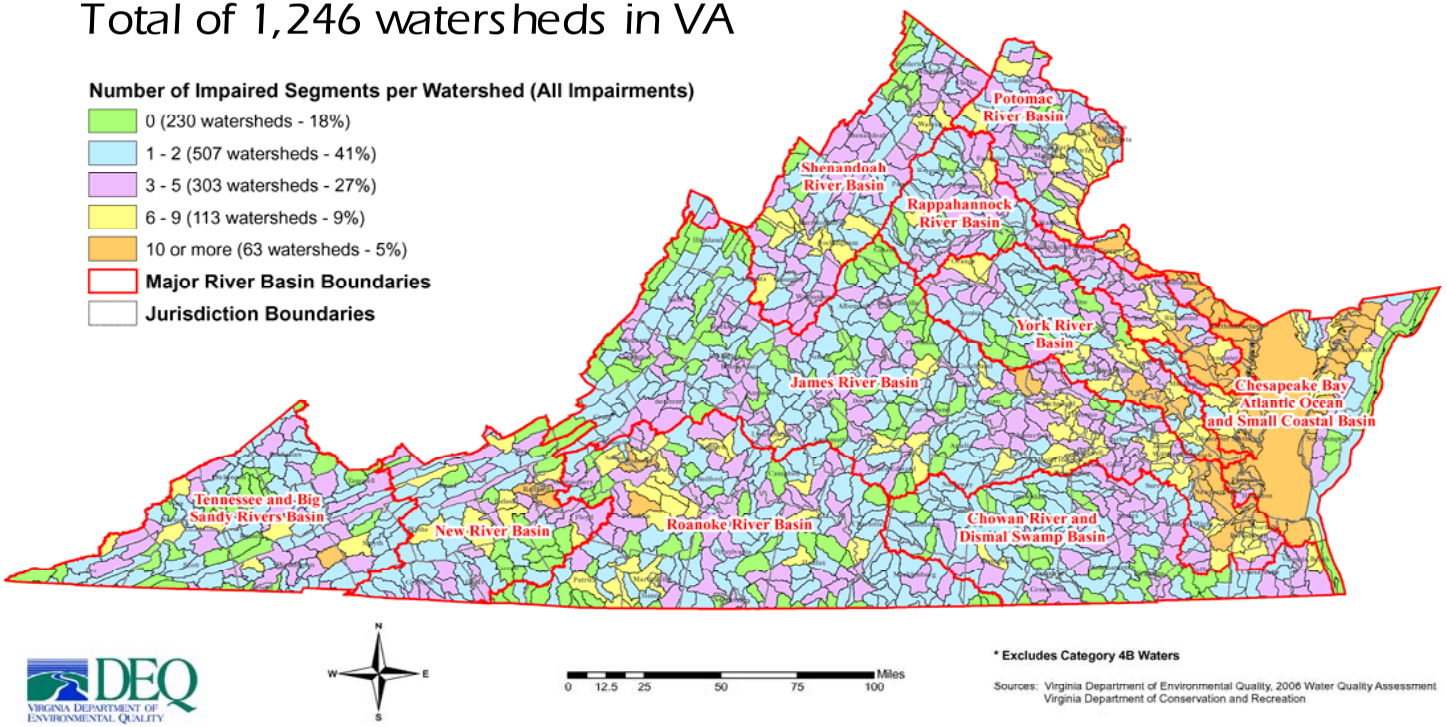
Virginia Waters - Types and Dimensions	**Impaired Waters - 2006 Assessment**	**Top Reasons for Impairments**	**Uses Lost or Impaired**
Rivers - 50,357 miles	9,002 miles	High Bacteria Levels	Recreational
Lakes -116,058 acres	109,201 acres	Low dissolved oxygen and high PCB levels in fish tissue	Aquatic Life and Edible Fish
Estuaries - 2,428 sq. miles	2,212 sq. miles	Low dissolved oxygen (nutrient pollution) and high PCB levels in fish tissue	Aquatic Life and Edible Fish and Shellfish

New impairments were identified in 2006, 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 2,071 additional impaired river miles were added to the 2006 list, the good news is that 411 river miles were removed from the list because the 2006 assessment showed that these waters, previously listed as impaired, were now meeting water quality standards.

The following map shows the distribution of impaired waters throughout the Commonwealth. You can access a searchable, electronic version by going to http://gisweb.deq.virginia.gov/ and selecting "2006 Impaired Waters" from the pull-down menu.

Distribution of Impaired* Waters In Virginia's Watersheds

Total of 1,246 watersheds in VA



DEQ
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

* Excludes Category 4B Waters

Sources: Virginia Department of Environmental Quality, 2006 Water Quality Assessment
Virginia Department of Conservation and Recreation

II. CLEAN-UP OBJECTIVES

A successful clean-up plan must be able to document the following:

1) Measurable Environmental Outcomes; and

2) Quantifiable Pollution Reductions.

Measurable Environmental Outcomes include:

- 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.

  These partial restorations will be tracked and reported in the same manner as noted above for fully restored waters.

Quantifiable Pollution Reductions will include:

- For the Chesapeake Bay Clean-Up: Total reductions (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 all Other Impaired Waters: 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:

1) 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; and
2) Virginia's bi-annual Water Quality Report ["305(b)/303(d) Water Quality Assessment Integrated Report"].

III. CLEAN-UP STRATEGY COMPONENTS

The Clean-up plan has been organized by pollution source category. The major pollution source categories include: 1) wastewater; 2) agricultural and forested lands; 3) developed and developing lands; and 4) air.

Wastewater Category[1]

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, the 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. 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 the most cost-effective means of achieving and maintaining nutrient reduction goals.

[1] More detailed information regarding Virginia's point source pollution control programs can be found in Appendix A - "Additional Information on Virginia's TMDL Clean-Up Program" - at the back of this report.

Strategy:

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

The recently approved Virginia Pollutant Discharge Elimination System (VPDES) General Watershed Permit Regulation, which became effective on November 1, 2007, authorizes the discharge of nutrient pollution from wastewater facilities within the Chesapeake Bay watershed. 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. However, the compliance dates may change after DEQ and the State Water Control Board evaluate the basin compliance schedules as required by state law. These compliance plans are due by August 1, 2007 and must address the factors listed in Virginia Code §62.1-44.19:14.C.2.

The compliance plans will 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 must describe all capital projects and implementation schedules. The Nutrient Credit Exchange Association is drafting a *Compliance Options Report*, which will explore a series of trading scenarios that achieve the nutrient waste load allocations for each river basin in a timely and cost effectively manner. This report is expected to serve as the official compliance plan for a number of the dischargers who are participating in the Exchange.

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 as population and wastewater flows increase.

As a combined result of past appropriations, interest earned and other significant funding provided by the 2006 General Assembly, the WQIF currently contains approximately $300 million in available funds to provide cost-share

assistance to localities for installing nutrient removal technologies at wastewater facilities in the Chesapeake Bay watershed.[2]

DEQ is currently reviewing grant applications from 60 of the eligible, significant facilities requesting approximately $609 million in WQIF grant funds. The table below lists the 28 projects with Preliminary Engineering Reports already submitted that are expected to have the first round of grant agreements negotiated and signed during the first half of 2007.

River Basin	Applicant	Grant Amount
Shenandoah/ Potomac	ACSA - Fishersville STP	$5,548,705
	ACSA – Middle River Regional STP	$6,912,000
	Arlington Co. WPCF	$95,582,384
	Dale Service Corp. STP #1	$730,521
	Dale Service Corp. STP #8	$713,197
	Fairfax Co. – Noman Cole Pollution Control Facility	$1,400,000
	FWSA - Parkins Mill WWTF	$9,527,815
	HRRSA-North River WWTF	$25,545,525
	Dahlgren Sanitary District WWTP	$682,000
	Fairview Beach STP	$528,600
	LCSA – Broad Run WRF	$23,226,700
	Mount Jackson STP	$1,268,252
	Purcellville-Basham Simms WWTF	$4,686,965
	PWCSA – H.L. Mooney WWTF	$25,355,000
	Stafford Co. – Aquia WWTP [Phase I]	$2,622,150
	Waynesboro STP	$17,047,800
	Woodstock STP	$8,525,753
	Alexandria Service Authority WWTP	$23,585,522
	FWSA-Opequon Water Reclamation Facility	$13,650,700
Rappahannock	Culpeper WWTP	$5,463,847
	Orange STP	$7,000,000
	Warrenton STP	$2,972,573
	Warsaw STP	$3,867,150
York	New Kent Co. – Parham Landing STP	$2,488,750
James	Farmville STP	$596,983
	Henrico Co. WWTP	$2,236,850
	MSA-Lexington	$7,125,000
Eastern Shore	Onancock STP	$2,790,072
	Total	**$301,680,814**

[2] Governor Kaine has proposed a legislative initiative to make an additional $250 million in cost-share funds available through issuance of bonds through the Virginia Public Building Authority. The General Assembly should act on this proposal before it adjourns on February 24, 2007.

While the signed agreements for these 28 projects would obligate about all of the funds currently in the WQIF, only about $30 million is estimated to be invoiced for reimbursement by the end of FY07 for the cost of work already finished, construction scheduled for completion, equipment purchases, or developing final engineering design plans. The final WQIF grant obligations may vary from the requested amounts due to eligibility determinations and construction bid prices.

These initial projects, once constructed, would reduce expected 2010 nitrogen loads by about 1,700,000 pounds per year, and phosphorus loads by about 39,000 pounds per year.

Throughout the remainder of 2007 and 2008, additional grant agreements will be signed as other applicants complete preliminary engineering reports that identify the specific nutrient removal technologies they plan to install. These 32 projects include:

River Basin	Applicant	Grant Request
Shenandoah/ Potomac	Augusta County SA-Stuarts Draft	$2,189,713
	Augusta County SA-Weyers Cave	$10,703,467
	Colonial Beach STP	$3,262,500
	Fauquier County W&SA-Vint Hill WWTF	$1,670,505
	Luray STP	$1,204,800
	New Market STP	$9,900,000
	Purkins Corner WWTP	$3,690,000
	Stoney Creek S.D. STP	$6,825,000
Rappahannock	Fauquier County W&SA-Remington WWTP	$2,291,025
	Fredericksburg WWTF	$5,928,524
	HRSD-Urbanna	$1,635,600
	Kilmarnock WWTP	$2,270,700
	Marshall WWTP	$1,540,687
	Montross-Westmoreland WWTP	$759,113
	Spotsylvania Co.-FMC WWTF	$945,000
	Tappahannock WWTP	$3,400,000
York	Ashland	$1,293,810
	Doswell	$1,420,563
	HRSD-Matthews Courthouse	$2,091,600
	HRSD-West Point	$4,872,000
	HRSD-York River	$54,035,325
	Totopotomoy	$4,925,230
James	Amherst	$5,589,180
	Buena Vista STP	$22,200,000
	Covington	$4,371,000

	Crewe	$10,452,000
	Hopewell WWTF	$33,975,000
	HRSD-Army Base	$60,618,300
	Lynchburg	$7,590,000
	Rivanna WSA-Moore's Creek	$9,035,964
	South Central WWA	$16,780,725
E. Shore	Cape Charles WWTP	$9,652,500
	TOTAL	**$307,119,831**

Once completed, these construction projects will reduce expected 2010 nitrogen loads by roughly 1.3 million pounds per year, and phosphorus loads by an estimated 215,000 pounds per year.

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. Recently adopted regulations require that new and expanded facilities must 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, DEQ has received WQIF grant applications from three eligible, non-significant facilities, requesting approximately $6 million in grant funds to cost-share the installation of the needed nutrient removal technologies. They include Amelia County Sewage Treatment Plant (STP), Hampton Roads Sanitation District's King William County STP and Nelson County's Wintergreen STP.

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 20 years since its inception, the VCWRLF has provided more than $1 billion in low interest loans for more than 250 wastewater projects in Virginia localities.

Historically, the VCWRLF has made available about $150 million per year for financing wastewater treatment upgrades. The majority of the available funds are from repayments on outstanding loans, but a small portion comes from federal appropriations. Unfortunately, the federal fund appropriations have been declining and may be discontinued in the future. **The DEQ and VRA have proposed that by leveraging existing funds, the VCWRLF could finance $300 million per year for the next five years.**

The current (2007) draft list of targeted loan recipients includes 20 projects requesting slightly more than $300 million.

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 reductions goals for each river basin. However, a detailed schedule and timing of specific facilities will not be known until August, 2007, when the facilities submit compliance plans as required under the nutrient trading regulations. A schedule for facility upgrades will be provided in future editions of this impaired waters clean-up plan.

Potential Problem Areas:

1) 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.

2) Insufficient State Funding - Currently, there are insufficient funds in the WQIF to support construction of needed nutrient removal facilities during the next five years. As noted previously, the total requested grant amount for the 28 facilities expected to have signed WQIF grant agreements by early 2007 would commit more than $306 million – exceeding the approximately $300 million currently available in the WQIF for point source projects. Regardless of the availability of funds, the Virginia Water Quality Improvement Act [§10.1-2131.B.] requires the DEQ Director to enter into grant agreements with eligible facilities that apply; however, the Code 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:

1) 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 plans (due August 1, 2007) to determine whether they are fully utilizing the advantages of the nutrient credit exchange program.

2) 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 passage of the Governor's proposed $250 million bond initiative, combined with the $300 million currently available in the WQIF, 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.

3) Cost Containment - Several cost containment methods will be pursued in order to maximize the purchasing power of available state funds, including:

- 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 indexes for anticipated unit costs of basic construction materials;
- 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; and

- Closely review proposed expansion projects to ensure that the additional capacity is reasonable and necessary.

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

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.[3] 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 under the Developed and Developing Lands Category]**;**
- discharges from boats;
- discharges or releases of toxic chemicals (such as PCBs and mercury) from contaminated industrial sites; and
- 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 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. These problems are being addressed through enforcement actions and 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

[3] For a more detailed discussion of the TMDL process see Appendix A - "Additional Information on Virginia's TMDL Clean-Up Program" - at the back of this report.

Virginia's Department of Mines, Minerals and Energy which has the authority for issuing permits to mining operations; and

- 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%.

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. [4]

Potential Problem Areas:

1) In some cases, necessary levels of pollution reduction may be economically and/or technologically unachievable; and

2) Water quality standards (designated safe levels) may be inappropriate for some specific waters.

Risk Mitigation Strategy:

1) WQIF grants and low interest loans (Virginia Clean Water Revolving Loan Fund) are available to offset additional treatment costs for installing nutrient removal technologies. The 2006 General Assembly also appropriated $17

[4] For detailed actions necessary to expedite the development and implementation of TMDL clean-up plans, see Appendix A "Additional Information on Virginia's TMDL Clean-Up Program" - at the back of this report.

million to the WQIF for areas outside of the Chesapeake Bay watershed, known as the "Southern Rivers." These funds shall be used for the following:

- design and construction of mandated water quality improvement facilities at publicly owned treatment works for projects that would otherwise result in a financial hardship for the residential users of the facilities;
- correction of on-site sewage disposal problems; and
- development of comprehensive local and regional wastewater treatment plans, preliminary engineering, and environmental reviews.

The Secretary of Natural Resources and DEQ are currently developing guidelines for cost-effective distribution of these funds.

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.

2) All of Virginia's water quality standards are re-evaluated every three years to determine if they remain appropriate and reflect recent scientific findings. Also, recent amendments to the Code of Virginia [§62.1-44.19:7] allow for an aggrieved party to present to the State Water Control Board reasonable grounds that attainment of any water quality standard is not feasible. The 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: 1) the amount of loans and grants used to address TMDL implementation; and 2) the permitting and compliance actions taken in accordance with TMDL Implementation Plans.

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:

Designate specific waters as "No Discharge Zones" (NDZ), thereby prohibiting the discharge of sanitary waste from boats.

Example: As part of a recent TMDL clean-up plan for Lynnhaven Bay, the City of Virginia Beach requested that DEQ designate Lynnhaven Bay as a "No Discharge Zone." The request is currently awaiting EPA approval. Middlesex County and other local governments participating in development of TMDL clean-up plans have also expressed interest in NDZ designation as an impaired waters restoration tool.

Potential Problem Areas:

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

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

Risk Mitigation Strategy:

1) 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;
2) Additional state and local staff may be needed to assure adequate enforcement of NDZs; and
3) Mitigation of local government and boat owner resistance to NDZ designations may be possible through extensive boater and marina educational efforts. Such programs could promote the water quality benefits of NDZ designation.

Performance Measurement: Report semi-annually on outreach efforts and NDZ designations being pursued.

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 October 2006, there are 51 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 – expected completion date September 2007
- Bluestone River PCB TMDL – expected completion date July 2007
- Roanoke River PCB TMDL – expected completion date December 2007
- South River mercury TMDL – expected completion date October 2008
- North Fork Holston mercury TMDL – expected completion date December 2009
- Levisa Fork PCB TMDL – expected completion date March 2010

Other clean-up plans will be scheduled at a later date.

Potential Problem Areas:

1) Technical guidance for measuring low-levels of toxic substances in wastewater discharges is lacking;
2) Sources of toxic contamination may be widely dispersed throughout the watershed, making identification very difficult and labor intensive. Significant increases in data collection will require additional staff resources;
3) Lack of adequate funding for timely implementation of clean-up plans. PCB and mercury pollutants degrade very slowly and remain in the environment for generations. Shortening the time it takes to identify and remediate toxic contamination will reduce the amount of toxic substances entering the water, resulting in less costly and more timely clean-up; and
4) Increased toxic monitoring requirements for some smaller wastewater facilities may create financial hardships.

Risk Mitigation Strategy:

1) Technical guidance on collecting low-level PCB data using low-level detection methods is due to be developed by 2007;
2) Where responsible parties can be identified, their resources will be utilized to the fullest possible extent to characterize the sources of contamination. However, additional state funding will be needed to expand monitoring and identification of contamination sources;
3) Additional state funding or revisions to the WQIF could be used to offset increased toxic monitoring costs at permitted facilities experiencing financial hardship; and
4) 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.

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

Objective: Significantly increase the number of failing on-site septic 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 EPA indicate that 10% to 20% of on-site systems are failing and releasing pollutants to the environment. TMDL clean-up studies in Virginia confirm that failing on-site systems are commonly identified as a significant source of pollution. Currently, only limited restoration of on-site systems is occurring through the TMDL implementation process. More fiscal and staff resources, as well as better inter-agency cooperation, are needed to increase the pace of repair or replacement of these failing systems.

Strategy:

1) Work closely with the Virginia Department of Health and revise their on-site sewage disposal regulations to address technical advances, inspections of existing systems, and enforcement issues;
2) Explore the possibility of increasing the availability of cost-share funds for property owners to repair or replace failing septic systems of straight pipes. The Department of Conservation and Recreation (DCR) administers the Commonwealth's cost-share program, wherein, agency guidelines outline the application and review process, selection criteria and administrative procedures for providing cost-share assistance to property owners. This funding is provided for a limited number of TMDL clean-up plan implementation projects through a federal 319 grant or competitive WQIF grant. The amount available for on-site remediation through this funding is currently not sufficient to meet the statewide need; and
3) Target recent legislative appropriations to assist local governments with septic remediation programs. The 2006 General Assembly provided a special appropriation to the Water Quality Improvement Fund (WQIF) of $17 million to provide grants to local governments outside of the Chesapeake Bay watershed for three purposes, one of them being the correction of on-site sewage disposal problems. Guidelines, for distribution of these funds are currently under development by the Secretary of Natural Resources.

Potential Problem Areas:

1) Multi-agency responsibilities and different agency restoration priorities make a concentrated focus on the issue of failing septic systems difficult;

2) Lack of local government awareness of the extent of the problem;
3) Localities that are aware of the problem often place a low priority on remedying the situation, despite requirements such as those contained in the state's Chesapeake Bay Preservation Act;
4) High cost of repair/replacement of failing septic systems or installation/extension of sewer service;
5) Inadequate levels of available cost share funding for septic system remediation;
6) Impediments to enforcement of the Virginia Department of Health's Sewage Handling and Disposal Regulations, such as lack of staff, lack of emphasis on enforcement, limited enforcement mechanisms, or lack of options for affected homeowners to fix the problem; and
7) The potential for continued shoreline residential development to result in closures of shellfish areas may be significant.

Risk Mitigation Strategy:

1) Develop a Memorandum of Agreement (MOA) between DEQ, DCR and VDH to mitigate multi-agency responsibilities and different priorities on restoration efforts. The MOA should provide an integrated strategy to prioritize and accelerate the pace of remediation of pollutants from illegal straight pipe discharges and failing septic systems;
2) 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;
3) 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. Consider allowing Soil and Water Conservation Districts and Planning District Commissions to administer these additional funds; and
4) Explore the need for regulatory revisions to ensure that appropriate enforcement tools are available to address failing septic systems and illegal straight pipes.

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.

Agriculture and Forestry Category

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

Objective: By 2013 fully implement priority agricultural best management practices in the Chesapeake Bay watershed in order to significantly advance the Commonwealth's nutrient and sediment pollution reduction goals.

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 in order 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:

1) 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); and
    - livestock exclusion.

    It should be noted that not all practices may be applicable to every farm operation.

2) Focus a substantial portion of available state agricultural BMP cost-share assistance on the installation of the five conservation "priority practices" in the Chesapeake Bay watershed. 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;
3) Provide funding to Virginia's 47 Soil and Water Conservation Districts (SWCD) for additional on-the-ground technical staff to deliver the increased agricultural cost-share program. The level of funding needed is dependant on the funds appropriated to the WQIF for BMP cost share. Current estimates are that one local district staff person is needed for every $350,000 in BMP cost-share funds;

4) 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. Additional funds will be needed to modernize computer reporting systems for increased efficiencies;
5) 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 which is increasingly difficult for federal staff to provide. Estimated DCR staff requirements for this function are 4 FTEs and $400,000 (out-sourcing will also be evaluated);
6) In early 2007, DCR in consultation with Soil and Water Conservation Districts and agricultural producers, will explore ways to boost levels of farmer participation in agricultural cost-share programs through additional voluntary certification or recognition programs or other promotional activities including beginning a media outreach program in the Shenandoah Valley; and
7) Plans for the expenditure of additional WQIF funds appropriated in the 2007 session will be developed following final adoption of the budget bill.

Potential Problem Areas:

1) Inadequate BMP cost-share funding or the technical staff support funding needed to deliver the BMPs at local and state level; and
2) Some farmers, for a variety of reasons, will prefer not to participate in government programs that will 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. Currently, it is estimated that only 30% to 40% of all available lands have implemented BMPs.

Performance Measurement: Pounds of nitrogen and phosphorus reduced through the implementation of priority practices as reported annually to the EPA Chesapeake Bay Program.

Implement nutrient management on lands receiving poultry litter

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

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 law, nutrient management plans are only required where poultry litter is applied on the same land where the birds are grown. 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.

Strategy/Timeframe:

1) DCR will work with the Virginia Poultry Federation, poultry integrators, and poultry growers to better organize poultry litter supply and demand. Specific actions include: 1) maximizing the effectiveness of the "market maker," recently hired by the Virginia Poultry Federation, to facilitate the transfer of poultry litter between buyers and sellers, 2) expand the market for poultry litter by using the "market maker" to promote the benefits of land application in agricultural areas that currently use little, and 3) using the poultry integrators to provide field staff to assist contract growers in better managing litter and coordinating poultry house cleanouts. DCR will provide assistance and guidance to these efforts and work with the parties involved to evaluate their effectiveness;
2) Develop a targeted Virginia litter transport program by July 1, 2007, to establish incentives for the movement of surplus poultry litter to areas of the state that can better utilize the nutrient content. Evaluate the existing federal U.S. Department of Agriculture Natural Resources Conservation Service's (USDA/NRCS) poultry litter transport program; and
3) Implement funding of litter transport incentives to assist in moving litter from grower's farms to sites that can fully utilize the nutrients for crop production. DCR has committed to providing $450,000 from the WQIF for the state share of a three-year litter transport program in partnership with the Virginia Poultry Federation. VPF has pledged a matching $150,000 per year for the next three years to match the state share.

Potential Problem Areas:

1) The poultry industry has raised concerns that additional nutrient management requirements on the end-user of poultry litter may inhibit the movement of litter off poultry farms;
2) Resistance by poultry companies to support the growers' needs to move litter;
3) Resistance by litter end-users to acquire and follow prescribed nutrient management requirements to insure proper use of the nutrients in litter and protect water quality;
4) Lack of funds beyond three years to support the continuation of a litter transport system; and
5) Lack of development of longer term alternative uses for poultry litter to complement transport programs.

Performance Measurement: Number of nutrient management plans written and implemented and pounds of litter and nutrients transferred.

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 20% 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 the Chesapeake Bay watershed and elsewhere 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 900 operations) are fully independent operations.

Strategy:

1) Secure a commitment from all Virginia poultry and swine integrators to work towards achieving the 30% reduction level;
2) Set a time frame within which the 30% phosphorus reduction shall be achieved;
3) Establish a system of incentives/disincentives to insure that companies will meet goals within the time frame;
4) Establish a means to provide on-going monitoring to insure the reductions are maintained once met;
5) Develop and carry out an 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; and
6) Develop an 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 20% phosphorous reduction in dairy manure.

Timeframe:

1) Secretary of Natural Resources convenes a meeting of Virginia poultry integrators by April 1, 2007 and swine integrators by May 1, 2007 to seek integrator commitment to the application of phosphorous reduction strategies;

2) Secure confirmation of poultry and swine integrator commitment, from each integrator, by July 1, 2007;
3) Establish an agreed "compliance date" of no later then July 1, 2009 in all integrator commitments;
4) Annually assess the level of feed supplement implementation by each integrator and determine state-wide phosphorus reductions, beginning July 1, 2008;
5) Beginning on July 1, 2009, annually evaluate the phosphorous reduction progress demonstrated by poultry and swine integrators and determine the need for adjustment to achieve full compliance of the 30% reduction goal; and
6) By 2010, achieve a 20% reduction in phosphorous levels in manure in one-third of the dairy animals in Virginia's part of the Chesapeake Bay.

Potential Problem Areas:

1) Possible reluctance of poultry and swine integrators to commit to a phosphorus reduction goal and to entering into an agreement with the Secretary of Natural Resources;
2) Inability for one or more integrators to achieve the 30% reduction target; and
3) Insufficient resources to carry out the required outreach and incentive program needed to convince the majority of Virginia's 900 diary operators that diet and feed management can help their operation and provide environmental benefits.

Performance Measurement:

1) Percentage reduction in phosphorus content of sampled poultry litter and swine manure; and
2) Percentage of dairy animals in the Chesapeake Bay in dairy operations utilizing diet and feed modification technology.

Significantly accelerate removal of waters in the Southern Rivers watersheds from the impaired waters list

Objective: Improve the quality of waters located outside of the Chesapeake Bay watershed ("Southern Rivers" region) through development and implementation of individual clean-up plans (TMDLs). [5]

Rationale: Whereas there are nutrient and sediment pollution reduction goals established for waters within the Chesapeake Bay, similar clean-up goals do not exist for waters within the "Southern Rivers" region of Virginia. Therefore, the focus for these watersheds is the removal of individual water bodies from the impaired waters list. The

[5] For detailed actions necessary to expedite the development and implementation of TMDL clean-up plans, see Appendix A "Additional Information on Virginia's TMDL Clean-Up Program" at the back of this report.

causes of impairments vary from watershed to watershed and many are related to improper management of agricultural operations.

Strategy:

1) 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;
2) As funding is available, DCR will develop contracts with the local SWCD to provide staff support and deliver the agricultural BMPs with the farming community as appropriate to address the specific impairments;
3) Provide summary reports of progress in the installation of conservation practices and water quality monitoring results in order to demonstrate measurable improvements in water quality;
4) Depending on the amount of funds appropriated, direct additional funds to targeted TMDL clean up activities in the Southern Rivers watersheds under contracts with Soil and Water Conservation districts; and
5) Beginning July 2007, DCR will evaluate agricultural BMP adoption in TMDL watersheds. The evaluation will include the extent to which current programs can be relied upon to meet TMDL implementation plan requirements and what other measures may be necessary to insure BMPs are adopted in order to meet and maintain water quality standards.

Timeframe:

Initial contracts with eight SWCDs were signed in 2006 and nine additional staff positions were established in the 8 SWCDs to support the delivery of agricultural BMPs. DCR signed contracts for approximately $500,000 per year for the next two years for the staff positions. The contract also includes a TMDL Agricultural BMP cost-share commitment of $5.7 million through the end of the current biennium.

Potential Problem Areas:

1) Potential lack of continued implementation funding for agricultural practices and supporting technical service delivery staff;
2) Farmer participation in voluntary agricultural BMP programs may be insufficient to eliminate impairments in Southern River watersheds; and
3) State 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:

1) Number of water bodies removed from the list of impaired waters; and
2) Measurable improvements in waters not removed from the impaired waters list.

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.

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. 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 is 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. In the last six years (FY2001-FY2006), an average of 56,000 acres per year statewide have been protected in Virginia, counting the combined efforts of both private and public organizations and agencies. In Fiscal Year 2006, 65,764 acres were protected in the Commonwealth, and an ambitious goal of protecting 400,000 acres by 2010 has been set.

Strategy:

1) 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;
2) Identify opportunities of additional state land holding for parks, natural areas, wildlife management areas and state forests;
3) Continue coordination among state agencies and private, federal and local partners on land conservation priorities;
4) Support currently established local purchase of development rights and encourage the creation of new programs where they currently do not exist;
5) Employ geographic information based systems to identify lands with multiple conservation values to maximize water quality and other benefits; and

6) Work with the Virginia Liaison Office and Virginia's Congressional Delegation in securing federal funding for land conservation in the Commonwealth.

Potential Problem Areas:

1) Lack of consistent and dedicated source of funds for PDR, matching grants and acquisition programs;
2) Inflated land prices in some areas of the Commonwealth make preservation difficult;
3) 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; and
4) Additional agency staffing capacity to handle expanded land preservation and stewardship activities is greatly needed. Staff are needed at the Virginia Outdoors Foundation, the Department of Conservation and Recreation and the Department of Historic Resources. The Governor's 2007 introduced budget includes funding for such staff.

Risk Mitigation Strategy:

1) Work to secure a dedicated source of funding for land conservation;
2) Increase targeting of conservation lands based on a competitive review of grants and enhanced data analysis and mapping;
3) Work with Virginia's congressional delegation to reauthorize current federal conservation tax credits that are scheduled to expire at the end of the 2007 tax year;
4) 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; and
5) Continue efforts through the biennial budget to secure necessary staff resources.

Performance Measurement:

1) 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 (http://www.dcr.virginia.gov/land_conservation/index.shtml); and
2) Percentage of land preserved towards the 20% Chesapeake Bay watershed goal.

Developed and Developing Lands Category

Measurable improvement toward full implementation and compliance of erosion and sediment control programs statewide

Objective: By the end of 2010, 90% of the 166 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 sediment loss from construction sites is a foundational nonpoint source control program. Unfortunately, Department of Conservation and Recreation reviews have shown that only some 20% of local erosion and sediment control programs meet minimum state standards. Without compliant local programs, Virginia's waters will continue to be unnecessarily degraded by pollution from construction and other land disturbing activities.

Strategy:

1) Improve compliance of all local erosion and sediment control programs by accelerating the program review cycle from current five years to a two or three year cycle using additional DCR staff, contracting with private firms, or a combination of the two. Depending on the approach, costs to implement the accelerated program review could range from $650,000 to $900,000 annually;
2) Accelerate local program's status review by the Soil and Water Conservation Board;
3) Local programs found not consistent with the law will be required to complete a Corrective Action Agreement (CAA) outlining measures/timeframes necessary for compliance; and
4) DCR staff will refer chronic non-compliance issues to the Soil and Water Conservation Board for enforcement action and possible civil penalties.

Time Frame: Begin two or three-year review cycle in 2008 if additional resources are provided. Include results of program reviews in future revisions to this report.

Potential Problem Areas:

1) Current DCR staffing level will be insufficient to assist localities in the timeframe necessary for compliance; and
2) Localities must be willing partners in improved compliance. Some may lack the will to increase local permit fees and assess civil penalties sufficient to ensure full compliance with the program.

Risk Mitigation Strategy:

1) Provide additional funds for 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. Such activities would cost approximately $150,000 per year;
2) Provide state funding assistance for local program implementation;
3) Review the need to initiate legislative action authorizing local governments to charge additional fees for site-specific non-compliance**.** Localities are restricted by state law on the size of penalties they can impose on land disturbers that have significant compliance issues during construction activities. Current penalties are at such a level that they provide little incentive to undertake corrective actions; and
4) 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 or programs reviewed in compliance with state standards.

Establish jurisdictional nutrient pollution caps in the Chesapeake Bay watershed

Objective: Establish jurisdictional nutrient loading caps 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 caps (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 loading caps" 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 and TMDL implementation into local land use decisions. Jurisdictional caps also set the stage for nutrient trading and other market based approaches to pollution control.

Strategy/Timeframe:

1) Beginning in January 2007, DCR will work with the Chesapeake Bay Program and local governments within the Chesapeake Bay watershed to verify jurisdiction-specific data regarding nutrient and sediment loads and land use information contained in the revised Chesapeake Bay Program watershed model;
2) By July 2007, should grants funds be available, DCR will initiate a 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 assigned nutrient load (a grant proposal has been submitted for federal funds for this effort);

3) Should the pilot program be successful, by January 2009, DCR will begin a process of educating local governments and other interested organizations on the framework for using established caps;
4) By September, 2009, DCR, in consultation with the Chesapeake Bay Program and local governments, will determine the state resources necessary for state agencies and local governments to implement cap-based land management programs; and
5) Estimated costs:

    1. Software development and data tracking - $3.0 million needed over 2 years beginning July 1, 2008;
    2. Outreach, education and public information - $500,000 annually beginning January 1, 2009;
    3. Implementation grants to local governments to develop and operate a GIS-based land management system that identifies loadings by land use and land management and enables evaluations of land use change so loadings can be managed to stay within nutrient cap levels. $5.0 million annually beginning January 1, 2009; and
    4. Beginning July 1, 2008, DCR staffing needed to support local cap program $450,000 and 6 FTE (5 FTE in regional watershed offices in Bay and 1 FTE central office).

Potential Problem Areas:

1) Reluctance by local governments to commit to a cap that may have the potential to influence growth and development decisions;
2) Insufficient/unpredictable state funding to assist local governments in evaluating land use options under the cap;
3) Insufficient state staffing to implement jurisdictional cap program; and
4) Insufficient outreach and promotion to engage and educate local governments of the details of the program and the benefits to be achieved.

Performance Measurement: Performance measures will be developed as this process moves forward.

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

Objective:

Initial: Achieve 100% Chesapeake Bay Preservation Act compliance by Tidewater localities with septic pump-out requirements by 2010 in order to reduce impairments caused by high levels of fecal Coliform bacteria.

With state assistance, establish maintenance and inspection programs for all Tidewater (Bay Act) localities that are consistent, effective and fully compliant with Chesapeake Bay Preservation Act Best Management Practices (BMPs) maintenance requirements.

Future: 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.

Rationale: Improperly maintained septic systems can be a source of excess nutrients and bacteria both to ground and surface waters. In fact, elevated levels of fecal Coliform bacteria are the cause of a significant percentage of Virginia's impaired waters, especially in highly developed areas where a predominant source of the bacteria is improperly maintained septic systems. Because of this concern, the Chesapeake Bay Preservation Act regulations have contained performance criteria for the periodic pump-out of septic systems for nearly 20 years.

Currently, only about 30% of localities in Tidewater Virginia with on-site septic systems have met this septic pump-out requirement. Most of these localities lack the staff and funding resources necessary to develop and implement such programs. While the Commonwealth has provided some grant funds to localities to assist with these programs over last decade, such funds have been insufficient and inconsistent. Furthermore, there is no dedicated program to require periodic septic pump-out and maintenance program outside of the Chesapeake Bay Preservation Act area.

The Chesapeake Bay Preservation Act also requires that there shall be "no net increase" in phosphorous loadings from new development and redevelopment activities. In general, this requirement has been implemented by all Tidewater localities since the mid-1990s. However, as an integral part of this process, installation of BMP facilities (typically including wet ponds, extended detention ponds, bioretention facilities and created wetlands) have been used to reduce pollutants and the Act's implementing regulations further require that such facilities be consistently inspected and maintained. While many localities have adequate programs to ensure that these facilities are inspected and maintained, a significant number of localities do not. In addition, some localities that currently attempt to track BMP maintenance are not doing so in a consistent manner. 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.

The regulatory authority for the Bay Preservation Act along with the administration of the Chesapeake Bay Local Assistance Board was transferred to DCR in July 2004.

Strategy:

1) Secure a consistent funding source to assist localities in establishing and implementing septic pump out programs. These funds will allow localities to set up programs to notify septic owners of the need to pump their systems out, provide educational materials to homeowners on the benefits of maintaining septic systems, and establish mechanisms to track septic system maintenance. It is 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 remainder would be achieved through replacement of failing systems;
2) Dedicate new funds to DCR, as available, to support local establishment of BMP inspection, maintenance and tracking programs. Estimated amount would be $100,000 to be 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;
3) Provide guidance to localities that are implementing such programs to ensure consistency between the programs; and
4) Monitor compliance to ensure that predicted pollutant removal is actually being achieved.

Timeframe:

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

Potential Problem Areas:

1) Resistance in some localities to implementation of elements of the Chesapeake Bay Preservation Act; and
2) Lack of automation of existing records and additional database tools to track BMPs and septic pump-out status.

Performance Measurement:

1) Number of localities in compliance with local septic pump-out programs;
2) Number of systems pumped with estimated resulting nutrient reductions; and
3) Numbers of BMPs installed along with pollutants removed and acres treated.

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

Objective: Incorporate specific water quality protection measures into local land development codes, ordinances and processes.

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 other local land development codes and requirements. As a result, local zoning and subdivision codes often contain requirements that are in direct conflict with local Chesapeake Bay Preservation Act ordinances.

The next phase of Chesapeake Bay Preservation Act implementation seeks to correct this conflict by working with local governments in the Chesapeake Bay Preservation Act area to integrate water quality provisions into all land development ordinances (focusing on zoning and subdivision codes and plan of development processes). Key elements of this phase will be aimed at reducing the amount of impervious cover associated with land development and eliminating impediments to implementing low impact development practices. Completion of this phase 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 is critical to significantly reduce nonpoint source pollution from land development activities.

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

Strategy:

Determine a level of funding necessary to provide competitive grants to localities and developers for projects that demonstrate how watershed management and other water quality based land planning tools can be effectively used and incorporated into local codes and processes.

Timeframe:

By 2010 - Full compliance with local code revisions by Chesapeake Bay Preservation Act localities.

Potential Problem Areas:

1) Resistance by some localities to recommended changes to ordinances; and
2) Lack of trained staff with adequate planning experience and expertise to undertake needed analysis - particularly in smaller, rural jurisdictions.

Performance Measurement:

1) Number of local governments with compliant programs; and
2) Levels of impervious cover for new commercial and residential development.

Implement a revised stormwater management program statewide

Objective: Complete the revision of Virginia's stormwater management regulations, implement the regulations statewide and maximize local government adoption of the program.

Rationale:

The regulatory authority in Virginia for the National Pollutant Discharge Elimination System (NPDES) programs related to municipal separate storm sewer systems (MS4) and construction activities was transferred effective January 29, 2005 from the State Water Control Board to the Virginia Soil and Water Conservation Board, with DCR as the implementing agency. As a result, DCR is responsible for the issuance, denial, revocation, termination and enforcement of federal NPDES permits for the control of stormwater discharges from MS4s and land disturbing activities under the Virginia Stormwater Management Program.

The Virginia Stormwater Management Program seeks to protect properties and aquatic resources from damages caused by increased volume, frequency and peak rate of stormwater runoff. Further, the program seeks to protect those resources from increased nonpoint source pollution carried by stormwater runoff. A regulatory revision is underway that seeks to establish specific requirements for stormwater quality and quantity controls for development. The rule-making also will define what is required for a local government to be approved to operate a local stormwater management program and receive a significant portion of the permit fees to support program implementation. The regulations will also include an updated fee schedule for construction general permits with the goal of providing the necessary resources to operate the permit program. The changes to the law that provided for the transfer of this program to the Soil and Water Conservation Board also envisioned local stormwater programs statewide operated by the local governments themselves.

Strategy/Timeframe:

1) Provide draft regulatory revisions for public comment by September 1, 2007;
2) Obtain EPA approval of state permit program delegation to the qualified local governments by July 1, 2008;
3) Increase the level of registration of construction sites that require the stormwater general permit to 75% by July 1, 2008;
4) Delegate the state stormwater general permit program to qualifying local governments that are in MS4s or in the Chesapeake Bay Preservation Act area by July 1, 2009; and
5) By July 1, 2011, at least 25% of local governments not required by law to adopt the stormwater general permit program will qualify and will voluntarily adopt the

program. DCR will continue to administer the program in localities without an approved program.

Potential Problem Areas:

1) EPA may not approve a program that enables local delegation and, therefore, may require additional regulatory efforts by DCR;
2) New regulatory requirements may require additional time for local governments to comply. Therefore, DCR may be required to operate local programs for a period of time; and
3) Additional state resources could be significant depending on the number of localities that require DCR oversight.

Local/State Coordination:

1) Significant coordination between the state and local governments will be needed. Coordination will take two forms. First, for local governments that adopt the local program there will be a sharing of the collected permit fees between the state and locality. Second, for local governments not currently adopting the program locally, the state (DCR) will be responsible for operating the program in each of these localities. Plan review and approval, permit issuance, site inspection and enforcement, tracking and monitoring of stormwater BMPS and BMP maintenance will all be carried out by state employees or contracted to private firms. This will require coordination with the local development process and additional communications with the development community to insure that they understand how the system will function. It is believed that many local governments will operate the programs themselves and take steps necessary for state approval. DCR may require up to 15 FTEs and $1.1 million annually in order to operate the local programs in jurisdictions that choose not to adopt the program. Some part of this funding may be covered by funds generated by permit fees, but until the regulatory process currently underway is completed it is not possible to make a final determination of staff and funding needs;
2) Training for local governments to familiarize them with new program requirements will be necessary and will take additional resources to accomplish. It is estimated that training and program development assistance will require at least 2 FTE and approximately $170,000 annually. Existing DCR staff will provide general support and assistance as they currently do, but the new, expanded statewide program will require assistance beyond what can be provided with existing staff. Individual, locality-specific training will be needed beyond general information meetings and publications; and
3) DCR will be required to operate the jurisdiction-level stormwater program in localities that have not been approved for adoption by the Soil and Water Conservation Board. This state-level oversight will require that DCR staff coordinate project plan reviews closely with the local governments to maintain an acceptable plan approval process for the development community. Significant additional resources may be needed, but can not be quantified at this time.

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:

1) Number of programs compliant with state law; and
2) Number of localities covered by stormwater general permit.

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; and
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. Tables 1 and 2 present the current and predicted emission levels and the anticipated reductions that will result from implementation of the programs. 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 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 exceedence 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 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 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 EPA and states have implemented a program to reduce NO_X emissions from the electrical power generation sector. This program began in 2004 has already resulted in substantial reductions of both NO_X emissions and transported ozone levels.

Clean Air Interstate Rule (CAIR): To further reduce pollutant transport, the 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 will also produce further reductions of NO_X emissions. Virginia is in the process of adopting a state rule to implement the CAIR emissions reduction requirements and caps.

Clean Air Mercury Rule (CAMR): The EPA has adopted the national CAMR rule to reduce mercury air emissions from the electric power generation sector. Virginia is in the process of adopting a state rule to implement the CAMR emission reduction requirements and caps.

Virginia Mercury Rule: In addition to the CAMR program, Virginia's State Air Pollution Control Board is considering regulations that would impose additional restrictions on electric power generation facilities and other sources. 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.

VA Mercury Study: The 2006 General Assembly also directed DEQ to conduct a detailed assessment of mercury emissions, and local deposition, from Virginia sources. The study will examine the mercury reductions expected to occur as a result of the CAIR and CAMR regulations as well as the requirements of the state specific regulations, the costs of available controls, public health impacts, and recommendations on whether additional steps should be taken to control mercury emissions. This study is to be completed by October 2008.

TABLE 1: Mercury Base & Future Predicted Air Emissions

	Pounds/Year				
Source Categories	1999	2010	Change from 1999 to 2010	2018	Change from 1999 to 2018
Electric Utilities [1]	1,266	1,184	***-82***	468	***-798***
Totals:	1,266	1,184	***-82***	468	***-798***

[1] Electric utility emission reductions are the result of the federal Clean Air Mercury Rule. Additional reductions may be achieved from the Virginia Mercury Rule.

TABLE 2: Air Deposition Pollutant Base & Future Predicted Emissions

	2002 (Tons/Year)		2009 (Tons/Year)		2009 (Tons/Year)		2018 (Tons/Year)		2018 (Tons/Year)	
Source Categories	NO_X	SO_2	NO_X	SO_2	Diff. NO_X	Diff. SO_2	NO_X	SO_2	Diff. NO_X	Diff. SO_2
Electric Utilities [1]	85,080	233,690	63,546	193,112	***-21,534***	***-40,578***	66,074	114,254	***-19,006***	***-119,436***
Large Industries	75,803	137447	67,263	135,611	-8,540	-1,836	70,342	140,994	-5,461	3,547
Other Fuel Consumption	15,642	5,507	15,965	5,257	323	-250	17,851	5,369	2,209	-138
Chemical Manufacturing	8,061	2,126	7,789	1,995	-272	-131	9,210	2,291	1,149	165
Metals Processing	936	5,251	826	4,812	-110	-439	1,016	5,947	80	696
Petroleum Industries	182	170	197	186	15	16	228	217	46	47
Other Ind. Processes	9279	17,702	9,425	18,871	146	1,169	10,835	21,293	1,556	3,591
Solvent Utilization	0	2	0	2	0	0	0	3	0	1
Storage & Transport	11	0	12	0	1	0	15	0	4	0
Waste Disposal	1,864	1,581	2,173	1,804	309	223	2,594	2,171	730	590
Miscellaneous Area	565	151	645	174	80	23	769	209	204	58
Highway Vehicles [2]	219,835	8,195	132,698	1,067	***-87,137***	***-7,128***	57,191	948	***-162,644***	***-7,247***
Nonroad Vehicles [3]	44,364	4,363	54,993	1,707	***10,629***	***-2,656***	40,393	507	***-3,971***	***-3,856***
Totals:	461,628	461,628	354,537	364,604	***-106,090***	***-51,587***	276,525	294,208	***-185,104***	***-121,982***

[1] Electric utility emission reductions are the combined result of the State NOX 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:

1) The federal electric utilities control programs allow for emissions trading of all three pollutants of concern between sources and states. This trading mechanism may impact the amount of reductions achieved in Virginia under these programs;
2) The predicted emission reductions in Table 2 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; and
3) The 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, thus requiring 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.

IV. State and Local Government Coordination

In addition to coordination activities highlighted through out the Clean-Up Plan, additional options for increasing coordination between state agencies and local governments will include the following (additional tools will be explored in future reports):

1. Some Tidewater localities have incorporated TMDL clean-up implementation efforts 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.

2. DEQ has formed partnerships with a number of Planning District Commissions for TMDL clean-up plan development and implementation.

3. 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 to foster communication and coordination with local governments.

V. Cost Containment Mechanisms

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.

Variation of 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."

Advantages:

- Minimizes cost to WQIF for grants to localities with sufficient "capacity" to fund the project with local funds.

Disadvantages:

- Does not directly address cost-effectiveness of individual projects.
- DEQ must sign grant agreement for all dischargers that apply for grants.

Only Eligible Costs Are Reimbursed

DEQ staff, through intensive project review, ensures that only those costs related to nutrient reduction are available for reimbursement through a WQIF grant as required by § 10.1-2131.C.

Advantages:

- Only costs necessary for nutrient reduction technology are reimbursed.
- Encourages localities to install the best treatment that they can cost share with the state.

Disadvantages:

- Localities may elect to construct more expensive nutrient reduction technology paid in part by the WQIF grant so that non-reimbursable operational costs can be lower in the long run.

The Virginia Public Procurement Act (VPPA)

Localities receiving WQIF grant funds are subject to the VPPA, which generally requires such localities to accept the lowest bids for construction projects.

Advantages:

- The VPPA facilitates competition between bidders, which results in generally lower costs.

Disadvantages:

- Because of extremely high demand, costs may still be high if only one or a few contractors bid on the project.
- Localities may request bids to construct more expensive nutrient reduction technology paid in part by the WQIF grant so that non-reimbursable operational costs can be lower in the long run.
- Does nothing to reduce the cost of materials, only the markup on materials.

Voluntary Market-Based Point Source Nutrient Credit Trading

Virginia's Nutrient Credit Exchange Program and Watershed General Permit will implement a market-based nutrient trading program to help minimize the costs of achieving our nutrient reduction goals.

Advantages:

- 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 will result in a more robust market.

Disadvantages:

- Nutrient trading is a relatively new concept and, given the current unpredictability of sufficient credits in the future, localities may be reluctant to rely on the purchase of credits to satisfy their compliance obligations.

2007 General Assembly Cost-Containment Measures

Both the House (HB 1710) and Senate (SB771) versions of Governor Kaine's "Bay Bonds" legislation contain enactment clauses that require the Department of Environmental Quality to identify and evaluate options to ensure the efficient use of cost-share funds. If enacted into law, DEQ would, through their WQIF guidelines, evaluate the potential for greater cost control measures including closer evaluation of eligible and appropriate costs, applicability of the Virginia Public Procurement Act, maximizing the benefits of the nutrient trading program, basing grant amounts on full life cycle cost evaluations, and establishment of usual and customary rates.

VI. Alternative Funding Mechanisms

Alternative Financing for Wastewater Treatment Facility Upgrades

Needs

The total capital cost for the nutrient reduction upgrades required of the public waste water 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 recently issued Watershed General Permit, Virginia dischargers are expected to submit their compliance plans to DEQ by August 1, 2007. These plans will provide, for the first time, a comprehensive picture of the overall costs and schedule for achieving the cap load allocations in each river basin. This information will provide 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. In addition, review of these plans will indicate whether the dischargers are fully utilizing the benefits of the credit exchange program to minimize the costs of the nutrient control projects. Subsequent changes to the WQIF grant program may be needed if the compliance plans do not propose cost-effective utilization of these public funds.

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; and
- Localities going directly to the bond market for financing.

The VCWRLF has been financing wastewater treatment upgrades at about $150 million per year from a variety of funding sources, including repayments on outstanding loans, interest earnings, and bond issues to leverage available funds in years with excess demand. In addition, a portion of the funding has come from federal capitalization grants that have declined significantly in recent years and are expected to decline further in the future. **VRA projects that with the use of leveraging they could finance $300 million to fund the current FY2007 projects and an additional $300 million per year for the next five years through the VCWRLF. This aggressive level of increased financing capacity is contingent upon several key assumptions, including:**

- Continued $10 million annual Federal grant contributions *plus* $2.5 million state match ($12.5 million total annual contributions); and
- Loan interest rates and maturities similar to loans currently made under VCWRLF program.

The $300 million annual capacity under the VCWRLF will have demands on it from: (i) the WQIF match (the portion of the upgrades/expansions that would not be eligible for WQIF funding); (ii) financing needed for work outside of the Bay watershed; and (iii) potentially some type of interim financing in cases where WQIF grant funding does not keep pace with construction activity. These demands may well exceed the $300 million 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.

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 if increased considerably as the result of future incentive programs.

Details of this initiative remain proprietary at this time.

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

Alternative Financing of Failing Septic System Repair/Replacement

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

Details of the initiative remain proprietary at this time.

APPENDIX A

ADDITIONAL INFORMATION ON VIRGINIA'S TMDL CLEAN-UP PROGRAM

Virginia's strategy to restore impaired waters throughout the Commonwealth will rely upon two primary programs: (i) the Total Maximum Daily Load (TMDL) program and (ii) the Chesapeake Bay Program.

The TMDL program is a watershed-based regulatory program described in the federal Clean Water Act and State Water Control Law. It applies to all waterbody types throughout the entire state and addresses many different types of pollution impairments.

The Chesapeake Bay Program, although similar to the TMDL program, addresses only nutrient (nitrogen and phosphorus) and sediment pollution in waters within the Chesapeake Bay watershed. The Chesapeake Bay Program has pursued a cooperative, mostly non-regulatory approach over the past several decades, resulting in the development of Virginia's Tributary Strategies - the master plans to reduce nutrient and sediment pollution into the Bay. This section will describe both the TMDL and Chesapeake Bay Programs.

TMDL Strategy

The latest progress report for Virginia's TMDL program is located on the DEQ website at http://www.deq.virginia.gov/tmdl/.

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.:

1. Development of Total Maximum Daily Loads;
2. Development of TMDL Implementation Plans;
3. Implementation of TMDL Implementation Plan; and
4. Monitoring Towards Water Quality Standard Attainment.

Each of these steps is initiated sequentially and further discussed below, including status, outlook and recommended future strategies.

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 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 EPA for failure to comply with the provisions of §303(d) of the Clean Water Act in Virginia. As a result, EPA signed a Consent Decree with the plaintiffs in 1999 that contains Virginia's TMDL development schedule through 2010. Also under the Consent Decree, 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 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, EPA guidance requires TMDLs to be completed within 12 years of the initial listing date.

Status:

As of May 2006, Virginia has developed TMDLs to address 344 impairments. Of those, 33 impairments were not included on the Consent Decree but TMDLs were development because they were located in the same watershed as a Consent Decree impairment. For development of most TMDLs to date, DEQ has relied on help from outside contractors. Total contractual TMDL development expenditures for DEQ through May 1, 2006 equal approximately $6.5 million, or on average approximately $19,000 per TMDL.

Table 3 - Total Impairments Needing TMDL Development

Due Date	Number of impairments
2000	12
2002	27
2004	98
2006	207
Total impairments with TMDLs developed by May 2006	**344**
2008	213
2010	252
2012	248
2014	221
2016	323
2018	443
Total impairments on 2006 Impaired Waters List still requiring TMDL development	**1700**

Outlook:

Table 3 shows the projected schedule for TMDL development for each biennium through 2018, adhering to the timeframe in EPA's guidance for TMDL development. The table is based on the identified impaired waters as of 2006.

Assuming that the current level of state funding is maintained for the next four years at approximately $2 million/year, and average costs of $19,000/TMDL (based on current program efficiencies), DEQ can develop an additional 470 TMDLs by May 1, 2010. This would address all impairments shown in table 3 for 2008 and 2010 and fulfill our requirements 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:

- A number of impairments identified to date have questioned the appropriateness of some water quality standards. Several of these are being addressed in the current triennial review of the state's water quality standards. Upon completion of the review process, the number of impairments could decrease;
- Many impairments resulting from nutrient pollution in the tidal portion of Virginia's rivers are also being addressed as part of the Chesapeake Bay Program clean-up process (discussed in more detail in the next section). Therefore, a certain degree of "overlap" exists between the two programs and may significantly reduce the total TMDL development funding needs;
- Ongoing pollution control initiatives (both point source and nonpoint source) unrelated to the TMDL process will also assist in restoring

impaired waters, possibly reducing the total cost for TMDL development and implementation; and

- 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:

1) Progress with TMDL development in accordance with the Consent Decree and as outlined in Table 3, adding high priority TMDLs as needed and as resources permit; and
2) 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 EPA for developing a post-Consent Decree Memorandum of Agreement addressing TMDLs not included in the 1998 Consent Decree.

Development of TMDL Implementation Plans

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

Table 4 - Total Impairments Needing TMDL Implementation Plan Development

Completion Date	Number
2001	11
2004	7
2005	16
2006	26
Total impairments with completed IPs to date	**60**
Additional impairments scheduled for IP development with current available funds	**47**
Total impairments with TMDLs already completed, but still needing IP development	237
Remaining impairments (TMDLs not yet completed) still needing IP development	1700
Total impairments still requiring IP development	**1937**

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 May 2006, Virginia has completed 36 IPs addressing 60 impairments. Contractual expenditures for IP development through May 1, 2006 have averaged $12,500 per impairment.

Outlook:

Recent appropriation (2006) of funds for agricultural BMP implementation ($28 million to be distributed under Virginia's agricultural cost-share program, with 60% going to the Chesapeake Bay watershed) has afforded DCR the opportunity to target a certain percentage of those funds toward areas where TMDL IPs have already been developed or can shortly be developed. More information on nonpoint source pollution control to support the restoration of impaired waters can be found in section III of this report (Clean-Up Strategy Components"). DEQ and DCR are coordinating TMDL IP development efforts in those areas. The increasing effort is obvious from Table 4 above, showing the increased number of IPs developed in 2005 and 2006.

In order to expedite the development of implementation plans for the remaining 237 impairments where TMDLs have already been completed, DEQ would need to shift some resources away from continued TMDL development and toward implementation plan development. Such a shift, together with cost reductions due to program efficiencies, would likely result in development of TMDL IPs by 2010 for those 237 impairments.

However, 465 additional TMDLs are scheduled to be developed between now and 2010 (see Table 3) ─ current funding levels will be inadequate to develop IPs at that same pace.

Proposed Strategies:

1) Begin shifting resources away from TMDL development and toward IP development. Assuming no increase in future funding levels, shift 5% of available resources by 2008 and 15% by 2010 for a total combined shift of $750,000. This approach will only be pursued as long as the Consent Decree schedule can be still be met;
2) Increase the resource shift to 50% beyond 2010; and
3) Defer the development of TMDLs for low-priority waters beyond the 12-year schedule until all necessary high priority implementation plans have been developed.

Implementation of TMDL Implementation Plans

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.

Status:

To date, the Commonwealth has not specifically targeted funding for TMDL implementation. Therefore, implementation efforts have relied upon federal funds from 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, urban BMPs, residential BMPs such as failing on-site septic systems, technical assistance and outreach/technology transfer.

The most sustained TMDL implementation efforts have been occurring in three pilot areas since 2001, and have involved significant effort to encourage voluntary participation in BMP programs. However, five years of significant funding, extensive outreach efforts and technical assistance have still failed to garner full voluntary participation in two of the most critical conservation practices ─ stream fencing (livestock exclusion) and repairing/replacing failing septic systems and illegal straight pipe discharges. While water quality improvements are observable, some level of impairment still remains.

Outlook:

In the previous section ("Development of TMDL Implementation Plans") it was shown (Table 4) that TMDL implementation plans have been developed, or will be shortly using currently available funds, to address 107 identified impairments. Approximately 46 of these impairments will receive funding to implement clean-up actions as a result of recently appropriated state funds for agricultural BMPs. Eight of these impairments have completed implementation plans, and IPs for the remaining 38 impairments will be developed over the next 12 months. Using a targeted approach, eight Soil and Water Conservation Districts will receive $5.7 million in combined cost-share funds for 2007 and 2008 and $1M in technical assistance. An additional 45 impairments are identified to receive federal funds through the previously described federal 319 program. There are 16 impairments that are not currently targeted to receive any implementation funding. The locations of these 107 impairments are shown on the map and Table 5 below.

For the eight impairments with completed implementation plans that have been targeted to receive state funds, the total cost for implementing all necessary agricultural BMPs is $5.9 million, with necessary technical assistance estimated to cost and additional $1.65 million. Moreover, an estimated $11 million will also be needed to address failing septic systems and illegal straight pipes, while urban pollution reduction practices are expected to require significant expenditures as well. **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.

As can be seen on the map and Table 5 below, the proposed approach for targeting state funds is quite aggressive, with areas receiving funding over the next two years (shown in orange and blue) approximately equal to the combined areas funded over the previous seven years using federal 319 funds.

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 on-site septic systems, urban stormwater and mining issues; and
- Current implementation efforts are based on voluntary, incentive-based programs with the assumption that the conservation practices will be implemented within five years and actively maintained for the life of the practice. Unfortunately, this assumption has not resulted in full water quality attainment in the three pilot areas where implementation efforts have been aggressively focused.

Proposed Strategies:

1) 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;
2) 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;
3) Identify and implement additional strategies to accelerate implementation of other priority BMPs. For example, actively promote conservation easements programs at TMDL public outreach meetings;
4) Increase coordination between DEQ, DCR and DMME to identify stream mitigation projects as tools to restore impaired waters;
5) Explore the need for revised, or new, regulatory tools to ensure adequate implementation of conservation practices; and
6) Where appropriate, for specific waters, evaluate the validity of the designated uses and water quality standards that are driving the clean-up requirements.

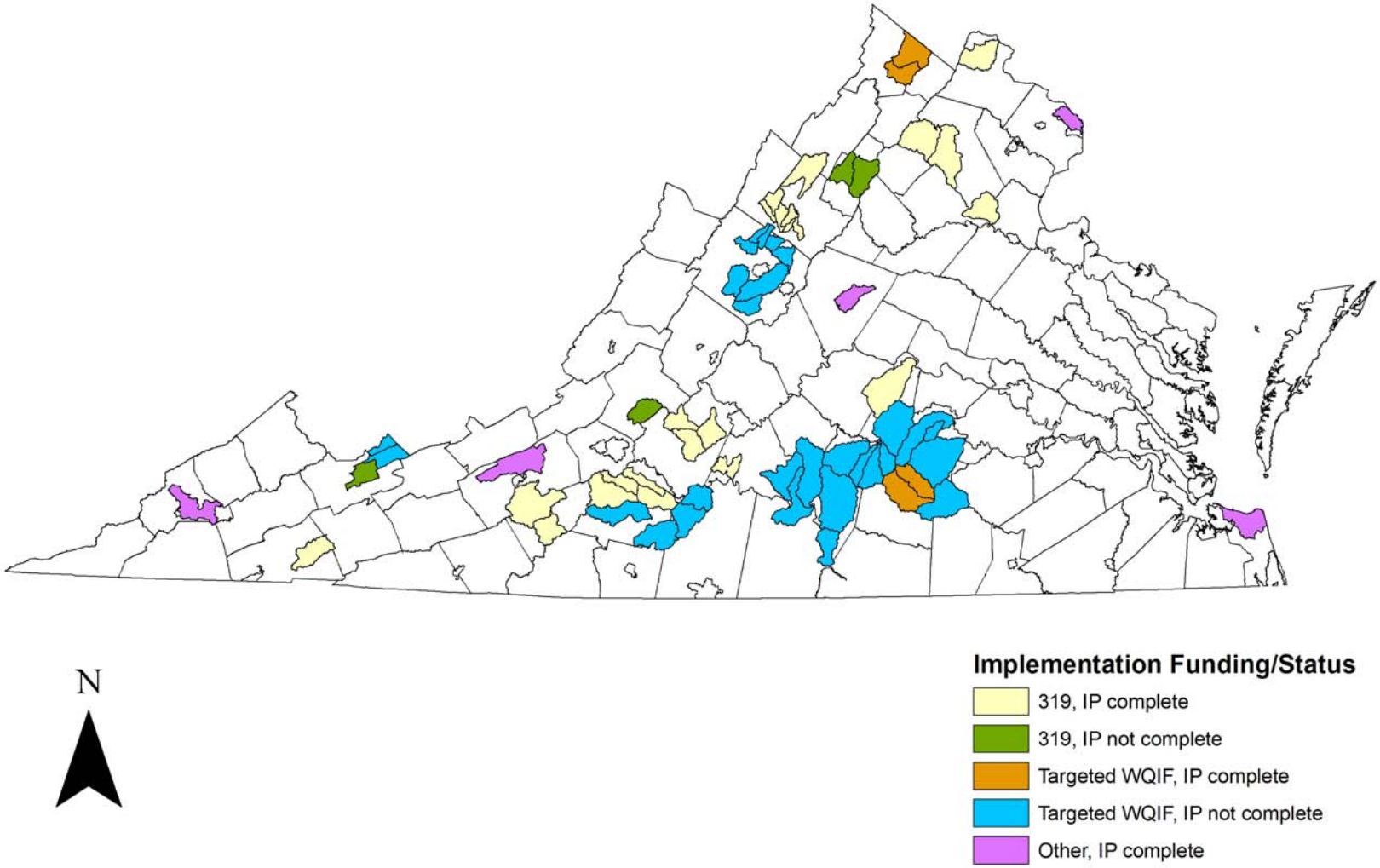

N
Implementation Funding/Status
319, IP complete
319, IP not complete
Targeted WQIF, IP complete
Targeted WQIF, IP not complete
Other, IP complete

Table 5 - Impairments With Completed or Scheduled TMDL Implementation Plans (colors reflect map legend)

	TYPE	HUC	WBID	STREAM NAME	IMPAIRMENT	IP COMPLETE
1	319	P01	VAS-P01R	Upper Clinch River	Benthic	N
2	WQIF	N37	VAS-N37R	Laurel Fork	Bacteria	N
3	WQIF	N37	VAS-N37R	Laurel Fork	Benthic	N
4	WQIF	N37	VAS-N37R	Laurel Fork	DO	N
5	WQIF	N36	VAS-N36R	Bluestone River	Bacteria	N
6	WQIF	N36	VAS-N36R	Bluestone River	Benthic	N
7	WQIF	L34	VAW-L34R	Falling River	Bacteria	N
8	WQIF	J02	VAC-J02R	Spring Creek	Bacteria	N
9	WQIF	J03	VAC-J03R	Little Sandy Creek	Bacteria	N
10	WQIF	J04	VAC-J04R	Bush River	Bacteria	N
11	WQIF	J05	VAC-J05R	Briery Creek	Bacteria	N
12	WQIF	J06	VAC-J06R	Saylers Creek	Bacteria	N
13	WQIF	J08	VAP-J08R	Flat Creek	Bacteria	N
14	WQIF	J09	VAP-J09R	Nibbs Creek	Bacteria	N
15	WQIF	J11	VAP-J11R	Deep Creek	Bacteria	N
16	WQIF	J11	VAP-J11R	Deep Creek	DO	N
17	WQIF	J11	VAP-J11R	West Creek	Bacteria	N
18	WQIF	K14	VAC-K14R	Nottoway River	Bacteria	Y
19	WQIF	K15	VAC-K15R	Little Nottoway River	Bacteria	Y
20	WQIF	K14	VAC-K14R	Big Hounds Creek	Bacteria	Y
21	WQIF	K14	VAC-K14R	Nottoway River	Bacteria	Y
22	WQIF	K16	VAC-K16R	UT Hurricane Branch	Benthic	N
23	319	L14	VAW-L14R	Pigg River	Bacteria	N
24	319	L14	VAW-L14R	Story Creek	Bacteria	N
25	319	L13	VAW-L13R	Old Womans Creek	Bacteria	N
26	319	L17	VAW-L17R	Snow Creek	Bacteria	N
27	319	L18	VAW-L18R	Pigg River	Bacteria	N
28	319	B19	VAV-B19R	Mossy Creek	Bacteria	N
29	319	B19	VAV-B19R	Mossy Creek	Benthic	N
30	319	B24	VAV-B24R	Long Glade Run	Bacteria	N
31	WQIF	B10	VAV-B10R	Middle River	Bacteria	N
32	WQIF	B10	VAV-B10R	Middle River	Benthic	N
33	WQIF	B15	VAV-B15R	Middle River	Bacteria	N
34	WQIF	B30	VAV-B30R	South River	Bacteria	N
35	WQIF	B14	VAV-B14R	Christians Creek	Bacteria	N
36	WQIF	B14	VAV-B14R	Christians Creek	Benthic	N
37	WQIF	B13	VAV-B13R	Moffett Creek	Bacteria	N
38	WQIF	B13	VAV-B13R	Moffett Creek	Benthic	N
39	WQIF	B15	VAV-B15R	Polecat Draft	Bacteria	N
40	WQIF	B28	VAV-B28R	Naked Creek	Bacteria	N
41	319	L39	VAC-L39R	Twittys Creek	Benthic	N
42	319	L39	VAC-L39R	Ash Camp Creek	Bacteria	N
43	319	L39	VAC-L39R	Ash Camp Creek	Benthic	N
44	WQIF	L37	VAC-L37R	Cub Creek	Bacteria	N
45	WQIF	L36	VAC-L36R	Turnip Creek	Bacteria	N

46	WQIF	L40	VAC-L40R	UT Buffalo Creek	Bacteria	N
47	WQIF	B08	VAV-B08R	Opequon Creek	Bacteria	Y
48	WQIF	B08	VAV-B08R	Opequon Creek	Benthic	Y
49	WQIF	B09	VAV-B09R	Abrams Creek	Bacteria	Y
50	WQIF	B09	VAV-B09R	Abrams Creek	Benthic	Y
51	319	B38	VAV-B38R	Hawksbill Creek	Bacteria	N
52	319	B39	VAV-B39R	Mill Creek	Bacteria	N
53	319	I26	VAW-I26R	Looney Creek	Bacteria	N
54	319	N21	VAS-N21R	Mill Creek	Bacteria	Y
55	319	N20R	VAS-N20R	Dodd Creek	Bacteria	Y
56	Other	C08E	VAT-C08E	Broad Bay	Bacteria	Y
57	Other	C08E	VAT-C08E	Linkhorn Bay	Bacteria	Y
58	Other	C08E	VAT-C08E	Lynnhaven River	Bacteria	Y
59	319	L26	L26	Little Otter Creek	Bacteria	Y
60	319	L28	L28	Lower Big Otter Creek	Bacteria	Y
61	319			Buffalo Creek	Bacteria	Y
62	319	L23	L23	Sheeps Creek	Bacteria	Y
63	319	L26	L26	Machine Creek	Bacteria	Y
64	319	L25	L25	Elk Creek	Bacteria	Y
65	319	L25	L25	North Otter Creek	Bacteria	Y
66	Other	E02	VAN-E02R	Carter Run	Bacteria	Y
67	Other	E02	VAN-E02R	Great Run	Bacteria	Y
68	Other	E10	VAN-E10R	Deep Creek	Bacteria	Y
69	Other	E01	VAN-E01R	Thumb Run	Bacteria	Y
70	319	B25R	VAV-B25R	Cooks Creek	Benthic	Y
71	319	B25R	VAV-B25R	Cooks Creek	Bacteria	Y
72	319	B26R	VAV-B26R	Blacks Run	Bacteria	Y
73	319	B26R	VAV-B26R	Blacks Run	Benthic	Y
74	Other	N22	VAW-N22R	Stroubles Creek	Benthic	Y
75	319	L08	VAW-L08R	Lower Blackwater River	Bacteria	Y
76	319	L09	VAW-L09R	Maggodee Creek	Bacteria	Y
77	319	L11	VAW-L11R	Gills Creek	Bacteria	Y
78	319	H36R	VAC-H36R	Willis River	Bacteria	Y
79	Other	H28R	VAV-H28R	Moores Creek	Bacteria	Y
80	Other	P11R	VAS-P11R	Sepulcher Creek	Bacteria	Y
81	Other	P11R	VAS-P11R	Sepulcher Creek	Benthic	Y
82	Other	P11R	VAS-P11R	Toms Creek	Bacteria	Y
83	Other	P11R	VAS-P11R	Toms Creek	Benthic	Y
84	Other	P11R	VAS-P11R	Little Toms Creek	Bacteria	Y
85	Other	P11R	VAS-P11R	Little Toms Creek	Benthic	Y
86	Other	P11R	VAS-P11R	Crab Orchard Creek	Bacteria	Y
87	Other	P11R	VAS-P11R	Crab Orchard Creek	Benthic	Y
88	Other	P11R	VAS-P11R	Guest River	Bacteria	Y
89	Other	P11R	VAS-P11R	Guest River	Benthic	Y
90	319	B45R	VAV-B45R	Holmans	Bacteria	Y
91	319	B45R	VAV-B45R	Holmans	Benthic	Y
92	319	A02R	VAN-A02R	Upper South Fork Catoctin Creek	Bacteria	Y
93	319	A02R	VAN-A02R	Lower South Fork Catoctin Creek	Bacteria	Y

94	319	A02R	VAN-A02R	North Fork Catoctin Creek	Bacteria	Y
95	319	A02R	VAN-A02R	Catoctin Creek	Bacteria	Y
96	Other	A12R	VAN-A12R	Four Mile Run	Bacteria	Y
97	319	B22R	VAV-B22R	Muddy Creek	Bacteria	Y
98	319	B21R	VAV-B21R	Lower Dry River	Bacteria	Y
99	319	B27R	VAV-B27R	Pleasant Run	Bacteria	Y
100	319	B29R	VAV-B29R	Mill Creek	Bacteria	Y
101	319	O05R	VAS-O05R	Cedar Creek	Bacteria	Y
102	319	O05R	VAS-O05R	Hall/Byers Creek	Bacteria	Y
103	319	O05R	VAS-O05R	Hutton Creek	Bacteria	Y
104	319	L08R	VAW-L08R	North Fork Blackwater River	Bacteria	Y
105	319	L08R	VAW-L08R	South Fork Blackwater River	Bacteria	Y
106	319	L10R	VAW-L10R	Upper Blackwater River	Bacteria	Y
107	319	L10R	VAW-L10R	Middle Blackwater River	Bacteria	Y

Monitoring Towards Standards Attainment

Follow-up monitoring of impaired waters is periodically conducted to assess improvements in water quality resulting from implementation of management actions. Such monitoring and assessment identifies the need for any adjustments to the TMDL Implementation Plans.

Chesapeake Bay Strategy

The single greatest challenge faced by Virginia's water quality management programs is 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 restoring the Bay will require an enormous effort by the citizens of the Commonwealth, 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 caps that were assigned to each of the river basins throughout the Chesapeake Bay watershed. Copies of the strategies are located at the Secretary of Natural Resources' website at http://www.naturalresources.virginia.gov/Initiatives/VirginiaWaterQuality/index.cfm

Even with aggressive implementation of pollution reduction practices, current data and projections indicate that portions of the Chesapeake Bay and its tidal rivers will most likely remain impaired in 2010. As a result, Virginia is working with EPA and the other Bay watershed states to develop a TMDL clean-up plan for those waters that are projected to remain impaired. Current expectations are that the results of this parallel effort will not significantly change the nutrient pollution caps assigned to each of the river basins, if at all. However, the sediment pollution caps assigned to each of these basins will likely be revised due to improved scientific understanding and advancements in computer modeling. Therefore, the Virginia Tributary Strategies will need to be reviewed and updated, as appropriate, once the TMDL for the Bay is developed and approved by EPA in 2010.