Chesapeake Bay and Virginia Waters Clean-Up Plan

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

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

June 2008

COMMONWEALTH of VIRGINIA

Office of the Governor

L. Preston Bryant, Jr.
Secretary of Natural Resources

June 13, 2008

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

The directive for the construction of this Plan – and annual progress report – 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, but it has become a useful tool for planning, coordinating, and focusing on the key water clean-up programs that are being implemented throughout various natural resource agencies. I trust that you will find the report useful as we work to protect and restore the Commonwealth's many natural assets

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

2008 Clean-Up Plan Highlights

Land and Water Conservation

- Accelerate land conservation efforts.
- Foster local government natural resources planning and water resource conservation efforts by providing technical assistance and incentives.
- Implement a broad advocacy, legislative, and policy package around a "Healthy Lands and Waters approach."

Wastewater

- Implement Virginia's Chesapeake Bay 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.

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

Table III-I Impaired Waters in Virginia

Virginia Waters - Types and Dimensions	**Impaired Waters Assessment**		**Top Reasons for Impairments**	**Uses Lost or Impaired**
	2006	**2008**		
Rivers - 50,021 miles	9,022	10,604	High Bacteria Levels	Recreational
Lakes -114,884 acres	109,201	94,039	Low dissolved oxygen and high PCB levels in fish tissue	Aquatic Life and Edible Fish
Estuaries - 2,308 sq. miles	2,212	2,185	Low dissolved oxygen (nutrient pollution) and high PCB levels in fish tissue	Aquatic Life and Edible Fish and Shellfish

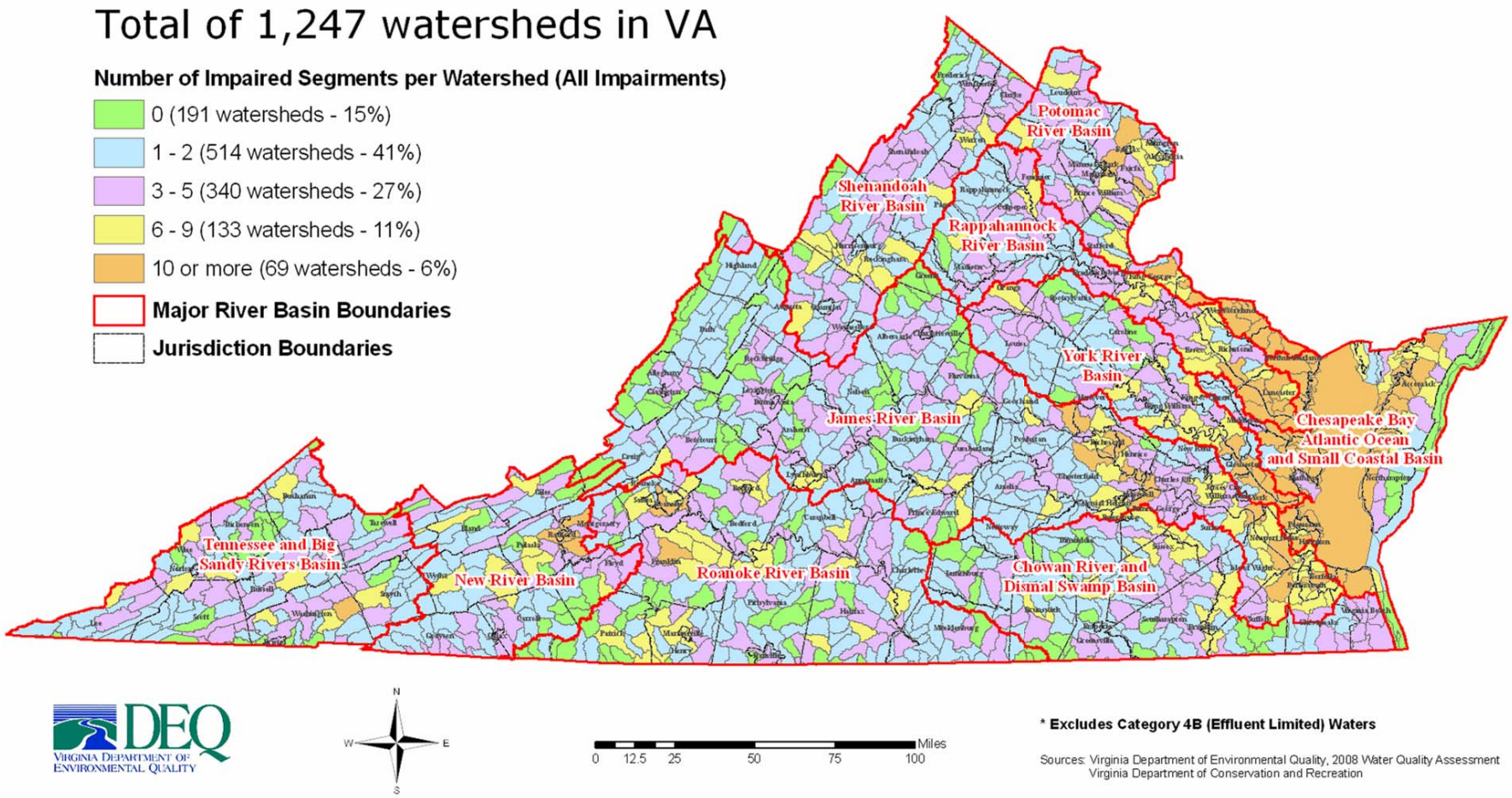
New impairments were identified in 2008, primarily due to DEQ's assessment of waters which had not previously been monitored, or due to the adoption of more stringent water quality criteria. While there was a net addition of 1,602 impaired river miles to the 2008 list, the good news is that 330 river miles were removed from the list because the 2008 assessment showed that these waters, previously listed as impaired, were now meeting water quality standards. In addition, another 415 river miles, while they remain on the 2008 list for other pollutants, have shown partial improvement since they meet standards they failed to meet previously. The 2008 results also show a significant reduction in the acreage of impaired lakes due mainly to verification that these previously documented impairments were due to natural causes.

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

Once the final 2008 assessment has been approved, the report and supporting information will be available on the DEQ website: http://www.deq.virginia.gov/wqa/. In addition, access to a searchable, electronic map of the Commonwealth showing the results of the assessment will be available by going to http://gisweb.deq.virginia.gov/ and selecting "2008 Impaired Waters" from the pull-down menu.

Figure 1

Distribution of Impaired* Waters In Virginia's Watersheds



DEQ
Virginia Department of Environmental Quality

* **Excludes Category 4B (Effluent Limited) Waters**

Sources: Virginia Department of Environmental Quality, 2008 Water Quality Assessment
Virginia Department of Conservation and Recreation

II. CLEAN-UP OBJECTIVES

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

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

  Waters that meet and exceed water quality standards are protected by the Commonwealth's anti-degradation policy. The measures used to track success will be the status and trend in water quality that document either maintenance or improvement of these high-quality waters.

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

[1] More detailed information regarding Virginia's point source pollution control programs can be found in Section VIII – Restoring Impaired Waters.

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.

Strategy:

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

The Virginia Pollutant Discharge Elimination System (VPDES) General Watershed Permit Regulation, which became effective on November 1, 2007, authorizes the discharge of nutrients 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 DEQ and the State Water Control Board will reevaluate the basin compliance schedules as required by state law after each annual submittal of Compliance Plan updates by the affected dischargers. These compliance plans were first due by August 1, 2007 and addressed the factors listed in Virginia Code §62.1-44.19:14.C.2.

All of the dischargers required to register for coverage under the Watershed General Permit have done so. Several smaller, non-significant dischargers have also registered, either because of a planned expansion or to be included as part of an owner's "bubbled" allocation.

In addition, Compliance Plans were submitted by nearly all the affected dischargers by the first deadline, as well as annual updates that are due by February 1st of each year. DEQ staff is currently working with the outstanding facilities to ensure that they submit plans, and the February updates are currently under review. Overall, **preliminary results reaffirm that the January 1, 2011, compliance date will be met for the aggregate annual point source nutrient waste load allocations in all Bay tributaries**.

The compliance plans identify how each discharger plans to meet the assigned nutrient allocations, whether by installing nutrient removal technologies, purchasing nutrient credits under the Nutrient Credit Exchange Program, or a combination of the two. The plans also describe all capital projects and implementation schedules. The Nutrient Credit Exchange Association drafted a *Compliance Options Report*, which explored 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 serves 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.

Since FY2005, grant requests for the design and installation of nutrient reduction technology (NRT) have been received from 78 eligible applicants. Progress continued through the winter and spring of 2007-2008 on processing these applications; following is a status summary of the grant projects:

- 32 grant agreements have been signed to date (up from 17 last October), committing a total of just over $375 million in cost-share funds.

- 25 projects are "ready-to-proceed" (Preliminary Engineering Report [PER] submitted) and agreement negotiations are underway. Estimated cost-share for these 24 projects is approximately $213 million.

- 21 applications are pending PER submittal; the total grant amount requested for these projects is about $155 million.

- $3.6 million has been requested for Technical Assistance projects. Given the limited amount of available grant funds and the deadline to comply with nutrient waste load allocations beginning in 2011, funding priority is on design and construction of NRT rather than Technical Assistance grants.

- For details on processing WQIF point source grant agreements, see the weblink: http://www.deq.virginia.gov/bay/ReadytoProceed.pdf

As a combined result of past appropriations, interest earned and other significant funding provided by the 2006 General Assembly, the WQIF has received approximately $387 million to provide as cost-share assistance to localities for installing nutrient removal technologies at wastewater facilities in the Chesapeake Bay watershed. Table III-2 provides a summary of deposits to the WQIF for point source projects and available funds.

Table III-2. Chesapeake Bay NRT Projects - WQIF Appropriations		
Period	**WQIF Reserve (Million Dollars)**	**WQIF Funds for Bay Point Source Projects (Million Dollars)**
FY 1998	$0.00	$10.00
FY 1999	$0.00	$37.10
FY 2000	$0.00	$25.24
FY 2001	$0.00	$10.30
Interest earned (through FY04)	NA	$11.71
FY 2005	$0.68	$13.25
Interest earned (FY05)	NA	$0.29
FY 2006	$3.91	$67.21
Interest earned (FY06)	$0.08	$1.57
FY 2007	$0.09	$197.33
Interest earned (FY07)	$0.23	$8.46
FY 2008	$0.00	$5.00
Totals =	**$4.99**	**$387.46**
Expenditures To Date		($163.40)
Balance on Signed Agreements		($313.01)
Funds Available =		**($88.95)**

The "Funds Available" figure above indicates that the WQIF has been over-obligated, and unless additional funds are appropriated this figure will grow as more agreements are signed. The DEQ Director is mandated to sign an agreement with every eligible applicant, except if the project is deferred based on the cost-effectiveness of nutrient trading in lieu of NRT installation.

In 2007, legislation was passed that authorized bonds up to $250 million to be issued through the Virginia Public Building Authority, after July 1, 2008, for ongoing WQIF grant reimbursements. The General Assembly has sole authority to determine if bond proceeds will be appropriated to the WQIF, based on DEQ's determination that reimbursements will exceed the amount available in the current fiscal year. Using owner-furnished data and construction schedules for the signed grant agreements, it is estimated that available WQIF funds will be expended in the first quarter of FY2010 (July – October, 2009). Therefore, **DEQ intends to notify the 2009 General Assembly that bond proceeds will be needed (the current estimated amount is about $160 million) to cover expected grant reimbursement requests in FY2010**.

In addition to the existing 125 significant discharges currently covered by the General VPDES Watershed Permit Regulation, continued population growth within the Chesapeake Bay watershed will necessitate the construction of new wastewater treatment facilities or the expansion of existing "non-significant" treatment facilities. The nutrient discharge control regulations adopted in 2005 require that new and expanded facilities install state-of-the-art nutrient removal technologies and completely offset any additional nutrient discharge beyond the loads assigned to them as of July 1, 2005. Currently, one eligible non-significant

facility has been awarded a WQIF grant (Middletown), and 4 others have applied for approximately $13.7 million in cost-share to install needed nutrient removal technologies. They include Craigsville, Clarke County, Hampton Roads Sanitation District and Louisa County.

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 an estimated $225 million per year for the next five years.**

In December 2007, the SWCB authorized $227,043,051 in loan funding from the VCWRLF for 21 projects throughout Virginia. Within that list are 14 projects located in the Chesapeake Bay watershed (totaling $194,039,515) that include the installation of nutrient reduction technology. Over 90% of the FY2008 VCWRLF funding authorization is for projects addressing TMDL implementation.

The VCWRLF will issue a request for applications this May, with a closing date of July 18, 2008. The FY2009 project list is expected to be approved

by the SWCB this December, to include additional wastewater treatment plant and sewer system improvement projects, as well as agricultural projects.

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

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 WQIF is currently over-obligated, and unless additional funds are appropriated this figure will grow as more agreements are signed. Regardless of the availability of funds, the Virginia Water Quality Improvement Act [§10.1-2131.B.] requires the DEQ Director to enter into a grant agreement with all eligible facilities that apply, unless a project is deferred due to the cost-effectiveness and availability of using nutrient credit exchange instead of installing nutrient reduction technology. However, the Code 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 plan (updates due by February 1st each year) 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 $250 million bond initiative in 2007 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 were approved by the DEQ Director in October 2007 in order to maximize the purchasing power of available state funds. These measures are more fully described in Section V - Cost Containment Mechanisms.

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

Table III-3 Estimated Nutrient Reductions from WQIF-Funded Projects

Facility	Delivered Total Nitrogen Load (lbs/yr)			Delivered Total Phosphorus Load (lbs/yr)		
	2007	WLA	2011	2007	WLA	2011
Onancock STP	3,549	9,137	6,944	1,070	685	521
HRSD-Army Base STP	862,073	610,000	940,503	23,208	54,820	58,606
Lex-Rockbridge Reg. STP	7,618	16,446	9,356	12,665	4,568	8,576
RWSA-Moores Crk. STP	413,956	167,201	222,340	120,228	22,842	23,195
Warrenton STP	61,777	18,578	18,578	5,516	2,284	2,284
Orange STP	23,406	22,293	8,174	4,370	2,741	1,005
Culpeper WWTP	59,411	33,440	24,300	7,443	4,112	3,984
Tappahannock STP	15,085	9,746	6,091	1,254	731	457
Warsaw STP	10,522	3,655	1,827	2,700	274	244
Arlington Co. WPCF	619,020	365,467	365,292	5,485	21,928	7,306
ACSA-Fishersville STP	21,340	21,441	11,846	9,744	2,814	1,555
ACSA-Middle River STP	37,510	36,449	26,855	10,503	4,784	3,525
Colonial Beach STP	33,867	18,273	18,273	5,977	1,827	1,827
Dale Service Corp. #1 STP	30,995	42,029	34,719	1,013	2,522	2,083
Dale Service Corp. #8 STP	28,901	42,029	34,719	957	2,522	2,083

FWSA-Opequon STP	56,564	75,724	113,390	7,286	5,910	9,439
FWSA-Parkins Mill STP	106,666	45,074	26,594	28,051	3,517	2,767
K. Geo. Co-Fairview Beach	836	1,827	822	323	183	82
K. Geo. Co-Dahlgren STP	6,778	9,137	7,675	230	914	672
Mt. Jackson STP	4,597	5,713	4,081	775	493	352
Purcellville STP	9,333	15,167	12,285	308	1,055	760
Pr. Wm. Co.-Mooney STP	238,112	219,280	150,755	3,073	13,157	9,045
HRRSA-North River STP	74,419	111,492	71,826	18,458	14,633	9,427
Stafford Co.–Aquia STP	85,882	73,093	57,470	1,887	4,386	3,448
Waynesboro STP	68,905	21,441	16,643	24,246	2,814	2,718
Woodstock STP	12,268	16,324	16,324	3,844	1,407	1,407
Totals =	2,893,390	2,010,456	2,207,682	300,614	177,923	157,368

Table III-3 shows estimated pollution reductions resulting from 31 projects with signed WQIF grant agreements (one grant project not shown is a non-significant discharger that must only maintain its "permitted design capacity", not achieve reductions from existing loads). It illustrates the nutrient load each facility delivered to the Bay and tidal rivers in 2007, compared to the maximum nutrient load they are allowed to deliver (WLA), and what they are projected to deliver in 2011. As can be seen, in 2011 these projects will reduce the amount of nitrogen and phosphorus being delivered to the Bay and tidal rivers by more than 685,000 pounds and 143,000 pounds respectively, compared to the 2007 loads.

Table III-4 summarizes the 2007 delivered nitrogen and phosphorus loads from point sources within each of Virginia's Bay tributary basins, compared to the total point source Waste Load Allocations (WLA) to be achieved beginning January 1, 2011:

Table III-4 Delivered Point Source Nutrient Loads – 2007 vs. Waste Load Allocations

River Basin	Total Nitrogen Delivered Load (lbs/yr)		Total Phosphorus Delivered Load (lbs/yr)	
	2007	WLA	2007	WLA
Shenandoah-Potomac*	3,623,742	3,407,870	269,177	187,948
Rappahannock	517,612	497,721	56,716	41,792
York	1,412,097	963,875	140,302	161,536
James	14,131,305	13,898,522	1,115,532	1,351,775
Eastern Shore	179,466	31,370	4,002	1,780
TOTALS =	19,866,229	18,799,358	1,587,736	1,744,831

*Note: figures do not include VA Portion of Blue Plains.

Other wastewater dischargers and sources

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

- municipal sewerage systems (treatment plants and collection pipes);
- industrial wastewater treatment systems;
- mining operations;
- industrial storm water [**Note: municipal storm water is addressed in the Developed and Developing Lands Category of this report]**;**
- discharges from boats;
- discharges or releases of toxic chemicals (such as PCBs and mercury) from contaminated industrial sites; 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 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.

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) Low interest loans (Virginia Clean Water Revolving Loan Fund) are available to offset additional capital costs for upgrading and expanding needed wastewater treatment facilities.
2) 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.
3) 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.

Completed: 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 was approved by EPA in March of 2007 and has been in effect for one year resulting in improved water quality that may have contributed to the opening of shellfish areas that have been condemned for more than 70 years, and increasing the demand for pump out services by double the pre-NDZ period.

Under Consideration: Marine industries and citizens of the community of Deltaville in Middlesex County have requested and are actively participating in the preparation of a NDZ application for shellfish growing areas in Broad Creek, a tributary to the Rappahannock River, Jackson Creek and Fishing Bay, tributaries to the Piankatank River in Middlesex County, Virginia. Additionally, the Northern Neck Counties of Lancaster, Westmoreland and Northumberland, and the Northern Neck Planning District Commission have expressed interest and are evaluating their participation in designating NDZ's for selected waters as an impaired waters restoration tool. DEQ staff are conducting ongoing out reach to these counties to facilitate their participation.

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) Currently there is a federal 75% cost share program administered by the Virginia Department of Health, Marina Program, for establishing pump-out facilities. Should this funding be insufficient, future state grant funding or low-cost loans may be needed to meet the demand for increasing numbers of boat pump-out facilities for recreational and commercial vessels;
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 December 2007, there are 54 waters throughout the Commonwealth with fish consumption advisories due to toxic contamination.

Strategy:

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

- Potomac River PCB TMDL – completed September 2007
- Bluestone River PCB TMDL – expected completion date fall 2008
- Roanoke River PCB TMDL – expected completion date spring 2009
- 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) The 2006 General Assembly also appropriated $17 million to the WQIF for areas outside of the Chesapeake Bay watershed, known as the "Southern Rivers." These funds are targeted, in part, to assist local governments with on-site septic remediation programs, including connections to central sewerage systems. These funds have been used as follows:
    - Of the $17 million available, the Southern Rivers Watershed Enhancement Program has awarded over $14.8 million.
    - These awards were announced by Governor Kaine on October 11 (2007) and May 13 (2008).
    - Most of the monies were awarded as wastewater treatment (WWT) system construction grants to localities in 16 counties outside the Chesapeake Bay watershed.
    - Combined, these projects will connect over 700 households to public wastewater services and install more than 45,000 linear feet of sewer line thus reducing the amount of sewage flowing into a number of impaired waterbodies.
    - While most of the monies have been awarded, a final round of awards will be announced later this year.

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) High cost of repair/replacement of failing septic systems or installation/extension of sewer service;
4) Inadequate levels of available cost share funding for septic system remediation;
5) 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
6) 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 ("Five Priority Practices")

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

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

Strategy:

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) 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 or district) for additional on-the-ground technical staff to deliver the increased agricultural cost-share program. The level of funding needed is dependent on the funds appropriated to the WQIF for BMP cost share. Current estimates are that one local district technical employee is needed for every increment of roughly $370,000 they receive in BMP cost-share funds;
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. While a special appropriation of up to $500,000 of nonpoint WQIF interest was committed by the 2007 General Assembly towards modernizing the computer reporting system that documents BMP implementation, additional funds are necessary to fully achieve a modernized 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) Continue to work collaboratively with the Natural Resources Conservation Service (NRCS), SWCDs and others to provide training for new technical staff;
7) Extend engineering training agreement with NRCS to perform this service on an ongoing basis;
8) 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 expanding media outreach efforts statewide;
9) Plans for the expenditure of the additional $20 million in WQIF funds appropriated in the 2008 session will be developed and presented to the Soil and water Conservation Board in May 2008; and
10) Work to implement a MOU with commodity groups for stream exclusion.

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, 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. All BMPs are implemented through the voluntary participation by farmers that wish to implement practices with costs that they must bear.

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

Rationale: Given the need for widespread implementation of nutrient management planning to meet the Commonwealth's nutrient and sediment pollution reduction goals, it is critical for Virginia to better address the issue of off-site application of poultry litter. Poultry litter can be a significant source of nitrogen and phosphorus pollution where runoff results from improper application, management or storage. Under current state 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 with partial funding from 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) Continue implementation of a targeted Virginia litter transport program established in the fall of 2007, to provide incentives for the movement of surplus poultry litter to

areas of the state that can better utilize the nutrient content. Evaluate the existing federal U.S. Department of Agriculture Natural Resources Conservation Service's (USDA/NRCS) poultry litter transport program.

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 $300,000 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 $100,000 per year for the next three years to match the state share.
4) Revise the poultry waste management regulations by the end of 2008 to require implementation of nutrient management plans and/or proper nutrient management practices by end users of poultry litter generated within and outside of Virginia, and require improved tracking of poultry litter transfers from growers to brokers and end users.

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 litter end-users to acquire and follow prescribed nutrient management requirements to insure proper use of the nutrients in litter and protect water quality;
3) Lack of funds beyond three years to support the continuation of a litter transport system; and
4) 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 Virginia have achieved significant nutrient reductions while at the same time protecting animal health and productivity. Virginia has previously assisted the poultry and swine industries in the use of this feed alternative through grants from the Water Quality Improvement Fund. For most poultry and swine operations in Virginia, feed management is handled by a few large integrators that control the feed supply to

hundreds of contract growers, whereas most dairies (more than 900 operations) are fully independent operations.

Strategy:

1) Implement the Memorandum of Agreements with six poultry integrators to achieve a goal of a 30% reduction level in phosphorus excreted in broiler and turkey litter by December 31, 2010;
2) Develop Memorandum of Agreements with the major swine integrators in Virginia;
3) Establish a means to provide on-going monitoring to insure the reductions are maintained once met;
4) 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
5) 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) Monitor progress of each poultry integrator annually beginning on July 1, 2008 by reviewing progress with each company and determine the need for adjustment to achieve full compliance of the 30% reduction goal;
2) The Secretary of Natural Resources will convene a meeting of swine integrators by December 31, 2008 to seek integrator commitment to the application of phosphorous reduction strategies; and
3) 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 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). [2]

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 causes of impairments vary from watershed to watershed and many are attributed to agricultural sources.

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 written agreements with the local SWCD to provide staff support and deliver the agricultural BMPs with the farming community as appropriate to address the specific impairments;
3) Provide summary reports of progress in the installation of conservation practices and water quality monitoring results (as available from DEQ) to assess linkages that may demonstrate measurable improvements in water quality;
4) Depending on the amount of funds appropriated and the collective capabilities to effectively administer multiple projects, direct additional funds to targeted TMDL clean up activities in the Southern Rivers watersheds under contracts with Soil and Water Conservation districts; and
5) DCR will evaluate, on an ongoing basis, 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 with nine additional staff positions established in the 8 SWCDs to support the delivery of agricultural BMPs. DCR signed written agreements with all 8 SWCDs for approximately $500,000 per year for each of the next two years for the staff positions. The collective agreements also

[2] For detailed actions necessary to expedite the development and implementation of TMDL clean-up plans, see Section VIII – Restoring Impaired Waters.

include a TMDL Agricultural BMP cost-share commitment of $5.7 million through the end of the current biennium.

Potential Problem Areas:

1) Lack of continued federal 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) Virginia may need to develop a new approach to improve participation in voluntary agricultural BMP programs including additional incentives and possibly additional measures for those that remain unwilling to participate.

Performance Measurement:

1) Number of water bodies removed from the list of impaired waters; and
2) Incremental measurable improvements in waters not removed from the impaired waters list as demonstrated from available monitoring data performed by DEQ.

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

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. Statewide in the last six years (FY2001-FY2006), an average of 56,000 acres per year has 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. As of April 2008, nearly 243,000 acres of the goal had been met.

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.
7) Work with Virginia Conservation Coalition to secure state funding for land conservation.

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 is needed at the Virginia Outdoors Foundation, the Department of Conservation and Recreation and the Department of Historic Resources.

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) Working with Virginia's congressional delegation, the enhanced federal land preservation income tax deduction that was set to expire at the end of the 2007 tax year was extended through 2009 as part of the federal farm bill;

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 164 local erosion and sediment programs will be consistent with the requirements of the Virginia Erosion and Sediment Control Law.

Rationale: The control of erosion and resulting sediment loss from construction sites is a foundational nonpoint source control program. As of the March 2008 meeting of the Virginia Soil and Water Conservation Board, approximately 69% of the 104 local programs reviewed since July 1, 2005 have been found consistent with the Erosion and Sediment Control Law and Regulations. Compliant local programs protect Virginia's waters from pollution associated with construction and other land disturbing activities.

Strategy:

1) Improve compliance of all local erosion and sediment control programs by accelerating the program review schedule and process 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 2009 if additional resources are provided.

Potential Problem Areas:

1) Current DCR staffing level will be insufficient to assist localities in the accelerated review 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 reduction goals in the Chesapeake Bay watershed

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

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

Strategy/Timeframe:

1) DCR is working 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) DCR will continue a pilot study that will examine pollutant loads and land use patterns in a chosen jurisdiction (currently working with Richmond County) to examine how land management practices can be used to meet and maintain an apportioned nutrient load;
3) DCR, in cooperation with the Chesapeake Bay Program and local government partners, will assess the success of the pilot study to determine if it is feasible to transfer this approach to other localities;
4) By September 2009, DCR, in consultation with the Chesapeake Bay Program and local governments, will determine the resources necessary for state agencies and local governments to implement nutrient goal-based local programs, Additional anticipated resources include:

    a) Software development and data tracking - $3.0 million needed over 2 years;
    b) Outreach, education and public information - $500,000 annually;
    c) Implementation grants to local governments to develop and operate GIS-based land management systems for identifying and tracking land use changes and pollutant loads - $5.0 million annually; and
    d) DCR support staff - $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 goal 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 goal;
3) Insufficient capacity and knowledge at both the state and local level to implement jurisdictional goal program;
4) Insufficient outreach and promotion to engage and educate local governments of the details of the program and the benefits to be achieved;
5) Local government and business opposition to any system that has the potential of limiting growth and development control from local government authority; and
6) Potential for the jurisdictional goals to prove technologically infeasible to implement.

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 maintenance and inspection requirements of the Chesapeake Bay Preservation Act

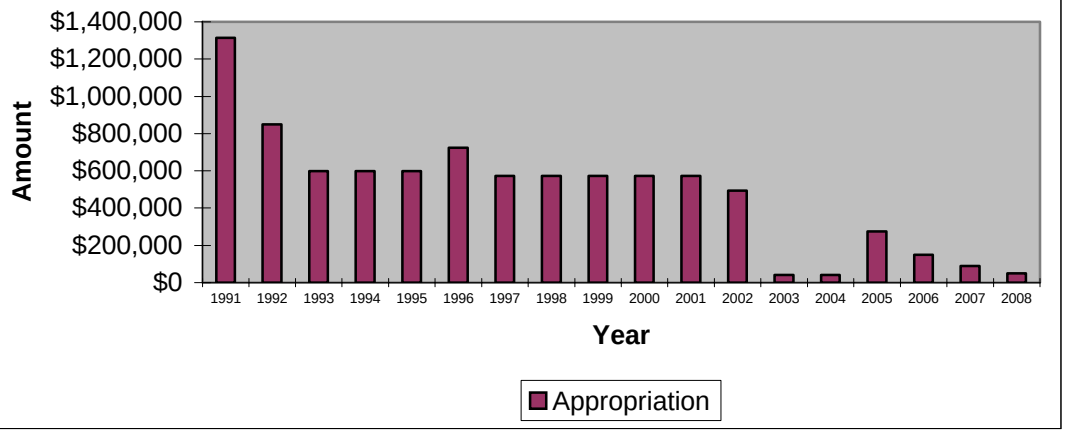
Objective:

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

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

Currently, about 62% of localities in Tidewater Virginia with on-site septic systems have been found to meet this septic pump-out requirement. Many of these localities lack the staff and funding resources necessary to develop and implement such programs on a continuous basis and have relied upon various grant funds for assistance. During the last decade, such funds have been insufficient and inconsistent, particularly during the last two years (as shown in Figure 2). Furthermore, there is no requirement for a periodic septic pump-out and maintenance program outside of the Chesapeake Bay Preservation Act area, or outside the designated Chesapeake Bay Preservation Areas within Tidewater localities.

Figure 2 - Local Grant Program History



The Chesapeake Bay Preservation Act also requires pollutant loadings from new development and redevelopment activities be reduced. This requirement has been implemented by all Tidewater localities since the mid-1990s through the use of BMP facilities such as wet ponds, extended detention (dry) ponds, bioretention facilities and created wetlands. The Act's implementing regulations further require that these facilities be maintained, a requirement that necessitates tracking and periodic inspection. 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.

Strategy:

1) Secure a consistent funding source to assist localities, Planning District Commissions or private entities in establishing and implementing septic tank pump-out programs. These funds will enable the PDCs, localities or other groups 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. It is proposed that $150,000 in funds be made available to achieve this goal.
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 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) Develop tool kit of information for localities to use to help facilitate implementation of such program; and
4) Monitor compliance and obtain data from localities on the number of systems pumped and report this information to the Chesapeake Bay Program so that the pollutant load reductions resulting from local septic pump out programs can be accounted for in the Chesapeake Bay model.

Timeframe:

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

Potential Problem Areas:

1) Several localities do not have adequate facilities to accept the septage resulting from the septic pump-out programs in those areas. Transportation costs to available facilities are cost-prohibitive, raising the risk of illegal dumping. The Virginia Department of Health has confirmed that there is inadequate wastewater treatment plant capacity in the Northern Neck to accommodate the septage being generated through this program. There will be a need to make State funds available to increase wastewater treatment plant capacity in this area. Currently, an interagency workgroup representing the Departments of Health, Environmental Quality and Conservation & Recreation are working to address this issue. A report of the group's findings in expected in June of 2008. Similar capacity issues exist in localities outside of Tidewater Virginia.
2) Resistance in some localities, particularly the more rural ones with very little staff resources, to implement elements of the Chesapeake Bay Preservation Act, especially where the pump-out requirement imposes a direct cost on homeowners.
3) 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 localities in compliance with BMP maintenance requirements;
3) Number of systems pumped with estimated resulting nutrient reductions; and
4) 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, and achieve compliance by Tidewater localities with Chesapeake Bay Preservation Act "Phase III" ordinance reviews and revision requirements by 2010.

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 third implementation phase of the Chesapeake Bay Preservation Area Designation and Management Regulations requires local governments to review their land development regulations and processes to ensure they are consistent in promoting and achieving the protection of state waters and that any conflicts among the components of the local programs are resolved. Ordinance reviews will focus on zoning and subdivision codes and plan of development processes. Key elements of Phase III are

reducing the amount of impervious cover associated with land development and eliminating impediments to implementing low impact development practices. Completion of Phase III will ensure that water quality protection is incorporated into all steps of the land use approval process, from comprehensive plans to final plan approvals. Removal of these conflicts will be a key tool, along with other DCR nonpoint source initiatives, to significantly reducing nonpoint source pollution from land development activities.

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

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

Strategy:

1) Implement the Phase III ordinance review of all 84 Bay Act localities, either by requiring self-assessments and reporting, or conducting reviews on behalf of localities.
2) Use federal Chesapeake Bay Implementation grant funds to assist Tidewater localities with the development and adoption of specific local code amendments that address water quality protection and comply with the Chesapeake Bay Preservation Act Phase III requirements. As defined in the Bay Act Designation and Management Regulations, these provisions specifically require localities to adopt local code amendments that minimize impervious cover, minimize land disturbance and preserve indigenous vegetation. Funds to be provided to the localities will be up to $50,000 (this represents the Division of Chesapeake Bay Local Assistance allocation of Chesapeake Bay Implementation Grant funds for 2008).
3) Provide additional financial assistance to localities in the amount of $100,000 for compliance with Phase III of the Bay Act through a competitive grant program to support development and adoption of specific local code amendments that address water quality protection. Ordinance language (transferable to other localitlies) will be developed and will serve as the primary grant deliverable. The transferable product will be used by CBLA to develop an ordinance review and revision "tool box" for use by other Bay Act localities in their efforts to comply with the Phase III requirements.

Timeframe:

By 2011- 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 with BMP maintenance, septic pump-out and Phase III requirements ;
2) Nitrogen reductions resulting from active septic tank pump-out programs; and
3) Phosphorous reduction achieved by the use of urban BMPs.

Implement a revised stormwater management program statewide

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

Rationale:

The 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 November 1, 2008;

2) Obtain EPA approval of state permit program delegation to the qualified local governments by December 31, 2009;
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 beginning January 1, 2010; 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 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 25 FTEs and $2.0 to $2.5 million annually 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 4 FTEs and approximately $500,000 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 DCR staff coordinate project plan reviews closely with the local governments to maintain an acceptable plan approval process for the development community. DCR may require up to 25 FTEs and $2.0 to $2.5 million annually 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 need.

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 issuing the 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 III-5 and III-6 present the current and predicted emission levels and the anticipated reductions that will result from implementation of the programs. Table III-6 contains updates to the data included in the 2007 Clean-Up Plan on air emissions of oxides of nitrogen and sulfur dioxide for 2002, 2009, and 2018. The main change involves additional sulfur dioxide emission reductions expected in the future due to additional source control requirements. Additional information on all of these programs can be obtained from the air quality page on the DEQ website at (www.deq.virginia.gov/air).

Air Quality Standards: The Clean Air Act requires the 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. A recent decision by the U.S. Court of Appeals for the D.C. Circuit has vacated the U.S. EPA's Clean Air Mercury Rule (CAMR). However, it is too early to determine the possible impacts of this decision on the Virginia mercury control regulations and the projected emission reductions included in Table III-5. The EPA is appealing this decision.

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. A mercury symposium was held in Newport News on November 28-29, 2007 and was well received by all the participants. The mercury deposition modeling analysis has been completed by ICF International and the study report is currently being drafted. This study is to be completed by October 2008.

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

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

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

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

Potential problem areas:

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 III-6 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.

4) Networked Education for Municipal Officials - NEMO

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

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

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

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

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

1) Virginia Tech and the Virginia Cooperative Extension Community Viability Program
2) Chesapeake Networked Education for Municipal Officials
3) Virginia Department of Conservation and Recreation Divisions of
    a. Soil and Water
    b. Chesapeake Bay Local Assistance

    c. Natural Heritage
4) Virginia Department of Forestry
5) Virginia Department of Transportation
6) Virginia Department of Historic Resources
7) Planning District Commissions
8) Soil and Water Conservation Districts
9) Watershed Groups

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

1) developing community vision and goals;
2) assessing and inventorying natural resources; and
3) developing and implementing natural resource and land use management tools.

Within these three areas of expertise, initial NEMO partners can already commit the following types of assistance:

1) developing stakeholder involvement strategies
2) facilitating community visioning and goal setting
3) strategic planning
4) natural resource and conservation planning
5) urban forestry master planning
6) low-impact development
7) code and ordinance development

Time Frame: Ongoing

Potential Problem Areas:

1) Current staffing cannot meet the demands of the localities due to the geographic distribution of requests; and
2) Current staffing cannot meet the technical requests for services.

Risk Mitigation Strategy:

1) Support the DCR's Division of Soil and Water Conservation to coordinate this collaborative approach to local assistance;
2) Seek additional funding to further implement the Virginia NEMO Program;
3) Provide direction to enable the various agencies to implement a coordinated, collaborative approach to assisting localities; and
4) Maximizing the capabilities of Virginia NEMO partners by utilizing Web 2.0 tools to manage the implementation of local assistance.

Performance Measure:

1) Number of localities requesting and utilizing the NEMO approach.
2) Number of participating partners utilizing the NEMO approach (growing the network).

Existing NEMO Pilot Project - Mathews County

The Virginia DCR Division of Soil and Water Conservation Coastal Nonpoint Source Pollution Program Manager undertook the development of the Virginia NEMO program with funding from the Virginia Coastal Zone Management Program. The Virginia NEMO Program is a partnership between the Chesapeake Bay Office of NOAA/EPA/NPS and the Virginia Tech Virginia Cooperative Extension Community Viability Program to provide technical assistance to localities in Virginia. The Chesapeake Bay office has created the Chesapeake NEMO Program to provide resources, coordination of Maryland and Virginia NEMO Programs and local assistance.

Mathews County Officials contacted NEMO for assistance in preparing for revising the County's comprehensive plan. Specifically, the County wanted to:

1) Stimulate interest and citizen engagement in the forthcoming planning process;
2) Introduce the community stakeholders to broad topics expected to influence Mathews County in the next five to 20 years; and
3) Prepare community stakeholders and county officials with a solid understanding of the value and function of the comprehensive planning process.

Working with County Officials, NEMO partners helped design, develop and deliver a five part civic education series and plan a citizens planning academy workshop. The series called, "Talking about the Future—Second Tuesdays in Mathews" explored a specific topic each month from October 2007 to February 2008 in evening workshops. Workshop themes included:

1) Linking Land, Water and Growth;
2) Growth In and Around Mathews;
3) Mathews Economy: Fostering Sustainable Economic Development;
4) Mathews Valuable Resources (Shorelines; Wetlands; Forests; Agriculture; Natural Heritage; Historic Resources); and
5) Planning the Direction of your Community.

Each evening workshop began with an introduction by the County Administrator, followed by a presentation and approximately an hour of facilitated discussion.

All five of the "Second Tuesdays" sessions were well attended—sixty to eighty-five participants each evening, including citizens, planning commission members, and members of the County Board of Supervisors. Discussions were lively with participants voicing their concerns and desires for the future of the County.

For example, during the final Tuesday session, participants saw a NEMO presentation on steps and tools communities can use to plan for the future and incorporate key resources into decision making. NEMO team members facilitated an interactive exercise to help participants describe elements of their vision for Mathews' future. On a

long wall, the team had pre-posted elements participants had already identified in the prior four forums. Using large sticky cards and markers, participants added dozens of elements they want to see in Mathews, in categories ranging from "landscape and the environment" to "economy" to "governance". The active evening ended with the group noting ways to continue their involvement in the next stage of the county's comprehensive planning process.

Local Project sponsors and partners included: Mathews County, Mathews County Sustainable Environment and Economic Development, Mathews Memorial Library, Virginia Department of Conservation and Recreation, Divisions of Soil and Water Conservation and Natural Heritage, Virginia Tech and the Virginia Cooperative Extension Community Viability Program and Agricultural Extension Service, National Park Service, Middle Peninsula Planning District Commission, Virginia Department of Forestry, Natural Resources Conservation Service, Mathews County Historical Society, and Mathews County Maritime Heritage Foundation.

V. Cost Containment Mechanisms

WQIF Point Source Program

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

Variable WQIF Grant Percentages

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

Efficient Use of WQIF Grant Funds

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

- Assure use of a consistent and equitable decision making process in reviewing applications and prioritizing grant agreement drafting/negotiation.

- Standardize methodologies used to determine the eligible scope of work and appropriate cost-share percentages for units comprising the nutrient reduction technology being designed and installed.

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

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

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

- sizing, safety factors and redundancy of treatment units;
- future flow projections that are reasonable and necessary for a 20 year design life; and,
- reuse of existing facilities as much as possible instead of new construction.

To date, one grantee has utilized the Design-Build procurement approach, seeing very positive results from this process with proven time and cost savings. The use of Value Engineering (VE) has yielded savings for another grantee on the order of 22 or 24 to 1 in terms of savings per VE dollar spent. Grantees are not barred from selecting and constructing more costly alternatives; however, if a lower cost alternative is viable then

cost share may be prorated or reduced. Cost control measures are difficult to quantify exactly, since they typically result in "cost-avoidance" and are applied to estimated figures, rather than actual reductions to an "as-bid" amount.

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

WQIF Nonpoint Source Program

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

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

Separate guidance will be developed to cover the sale of nonpoint source offsets from redeveloped lands and urban lands.

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 Watershed General Permit, Virginia dischargers submit their compliance plans to DEQ by August 1, 2007 with updates in February 2008. These plans provided, 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 provided the DEQ funding programs with a much better understanding of the timing/cost of projects which will assist them in evaluating the adequacy of available funding capacity as well as matching loan/grant resources to cash flow funding needs. For example, based on this information DEQ estimates that approximately $160 million in bond proceeds will be needed to cover expected grant reimbursement requests in FY2010.

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

Financing

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

- Use of the Virginia Clean Water Revolving Loan Fund (VCWRLF) administered by DEQ and the Virginia Resources Authority (VRA);
- Pooled bond issuances administered by the VRA; 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 $225 million 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 $225 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 $225 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.

VII. Healthy Waters Initiative

Background

This Chesapeake Bay and Virginia Waters Clean-Up Plan describes a comprehensive approach for addressing all sources of pollution to Virginia's waters. The Plan describes the magnitude of the water-quality challenges, the actions being taken to address those challenges, cost-estimates and accountability measures being applied.

During implementation of the Plan over this past year, a recent trend has become increasingly clear and troublesome – the rate at which new impaired waters are being identified far exceeds the rate of restoration of impaired waters. For example, as illustrated in Section I (Status of Impaired Waters), in 2008 we identified a net increase of an additional 1,557 impaired stream miles. That is, an additional 1,867 miles of streams were added to the impaired waters list while only 330 miles of streams were removed.

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

The slow pace of restoration of impaired waters is largely due to insufficient financial resources and inadequate implementation tools. While other parts of this Plan recognize these long-term challenges, this Healthy Waters section is being added to the Plan to explore what steps can be taken in the short-term as a means of accelerating restoration, improving program efficiencies, enhancing preventive approaches, protecting special waters and promoting clean waters.

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

New EPA Initiative – Healthy Waters Priority

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

- Significant restoration progress has been made, but the challenges of water protection continually evolve and water protection tools must evolve in parallel.

- A strategic refocusing of resources is needed to accelerate the pace of restoration and protection.

- Wholesale approaches need to be employed that include policy innovations and systems-level changes that are both efficient and can yield across-the-board results.

- An increased focus is needed to keep "healthy waters healthy."

- Components of the healthy waters initiative will include the following:

    - State and interstate healthy waters plans [using Virginia's Chesapeake Bay and Virginia Waters Clean-Up Plan as a working model];
    - Implementation plans for identified priority sectors that include agriculture, mining, development/developed lands and transportation; and
    - Water policy innovations and data support.

- Funds will be provided to states for pilot projects that can demonstrate new approaches and build capacity for water quality protection and restoration. [See description below of Healthy Waters projects funded in Virginia].

- An alternative approach to the "All or Nothing" process for reporting restoration progress must be developed. Currently a waterbody can not be delisted until all impairments are removed, providing no opportunity to demonstrate interim restoration progress.

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

Virginia Healthy Waters Initiatives

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

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

2. Develop Integrated Watershed Management Planning: Improving local government buy-in and acceptance of TMDL implementation planning by developing a watershed implementation plan that is integrated into a community's comprehensive watershed planning process. A Planning District Commission, local government entity, or contractor will be selected for this phase.

3. Enhance Watershed Protection Planning: Developing a pilot watershed protection plan for a specific healthy water body. The watershed protection planning process

would involve: extensive citizen and stakeholder participation; assessment of existing land use and build-out analysis for the watershed based on existing conditions; review of codes and ordinances; development of a watershed plan along with watershed protection measures (including recommended code and ordinance changes needed to protect water quality); and development of presentation material for local officials.

Future progress reports on the Plan will detail the outcomes from these projects.

Anti-Degradation Policy

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

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

Impaired waters fail to meet Tier 1 standards.

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

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

Currently, the Commonwealth has designated 27 waters as Tier 3 waters; these include 25 streams covering approximately 128 miles and two estuaries covering about 6.1 square miles. Almost all of these waters were designated during an initiative within the past five years. Citizens may petition the State Water Control Board to extend this additional protection to other waters in the Commonwealth.

Initiative to Protect Aquaculture Waters

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

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

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

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

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

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

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

Enhancing Water Monitoring and Assessment Tools

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

in one or more parameters. Through December 2007, Virginia was credited with 310 partial delistings.

The U.S. EPA Region III office hosted a meeting in March 2007, to solicit additional ideas from its member states for ways of measuring and tracking improvements in water quality. Virginia is participating in this effort and will combine Geographical Information Systems with intensive statistical analysis of water chemistry and biological monitoring data to evaluate additional interim measures of water quality improvement. EPA intends to adopt additional measures in its next Strategic Plan update (2009-2014).

VIII. Restoring Impaired Waters

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

The Chesapeake Bay Program, although similar to the TMDL program, addresses only nutrient (nitrogen and phosphorus) and sediment pollution in tidal 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. In comparison, 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. This section will describe Virginia's efforts in both the Chesapeake Bay and TMDL programs.

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 significant 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 (see below). 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. The TMDL does provide the jurisdictions with an opportunity to assess progress and make adjustments in implementation. 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, currently scheduled for May 2011.

Current plans will use the 2008 303(d) lists for Maryland, Virginia, Delaware and the District of Columbia to identify specific Bay tidal waters that are not attaining water quality criteria for dissolved oxygen, water clarity and chlorophyll *a*, as prescribed by the states' water quality standards regulations. The Bay watershed TMDL will focus on identifying the maximum pollutant loadings (in terms of nitrogen, phosphorus and sediment) necessary to attain the water quality criteria and maintain designated uses.

The partners agree there is a shared urgency to restore waters of the Bay to focus on targeting pollutant sources and accelerating implementation of corrective measures. This can best be accomplished by clear communication and use a common message. This will be accomplished by fully engaging the public about the challenges that lay ahead and the legal obligations that must be met. This process will apply the latest science and best modeling tools available. It will also allow flexibility of sub-allocations within the major basins while keeping healthy waters healthy. A timeline of major events are outlined in Table VIII-1.

Table VIII-1. Chesapeake Bay TMDL Timeline (revised March 2008)

Chesapeake Bay TMDL Timeline	2008				2009				2010				2011	
	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr
Bay Reevaluation														
States' 303(d) list released for public comment														
Allocation Reevaluation														
Partners approval of the refined major basin/jurisdiction allocations														
States sub-allocate cap loads within major tributary basins														
Confirmation draft sub-allocations meet State's WQS														
Reevaluation Documentation														
Draft Bay TMDL report ready for public comment														
Public Participation														
CBP PSC public announcement on Bay TMDL development		**PSC**												
Federal Register publication of Notice of Intent for Bay TMDL		**EPA/ States**												
Formal Public comment period on the Bay TMDL (60 - 90 days)														
Partners sign-off of the final Bay TMDL and documentation														
EPA publication of the Baywide TMDL and documentation														

VIRGINIA'S TMDL CLEAN-UP PROGRAM

TMDL Strategy

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

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 2008, Virginia has developed TMDLs to address 546 impairments (Table VIII-2). Of those, 110 impairments were not included on the Consent Decree but TMDLs were developed because they were located in the same watershed as a Consent Decree impairment.

Table VIII-2 - Total Impairments Needing TMDL Development

Due Date	Number of impairments
2000	12
2002	27
2004	98
2006	207
2008	**202**
Total impairments with TMDLs developed by May 2008	**546**
* 2010	208
** 2012	248
** 2014	221
** 2016	323
** 2018	443
Total impairments on 2006 Impaired Waters List still requiring TMDL development	**1700**

* Of the 208 impairments, 56 are in Triennial review changes to the VA Water Quality Standards and approximately 20 will be part of the Bay TMDL. This number doesn't include any non-consent decree impairments.

** The total number of impairments beyond 2010 will be updated in the next 6 month report pending completion of the final VA Water Quality Assessment report for 2008.

Outlook:

Table VIII-2 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.

Funding for the TMDL program from federal and state sources in recent years has been approximately $2 million/year. Average costs to develop a TMDL is $19,000 (based on current program efficiencies). With those resources DEQ can develop an additional 208 TMDLs by May 1, 2010. This would address all impairments shown in Table VIII-2 for 2010 and fulfill Virginia's schedule under the Consent Decree.

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

- 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 VIII-2, 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 VIII-3 - Total Impairments Needing TMDL Implementation Plan Development

Completion Date	Number
2001	12
2004	7
2005	20
2006	26
2007	**12**
2008	**11**
Total impairments with completed IPs to date	**88**
Additional impairments scheduled for IP development with current available funds	**29**
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**

* These numbers will be updated in the next 6 month report pending completion of the final water Quality Assessment Report for 2008.

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 2008, Virginia has completed 23 IPs addressing 88 impairments (Table VIII-3). Contractual expenditures for IP development through May 1, 2008 have averaged $20,000 per impairment.

Outlook:

Recent appropriation (2008) of funds for agricultural BMP implementation ($20 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 "Clean-Up Strategy Components". DEQ and DCR are coordinating TMDL IP development efforts in those areas.

In order to expedite the development of implementation plans for the remaining impairments where TMDLs have already been completed, DEQ would need to shift some resources away from continued TMDL development and toward implementation plan development; however, current funding levels will be inadequate to develop IPs at that same pace.

Proposed Strategies:

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

TMDL Implementation Projects

Virginia uses a staged approach to implement TMDLs that provides opportunities for periodic evaluation of the effectiveness of the implementation actions and allows for adjustment of efforts to achieve water quality objectives in a timely and cost-effective manner. As can be seen on figure 3, the approach for targeting TMDL implementation is quite aggressive.

Status:

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

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, six years of targeted funding, extensive outreach efforts and technical assistance was unable to achieve 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 VIII-3) that TMDL implementation plans have been developed, or will be shortly using currently available funds, to address 117 identified impairments. The locations of these 117 impairments are shown on the map below. Approximately 40 of these impairments will receive funding to implement clean-up actions as a result of recently appropriated state funds for agricultural BMPs. Of these 40 impairments, 14 have completed implementation plans, 14 are covered by implementation plans currently under development, and 12 implementation plans 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 28 impairments are identified to receive federal funds through the previously described federal 319 program. There are 33 impairments for which there is insufficient funding and staffing to begin implementation projects.

For 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**.

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

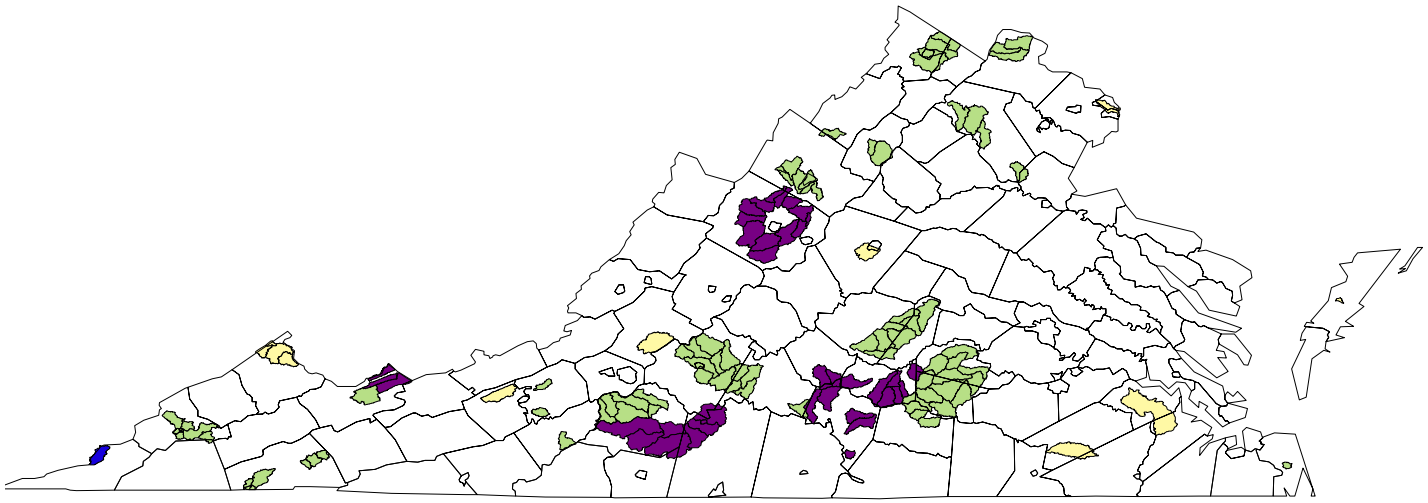
- DCR's state funds are only targeted toward agricultural BMPs. Additional funds must be identified to address other nonpoint source pollution sources such as mining issues, on-site septic systems, and urban stormwater; and
- Current implementation efforts are based on voluntary, incentive-based programs and regulatory requirements (eg. on-site sewage disposal) that are not adequately enforced. Implementation is generally based on the assumption that the conservation practices will be implemented within five to ten years and actively maintained for the life of the practice. Unfortunately, this approach has not resulted in full water quality attainment of the bacteria standard 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) Of the $20 M WQIF Ag BMP monies appropriated for FY09, $1,675,000 will be targeted for use in implementing agricultural BMPs in the Southern Rivers and $550,000 will be targeted for local TMDLs in the Chesapeake Bay;
3) 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;
4) Identify and implement additional strategies to accelerate implementation of priority BMPs. For example, explore the feasibility of revising §58.1-3230 et. seq. to require that certain BMPs be implemented in order for agricultural, horticultural, forested, or open-space lands to be eligible for use value assessment and taxation;
5) Collaborate between DEQ, DCR and DMME to identify stream mitigation projects as tools to restore impaired waters;
6) Adequately enforce on-site sewage disposal regulations and prescribe time limits for corrective action;
7) Seek revised, or new, regulatory tools to ensure adequate implementation of conservation practices, such as livestock exclusion, as a back-up approach where incentive based approaches fail;
8) Explore the possibility of amending the Agricultural Stewardship Act to include pathogens in the definition of pollution; and
9) Where appropriate, for specific waters, evaluate the validity of the designated uses and water quality standards that are driving the clean-up requirements.

Figure 3

TMDL Implementation Plan Development in Virginia: March 2008



Legend

- County boundaries

Implementation plan status

- IP complete
- IP under implementation
- IP under development
- Implementation started (IP under development)

N

40 0 40 80 Miles

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