Chesapeake Bay and Virginia Waters Clean-Up Plan

- Progress Report -

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

December 2008

COMMONWEALTH of VIRGINIA

Office of the Governor
P.O. Box 1475
Richmond, Virginia 23218

L. Preston Bryant, Jr.
Secretary of Natural Resources

December 16, 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: Progress Report on the Chesapeake Bay and Virginia Waters Clean-up Plan (House Bill 1150; 2006)

I am pleased to present this year's Progress Report for the *Chesapeake Bay and Virginia Waters Clean-up Plan*. This report is submitted per Chapter 204 of the 2006 Acts of Assembly. The directive for the construction of the Clean-up Plan – and this 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.

This report describes progress in implementing the Clean-up Plan for 2008. Clean-up activities are the responsibility of many state agencies, including the Virginia Department of Environmental Quality (DEQ) and the Virginia Department of Conservation and Recreation (DCR). In addition to reporting on progress, this report also identifies significant impediments to plan implementation – seeking to efficiently communicate both progress and challenges.

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Although there is not a direct correspondence, this report generally follows the structure and elements of Clean-Up Plan as updated in June 2008. To ensure efficient reporting, we focused on the specific Objectives and Performance Measurements included in that plan. To efficiently communicate relative levels of progress, we have assigned graphic indicators for goals and objectives of the plan:

indicates substantial progress toward the goal;

indicates progress toward the goal; and,

 indicates limited progress during this reporting cycle.

We also have combined some statutory reporting elements within this report per Chapter 637 of the 2007 Acts of Assembly. We continue to work toward full integration of all relevant reporting in an efficient and effective manner.

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 and restore the health of our Commonwealth's streams, rivers, lakes, and estuaries.

An electronic version of this document may be viewed on the website of the Office of the Secretary of Natural Resources, which is located at: www.naturalresources.virginia.gov/Initiatives/WaterCleanupPlan. Should you have questions or desire additional information, please let me know.

LPBJr/cbd

TABLE OF CONTENTS

Page

I. Measurable Environmental Outcomes 1

II. Clean-Up Strategy Components 3

A. Wastewater Category 3

B. Agriculture and Forestry Category 10

C. Developed and Developing Lands Category 20

D. Air Category 27

III. State and Local Coordination 27

IV. Healthy Waters Initiative 28

V. Significantly accelerate removal of waters from the impaired waters list 28

I. Measurable Environmental Outcomes

The Department of Environmental Quality (DEQ) reports on the status of the water quality in all of Virginia's waters through the biennial Water Quality Assessment. The final 2008 Assessment has been submitted to EPA for approval. The following table compares the impaired waters identified in the 2008 Assessment with the 2006 results.

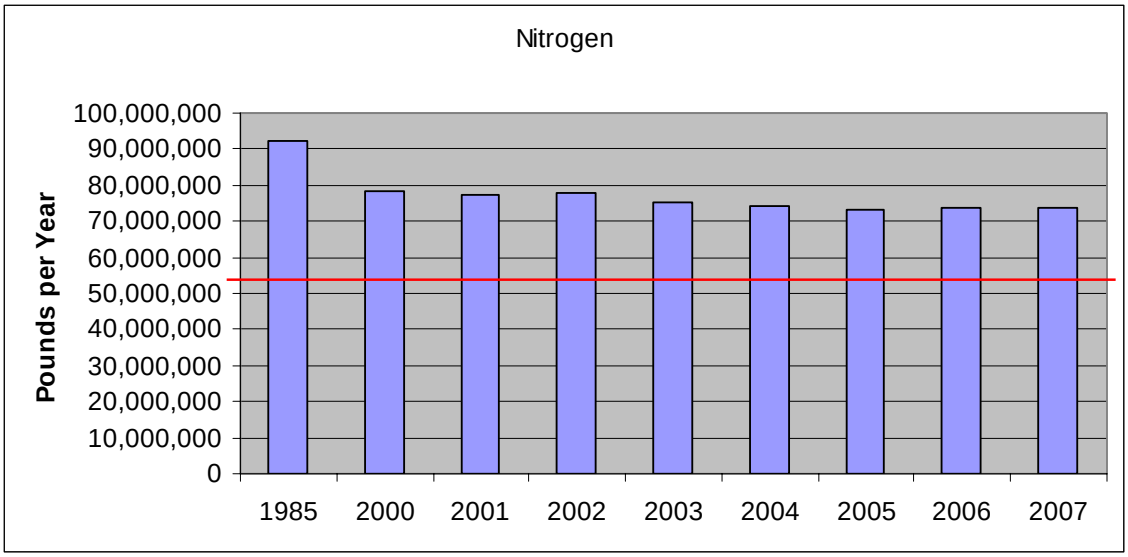
Virginia Waters - Types and Dimensions	Impaired Waters Assessment		Top Reasons for Impairments	Uses Lost or Impaired
	2006	2008		
Rivers - 50,016 miles	9,002	10,543	High Bacteria Levels	Recreational
Lakes - 115,835 acres	109,201	94,044	Low dissolved oxygen and high PCB levels in fish tissue	Aquatic Life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

New impairments were identified in 2008, primarily due to DEQ's assessment of waters which had not previously been monitored, or due to the adoption of more stringent water quality criteria. While the 2008 list includes additional impaired river miles, the good news is that 343 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 403 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.

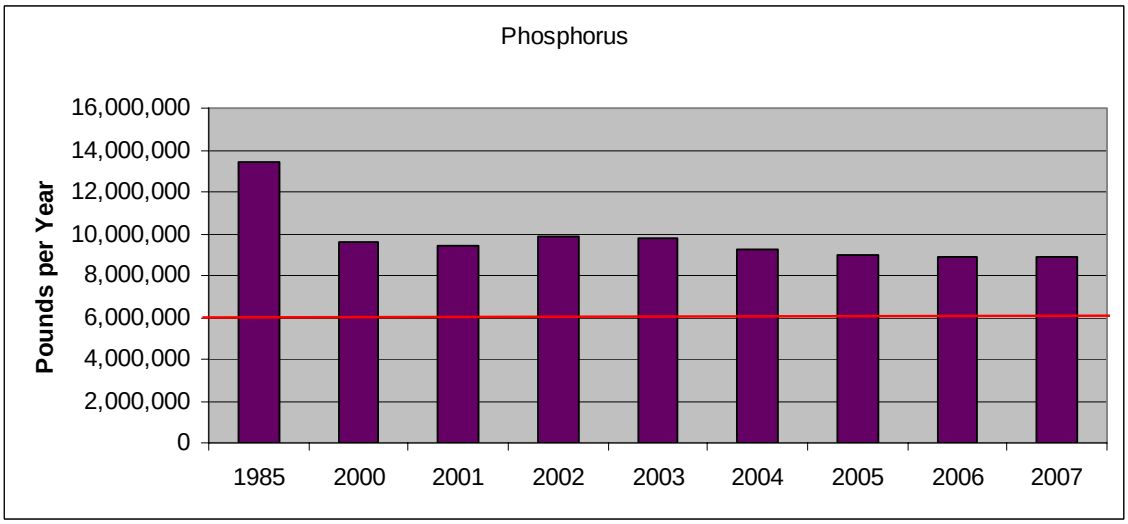
Pollution Reductions

The most recent estimates for the quantity of nutrients and sediments entering the Chesapeake Bay from Virginia's point and non-point sources through 2005 are shown in the following charts and are compared to Virginia's allocation caps.

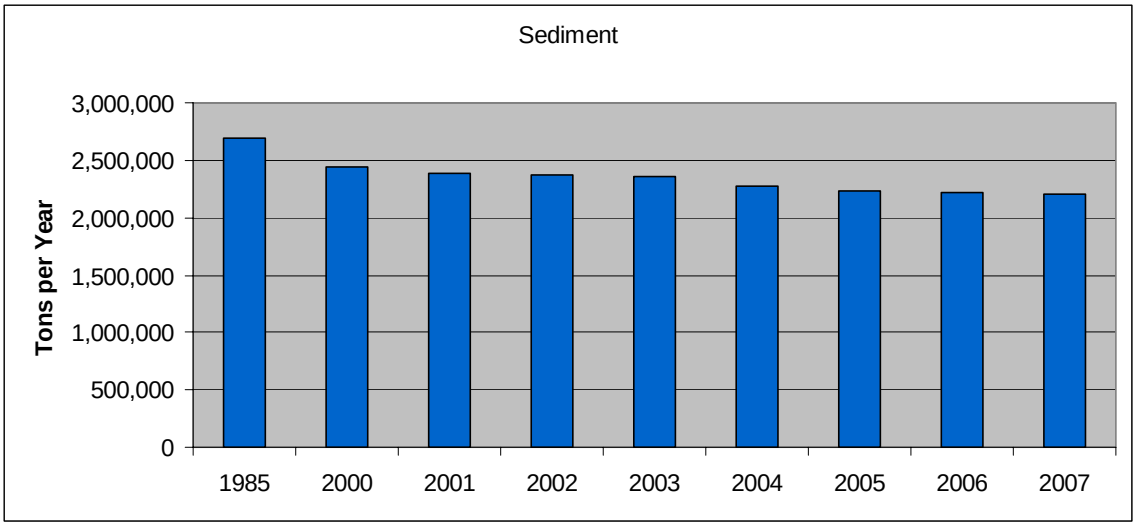
For nitrogen, Virginia has reduced its loadings by 18.4 million pounds/year [MPY] between 1985 and 2007, but still needs to reduce loads by another 22.4 million MPY to meet the assigned allocation of 51.4 MPY.



For phosphorus, Virginia has reduced its loadings by 4.57 MPY between 1985 and 2007, but still needs to reduce loads by another 2.9 million MPY to meet the assigned allocation of 6.0 MPY.



For sediment, Virginia has reduced its loadings by 480,000 tons per year [TPY] between 1985 and 2007, but still needs to reduce loads by another 270,000 TPY to meet the assigned allocation of 1,941,000 TPY.



II. Clean-Up Strategy Components

A. Wastewater Category

<u>Wastewater Dischargers of Nutrient Pollution into the Chesapeake Bay</u>

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

The Chesapeake Bay Watershed General Permit, which became effective on January 1, 2007, authorizes nutrient discharges from wastewater facilities within the Chesapeake Bay watershed. All of the 125 individual significant dischargers who were required by law to register for coverage under the Watershed General Permit have done so, along with several smaller non-significant dischargers, either because of a planned expansion or to be included as part of an owner's "bubbled" allocation. Mandatory annual Compliance Plan Updates were received from the affected dischargers by the February 2008 deadline. **A review of those submittals has reaffirmed previous estimates 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 following table presents the 2007 delivered loads of nitrogen and phosphorus pollution from point sources within each of Virginia's river basins compared to the point source allocations (Waste Load Allocation – WLA) to be achieved by January 1, 2011:

Table II-1. 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.

Summary of Water Quality Improvement Fund (WQIF) Point Source Program Activities

There are currently 36 signed WQIF agreements, obligating $422.7 million in State cost share, for design and installation of nutrient reduction technology at the Bay watershed point source discharges. This is critical support for compliance with the nutrient discharge control regulations and achieving Chesapeake Bay nitrogen and phosphorus waste load allocations. A summary of active grant projects is accessible via the DEQ-WQIF webpage at this Internet address: www.deq.virginia.gov/bay/wqiflist.html#SGA.

Since its formation in 1998, the WQIF Point Source Program has received a total of $385.92 million in appropriations and accrued interest. The following table summarizes these deposits:

Table II-2: WQIF Point Source Program Appropriations

Period	WQIF Reserve (million dollars)	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
Interest Earned (FY08)	$0.14	$13.46
Funds Transferred to DCR (7/08)	NA	($15.00)
TOTALS	$5.13	$385.92

Of the $385.92 million made available, $95.37 million was used for twenty-five voluntary/cooperative "BNR" grants prior to adoption of nutrient discharge control regulations. A total of $3.88 million was awarded as Technical Assistance grants, for projects such as Basis of Design Reports, Interim Optimization Plans, and support for the Nutrient Credit Exchange Association. The $286.67 million balance has been made available for recent grants to meet the Bay nutrient waste load allocations. With $422.7 million obligated for these additional projects, and an available balance of $286.67 million, **the WQIF has been over-obligated by about $136.03 million.**

The 2007 General Assembly authorized $250 million in bonds, available after July 1, 2008, to capitalize the WQIF. Bond proceeds are to be added to the WQIF upon certification by the DEQ Director that anticipated grant reimbursements in a given fiscal year will exceed the amount available in the WQIF. This certification will be made for the 2009 General Assembly session, with an estimate that $137.61 of the $250 million is needed to cover grant reimbursement requests through FY 2010.

Based on WQIF applications received to date and grant agreements being negotiated, it is estimated that the following additional grant amounts are needed to achieve the nutrient waste load allocations by the January 1, 2011 deadline and maintain compliance into the future:

a. 21 applicants are ready-to-proceed with grant agreements expected to be signed in FY09, obligating $218.98 million.
b. 26 applications are pending submission of a Preliminary Engineering Report, or were withdrawn and are likely to be resubmitted in the near future, requesting $177.94 million.
c. 16 eligible significant dischargers have not yet applied. Based on facility size and level of nutrient control technology needed to meet their limits, it is estimated that $141.61 million in grant funds will be needed for their projects in the near future.

These additional projects total $538.53 million in needed grant funds. The projected balance of bond proceeds after covering the existing, signed agreements is $113.97 million. Therefore, it is estimated that an additional $424.56 million is needed for all expected projects, beyond existing signed agreements, to meet and maintain the point source nutrient waste load allocations. If no additional funds are added to the WQIF beyond current appropriations and the bond authorization, reimbursements from the WQIF are projected to expend the available funds during FY2012, assuming all expected projects from 'a', 'b' and 'c' above are added to the "signed agreements" list.

<u>Estimated Nutrient Reductions from WQIF-Funded Projects</u>

The current deadline for compliance with the point source nitrogen and phosphorus waste load allocations in the Chesapeake Bay watershed is January 1, 2011.

Table II-3 below shows estimated pollution reductions resulting from the 36 projects with signed WQIF grant agreements (3 projects with "NA" values are non-significant dischargers that must only maintain their "permitted design capacity", not achieve reductions from existing loads). It illustrates the nutrient load each facility delivered to the Bay and tidal rivers in 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, by 2011 these projects will reduce the amount of nutrients being delivered to the Bay and tidal rivers by approximately 1,199,000 pounds of nitrogen and 148,000 pounds of phosphorus compared to the 2007 loads.

Table II-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
Craigsville STP	NA	NA	NA	NA	NA	NA
Farmville STP	10,370	16,665	16,665	5,487	1,572	1,572
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
Culpeper WWTP	59,411	33,440	24,300	7,443	4,112	3,984
Orange STP	23,406	22,293	8,174	4,370	2,741	1,005
Tappahannock STP	15,085	9,746	6,091	1,254	731	457
Warrenton STP	61,777	18,578	18,578	5,516	2,284	2,284
Warsaw STP	10,522	3,655	1,827	2,700	274	244
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
Alexandria S.A.	506,436	493,381	493,381	5,384	29,603	22,202
Arlington Co. WPCF	619,020	365,467	365,292	5,485	21,928	7,306
Broadway STP	34,723	15,671	13,059	17,228	1,351	1,351
Clarke Co. SA-Boyce STP	NA	NA	NA	NA	NA	NA
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
FCW&SA-Vint Hill STP	2,902	3,180	2,685	268	241	76
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
HRRSA-North River STP	74,419	111,492	71,826	18,458	14,633	9,427
K. Geo. Co-Dahlgren STP	6,778	9,137	7,675	230	914	672
K. Geo. Co-Fairview Beach	836	1,827	822	323	183	82
LCSA-Broad Run STP	0	101,113	44,085	0	2,345	1,022
Luray STP	8,759	8,576	8,576	2,859	1,126	1,126
Middletown STP	NA	NA	NA	NA	NA	NA
Mt. Jackson STP	4,597	5,713	4,081	775	493	352
Pr. Wm. Co.-Mooney STP	238,112	219,280	150,755	3,073	13,157	9,045
Purcellville STP	9,333	15,167	12,285	308	1,055	760
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
HRSD-York STP	752,766	274,100	223,762	22,906	31,978	22,376
Totals =	4,209,346	2,923,142	3,009,895	354,746	246,139	207,093

Other Wastewater Discharges and Sources

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.

The Virginia Clean Water Revolving Loan Fund completed loan closings procedures on 69 loans in FY 08 totaling $193,548,590. This includes 54 non-point source improvement projects and 15 wastewater treatment plant or sewer system improvement projects. Approximately 76.7% ($148,374,905) of this funding was for projects improving the water quality of impaired streams and/or addressing the impairment of the Chesapeake Bay (see table on next page).

FY 08 Virginia Clean Water Revolving Loan Fund Project List					
Name	**Loans**	**Stream Impairment**	**Bay Impairment**	**Total Funding for Impaired Waters**	**Purpose**
Augusta County Service Authority	$17,028,808		$8,514,404	$8,514,404	Reduce Nutrients to the Bay
City of Lynchburg	$12,350,000	$12,350,000		$12,350,000	Reduce CSO/SSO
City of Newport News	$3,200,000	$3,200,000		$3,200,000	Reduce SSO
City of Norfolk	$17,000,000	$17,000,000		$17,000,000	Reduce SSO
City of Richmond	$6,900,000	$6,900,000		$6,900,000	Reduce CSO/SSO
City of Staunton	$9,528,519	$9,528,519		$9,528,519	Reduce Nutrients to the Bay
City of Waynesboro	$14,594,900		$14,594,900	$14,594,900	Reduce Nutrients to the Bay
County of Hanover	$616,206	$0		$0	New collection system to eliminate existing residential septic tank/drainfields
Harrisonburg Rockingham Regional Service Authority	$30,000,000		$15,000,000	$15,000,000	Reduce Nutrients to the Bay
Mercury Mall Associates	$1,500,000	$0		$0	Brownfield Clean Up
Town of Chilhowie	$1,584,125	$1,584,125		$1,584,125	Improve local water quality
Town of Colonial Beach	$2,671,606		$2,671,606	$2,671,606	Reduce Nutrients to the Bay
Town of Orange	$16,177,744		$8,088,872	$8,088,872	Reduce Nutrients to the Bay
Town of Tappahannock	$4,564,119		$4,564,119	$4,564,119	Reduce Nutrients to the Bay
Truxton Development LLC	$900,000	$900,000		$900,000	Improve local water quality
Cafferty/ARC	$1,000,000	$0		$0	Brownfield Clean Up
Woodstock	$13,917,296		$13,917,296	$13,917,296	Reduce Nutrients to the Bay
Town of Purcellville	$24,944,377		$17,461,064	$17,461,064	Reduce Nutrients to the Bay
Crows Nest - Stafford County	$9,500,000		$9,500,000	$9,500,000	Reduce Nutrients to the Bay
AgBMP	$5,570,890	$2,600,000		$2,600,000	Eliminate Non-Point Source Pollution
Total Value	$193,548,590	$54,062,644	$94,312,261	$148,374,905	
To Impaired Non-Bay Waters		$54,062,644	27.9%		
To Impaired Bay Waters		$94,312,261	48.7%		
Total Impaired Assistance		$148,374,905	76.7%		

Discharges from Boats

Performance Measurement: Report semi-annually on outreach efforts and No Discharge Zone designations being pursued.

A No-Discharge-Zone designation covering the Lynnhaven River, Broad Bay and Linkhorn Bay in Virginia Beach was approved by EPA, with final adoption by the State Water Control Board in March of 2007. Through efforts by the City of Virginia Beach, Hampton Roads Sanitation District, and Lynnhaven River Now, and other stakeholders, this watershed has been restored for shellfish harvesting. No Discharge Zone designation, agricultural BMPs, sanitary sewer system improvements, stormwater programs, and erosion and sediment controls were effectively implemented. EPA has selected the Lynnhaven Bay restoration project as a highlighted success story. Consideration is being given to pursuing expansion of this designation to other waters in the area.

Based upon the recommendations in completed TMDLs and the positive support from marina operators and local citizenry, DEQ has completed the outreach and application to designate Broad Creek, Jackson Creek, and Fishing Bay as No Discharge Zones. They are located in Middlesex County. The application should be submitted to EPA for approval November '08.

Discharges of Toxic Substances

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

DEQ is working to identify and quantify sources of fish mercury contamination in the waters of the North Fork Holston River. The "impaired" stream segments total approximately 81 miles from Saltville (VA) to the Tennessee state line. DEQ announced a study to restore water quality. Additional monitoring was completed by Olin in 2008. The first Technical Advisory Committee and public meetings are scheduled for November (2008) in Saltville and Hilton (VA). In order to meet the consent decree schedule, this TMDL is to be completion by May 1, 2010.

The Total Daily Maximum Load (TMDL) addressing Polychlorinated Biphenyl (PCB) contamination is actively under development for the Roanoke (Staunton) River. The final TMDL report is due May 2010. Results from two rounds of monitoring have led to improved characterization of PCBs in the river and to the identification of on-going PCB sources.

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

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.

The 2007 General Assembly allocated $17 million from the Water Quality Improvement Fund to be provided as grants to communities located outside the Chesapeake Bay watershed for construction of mandated water quality improvement facilities at publicly owned treatment works, correction of onsite sewage disposal problems, and other planning activities. These funds are now being administered by the Department of Housing and Community Development, with several projects now underway to utilize these funds.

- As announced by the Governor's Office in October 2007 and May 2008, under the "Southern Rivers Watershed Enhancement Program" over $14.8 million was previously awarded, mostly as wastewater treatment 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.
- $1.44 million in additional construction grants were announced in August 2008, along with one $20,000 planning grant. These grants will allow four localities to eliminate urgent health hazards and provide public sewer service to households now using individual septic systems, many of which are failing and discharging inadequately treated wastewater to State waters. These projects will benefit 66 homes currently relying on failing septic systems or "straight pipes", and also replace 2 community drainfield systems serving public schools, municipal buildings and several commercial operations.
- The balance of approximately $740,000 in grant funds will be awarded under a future solicitation.

B. Agriculture and Forestry Category

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

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

An action of the 2008 Virginia General Assembly established the Natural Resources Commitment Fund (NRCF) as a new "Subfund" of the Water Quality Improvement Fund for the purpose of more directly addressing agricultural nonpoint source pollution. The Assembly placed $20 million in the NRCF for fiscal year 2009 and codified requirements that 5% of monies placed in the subfund are to be distributed to soil and water conservation districts (SWCDs) for technical assistance, 57% will be directed to agricultural BMPs in the Chesapeake Bay basin and the remaining 38% balance is directed to implement agricultural BMPs on other lands outside the Chesapeake Bay basin. DCR is administering these monies through the state-wide Agricultural BMP Cost-Share Program which is implemented locally by the state's 47 SWCDs. Portions of the funds are enabling established "TMDL" projects in targeted watersheds to continue to address the most serious water quality problems that are attributed to agricultural operations.

Five suites of best management practices have been identified as priority practices by Virginia, they include: nutrient management, conservation tillage, cover crops, riparian buffers, and livestock stream exclusion.

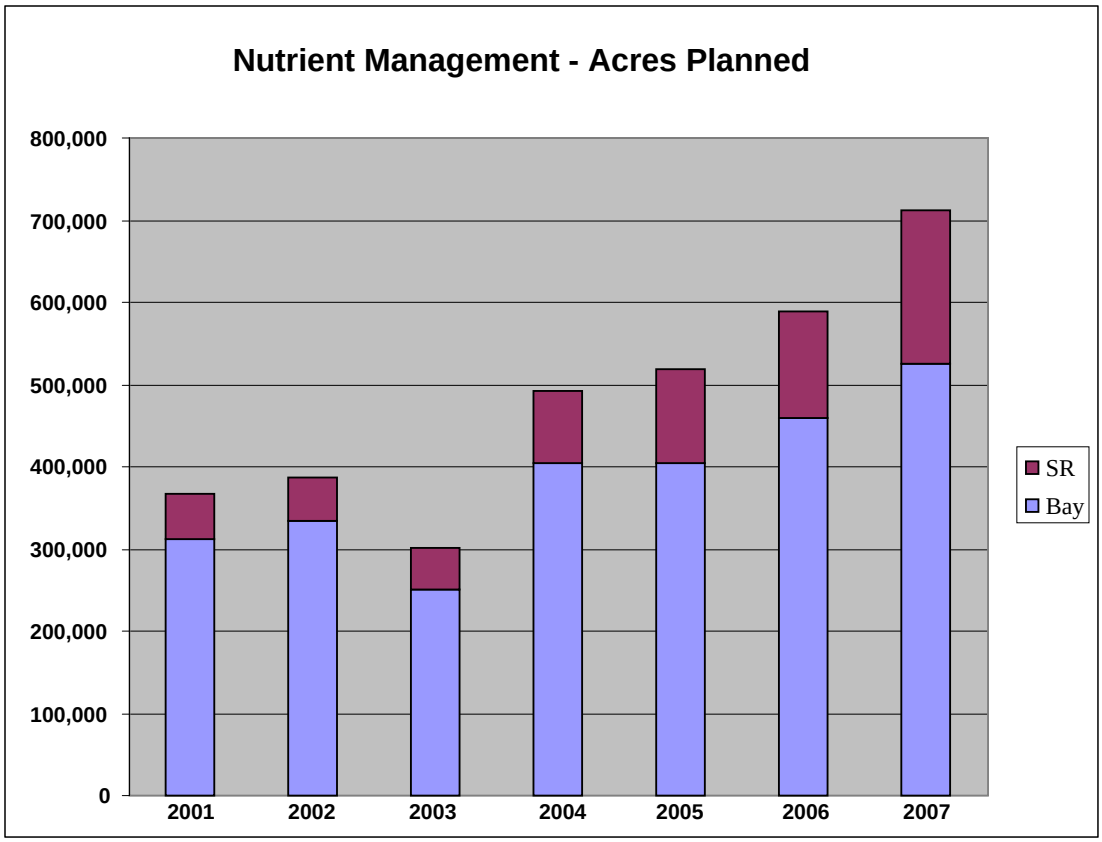
Over eighty three percent ($13.820 million of $16.525 million) of the total cost share allocations from the NRCF were committed to soil and water conservation districts for cost-sharing on priority practice BMPs in fiscal year 2009.

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

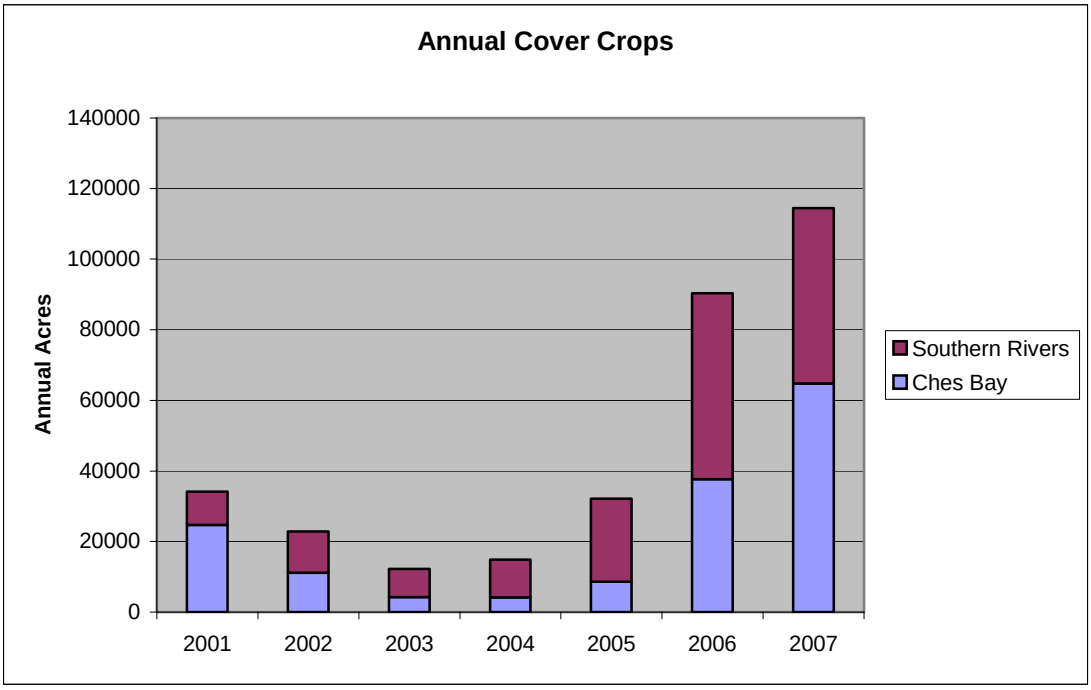
Potential Nutrient Reductions Calculations from Priority Practice implementation in Calendar Year 2007

Practice	**Total Nitrogen Pounds Reduced**	**Total Phosphorus Pounds Reduced**
Nutrient Management	964,856	85,678
Cover Crops	441,500	9,603
Livestock Exclusion	112,934	25,060
Stream Buffers	32,378	2,918
Continuous No-Till	166,616	45,430

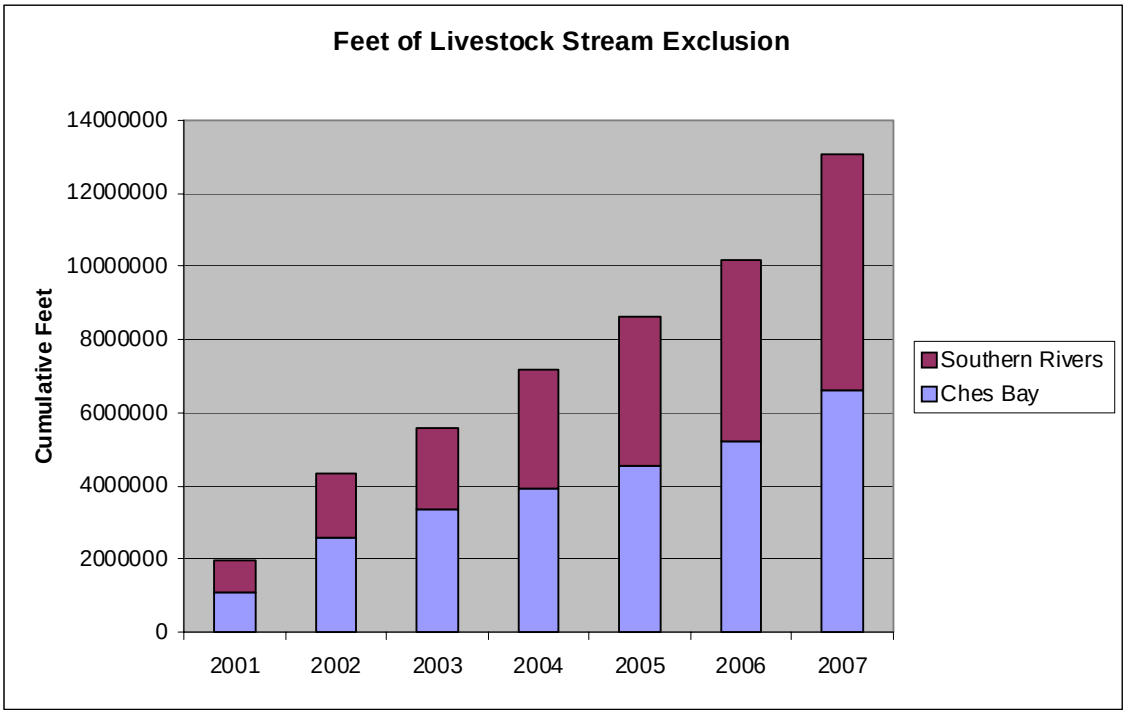
Summary graphs of the priority practice implementation levels are included on the next pages:



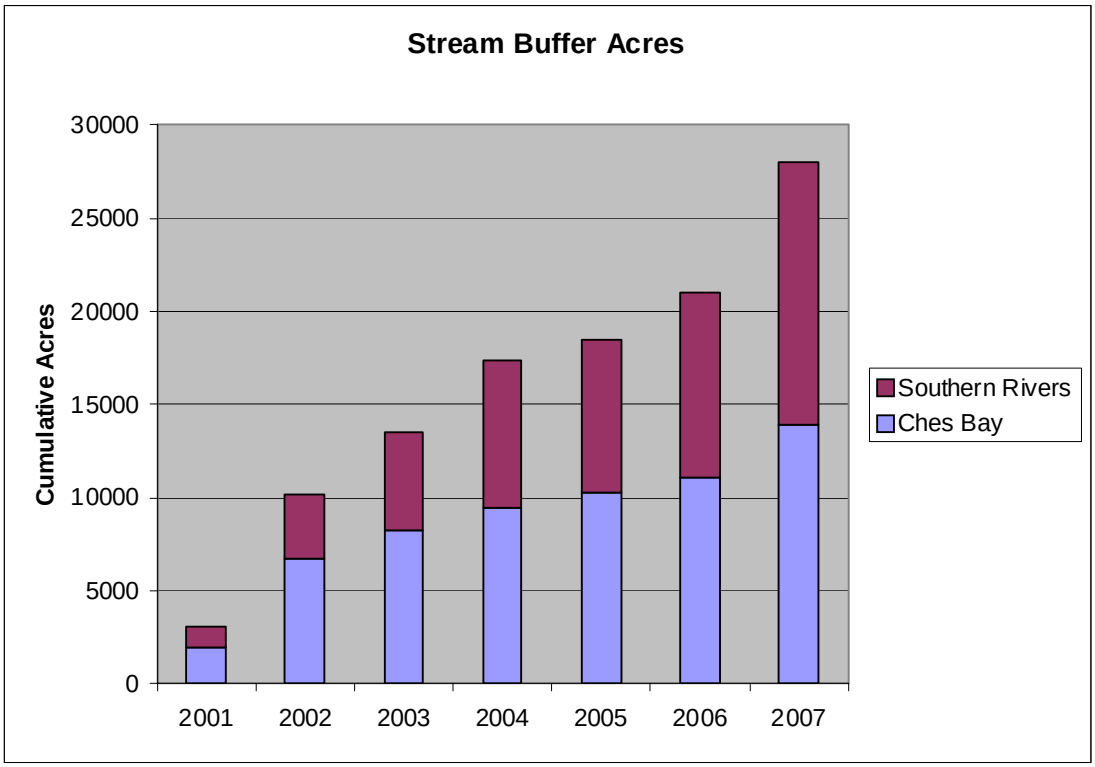
Tributary Strategies Based Bay Goal:	***1,009,595 Acres***
Progress: 524,197 Acres	***52%***



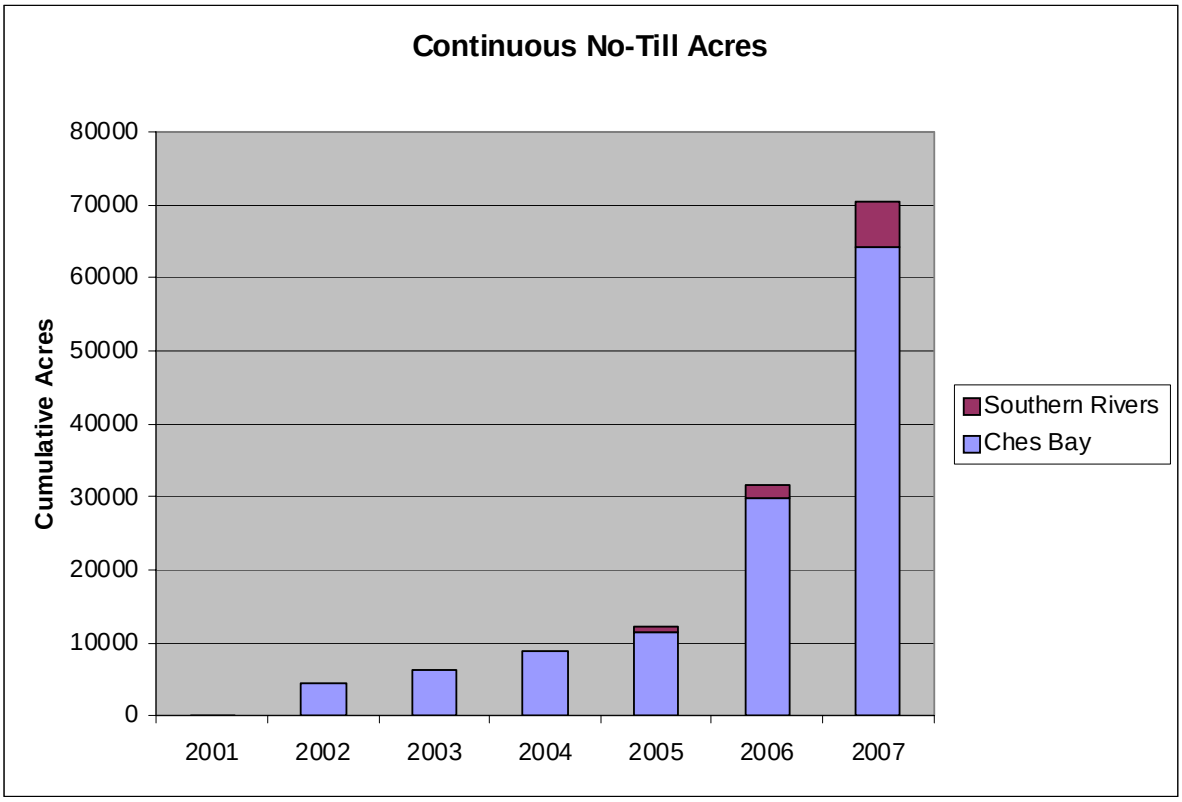
Tributary Strategies Based Bay Goal:	***413,232 Acres***
Progress: 64,811 Acres	***16%***



Tributary Strategies Based Bay Goal:	***54,754,946 Linear Feet***
Progress: 6,604,337 Linear Feet	***12%***



Tributary Strategies Based Bay Goal:	***312,523 Acres***
Progress: 13,927	***4%***



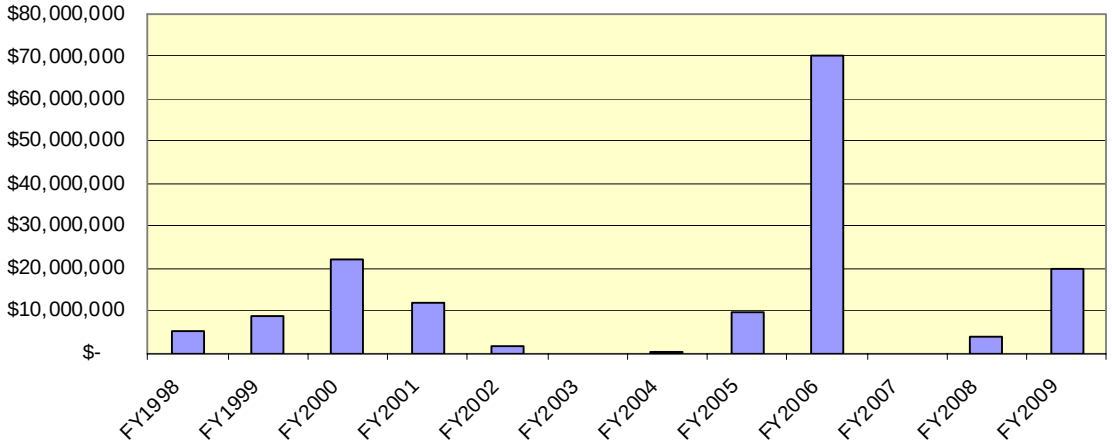
Tributary Strategies Based Bay Goal:	***41,686 Acres***
Progress: 64,083	***150%***

The Tributary Strategies Goals for Continuous No-till (a form of conservation tillage) were set as a placeholder since at the time of the strategies development this practice was not officially recognized by the Chesapeake Bay Program as a quantifiable nutrient and sediment reduction practice. Virginia is working toward having a much higher percentage of overall conservation tillage being implemented via Continuous No-till since this BMP has a 5-year lifespan and is considered to produce higher reductions than other forms of conservation tillage. Therefore, future progress reports will likely include a significantly increased Tributary Strategies Based Bay Goal for this practice and a proportionally significant reduction in the progress achieved to date.

The following graph depicts the total WQIF funding (for nonpoint source projects) from 1998 through 2007. Significant fluctuations in funding amounts have jeopardized farmer commitment and compromised Soil and Water Conservation District staff resources.

Virginia Department of Conservation and Recreation
Water Quality Improvement Fund (WQIF)

Fluctuations in Appropriations to WQIF for Nonpoint Source Reduction Practices
FY1998 to FY2008



An unprecedented level of funding (approximately $69 million) was made available during fiscal year 2006 from actions taken by the 2005 and 2006 sessions of the Virginia General Assembly. This collective funding supported Cooperative Nonpoint Source Pollution Program Projects with local governments, the Conservation Reserve Enhancement Program, priority water quality initiatives, and the Virginia Agricultural BMP Cost-Share Program. The monies were planned and apportioned for FY06, FY07 and FY08 to enable greater stability and consistency with financial incentives directed to the Agricultural BMP Cost-Share Program. The 2008 session of the General Assembly established the Natural Resources Commitment Fund within the WQIF. The Commitment Fund received $20 million for implementation of agricultural BMPs for FY09 (this funding included 5% technical assistance for soil and water conservation districts).

The Department of Conservation and Recreation's latest estimates indicate that the Commonwealth will need to appropriate approximately $409 million over the ensuing five years to implement sufficient levels of the five priority practices and other agricultural BMPs needed to meet our Bay clean-up goals. An additional $219 million in costs will also be incurred by the farmers.

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.

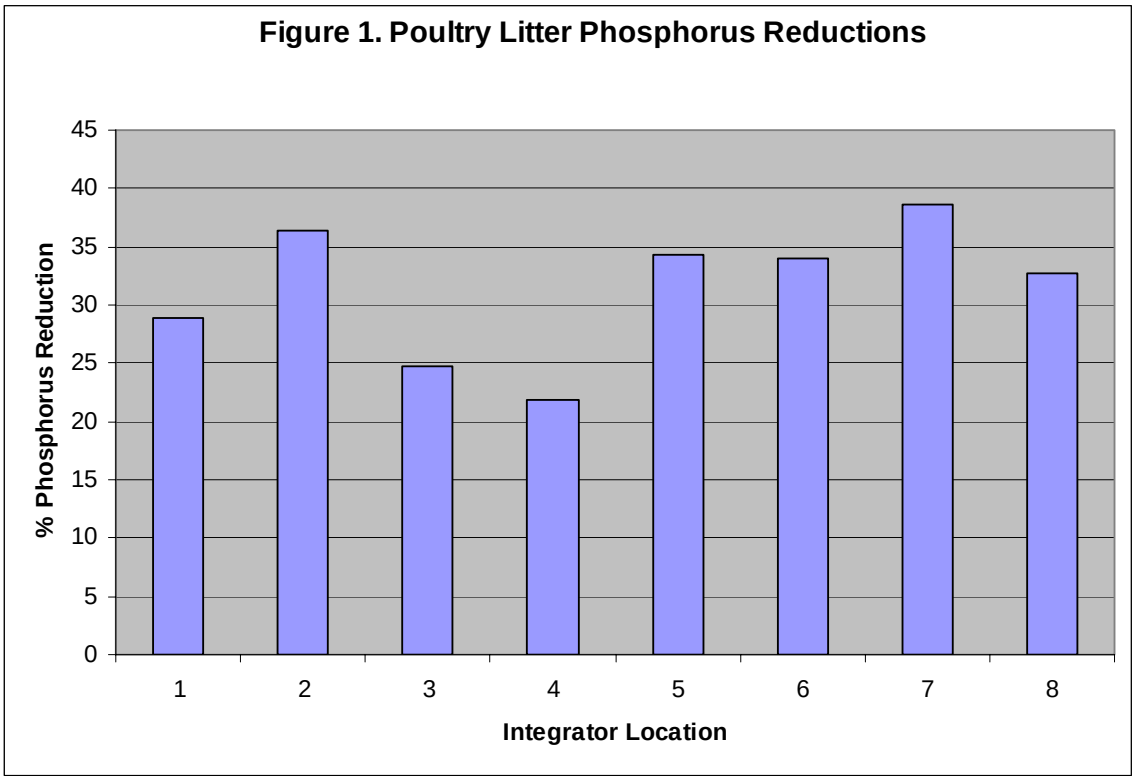
Two efforts continue to be pursued relative to this objective. First, the Department of Conservation and Recreation and the Virginia Poultry Federation initiated a cooperative effort to cost-share the transport of poultry litter from areas of concentrated poultry production where soils are phosphorus rich to outlying areas where soil analyses indicate that crops need additional phosphorus. This effort began late in 2007. The Commonwealth and the Virginia Poultry Federation will each contribute up to $100,000 per year in transport cost-share funding. The program pays $5 per ton of poultry litter transferred from either Page or Rockingham counties to outlying areas within the Chesapeake Bay watershed, and $12 per ton for areas outside the Bay watershed. As of November, 2008, 4,419 tons of litter had been transported outside phosphorus rich areas utilizing $30,454 of cost-share money. Nutrient management plans submitted with applications for this program have been reviewed by Department of Conservation and Recreation staff, and all litter that has been transferred with the help of cost-share dollars from this program has been applied in accordance with the approved nutrient management plan.

The second effort was to consider potential regulatory or legislative changes to the poultry waste management law or regulations to ensure proper nutrient management practices by end users of poultry litter continues to progress. The Department of Environmental Quality formed a Technical Advisory Committee (TAC) to pursue the recommendations of the stakeholder committee previously formed by the Secretary of Natural Resources. It was the recommendation of the stakeholder group that existing regulations be revised to include additional safeguards for the off-site application of poultry litter. The TAC held meetings with representatives from the poultry industry, growers, litter brokers, and other government agencies throughout 2008. The final draft of revisions to the existing poultry waste management regulations that came out of the TAC meetings included adding a technical regulation for poultry waste end users that gives several options for them to apply litter in ways that will reduce nutrient pollution. A key part of the draft revised regulations also addressed the improvement of tracking poultry waste transfers from growers to brokers and end users. The regulations addressing end users of poultry litter will go to the water board in March 2009 for their approval to go to public notice. The regulations are expected to be final by fall of 2009.

Significantly reduce the phosphorus 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% phosphorus content reduction in dairy manure through improved diet and feed management.

Memorandums of Agreement were signed with eight poultry integrators in November, 2007. These Memorandums established a goal of a 30% reduction in phosphorus in litter for each integrator as compared to baseline data. Monitoring of each poultry integrator's phosphorus reduction began on July 1, 2008, and will continue annually. DCR staff will meet with each integrator individually to inform them of the results of the monitoring and discuss with them any needed adjustments for them to achieve full compliance with the 30% reduction goal. The July 1, 2008, monitoring results are shown in Figure 1.



Efforts to establish a Memorandum of Agreement with swine integrators in Virginia are being investigated.

The Department of Conservation and Recreation continues to fund a Dairy Precision Phosphorus Feeding program to help reduce phosphorus in dairy feed. DCR contributed $400,000 of Water Quality Improvement Fund (WQIF) funds to create this pilot incentive program for dairy producers. An additional $880,000 in federal grant funds were leveraged through the use of these state funds. Farmers who meet performance targets for phosphorus in their rations are eligible to receive incentive payments. Producers who participate in the program also receive free feed and manure analyses. At the beginning of 2008, 215 farms, or 29% of all dairy farms in the Commonwealth of Virginia, were enrolled in this program. Dairies have qualified for over $56,000 in incentive programs, and over $114,000 in grant money has been spent to run 5,500 feed analyses. Monitoring of phosphorus reduction is ongoing. In the 128 herds which completed a total monitoring cycle, their reduction in phosphorus fed was 109 lbs/day over a year. This equals a reduction in phosphorus fed and excreted of 19.9 tons from the 18,994 cows in those groups. These numbers show a significant decline in over-feeding of phosphorus due to

the implementation of this program. As enrollment continues to increase, further reduction is expected. However, the rise in cost of feed supplements that are low in phosphorus, primarily due to the demand for crops for ethanol production, has been somewhat detrimental to the program over the last year, and may cause future difficulties.

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 to meeting water quality objectives, protecting land helps meet goals related to outdoor recreation and quality of life.

Of all the development that has occurred in the last 400 years, more than a quarter of it has taken place in the last 15 years. Protecting land, particularly riparian lands, is a critical element of Virginia's Chesapeake Bay Tributary Strategies and will help restore and protect waters statewide. Permanently preserving land not only benefits water quality, but it also protects Virginia's natural, historic, recreational, scenic and cultural resources. Statewide 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 26 the Commonwealth, and an ambitious goal of protecting 400,000 acres by 2010 has been set. As of November 2008, approximately 263,390 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;
6. Work with the Virginia Liaison Office and Virginia's Congressional Delegation in securing federal funding for land conservation in the Commonwealth; and
7. Work with Virginia Conservation Coalition to secure state funding for land conservation.

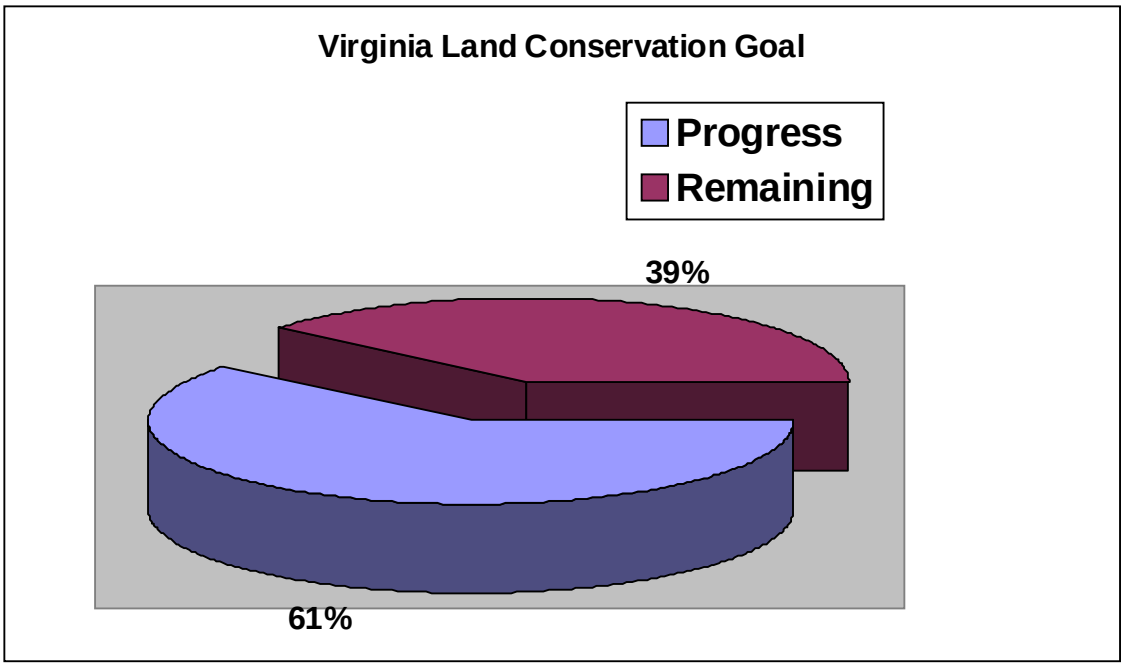
Potential Problem Areas:

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



August 15, 2008 Annual Report Summary

January 1, 2008 – June 30, 2008 Permanently Protected Acres via recorded instruments/deeds			
Entity Level	**Fee Simple**	**Easement**	**Totals**
Federal	245.10	96.87	341.97
State	7,619.59	1,205.85	8,825.44
Private/Land Trust	114.12	585.22	699.34
Local	369.22	1,675.72	2,044.94
VOF	0.00	8,617.91	8,617.91
Jan 08-June 08 Totals:	8348.03	12,181.57	20,529.60
2008 Fiscal Year:	89,282.24		
Acres Remaining on the 2010 400,000 acre goal	400,000 - 67,325.76 (FY06) – 94,201.09 (FY07) – 89,283.23 (FY08) = 149,189.92		

C. Developed and Developing Lands Category

Progress on two of the five policy areas under the Developed and Developing Lands Category has been good, with measurable gains made towards full implementation and compliance of erosion and sediment control programs statewide and full compliance with septic maintenance and pump-out and BMP monitoring and inspection requirements. Reviews of local erosion and sediment control programs and Chesapeake Bay Preservation Act implementation have progressed, and will continue until these two areas have been fully addressed. Progress in these

two areas has been steady due, in part, to the regulatory nature of these two areas and the availability of state staff to undertake these reviews.

Progress on revising local codes and ordinances so as to not conflict with water quality is ongoing, with two localities having initiated a review of their codes to maximize water quality protection. DCR is continuing to develop standards for review the of 84 Tidewater localities. By the end of 2008, it is expected that DCR will begin reviewing the 84 Tidewater localities for compliance in this area.

Progress on the remaining area – establishing jurisdictional nutrient pollution targets in the Bay watershed – has been limited, due in large part, to the unavailability of jurisdiction-specific land use data from the Chesapeake Bay Program and the inability to secure grant funds (National Fish & Wildlife Foundation Small Watershed grant program) for a pilot project to be undertaken in Richmond County.

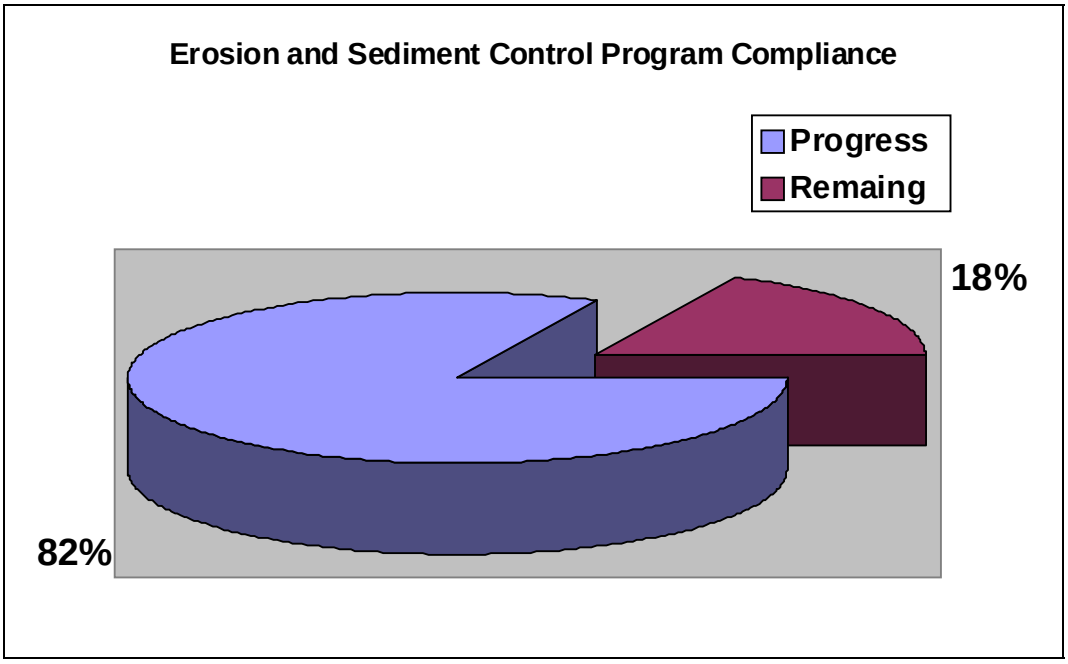
Measurable improvement toward full implementation and compliance of erosion and sediment control programs statewide

Objective: By the end of 2010, 90% of the 166 local erosion and sediment programs will be consistent with the requirements of the Virginia Erosion and Sediment Control Law.

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

Current status:

The Virginia Soil and Water Conservation Board (VSWCB) adopted revised local program review criteria effective July 1, 2004. Utilizing the revised review process, DCR staff has completed 131 local program reviews as of September 24, 2008. The remaining 34 local programs are scheduled for review in FY09. As of September 24, 2008, the VSWCB has recognized 107 local programs as being consistent with law and regulations. Programs found to be not consistent with the law and regulations are required to develop and implement corrective action agreements. These programs are then considered as being conditionally consistent with corrective action pending.



Establish jurisdictional nutrient pollution targets in the Chesapeake Bay watershed

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

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

Current status:

1. DCR coordinated a review of land use data from the Bay Program through the Phase 5 computer model with the localities in cooperation with the Planning District Commissions.
2. The Commonwealth received substantial funding through a National Fish and Wildlife Foundation Small Watershed Grants and a pilot project has been initiated in Richmond County to evaluate the relationship between pollutant loads and land use. This project should inform future discussions regarding jurisdictional nutrient pollution caps.

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

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

Performance Measurement:

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

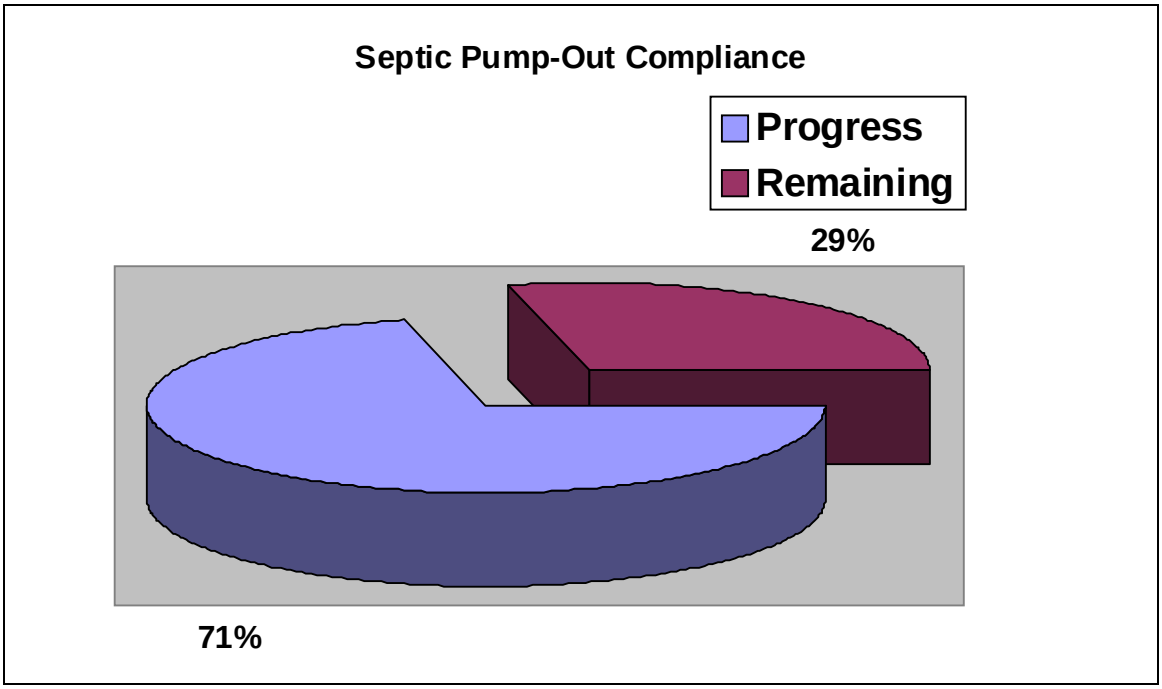
Current status: As of September 30, 2008, 60 of the 84 Tidewater localities have been found by the Chesapeake Bay Local Assistant Board, to have met the septic tank pump-out requirements. An additional 5 are known to have programs; however, a formal Board evaluation has not yet been completed. This is an increase from 37 in 2007.

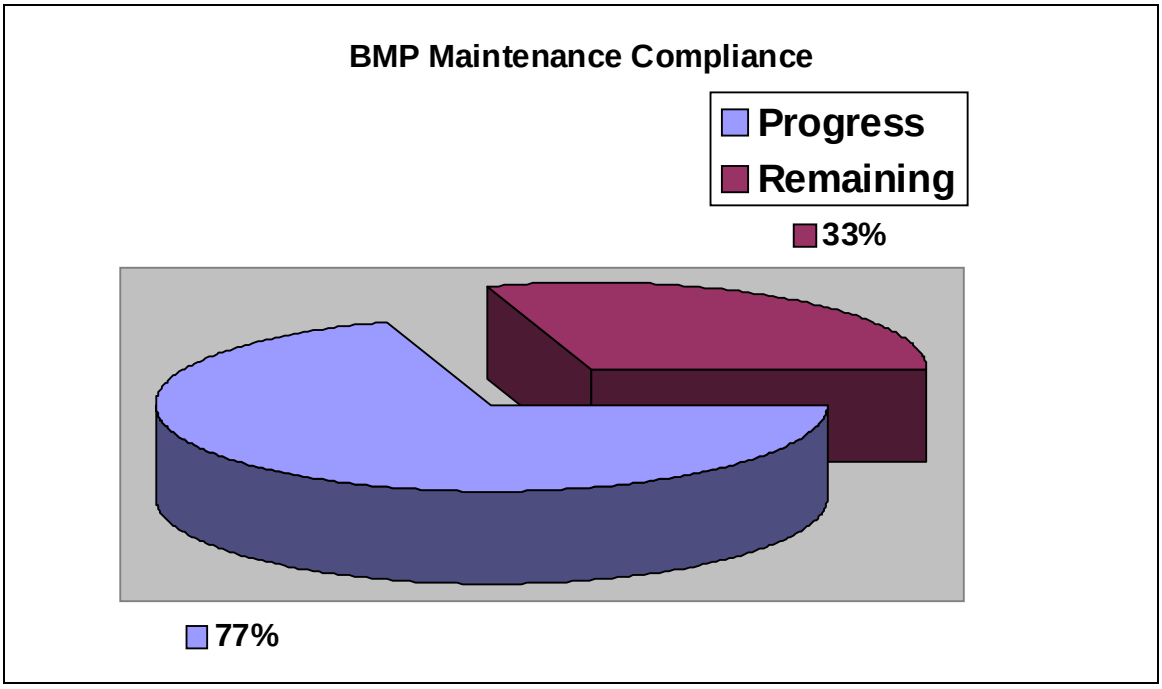
In Chesapeake Bay Preservation Areas, 13,904 septic systems are known to have been pumped out during Fiscal year 2007-08. This is based upon survey responses from 39 localities. These pump-outs translate to estimated nutrient reductions of 6,952 pounds of nitrogen (based on ½ pound per system). An additional 2047 septic systems were documented to have been inspected and 1278 were documented to have been fitted with a plastic filter.

As of September 30, 2008, 65 of the 84 Tidewater localities have been found by the Chesapeake Bay Local Assistant Board, to have met the BMP maintenance requirement. An additional 6 are known to have programs however a formal Board evaluation has not yet been completed. This is an increase from 40 in 2007.

In Chesapeake Bay Preservation Areas, 594 water quality BMPs currently are tracked, treating runoff from 10,598 acres of land.[1] These data are based upon July 2008 survey responses from 39 localities. An estimate of pollutant removal resulting from these BMPs is not currently available and will be provided in a future update.

[1] Two localities were unable to determine the acreage served by a total of 88 BMPs





Potential Legislation

There appears to be legislative interest to address the significant issue of financing septic system replacements and upgrades throughout the Commonwealth. Proposed legislation will likely allow for 'betterments loans,' a type of creative financing tool that certain other states are using where the state has a compelling interest in mitigating environmental and/or public health risks. For example, since failing home septic systems represent a source of nutrient pollution loading to

Virginia waters, betterments financing could be used to help homeowners faced with the substantial expense of having to replace failing septic systems. Such a mechanism has a dual benefit of both providing homeowners with affordable financing options and furthering the Commonwealth's goal of cleaning up polluted waters.

As envisioned, the betterments statute would likely be structured to address the following key components:

1. Provide state agencies (*i.e.*, Department of Health, Department of Environmental Quality, and Department of Conservation and Recreation) and local governments the authority to qualify a private party to receive a betterments loan for a specific purpose;

2. Ensure that there is no 'debt' to the Commonwealth, state agencies, or local governments;

3. Allow credit providers to compete in the marketplace, thereby allowing borrowers multiple sources of financing options; and

4. Avoid unfunded mandates on local governments by allowing localities to receive minor compensation for helping to facilitate the financing.

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.

Performance Measurement:

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

Current status: At least two localities in the Bay Act area have initiated a review of development codes to maximize water quality protection. DCR review of the remaining programs will commence when they complete all local government compliance reviews.

Implement Revised Stormwater Management Program

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

Performance Measurement: Upon completion of the regulatory revision process, progress will be tracked semi-annually through future revisions to the Clean-Up Plan.

Current status: The Virginia Soil and Water Conservation Board (VSWCB), through DCR staff, has developed, undertaken, and completed two regulatory actions to amend and modify the Virginia Stormwater Management Program (VSMP) Permit Regulations. One regulatory action addressed 2 separate parts of the regulations: Part II - Stormwater Management Program Technical Criteria and Part III - Local Programs. The second regulatory action addressed Part XIII: Fees.

The VSWCB and DCR established a Technical Advisory Committee (TAC) to provide public participation in the development, modification and amendment of Parts II, III, and XIII of the regulations. The TAC was very active and developed proposed draft regulations. The TAC has proposed enhancements to the water quantity and quality criteria for proposed projects, new procedures for localities and DCR to follow when implementing a stormwater management program and modifications to the fees to cover the costs associated with the program. The proposed draft regulations were approved by the VSWCB at the September 24, 2008 meeting.

Next steps in the regulatory development process include:

- Preparing a fiscal analysis of the proposed regulations for submittal to the Department of Planning and Budget for review and approval.
- Submit proposed regulations to the Secretary of Natural Resources for review.
- Submit proposed regulations to the Governor for review.
- Submit approved regulations to the Registrar for publishing.
- Complete a 60-day public comment period.
- Revise regulations based on public comment.
- Submit regulations to VSWCB for final approval.
- Submit regulations to the Department of Planning and Budget, the Secretary of Natural Resources, the Governor, and the U.S. Environmental Protection Agency for final approval.

D. Air Category

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

On July 11, 2008 U.S. Court of Appeals for the D.C. Circuit has vacated the U.S. EPA's Clean Air Interstate Rule (CAIR). This is now the second utility control program struck down by this court, joining the Clean Air Mercury Rule (CAMR) decision. All the impacted states, including Virginia, are currently evaluating the impact of this latest court decision. However, it is too early to determine the possible impacts of this decision on the projected emission reductions listed in the Clean-Up Plan. The EPA is appealing the CAIR decision. The CAMR decision is also still involved in the appeal process. Additional revisions to the emission reduction projections in this plan will not be made until the full impact of these court decisions is determined.

The Virginia mercury deposition study has been completed and the final report has been posted to the DEQ website at: www.deq.virginia.gov/regulations/reports.html.

III. State and Local Coordination

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.

Performance Measures:

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

There was significant progress in advancing a Networked Education for Municipal Officials (NEMO) approach in 2008. As anticipated, the demand for support has grown rapidly and the likely impediment for advancing this approach will be staffing and funding limitations.

In addition and in concert with the NEMO approach, the Coastal Zone Management Program has focused available resources on sustainable communities planning. Working with Planning Districts, the program has focused technical and financial assistance on adaptation to climate

change and blue and green infrastructure planning. These focal areas are mutually dependant and complement conservation of vital land and water resources.

IV. Healthy Waters Initiative

Background: The Commonwealth is concerned about the widening gap between impaired and restored waters. This concern has also been expressed by the U.S. EPA, Region III through its Healthy Waters priority which seeks to accelerate restoration of impaired waters and to advance preventative approaches to protect existing healthy waters.

The Department of Conservation and Recreation and the Department of Environmental Quality are implementing the following healthy waters elements as part of a pilot healthy waters grant initiative funded by EPA. The goal of this initiative is to establish a comprehensive Healthy Waters Strategy for the Commonwealth.

- Building Capacity for Conserving Healthy Streams: This project element utilizes ecological assessment data to identify and communicate the importance of protecting high quality or ecologically rich streams that are increasingly at risk. This data base has been developed as part of the Interactive Stream Assessment Resource (INSTAR) by Virginia Commonwealth University in partnership with DCR and DEQ. Significant progress has been made of developing outreach material and web-based decision support tools.
- Integrated Watershed Management Planning: The goal of this project element is to enhance local government acceptance of TMDL implementation. The Smith Creek TMDL implementation planning process has been initiated and an extensive effort has been made to better integrated local government officials into the planning process.
- Watershed Protection Planning: Developing a pilot watershed protection plan for an identified healthy water body is the goal of this project element. Discussions are underway with local government representatives for a couple of candidate watersheds.

V. Significantly accelerate removal of waters 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.
Performance Measurement:

- *Number of Waterbodies removed from the list of impaired waters; and*
- *Measurable improvements in waters not removed from the impaired waters list.*

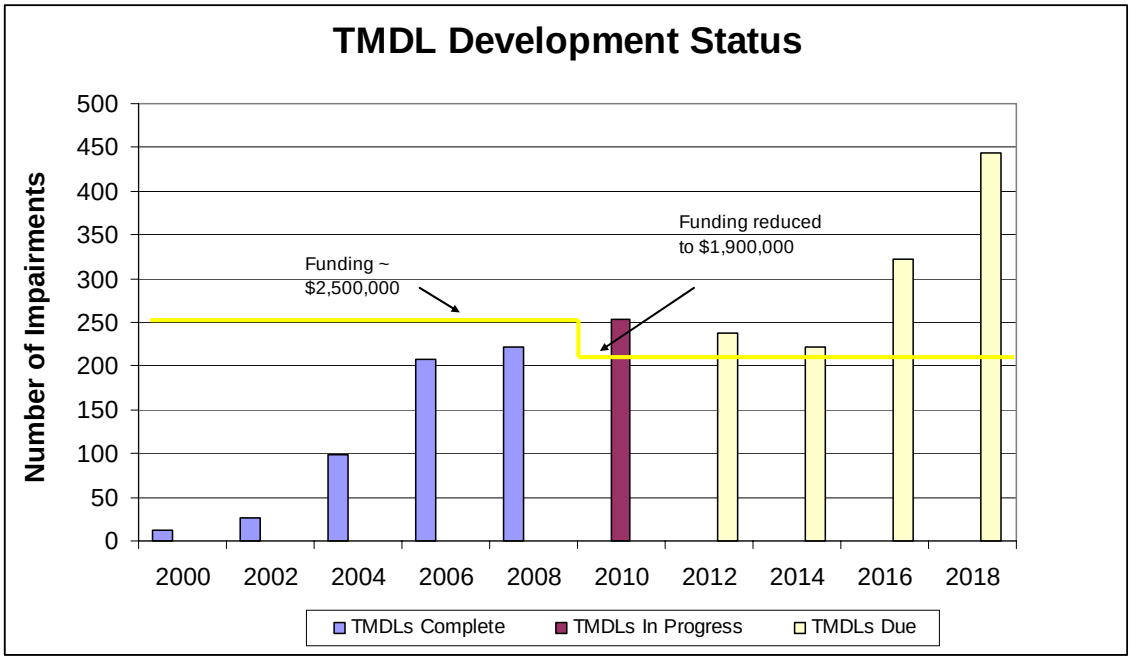
Following the completion and approval of the Total Maximum Daily Load (TMDL) for a pollutant for a particular waterbody, a TMDL Implementation Plan (IP) is required by the Virginia Water Quality Monitoring, Information and Restoration Act of 1997. While TMDL development is pollutant specific, IP's are designed to address multiple water quality problems

within a watershed at one time. IP's describe the actions (*i.e.*, best management practices) required to achieve the allocations contained in the TMDL.

To meet the May 1, 2008 Consent Decree (CD) requirements, Virginia submitted TMDLs covering 138 shellfish and non-shellfish CD impairments, and 77 non-CD impairments. The 2010 CD schedule is currently underway, with 216 CD and 75 non-CD impairments contracted for TMDL completion.

Virginia is working with EPA Region III and Maryland to complete the TMDL for the Chesapeake Bay and Tributaries. This TMDL is covered under the Consent Decree, and is scheduled for completion by December 2010.

Annual program funding is decreasing from $2.5 million to $1.9 million. TMDL development will be completed to meet the consent decree requirements through May 1, 2010. For the years beyond 2010, increased funding will be necessary to maintain the development pace. A new MOU is being developed with EPA to establish future TMDL and Implementation Plan goals.

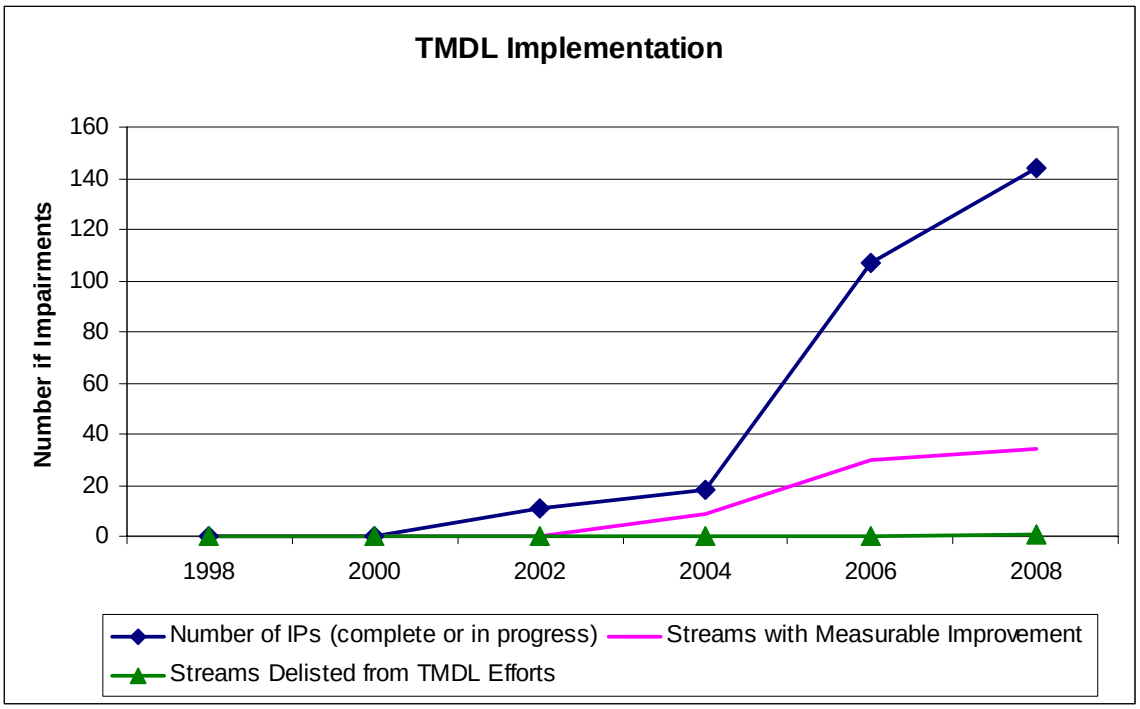


* 2012 – 2018 numbers updated as of 2006 305(b)/303(d) Integrated Report.

Development of TMDL Implementation Plans [IPs] has not progressed nearly as quickly as development of the TMDLs, largely due to lack of funding. In fact, only Six IPs have been completed since the 2007 progress report that address 14 impaired stream segments. Seven additional IPs were started that address 22 impaired stream segments.

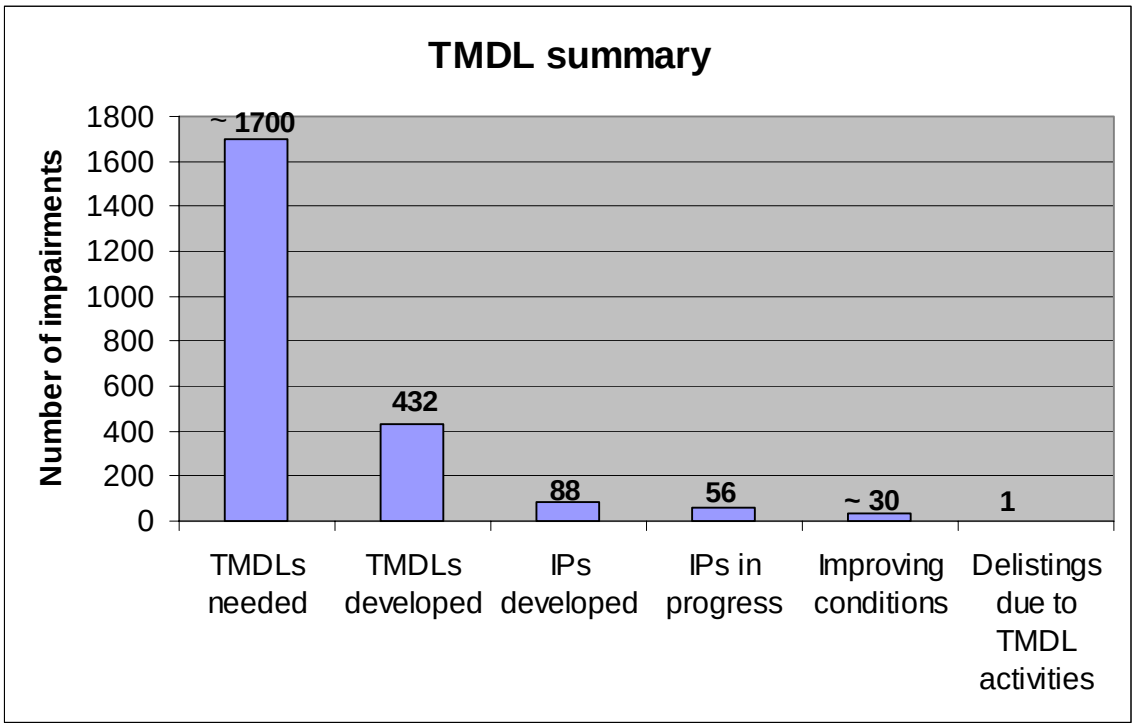
Several of Virginia's streams are showing measurable improvements following TMDL implementation activities in the watersheds or implementation in headwater streams resulting in downstream improvements. These include the Willis River in Buckingham and Cumberland Counties and the North River in Rockingham County based on the Virginia's 2006 Water

Quality Assessment Report that indicated that these previously impaired stream and river were attaining the bacteria standard. In the 2008 Assessment Report five additional stream segments were listed that have received targeted federal and state implementation funding and are attaining water quality standards. These include: Willis River, Buckingham and Cumberland Counties, 16.68 miles; Big Otter River, Bedford and Campbell Counties, 13.98 miles, Maggodee Creek Upper, Franklin County, 4.40 miles; Stroubles Creek Middle, Montgomery County 2.20 miles, Deep Creek, Nottoway County, 5.59 miles, and the Lynnhaven River in the City of Virginia Beach.



Prior to July 2006, the only targeted funding available for TMDL implementation in Virginia was from EPA's 319 program. This funding is used to implement agricultural, urban, and residential best management practices and technical assistance funding to hire staff through Soil and Water Conservation Districts and local Health Departments to work with landowners. Starting in July 2006, DCR began targeting a portion of the Water Quality Improvement Fund (WQIF) to an additional eight soil and water conservation districts for TMDL implementation. In addition to targeting WQIF agricultural cost-share funding, an allocation of general funds was made to support technical assistance staff in these districts. Approximately $5.6 million of WQIF, 319, and general funds were spent or obligated for contracted BMPs and to provide technical assistance in TMDL implementation during 2007.

The figure on the next page summarizes the current status in all steps of the TMDL process. The figure highlights the large number of TMDLs required due to the number of impaired waters throughout Virginia. While progress in Virginia continues in TMDL development, additional impairments continue to be added with each assessment cycle. The figure clearly shows the challenge of moving from the study and planning phase into implementation. To date, there is only one stream that has been fully restored through the TMDL process.



EPA Funded TMDL Initiatives:

Smith Creek Implementation Plan: The goal of this initiative is to integrate water quality improvements that will be developed as part of the TMDL Implementation Plan (IP) with local land use priorities within the Smith Creek watershed, located in Rockingham and Shenandoah Counties. In order to accomplish this objective, the IP must reflect the needs of the community with respect to both development and water quality, and the IP must be well-integrated with existing planning efforts, including local comprehensive plans.

Accotink Benthic TMDL: The Accontink Creek Benthic TMDL is within a highly urbanized watershed in Fairfax County. This innovative TMDL is addressing the impact of increased storm flows resulting from large areas of impervious surfaces. Very little of the sediment responsible for the benthic impairment is being transported from the watershed. Instead the exacerbated stream flows (volume & velocity) produce bottom scour and bank erosion resulting in periodic re-suspension of the bottom sediment responsible for the degraded benthic community. The goal of the TMDL is address reasonable options to reduce the extreme stream flows that cause the physical destruction of benthic habitat. This TMDL will serve as the prototype for future urban TMDLs in Virginia.

Measureable Improvements:

It is generally too early to show water quality improvements and results for projects in the early stages of implementation (those less than two years old). It should be noted that since 2001 when the two (2) pilot projects were initiated in the Southern Rivers (Middle Fork Holston and Upper

Blackwater River), the State's water quality bacteria standard has been modified twice, and a third revision was approved through the State Water Control Board's Triennial Review of Water Quality Standards. In the case of the two previous modifications, the revisions have been more conservative and this has impacted the achievement of measurable progress for water quality improvements.

There are several implementation projects that are showing marked improvement in water quality, but for many of the TMDL implementation projects it is still too early in the process to assess the degree of water quality improvement. The Willis River, however, may be an exception. This project has shown remarkable success in the 30 months it has been active. In 1996, the Willis River (part of the James River Basin, located in Cumberland and Buckingham Counties) was placed on the Commonwealth of Virginia's 1996 303(d) list because of violations of the fecal coliform bacteria water quality standard. In 2005, DCR and Peter Francisco Soil and Water Conservation District, with extensive public input, started a five-year TMDL project to reduce fecal coliform levels in the Willis River through implementation of agricultural and residential BMPs in accordance with an approved TMDL implementation plan.

As of June 2008 numerous implementation actions had occurred to address the Willis River impairment, including: (1) 18 miles of livestock exclusion stream fencing installed, resulting in removal of 2,577 livestock from having direct stream access, (2) one loafing lot management system for a dairy was installed, (3) ten septic tanks have been pumped out, an additional three are contracted, (4) one septic system has been repaired and three repairs are contracted, (5) one septic system has been replaced and two more are contracted, and (6) an alternative waste treatment system is contracted. As a result of these actions, the bacteria standard violation rate has been reduced to 10% or less for portions of the Willis River resulting in a partial de-listed from the Impaired Waters List.