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 2009

COMMONWEALTH of VIRGINIA

Office of the Governor
P.O. Box 1475
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L. Preston Bryant, Jr.
Secretary of Natural Resources

December 31, 2009

TO: Chairman and Members, House Committee on Agriculture, Chesapeake and Natural Resources
Chairman and Members, House Appropriations Committee
Chairman and Members, Senate Committee on Agriculture, Conservation and Natural Resources
Chairman and Members, Senate Finance Committee

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

SUBJECT: 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 2009. 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 July 2009. 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:

The completely filled water droplet indicates that the work effort has either achieved stated goals or is very close to completion, in the case of on going activities it dictates the activities are occurring and serving the goal as planned;

The half-filled water droplet indicates that the effort to achieve the goal is underway, achieving success, and approaching completed status; and,

The clear water droplet indicates that the effort to accomplish the goal has either not begun, is temporarily on hold, or has not achieved significant progress.

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

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Measuring Progress:

The clear water droplet indicates that the effort to accomplish the goal has either not begun, is temporarily on hold, or has not achieved significant progress.

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I. Measurable Environmental Outcomes

Impaired Waters Assessment

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. Virginia was the first state in the mid-Atlantic region to receive United States Environmental Protection Agency (EPA) approval of the final 2008 Assessment. The following table compares the impaired waters identified in the 2008 Assessment with the 2006 results.

Table II-1 Impaired Waters Assessment

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

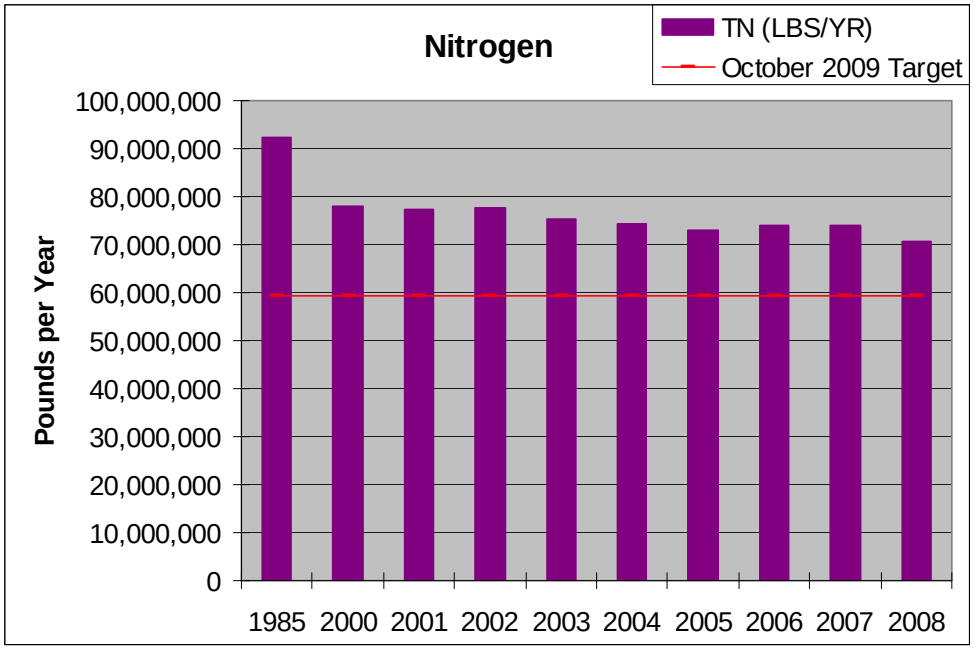
New impairments were identified in 2008, primarily due to DEQ's assessment of waters which had not previously been monitored, or due to the adoption of more stringent water quality criteria. While the 2008 list includes additional impaired river miles, the good news is that 343 river miles were removed 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 2008 are shown in the following charts and are compared to Virginia's allocation. These figures are based on Phase 4.3 of the Chesapeake Bay watershed model.

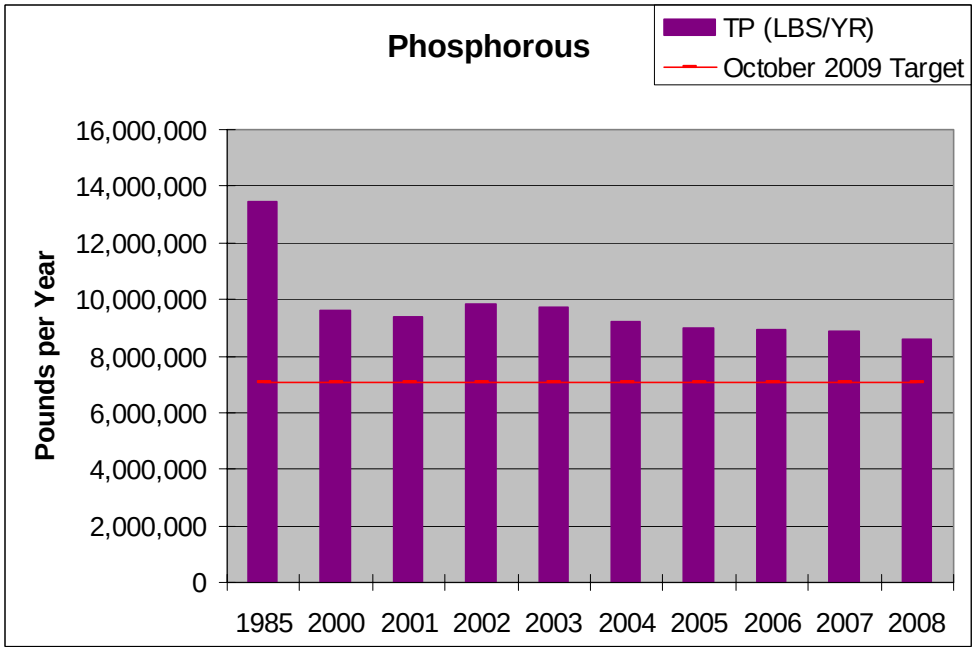
For nitrogen, Virginia has reduced its loadings by 21.7 million pounds/year [MPY] between 1985 and 2008, but still needs to reduce loads by another 11.4 million MPY to meet the goal of 59.2 MPY adopted by the Chesapeake Bay Program's Principal Staff Committee in October of 2009.

Figure 1.



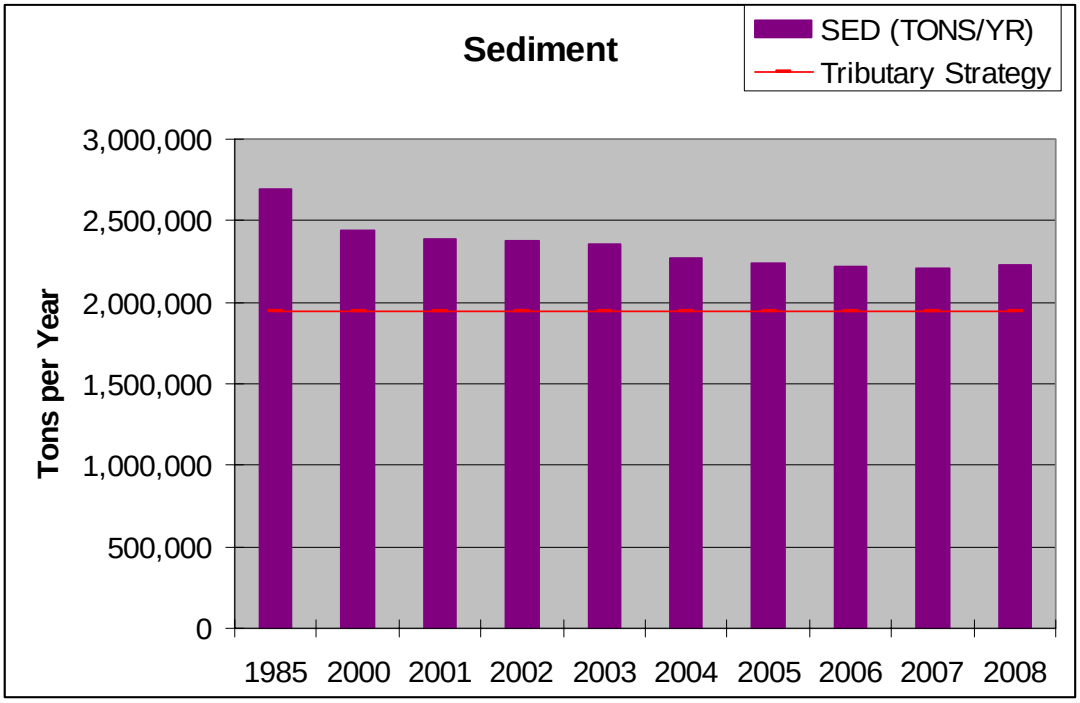
For phosphorus, Virginia has reduced its loadings by 4.85 MPY between 1985 and 2008 but still needs to reduce loads by another 1.55 million MPY to meet the 2009 adopted target of 7.05 MPY of TP.

Figure 2.



For sediment, Virginia has reduced its loadings by 462,000 tons per year [TPY] between 1985 and 2008 but still needs to reduce loads by another 289,000 TPY to meet the assigned allocation of 1,941,000 TPY. New sediment pollution reduction targets will be developed for sediment goals as the Bay watershed model is recalibrated and numbers are released in the spring in 2010.

Figure 3.



II. Clean-Up Strategy Components

Wastewater Category

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.

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 2009 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 2008 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 – 2008 vs. Waste Load Allocations

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

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

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

There are currently 49 signed WQIF agreements, obligating $613.9 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#draft.

Since its formation in 1998, the WQIF Point Source Program has received a total of $398.89 million in appropriations and accrued interest. The following table summarizes these deposits:

Table II-2: WQIF Point Source Program Appropriations

Period	Funds for Bay Point Source Projects (million dollars)
FY 1998	$10.00
FY 1999	$37.10
FY 2000	$27.64
FY 2001	$10.30
FY 2005	$12.57
Interest Earned (though FY05)	$8.16
FY 2006	$80.28
Interest Earned (FY06)	$1.57
FY 2007	$197.33
Interest Earned (FY07)	$8.46
FY 2008	$5.00
FY 2009	$0.48
TOTAL DEPOSIT =	$398.89

Of the $398.89 million made available, $95.25 million was used for twenty-four voluntary/cooperative "BNR" grants prior to adoption of nutrient discharge control regulations. A total of $4.01 million was awarded through 39 Technical Assistance grants, for projects such as Basis of Design Reports, Interim Optimization Plans, and support for the Nutrient Credit Exchange Association. The $299.63 million balance has been made available for recent grants to meet the Bay nutrient waste load allocations. With $613.9 million obligated for these additional projects, and an available balance of $299.63 million, **the WQIF has been over-obligated by about $314.27 million.**

This over-obligation will be addressed, in part, by additional funding provided by the 2007 General Assembly, which authorized $250 million in bonds 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 was given to the 2009 General Assembly session, with an estimate that $176 of the $250 million was needed to cover grant reimbursement requests through FY 2010.

In addition to the 49 executed grant agreements, another 10 projects are in the "ready to proceed" stage (Preliminary Engineering Reports submitted) and are likely to have signed agreements within the next year. These projects could add an estimated $70-80 million to the existing total grant commitment total, and as a result the WQIF is being over-obligated beyond the amount provided by the bonds. This is due to the fact that the DEQ Director is mandated to sign an agreement with all eligible applicants, except if the project is deferred based on the cost-effectiveness and viability of nutrient trading in lieu of NRT installation. The bond proceeds are projected to be fully expended by the end of FY 2011, and **the funding shortfall is currently estimated to be about $137 million by the end of FY2014**.

Estimated Nutrient Reductions from WQIF-Funded Projects

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 shows estimated pollution reductions resulting from the 49 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 2008, compared to the maximum nutrient load they are allowed to deliver (WLA), and the amount they are projected to deliver in 2011. As can be seen, by 2011 these projects will reduce the nutrient load being delivered to the Bay and tidal rivers by approximately 1,295,910 pounds of nitrogen and 146,760 pounds of phosphorus compared to the 2008 loads.

Table II-3. Estimated Nutrient Reductions from WQIF-Funded Projects

Facility	Delivered Total Nitrogen Load (lbs/yr)			Delivered Total Phosphorus Load (lbs/yr)		
	2008	WLA	2011	2008	WLA	2011
Onancock STP	3,288	9,137	6,944	886	685	521
Cape Charles STP	4,873	3,046	3,655	761	228	274
Alleghany Co.-Lower Jackson	0	8,223	3,868	0	2,284	1,289
Craigsville STP	NA	NA	NA	NA	NA	NA
Chesterfield Co.-Falling Crk	428,945	153,801	153,801	30,149	15,380	15,380
Chesterfield Co.-Proctors Crk	405,488	411,151	388,004	56,063	41,115	29,846
Farmville STP	4,120	16,665	16,665	4,917	1,572	1,572
Henrico STP	1,020,371	1,142,085	850,625	32,962	114,209	86,798
HRSD-Army Base STP	837,408	610,000	917,058	20,672	54,820	55,024
HRSD-James River STP	841,107	1,250,000	537,525	32,806	60,911	44,794
HRSD-Nansemond STP	644,533	750,000	621,169	58,123	91,367	56,470
Lex-Rockbridge Reg. STP	11,981	16,446	9,356	15,406	4,568	8,576
Richmond STP	1,958,363	1,096,402	1,047,673	104,502	68,525	65,480
RWSA-Moores Crk. STP	268,126	167,201	222,340	114,785	22,842	21,538
HRSD-York STP	556,513	274,100	260,210	19,450	31,978	24,286
Culpeper WWTP	40,692	33,440	24,300	6,404	4,112	3,984
FCW&SA-Remington	6,407	18,578	6,962	689	2,284	884
Orange STP	24,215	22,293	8,174	4,465	2,741	1,005
Rapidan SA-Wilderness	14,976	9,289	5,722	6,073	1,142	704
Stafford Co.-Little Falls Run	43,218	97,458	72,941	2,418	7,309	4,376
Tappahannock STP	12,931	9,746	6,091	835	731	457
Warrenton STP	63,498	18,578	18,578	3,311	2,284	2,284
Warsaw STP	9,017	3,655	1,827	2,836	274	244
ACSA-Fishersville STP	19,416	21,441	11,846	9,178	2,814	1,555
ACSA-Middle River STP	30,913	36,449	26,855	8,592	4,784	3,525
ACSA-Stuarts Draft STP	4,906	21,440	8,737	1,862	2,814	1,147
Arlington Co. WPCF	502,377	365,467	365,292	4,663	21,928	7,306
Berryville STP	20,261	5,713	14,088	4,305	492	2,032
Broadway STP	52,933	15,671	17,140	11,362	1,351	1,674
Clarke Co. SA-Boyce STP	NA	NA	NA	NA	NA	NA
Colonial Beach STP	35,943	18,273	18,273	7,187	1,827	1,827
Dale Service Corp. #1 STP	31,096	42,029	34,719	952	2,522	2,083

Facility	Delivered Total Nitrogen Load (lbs/yr)			Delivered Total Nitrogen Load (lbs/yr)		
Dale Service Corp. #8 STP	24,651	42,029	34,719	928	2,522	2,083
Fairfax Co.-Noman Cole	701,558	612,158	612,158	12,923	36,729	22,038
FCW&SA-Vint Hill STP	2,057	3,180	1,325	161	241	104
FWSA-Opequon STP	71,091	75,724	113,390	3,595	5,910	9,439
FWSA-Parkins Mill STP	67,936	45,074	26,594	26,846	3,517	2,767
HRRSA-North River STP	78,519	111,492	71,826	11,447	14,633	9,427
K. Geo. Co-Dahlgren STP	4,913	9,137	7,675	275	914	672
K. Geo. Co-Fairview Beach	534	1,827	822	104	183	82
LCSA-Broad Run STP	15,543	101,113	44,085	301	2,345	1,022
Luray STP	9,467	8,576	8,576	2,478	1,126	1,126
Middletown STP	NA	NA	NA	NA	NA	NA
Mt. Jackson STP	5,162	5,713	4,081	206	493	352
Pr. Wm. Co.-Mooney STP	263,289	219,280	150,755	3,351	13,157	9,045
Purcellville STP	7,673	15,167	10,617	250	1,055	591
Stafford Co.–Aquia STP	82,899	73,093	57,470	1,464	4,386	3,448
Waynesboro STP	57,288	21,441	16,643	25,548	2,814	2,718
Woodstock STP	14,520	16,324	16,324	3,528	1,407	1,407
Totals =	9,305,015	8,009,105	6,857,498	660,019	661,325	513,256

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 60 loans in FY 09 totaling $340,417,221. This includes 41 non-point source improvement projects and 19 wastewater treatment plant or sewer system improvement projects. Approximately 86.7% ($294,982,704) 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).

Table II-4. Clean Water Revolving Loan Fund Project List

FY 09 Virginia Clean Water Revolving Loan Fund Project List					
Name	**Loans**	**Stream Impairment**	**Bay Impairment**	**Total Funding for Impaired Waters**	**Purpose**
Arlington	$50,000,000		$50,000,000	$50,000,000	Reduce Nutrients to the Bay
Arlington	$35,000,000		$35,000,000	$35,000,000	Reduce Nutrients to the Bay
Falls Church	$4,100,000		$4,100,000	$4,100,000	Reduce Nutrients to the Bay
Lynchburg	$19,000,000	$19,000,000		$19,000,000	Reduce CSO/SSO
City of Newport News	$3,200,000			$0	Reduce SSO
City of Richmond	$32,000,000		32,000,000	$32,000,000	Reduce Nutrients to the Bay
Clark County	$3,936,171	$3,936,171		$3,936,171	Reduce Nutrients to the Bay
Frederick/Winchester Service Authority/Opequon WWTP	$19,870,089		$13,909,062	$13,909,062	Reduce Nutrients to the Bay
Hampton Roads Sanitation District/ York River WWTP	$30,000,000		$30,000,000	$30,000,000	Reduce Nutrients to the Bay
Hampton Roads Sanitation District/Nansemond WWTP	$19,410,226		$19,410,226	$19,410,226	Reduce Nutrients to the Bay
Harrisonburg-Rockingham Regional Service Authority	$34,000,000		$23,800,000	$23,800,000	Reduce Nutrients to the Bay
Maury Service Authority	$6,543,947	$6,543,947		$6,543,947	Improve Local Water Quality
Prince William County SA	$41,000,000		$30,750,000	$30,750,000	Reduce Nutrients to the Bay
Big Stone Gap	$4,023,000			$0	Reduce I/I flows to the WWTP
Town of Broadway	$8,000,000	$4,000,000	$4,000,000	$8,000,000	Improve Local Water Quality and Reduce Nutrients to the Bay
Town of Luray	$2,080,038	$1,040,019	$1,040,019	$2,080,038	Improve Local Water Quality and Reduce Nutrients to the Bay
Town of Onancock	$5,032,725		$3,774,544	$3,774,544	Reduce Nutrients to the Bay
Town of Washington	$4,000,000	$4,000,000		$4,000,000	Improve Local Water Quality
City of Waynesboro	$14,624,858		$5,264,949	$5,264,949	Reduce Nutrients to the Bay
AgBMP	$4,596,167	$3,413,767		$3,413,767	Eliminate Non-Point Source Pollution
Total Value	$340,417,221	41,933,904	$253,048,800	$294,982,704	
To Impaired Non-Bay Waters		$41,933,904	12.3%		
To Impaired Bay Waters		$253,048,800	74.4%		
Total Assistance		$294,982,704	86.7%		

Discharges from Boats

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

No Discharge Zones (NDZs) are federally designated areas where the current prohibition on the discharge of untreated sewage from boats is extended to include discharge of any sewage, regardless of treatment status. The 2009 Virginia General Assembly adopted HB 1774, which resolves that Virginia seek this designation for all its tidal Bay tributaries. The designation is contingent on EPA's determination that (1) adequate local disposal alternatives (such as marina-based pump-outs) exist, and (2) the designation has the support of local stakeholders. These criteria are most easily satisfied on a limited geographic scale. Thus, Virginia's approach has been to prepare applications for individual creeks or groups of creeks, giving priority to areas where either a particular need is identified through the TMDL process, or a stakeholder petition is received. DEQ is the lead agency for preparing NDZ applications, collaborating with stakeholders and sister agencies to define appropriate boundaries, estimate peak-season demand for boat sewage disposal, evaluate the adequacy of existing disposal alternatives, and conduct local education and outreach.

Virginia currently has three EPA-approved NDZ applications, two for tidal water. Smith Mountain Lake, a non-tidal impoundment on the Roanoke River, was designated in 2000. The tidal Lynnhaven River and its tributaries near Virginia Beach was federally designated in February 2007, with final adoption by the State Water Control Board (SWCB) in March. Along with sanitary sewer upgrades, agricultural BMPs and stormwater programs, the Lynnhaven NDZ is regarded as a key element in that river's remarkable recovery from bacteria pollution, documented as a national "success story" by EPA in 2009. The second application in tidal waters establishes NDZs on three tidal creeks in Middlesex County: Broad Creek, a tributary to the Rappahannock River, and Jackson Creek and Fishing Bay, tributaries to the Piankatank River. This application was approved by EPA in 2009, and adopted by the SWCB in October. A third tidal NDZ application, for Rudee Inlet and Owl Creek in Virginia Beach, is in final stages of preparation, with formal submission to EPA anticipated in early 2010.

Fulfilling the vision of HB 1774 will require that DEQ step up its effort to designate individual NDZs, and explore means of expanding and consolidating them while maintaining the sense of local support that is essential for a successful application. DEQ has responded with a pilot initiative focusing on tidal creeks fringing Virginia's Northern Neck (the peninsula of land separating the tidal Potomac and Rappahannock Rivers). This area was selected based on need (22 bacteria TMDLs, covering over 90 individual shellfish impairments, completed since 2000), locally high density of recreational boat traffic, and stakeholder support expressed at TMDL public meetings. Working in collaboration with the Northern Neck Planning District Commission, DEQ completed boat-based shore reconnaissance and boat traffic estimates for approximately one half of the area's shoreline in fall, 2009. Data analysis is underway, and public outreach is scheduled to begin in winter, 2009. DEQ anticipates submitting the first applications to EPA by spring, 2010, with the project scheduled to be completed by December, 2010.

Discharges of Toxic Substances

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

Polychlorinated Biphenyl (PCB) TMDLs:

Potomac River: This TMDL was completed in 2008 as part of a consent decree for the District of Columbia. PCB point source monitoring has been implemented for those VPDES permits identified in the TMDL as discharging PCBs to jurisdictional waters.

Bluestone: This is not a consent decree TMDL. West Virginia plans to join Virginia in the development of an interstate PCB TMDL for the Blustone River. The Virginia portion of the watershed has impairments for PCBs in fish and water. High PCB concentrations in the water column found during Virginia's TMDL data acquisition phase triggered an EPA concern and a cleanup effort. A former Super Fund site, Lin Electric facility located one mile upstream in West Virginia, was targeted for additional remediation. This effort resulted in the discovery of 38 barrels, some containing hazardous materials, 3 transformers, contaminated groundwater, and extremely high levels of PCBs in sediment/sludge. The EPA Super Fund effort is conducting additional PCB monitoring in both states.

Roanoke (Staunton): This consent decree TMDL is nearly complete with a report due May 2010. The Roanoke TMDL monitoring has identified two significant PCB sources. The TMDL is including monitoring requirements and Pollution Minimum Plans for the active point sources.

Levisa Fork: This consent decree TMDL is currently under development with a report due May 2010. Since TMDL monitoring has not revealed a viable source(s) of the contaminant, this particular TMDL may be submitted to EPA as a phased TMDL. As a phased TMDL, it would contain a monitoring plan to collect additional data and a commitment date to reopen TMDL.

Mercury TMDLs:

North Fork Holston River: This consent decree TMDL will be completed by May 2010. A fish consumption advisory for mercury extends approximately 81 miles from Saltville (VA) to the Tennessee state line. Additional monitoring for the TMDL effort was completed by Olin in 2008. A final series of public meetings are scheduled for January 2010 with the TMDL report due by May 2010. While most of the river mercury originated from the Olin plant site, this contaminant has been distributed throughout the floodplain down stream. The TMDL also identified extensive mercury loadings coming off the watershed through both groundwater and surface runoff. Mercury may naturally occur in the soil or may have fallen onto the soil from atmospheric deposition. The latter would have most likely originated from the many coal fired power plants in region.

South River and Shenandoah River: This is another consent decree TMDL that will be submitted by May 2010. The South River has a fish consumption advisory that extends about 150 miles from Waynesboro to the confluence of the Shenandoah and Craig Run. The DuPont facility, which operated for 21 years on the banks of the South River, was the primary source of mercury deposited in the floodplain. Smaller amounts of mercury are transported from the old Dupont site; atmospheric deposition was not identified as a significant mercury source. Fish

tissue from a reference site above a dam in Waynesboro show safe mercury levels while fish tissue below the dam containing elevated amounts of mercury. Unfortunately, mercury levels in fish tissue from this portion of the River have not shown a decline since the use of mercury was eliminated by Dupont in 1958.

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

Objective: Encourage nitrogen-reducing treatment units in the repair of failing onsite sewage systems and in new systems. Continue to identify and replace straight pipe discharges with approved onsite sewage systems.

Performance Measurement: Report semi-annually on the number of failing systems or straight pipes that have been repaired.

The Virginia Department of Health is in the process of promulgating regulations in the following areas:

- Alternative Onsite Sewage Systems (AOSS)
    - Operation and maintenance of all AOSS will improve the reliability of these systems and result in a consistently higher quality effluent entering the environment.
    - Assist owners in procuring available funds including betterment loans and WQIF funding. The department shall evaluate alternative onsite sewage system designs and establish nitrogen reducing capability.
    - For AOSS >1000 gpd, the system must be designed to produce less than 5 mg/l TN at the lower vertical boundary of the project.
- Indemnification Fund
    - Assist qualified owners in obtaining an award when a VDH employee was negligent and such negligence caused the sewage system to fail within 3 years of installation.
- Civil Penalties
    - Establish a uniform schedule of civil penalties for violations of the operation permit of non-conventional onsite sewage systems

The percentage of sewage system repair applications and component replacement applications increased from 14% of the total applications in 2008 to 22% from January 2009 through September 2009.

Agriculture and Forestry Category

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

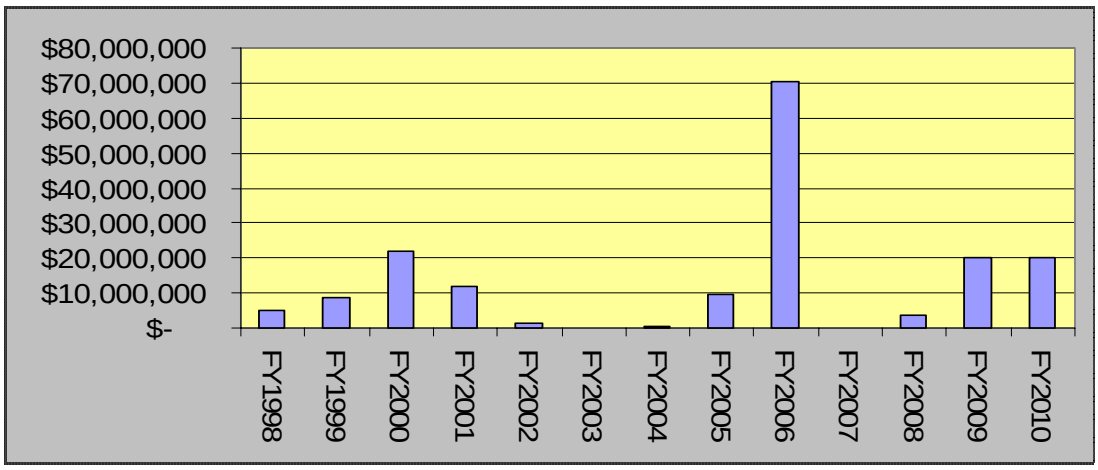
Performance Measurement: Pounds of nitrogen and phosphorus reduced through the implementation of priority practices as reported to the EPA Chesapeake Bay Program.

Table II-5 Potential Nutrient Reductions Calculations, Priority Practice Implementation, calendar year 2008

Practice	Level of Implementation	Total Nitrogen Pounds Reduced	Total Phosphorus Pounds Reduced
Nutrient Management	171,436 acres	1,028,616	77,146
Cover Crops	1,231 acres	422,669	0
Livestock Exclusion	541,277 linear feet	40,256	7,319
Stream Buffers	531 linear feet	6,372	643
Continuous No-Till	11,760 acres	99,960	19,639

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.

Figure 4. Fluctuations in Appropriations to WQIF for Nonpoint Source Reduction Practices



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. FY 2010 funding remained level with a $20 million commitment to the Natural Resource Commitment Fund. $4.8 million of the commitment was generated from interest on WQIF funds and 15.2 were non-general revenue, special state funds.

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.

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

Two efforts continue to be pursued relative to this objective. First, the Department of Conservation and Recreation (DCR) and the Virginia Poultry Federation (VPF) initiated a cooperative effort to cost-share the transport of poultry litter from areas of concentrated poultry production to outlying areas where soil analyses indicate that crops need additional phosphorus. The Commonwealth and the VPF 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. From January through November, 2009, 6,695 tons of litter was transported utilizing $49,679 of cost-share money. Nutrient management plans submitted with applications for this program are reviewed by DCR staff, and all litter that has been transferred under this program has been applied in accordance with these plans.

The second effort is the continued consideration of regulatory or legislative changes to the poultry waste management law or regulations to ensure proper nutrient management practices by end users of poultry litter. The Department of Environmental Quality formed a Technical Advisory Committee (TAC) to pursue the recommendations made by a Secretary of Natural Resources stakeholder committee. The stakeholder group had recommended 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 TAC drafted a set of revisions to the existing poultry waste management regulations including a technical regulation for poultry

waste end users that gives several options for application of litter in ways that will reduce nutrient pollution. Another key component of the revised regulations addressed the improvement of tracking poultry waste transfers from growers to brokers and end users. Final regulations were approved by the water board at their October 26, 2009 meeting.

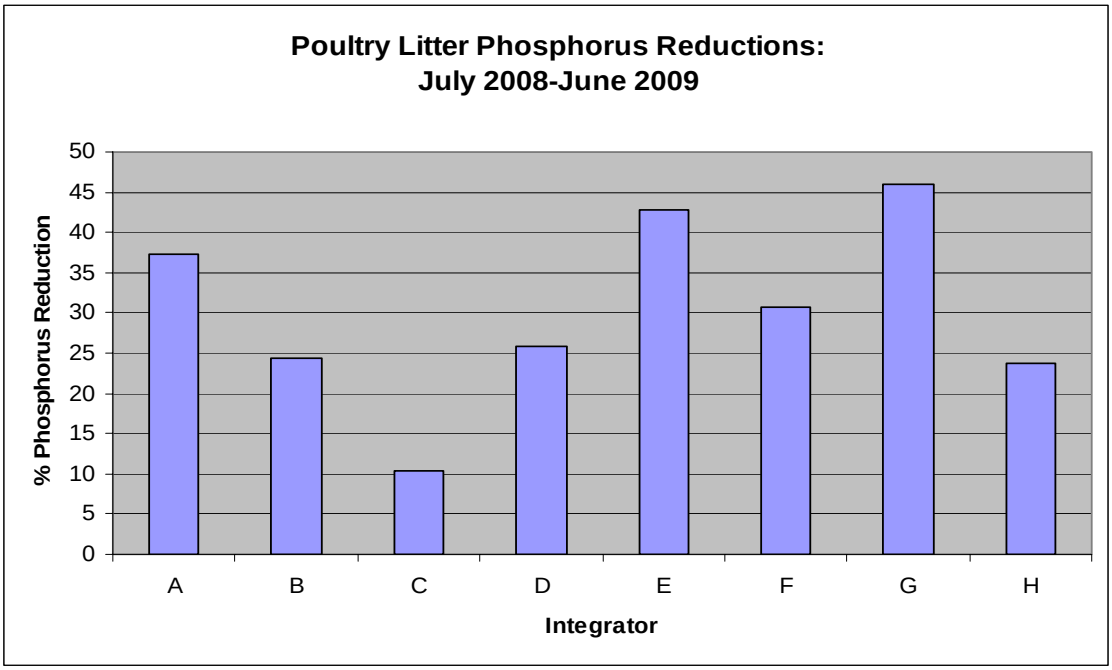
Significantly reduce the phosphorus content of poultry, swine and dairy manures through aggressive diet and feed management

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 10% phosphorous content reduction in dairy manure through improved diet and feed management.

Performance Measurement: (1) Percentage reduction in phosphorus content of sampled poultry litter and swine manure. (2) Percentage of dairy animals, in the Chesapeake Bay, in dairy operations, that utilize diet and feed modification technology.

Memorandums of Agreement were signed with eight poultry integrators in November, 2007. These signing 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 met 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, 2009, monitoring results are shown in Figure 5.

Figure 5. Poultry Litter Phosphorous Reductions



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.

The program had 160 herds complete sufficient sampling to generate an annual summary of phosphorus feeding levels. There was a reduction of phosphorus fed and thus excreted of 2.65 lbs. per cow per year or 32.6 total tons per year in the 24,522 cows in these herds. In addition, approximately $126,445 has been approved for incentive payments to Virginia dairy farms and free feed testing has contributed $137,601 for 7,047 lab analyses in support of better feeding management to reduce environmental pollution potential from dairy farms

A newsletter was prepared for all farm participants summarizing results from the project. In addition results were shared via newsletters and magazine articles. Programs were conducted highlighting impacts of the project.

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

Objective: The Virginia Department of Forestry (DOF) plays a significant role in maintaining water quality in Virginia by inspecting timber harvest sites to ensure that sediment is not eroding into streams and waterways, monitoring streams for sediment deposition, and conducting field audits.

Performance Measurement: Control active sedimentation from logging activity on 98% of timber harvesting operations.

Current Status:
DOF is in the process of revising the performance measure to reflect the implementation of Forestry Best Management Practices on timber harvest sites across the Commonwealth. The new performance measure goal will be to ensure that 85% of all timber harvest lands across the Commonwealth will have all required BMPs implemented in the next biennium
The DOF also is responsible for implementation of the Riparian Forest Buffer Goal for the Chesapeake Bay Restoration Effort, as well as responsible for directing the Riparian Forest Buffer Tax Credit Program.

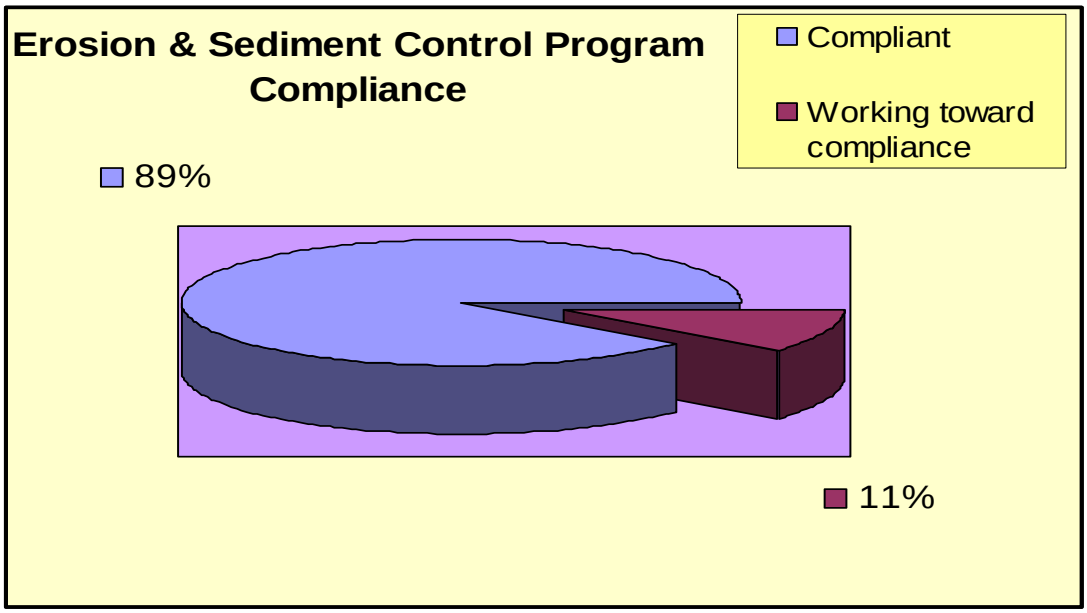
Developed and Developing Lands Category

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

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 162 of 164 local program reviews as of the November 19, 2009 VSWCB meeting. The remaining 2 local programs are small towns scheduled for review in the next review cycle beginning in FY11. As of the November 19th meeting, the VSWCB has recognized 146 local programs as being consistent with the 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.

Figure 6. Program Compliance



Implement Revised Stormwater Management Program

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

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: In early October, 2009 Governor Kaine highlighted the adoption of enhanced stormwater regulations by the Virginia Soil and Water Conservation Board. The new regulations are expected to reduce the impact of polluted runoff from newly developed land into the waters throughout the Commonwealth. The Virginia Soil and Water Conservation Board (VSWCB), through DCR staff, recently completed a number of regulatory actions to amend and modify the Virginia Stormwater Management Program (VSMP) Permit Regulations. One regulatory action addressed Part I – Definitions. Another regulatory action addressed 2 separate parts of the regulations: Part II - Stormwater Management Program Technical Criteria and Part III - Local Programs. A third regulatory action addressed Part XIII – Fees.

The new regulations incorporate several significant amendments made since the end of Virginia's public comment period that address many of the key issues raised in the process. The amendments include:

- New grandfathering provisions;
- Additional offsite options (including a state buy-down provision);

- More flexibility for localities to address sprawl and to handle inspections; and
- Recognition of the need for different standards for smaller sites and redevelopment and different water quality standards for Virginia's southern rivers and those within the Bay watershed.

The adoption of the regulations marks the end of a four year process undertaken by the members of the Virginia Soil and Water Conservation Board and the staff of the Virginia Department of Conservation and Recreation. More than 3,400 formal comments were contributed by citizens during the public comment period.

After adopting the regulations, the VSWCB immediately suspended the regulations and opened an additional comment period. The additional comment period allows for the review and comment on the proposed amendments offered at the October Board meeting. The additional comment period closed on November 25, 2009.

Since closing of the comment period the VSWCB adopted and authorized the new regulation on December 9, 2009. The final regulations were filed with the Registrar on December 15th, 2009 and will be published in January 2010. This will initiate a final public comment period ending in February 2010. Absent additional legislative action, parts I, II, and III will have an effective date of July 1, 2010. It is written in Code that implementation is required 15 to 21 months following the effective date in July 2010.

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, 2009, 83 of the 84 Tidewater localities have been found by the Chesapeake Bay Local Assistant Board to have met the septic tank pump-out requirements. The final locality is expected to become compliant with the septic pump requirement by the end of 2009, at which point, 100% of the Bay Act localities be compliant with this component of the Bay Act regulations.

The Chesapeake Bay Preservation Area Designation and Management Regulations (Regulations) require all Bay Act localities to submit an annual report outlining the implementation of their Bay Act programs. According to the information annual report information for the 57 localities submitting reports for the 2008-09 fiscal year, some 152,170 onsite systems exist in the local

Chesapeake Bay Preservation Areas. In addition, more than 42,500 notices were sent to owners of onsite systems, and 18,461 systems were pumped, inspected or had a plastic filter installed. These pump-outs translate to an estimated nutrient reduction of 9,200 pounds of nitrogen (based on the Bay Model assigned reduction of .5 lb. nitrogen per 1000 gallons pumped).

As of December, 2009, 80 of the 84 Tidewater localities will have been found by the Board to have met the BMP maintenance requirements or the Bay Act Regulations. The remaining 4 localities are expected to be deemed compliant in March of 2010.

As part of the required annual report of Bay Act implementation, localities are also required to track the number of water quality BMPs that have been installed for the previous fiscal year as well as the acres treated by those BMPs. For the 2008-09 fiscal year, 30 localities reported 787 water quality BMPs were installed. Although the acreage served by these BMPs was not reported by all respondents, more than 7,255 acres of development were treated by water quality BMPs.

Figure 7.

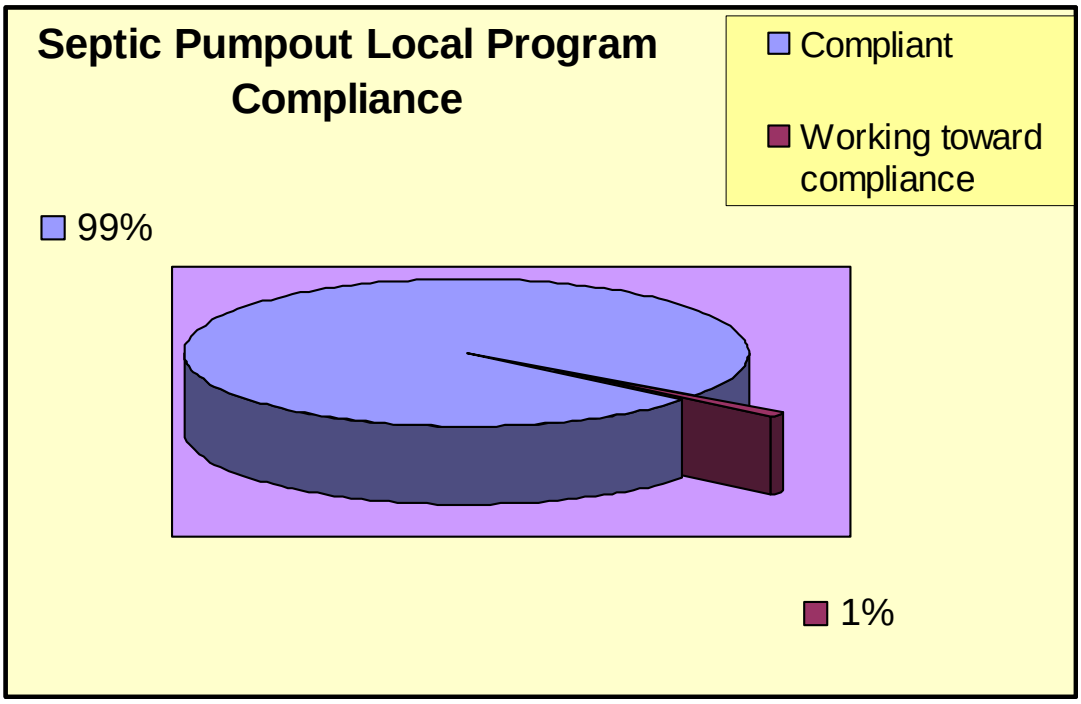
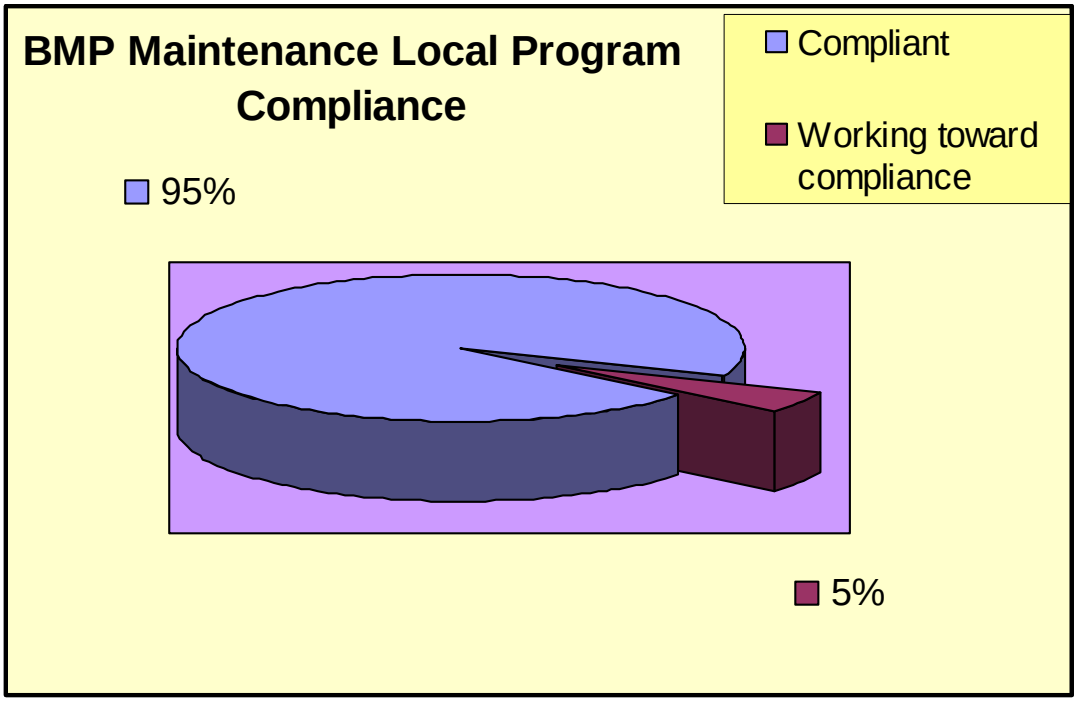


Figure 8.



Incorporate water quality protection into local land use codes and ordinances

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

Performance Measurement: Number of local governments that have incorporated water quality protection measures into their local codes.

Current status: Phase III of local government implementation of the Chesapeake Bay Preservation Act Regulations (Regulations) requires the 84 Tidewater local governments to review local land development ordinances, and revise them if necessary, in order to ensure these ordinances adequately address the protection of the quality of state waters. An important element of Phase III is the requirement for local ordinances to have specific standards to ensure that development in Chesapeake Bay Preservation Areas minimizes land disturbance, preserves indigenous vegetation, and minimizes impervious cover, as well as six specific requirements for approved plats and development plans. Phase III will also involve the identification and resolution of obstacles and conflicts to achieving the water quality goals of the Chesapeake Bay Preservation Act within local programs and ordinances. Although DCR cannot yet quantify the level of accomplishment achieved by the local code changes, progress has been made in this area.

On June 15, 2009, the Chesapeake Bay Local Assistance Board approved a Phase III review approach that will assess the extent to which Bay Act localities are in compliance with these requirements. To assist local governments in reviewing local ordinances, the Board has developed two checklists. The Plan and Plat Consistency Review Checklist will determine if a locality has addressed the six plan and plat provisions that must be contained in local ordinances, as they are specifically required by the Regulations. The Checklist for Advisory Review of Local Ordinances will determine if there are adequate provisions to address the three performance criteria and contains numerous examples of requirements that may be contained within a locality's land development ordinances. Over the next eighteen months, DCR staff will work with local government staff to evaluate local ordinances and processes to determine the extent to which specific provisions exist to enable the locality to implement the requirements of the Regulations described above. Based on this review, localities may choose to modify ordinances and processes to address development standards that benefit water quality. The advisory review process began in September of 2009. Specifically, as of October 2009, DCR initiated the review of the codes and ordinances of 6 Bay Act localities.

In addition to the above activities, the following additional projects were undertaken during the past year to address this objective.

George Washington Regional Commission:
Beginning in 2008 DCR worked with the George Washington Regional Commission (GWRC) and its member localities on the completion of a Regional Water Quality Code and Ordinance Review. The GWRC area includes the City of Fredericksburg, the counties of King George, Caroline, Stafford and Spotsylvania and the Towns of Port Royal and Bowling Green. These reviews were conducted to assist localities in addressing Phase III of the Chesapeake Bay Preservation Act, which will ensure that localities have adequate ordinance provisions to minimize impervious cover, minimize land disturbance and preserve indigenous vegetation. The component of the project involving the ordinance review is now complete. GWRC will continue to work with the above localities to amend their ordinances in order to be compliant with Phase III.

Friends of the Rappahannock:
Also during 2008, the Friends of the Rappahannock (FOR) initiated a project, under a Chesapeake Bay Implementation Grant from DCR, involving the review of the codes and ordinances of Caroline and Lancaster Counties using the DCR code and ordinance advisory review checklist. FOR has now completed the reviews of the codes and is in the process of identifying and preparing draft ordinance language that will address the Phase III requirements, and in particular, address requirements to minimize impervious cover and land disturbance and to maintain indigenous vegetation.

Accelerate land conservation efforts

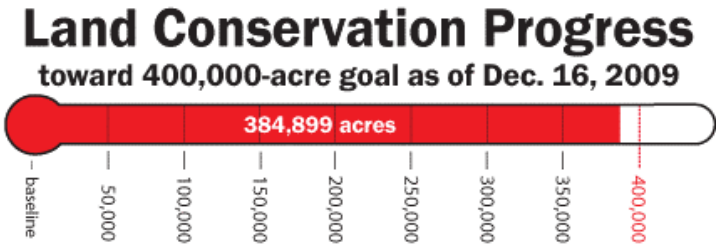
Objective: The Commonwealth will, in conjunction with private and public partners, preserve for conservation purposes 400,000 acres of land statewide by 2010.

Performance Measurement: (1) Number of acres conserved by 2010 within the Chesapeake Bay and Southern Rivers watersheds. (2) Percentage of land preserved towards the 20% Chesapeake Bay watershed goal. Acreage numbers are tracked and reported monthly and semi-annually by the Department of Conservation and Recreation.

Progress towards acres conserved by 2010:

As of December 16, 2009, 384,899 acres have been permanently preserved, leaving 15,101 acres remaining. The Bay watershed in Virginia is 18.46% permanently protected, as of June 30, 2009.

Figure 9.



Air Category

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

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). However, on December 23, 2008 the same court revised its decision and remanded the CAIR rule in place to the EPA for appropriate action. This means that the CAIR rule and control requirements will remain in place until the EPA develops a replacement rule to address the court's concerns. It is expected that this replacement rule will be proposed during the spring of 2010, and finalized in 2011.

As a result of the decision that vacated the Clean Air Mercury Rule (CAMR), the EPA has decided to regulate mercury emissions from power plants under Section 112 of the Clean Air Act. No schedule for these standards has been announced yet. However, the DEQ has begun to require emission limits for new major sources of mercury under Section 112(g). The first such permit was issued to the Dominion Wise County power plant in 2008.

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.

Resource Extraction

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

Current Status: The Virginia Department of Mines, Mineral and Energy (DMME), Division of Mineral Mining, reclaimed five abandoned mineral mines in calendar year 2009. The work

resulted in 7 acres of mine spoil revegetated, 800 feet of stream restoration, 8 mine shafts sealed to eliminate them as conduits for pollution to groundwater, and approximately 25 tons of trash removed to a certified landfill. In addition, DMME assisted in sealing three mine shafts, and the construction of three bat-gates on mine openings at abandoned mineral mines on property administered by the U.S. National Forest Service in Virginia. A number of partners assisted DMME included: Merck & Co., the U.S. National Forest Service, U.S. Geological Survey, the Virginia Department of Conservation and Recreation, and private landowners.

DMME Division of Mined Land Reclamation accomplished the reclamation of 420 acres of abandoned coal mine land during 2009. This included planting over 20,000 native hardwood seedlings on abandoned sites. DMME's work to reclaim abandoned coal mine sites is funded through a fee on active coal production paid by the coal industry and administered by the federal Office of Surface Mining. Partners in DMME's reclamation include the Office of Surface Mining, the Virginia Department of Conservation and Recreation, United States Army Corps of Engineers, Upper Tennessee River Roundtable, United States Forest Service, along with numerous corporate and private landowners. One highlight of DMME's 2009 reclamation has been the restoration of 900 feet of stream that had been buried by as much as twenty feet of coal waste.

In 2009, DMME partnered with the Natural Resources Conservation Service, the Daniel Boone Soil and Water Conservation District, and Lee County in a watershed effort to abate acid mine drainage in the North Fork Powell River. This multi-year effort should accomplish its initial on-the-ground projects in 2010.

In addition to its own contracted reclamation, DMME realized additional reclamation of abandoned coal mine sites through the process of remining. This is the activity wherein companies remine areas mine and abandoned prior to August 3, 1977, and reclaim the areas to current and effective standards through the remining process. For 2009, remining efforts of the Virginia coal industry reclaimed an estimated 2100 acres, with approximately 25% of this area being previously mined lands. In 2009, the Virginia coal industry planted over 979,000 tree seedlings to complement its reclamation efforts.

III. State and Local Coordination

Virginia Network for the Education of Municipal Officials (NEMO)

Objective: Develop and implement 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: 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 is a mechanism to conserve healthy lands and waters and restore water quality. Through request-based technical assistance to local governments, this initiative provides land use planning tools and conservation information to help take a holistic view of natural resource management.

Performance measurement:
Metric: Number of communities requesting NEMO education/assistance.
***Result*:** 25 Communities requesting assistance.

Metric: Number of communities which received NEMO education/assistance.
Result: 12 Communities were provided assistance

Metric: Number of hours of contact with local officials and community stakeholders in communities receiving NEMO assistance. The measurement is determined by multiplying the number of community participants by number of hours per contact event (e.g. workshop, project team meeting, scoping session, etc.).
Result: 763 Total community contact hours.

The program has developed long term performance measurements for which outcomes have not been measured at this time. They include:
Adopted changes in plans, codes & ordinances: Number of plan, code or ordinance changes adopted that are designed to:

- Directly or indirectly contribute to reducing or preventing water quality degradation [includes restoration, conservation, and sound planning and development policy changes]
- Prepare communities for addressing potential effects of climate change
- Improve community viability [for ex. Mathews County Aquaculture project]

Implemented restoration or conservation actions: This is a general title for possible measurements of outcomes such as:

- Number of acres of forest land or wetlands permanently protected
- Number of acres of wetlands restored
- Number of miles of stream buffers restored

Virginia Department of Defense Eagle Awards

Objective: In cooperation with Department of Defense (DOD), the Commonwealth has established the Defense Eagle Award. The objective is to award DOD installations that exhibit exemplary management of activities and programs with regard to seven performance measures: biological resources, habitat protection and restoration, watershed protection and restoration, land use, environmental stewardship, conservation plans and environmental compliance.

Current Status: The Virginia Department of Defense Eagle Awards and the partnership developed to establish the program is an outgrowth of the state's and the EPA's Chesapeake Bay Program's land conservation goal. The Department of Defense manages more than 275,000

acres in Virginia. Each military installation can submit an Installation Environmental Scorecard annually to the state for evaluation.

In October, 2009 Governor Timothy M. Kaine announced the winners of the first Virginia Department of Defense Eagle Awards for environmental stewardship. More than 20 military installations across Virginia were eligible to compete for the award. Fort A.P. Hill, Fort Pickett and Defense Supply Center Richmond were the first three winners.

The Virginia Department of Conservation and Recreation and the Virginia Department of Environmental Quality worked with DoD to develop this program and evaluate the results. Results from the first year of competition included air emissions being reduced by 930 tons, hazardous waste by 268 tons, pesticide use by 564 pounds and more than 1,570 tons of materials diverted from landfills.

Among its award-winning accomplishments Fort A.P. Hill was cited for establishing stream buffers, using innovative stormwater management approaches and protecting more than 2,900 acres through conservation easements. Fort Pickett established an environmental management zone along the Nottoway River, captured rainwater for reuse and also protected more than 2,500 acres. Defense Supply Center Richmond was recognized for their use of low impact stormwater management techniques and reductions in air emissions and hazardous waste generation.

IV. Healthy Waters

Virginia Healthy Waters Initiative

Objective: Establish a comprehensive Healthy Waters Strategy for the Commonwealth

Current status: 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.

2009 brought significant new attention and support to Virginia's Healthy Waters Initiative. At the federal level, EPA launched a Healthy Watersheds Initiative, corollary to the Virginia and EPA Region III Healthy Waters effort, and began a national dialogue on this issue. In addition, the Chesapeake Bay Program has launched a major work effort aimed at advancing conservation of healthy watersheds. This effort is part of the Chesapeake Bay Action Plan and President Obama's Executive Order for the Chesapeake Bay. These efforts have resulted in the formation of an interstate team that seeks to make maintenance of healthy watersheds a major conservation priority for the Chesapeake Bay Program.

At the state level, there is growing interest on the part of local governments and non governmental organizations such as the Nature Conservancy. This interest has been bolstered by a front page article on Virginia's Healthy Waters Initiative that ran in the *Richmond Times Dispatch*.

Ongoing Healthy Waters Initiative projects are highlighted below. Collectively, these efforts represent a major work effort toward implementing this important initiative.

Virginia's work on the Healthy Waters Initiative has advanced toward completion in many areas and has grown to become an element of the Chesapeake Bay and Virginia Waters Clean-Up Plan. Through follow-up actions to foster integration of restoration and conservation into local codes and ordinances, elements of the Smith Creek TMDL project have resulted in a sustained restoration effort.

Considerable implementation has occurred regarding the local pilot project to identify and conserve healthy waters in the Rivanna River Basin is in full swing. An expanded ecological assessment of water resources is underway. The findings of this assessment will be linked to a much larger National Fish and Wildlife Foundation project that has been initiated in the basin. By leveraging and targeting the growth readiness, stormwater management, and planning elements of the NFWF project, the Healthy Watersheds pilot project will advance conservation of healthy waters throughout the basin.

The capacity building/ outreach element of the initiative is reaching fruition. A copy of the outreach and engagement document is available on the DCR website: www.dcr.virginia.gov/soil_and_water/healthy_waters/index.shtml.

Moreover, there are plans to incorporate significant elements of the healthy waters message into stormwater management and Chesapeake Bay restoration outreach activities. Through this message integration, we believe that healthy waters will significantly foster conservation and local action.

V. Chesapeake Bay and Southern Rivers Water Quality Strategic Efforts

Chesapeake Bay Total Maximum Daily Load Report and Implementation Plan Development

Objective: Work with EPA Chesapeake Bay Program and program partners to establish the Chesapeake Bay TMDL and State Implementation Plan.

Current Status: On Oct. 23, 2009, the Chesapeake Bay Program's Principal's Staff Committee (PSC) reached tentative agreement on nitrogen and phosphorus "initial working target loads" for

each of the seven Chesapeake Bay jurisdictions (Virginia, Maryland, Pennsylvania, New York, West Virginia, Delaware and the District of Columbia). EPA has since divided these overall loads among the major river basins by jurisdiction. Sediment targets are still under development.

These draft target loads are "allowable loads," meaning the amount of nitrogen or phosphorus that may enter each major river basin on an annual basis. A smaller allowable load means there is a need for an increase in reduction efforts.

For the Chesapeake Bay tributary basins in Virginia (James, York, Rappahannock, Potomac/Shenandoah and the Eastern Shore), the annual working target load for nitrogen is roughly 59 million pounds and roughly 7 million pounds for phosphorus. These draft target loads have been developed so jurisdictions can begin developing watershed implementation plans to meet the Bay-wide TMDL.

The PSC agreed to these loads with the understanding that they are very broad targets that will change as additional information is gathered by EPA, the states and stakeholders over the coming months. Final loads will likely be different than these initial working targets. The current target loads were developed looking primarily at one of the main water quality "criteria" – dissolved oxygen in the Bay's mainstem. There are a number of factors that will likely result in revisions to these target loads including:

- *Upgrading the EPA Chesapeake Bay watershed model from Phase 5.2 to 5.3.* When the model has been updated in the past, existing pollution loads have often been revised. The model is based on monitoring data and is used to guide and evaluate reduction efforts.
- *Filter feeder inclusion in the WQ model.* EPA is proposing to include the impact of filter feeders, such as oysters and menhaden, in the model calculations. It is uncertain how large an impact this change would have.
- *Submerged Aquatic Vegetation - water clarity target load analysis.* While generally thought to be primarily a sediment issue, it is believed beds of these important grasses in certain segments of the watershed are also impacted by nutrients.
- *Atmospheric deposition.* These loads come from within and outside the Chesapeake Bay watershed. EPA has the lead on quantifying these loads.
- *Loading reductions needed to meet local water quality criteria for SAV, dissolved oxygen or chlorophyll a.* While nutrients from watersheds, such as the York and the James, have less impact on the Bay mainstem's dissolved oxygen levels than those from other Bay basins, there are local water quality issues that could affect final allowable loads. For example, the James River has a separate *chlorophyll a* water quality standard. Meeting that standard may affect reduction efforts in the James, and therefore, the overall Virginia allowable loads.

Taking these and other considerations into account, the Bay Program will update these working target loads by April 30, 2010.

The PSC and EPA also agreed to a revised schedule for developing the TMDL report and watershed implementation plans, including a phased approach for the development of the

implementation plans. Phase I will divide basin nutrient and sediment loads between nonpoint sources and individual permitted point sources in the drainage basins. They will include control measures to be implemented. Phase II plans will further divide the loads and actions to smaller geographic areas within the drainage area. These will also present more localized strategies. The new schedule is as follows.

- June 1, 2010: States and D.C. submit preliminary Phase I Watershed Implementation Plans to EPA. (*This had been Nov. 1, 2009.*)
- Aug 1, 2010: States and D.C. submit revised draft Phase I Watershed Implementation Plans to EPA.
- Aug. 15-Oct. 15, 2010: Bay TMDL public review and second round of public meetings. (*This had been June 1, 2010.*)
- Nov. 1, 2010: Final Phase 1 Watershed Implementation Plans to EPA.
- Dec. 21, 2010: EPA publication of final Bay TMDL.
- Nov. 1, 2011: States and D.C. incorporate local target loads into their plans and submit to EPA.

Virginia's Chesapeake Bay Two-Year Milestones

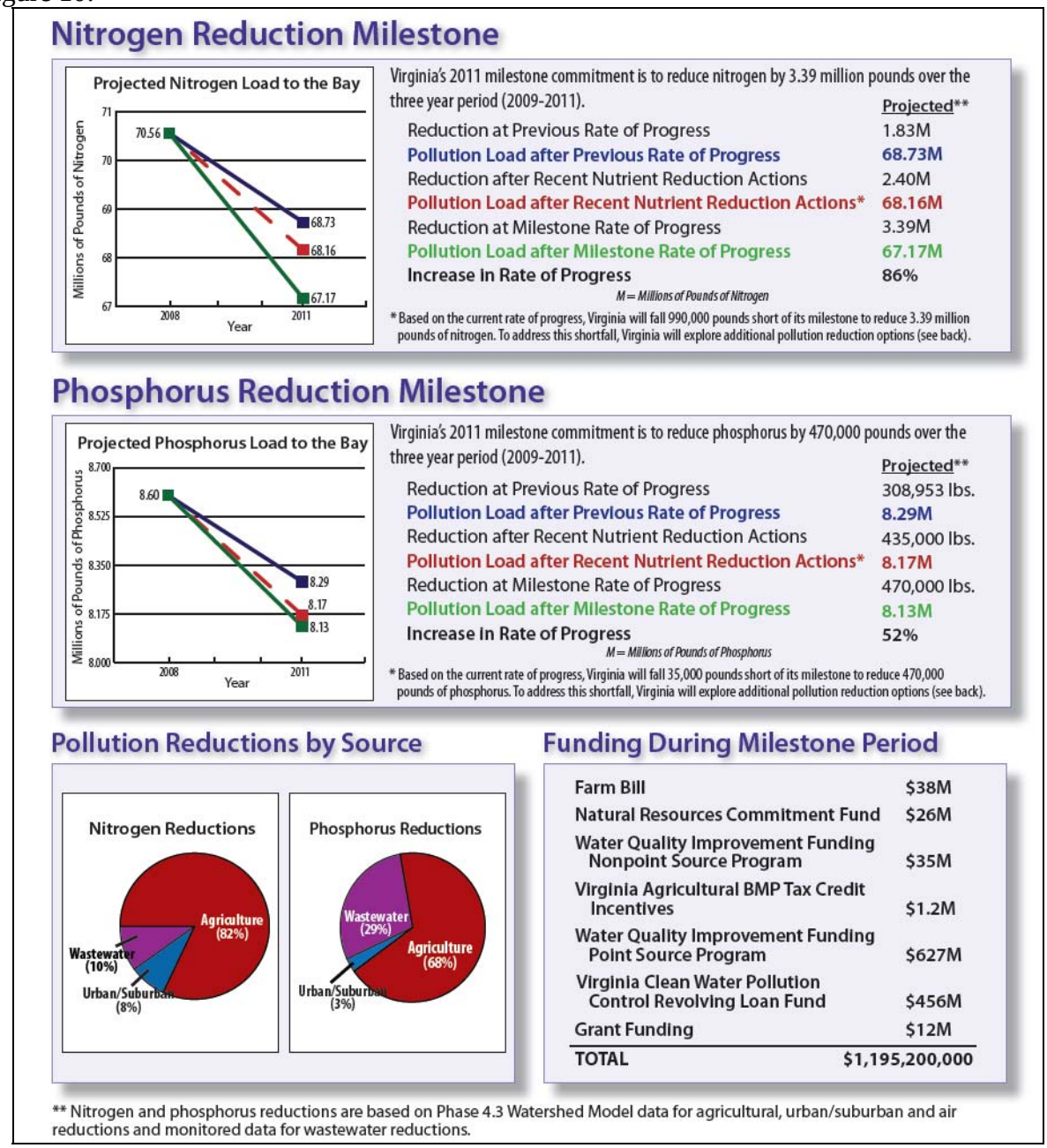
Objective: Establishment of two-year milestones that accelerate nutrient pollution reductions

Current status: In May of 2009 the Chesapeake Bay Program's Executive Council, chaired by Governor Kaine, charted a new course for the Bay's recovery. The intent is to accelerate the cleanup of the Bay, increase government accountability and provide clean water in our communities through focus on aggressive, short-term goals for reducing pollution. In the past, the Chesapeake Bay Program has set one overall long-term pollution reduction goal for cleaning up the Bay. It did not include the incremental, short-term goals needed for steady progress in reducing pollution. Now the partnership will use two year goals to monitor restoration work. In addition, the Council adopted a new end date for Bay restoration efforts of "No Later Than" 2025. This is the date by which all necessary restoration actions must be fully implemented.

The first milestone period covers the period through Dec. 31, 2011. Future biennial milestones will be integrated with the strategies developed in the Chesapeake Bay TMDL Watershed Implementation Plan.

To meet the 2011 milestone Virginia will increase progress to reduce nitrogen by 86 percent and increase progress to reduce phosphorus by 52 percent.

Figure 10.



Significant funding and programs recently established over the last several years are in place to reduce a large portion of the 2.4 million pounds of nitrogen and 435,000 pounds of phosphorus by 2011. However, additional funds and initiatives will be necessary to achieve the full reductions.

Past and current actions include:

1. $61 million in funding for agricultural conservation practices in the Bay watershed.
2. $1.08 billion in grants and loans for nutrient removal technologies at sewage treatment plant upgrades to meet and maintain pollution caps.

3. Agreements with poultry companies to achieve a 30 percent phosphorus reduction in poultry litter.
4. Acceleration of landowner participation in the Conservation Reserve and Enhancement Program (CREP).
5. Significantly increased compliance with erosion and sediment control requirements.
6. Development of aggressive stormwater control regulations.
7. Revision of poultry waste management regulations to address off-site nutrient management.

Virginia's Total Maximum Daily Load Report and Implementation Planning

Objective: For each impaired waterbody a TMDL study must be conducted that identifies the maximum pollutant load allowable and the level to which each pollutant must be reduced to maintain water quality standards. The process includes: developing TMDL reports, developing TMDL implementation plans designed to impart practices to reduce pollution in order to meet standards, implementation of pollution reduction strategies, and water quality monitoring.

Performance Measurement:

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

To meet the May 1, 2010 Consent Decree (CD) requirements, Virginia will submit TMDLs covering approximately 130 shellfish and non-shellfish CD impairments, and approximately 75 non-CD impairments. In addition, Virginia will receive credit under the consent decree for an additional 54 delisted impairments.

TMDL development will continue and 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. Virginia anticipates that approximately 1,180 additional waters will require TMDL development in the next 12 years, with a goal to complete approximately 200 TMDLs per biennium through 2022.

Figure 11.

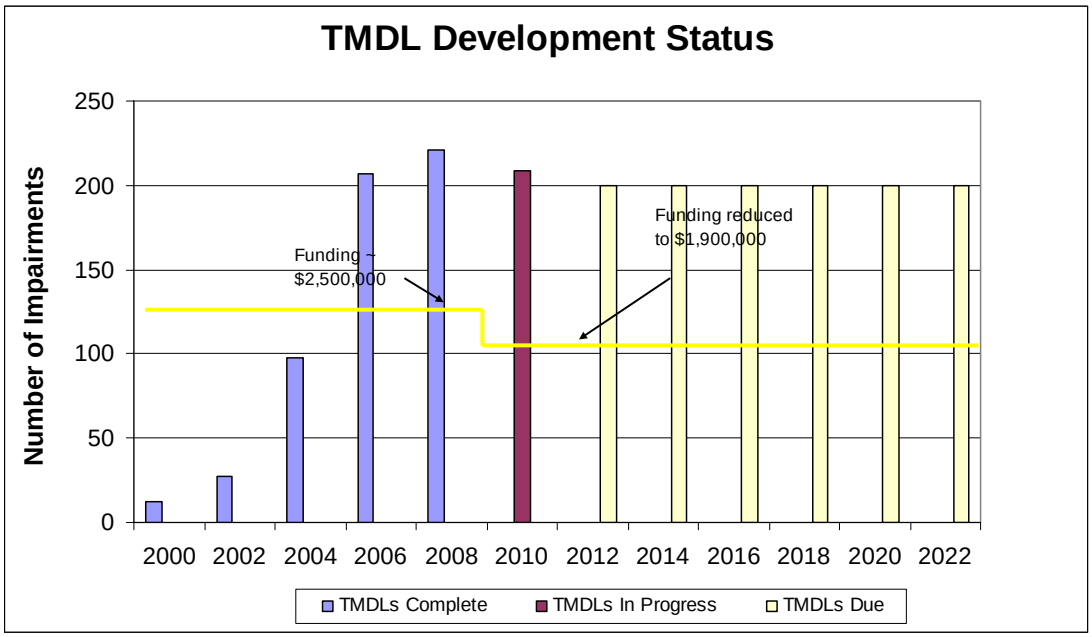
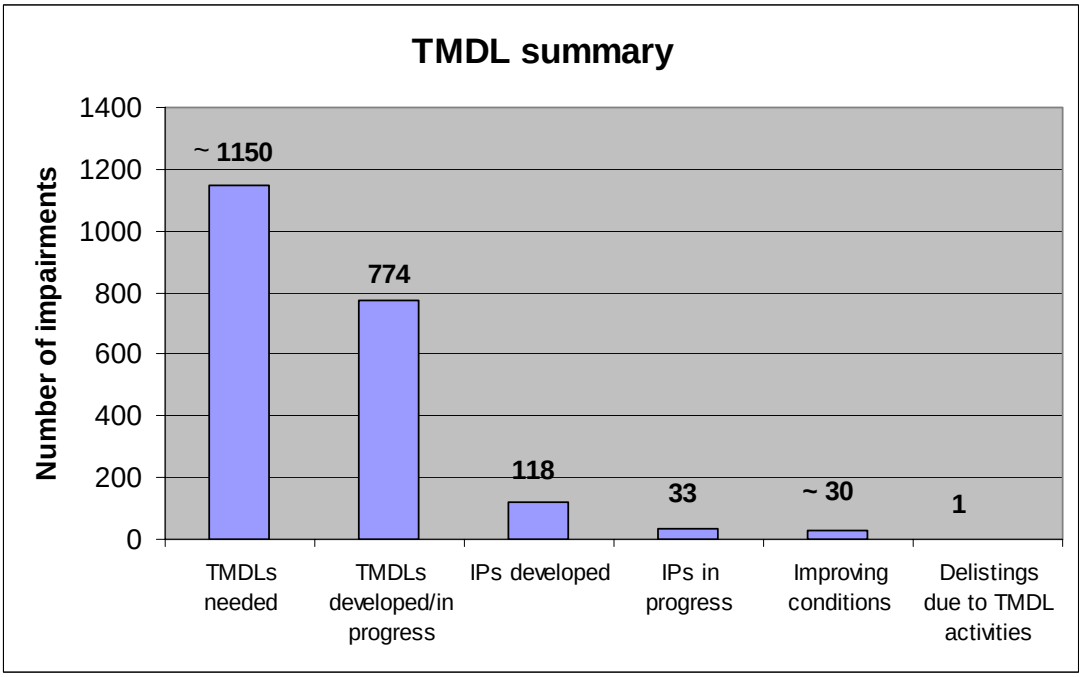


Figure 12 summarizes the current status in all steps of the TMDL process. The figure highlights the large number of TMDLs required due to the number of impaired waters throughout Virginia. While progress in Virginia continues in TMDL development, additional impairments continue to be added with each 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, but several streams have achieved partial delisting.

Figure 12.



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. This project has been successfully completed during this reporting period.

Accotink Creek Benthic TMDL: The unique component of this TMDL is that the major source of the sediment is stream bottom scour and bank erosion rather than the conventional transport from the watershed to the stream. EPA has recommended that we use a sediment/flow method. In this approach the mechanisms (increased watershed runoff and stream flows) responsible for pollutant sediment generated by stream scour and re-suspension are quantified and their relationships established. The major difference in this approach and the convention approach is that sediment remediation will place more focus on flow reductions/dampening components of the BMPs. The TMDL implementation will be implemented through standard BMPs to retard sediment transport from the watershed and will serve as the prototype for future urban TMDLs in Virginia.

Summary of 2009 TMDL Implementation Program

Development of TMDL Implementation Plans [IPs] does not progress nearly as quickly as development of the TMDLs themselves.

Once the TMDL report is submitted to EPA and approved, Virginia state law (1997 Water Quality Monitoring, Information, and Restoration Act (§62.1- 44.19:4 through 19:8 of the Code of Virginia), or WQMIRA, requires the development of a TMDL implementation plan (IP). There is not a mandated schedule for IP development; however, local or state agencies, as well as community watershed groups, can take the lead in developing TMDL IPs. The IP describes the measures that must be taken to reduce pollution levels in the stream, and includes a schedule of actions, costs, and monitoring. DCR and DEQ have both worked on the development of approved IPs. In 2009 DCR and DEQ completed 7 implementation plans covering 25 impaired segments and have drafts ready for an additional 3 implementation plans covering 8 impaired segments. An additional six TMDL implementation plans are in progress addressing 17 stream segments and 16 impairments. Since 2000, the agencies have completed 39 IPs, covering over 109 TMDL segments and 130 impairments.

As of June 2009, the program consists of 39 organized implementation projects funded through a variety of federal, state, local and non-profit sources. A summary of these projects are found in the following table.

Table V-1

Watershed Area	TMDL Segment	Status	Year Implementation	Lead Agency	Funds Used
A. Projects received 5-7 years of continuous funding from 319(h) administered by DCR. These projects are no longer receiving 319 funds, but may continue to receive funding from other sources.					
1. -Middle Fork Holston River	VAS-O05R	MI	2001-2007	DCR	§319(h)
2. Upper Blackwater River	LAW-L08R	SI	2001-2007	DCR	§319(h)
3. North River	VAN-B21R, B22R, B27R & B29R	I	2001-2008	DCR	§319(h)
4. Holmans Creek	VAV-B45R	SI	2005-2008	DCR	§319(h)
B. Projects are being funded by Federal 319(h) as well as State VNRCF administered by DCR (for select projects)					
1. Catoctin Creak	VAN-A-02R	I	2005-2009	DCR	§319(h)
2. Willis River	VAC-H36R	I, D2006 (2) D2008	2005-2010	DCR	§319(h)
3. Lower Blackwater River	VAW-L09R, L10R and L11R	SI, CFD (2008)	2006-2011	DCR	§319 & VNRCF
4.-Cooks Creeks & Blacks Run	VAV-B25R & B26R	TETD	2006-2011	DCR	§319, WQIF, NFWF
5. Thumb, Great, Carter & Deep Runs	VAN-E01R, E02R & E10R	TETD	2006-2011	DCR	§319(h) & VNRCF
6. Big Otter River	VAW-L23R, L25R, L27R, & L28R	I, CFD, D2008	2006-2011	DCR	§319 & VNRCF
7.. Mill and Dodd Creeks	VAW-N20R & N21R	TETD	2007-2012	DCR	§319 & VNRCF
8..Little and Beaver Creeks	VAS-O07	TETD	2007-2012	DCR	§319 & VNRCF
9 Hawksbill and Mill Creeks	VAN-B38R, B39R	TETD	2008-2012	DCR	§319(h)
10. Looney Creek	VAW-I26R	TETD	2009-2013	DCR	§319 & VNRCF
11. Hazel River	VAN-E03R, E04R, E05R	TETD	2009-2013	DCR	§319, WQIF RFP, NFWF & VNRCF
C. Projects have received some WQIA RFP funds (and other funds as well)					
1. Moore's Creek	VAV-H28R	TETD	2005+	N/A	WQIF RFP
2. Guest River	VAS-P11R	TETD	2005+	N/A	WQIF RFP
3. Stroubles Creek	VAW-N22R	CFD (2008)	2006+	N/A	WQIF RFP
D. Projects are not receiving designated funding from DCR					
1. Four Mile Run	VAN-A12R	D	N/A	DEQ	OTHER
2. Middle Creek/Tazewell County	VAS-P03R	D 2006	N/A	DMME	OTHER
3. Quail Run/Rockingham County	VAV-B35R	D 2005	N/A	DEQ	OTHER
4. Lynnhaven (Shellfish)	VAT-V08E	D/SFB 2008	2005-2008	VA Beach	OTHER
5. Smith CreeK		TETD	2008+	DEQ/DCR	OTHER, NFWF, NRCS, §319
6. Back Creek		TETD	2008+		OTHER
7. Knox and Paw Paw Creek		TETD	2008+		OTHER
8. Occahannock Creek		TETD	2008+	DCR	OTHER
9. Dumps Creek		TETD	2008+		OTHER
10.Back Bay Watershed		TETD	2008+	DEQ	OTHER
11.North Landing River		TETD	2008+	DEQ	OTHER
12.Straight Creek and Tributaries		TETD	2009+		OTHER
13.Grennvale, Paynes, and Beach Creeks		TETD	2009+	DCR	OTHER

E. Projects are receiving some WQIF / VNRCF funds (and other funds as well)					
1. Chowan Study Area	VASC-K14R,	TETD	2005-2009+ (Ag only)	DCR	WQIF/VNRCF
2. Falling River	VAW-L34R	TETD	2007+ (Ag only)	DCR	WQIF/VNRCF
3. Mossy & Naked Creeks, Long Glade Run	VAV-B19R, B24R, B28R	TETD	2007+ (Ag only)	DCR	WQIF/VNRCF
4. Pigg River (Blue Ridge SWCD)	VAW-L14R, L15R, L16R, L17R	TETD	2007+ (Ag only)	DCR	WQIF/VNRCF
5. Pigg River (Pittsylvania SWCD)	VAW-L13R, L17R, L18R	TETD	2007+ (Ag only)	DCR	WQIF/VNRCF
6. Twittys and Ash Camp Creeks	VAC-L39R	TETD	2007+ (Ag only)	DCR	WQIF/VNRCF
7. Abrams & Opequeon Creeks	VAV-B08R & VAV-B09R	TETD	2006+	DCR/DEQ	WQIF/VNRCF , WQIF-RFP
8. Cub, Turnip and Buffalo Creek	VAC-L36R, L37R, L40R	TETD	2007+ (Ag only)	DCR	WQIF/VNRCF
9. Appomattox: Flat, Nibbs, Deep, West Creeks	VAP-J08R, J09R, J11R	TETD	2007+ (Ag only)	DCR	WQIF/VNRCF
10. -Moffett Creek, Middle River, Polecat Draft	B10, B13, B15	TETD	2007+ (Ag only)	DCR	WQIF/VNRCF
11. -Christians Creek & South River	B14, B30	TETD	2007+ (Ag only)	DCR	WQIF/VNRCF
12. Upper Clinch River	VAS-P01R	TETD	2007+ (Ag only)	DCR	WQIF/VNRCF
13. Bluestone River	VAS-N36R	TETD	2007+ (Ag only)	DCR	WQIF/VNRCF
14. Appomattox: Briery, Little Sandy, Spring, Saylers Creeks and Bush River	VAC-J02, J03, J04, J05 and J06R	TETD	2007+ (Ag only)	DCR	WQIF/VNRCF
TETD=To early to determine, I=Improvement, SI=Some improvement, MI=Moderate Improvement, , NI= No Improvement, D=Segment Delisted, CFD=Segment candidate for delisting, SFB= Shellfish beds were reopened, NFWF=National Fish and Wildlife Fund grant, NRCS – USDA Natural Resource Conservation Service, VNRCF=Virginia Natural Resource Commitment Fund					

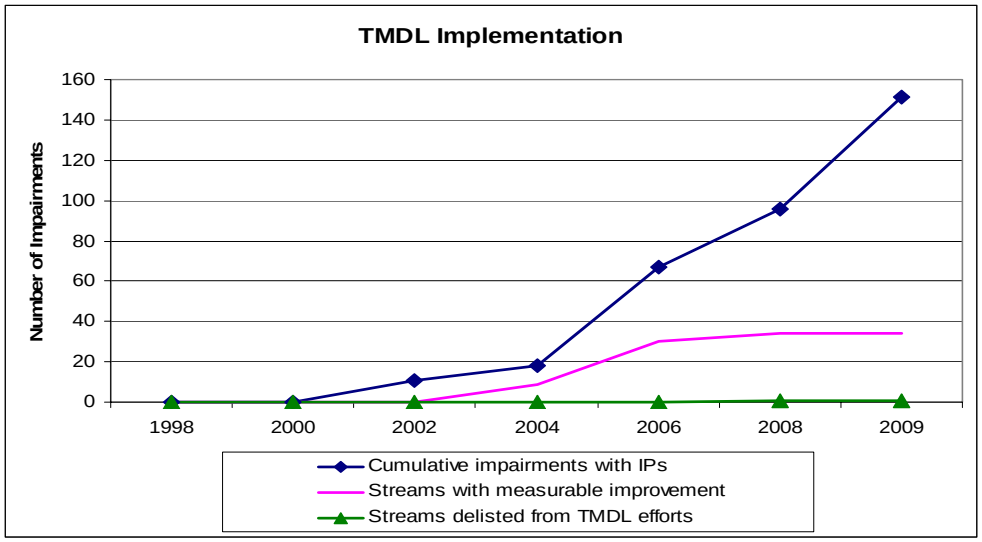
Measureable Improvements

Delisting

As of 2008, 92 free-flowing segments have been approved by EPA for de-listing from the list of Consent Decree waters. Six segments were nominated for delisting in 2006 and 2008. Water quality monitoring by DEQ is indicating that water quality is improving in a number of streams where TMDL targeted implementation is ongoing in the watershed. In the 2008 305(b) Report DEQ identified portions of six streams that are eligible for delisting from the Impaired Water List due to attaining the bacteria water quality standard, these include:

1. Willis River, Buckingham and Cumberland Counties, 34.71 miles (18.03 miles in 2006 and 16.2 in 2008);
2. Big Otter River, Bedford and Campbell Counties, 13.98 miles (2008);
3. Maggodee Creek, Franklin County, 4.40 miles (2008);
4. Stroubles Creek Middle, Montgomery County, 2.20 miles (2008);
5. Deep Creek, Nottoway County, 5.59 miles (2008); and
6. Lynnhaven River in the City of Virginia Beach, 1,462 acres (2008).

Figure 13.



Water Quality 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). For older projects it is possible to track water quality improvements as the level of implementation and the number of BMPs that are installed increases. There are several implementation projects that are showing marked improvement in water quality, but for many of them the TMDL implementation process is still too early in the process to fully assess the degree of water quality improvement.

Since 2001 a total of thirty (30) of the forty-five (45) TMDL IP projects have shown some level of improvement in water quality conditions. Seven projects have had some of their stream miles listed on the 303(3)/305(b) Integrated Report as "candidates for delisting."

It should be noted that since 2001 when the first two 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.

Willis River: (Buckingham and Cumberland counties): 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. The Willis River TMDL Implementation Project has been active for three years and has shown remarkable success during this time. The widespread installation of BMPs throughout the Willis River Watershed has reduced bacterial levels to allow three stream segments, totaling 34.71 miles of streams, to attain water quality standards for primary contact recreation. These three segments of the Willis River were removed from Virginia's 303(d) list of impaired waters in 2006 and 2008

as a direct result of TMDL implementation activities. As a result of three plus years of TMDL implementation activities 54 agricultural best management practices have been installed, including 32 miles of stream exclusion fencing, exclusion of 3,500 livestock from streams, and the establishment of 82 acres of riparian vegetative buffers. The Willis River TMDL Implementation Project was nominated in 2009 as an EPA Success Story due to its delisting.

Southern Rivers Strategy

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

Current status: A substantial portion of Virginias land area drains outside of the Chesapeake Bay watershed. This region, referred to as the Southern Rivers, represents Virginia's drainage across the southern portion of the state into the Albemarle-Pamlico Sound in North Carolina, or across the southwestern portion of the state draining to the Ohio River and then to the Mississippi River.

To foster water quality protection and improvement across such a diverse and large region the Commonwealth has worked to support federal, state, and interstate watershed projects and partnerships. Following is a brief summary on some of these activities.

Big Sandy River Basin Coalition: www.bigsandybasin.org/node/2
The Big Sandy River Basin Coalition, Inc. (BSRBC) is a tri-state, nonprofit, citizen-led organization united to achieve clean water throughout the Big Sandy River Basin and contiguous watersheds by educating citizens, community leaders and businesses within the region of the Basin to help instill a land and water ethic in their communities. The Coalition is focused on improving wastewater treatment and removing straight pipe discharges of sewage into local streams, increase awareness of community members regarding environmental pollution and sources, improve the communication and coordination of state and local governments, and reduce the impact of sediment as a source of pollution generated during resource extraction activities. The Coalition was the first tributary watershed group to develop a formal working relationship with Ohio River Valley Water Sanitation Commission (ORSANCO) and has partnered with ORSANCO to develop an interstate agreement.

Albemarle-Chowan Watershed Roundtable: www.acwrt.org/
Virginia's Department of Conservation and Recreation and the Albemarle-Pamlico National Estuary Program provide support for the coordination of the watershed roundtable which serves as regional stakeholder group whose goal is to preserve and protect the natural resources and water quality within the basin. The roundtable conducts water quality and watershed awareness workshops as well as hosting a River Day celebration to raise awareness in the Basin.

Dan River Basin Coalition: http://danrivercoalition.org/
The Coalition is a partnership of governmental agencies, non-profits, and civic organizations working together to address environmental issues, promote conservation as well as responsible land and water use, and offer environmental education throughout the Dan River Basin of North Carolina and Virginia. The Coalition was formed in 2008 with the intention of creating partnerships and resources to advocate for and encourage the protection and stewardship of the natural resources of the Dan River Basin – an area that stretches from the headwaters of the Dan River in Virginia to Kerr Lake.

Upper Roanoke River Roundtable: www.upperroanokeriver.org/
The Roundtable serves as an advisory group in the upper basin that identifies and works to address issues of water quality and quantity as well as make recommendations about appropriate management solutions for issues or decisions that impact the upper basin of the Roanoke River.

New River Watershed Roundtable: www.newriverroundtable.org/
The Roundtable's mission is to promote better water quality through fair, open dialogue and effective partnerships. The focus is on working as a watershed community to protect and enhance the water quality of the New River Watershed.

Upper Tennessee Watershed Roundtable: www.uppertnriver.org/
The Upper Tennessee River Roundtable is a non-profit organization with an overall interest in improving water quality in the Upper Tennessee River Watershed. The Roundtable is active in water quality improvement efforts in the Clinch, the Powell and the Holston Rivers. The greater watershed is host to numerous species of fish, mussel, and other aquatic life species. According to the Nature Conservancy, the Upper Tennessee River watershed greatly exceeds all other watersheds in the lower 48 states in terms of species richness and diversity. At last count, the watershed included 48 imperiled and vulnerable fish and mussel species, including 21 federally endangered or threatened species.

Pilot Project: Richmond County Local Tributary Strategy Implementation Project

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

Current status:
Since March of 2008 DCR has worked consistently with a variety of partners on Virginia's Northern Neck to establish and implement the Richmond County Local Tributary Strategy Pilot Project. The project is entering the final phases which will focus on community engagement as a part of the comprehensive plan revision process and implementation of developed land best management practices to mitigate the impact of stormwater and protect local water quality. An important outcome of the project was to establish the major components needed to support a local tributary strategy program. The project partners have identified the following components, with qualifying comments, to be of importance:

i. Jurisdiction Nutrient Reduction Target
   1. Though a pollution reduction target was integral to the development of this pilot project proposal the value of this number, in terms of effective local implementation, is in question because the target is developed at a scale, that when either deconstructed or aggregated to fit a County jurisdiction, does not adequately inform local planning efforts.

ii. Accurate, up to date land use/land cover data developed on a five year basis to allow for the developing trends data both geographically and temporally

iii. Accurate accounting of agricultural and urban BMP implementation
   1. Agricultural BMP implementation data provided by the Bay Program is difficult to reconcile with local data, making it difficult to determine the level of implementation and spatial distribution for individual types of BMPS. This is a major barrier to developing a local tributary strategy implementation program.
   2. While the urban component is relatively easily established in Richmond County due to the County's rural characteristic, many localities will account for urban BMPs to some degree and some localities are required to account for BMPs.

iv. Current water quality and biologic integrity assessment of jurisdiction's surface water system
   1. The Bay Program watershed model does not provide local water quality or stream resource condition. This is a critical component for building the case for conservation at the local level. Historically, local water quality data has been integral to TMDL implementation efforts, justifying the type and spatial implementation of specific BMPs.

v. Modeling/predictive capabilities; apply land use/land cover to BMP implementation scenarios and estimate environmental endpoints
    1. The project was proposed with the intent of utilizing a modeling component developed by the Bay Program to allow for local BMP implementation and land use change scenario development, but that work was never completed by the Bay Program.
    2. The lack of accurate agricultural BMP data (location and area treated) has inhibited the ability to develop a predictive component of a local modeling tool.
vi. Review of planning codes and ordinances with regard to performance for water quality
    1. Opportunities exist for localities to perform a comprehensive plan review every five years. This opportunity can be used to build awareness and action with regard to linking land use and water quality.
    2. Phase III of the Chesapeake Bay Protection Act provides a framework for reviewing codes and ordinances and determining performance in terms of water quality protection. This requirement for Tidewater localities could serve as a process template for expansion to all localities.
vii. Implementation strategy: A strategy for BMP implementation to meet pollution targets will have to be developed that fully integrates the results of (1) the data collection and review, (2) the comprehensive planning and code/ordinance review, and (3) the review of current levels of both urban/developed land and agricultural BMP implementation.