Commonwealth of Virginia

Local Government Nonpoint Source Pollution Management Survey
Summary of Survey Response

Draft October 17, 1994

Prepared by the Virginia Department of Conservation and Recreation, Division of Soil & Water Conservation

"This survey report was funded, in part, by the Department of Environmental Quality's Coastal Resources Management Program through Grant # NA37oz0360-01 of the National Oceanic and Atmospheric Administration, Office of Ocean and Coastal Resource Management, under the Coastal Zone Management Act of 1972, as amended."

Executive Summary

The Local Government Nonpoint Source Pollution Management Survey was developed by the Division of Soil and Water Conservation to quickly gather information about nonpoint source management and was distributed to 65 counties, 36 cities and 23 of the larger towns within the Chesapeake Bay drainage. The Division was interested in identifying local nonpoint source pollution (NPS) initiatives which exceed current state and federal requirements, particularly those not administered or funded through state or federal agencies.

Survey questions were divided into three categories: questions related to agriculture, questions related to land use planning and development, and questions related to nonpoint source pollution management. Questions were designed to encourage a high rate of response and solicit information about all forms of NPS management, including state and federal best management practices (BMPs) programs. The survey received a cumulative response rate of 62%.

Agriculture (Questions 1-4)
Typically, localities relied on Soil and Water Conservation Districts (SWCDs) and the Virginia Cooperative Extension (VCE) to address agricultural nonpoint source pollution. Many localities stated that agriculture is currently being regulated by state and federal government. Coastal localities often mentioned agricultural requirements contained in local Chesapeake Bay Preservation Act (CBPA) ordinances.

In response to question #1 concerning *Soil Conservation*, localities reported a number of BMPs being implemented through cost share programs, including: Filter Strips or Buffer Areas (28%), Conservation Tillage (25%), Cover Cropping (25%), Field Strip Cropping (25%), and Wetlands Conservation (25%).

In question #2 dealing with *Pesticide Management*, most localities reported no additional restrictions other than CBPA requirements; however, a number of localities mentioned special or conditional use permits were required for siting pesticide and fertilizer operations. Though not considered an agricultural use, two localities required integrated pest management (IPM) for approval of new golf courses.

Response to question #3 regarding *Confined Animal Operations* indicates that certain localities have taken steps to encourage the proper management of animal waste produced by such facilities. Augusta and Rockingham county have both adopted local ordinances to specifically address animal waste issues, (#) other localities have incorporated special provisions within their existing zoning ordinance to address waste from these facilities. The most frequently mentioned BMPs were: Buffer Areas or Setback Requirements (30%), Waste Utilization or Nutrient Management Plans (24%), and Waste Storage Structures (22%).

With the exception of farm conservation plans encouraged by the Chesapeake Bay Act, USCS-SCS, and SWCD activities, localities reported no additional restrictions on *Grazing Management* (question #4). The following grazing BMPs were implemented by SWCD's: Fencing (23%), Planned or Rotational Grazing (19%), and Alternative Drinking Water Supply (19%).

Land Use Planning and Development (Questions 5-8)
A higher rate of response was received on questions #5 through #8, presumably because land use planning and development is largely within the purview of all local governments. Despite this higher rate of response, most localities have adopted few controls or restrictions directed at reducing nonpoint source pollution, other than those encouraged through state or federal programs.

In response to question #5 concerning *Watershed Protection,* 78% of the localities surveyed had adopted Floodplain Management Plans, many of which meet FEMA standards. In addition, 62% of the localities reported Land Use Restrictions, and 47% reported Open Space Plans and Ordinance Provisions. Many of the local watershed protection initiatives were limited to watersheds which provided a common source of drinking water.

In question #6 dealing with *Site Development and Construction*, most localities reported using the Erosion and Sediment Control Law or CBPA ordinances to regulate site development. The most frequently used BMPs were: Phasing or Limiting Areas of Disturbance (43%), Preserving Natural Drainage/Storage Features (43%), and Minimizing Impervious Surfaces (40%).

Many of the localities reported some sort of *Stormwater Management* activities (question #7), usually through provisions in the Virginia Erosion and Sediment Control Law, local Chesapeake Bay Act ordinances, or stormwater management plans or ordinances. Most stormwater initiatives are limited to managing stormwater quantity, implementing BMPs to improve runoff quality are usually too expensive. Several Virginia localities have adopted stormwater utilities to provide funding to implement BMPs. Planning District Commissions are also active in developing and implementing stormwater BMP programs and guidelines to address stormwater management.

In response to question #8, most localities reported using *Onsite Disposal System* standards developed by the Virginia Department of Health (VDH); however, a few counties have adopted more stringent standards. Coastal localities usually mentioned provisions and standards for such systems required by local CBPA ordinances. To accommodate growth some localities are planning to expand sanitary sewer systems, while other localities are pursuing alternative systems.

General Nonpoint Source Management Questions (Questions 9-11)
Technical assistance Question #9 asked localities to rank types of *Technical Assistance*, storm water management received the highest ranking (1), followed by financing techniques (2), and public education (3).

Question #10 enquired about *Additional Efforts* to address nonpoint source pollution. A list of specific and unusual local NPS initiatives is included as an appendix to this document. This list summarizes many of the items reported in question #10.

In response to question #11, lack of funds and staff was one of the most frequently mentioned *Obstacles to NPS Control*, followed by lack of awareness and education, and ineffective enforcement mechanisms and poor coordination. Several localities reported difficulties obtaining wetland and stream permits to implement stormwater BMPs.

Purpose:

The purpose of the Department of Conservation and Recreation's Local Government Nonpoint Source Pollution Management Survey is to gather information about nonpoint source pollution management techniques being implemented at the local level. The Department recognizes that local officials are often aware of nonpoint source pollution problems and through their own initiatives may already be effectively addressing these problems. The information gathered by this survey will be used to coordinate state and local management activities, assess the need for any additional state or federal management efforts, and develop a state-wide nonpoint source pollution control strategy.

The survey results will be used by several programs within the Division of Soil and Water Conservation, primarily: Virginia's Watershed Management Program developed pursuant to section 319 of the Clean Water Act; Virginia's Tributary Strategies being developed to meet the goals set forth in the Chesapeake Bay Agreement; and Virginia's Coastal Nonpoint Source Pollution Control Program, currently being developed pursuant to section 6217 of the Coastal Zone Act Reauthorization Amendments.

Distribution:

The survey was distributed only to Virginia localities located within the Chesapeake Bay drainage area, because the Bay drainage and the Coastal Zone have been the focus of Virginia's nonpoint source pollution management efforts. Efforts have been targeted within this area due to the limited resources available for nonpoint source pollution control.

The survey was distributed to 65 counties, 36 cities and 23 of the larger towns within the above mentioned area. A list of each of these localities and a summary of local NPS initiatives is included in an appendix to this document.

Approach:

The survey was developed by the Division of Soil and Water Conservation to quickly gather information about nonpoint source management at the local level. The survey is not intended to be a scientific instrument; and therefore, conclusions derived from the results should be considered tentative.

The survey questions were divided into three categories: questions related to agriculture, questions related to land use planning and development, and general questions concerning nonpoint source pollution management. Questions related to agriculture were emphasized because a large amount of land is devoted to agricultural operations in Virginia, and agriculture has been identified as the largest source category of nonpoint source pollution. Questions related to land use planning and development were included because urban areas within the state are continuing to grow and constitute more difficult nonpoint source problems

than other source categories. Rectifying pollution problems in developing areas is also a more costly endeavor, because structural solutions are often required and the value of land is substantially higher. Several general questions were included in the survey to identify local needs and potential obstacles to nonpoint source pollution control.

Check boxes were used with many of the questions to solicit information about particular best management practices and help categorize and simplify the responses. Most of the responses indicate that many of the BMPs are being implemented with state and federal assistance. The survey also requested names of individuals involved in nonpoint source pollution control.

Information on local government programs in the upper Potomac River basin was collected using interviews with local officials which guaranteed a high rate of response in this portion of the Chesapeake Bay drainage. A high response rate was desired, because the Potomac basin is a priority for Virginia's Tributary Strategies. DCR-DSWC staff was also aware that certain localities in the Shenandoah Valley had adopted ordinances or ordinance provisions regulating animal waste management at confined animal operations.

The interviews with local officials complemented the survey by providing a valuable opportunity to discuss nonpoint source pollution issues in greater detail. Though limited in number, these interviews allowed improved communications and provided a depth of insight regarding local efforts, unmatched by mail-in survey responses. Selected comments from these interviews have been incorporated into this survey summary.

Response:
Surveys were mailed to 124 localities within the Chesapeake Bay drainage and 75 localities responded either by mail or interview. The cumulative response rate was 62%.

The results of the survey have been summarized based on two distinct management areas within the Bay drainage: localities within the coastal zone and localities outside the coastal zone. The difference in physiographic conditions between these two areas often affects the type of BMPs programs used to manage NPS pollution. The distinction is also useful to program managers and policy-makers that must coordinate nonpoint source pollution management programs, such as Virginia's existing coastal zone management program and the Chesapeake Bay Preservation Area Designation and Management Regulations, with other NPS programs throughout the state.

For each survey question, the responses and comments have been summarized and response rates are shown both as ratios and as simple percentages. The ratios consists of the number of positive responses divided by the total number of responses received.

Cumulative response rates are shown by type of locality and location in the following table.

	Coastal	Non-Coastal	Combined
Counties	20/28 71%	22/37 60%	42/65 65%
Cities	14/18 77%	7/18 38%	21/36 58%
Towns	6/10 60%	8/13 61%	14/23 61%
Combined	40/56 71%	37/68 54%	77/124 62%

While agricultural questions (#1 through #4) were directed primarily toward counties, all responses have been summarized collectively. Towns and cities often did not respond to these questions or simply commented that the questions did not apply. Questions 5 through 11, addressing land use planning and development, were applicable to all localities and received a higher response rate; however, towns and cities seemed to be more actively involved in these types of activities. General questions (#9 through #11) allowed local representatives an opportunity to prioritize types of assistance needed, provide more detailed information about relevant local initiatives, and describe obstacles to local nonpoint source pollution control efforts. These questions seemed to be well received, particularly by localities which were actively involved in nonpoint source pollution control.

In the following section, responses to each of the survey questions have been analyzed and summarized.

QUESTIONS #1 THROUGH #4 ARE RELATED TO AGRICULTURAL

1. Soil Conservation

Please check any of the following agricultural best management practices your locality requires or promotes through local policies, plans, ordinances, tax incentives, or other means. If your locality does not have applicable programs please go to question #2.

Listed BMPs:	Coastal Localities		Non-Coastal Localities		Combined	
Conservation Tillage	12/40	30%	8/37	22%	20/77	25%
Contour Farming	4/40	10%	3/37	8%	7/77	9%
Cover Cropping	12/40	30%	7/37	19%	19/77	25%
Critical Area Planting	7/40	17%	6/37	16%	13/77	17%
Filter Strips or Buffer Areas	13/40	32%	9/37	24%	22/77	28%
Grassed Waterways	6/40	15%	9/37	24%	17/77	22%
Field Strip-cropping	13/40	32%	6/37	16%	19/77	25%
Terrace	3/40	7%	2/37	5%	5/77	10%
Wetland Conservation	14/40	35%	5/37	13%	19/77	25%
Riparian Zone Protection	10/40	25%	5/37	13%	15/77	19%

Other _____
Sediment retention structure & reforestation

Please describe how your locality addresses these practices.

Typically, Soil and Water Conservation Districts address agricultural soil conservation. The local SWCD in cooperation with the USDA's Soil Conservation Service and Virginia's Cooperative Extension Service provide technical assistance and cost share funding for agricultural best management practices (BMPs). Coordination between localities and SWCDs usually involves regular meetings and/or memos of understanding (MOUs).

Some of the localities commented that agriculture is generally considered to be the subject of federal or state government.

Coastal Localities:

Many coastal localities mentioned CBPA ordinances which require the preparation of farm conservation plans. Wetland protection, field strip-cropping, and riparian zone protection were more frequently mentioned by coastal localities. The difference in the type of BMPs used might be attributed to the greater number of wetlands and riparian areas within the coastal area.

2. Pesticide Management

Does your locality have plans, ordinance requirements (for example site plan or special use provisions), or other mechanisms which place conditions on the use of pesticides or which address the siting of commercial fertilizer and pesticide operations?

	Coastal Localities	Non-Coastal Localities	Combined
Yes	15/40 37%	8/37 22%	23/77 30%
No	15/40 37%	22/37 65%	39/77 51%

For question #2 only positive responses (checked boxes or written comment) were tabulated.

If yes, please describe any applicable requirements.

Pesticide management is usually addressed through local SWCDs in cooperation with VCE agents. Fertilizer or pesticide production facilities typically are categorized as industrial uses and are so regulated by local zoning ordinances. Localities seem to rely on federal and state regulations to control the use of agricultural pesticides and fertilizers

Certain localities require golf courses to implement integrated pest management as a condition for approval; however, most localities do not have special requirements governing pesticide use, siting of commercial fertilizer and pesticide operations, or the application of pesticides and fertilizers for agricultural use.

Coastal Localities:
Many coastal localities mentioned ordinances adopted through the Chesapeake Bay Preservation Act and wetlands management by local wetlands boards in response to question #2.

3. Confined Animal Operations

Please check any of the following confined animal siting and management practices your locality requires or promotes through local policies, plans, ordinances, or other means. If your locality does not have applicable requirements please go to the next question.

Listed BMPs:	Coastal Localities		Non-Coastal Localities		Combined	
Constructed Wetlands	6/40	15%	1/37	3%	7/77	7%
Waste Storage Structures	9/40	22%	8/37	22%	17/77	22%
Waste Treatment Lagoons	8/40	20%	5/37	13%	13/77	17%
Buffer Areas or Setback Requirements	13/40	32%	10/37	27%	*23/77*	*30%*
Animal Density Restrictions	2/40	5%	1/37	3%	3/76	4%
Site Restrictions	8/40	20%	4/37	11%	12/76	15%
Loafing Lots	6/40	15%	2/37	5%	8/77	10%
Application of Waste and/or Runoff to Crop Land	9/40	22%	7/37	19%	16/77	21%
Waste Utilization or Nutrient Management Plans	12/40	30%	10/37	27%	22/77	24%

Please describe how your localities plans, ordinances, or other mechanisms apply to any of the practices checked above. In addition, if your locality requires that a nutrient management plan be prepared for confined animal operations, please indicate if this plan addresses commercial fertilizer and animal waste use, timing, and rates of application.

SWCDs are involved with nutrient management planning and sludge application. Buffer areas or setback requirements were the most often mentioned BMP in both management areas. Confined animal operations are sometimes restricted by special use or conditional use permits incorporated into local zoning requirements. Two counties, Augusta and Rockingham, have developed local ordinances to address confined animal feeding operations and nutrient management associated with animal wastes.

Coastal Localities:

Farm conservation plans encourage nutrient management and are required by the Chesapeake Bay Preservation Act (CBPA). None of the coastal localities reported having an ordinance

specifically dealing with animal waste from confined animal feeding operations; however, CBPA requirements may already be adequately controlling NPS pollution from confined animal operations.

4. Grazing Management

Please check any of the following best management practices for grazing livestock your locality requires or encourages through land use plans, ordinance provisions, or other means. If your locality does not address grazing management, please go to the next question.

Listed BMPs:	Coastal Localities		Non-Coastal Localities		Combined	
Planned or Rotational Grazing Systems	9/40	22%	6/37	16%	15/77	19%
Alternative Drinking Water Supply (pipeline, pond or well construction)	9/40	22%	6/37	16%	15/77	19%
Fencing	10/40	25%	8/37	22%	18/77	23%
Livestock Exclusions	5/40	12%	5/37	13%	10/77	13%
Hardened Stream Crossings	7/40	17%	5/37	13%	12/77	16%
Hardened Watering Access	8/40	20%	5/37	13%	13/77	17%
Pasture and Hayland Planting	9/40	22%	5/37	13%	14/77	18%
Critical Area Planting	9/40	22%	4/37	11%	13/77	17%
Brush & Weed Management	5/40	12%	4/37	11%	13/77	17%
Prescribed Burning	7/40	17%	3/37	8%	10/77	13%

Other _____

If you checked any of these practices, please describe.

The items listed above are typically handled by local SWCDs and CBPA ordinances. Grazing management is one component of the farm conservation plans encouraged by local CBPA ordinances and the USCS-SCS. No other local grazing management initiatives were reported.

QUESTIONS #5 THROUGH #11 ARE RELATED TO LAND USE PLANNING AND DEVELOPMENT

5. Watershed Protection

Please check any of the following watershed protection efforts your locality is currently involved in.

Listed BMPs:	Coastal Localities	Non-Coastal Localities	Combined
Resource Inventory and Analysis	21/40 52%	2/37 5%	23/77 30%
Regional Stormwater Management	8/40 20%	13/37 35%	21/77 27%
Designation of Critical Watersheds	7/40 17%	6/37 6%	13/77 17%
Flood Plain Management	31/40 77%	29/37 78%	60/77 78%
Land Use Restrictions	29/40 72%	19/37 51%	48/77 62%
Overlay Zones	15/40 37%	9/37 24%	24/77 31%
Riparian Area Protection	17/40 42%	1/37 03%	18/77 23%
Watershed Management	17/40 42%	6/37 16%	23/77 30%
Fee Simple Acquisition	2/40 5%	0/37 0%	2/77 2%
Conservation Easements	5/40 12%	4/37 11%	9/77 12%
Open Space Plans and Ordinance Provisions	21/40 52%	15/37 40%	36/77 47%
Ground Water Protection Plans and Ordinances	15/40 37%	8/37 22%	23/77 30%

Other _____

If you checked any of these practices, please describe.

Most local watershed planning consists of floodplain and storm water management programs. Other localities are using provisions of the Erosion and Sediment Control Law to manage stormwater. Local watershed protection efforts are typically used to protect sources of drinking water, or are funded by state or federal programs.

Certain localities have implemented groundwater and well head protection programs or water resource protection plans.

Coastal Localities:
Many of the localities mentioned watershed protection activities required by CBPA ordinances. Watershed management issues are often addressed in local comprehensive plans. Regional groundwater protection plans have been done for Eastern Shore localities; and the Hampton Roads PDC is presently updating groundwater plans for localities within its district.

6. Site Development and Construction

In addition to erosion and sediment control, are any of the following practices required or encouraged to protect areas susceptible to erosion and sediment loss, limit disturbance of natural drainage features and vegetation, or limit increases of impervious area?

Listed BMPs:	*Coastal Localities*	*Non-Coastal Localities*	*Combined*
Phasing and Limiting Areas of Disturbance	21/40 52%	12/37 32%	33/77 43%
Minimum Disturbance Requirements	19/40 47%	7/37 19%	26/77 34%
Open Space Requirements	14/40 35%	15/37 40%	29/77 38%
Clustering	10/40 25%	12/37 32%	22/77 29%
Performance Criteria	22/40 55%	6/37 16%	28/77 36%
Site Fingerprinting	3/40 7%	0/36 0%	3/77 4%
Preserving Natural Drainage/Storage Features	22/40 55%	11/37 30%	33/77 43%
Minimizing Impervious Surfaces	26/40 65%	5/37 13%	31/77 40%
Reducing Hydraulic Connectivity of Impervious Surfaces	5/40 12%	2/37 5%	7/77 9%
Tree Protection Requirements	17/40 42%	10/37 27%	27/77 35%

If you checked any of these practices, please describe.

Some of the localities are encouraging clustered development and many site development issues are addressed through local comprehensive plans. Erosion and sediment control ordinances are used locally to regulate site development practices, minimum standards for such programs have been established by the state. The erosion and sediment control law has been used by some localities to regulate activities which are normally exempt from the law, such as logging road construction and management, and access roads to residential properties.

Many localities complained that VDOT is frequently violates E&S requirements.

Coastal Localities:
Site development in coastal areas is further restricted by local CBPA ordinances.

7. Stormwater Management

Please describe how your locality addresses the quantity and quality of post construction storm water runoff. If your locality does not address storm water runoff, please go to the next question.

Many of the localities reported stormwater management activities addressing quantity rather than quality. If the locality had not already adopted a stormwater management plan, often they planned to pursue such a plan, or used provisions of the Erosion and Sediment Control Law to address stormwater management.

Two management strategies seemed apparent, addressing stormwater management on-site and/or adopting regional stormwater management facilities. Eight localities have adopted stormwater utility taxes to pay for stormwater improvements, other localities are presently considering such taxes. Localities within the Occoquon Watershed have adopted stringent stormwater management programs and policies which include phosphorous reduction goals. The City of Alexandria, which lies within the Occoquon watershed, has pioneered the use of intermittent sand filters. Stormwater management BMPs are defined and encouraged through PDCs (see the BMP Handbook developed by the Northern Virginia PDC).

Coastal Localities:
Locally adopted Chesapeake Bay Preservation Act ordinances include provisions which prohibit increases in post development runoff and reduce runoff from redevelopment projects by 10%. The Hampton Roads Planning District Commission works with localities to address stormwater management and have published the HRPDC BMP Handbook.

8. Onsite Disposal Systems

Please describe any plans or ordinances your locality has which address the installation, operation, or maintenance of onsite septic systems. If your locality does not address onsite disposal systems please go to the next question.

A number of localities are faced with problems related to on site sewage disposal systems, some localities are limited by soil and geology and are allowing the use of alternative systems. Others are trying to provide adequate public treatment facilities. Many localities with public systems have prohibited or limited the use of OSDSs. Failure of both traditional and alternative OSDS is usually related to inadequate maintenance, though the design and applicability of some types of alternative systems has been questioned. Some localities have prohibited the use of alternative systems or applied conditions to their use.

A number of localities within the state have adopted more stringent standards than those required by VDH for drainfield separation distances and have required reserve drainfield sites. Other localities rely solely upon VDH guidelines for OSDS standards.

Coastal Localities:
Local CBPA ordinance usually require reserve drainfields and five year pump-out. Often drain fields are not allowed in resource management areas (RMAs).

GENERAL QUESTIONS REGARDING NONPOINT SOURCE MANAGEMENT:

9. Technical Assistance

Please rank the following types of technical assistance in the order which would be most helpful in your efforts to manage nonpoint source pollution?

The items below have been reordered based on the survey score results:

1 (.17)	__	Stormwater Management
2 (.15)	__	Techniques for Financing Local NPS Pollution Management
3 (.13)	__	Public Educational Material Regarding NPS Pollution
4 (.11)	__	Managing NPS Pollution from Agriculture
5 (.10)	__	Information Regarding the Environmental Effects of NPS Pollution
6 (.09)	__	Lawn care and NPS Pollution Management
7 (.08)	__	Managing NPS Pollution from Septic Systems
8 (.08)	__	Managing NPS Pollution from Boats and Marinas
9 (.07)	__	Floodplain Management

Stormwater management, financing techniques, and public education received the highest combined scores. Floodplain management was ranked second for localities outside the existing coastal zone, but was ranked last by coastal localities. This was the only significant disparity between these management areas.

Four items were listed in the category "Other:" control of silvicultural sources, cost/benefit analysis of NPS controls, assistance targeting available resources, and grant aid programs.

10. Additional Information Regarding Local NPS Management Efforts

In the space below, please describe any additional or innovative efforts your locality has undertaken to manage nonpoint source pollution.

Generally, rural localities seemed to be addressing NPS management through the E&S law, stormwater management, zoning and land use planning, and through the CBPA within the coastal zone. More restrictive watershed and water quality protection was initiated in developing communities and specifically to protect important sources of drinking water.

Aside from local ordinances addressing nutrient management and animal waste from CAFOs, few localities had adopted special restrictions on agricultural uses.

See appendix for a detailed summary of initiatives from each locality.

11. Obstacles to Local Efforts to Control NPS Pollution

In the space below, please identify what you see as the most significant obstacles in local implementation of effective NPS pollution management programs. Also, please provide any suggestions you may have for overcoming these obstacles

The most frequently mentioned obstacles were:

1) lack of Funding(cost)/Staff,
2) lack of Awareness/Education, and
3) ineffective enforcement mechanisms.

Other comments included:

lack of authority to enforce farm plans,
difficulties obtaining wetland/stream permits for stormwater BMPs, and
too many agencies and organizations involved in implementation of regulations.

APPENDIX:

The following list includes information about local initiatives, programs and ordinances in addition to minimum federal and state programs requirements. Localities in boldface type responded to the survey; however, some had no additional or unusual activities.

Accomack County - Poultry houses and swine operations require nutrient management plans to address waste disposal and must be located at least 300 feet from "public" wells. The county is developing a Waterfront Overlay District. A Groundwater Management Plan has been completed by the USGS for the Eastern Shore.

Albemarle County - The county's Water Resources Protection Area Ordinance requires buffer areas and encourages nutrient and pesticide management. The county also has: numerous watershed management plans, a groundwater protection study, regional stormwater facilities, performance criteria for stormwater quantity and quality, development clustering, open space requirements, 100% reserve drainfield requirement, a streambank restoration and citizen monitoring programs.

Alleghany County -

Amelia County - A watershed project on Flat Creek requires farm management plans.

Amherst County
Appomattox County

Arlington County - Phasing disturbance and open space requirements are routinely handled through the conditional zoning process. The county has a Storm Water Detention Ordinance. Development in the Four Mile Run Watershed must reduce 100 year storm runoff to "undisturbed" levels, within the remainder of the County, similar levels of detention are required for the ten year storm. The county also has a citizen water quality monitoring program.

Augusta County - The county has a CAFO and nutrient management ordinance. A 100% reserve drainfield required is required for on site disposal systems.

Bath County -

Bedford County - The county has a Roanoke River Overlay Zone which includes a 25' setback from the river. There is also an open space requirements for planned unit developments (PUDs).

Botetourt County - All exposed soils must be seeded. The county a "Fincastle" Groundwater

Protection Area. Development clustering is encouraged.

Buckingham County

Caroline County - Land application of sludge or animal waste is prohibited. The land disturbance threshold county-wide is 2,500 sq. ft. BMPs are required for developments with 16% or more impervious surface.

Charles County

Chesterfield County - There are three critical watersheds designated, which are managed by a county watershed management committee. CBLAD is supporting a local BMP monitoring program. The county has initiated an education program regarding lawn management.

Clarke County - A preharvest plan is required for forestry activity. IPM is required only for golf courses. CAFOs are subject to a special use permit. The county has developed a Mountainside Plan, a Water Resources Plan, and a Groundwater Protection Plan. The county has implemented sliding-scale zoning and a well and septic ordinance.

Craig County -

Culpeper County - The county has a setback requirement of 150' for CAFOs, a Watershed Protection Area, an open space provision, and encourages development clustering.

Chamberland County
Dinwiddie County

Essex County - The county has open space requirements for new subdivisions and has initiated a groundwater and well head protection program.

Fairfax County - Fairfax county: has a Master Drainage Plan, an Environmental Quality Council, a Regional Stormwater Management Plan, a Water Supply Protection Overlay District for the Occoquon Reservoir, a Floodplain Management Program, an Environmental Quality Corridor Policy, an open space requirement, a Hazardous Materials Response Team, Tree protection requirements, Stormwater Quality requirement (50% reduction in phosphorous within the Occoquon Watershed and 40% reduction in phosphorous throughout the remainder of the county) and is presently pursuing a stormwater utility fee.

Fauquier County - The county has an Occoquon Watershed Management Plan, a Groundwater Protection Plan, an Open Space Plan and Ordinance, and encourages development clustering.

Fluvanna County -

Fredrick County - The county has setback requirements for CAFOs.

Gloucester County - All of Gloucester County has been designated a CBPA.

Goochland County - The county has animal density requirements for CAFOs., open spaces requirements, and encourages development clustering.

Greene County

Hanover County -
Henrico County -

Highland County

Isle of Wight County - Isle of Wight has a Highway Corridor Overlay District which protects trees, and is implementing a "model" Stormwater Utility Ordinance for small communities prepared by HRPDC.

James City County - The entire county is designated a CBPA, nutrient management is required for all animal waste facilities, and there are open space requirements for several zoning classifications. The county also has a Reservoir Protection Overlay District.

King and Queen County
King George County

King William County -

Lancaster County - Lancaster County has open space requirements for new subdivisions, has initiated a groundwater and well-head protection program, and limits the use of mound OSD systems, (see also NNPDC).

Loudoun County - The county has increased the minimum required separation distance for OSDSs, has implemented a sliding scale zoning scheme, requires conservation plans of properties enrolled in the land use program, has provisions in its zoning ordinance to encourage open space and protect trees. The county also has a mountain side overlay district.

Louisa County - Animal waste storage structures require a conditional use permit, and all OSDSs must have a 100% reserve drain field site.

Madison County

Mathews County
Middlesex County

Nelson County -

New Kent County

Northampton County - A Groundwater Protection and Management Plan has been prepared for the Eastern Shore.

Northumberland County - (See NNPDC)

Nottoway County
Orange County
Page County

Powhatan County - The zoning ordinance contains provisions for stream side buffers for subdivisions.

Prince Edward County - Buffer areas and setbacks for CAFOs will soon be required, and the County is participating in a regional study of Nottoway and Appomattox River basins.

Prince George County

Prince William County - The county has a regional stormwater management plan, requires open space for some development, encourages development clustering and tree protection, and is implementing BMPs as listed in the NVPDC BMP Handbook - Occoquon method and has adopted a stormwater utility (tax).

Rappahannock County -

Richmond County - Open space, development clustering, and tree protection are encouraged. All new development must meet CBLADs 16% storm water quality standard. (see also NNPDC).

Roanoke County - The county has a Roanoke River Overlay District, CAFOs require special use permits, a regional stormwater management plan, a well-head overlay district has been proposed, and the county is pursuing a stormwater utility tax.

Rockbridge County

Rockingham County - The county has an ordinance for confined animal feeding operations

which requires nutrient management plans.

Shenandoah County - The county zoning ordinance contains regulations for siting CAFOs and requires nutrient management for land application of animal waste. Septic systems are prohibited in floodplains and aerobic treatment units are temporarily banned. Development clustering is encouraged.

Spotslyvania County

Stafford County - The county has a regional stormwater management program, open space requirements in its zoning ordinance, and encourages development clustering.

Surry County - Conditional use permit are required for Confined Animal Operations.

Warren County

Westmoreland County - The county has open space requirement for large subdivisions, and sludge application requires a water quality conservation plan (see also NNPDC).

York County - (See HRPDC)

City of Alexandria - The city zoning ordinance is comprehensive. It includes tree preservation, and prohibits OSDSs. The city has pioneered the use of intermittent sand filters for treating stormwater runoff (see Alexandria supplement to the NV BMP Handbook).

City of Bedford - Bedford needs to separate combined sewer system.

City of Buena Vista
City of Charlottesville

City of Chesapeake - (See HRPDC)

City of Clifton Forge - The city has provisions for tree protection and open space.

City of Colonial Heights
City of Covington

City of Fairfax - The city has open space requirements and is pursuing a stormwater utility tax.

City of Falls Church

City of Fredricksburg

City of Hampton - Special use permits are required for stables

City of Harrisburg - The city has provisions for tree protection and the sewer authority is addressing infiltration problems

City of Hopewell

City of Lexington - The city encourages development clustering and the preservation of natural drainage.

City of Lynchburg
City of Manassas

City of Manassas Park -

City of Newport News - (See HRPDC)

City of Norfolk - Water quality management is implemented for drinking water reservoirs and CBPA stormwater criteria is applied city-wide. The city has a tree protection ordinance and new OSDSs are prohibited. The city is developing an urban nutrient management program and is using an innovative approach to update the E&S program.

City of Petersburg

City of Poquoson - (See HRPDC)

City of Portsmouth - (See HRPDC)

City of Richmond - Combined Sewer Overflow Plan have been approved by DEQ and EPA.

City of Staunton - The city may develop a stormwater management plan. The city has a North River Watershed Management Initiative, open space provisions, and a lawn care education program.

City of Suffolk - (See HRPDC)

City of Virginia Beach - (See HRPDC)

City of Waynesboro - Waynesboro has a stormwater management ordinance, and tree protection provisions.

City of Winchester

City of Williamsburg - (See HRPDC)

Town of Ashland

Town of Berryville - The town has a Stormwater Management Plan, open space requirements, and encourages development clustering.

Town of Blackstone

Town of Bridgewater - The town has a Master Drainage Plan, whereby developers contribute to stormwater costs within their basin.

Town of Cape Charles - OSDSs are prohibited.

Town of Craigsville

Town of Culpeper - The town has a Watershed Protection Overlay District for the town reservoir, a 200' setback for CAFOs within that district, and environmental assessments required for large developments within the WPA. The town may initiate a stormwater management plan.

Town of Dayton

Town of Dendron -

Town of Dumfries - Stormwater management is addressed through the Northern Virginia BMP Handbook

Town of Farmville -

Town of Glade Spring

Town of Haymarket - Has adopted an Occoquon Policy.

Town of Herndon
Town of Occoquon
Town of Scottsville
Town of Stephens City
Town of Surry
Town of Tappahannock

Town of Vienna -

Town of Warrenton - Has a Master Drainage Plan (see PD-8 BMP Handbook) and a regional stormwater management plan.

Town of West Point - The town recently developed a Stormwater Management Plan and the zoning ordinances includes open space provisions.

Town of Woodstock - No increase in runoff to sinkholes is allowed and new OSDSs are prohibited.

Hampton Roads PDC - HRPDC assist localities with NPS related issues (i.e. Groundwater Protection Handbook for Southeastern Virginia, Vegetative Practices Guide for Nonpoint Source Pollution management , BMP Design Guidance for Hampton Roads).

Northern Neck PDC - Animal waste facilities require nutrient management plans within the PDC and localities are participating in the Rappahannock River Valley Planning Project