

ENVIRONMENT

INTRODUCTION

The environment is the sum of all parts; it encompasses our entire surroundings, the land we live on, the air we breathe, and the water we drink. Blessed with lush vegetation, 235 miles of tidal shoreline, rolling hills, and bluffs, York County is an area of great natural beauty. It is also an area where these and other natural features pose many challenges to development. Development regulations in York County seek to encourage the proper use, management, and protection of sensitive and unique lands and waterways in the County that contribute to the economy of the region and the environmental quality of the County. They are not necessarily meant to preclude development or use of these areas but rather to ensure that any development that occurs is undertaken in recognition of environmental qualities and conditions.

CLIMATE

York County's climate is generally mild, with average temperatures of 39.5°F in January and 78°F in July. The growing season is 190 days long and the annual rainfall averages about 44 inches and does not vary significantly from month to month. Average annual snowfall is six inches (6"). Prevailing winds are southeasterly.

Because of their climate and geography, York County and the other counties and cities in southeastern Virginia are vulnerable to a variety of weather-related natural hazards. These include hurricanes and nor'easters (and the associated coastal flooding), snow and ice storms (which are usually associated with nor'easters), tornadoes, and wildfires. In order to reduce losses from such natural hazards, the County joined with James City County and the cities of Hampton, Newport News, and Williamsburg to develop the *Peninsula Multi-Jurisdictional Natural Hazards Mitigation Plan*. Hazard mitigation is defined as any sustained action taken to reduce or eliminate long-term risk to human life and property from hazards, and the Federal Disaster Mitigation Act of 2000 requires localities to adopt a hazard mitigation plan in order to be eligible for Pre-Disaster Hazard Mitigation Program and Hazard Mitigation Grant Program funding from the Federal Emergency Management Agency (FEMA). The plan, completed in 2005, updated in 2011, and incorporated by reference into this Comprehensive Plan, identifies goals, information, and measures for hazard mitigation and risk reduction to make the five communities more disaster-resistant and contribute to the area's long-term sustainability. Climate change and sea level rise are also concerns in York County as they are in all of coastal Virginia.

AIR QUALITY

Air quality is regulated through implementation of the federal Clean Air Act, first passed by Congress in 1970 and amended in 1990. This legislation is reflected in regulations promulgated by the U.S. Environmental Protection Agency (EPA) and enforced by the individual states. In Virginia, these regulations are enforced by the Department of Environmental Quality (DEQ) pursuant to the Air Pollution Control Law of Virginia.

The Air Pollution Control Law of Virginia gives the DEQ the legal authority to carry out state air quality programs established by the State Air Pollution Control Board and determined necessary to protect public health and welfare. It also provides the authority to carry out federally mandated air quality programs. Virginia's Air Pollution Control Law is very broad and gives the State Air Pollution Control Board considerable latitude in developing regulations. It generally provides minimal guidance on the content of the regulations or other substantive aspects of programs. Together with state law, the federal Clean Air Act and its implementing regulations provide the authority for the department to develop air quality programs mandated at the federal level. They usually specify, in great detail, the requirements for an air quality program. State air

quality programs developed under the authority of the federal Clean Air Act must be approved by the EPA.

In accordance with the Clean Air Act, air quality is monitored throughout the state for compliance with the National Ambient Air Quality Standards (NAAQS). The NAAQS, which are set by the EPA after years of analysis and with the review of EPA's Science Advisory Board, establish maximum limits of "criteria pollutants" that are allowed to be emitted to the ambient (outside) air. The criteria pollutants are ozone (O₃), nitrogen oxides (NO_x), sulfur dioxide (SO₂), carbon monoxide (CO), lead (Pb), and particulate matter (PM₁₀). Areas that meet these standards are classified as attainment areas, while those that fail to meet one or more of the NAAQS are classified as non-attainment areas. A third category – maintenance area – applies to any geographic region previously designated as a non-attainment area and subsequently redesignated to attainment subject to the requirement to develop a maintenance plan.

The EPA requires that each state submit a State Implementation Plan (SIP) to show how air pollution will be reduced to levels at or below the NAAQS and how the state will maintain air pollution at the reduced levels. If a state does not submit an acceptable plan, the EPA can develop and implement a plan and impose sanctions. Virginia's SIP was submitted to EPA in early 1972, and more than 100 revisions have been made to the plan since its original submittal. The SIP consists mostly of regulations, as well as permits, emissions inventories, attainment demonstrations, and other related documentation. The overall process of developing the SIP is outlined below:

- Examine air quality across the state.
- Delineate areas where air quality needs improvement.
- Determine the degree of improvement necessary.
- Inventory the sources contributing to the problem.
- Develop a control strategy to reduce emissions.
- Implement the strategy.
- Ensure that air quality standards are not violated in the future.

The key element of the SIP is the control strategy, which describes the emission reduction measures to be used by the state to attain and maintain the air quality standards. There are three basic types of control strategy measures:

1. Stationary source control measures, which limit emissions primarily from commercial/industrial facilities and operations. (In York County, the two major sources of air emissions are the Western Refinery [now closed] and the Dominion Virginia Power Yorktown Power Station. There are also four federal government facilities that are classified as minor sources.)
2. Mobile source control measures, which limit tailpipe and other emissions primarily from motor vehicles, and include federal motor vehicle emission standards, fuel volatility limits, reformulated gasoline, emissions control system anti-tampering program, and the Inspection and Maintenance program.
3. Transportation control measures, which limit the location and use of motor vehicles and include carpools, special bus lanes, rapid transit, commuter park-and-ride lots, bicycle lanes, and signal system improvements. These are generally included as commitments in plans and do not require individual regulations.

Non-attainment areas are required to form local planning organizations (LPOs). The purpose of the LPO in a non-attainment area is to assist the DEQ in carrying out planning requirements for that area. These planning requirements can include examining baseline emissions levels to determine necessary control strategies, examining transportation needs for future growth, and if necessary, creating plans for EPA review and approval to bring the area into attainment with the

air quality standards. The extent of the planning requirements depends greatly on the classification of the non-attainment area and the severity of the air pollution problems.

In addition to the human health impacts associated with air pollution, non-attainment status can jeopardize a region's federal transportation funding. Regions that receive federal highway funding must demonstrate that their short- and long-term transportation improvements plans conform with air quality standards set forth by the EPA. In other words, a region cannot adopt a transportation plan that causes vehicle emissions to exceed the thresholds "budgeted" to that region by the EPA. York County is part of the Hampton Roads Air Quality Region, which the EPA designated as a marginal non-attainment area for ozone in 2004. In 2007, however, the EPA re-designated Hampton Roads as an attainment area for ozone, although technically, the region is considered a maintenance area – a designation given to an area that was originally designated a non-attainment area for a pollutant that later met the federal standard for the pollutant, and for which the EPA has approved an air quality maintenance plan that shows how the area will remain in attainment through 2018.

LAND

Topography

The topography of land in York County varies from generally low, flat land with high water tables in the lower County to rolling terrain with well-drained soils in the northern reaches at elevations of up to 130 feet. The Steep Slopes map shows those areas in the County with slopes greater than 20%, which are subject to potential erosion if not adequately protected during the course of any development activity. Construction of roads, driveways, structures, and other land disturbing activities in these areas are not allowed unless no other practical option exists. New construction on existing slopes in excess of 30% is generally prohibited except in certain unusual circumstances.

Soils

There are six main soil categories in the County as defined by the Virginia Soils Conservation Service. The different soil types dictate limitations on construction techniques required for successful development in each area. A significant issue in terms of construction is the potential for shrink-swell soils. To date there have been no major problems in York County but both James City and Chesterfield Counties have experienced major shrink-swell issues.

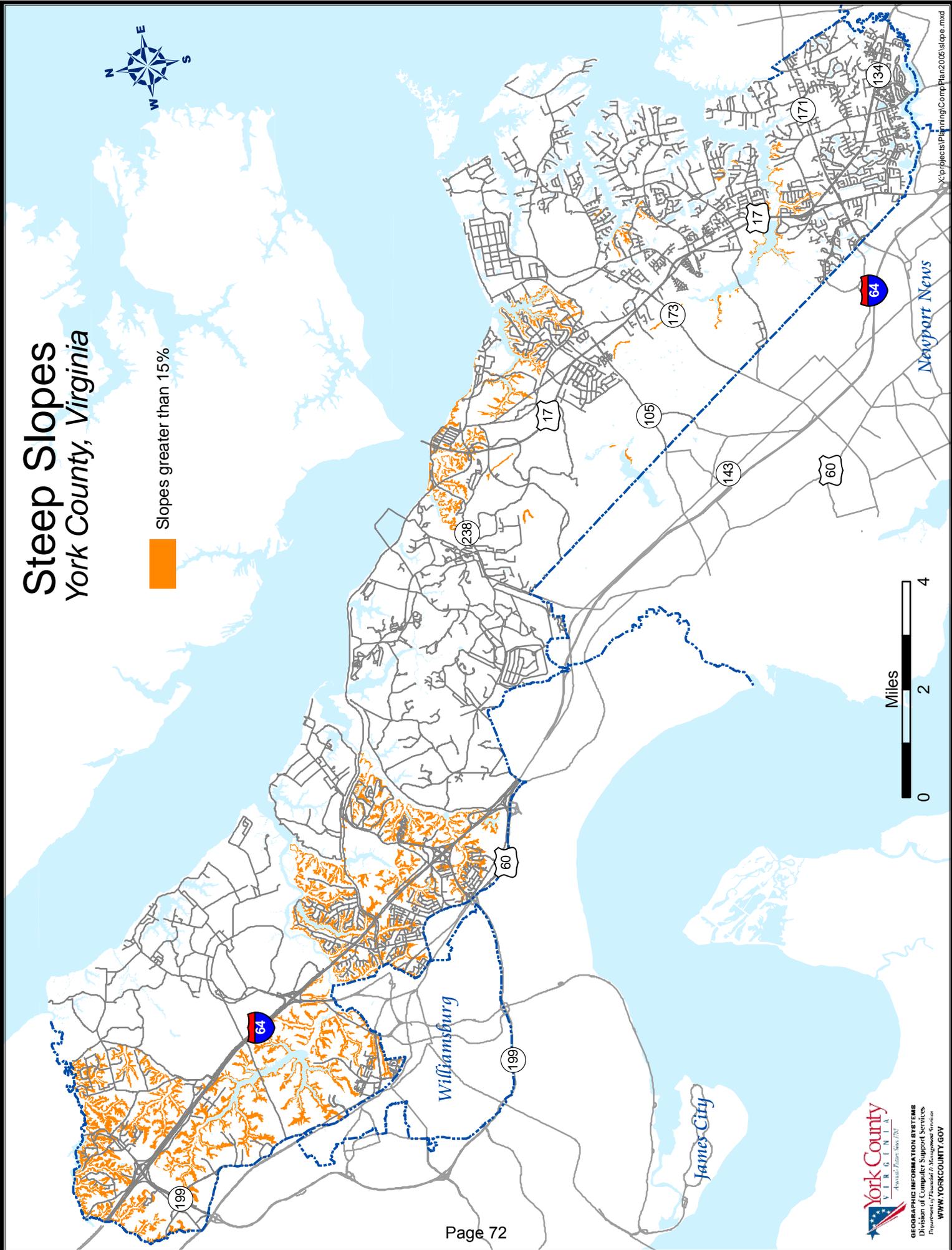
The County contains soil types that are conducive to agricultural use, but, for economic reasons, farming of land is often an interim use until the land can be developed for more profitable uses. The County's land use assessment program provides tax relief for much of this type of property, including qualifying lands dedicated to agricultural or horticultural use.

As shown on the High Water Table map, a significant portion of the County has a high water table, which is defined as being within 2½ feet of the ground elevation. In addition, much of this land with a high water table has been classified as hydric, which means that it stays saturated for enough time during the growing season to develop anaerobic conditions. This soil characteristic is significant in making wetland determinations.

With few exceptions, the entire County is generally characterized by soils with severe limitations for septic systems. The suitability of soils for supporting a properly functioning septic system is dependent on a variety of factors including lack of topographic relief, susceptibility to severe wetness, flooding potential, percolation (permeability) rate, and filtering characteristics. System failures have been reported by the Health Department in various areas of the County; however, they should not be construed as an absolute indication that septic systems will not function properly in a particular area. For site-specific conditions, on-site surveys and samples must be obtained. The combined characteristics of a high water table, slope, permeability, and flood

Steep Slopes York County, Virginia

Slopes greater than 15%

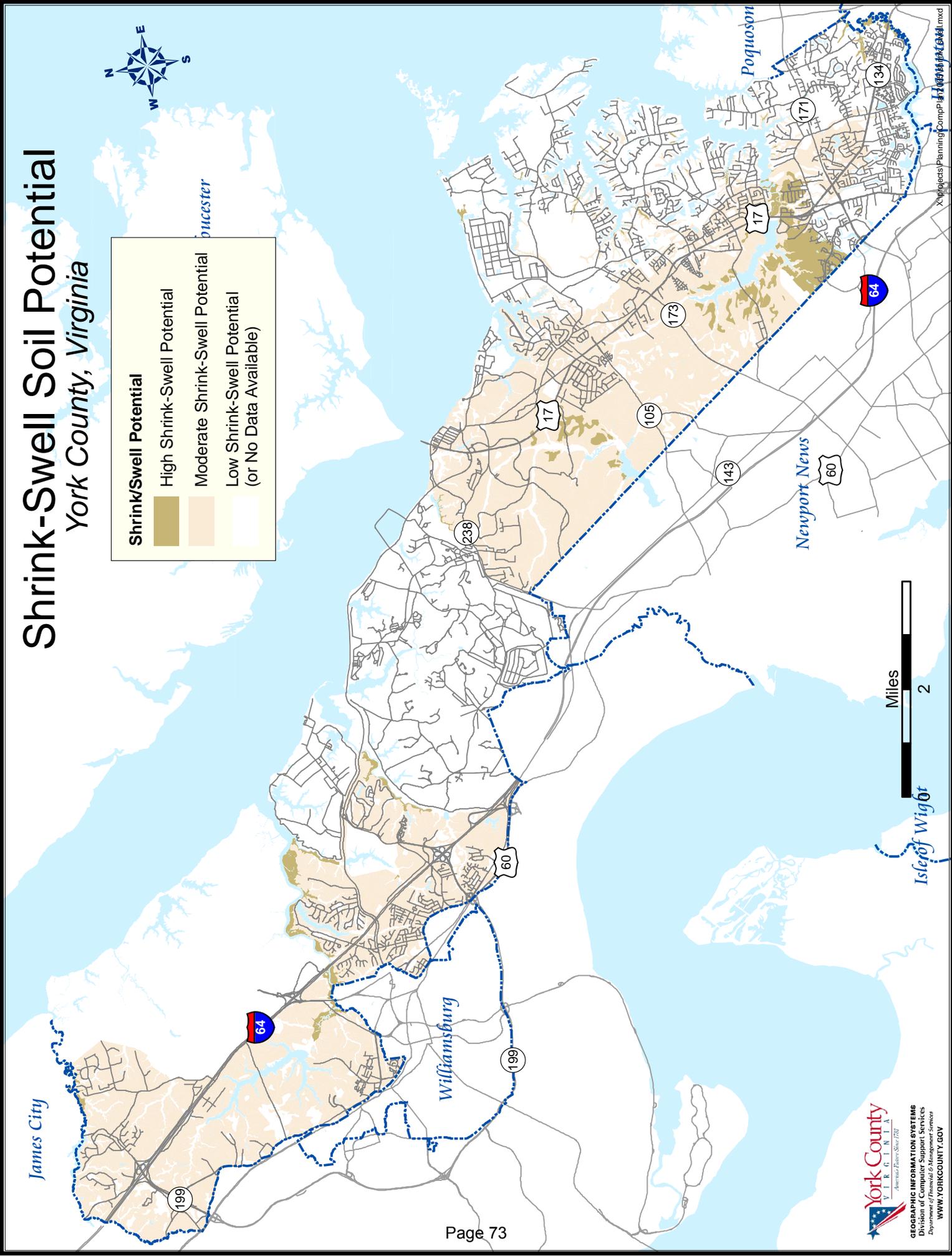


Shrink-Swell Soil Potential

York County, Virginia

Shrink/Swell Potential

-  High Shrink-Swell Potential
-  Moderate Shrink-Swell Potential
-  Low Shrink-Swell Potential (or No Data Available)



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High Water Table York County, Virginia



Gloucester

Areas with water table elevation within 2.5 feet of ground surface



James City

Williamsburg

Poquoson

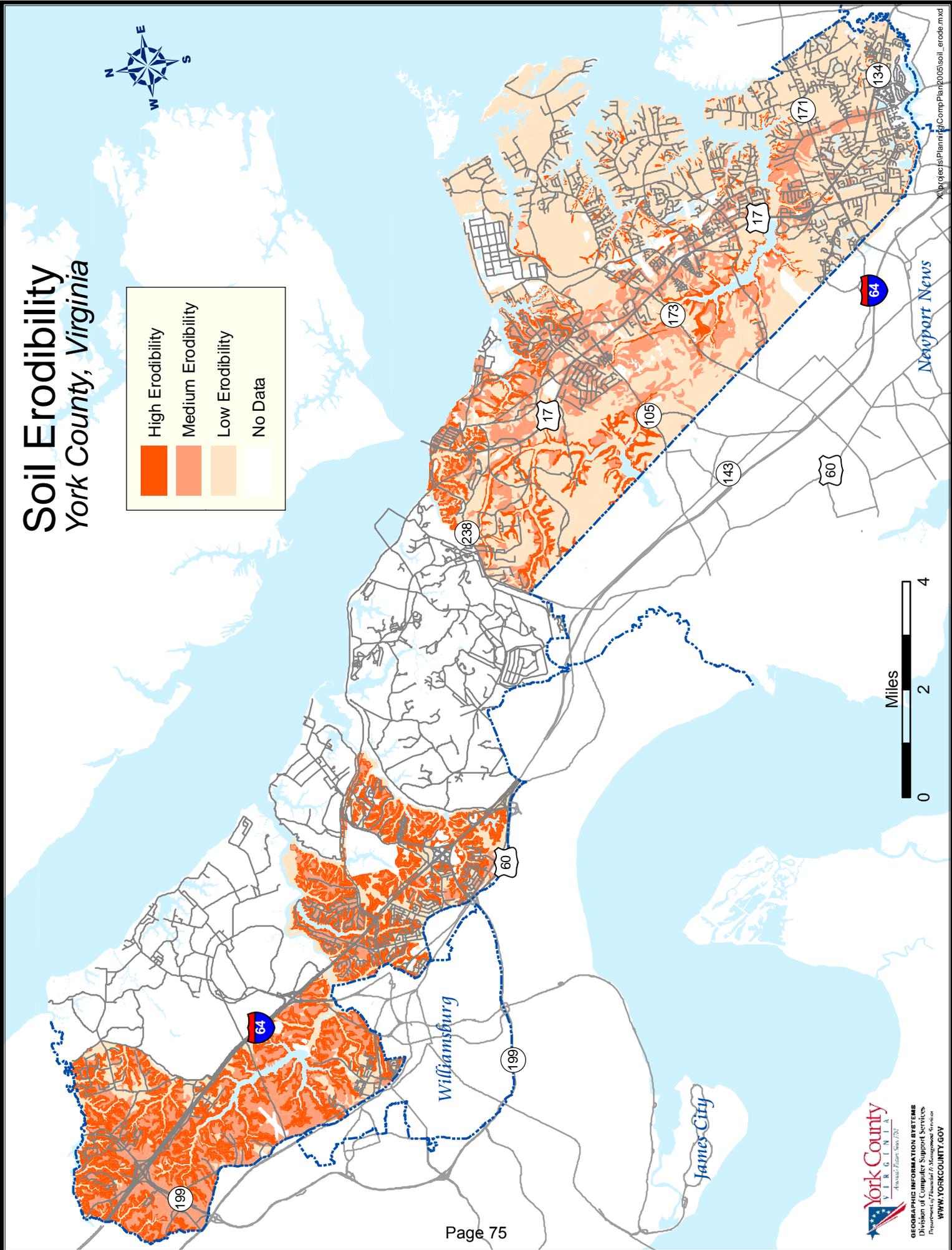
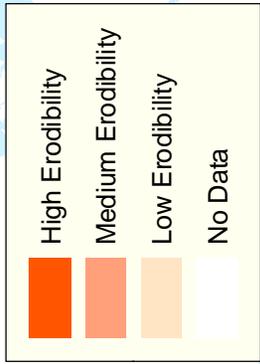
Newport News

Isle of Wight

Hampton



Soil Erodibility York County, Virginia



potential make the proper functioning of septic tanks difficult in the lower County. Periodically the Health Department conducts a “shoreline sanitary survey” of the County and, where on-site deficiencies are identified, the property owner is notified of the violation. Follow-up inspections are conducted by the local Health Department to ensure that corrections are made to the system.

Because of the County’s topography and its many peninsulas, alternative sanitary sewer systems, such as vacuum sewer systems, have been used in all or parts of the some of the County-funded sewer extension projects and are performing successfully. The use of grinder pumps can also be a cost-effective solution in specific applications where gravity or vacuum systems are not economically or technically feasible.

Erosion and Sedimentation Control

Adequate erosion control measures will minimize off-site sediment transport and, because sediments also pick up phosphorus and nitrogen, such control results in the reduction of nutrients to the receiving waters. The County’s Erosion and Sediment Control Ordinance, amended and re-adopted in 1991 and then rewritten in 2002, requires that all land disturbances greater than 2,500 square feet meet state standards relative to the installation of control systems such as silt fences, straw bales, sediment basins, and check dams to control soil loss.

The EPA, through the State Department of Conservation and Recreation (DCR), requires construction projects over an acre to obtain a Virginia Stormwater Management Program (VSMP) permit for discharges associated with construction. This is in addition to the state and local requirements.

The Colonial Soil and Water Conservation District provides assistance to Peninsula localities on the conservation of soil, water, and related natural resources. The District staff also works with the agricultural community in preparing conservation plans and advising farmers on proper land management. In 1990 the County and the District formalized this working relationship with a Memorandum of Understanding, which provides for the Soil Conservation District to 1) assist the County with erosion and sediment control programs; 2) provide education on natural resource conservation; and 3) assist in developing ordinances, policies, and plans for managing soil, water, and natural resources. Two York County citizens are elected to the District board.

Stormwater Management

As part of the erosion control program, York County has required development to control stormwater discharge quantities to pre-developed levels since the 1980s. All construction in the County must control stormwater quantity and now quality through Best Management Practices (BMP) designed for the site. The owner must also execute an agreement to guarantee maintenance of the BMP’s post-construction.

The EPA enacted the National Pollution Discharge Elimination System (NPDES) Phase II program in 1999. This requires that stormwater be regulated in urbanized areas of Small Municipal Separate Storm Sewer Systems (MS4) to make sure there are no unauthorized discharges. Unauthorized or illicit discharges are anything other than stormwater or as specified in the ordinance. The purpose of these regulations is to address non-point source discharges such as storm water that is a major contributor to the sediment and nutrient loadings in estuaries, rivers and the Chesapeake Bay. The state program for this is the Virginia Stormwater Management Program (VSMP) which requires that the County’s stormwater management program meet the following six minimum measures:

- Public education
- Public involvement/participation
- Illicit discharge detection and elimination

- Construction site controls
- Post-construction controls
- Pollution prevention/good housekeeping for municipal operations

York County was first granted a stormwater discharge permit to comply with this program in 2003. The permit was renewed in 2008 and must be renewed every five years. Reports are submitted annually to show the County is meeting the permit through the control measures. Water quality treatment to deal with TMDLs (Total Maximum Daily Loads) are also now incorporated into the permit requirements.

Non-point source pollution from fertilized lawns and impervious areas are addressed by the Stormwater Management Ordinance requirement to control water quality measures. In addition, non-point source pollution from areas without BMPs is being reduced through implementation of the County's *Strategic Capital Plan for Water, Wastewater and Stormwater*, which includes funding for projects to make improvements to the storm sewer system, construct BMP's and do stream restoration.

WATER QUALITY

Water quality is a critical issue for every community but particularly for York County because of its location and topography. Not only is water an important resource in terms of providing drinking water, it also provides important recreational, aesthetic, and economic benefits to the County and its citizens. The regulation of surface and ground water involves many federal, state, and local programs. These regulations are directed mainly at three targets: point sources such as end-of-pipe discharges and underground storage tanks; nonpoint sources such as stormwater runoff; and nontidal and tidal wetlands. Coastal wetlands absorb nutrients that drain from the uplands, which is an important filtering process to improve water quality. All of these sources together contribute to the level of water quality in the Chesapeake Bay, the York River, and all of their tributaries.

York County, for the most part, enjoys high-quality water in both its fresh water and brackish water systems. The protection of water systems in Virginia is the responsibility of the State Water Control Board and its regulatory agency, the Department of Environmental Quality, and to some extent the State Board of Health. Some specific issues relating to these systems are discussed below.

Fresh Surface Water

Surface water impoundments, all of them owned by other jurisdictions, are the major source of drinking water in York County. The five surface water impoundments used (or formerly used) as reservoirs for drinking water that are located completely or partially in the County are listed below:

- Lee Hall Reservoir (owned and operated by the City of Newport News)
- Harwoods Mill Reservoir (owned and operated by the City of Newport News)
- Waller Mill Reservoir (owned and operated by the City of Williamsburg)
- Big Bethel Reservoir (owned by the federal government for Langley Air Force Base but no longer used as a drinking water supply)
- Jones Pond (owned by the federal government for Cheatham Annex but no longer used as a drinking water supply)

Because the quality of surface water is directly related to land use, York County established the Watershed Management and Protection Area (WMP) overlay zoning district in 1985. The provisions of the WMP overlay district are intended to ensure the protection of watersheds

Watershed Protection Areas York County, Virginia



Watershed Areas

Gloucester

Poquoson

Newport News

Williamsburg

James City



Isle of Wight

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surrounding current and potential public water supply reservoirs. The regulations seek to prevent the degradation of reservoirs from the operation or accidental malfunctioning of the use of land or its appurtenances within the drainage area of water sources. The WMP provisions require that a 200-foot vegetated buffer be maintained from the edge of any reservoir or tributary stream. They also prohibit certain uses, such as feedlots, septic drainfields, and landfills, within 700 feet of reservoirs and their associated tributary streams. Storage of hazardous wastes is specifically prohibited throughout the district. In addition to limiting land use, the regulations require an impact study addressing water quality to ensure that post-development runoff does not exceed pre-development rates or quality. With the 2004 revisions to the Chesapeake Bay Preservation Act (CBPA), the reservoirs are afforded an even greater degree of protection by the CBPA regulations.

The water quality in all of these reservoirs is high with the exception of the Big Bethel Reservoir, where urbanization and development have diminished the water quality.

Ground Water

Ground water is directly related to surface water and is itself an important drinking water source. It is contained in the saturated pore spaces of sediments beneath the surface of the Earth. The underwater formations that yield water to wells are called *aquifers*. They store, disperse, and transmit water. Groundwater is replenished by precipitation on the land surface or downward seepage of water through overlying beds.

The amount of water an aquifer contains depends on the porosity and permeability of the surrounding soils. Porosity refers to the amount of open space (voids) between the sands, silt, and gravel. Permeability is the ability of the soil to transmit water through the aquifer material. Sandy and gravelly soils can hold large amounts of water because there are larger and more connected spaces between the particles. Clay soils, on the other hand, have small spaces that are not connected, making water passage difficult. Annual recharge to the groundwater system from precipitation is approximately ten inches per year in the York County area.

The ground water flow system in the Coastal Plain is a multi-aquifer system generally flowing from west to east. Studies have identified at least seven major aquifers – three shallow and four deep – in York County. Generally, the oldest aquifers are the deepest.

In general, there are six hydrogeologic units comprising the shallow aquifer system, three aquifers and three confining layers. The Columbia aquifer is the County's uppermost and is unconfined, its upper limit being the seasonally variable water table and its depth being at least five feet (5'). It is not the aquifer of choice for potable water because of its relatively low yields, poor water quality, and susceptibility to contamination. There are some very shallow wells in the County (9') still being used for potable water in older neighborhoods.

Of the deep aquifers, the Chickahominy-Piney Point aquifer, characterized by black and white sands interspersed with shells and dark, silty clay, is important to York County in that it is used by the five wells for public water distribution. This aquifer is also used (now or formerly) by industry in West Point and Franklin and lies approximately 150 to 400 feet below mean sea level. Below this aquifer is the Aquia Aquifer, which is not utilized much in eastern Virginia because the deposits are fine-grained and commonly contain a limy mud matrix and thin limestone beds. Deeper still is the Upper Potomac Aquifer, capable of producing large quantities of good water suitable for most uses. The two lowest aquifers, the Middle and Lower Potomac, also are capable of supplying large quantities of water but are generally too deep for all but major industrial and municipal applications.

Newport News Waterworks now operates three former York County production wells that serve the Skimino/Banbury Cross residential communities and the commercial sites in the upper County. The source water is groundwater from three wells drawing from the Chickahominy-

Piney Point aquifer. The installation of the Lightfoot wells was approved by the SWCB subsequent to computer modeling that indicated a minimal one-time draw-down of the water table would occur with the wells operating at approved production levels. The DEQ has designated York County as part of a ground water management area and major withdrawals (more than 10,000 GPD) require approval by the State Water Control Board (SWCB). The ownership, operation and testing of the three wells has been turned over to Newport News Water Works.

The overall natural quality of the groundwater in Hampton Roads is high. Large-scale human-induced contamination of the region's aquifers is not a problem. The major threats to groundwater quality are inefficient septic systems; leaking underground storage tanks; spills and improper disposal of hazardous material; leaking surface water impoundments; leaking landfills; improper pesticide and fertilizer application; and pumping induced saltwater encroachment. The most vulnerable aquifer in the County is the Columbia since it is shallow and unconfined. Deeper aquifers can be contaminated from downward migration, and the health and economic impacts on a community can be high. It is imperative, therefore, that groundwater be protected.

The Virginia Department of Health monitors wells and water supply systems serving 15 or more connections and systems serving more than 25 persons for more than 60 days of the year. Community wells and systems have quarterly testing and reporting requirements. Local Health Departments monitor non-community and non-transient wells. They also process the permits for private wells and administer the State's Private Well Regulations, which are intended to ensure that private wells are located, constructed, and operated in a manner that does not adversely affect public safety, health, or groundwater resources. The local Health Departments do not monitor, inspect, or track abandoned wells. Because improperly abandoned wells are a possible point of aquifer contamination, York County has an interest in assisting the Health Department to establish a database of abandoned wells and ensuring their proper closure. According to both the Williamsburg and Newport News offices of the Health Department, there have been no reports or complaints of saltwater intrusion into private wells in York County.

Most of the groundwater in the County distributed for drinking water comes from the Chickahominy-Piney Point aquifer, which is a confined aquifer. The confining units between the aquifers limit the movement of pollutants into the water supply, hence the majority of groundwater from wells in the County is afforded a significant level of protection from contamination. However, an unknown number of private wells in the County are withdrawing water from the unconfined surficial aquifers. Because of the lack of confining units, pollutants from the land's surface, underground storage tanks, or sanitary septic drainfields can move freely into the groundwater.

Although public water hook-up in the County is mandatory only in certain situations, the number of private wells used for potable water is decreasing. All *new* construction must use public water if it is available, and as capital improvement projects continue to bring public water to existing neighborhoods, more residents are voluntarily abandoning private wells in favor of the public water system. Neighboring localities have adopted ordinances requiring existing residences to connect to the public water system in the event of private well failure.

There are six landfills in the County, one active and five closed. The Virginia Department of Environmental Quality regulates landfills to prevent contaminants from leaching into groundwater.

Military installations (current or former) in the County have documented soil and groundwater contamination problems. The state-owned property at the intersection of Penniman Road and the Colonial Parkway (formerly part of Cheatham Annex) contains a defunct fuel farm and soils that are contaminated with fuel and solvents. The Naval Weapons Station contains a Superfund site that, according to the EPA, has been contaminated with polychlorinated biphenyls (PCBs), explosives, contaminated wastewater, organic solvents, and other material involved in the

testing and manufacture of explosives. There is no evidence of contaminated groundwater leaving either facility. York County will continue to monitor these situations as federal studies of the problems continue.

There are currently eight open cases of leaking underground storage tanks in the County that are being monitored and regulated by the DEQ through the LUST (Leaking Underground Storage Tank) program. Four of these cases are located at the former refinery site and two on local military bases. Although inclusion in this list does not necessarily mean there is an active leak, it does mean that steps required to clean up the site are underway.

The Department of Health routinely conducts Shoreline Sanitary Surveys to identify and evaluate sources of pollution that have the potential to contaminate shellfish. The focus is on surface water pollution, but some of the information is also pertinent to an evaluation of groundwater conditions, especially relating to shallow unconfined aquifers. The County has mapped all existing septic tanks and has a program to monitor and enforce septic tank pump-out. Septic tank owners are notified of the requirement to pump-out every five years and required to participate in a five-year regular pump-out maintenance program. This program assists in the proper functioning of on-site sewer systems and thus protects the groundwater and surface water. In addition, the County's ongoing program to extend sanitary sewer to low-lying areas and other areas with failing systems is based on a priority system driven by environmental and public health needs. Connection to public sanitary sewer in the County is mandatory wherever it is available.

An item of note is that the deeper aquifers have been dropping an average of two feet per year for at least the past twenty-five years. This drop is due primarily to increased production from large ground water users such as the paper mill in West Point and food processing plants on the southwest side of the James River. Many of the homes in the upper County utilize the aquifers and are of an age when this ongoing draw-down is beginning to affect the performance of their wells such that many will require replacement or lowering of the screen areas.

The Hampton Roads Planning District Commission (HRPDC) in cooperation with its Utilities Directors Committee has a comprehensive mitigation program that will fund remediation work that may be necessitated by the installation of water supply wells by member jurisdictions; however, to date, no such issues have surfaced in York County.

Brackish Water

The water quality of the York River and its estuaries located in York County is acceptable for full body contact. According to the Virginia Marine Resources Commission, all of the tidal areas in the County are eligible for shellfish cultivation and growth. However, all of the tributaries to the York River have been closed to direct marketing of shellfish by the Virginia Department of Health, Bureau of Shellfish Sanitation, because of high coliform bacteria counts or as a precautionary closure zone around point source discharges such as the power plant outfall. The shellfish harvested in these closed areas must be relayed to warm clean water for at least two weeks prior to marketing. Oyster aquaculture benefits the aquatic environment by filtering nutrients and enhancing water clarity. There are almost 5,000 acres of leased oyster beds in the waters of York County. The County works cooperatively with state and federal regulators to address and

- Wormley Creek
- Skimino Creek
- Carter Creek
- Queen Creek
- Patricks Creek
- Lambs Creek
- Poquoson River
- Chisman Creek
- Back Creek
- Felgates Creek
- Indian Field Creek
- King Creek
- York River at Cheatham Annex Sewage Treatment Plant discharge and between Sandy Point and Yorktown

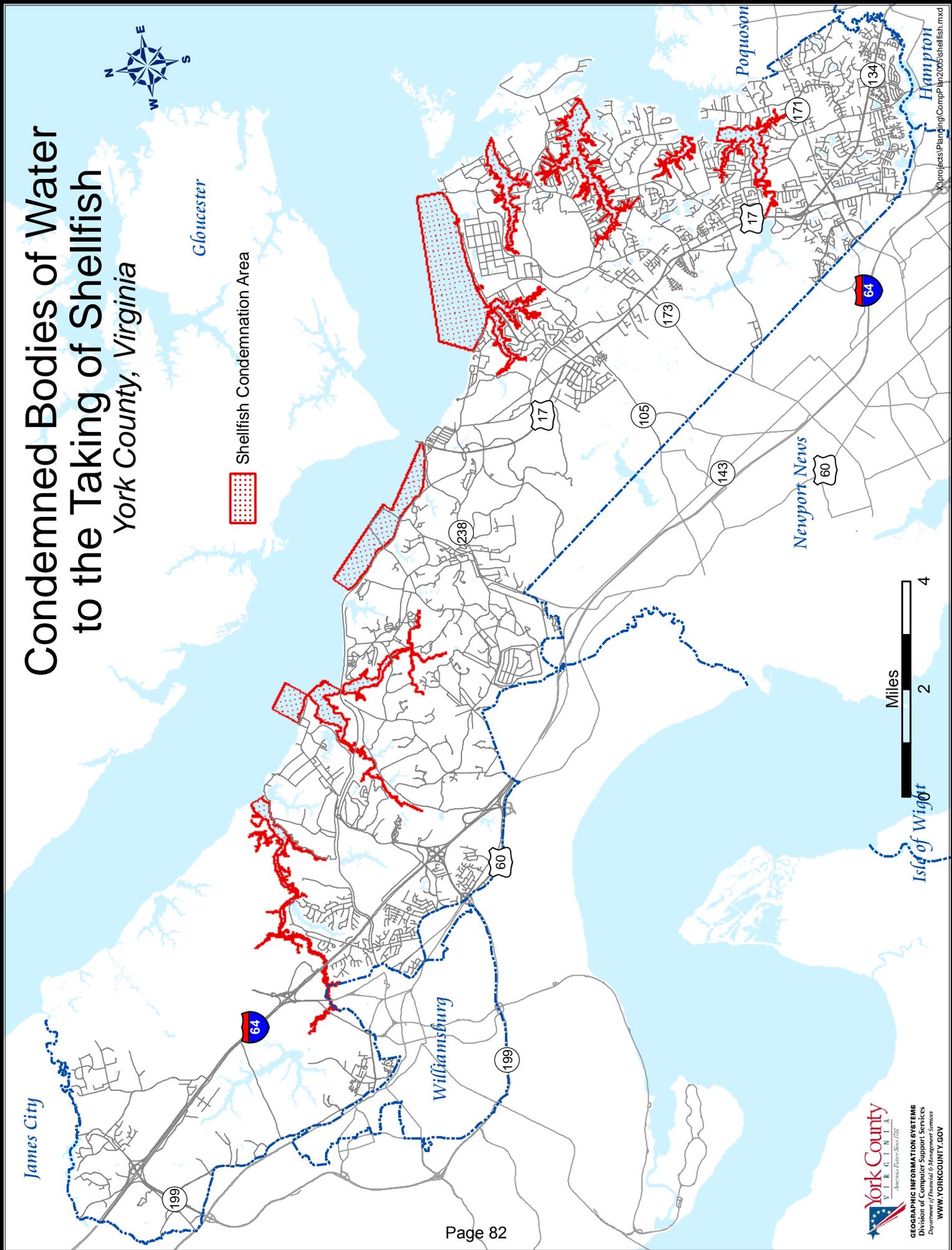
Condemned Bodies of Water to the Taking of Shellfish

York County, Virginia



Gloucester

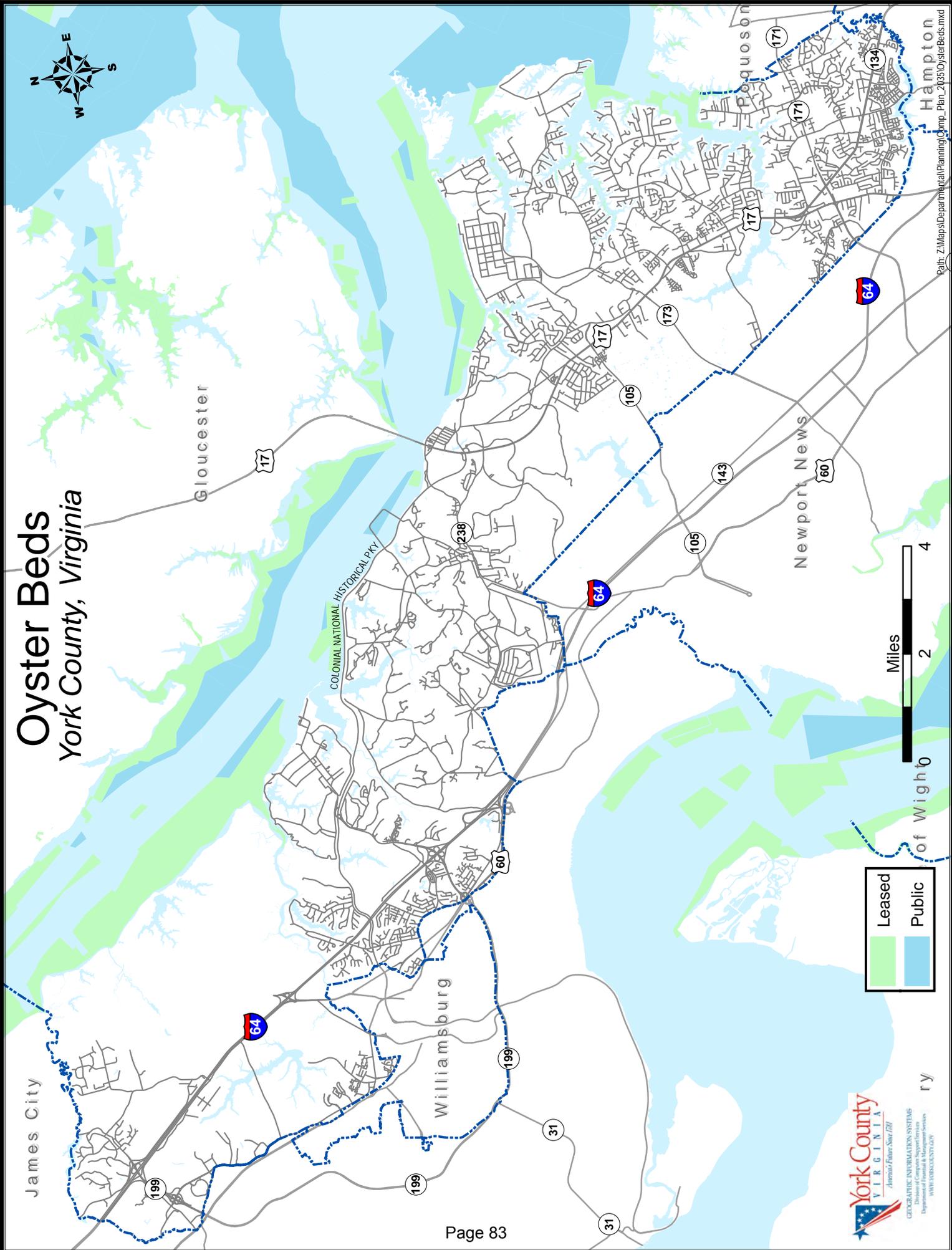
 Shellfish Condemnation Area



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Oyster Beds

York County, Virginia



encourage fisheries, backyard oyster gardening, and commercial aquaculture in appropriate areas.

York County is home to many commercial and recreational fisheries that contribute to the local economy. Skimino Creek, which has been stressed very little by the effects of human activities, is a valuable nursery ground for white perch and striped bass. Queen Creek Marsh, which is the largest marsh creek wetland system in the County, is regarded as a major fish nursery. King and Felgate's Creeks are considered nursery areas for striped bass, white perch, and other species as are the fringing marshes of Indian Creek. Many of these creeks are located at least partly on military installations. Remaining lands adjacent to these creeks that are subject to development must observe water quality requirements for stormwater runoff and the vegetated buffer requirements of the Chesapeake Bay Preservation Act. Studies also have shown that fish populations that spawn in freshwater creeks and migrate to the ocean are highly susceptible to the effects of urbanization, such as flow changes and pollution. Therefore, proper attention should be given to upland and waterfront development in these areas. Requests for dredging or filling in the wetlands and waterways adjacent to fish nursery areas should be discouraged.

According to VIMS, there are submerged aquatic vegetation (SAV) beds in certain sections of the York River in York County as shown on the SAV map. York County recognizes SAV beds as critical living resources. Certain types of land activities can contribute excessive pollutants into adjacent waterways, degrade water quality, and thus impact SAV habitats. The intensity of land use and the density of piers can increase or restrict boat traffic along waterways with SAV. Shoreline erosion control structures, especially bulkheads and revetments, can also negatively affect SAV beds.

The goal of the Clean Water Act, is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." To achieve this goal, the Act considered only point source discharges, which are regulated through Virginia Pollution Discharge Elimination System (VPDES) permits issued by the State Water Control Board. The Clean Water Act prohibits the discharge of a pollutant into State waters without a VPDES permit. Issuance of a permit requires that industries use the "best available control technology" in order to comply with water quality standards. In York County, VPDES permits have been issued to (8) industrial and municipal dischargers for point source discharges to the York River. These facilities meet or exceed federal guidelines established under the Clean Water Act.

VPDES Permits issued in York County
<ul style="list-style-type: none">• Plains Marketing• Dominion Virginia Power – Yorktown• Cheatham Annex• Williamsburg Water Filtration Plant• HRSD York River – Sewage Treatment Plant• U.S. Naval Weapons Station – Yorktown• Harwoods Mill Water Treatment Plant• Water Country, USA

Table 1

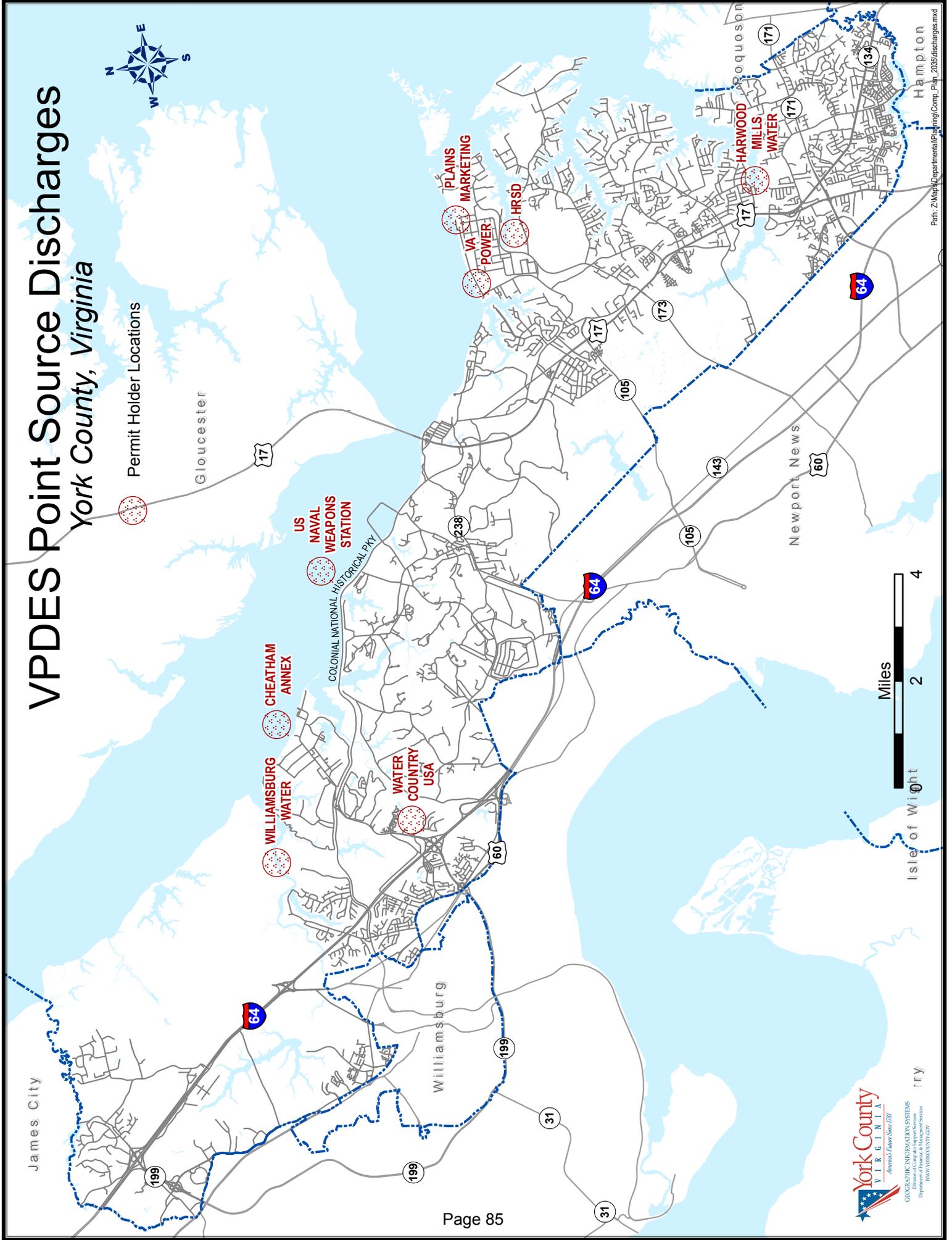
In 1987 the Clean Water Act was amended to include non-point sources (i.e., pollution from an indirect source such as stormwater runoff). Non-point source pollution in the lower York River basin comes from several sources, including "residential, urban, and/or agricultural runoff, failing/inadequate septic systems, natural conditions and drainage and boat pollution from the surrounding public and private boat slips." The loss of protective vegetation and the increase in impervious surfaces (buildings, roads, and parking lots) increases the amount of stormwater runoff and also the levels of pollution and nutrients. In addition to sediment and nutrients, toxins are discharged, adding to the overall stress on the finfish and shellfish population.

Chesapeake Bay Preservation Act

To counteract the widespread degradation of the Chesapeake Bay, the Virginia General Assembly enacted the Chesapeake Bay Preservation Act (CBPA) in 1988. The general purpose of the Act is to protect the 100-foot buffer adjacent to perennial bodies of water and require that land be managed in a manner that reduces pollutants entering the Bay by 40%. Local

VPDES Point Source Discharges York County, Virginia

Permit Holder Locations



WILLIAMSBURG WATER



CHEATHAM ANNEX



WATER COUNTRY USA



US NAVAL WEAPONS STATION



PLAINS MARKETING



VA POWER



HRSD



HARWOOD MILLS WATER



James City

Gloucester

Williamsburg

Newport News

Isle of Wight



governments are required to implement the Chesapeake Bay Preservation Act provisions since the regulation of land use and development has traditionally been a function of local government.

York County incorporated the initial regulations into its Zoning Ordinance in September 1990, revised the Ordinance in 2004 for compliance with the 2003 regulations and created a stand-alone Chesapeake Bay Preservation Area Ordinance in 2005. Certain areas of the County are designated as Chesapeake Bay Preservation Areas, which include a Resource Protection Area (RPA), Resource Management Area (RMA), and IDA (Intensely Developed Area). The RPA includes perennial bodies of water, tidal wetlands, adjacent non-tidal wetlands, and tidal shores and a 100' vegetated buffer adjacent to and landward of these areas. The RMA abuts and is 500' landward of the RPA or to the extent of the 100-year floodplain, whichever is greater. The IDA is an overlay that encompasses designated areas with a significant amount of impervious surface. This classification warrants utilizing these already built areas to their highest and best use prior to converting undeveloped property.

Standards for development in Chesapeake Bay Preservation Areas, applicable to these areas are designed to accomplish the following goals:

- Preserving vegetation
- Minimizing land disturbance
- Minimizing impervious cover
- Controlling stormwater runoff
- Pumping out septic tanks
- Providing a reserve drainfield

In addition, to further protect the estuaries and the Bay, new waterfront developments are encouraged to provide a community pier rather than lots with individual piers.

Special development standards apply to Chesapeake Bay Preservation Areas to ensure that new development will not result in degradation of the Bay. The cornerstone of the Chesapeake Bay Preservation Act is the requirement for a 100' vegetated buffer from the edge of tidal shores, tidal and connected non-tidal wetlands and perennial streams. The regulations require all development to perform a site-specific in-field natural resources inventory to locate unmapped perennial streams, wetlands, and other areas upon which a buffer is required.

As a condition of Phase III Chesapeake Bay Preservation Act compliance review, the state required and the County agreed to monitor all agricultural land use in the County to insure Conservation Assessments are prepared in order to address agricultural water quality concerns.

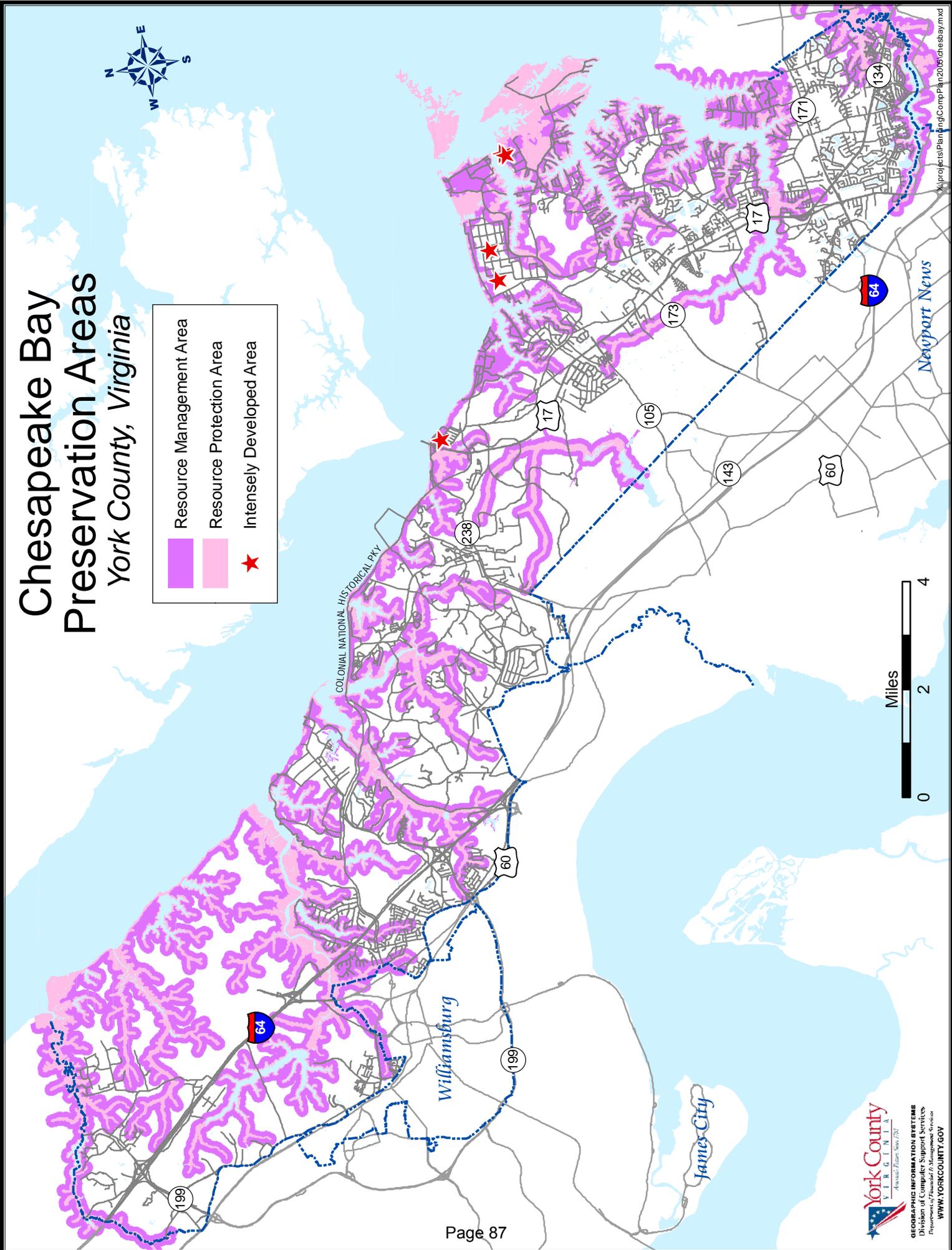
Total Maximum Daily Load (TMDL)

The EPA establishes Total Maximum Daily Load (TMDL) limits for discharges to waters of the US for various pollutants based on sampling and model scenarios from land use. These are established as part of the Clean Water Act and are assigned to impaired waters from the 303(d) list from impairments such as pathogens, nutrients, sediments and metals. These are assigned by watersheds. York County drains to three watersheds; the York River, James River, and Coastal Basin/Chesapeake Bay. Within those watersheds are sub-watersheds that are smaller rivers or creeks, such as the Poquoson River to the Bay, Queen Creek to the York, and Baptist Run to the James.

Pathogen or bacteria TMDLs have already been assigned to the Poquoson, and Back Rivers, and to Felgate, King, Queen and Skimino Creeks. The bacteria are in the form of fecal coliform from human and animal waste. The sources of human waste come from septic tanks and sewage leaks and spills. The sources of animal wastes come from pets, agriculture and wildlife.

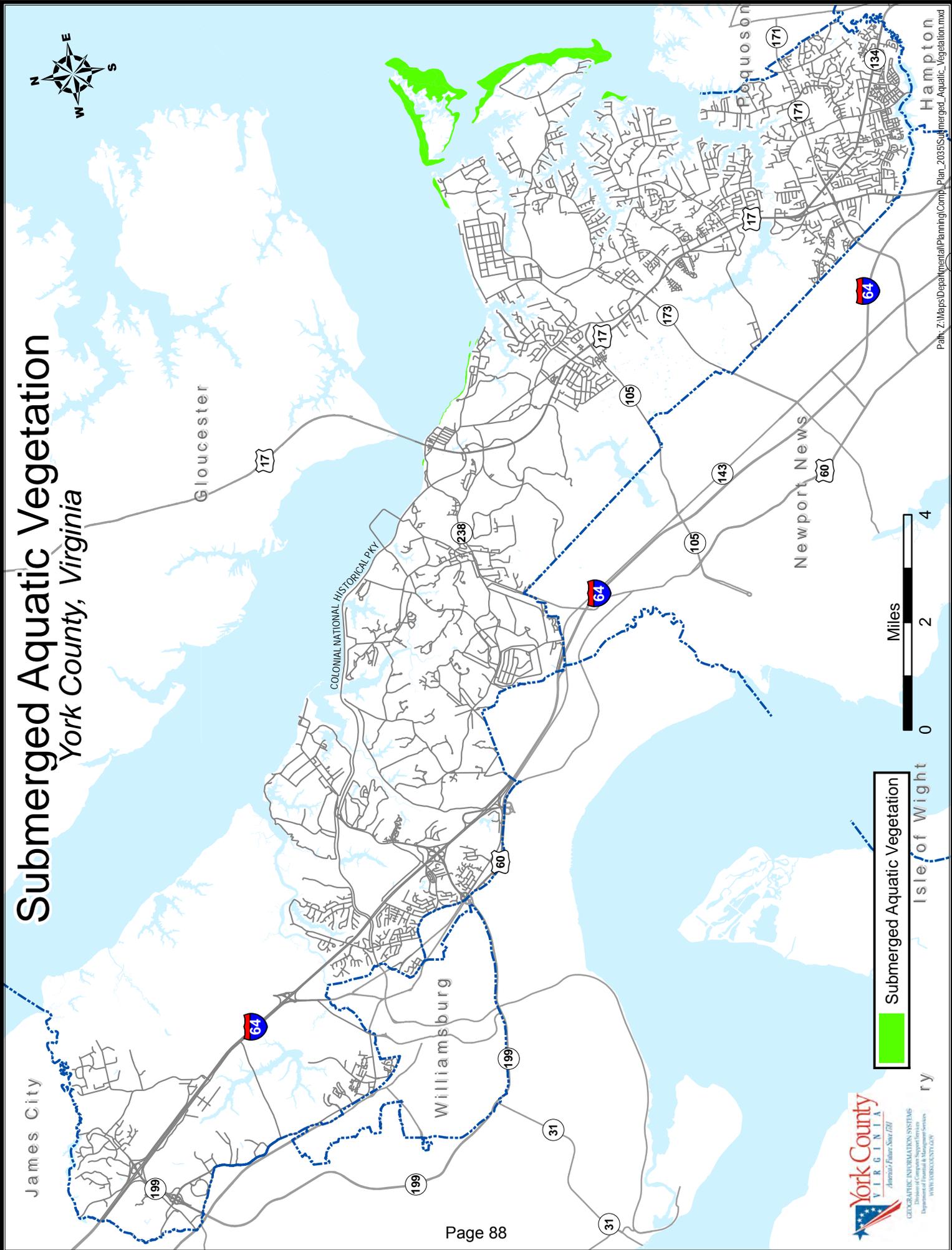
Chesapeake Bay Preservation Areas York County, Virginia

Resource Management Area
Resource Protection Area
Intensely Developed Area



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Submerged Aquatic Vegetation York County, Virginia



Submerged Aquatic Vegetation



The impairment comes from too much of these pollutants. The goal is to get the impairments reduced to get the waterways delisted.

Chesapeake Bay TMDL

In 2009 the EPA established TMDL limits on the whole Chesapeake Bay Watershed for the States of Virginia, Maryland, Pennsylvania, New York, Delaware West Virginia and Washington DC that drain to the Bay. This required that each state prepare a Watershed Implementation Plan (WIP) to address how the pollutants would be reduced. This is partly because the Chesapeake Bay Preservation Act only addressed new development in the preservation areas. The states and localities are now being required to address pollutants from areas developed prior to the act or not treated for water quality before 2009. This will require water quality retrofits

The goals established by the EPA are for the states to meet 60% of the reduction by 2017 and the final reduction goal by 2025. Virginia submitted a Phase I WIP in 2010 and Phase II WIP in 2011. A Phase III WIP will be done in 2017 to reevaluate the progress and set refined goals to meet the 100% by 2025.

Reductions from point sources from treatment plants and industrial sites as well as non-point source pollution from stormwater, agriculture, and septic systems are all expected to help meet this goal. The main sources in the County are being addressed through the County's *Strategic Capital Plan for Water, Wastewater and Stormwater* to bring public sanitary sewer to developed areas currently served by septic systems and to implement stormwater improvement retrofit projects. Furthermore, the Health Department's adoption of stringent separation requirements between groundwater and drainfields will also help lower the bacteria counts and improve water quality. Alternative on-site sewage disposal systems approved by the Health Department and permitted by the revised Chesapeake Bay regulations may also replace failing septic systems. York County has also required septic tank pump-outs every 5 years since 2000.

Docks and Piers

As of 2012, there are approximately 1,149 docks and piers in the County, most of them in the lower County along protected creeks and coves. Potential environmental impacts of small private piers include shading, displacement of aquatic life, increased turbidity, temporary impacts from construction, and impacts relating to motorized boat use. While the individual impacts from a single dock may be relatively small, the cumulative impacts of docks and piers can be significant. For these reasons, it is preferable to have community piers serving multiple users than for each individual waterfront property owner to have his or her own private dock.

The regulation of piers has traditionally been viewed as the jurisdiction of the state. However, York County manages pier density through the zoning and subdivision ordinances that encourage clustering development away from shorelines and retaining waterfront areas as common open space with a community pier. In York County, community piers are encouraged, but not absolutely required, for all new waterfront open space (cluster) subdivisions.

York County has seven public boat ramps, all of them in the lower County, and approximately thirteen commercial/private marinas. The Colonial National Historical Park, which is open to the public, provides a huge park setting for passive recreational opportunities and wildlife habitat. Additional public access sites are increasingly difficult to find, but there may be future opportunities for the County to pursue the acquisition of available surplus government lands that would enhance public access, or even to consider the acquisition of private property.

The environmental impacts of additional access should be considered in the siting and design of any new facilities. Future public access points, both public and private, must be sited and developed in accordance with guidelines issued by the VMRC. The County has improved public

access to the water through the Yorktown Revitalization project, including the Riverwalk (a pedestrian facility along Yorktown Beach) and replacement of a public wharf and pier with two deep-water piers. The piers accommodate deeper draft and large vessels, such as tall ships and dinner cruise boats, without dredging. Facilities are also provided for the docking of small pleasure boats for day-trippers, and an observation deck for pedestrians. The revitalization project also included beach stabilization, plantings and nourishment as well as the retrofitting of stormwater facilities to reduce pollutant-loading from the contributing upstream development.

Wetlands, Dunes and Beaches

Wetlands are commonly associated with swamps and marshes. Although most often considered to be located in tidal areas, they are also found along the floodplain, in waterways of various types, and in sheltered areas along inter-tidal coasts. Non-tidal wetlands can occur wherever there is, for at least a portion of the growing season, sufficient water to support hydrophytic plants and hydric soils. York County recognizes that wetlands are a unique and important ecosystem performing valuable functions.

The management of tidal and non-tidal wetlands in York County involves federal, state and local regulatory entities. A Joint Permit Application (JPA) must be submitted for any work occurring in a wetland area. The application is submitted to the Virginia Marine Resources Commission (VMRC) for distribution to the York County staff and Wetlands Board, the Virginia Department of Environmental Quality (DEQ), the U.S. Army Corps of Engineers, and other regulatory agencies.

The general areas of tidal and non-tidal wetlands in York County are shown on the Wetlands Map. There are approximately 2,308 acres of marshes in the County. Delineation by a wetlands scientist and verification by the Army Corps of Engineers is necessary to determine with certainty whether or not wetlands exist on a property. The 820-acre Goodwin Islands comprise the County's largest tidal wetland community. They are owned by the College of William and Mary and are managed as a Natural Estuarine Research Reserve. The Grafton Ponds are non-tidal isolated freshwater wetlands located mostly on property owned by the City of Newport News, which manages the area as a part of its water supply network. Many of the County's wetlands are considered to be unique environmental features and are described by the Virginia Department of Conservation and Recreation in the *Natural Areas Inventory of the Lower Peninsula of Virginia*.

The goal of the Virginia wetlands program is to achieve "no net loss" of wetlands acreage and function. Furthermore, in order to ensure that non-tidal wetlands regulations are enforced, the Zoning and Subdivision Ordinances require notification of regulatory agencies if wetlands exist or are thought to exist on the site.

The York County Wetlands Board enforces the County's Tidal Wetlands Ordinance and has jurisdiction from mean low water to 1.5 times the tide range. Requests for shoreline erosion control structures to protect actively eroding shorelines are typical of the projects reviewed by the Wetlands Board. York County recognizes the scientific research indicates that conventional shoreline erosion control structures like bulkheads and riprap limit the ability of the coastal ecosystem to perform many of the essential environmental functions. Wetlands are drowning in place as sea level rises and barriers to inland migration have been created by the construction of bulkheads and revetments. The continued armoring of shorelines will threaten the long-term sustainability of coastal ecosystems under current and projected sea level rise. As an alternative to bulkheads and revetments, the Wetlands Board has been promoting "Living shorelines" since the 1980's. "Living shoreline" projects used to consist of planting wetlands vegetation to provide natural shoreline erosion control. Today, a full spectrum of living shorelines options is available to address various energy settings and erosion problems. Living shoreline projects range from plantings and coir logs to the use of rock sills and breakwaters in combination with beach nourishment, living shorelines minimize the impact on the natural ecosystem and minimize

Wetlands

York County, Virginia

Wetlands (from the N.W.I.)

- Tidal Wetlands
- Non-Tidal Wetlands



Gloucester

James City

Williamsburg

Newport News

Poquoson

Hampton



Isle of Wight

York County
VIRGINIA
1776

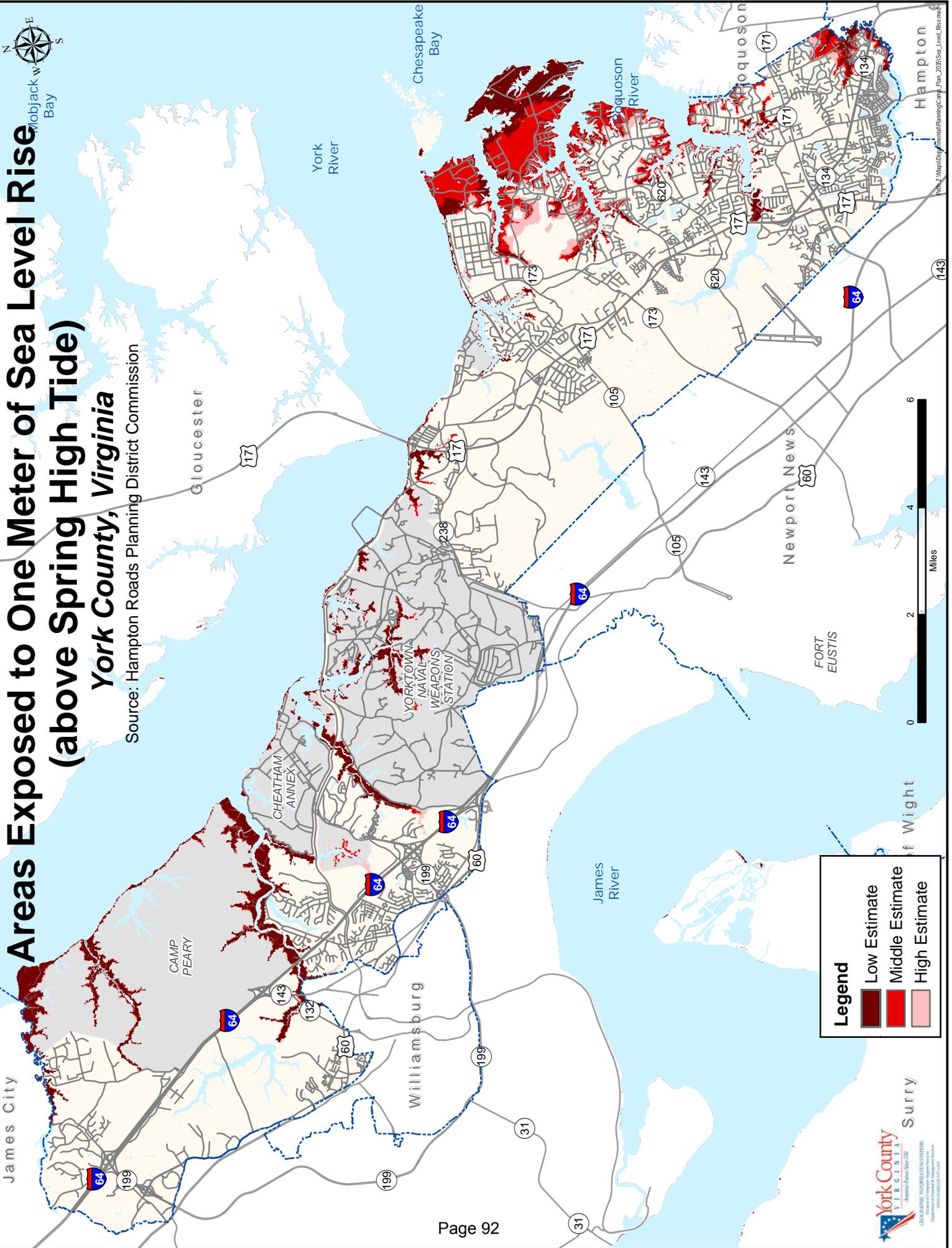
GEOGRAPHIC INFORMATION SYSTEMS
Division of Computer Support Services
Department of Planning & Management Services
WWW.YORKCOUNTY.GOV

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Areas Exposed to One Meter of Sea Level Rise (above Spring High Tide)

York County, Virginia

Source: Hampton Roads Planning District Commission



Legend

- Low Estimate
- Middle Estimate
- High Estimate

impacts on wetlands. The Wetlands Board requires that any impacts on vegetated tidal wetlands be avoided if at all possible in accordance with the Virginia “no net loss” policy. Any unavoidable impacts on tidal wetlands require mitigation to meet the “no net loss” of wetlands goal.

The Virginia Beach and Dune Act was amended in 2008 to include York County as a locality with beaches and dunes authorized to adopt the Coastal Primary Sand Dune Ordinance. There are beaches and remnant dunes in the County, mostly along Bay Tree Beach, York Point, and the York River shoreline. Since York County has not adopted the Coastal Primary Sand Dune Ordinance, projects which impact a beach or dune must present their applications to the Virginia Marine Resources Commission in Newport News for a permit

Shoreline and Streambank Erosion

York County’s shoreline consists of sheltered fine sand beaches, coarse sand beaches, exposed tidal flats, sheltered tidal flats, fringing intertidal marshes, supratidal marshes partially protected by elevation, and freshwater marshes and swamps.

Shoreline erosion is a naturally occurring process whereby forces, such as storms, the movement of the tides and sea level rise cause the boundary between land and water to recede and move inland. Erosion can contribute to the sedimentation and pollution of streams, rivers, and the Chesapeake Bay, resulting in the loss of wildlife habitat and reduced water quality and, when severe, threatening property. The increased rate and volume of stormwater runoff associated with development can accelerate the natural process of erosion.

York County encompasses approximately 235 miles of tidal shoreline. The upper County drains via a system of streams and rivers to the southern reach of the York River. This area is characterized by rolling terrain with well-drained soils and elevations up to 100 feet above Mean Sea Level. The lower County drains via a system of creeks and rivers to the Chesapeake Bay. Low flat lands with a relatively high water table characterize the topography of the lower County.

The impacts of natural and human activities on the shoreline can be measured by erosion rates, which are used to determine the most appropriate method to address erosion. In York County, the western shore of the Chesapeake Bay presents a unique challenge. The two areas with severe erosion are the Bay Tree Beach/York Point area and the Waterview Road area west of the entrance to the Thorofare), both of which historically experience moderate to severe erosion rates of up to 3.5 feet per year. Although there is residential and industrial development along both of these shorelines, the erosion does not appear to be associated with the development. The erosion is due in large part to wave action associated with the physical alignment of the shore and prevailing storms.

The rate of erosion in the remainder of the County and along the York River is slight to moderate. The shoreline at the mouth of the river is vulnerable to the high-energy waves generated by the dominant northeast storms. The Yorktown historic area and recreational beach is along this shoreline. There is an ongoing project to stabilize the beach with a combination of methods, including riprap, breakwaters, beach nourishment, and vegetation. In addition, just south of Yorktown, the National Park Service is pursuing a project to stabilize the shoreline along its lands adjacent to the Colonial Parkway.

One of the County’s goals is to protect shoreline property in a cost-effective manner that preserves and enhances shoreline resources, water quality, wetlands, and wildlife habitat. When shoreline erosion is severe and threatens properties, the Wetlands Board considers structural shoreline stabilization methods provided they are located as far upland as possible and in wetlands of lesser ecological value. When shoreline erosion is slight to moderate, the Board encourages living shorelines. The Wetlands Board favors living shorelines over riprap revetments and bulkheads. Maximizing the vegetated buffer in accordance with the provisions

Areas with Severe Erosion York County, Virginia



Gloucester

Reach 109

Reach 30

Poquoson

Hampton

Newport News

Williamsburg

Isle of Wight



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of the Chesapeake Bay Preservation Act reduces the need for structural controls that are only a temporary correction for erosion problems. The goal is to direct future development and redevelopment away from eroding shorelines to areas that can be developed without adversely affecting water quality.

In addition to the shoreline areas, there are streams and ditches in the County showing evidence of deterioration and erosion. Some of the streambank erosion is due to natural causes; however, some is due to upstream development and conventional ditch maintenance. Many of these streams have been identified for improvement in the County's *Strategic Capital Plan for Water, Wastewater and Stormwater*. Phase IIC of the Moore's Creek Drainage project, is currently underway utilizing a combination of options, including stream restoration, bioengineering, regrading, revegetating, and, where necessary, piping. The County is completing the design of the Dare Elementary School Stream restoration project and Cook/Falcon Road drainage project.

Stream bank erosion, like shoreline erosion, is a natural process, with many of the same negative impacts. Natural factors that contribute to stream bank erosion are steep slopes and highly erodible soils. Development on steep slopes greater than 20% is regulated through land use controls to ensure the integrity of slopes and waterways.

York County limits stormwater runoff from developed sites to pre-development rates through the strict application of the Stormwater Management Ordinance and the Erosion and Sediment Control regulations, which require that properties and waterways downstream of development be protected from sediment deposition, erosion, and damage caused by increases of volume, velocity, and peak flow rates of stormwater runoff for certain storm events. Inevitably, however, the volume and duration of stormwater runoff are increased with increased amounts of impervious area. Pursuant to the Erosion and Sediment Control Ordinance, the County requires calculations proving downstream adequacy of the channel. When possible, stream banks will be restored to a natural state using bioengineering options with contiguous floodways. Piping is considered a measure of last resort. In this manner, stormwater management, erosion control, non-point source pollutant, and habitat creation goals will be achieved. The reduction and minimization of impervious surfaces is a major issue, especially with regard to streambank erosion. Low-Impact Development and conservation design, as methods of retaining pre-development site hydrology, are extremely valuable tools that will reduce streambank erosion and protect water quality.

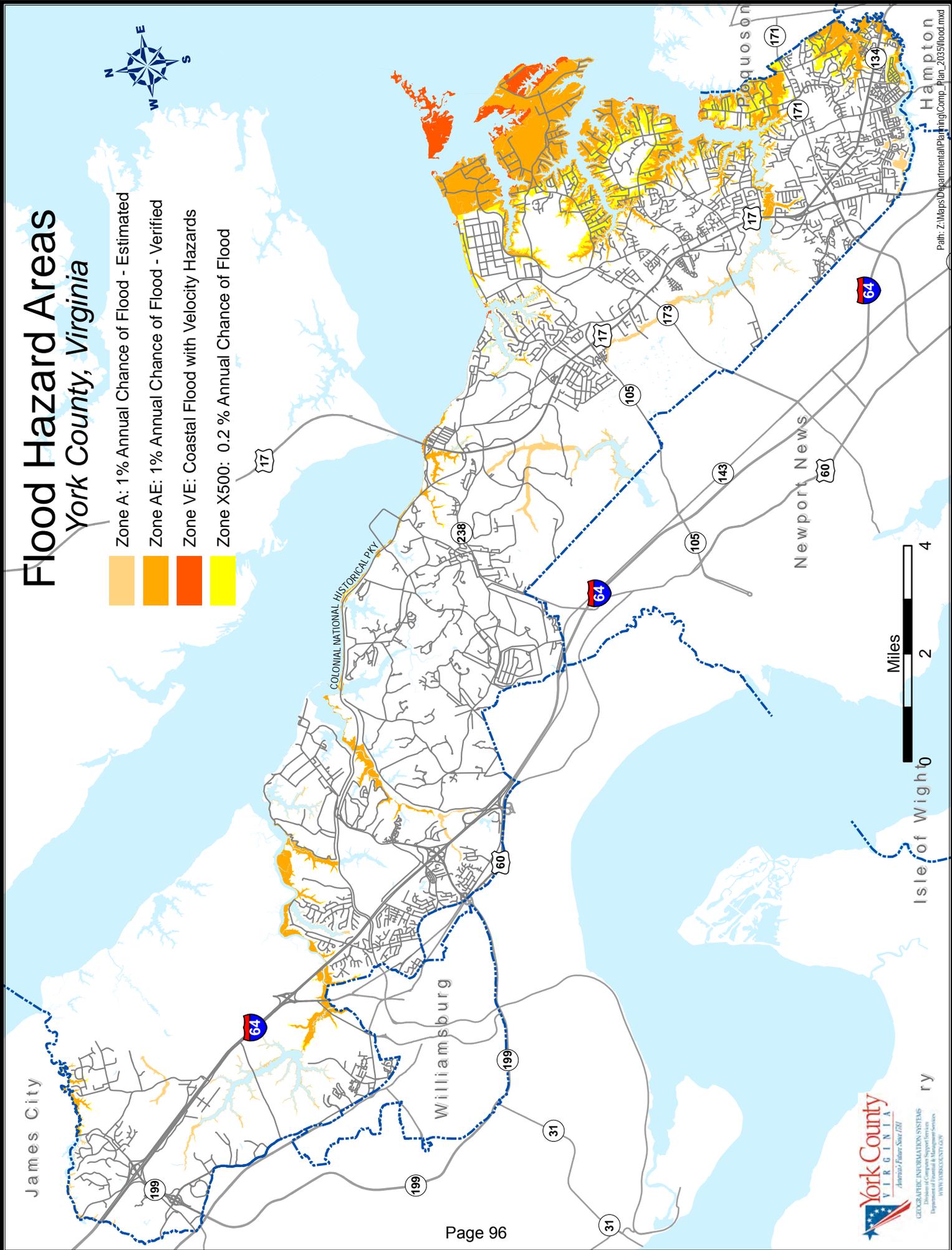
Shoreline and streambank erosion are significant issues for York County. The Wetlands Board is doing an admirable job of preventing shoreline erosion while limiting hardening of the County's tidal shoreline. The trend in the County is to favor streambank restoration and bioengineering over the conventional piping and bank hardening solutions.

Flood Zones

York County is in a tidal area and many near-shore areas are characterized by low and relatively flat terrain. Coastal flooding is a potential hazard, affecting approximately 7,000 acres of land close to coastal streams and creeks, especially with the added threat of sea-level rise. The flat topography of the Seaford, Dare, and Dandy areas resulted in flooding during Hurricane Isabel in 2003. Through the National Flood Insurance Program (NFIP), property owners can obtain flood insurance through the private insurance industry at a reasonable cost. Communities participating in the NFIP, such as York County, have established plans and adopted regulations to lessen potential losses from flood damage. These NFIP regulations apply to those portions of a locality that are within the 100-year floodplain, which are those areas subject to inundation by the 100-Year Flood (i.e., a flood level with at least a 1% chance of being equaled or exceeded in any year). The Flood Insurance Study (FIS) Rate Map shows those areas of the County identified by the Federal Emergency Management Agency (FEMA) as being located in a flood hazard area. It is broken down into flood zone areas based on degree of risk. The FIS Mapping

Flood Hazard Areas York County, Virginia

-  Zone A: 1% Annual Chance of Flood - Estimated
-  Zone AE: 1% Annual Chance of Flood - Verified
-  Zone VE: Coastal Flood with Velocity Hazards
-  Zone X500: 0.2 % Annual Chance of Flood



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was updated in 2009 to more accurately depict the flood zone based on GIS topography. The maps are proposed to be updated again in 2014 to more accurately reflect storm surge impacts.

York County requires newly constructed and substantially improved residential structures in the special flood hazard areas to have the lowest floor elevated at least 1.5 feet above “the base flood level.” Non-residential structures must either elevate the lowest floor or design the structure to be watertight. In an effort to reduce losses even further, York County has been accepted into the FEMA Community Rating System (CRS), which is an NFIP program that provides incentives for participating communities to complete activities that reduce flood hazard risk. In exchange for completing specified activities on the part of the community, the Federal Insurance Administrator will grant small general reductions in insurance premiums within the community.

WASTE MANAGEMENT

Since the adoption of the Comprehensive Plan in 1991, and as a direct result of the recommendations contained in that plan, the County’s waste management program has changed dramatically. Most significantly, the County initiated a roadside trash pickup program for all single-family detached homes through a contract with a private waste operator. Previously there had been no County trash collection; individual homeowners and homeowners’ associations were responsible for contracting out with a private hauler for their trash collection. By January 2005, the curbside trash collection program had grown to encompass nearly 15,000 homes. In an effort to provide the most efficient service available the current contract incorporates automated collection in all areas possible. As of December 2012, the curbside trash collection program has grown to encompass over 16,500 homes.

A curbside recycling program was also established for all single-family detached homes and most townhouse and mobile home communities. In addition, the County has expanded its drop-off recycling program to include waste oil, cooking oil, antifreeze, batteries, paper and tires and also participates in the Collection of Household Chemicals Program and Electronics Waste/Recycling Program. The program enable residents to dispose of various chemicals – such as paints, gasoline, brake fluid, pesticides, and drain cleaners – in an environmentally safe manner. These chemicals might otherwise be disposed of via the storm drainage system or be dumped on the ground and possibly contaminating groundwater.

During the 1997-98 leaf season a leaf and yard debris collection program was initiated. Running generally from November through January, residents may set out unlimited numbers of clear bags of leaves and/or yard debris for collection. During the 2004-5 season, operators collected 625 tons of leaves. During the 2011-12 season, operators collected nearly 800 tons of leaves.

New federal and state regulations adopted in the early 1990s would have made it prohibitively expensive for the County to continue to operate a landfill; consequently, the County landfill was closed. At the landfill site, the County has constructed a waste transfer station that is leased to a private operator to receive waste and transport it to approved disposal sites outside the County. Currently, approximately 350 tons of municipal waste is processed daily. In addition, there is a yard waste facility, operated under the direction of the Virginia Peninsulas Public Service Authority (VPPSA), which processes leaves, grass, and woody waste into mulch and compost.

York County has continued to market its recycling program to schools, homes, and businesses, and the success of these programs is demonstrated by the fact that in 2011, County homes and businesses diverted approximately 49 % of their municipal solid waste (including aluminum and other metals, auto bodies, newspaper, office paper, corrugated cardboard, plastic, glass, leaves and yard debris, and motor oil) from the County’s waste stream, well above the state-mandated goal of 25% by 1993.

NOISE

Though not generally acknowledged as a form of environmental pollution, noise has become a growing national concern with the addition of new highways and increasing air and automotive traffic. The EPA coordinates federal noise research programs and determines whether noise emission standards protect the public health. Although state and local governments do not set standards, noise can be controlled through local regulations and licensing requirements. York County currently regulates noise in public areas and various types and levels of noise. In addition, the Zoning Ordinance contains performance standards that limit noise to “non-objectionable” levels for certain categories of uses.

Aircraft operations at Newport News/Williamsburg International Airport and Langley Air Force Base (Joint Base Langley-Eustis), which are exempt from the County noise ordinance, are a principal source of noise in the County. Noise exposure contours indicate the levels of aircraft noise in areas close to airport runways and are based on the average day-night sound level (abbreviated as DNL) observed in these areas. DNL is the accepted unit for determining the compatibility of noise-generating activities with different types of development. For residential development, according to the Department of Housing and Urban Development, a DNL greater than 65 is considered to represent unacceptable level of noise exposure.

Most of the undeveloped land in York County that is subjected to unacceptable noise levels generated by operations at Newport News/Williamsburg Airport is watershed property for the Harwoods Mill Reservoir. There are only three relatively small residentially zoned parcels that lie within the 65 DNL noise exposure contour. However, there are three mobile home parks along Oriana Road that are approximately one mile from existing Runway 7/25 and are zoned and designated for high-density residential development. With a combined total of 9.6 acres, these parcels could potentially be subdivided into lots for approximately 25 new single-family detached homes. These noise contours have shrunk, however, as older, louder jet engines are phased out and replaced as mandated by the Federal Aviation Administration. Noise impacts associated with the planned runway modifications (extensions, additions, etc.) will have to be closely monitored. (More discussion of airport noise can be found in the Transportation element of this Plan.)

The noise exposure contour maps for Langley Air Force Base were updated in 2007 as part of its AICUZ (Air Installation Compatible Use Zone) study. While there currently are no areas of York County where the base's aircraft operations generate unacceptable noise levels (i.e., 65 DNL), the study does note that “the 65-70 noise zone comes within 0.3 miles of the Hampton/York County boundary in the vicinity of Hampton Highway/Magruder Boulevard (Rt. 134) and its intersection with Armistead Avenue and Semple Farm Road [in the City of Hampton].”¹ The study goes on to note that even though there is no York County land within a noise contour, “[i]t is useful... to assess the zoning classification of the real estate closest to the 65-70 noise zone since noise contours fluctuate over time and aircraft noise does not stop at the edge of the contour.”²

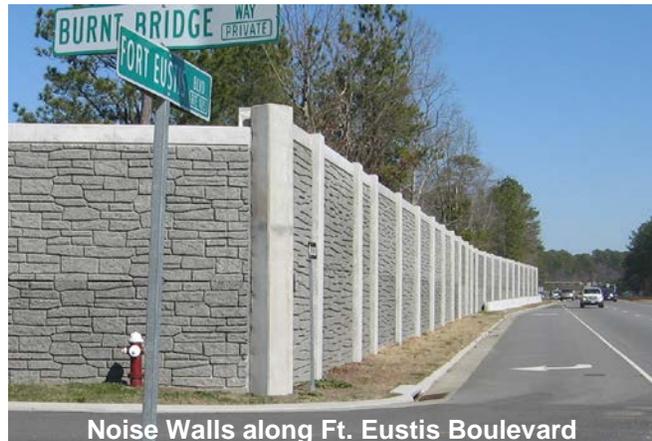
Section 15.2-2295 of the *Code of Virginia* authorizes any Virginia locality with a licensed airport or U.S. government or military air facility to enforce building regulations requiring acoustical treatment measures in residential buildings and structures (other than farm structures) “in areas affected by above average noise levels from aircraft due to their proximity to flight operations at nearby airports.” In addition, any locality in whose jurisdiction, or adjacent jurisdiction, is located a United States Master Jet Base, a licensed airport or U.S. government or military air facility, is also authorized to adopt and enforce building regulations requiring acoustical treatment measures applicable in certain non-residential structures, including Assembly, Business,

¹ *Langley Air Force Base – AICUZ Update: Air Installation Compatible Use Zone, Final Report*, (July 2007) p. 4-14.

² *Langley AICUZ p. 4-15*

Educational, Institutional, and Mercantile groups, as defined in the International Building Code. This is typically achieved with the adoption of a noise overlay zoning district with specific requirements for each noise zone based on the severity of the aircraft noise impacts. Any such regulations or amendments to a zoning map shall provide a process for reasonable notice to affected property owners. No such overlay district currently exists in York County, and the practical effect of adopting this land use compatibility tool would be limited since the regulations would apply only to new construction and most of the areas surrounding the airport and Langley are almost fully developed.

Another common source of objectionable noise in residential communities across the United States is highway traffic, particularly along major freeways and expressways such as Interstate 64. As with airport noise, better planning for transportation/land use compatibility is the optimum solution to this problem, although in some cases where conflicts exist between existing development and major highway corridors that are planned for expansion, noise walls can help to attenuate highway noise. Pursuant to the National Environmental Policy Act, Federal Highway Administration (FHWA) regulations “require that traffic noise be mitigated when a proposed highway project is expected to produce a noise level of over 67 decibels within adjacent residential areas or certain nearby commercial areas.”³ In York County, noise walls were constructed as part of the extension of Fort Eustis Boulevard east of Route 17 and the widening of this road west of Route 17 to provide a noise buffer between the road and the adjacent residential areas.



Noise Walls along Ft. Eustis Boulevard

As part of the Draft Environmental Impact Analysis for Interstate 64 from I-95 in Richmond to I-644 in Hampton, a preliminary analysis was conducted to quantify the likely noise impacts of the future widening of Interstate 64 on properties along this corridor, which runs through the entire upper County. This analysis identified two areas along the west side of I-64 in upper York County where some type of noise barrier is both feasible and reasonable based on federal criteria. Those areas are 1) between the Colonial Parkway and Queens Creek Road (Felgates Woods and Springfield Terrace) and 2) behind the Williamsburg Country Club, which fronts on Merrimac Trail.

CITIZEN INPUT

The citizens feel strongly that the County should place a high priority on preserving and protecting the natural environment; in a telephone survey conducted as part of the 2005 Comprehensive Plan, this was the citizens' top-ranked goal, with an average score of 4.56 on a scale of 1 to 5. Almost three-quarters of the citizens (72.2%) considered it an extremely important goal, and almost nine out of ten (88.7%) considered it important or extremely important. Preserving open space is also a high priority; in the 2012 Comprehensive Plan telephone survey, this goal ranked first overall among various potential future goals that were presented, with an average score of 8.08 on a scale of 1 to 10.

PLANNING ISSUES FOR THE FUTURE

It is projected that the next twenty years will bring almost 6,000 new homes to the County, housing over 13,000 more residents. There will also be more businesses with almost 14,000

³ Jeffrey Grob, “Concrete Examples,” *Planning*, April 2001, p. 14.

more employees.⁴ This means more traffic and vehicle emissions, more roads, and more impervious surface. If not properly managed and regulated, growth and development can stress the delicate balance between the natural environment and the built environment. The need for strict attention to environmental protection is heightened by the diminishing supply of land in the County. When land was cheap, the undesirable sites were left alone. Now with a scarcity of land in many parts of the County, development is being considered for those sites that previously had been “passed over” because of environmental constraints.

There are myriad Federal and state agencies that administer a variety of regulations to prevent degradation of the environment. It is not the role of local government to duplicate these efforts. However, the County government also has a key role in protecting the environment through the regulation of the development and use of land. Not only is land an important natural resource in and of itself, but its development and use also have a significant effect on air and water quality.

Land development is governed by various chapters of the York County Code, including the Zoning, Chesapeake Bay, Stormwater Management, and Erosion and Sediment Control Ordinances, that contain provisions to ensure the proper use, management, and protection of the vast amounts of sensitive and unique lands that contribute to the economy of the region, and the environmental quality of the County and especially the Chesapeake Bay. Among these are provisions dealing with erosion and sediment control, areas with slopes in excess of 20%, tidal and non-tidal wetlands, Chesapeake Bay Preservation Areas, and areas identified by the Virginia Department of Conservation and Recreation in the “Natural Areas Inventory of the Lower Peninsula of Virginia.” In addition, the Floodplain Management Area (FMA) overlay district provisions of the Zoning Ordinance regulate construction in flood zone areas, while the Watershed Management and Protection Area (WMP) Overlay District provisions establish development standards applicable to areas of the County surrounding public water supply reservoirs.

The various environmental regulations are intended not to prohibit development but to ensure that development is sensitive to the natural environment. Development and protection of the environment are not mutually exclusive goals. *Open space* or *cluster* subdivisions, which are discussed in detail in both the Housing and Land Use elements, are a good example of a development technique that helps to preserve the intricate balance between the natural and built environment. In a cluster development, at least 40% of the gross land area is set aside as common open space for the use and enjoyment of all the residents. This allows for better protection of environmentally sensitive areas by designating them as open space to be properly maintained by the homeowners’ association rather than including them within platted residential lots. The York County Zoning Ordinance permits cluster subdivisions as a matter of right in all single-family zoning districts.

In addition to regulating private development, York County is involved in protecting the natural environment through capital improvement projects. One good example is the County’s sewer extension program. As noted earlier, much of the land in the County has limitations for supporting septic systems, yet many areas of the County lack sanitary sewer service and have no other option. According to the Virginia Department of Conservation and Recreation’s Division of Chesapeake Bay Local Assistance, “even properly installed and maintained conventional septic systems remove less than 30% of the nitrogen from effluent. Unfortunately, septic systems are much more complicated and require more maintenance than many homeowners realize. Improperly functioning and failing systems exacerbate the problem of subsurface water contamination.”⁵

⁴ Employment as projected by the Hampton Roads Planning District Commission.

⁵ Virginia Department of Conservation and Recreation, Division of Chesapeake Bay Local Assistance, *Better Land Use Planning for Coastal Virginia*, November 2004, p.24.

The County is addressing the septic tank maintenance issue with the five-year pump-out requirement now in place. More importantly, the County has an aggressive program for extending sanitary sewer to unserved residential areas that are prioritized based on the following criteria approved by the Board of Supervisors:

- Impact on water wells,
- Impact on ground or surface water,
- Threat to the Chesapeake Bay or tributaries, and
- Growth factor.

These sewer extension criteria generally place highest priority on areas of the County that have one or more of the following characteristics:

- Shallow aquifer system susceptible to contamination from septic systems,
- Close proximity to fresh water systems,
- Close proximity to the Chesapeake Bay or tributaries, and
- Low potential for new development.

Sewer extension projects are identified in the County's *Strategic Capital Plan for Water, Wastewater, and Stormwater*, which is adopted by the Board of Supervisors and revised every two years; the current plan was adopted in 2010. The program is self-supporting and is funded through several sources of revenue including the connection fees charged to the residents receiving service, connection fees charged to developers, and one-half of the revenue generated by the County meals tax, which the voters approved in a referendum in the early 1990s. By targeting public sewer extensions toward environmentally sensitive areas and reducing the overall number of individual septic systems in the County, this ongoing program is the most effective means of preventing septic system pollution.

Another aspect of the County's ongoing utility extension program involves the extension of public water to areas that currently rely on wells or private water systems. As with the sewer program, areas are prioritized on the basis of a point system utilizing the following criteria:

- Septic problems in the area,
- Fire protection concerns,
- Water quality or quantity problems, and
- Growth factor.

Finally, the County has an active capital improvement program for stormwater projects. New homes and businesses will add significant impervious surface – rooftops, driveways, roads, parking lots, etc. – to a County where drainage is already a serious issue in many areas. Traditional stormwater management has focused on removing quantities of water from streets and neighborhoods, with the primary goal of preventing flooding. This water, which often carries fertilizers, pesticides, soil, and debris, previously went untreated and was discharged directly into area waterways. Federal and state regulations now require localities to better manage the quality of the stormwater, as well as the flow rates, that are entering creeks, streams, rivers, and bays. These regulations require much planning and educational effort to be effective, but the benefits include cleaner surface water and a healthier environment.⁶

The County completed a comprehensive Stormwater Management Plan that has been incorporated into the *Strategic Capital Plan for Water, Wastewater, and Stormwater*. County staff studied the various drainage sub-basins under full development conditions based on projected land use. For each sub-basin, the hydrology was computer-modeled and alternative solutions were analyzed to develop the optimum solution in terms of cost and effectiveness.

⁶ York County Stormwater Advisory Committee web site, Frequently Asked Questions,

Water quality issues were also taken into consideration. The plan makes recommendations for on-site and regional solutions. The plan suggested that stormwater management systems serving multiple properties may be more effective for controlling the quality and quantity of stormwater runoff than individual structural BMPs for every parcel.

The following criteria, adopted by the Board of Supervisors in July 1997, determine the ranking of drainage improvement projects:

- Safety problems in the area
- Potential damage/poor drainage
- Frequency of problem
- Environmental impact
- Number of properties affected, and
- Size of area affected.

With the TMDLs, new emphasis must be placed on adding stormwater water quality retrofits to previously developed areas with no stormwater management facilities.

For new development, the County reviews subdivisions and site plans for compliance with state and County regulations. Stormwater management has evolved over the years from providing proper drainage for prevention of flooding to controlling both quantity and quality of flow to pre-development conditions. This is done through a variety of *Best Management Practices* (BMPs), including wet ponds, dry ponds, infiltration systems, porous pavement, and even grass swales. The qualitative aspects of drainage are especially important to Chesapeake Bay Preservation Areas and properties in the Watershed Management and Protection overlay district.

Maintenance of private stormwater ponds has become a significant issue as such ponds have been constructed in residential subdivisions and commercial areas and turned over by the developer to homeowners' or property owners' associations that often do not have the resources or expertise to properly maintain them. To ensure the proper functioning of BMPs and prevent detrimental effects of surface water runoff on the Chesapeake Bay and its tributaries, the County has a BMP Inspector who is providing technical assistance to homeowners' and property owners' associations in the maintenance of stormwater management facilities.

County expenditures for water, wastewater, and stormwater facilities represent a significant public investment in improving the quality of our environment and the quality of life for County residents. A different approach that can yield similar benefits is for the County to fund the preservation of open space through conservation easements or fee simple purchase. Strongly supported by the citizens throughout the preparation of this plan, open space preservation ensures that property will not be developed and thus is probably the most effective way to prevent environmental degradation.

Growth affects the environment in ways not related to land development. The Hampton Roads Planning District Commission projects that the County's population growth will be accompanied by an additional 15,000 passenger cars and trucks in the next 25 years. Traffic growth will bring more highway noise and tailpipe emissions. Though Hampton Roads is currently in attainment (maintenance) of the 1997 eight-hour ozone national ambient air quality standard (NAAQS) and in attainment of all other applicable NAAQS, as traffic in Hampton Roads continues to grow, it will be increasingly important – to continue to receive federal transportation funds and, more importantly, to protect the quality of the air we breathe – for the County to work with the rest of the region to ensure that transportation plans are consistent with air quality goals. This will require greater emphasis on transit, carpooling, and ride-sharing as well as bikeways, walkways, and land use strategies that can reduce traffic congestion.

As noted earlier, traffic causes noise pollution as well as air pollution. Noise walls are an increasingly prevalent attempt to address the issue of highway noised. However, recent

research indicates that noise walls might not be as effective as is commonly believed.⁷ One study of a noise wall found that significant noise reduction was limited to the area within 60 feet of the wall and that beyond 200 feet noise reduction is caused more by distance from the highway than by the wall itself. In addition, whatever noise benefits result from such walls must be balanced against the cost and the aesthetic impact, which can be severe. Technological solutions to the problem of highway noise – such as rubberized pavement, low-noise tires, and a high-tech option known as “noise cancellation”⁸ – are also being studied.

In York County, the only likely candidate for noise walls is Interstate 64, where the proposed widening will increase noise impacts on existing residential development in the County. The best solution to the problem of highway noise is to implement appropriate land use controls to prevent residential development and other noise-sensitive uses along major freeways such as I-64, and to some extent the Greenbelt designation along the entire York County portion of the corridor will help ensure separation between the noise generator (the roadway) and the noise receptors (houses / businesses) and perhaps some minimal noise attenuation.

GOALS, OBJECTIVES, AND IMPLEMENTATION STRATEGIES

Goals

Protect the health of York County’s residents by achieving and maintaining clean air and water.

Establish and preserve a balance between York County’s natural and built environment that contributes positively to the quality of life of current and future generations.

Objectives

GENERAL

1. Preserve and protect environmentally sensitive areas and natural resources from the avoidable impacts of land use activities, development and shoreline erosion control structures.
2. Enhance public awareness and understanding of the importance of coastal ecosystems, environmental conservation and preservation.
3. Continue to implement special development regulations to protect natural resources areas, including low-lying areas, areas with steep slopes, tidal and nontidal wetlands, Chesapeake Bay Preservation Areas, and areas identified by the Virginia Department of Conservation and Recreation, Division of Natural Heritage in the Natural Areas Inventory of the Lower Peninsula of Virginia.
4. Reduce danger to persons, property, and the environment caused by stormwater runoff from developed areas.
5. Reduce or eliminate the loss of life and property damage from natural hazards.
6. Consider climate change and sea-level rise in long-term planning when siting County schools, fire stations, etc.

⁷ Kim Sorvig, “A Sound Solution? Expressway noise walls can fix some community problems – while causing others.” *Planning*, April 2001, pp 10-15.

⁸ Sorvig, p. 15.

AIR

Achieve and maintain regional attainment with the National Ambient Air Quality Standards.

LAND

1. Ensure that land development occurs in recognition of the ability of the land to support such development without environmental degradation.
2. Preserve open space for purposes of wildlife habitat and the preservation of ecologically sensitive areas.

WATER

1. Ensure the conservation and enhancement of adequate and safe future water supply areas.
2. Reduce the incidence of failing septic systems.
3. Ensure existing and proposed public and private access facilities (docks and piers) do not have a negative impact on water quality.
4. Protect coastal wetlands, marshes, rivers, inlets and other bodies of water from degradation associated with land development.
5. Protect shoreline property from erosion in a cost-effective manner that preserves and enhances shoreline ecosystem functions water quality, wetlands, riparian buffers, and wildlife habitat
7. Minimize the need for streambank and shoreline erosion controls.
8. Encourage living shoreline solutions to accommodate for sea level rise and erosion control

NOISE

1. Limit noise impacts associated with nonresidential development and highway traffic.
2. Promote compatible land use and development in areas where aircraft noise exceeds acceptable levels as determined by the Department of Housing and Urban Development.

WASTE MANAGEMENT

1. Achieve a 50% recycling rate.
2. Provide for the convenient, efficient, and safe removal and disposal of leaves and yard debris.
3. Expand markets for recycled and recyclable products.

Implementation Strategies

GENERAL

1. Continue to require that development plans identify environmental constraints and opportunities and show how unavoidable environmental impacts will be mitigated. (S)

2. Continue to require a natural resources inventory to identify environmentally sensitive areas and natural resources prior to any development. (S)
3. Continue to implement the *Strategic Capital Plan for Water, Wastewater, and Stormwater*. (S)
4. Consider using public properties, such as parks and watershed areas, as living laboratories to educate school children about environmental conservation and preservation with such activities as nature hikes and observations, environmental experiments, wetlands delineation activities, etc. (M)
5. Collaborate with civic groups and community organizations on environmental restoration projects to encourage stewardship. (M)
6. Continue to provide educational materials concerning environmental conservation and preservation. (S)
7. Encourage the School Division to provide a meaningful Bay or stream outdoor experience, such as a field trip, for public school students. (S)

AIR

1. Continue to support regional air quality initiatives through active participation in the Hampton Roads Air Quality Committee and the Interagency Consultation Group for Hampton Roads. (S)
2. Continue to discourage the recruitment of industries that emit high levels of air pollutants. (S)
3. Promote transportation modes and strategies that reduce the number of vehicle miles of travel (VMT) on the region's road network, including mass transit, HOV lanes, ride-sharing, bicycling, and walking. (S)
4. Work with VDOT to identify and pursue regional funding (through the Congestion Mitigation and Air Quality program) for transportation improvements – such as intersection improvements, coordination of traffic signal systems, ITS projects, bikeways, and transit – that reduce auto emissions. (S)
5. Continue to prohibit the open burning of leaves and yard debris in proximity to homes and other structures. (S)
6. Pursue activities and strategies, including public education efforts, that decrease air pollutants within the Hampton Roads region. (S)

LAND

1. Promote site design and land development that blends appropriately with natural features and terrain. (S)
2. Retain natural physical features, forests, and woodland areas throughout the development process. (S)
3. Maintain open space requirements within developing areas. (S)
4. Maintain tree preservation and landscaping requirements for all new development. (S)

5. Working with land conservancies, contribute funding for the purchase of conservation easements as a means of protecting and preserving areas with desirable or sensitive environmental or aesthetic qualities, especially shoreline, Resource Protection Areas and groundwater recharge areas. (M)

WATER

1. Identify potential sources of groundwater and surface water contamination and develop mitigation plans and procedures. (S)
2. Seek grants to assist with the development and mapping of abandoned private wells and develop a program to require closure in accordance with Health Department regulations. (M)
3. Monitor the septic tank pump-out program and pursue appropriate penalties for non-compliance. (S)
4. Continue to target public sewer extensions toward those developed areas where the soils cannot support septic systems. (S)
5. Collaborate with the local Health Department to encourage alternative and new technologies for failing on-site septic systems for existing homes. (M)
6. Support the upgrading of Hampton Roads Sanitation District wastewater facilities in accordance with the HRSD's adopted *Development Plan* and its annual *Facilities Management Plan* and *Capital Improvements Program*. (S)
7. Continue enforcement of the requirements of the Watershed Management and Protection Area Overlay District including water quality and vegetative buffers to protect potable water reservoirs. (S)
8. Support the Virginia Department of Environmental Quality's mandate to prevent destruction of non-tidal wetlands understanding they are important groundwater recharge areas. (S)
9. Continue to require appropriate construction methods to control sedimentation, pollutant loading, and stormwater runoff, especially where development takes place in close proximity to water bodies. (S)
10. Ensure that redevelopment of existing waterfront facilities will reduce non point source pollution and proposed shoreline access will address water quality issues consistent with the Chesapeake Bay Preservation Act. (S)
11. Encourage community piers and commonly owned shoreline open space in new waterfront housing developments. (S)
12. Use VIMS Shoreline Best Management Practices for recommendations for all tidal shorelines. (S)
13. Implement the guidelines from the Virginia Marine Resources Commission integrated shoreline guidance (when developed). (S)
14. Refer to the guidance in the Comprehensive Coastal Resource Management Plan (when prepared by VIMS). (S)
15. Continue to use the VIMS decision tree for the selection of appropriate shoreline erosion control practices. (S)

16. Consult the Marina Technical Advisory Program (MTAP), available through the Virginia Institute of Marine Science, on marina siting and design issues related to best management practices, water quality, and technical support for marinas. (S)
17. Monitor and develop clean-up strategies for illicit discharges. (S)
18. Continue the implementation of the re-inspection program of Best Management Practices. (S)
19. Provide technical assistance as needed to homeowners' and property owners' associations in the proper maintenance of stormwater management facilities. (S)
20. Encourage the development and use of regional retention and detention ponds in residential and commercial developments wherever possible. (M)
21. Continue to enforce the conditions of the County's stormwater discharge permit in accordance with the NPDES Phase II program. (S)
22. Continue to enforce the stormwater management ordinance with water quality requirements. (S)
23. Continue to review and evaluate drainage systems, both VDOT and County-maintained, identify deficiencies and maintenance needs, and develop priorities for funding and implementation. (S)
24. Evaluate watersheds in the County to identify opportunities for retrofitting existing stormwater management facilities and systems to meet or help address TMDL stormwater regulations. (M)
25. Update and enhance the stormwater management informational and educational materials regarding BMP maintenance and ensure that those materials are made available to for sharing with homeowner associations and other non-governmental entities responsible for maintaining BMPs and stormwater systems. (S)
26. Monitor and update, as enabled and as appropriate, stormwater models and design criteria to insure that stormwater conveyance systems are designed and constructed to alleviate flooding to the greatest extent practicable. (M)
27. Continue to rigorously enforce the Erosion and Sediment Control Ordinance to reduce sedimentation and degradation of surface waters. (S)
28. Reduce the non-point source pollutant loading from stormwater runoff on County projects and use indigenous and low-maintenance landscape materials. (M)
29. Encourage property owners to utilize living shorelines to address slight to moderate erosion and to only utilize structural measures when erosion is severe and threatens property. (S)
30. Encourage the coordination of shoreline erosion control measures among adjacent property owners. (S)
31. Ensure that vegetative buffers are retained, enhanced, or established. (S)
32. Ensure that drainage patterns are not altered to concentrate stormwater flow in erodible streams. (S)

33. Encourage Low Impact Development and conservation design to reduce impacts to receiving downstream resources. (S)
34. Ensure that required buffers are provided on all perennial streams. (S)
35. Continue to incorporate stormwater quality BMP's into County drainage projects. (S)
36. Retrofit existing storm drain systems with state-of-the art stormwater management facilities to minimize flooding while also addressing water quality objectives. (M)
37. Continue to favor BMPs with constructed wetlands to improve water quality. (S)
38. Implement the agricultural monitoring portion of the Chesapeake Bay Preservation Act. (M)
39. Strategically replace dunes and dune grasses at the most vulnerable shorelines. (L)
40. Investigate techniques to reduce the incursion of storm surge and tidal flooding of low lying areas. (L)

NOISE

1. Continue to employ Zoning Ordinance performance standards and other regulatory controls where applicable to minimize noise impacts of nonresidential uses on residential areas. (S)
2. Consider the establishment of sound attenuation zoning, as provided for by Section 15.2-2295 of the *Code of Virginia*, to require installation of acoustical treatment measures in residential buildings and structures in areas within the aircraft approach zones for Newport News/Williamsburg International Airport where average noise exposure is 65 DNL or higher. (M)
3. Discourage construction of schools and other noise-sensitive uses, such as hospitals and nursing homes, in areas within the aircraft approach zones for Newport News/Williamsburg International Airport where average noise exposure is 65 DNL or higher and consider establishment of requirements for notations on subdivision plats concerning noise exposure zones. (S)
4. Consider incorporation of noise walls in the widening of Interstate 64. (M)
5. To the maximum extent feasible, prevent construction of homes and other noise-sensitive uses in proximity to the Interstate 64 corridor. (M)

WASTE MANAGEMENT

1. Encourage recycling by both households and businesses as the preferred means of waste disposal. (S)
2. Aggressively advertise in local newspapers and the Citizen News the County's solid waste management programs both to inform residents and businesses of program offerings and to educate those already participating in the program. (S)
3. Expand the list of recyclable items based on participant input and/or market fluctuations. (M)
4. Expand information/education campaigns to instruct the public on the need for recycling by providing materials to interested businesses, civic and homeowners' associations and any interested party. (S)

5. Continue to incorporate recycling education into the public school program from elementary school through high school. (S)
6. Continue to work with the Virginia Peninsulas Public Service Authority (VPPSA) to organize household hazardous waste collection days for materials such as old paint cans, paint thinner, fertilizers and pesticides, etc. (S)
7. Continue to participate in the Household Chemical Collection System to encourage the safe disposal of chemicals that might otherwise be disposed of via storm drains and dumping. (S)
8. Continue the ongoing public information campaign to educate citizens in proper methods of recycling yard waste. (S)
9. Develop a program to publicly recognize and acknowledge "model" yard waste recycling programs by neighborhoods, groups, and individuals. (M)
10. Continue the County purchasing policy emphasizing the purchasing of supplies, where economically feasible, that are made of recycled products and/or are recyclable themselves. (S)
11. Aggressively market the products of the regional composting facility, including bagged compost material for sale to residents who do not own trucks. (M)

