Chapter 5

ENVIRONMENTAL PROTECTION

BACKGROUND AND ANALYSIS

Soils

Tappahannock is situated mainly on soils of the Tetotum-Tomotley-State Association. This soil association occurs typically at lower elevations of Essex County, on the river terrace paralleling the Rappahannock River. Soil conditions are a major determinant of future development, as soil characteristics affect excavating, road building, the design and construction of buildings and foundations, and the location of sanitary facilities. A fluctuating high water table, characteristic of the Tetotum-Tomotley-State Association, is the major limiting factor of these soils for development. The availability of central sanitary facilities in the town allows for development in all but the wettest (Tomotley) soils of this association; subsurface drainage and proper surface water drainage may eliminate problems associated with the Tomotley soils.

The remaining area of the town is on soils of the Rappahannock-Molena-Pamunkey Association. This soil association occurs at elevations below 15 feet, primarily along Hoskin's Creek and Tickners Creek. The soil association is predominantly Rappahannock soils, which are not suitable for any type of development because of flooding, high water table, and high organic matter and sulphur content. These Rappahannock soils are the tidal marsh areas which serve as a buffer zone along the waterfront, filtering runoff entering the waterways, minimizing shoreline erosion and serving as wetland wildlife habitat.

Highly Erodible Soils

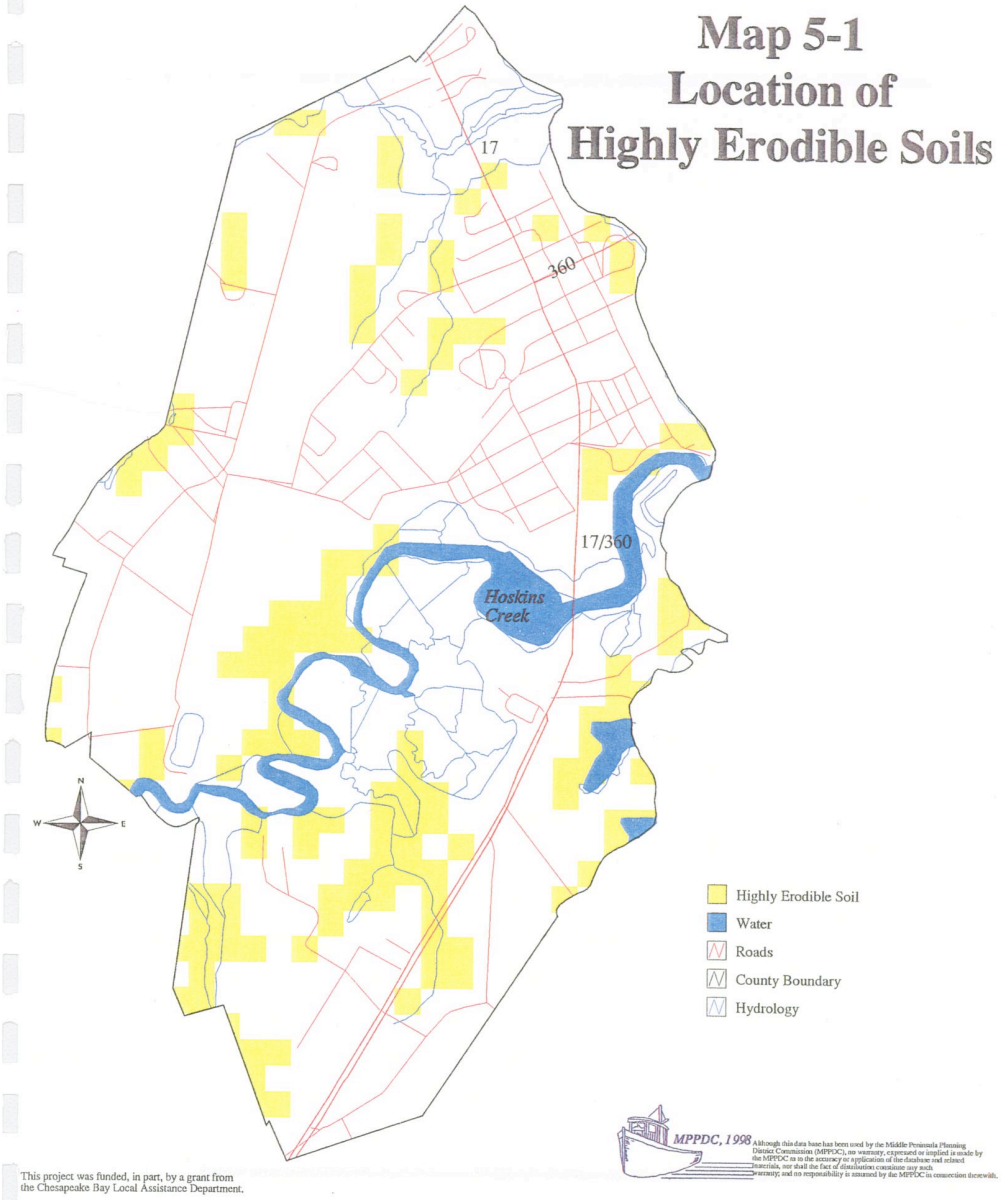
Highly erodible soils are those soils which have a high potential for erosion and sedimentation. This potential is often related to steepness and length of slope. Both of these factors act to increase precipitation runoff velocity which in turn serves to loosen and remove certain soil particles. The extent to which soil particles are moved or the soils “erodibility factor” varies depending on soil texture, infiltration rate, permeability and other factors. The general locations of soils which are highly erodible in Tappahannock are identified on Map 5-1. Approximately 15 % of the land area within the town is characterized by the presence of highly erodible soils. Most of these soils are in scattered locations with few areas of concentration in the community. These soils are less frequently present along the town’s Rappahannock shorefront, but are more often located near Hoskin’s Creek and inland stream systems.

The town has designated all county land area a Resource Management Area (RMA) as per the Chesapeake Bay Preservation Act, due largely to the fact that highly erodible soils are both sensitive to development disturbances and are present throughout the town (see discussion later in this section). When such soils occur in combination with steep slopes they are particularly

subject to greater rates of soil erosion when development disturbances occur. Therefore, the town should limit and/or discourage development of sites characterized by the co-occurrence of both highly erodible soils and steep slopes to reduce sedimentation to streams and transport of toxics which are often attached to soil particles.

When development occurs in such locations, plans required for sediment and erosion control should be carefully reviewed and Best Management Practices (BMP's) should be employed to minimize soil erosion. Such practices should include minimizing the land disturbance necessary and protecting indigenous vegetation on the site to the maximum extent feasible. Additional BMP's should also be considered as may be recommended by the Chesapeake Bay Local Assistance Department.

MAP 5-1:
Location of Highly Erodible Soils


Map 5-1
Location of
Highly Erodible Soils
17
360
17/360
Hoskins Creek
N
W
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S
Highly Erodible Soil
Water
Roads
County Boundary
Hydrology
MPPDC, 1998
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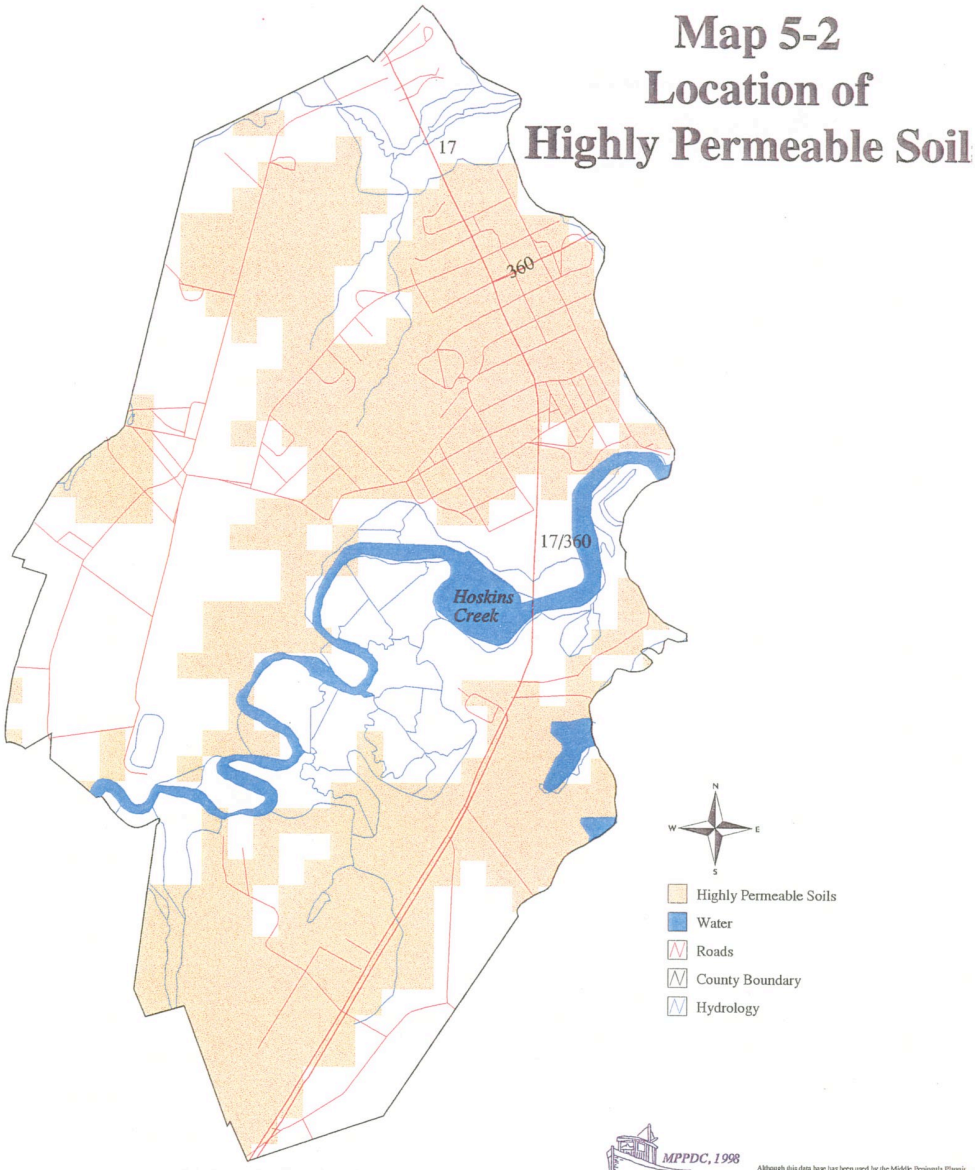
57

Highly Permeable Soils

Highly Permeable soils transmit water at such a rate that there is a potential for surface pollutants such as nutrient and other chemicals and sewage wastes to infiltrate, undegraded, into nearby surface water and groundwater systems. Highly permeable soils are those which can be characterized as having permeability equal to or greater than six inches of water movement per hour in any part of the soil profile to a depth of 72 inches. Map 5-2, prepared by the Middle Peninsula Planning District Commission, identifies the general location and extent of highly permeable soils within the Town of Tappahannock. These soils are concentrated in a number of locations which are already developed in the town including the Central Business District and adjacent residential neighborhoods as well as substantial portions of the Southern portion of the town where a number of highway oriented commercial uses have developed over time. Highly permeable soils occupy an estimated 50% of the town land area.

Highly permeable soils are highly susceptible to pollutant leaching, and thus have a greater potential for groundwater pollution and well as pollution of surface waters. Soil permeability is particularly important in relation to design of soil drainage systems. Shallow groundwater resources or surface aquifers are also a source of water for streams in the town which flow into Hoskins Creek, the Rappahannock and the Chesapeake Bay. The cumulative effects of chemical pollutants leaching into groundwater resources over time can increase the potential for water resource pollution.

MAP 5-2:
Location of Highly Permeable Soils



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61

More detailed maps, at a scale of 1:20,000, showing individual soil boundaries within the town, are available at the Middle Peninsula Planning District Commission Office or the Soil Conservation Service Office.

Shoreline

Shorelands are a limited resource which is, for the most part, nonrenewable. Shoreline erosion control has been the responsibility of private property owners and assistance to them in coordinating efforts is a recently developed service. It is desirable to preserve beaches for their beauty and recreational function and for protection of the fastland.

The entire Rappahannock shoreline in Tappahannock has been artificially stabilized, contributing to further erosion downstream. This is a temporary, ineffective means of beach protection. In order to reestablish or maintain existing beaches, the only course of action currently available would be a program of beach nourishment and structures specifically designed to trap moving sand at particular sites. A detailed study of the area involving a cost benefit evaluation would be necessary prior to initiation of any coordinated effort or unified solution.

The town should work with the county, the Middle Peninsula Planning District Commission and the Virginia Institute of Marine Science to develop a comprehensive shoreline management plan. This type of plan would provide a more coordinated strategy for managing the impacts of shore erosion, including appropriate wetland planting programs, policies to reestablish and maintain beaches, recommend maintenance practices for existing waterfront property owners, and better assess the impacts of current structures protecting the town shorefront and downstream county areas.

Commercial and Recreational Fisheries

The Rappahannock River, which flows adjacent to the Town of Tappahannock, serves as spawning ground to millions of shad, herring and yellow perch during the months of April and May each year. Below the fall line at Fredericksburg, the river broadens into a tidal estuary where fish, oysters, and crabs are abundant. Watermen make a living from the river, and their catch throughout the river system in 1991 brought in a dockside value of 6.3 million dollars. Smaller herring and white perch also support recreational fishing interests in tributaries to the Rappahannock and in particular larger creeks such as the Piscataway near Tappahannock.

Nearly one-third of Virginia's nesting population of bald eagles can be found along the Rappahannock. During the past few years, the U.S. Fish and Wildlife Service has studied the potential for establishing a wildlife refuge between the bridges of Port Royal and Tappahannock to help protect this section of the river corridor which is home to black ducks, mallards, Canada geese, a variety of anadromous fish, the threatened joint vetch plant, and tidal wetlands.

Of the 2,848 square miles in the Rappahannock basin, 61% is forested and 35% is covered by cropland and pasture, while only 4% is developed. Because the Rappahannock basin has retained its rural nature, the river has been spared the level of decline in water quality observed in other rivers that feed the Chesapeake Bay system. Nevertheless, the river is not entirely free

of water quality problems. In late 1992, over 6,500 acres of once-productive shellfish growing areas within a one mile radius of the Tappahannock bridge no longer met the bacteriological standards. Based on a Sanitary Survey conducted by the Virginia Department of Health in January, 1997 most of these areas remain restricted from shellfish harvesting today. Oxygen concentrations in those waters have also dropped to low levels because of periodic algal blooms which, upon decaying, rob the water of its oxygen. In general, stands of submerged aquatic vegetation throughout the river represent a fraction of those found in the 1960s which has adversely impacted many aquatic creatures, from crustacea to young fish, who depend on these grasses for food and shelter. Catches of certain fish and shellfish species, such as shad, river herring, and oysters, have declined in recent years.

Since 35% of the land in the Rappahannock basin is used for agricultural purposes, much of the river's pollution comes from agricultural runoff including soil, pesticides, and fertilizer. In the upper Rappahannock basin, the U.S. Soil Conservation Service estimates that 15 tons per acre of highly erodible soil washes off the rolling hills each year-- more than twice what soil scientists consider acceptable. Soil clouds water, smothering plants and fish eggs and clogging the gills of adult fish with silt and sediment. Fertilizers over-enrich the water with nutrients, in turn depleting oxygen supplies. Virtually the entire estuarine portion of the river, from Leedstown to the mouth, is now classified as "nutrient enriched" by the state's Department of Environmental Quality.

Major efforts are currently under way to reduce the amount of pollution that enters the Rappahannock. Virginia's Agricultural Best Management Practices (BMP) program has targeted the Rappahannock for cropland nonpoint pollution control efforts. In 1991 alone, 687 farmers in the Rappahannock basin signed up for the state's cost-share program, which provides funding and technical advice to farmers who want to use practices such as strip cropping, no-till farming, and vegetated filter strips to reduce runoff. The State has also provided cost share grants to five of the six sewage treatment plants in the basin for systems to reduce or eliminate the chlorine in their discharge. Residential septic system violations along shoreline areas are also being targeted by the state for cleanup so that shellfish grounds may be reopened. Finally, restoration of eelgrass, an important kind of submerged aquatic vegetation has been underway in recent years with success in some areas.

Water

Water activities which serve as major attractions to tourists as well as present and potential residents of the area, are dependent upon high standards of water quality. Runoff from ground areas, sewage treatment discharge, leaching of septic tank effluent and construction activity along the shoreline all affect water quality. Tappahannock residents take pride in the beautiful Rappahannock and support its preservation. By policy of the Virginia Department of Health, Bureau of Shellfish Sanitation, an area of one-half mile radius from the mouth of Hoskin's Creek, in the Rappahannock, is restricted from commercial fishing of oysters and clams due to the presence of the sewage treatment plant near Hoskin's Creek. This does not affect the enjoyment of water sports and activities, as the Rappahannock has been noted as one of the most beautiful rivers in the East.

Adequate groundwater supply for present and future residential, commercial, and industrial uses exists in the upper artesian and principal artesian aquifer systems. The upper artesian aquifer system is 150 to 200 feet below surface, consistently, and is a good source of domestic water supply. Currently, water of good quality is being tapped from this system for individual use around Tappahannock. Tappahannock's central water system is drawn from the principal aquifer at depths greater than 200 feet. Though it is costly to bring to the surface, this aquifer has potential for unlimited use of good water quality.

Water Quality Issues

Given the population served by the Town's municipal water supply facilities and expected growth in the Town, it is the policy of the Town that potential sources and effects of pollution on the Town's water supply be investigated. Sources may include storm water runoff, leaking petroleum storage tanks, abandoned wells, former refuse sites, and on-site sewage deficiencies. Since the last comprehensive plan update, the Town has taken many proactive steps addressing water quality issues. Elected, appointed and citizen representatives from the Town participated in a two year planning process facilitated by staff from the Middle Peninsula Planning District Commission. The mission was to research, educate, and promote action for the management, conservation, and protection of the Middle Peninsula's water resources. Town representatives undertook a Strengths-Weaknesses-Opportunities-and-Threats (SWOT) analysis and developed a management/recommendation plan for consideration by Town Government (APPENDIX B). Committee members from the Town comprehensively analyzed water quality issues from the following areas: water resources, contaminations and threats, and local planning tool effectiveness. Each section illustrates what participants viewed as important groundwater and surface water issues. Town Council is considering final recommendations for adoption.

<u>Town of Tappahannock Recommendations</u>

- The Town should explore developing controls for future high volume water users
- The Town should institute education efforts to inform the general public about contamination and threats to water resources
- The Town should develop an amnesty day for the disposal of unwanted chemicals, home hazardous waste, fertilizers, etc.

The Town considers these recommendations critical to providing safe ground and surface water for the residents. The Town will continue to work towards addressing all elements identified in the SWOT analysis using a proactive planning process. The Town Council understands that many types of land uses and the practices within the Town can affect the quality of both surface and ground water supplies. Runoff from lands adjacent to surface water reservoirs may contain chemical and biological contaminants. Pollutants can originate from agricultural practices, residential lawn care, pesticides, petroleum spills, and failing septic systems. Groundwater can be contaminated by these sources by infiltration through the soil to the water table.

The Department of Environmental Quality (DEQ) currently monitors above and below ground petroleum storage tanks in the Town of Tappahannock. As of April 21, 2001, DEQ records indicate 4 registered active monitored tanks (map 1). Of the 4 tanks, 3 show leakage and 1 tank is scheduled to be closed pending administrative process. Specific site information can be obtained from the Department of Environmental Quality web site at www.deq.state.va.us/tanks or by calling the Department of Environmental Quality Piedmont Regional Office.

- In an effort to address leaking underground storage tanks and other pollutant sources and improve the quality of water resources within the Town of Tappahannock, The Town will: Work with the Department of Environmental Quality to develop appropriate programs to mitigate any water quality problems associated with leaking petroleum storage tanks

- Work with Town business or residents to develop appropriate mitigation strategies on a case by case basis

- Explore the development of a Wellhead protection ordinance

- Conduct a town wide survey asking residents to locate abandoned wells

- Develop a program to provide these citizens with assistance for well closure

On-site wastewater failures have been practically eliminated within the Town. Water and sewer service is available town wide. Five to ten on-site systems remain within the Town (Map 1). At such time when these systems require repair, it is the policy of the Town to investigate the cost of public service hook up or directing the homeowner to the Middle Peninsula Planning District Commission's On-site Wastewater Revolving Loan Program which offers financial assistants for the repair or replacement of failing on-site systems. The Town desires to have 100% public water and sewer hookup town wide or when necessary require engineered on-site waste treatment systems with the Town overseeing operation and maintenance. This strategy will ensure 100% public sewer management by the Town.

The Town is sensitive to the role water conservation plays in the community. Groundwater protection and conservation is an incremental process. There are seldom any fast solutions. Rather, step-by-step changes lead to strong and lasting results. Community leadership will be responsible for developing, coordinating, and implementing the conservation activities. Following on the recommendation to inform the general public about contamination and threats to water resources, the Town will look towards the Middle Peninsula Planning District Commission's Water Resource Program to provide guidance to the Town. MPPDC's Water Resource Program has received financial assistance from the Department of Health, Drinking Water State Revolving Fund Program. The PDC will be introducing localities to the Groundwater Guardian Program. This program supports, recognizes, and connects communities protecting groundwater. It is designed to empower local citizens and communities to take voluntary steps toward protecting their groundwater resources. Groundwater Guardian can be a catalyst for groundwater protection programs such as a local wellhead protection or a source water protection program. The Town welcomes the opportunity to introduce the citizens and

businesses to a citizen based conservations program to help protect and manage the water resources of the Town.

Protection of Potable Water Supplies

The Town of Tappahannock provides the only municipal water supply system in Essex County. Given the large concentration of residents and businesses which are dependent on Municipal water supply facilities and expected growth around the Town of Tappahannock, the potential effect of pollution sources on the town water supply should be investigated in cooperation with the County. Such sources may include abandoned wells, former dump sites, and underground storage tanks and urban run-off as well as septic systems near the town.

The town should continue efforts to minimize the impacts of urban run-off. Such efforts should include a review of town ordinance criteria and requirements for site planning to assure standards and requirements are designed to minimize run-off and its impacts on water quality to both surface waters and groundwater supplies. Where possible standards should provide incentives to reduce the amount of impervious surface associated with development, preserve existing vegetation and utilize low impact development practices. Consideration should be given to reduction of required setbacks, minimizing driveway size and number of drives and reducing required street widths where appropriate as measures that can reduce the area of impervious surface.

Site planning practices should also be reviewed to assure they are designed to provide incentives to preserve as much of the original site vegetative cover as possible. Vegetative buffers along streams can do much to minimize the impact of development disturbances to wetlands, floodplains and other sensitive areas. Although there is presently no indication of stream bank erosion along Tickners Creek and Hoskins Creek, protection of streamside forest cover along both these water bodies and their tributary streams should remain a priority to minimize the erosion and sedimentation impacts of future development disturbances in the town on both bodies of water. Conserving vegetation, particularly trees along streams and other natural waterways can minimize the impacts of stream bank erosion and stormwater on groundwater supplies and tidal waters.

Measures for streamside buffering should include requiring protection of streamside (riparian) forest cover where it exists, and encouraging re-establishment of forest cover or afforestation where it does not presently exist along streams when development is proposed on sites adjacent to stream corridors.

The county and town should request technical assistance from the Middle Peninsula PDC and local health department officials to mutually define an appropriately sized well-head protection district for the town to assure maintenance of good water quality from the 3 existing wells used as the source for town water supplies and to assure protection of the upper artesian and principal artesian aquifers that may serve as the source of water supply for any additional wells that may be required in the future. In the interim, the town should also work with local health department officials to explore measures that minimize the likelihood that construction of septic systems in

proximity to the town or in aquifer recharge areas could result in their improper function and contamination of groundwater resources in future years.

The town and county should also encourage the State to identify resources that can be used to financially assist property owners to support remediation on sites in the town and nearby county locations occupied by leaking underground storage tanks. Sixteen such locations are presently known to exist in the County (many of which are located in or near the town) and should be targeted for underground storage tank removal, repair or replacement.

Finally, the town should promote the use of water conservation measures by residents and businesses in the community and should consider amending the building code to require the use of water conservation devices in new construction.

Development Constraints Analysis

The presence of sensitive environmental features on lands within the Town of Tappahannock clearly influences the development pattern of the community. Certain natural features or environmental resources (notably floodplains, wetlands, hydric soils, and steep slopes) pose limitations for development. The following discussion is provided to establish some understanding of which lands in the town contain sensitive environmental features which may limit development. A series of maps, prepared by the Middle Peninsula Planning District Commission identify their general location in the town.

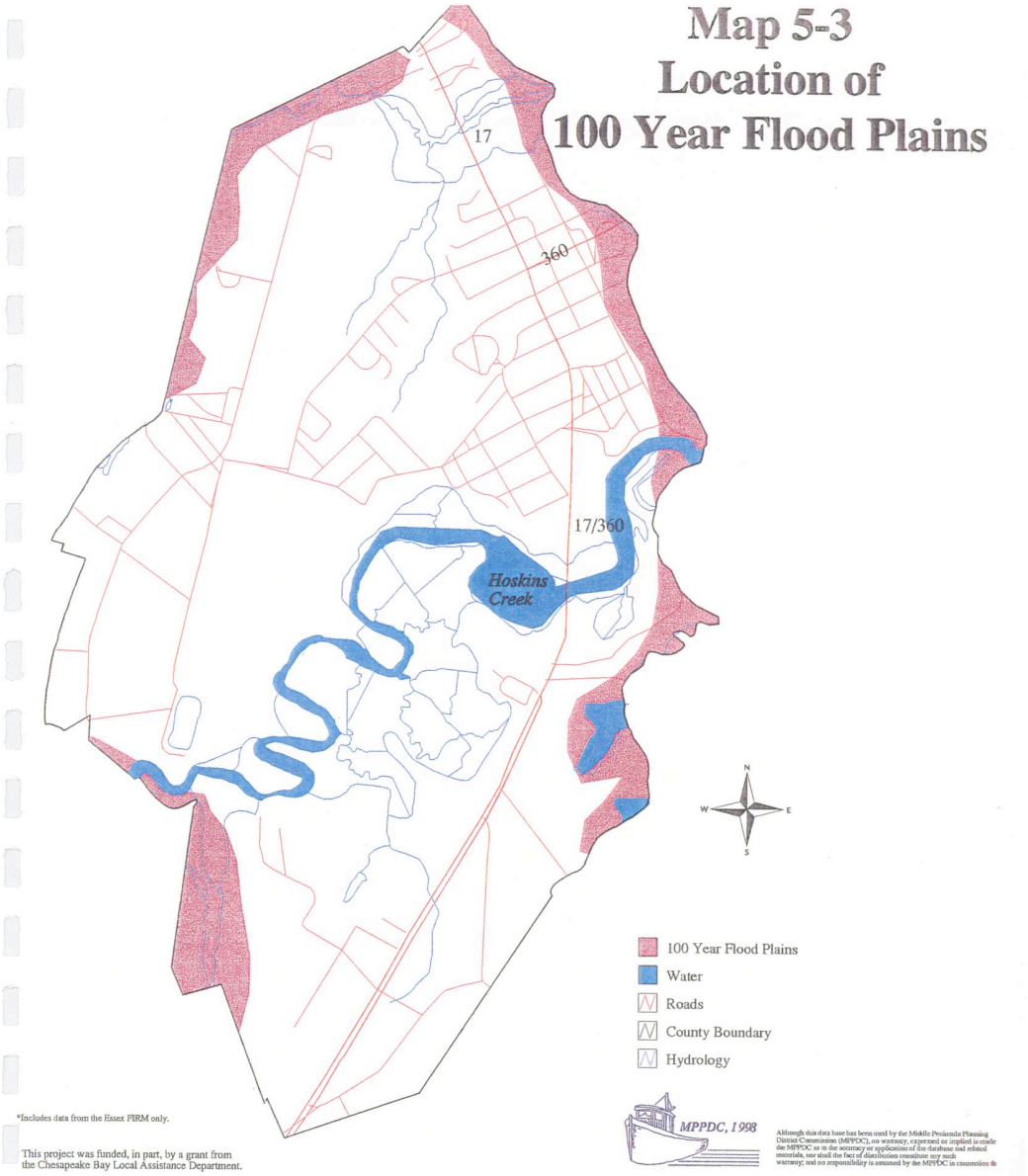
Floodplains

While protection of life and property provided the initial basis for protection of floodplains, there has been a growing recognition in recent years that limiting disturbances within floodplains can serve a variety of additional functions with important public purposes and benefits. Floodplains moderate and store floodwaters, absorb wave energies, and reduce erosion and sedimentation. Wetlands found within floodplains help maintain water quality, recharge groundwater supplies, protect fisheries, and provide habitat and natural corridors for wildlife movement.

The minimum requirements of the National Flood Insurance Program do not prohibit development within the 100-year floodplain. However, to adhere to the minimum Federal requirement, the town requires development and new structures in the floodplain to meet certain flood protection measures including elevating the first floor of structures a minimum of one foot above 100 year flood elevations and utilizing flood-proof construction techniques. Moreover, where alternative building sites on a parcel are available for construction outside the 100 year floodplain, construction outside of the 100-year floodplain is preferred.

Map 5-3 identifies the general location of floodplains in Tappahannock. These areas are generally located along the Rappahannock shoreline. Portions of the 100 year floodplain are also located along the town's northwestern and southwestern edges. The most current flood data can be found online at the Federal Emergency Management Agency website (www.fema.gov).

Map 5-3:
Location of Floodplains


Map 5-3
Location of
100 Year Flood Plains
17
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17/360
Hoskins Creek
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100 Year Flood Plains
Water
Roads
County Boundary
Hydrology
*Includes data from the Essex FIRM only.
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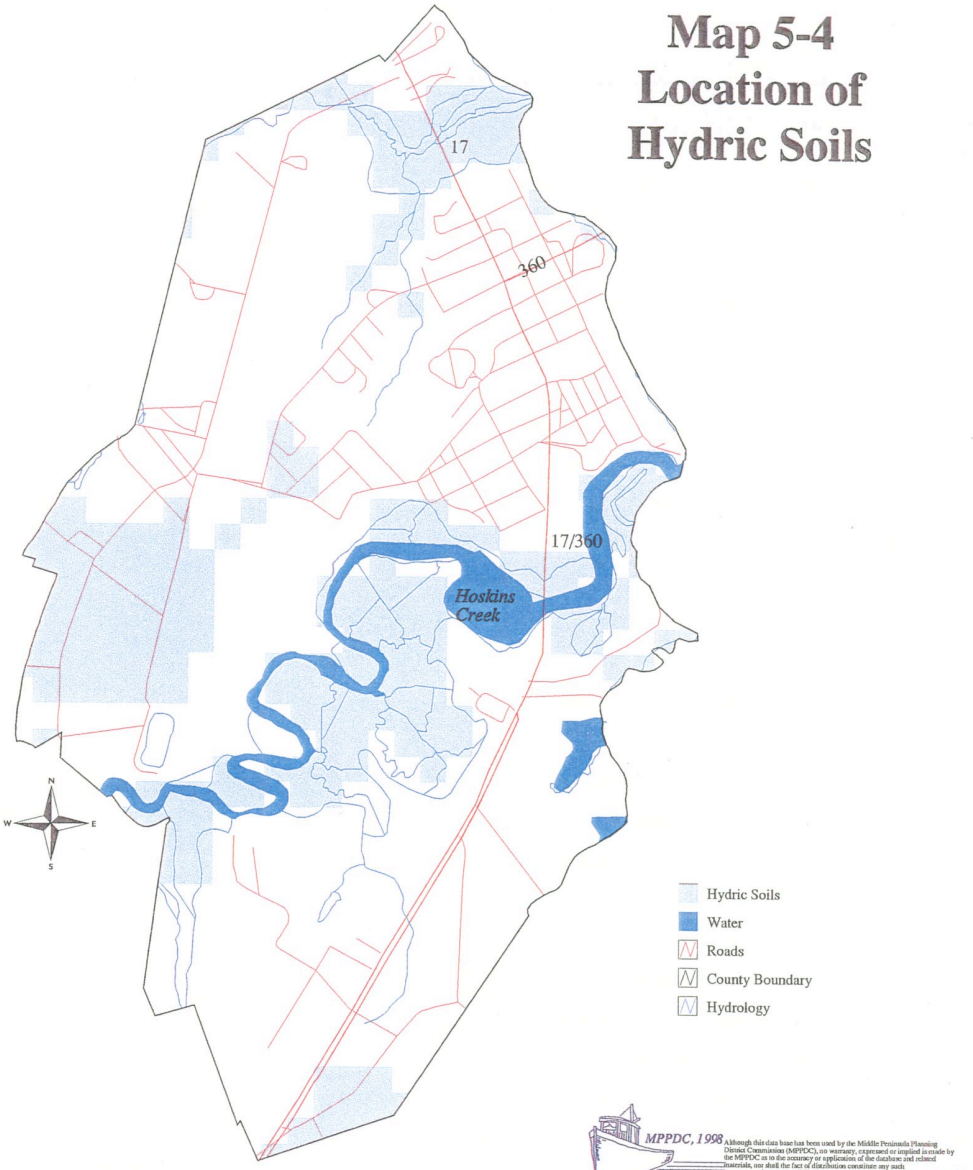
69

Hydric Soils

Soils are considered hydric if they are saturated, flooded, or ponded long enough to develop anaerobic (no oxygen) conditions in their upper layers. Chemical changes which result from prolonged saturation (at least one week during the growing season) are reflected in the soil color, composition, and in some cases, it's smell. Map 5-4, prepared by the MPPDC with the use of the Essex County Soil Survey, identifies the location of hydric soils in Tappahannock. Hydric soils are located in proximity to stream systems adjacent to Hoskins Creek and Tickners Creek and along the west central edge of the town.

Because the identification of hydric soils provided in the soil survey includes soils that are either drained or undrained, not all hydric soils are wetlands although in many cases they provide an indication of the possible presence of non-tidal wetlands. Determination of the presence of wetlands ultimately requires field verification. Any development proposal on lands identified as hydric soils should be required to verify the location of non-tidal wetlands to assure such areas are not impacted by development disturbances.

Map 5-4:
Location of Hydric Soils



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Wetlands

In the 20th century, well-intentioned public and private efforts to provide flood protection, mosquito control, greater agricultural productivity, better highways, and many other benefits to society have often resulted in filling or draining of wetlands for farming, forestry, industry, and development. In more recent years, research has concluded that wetlands play a vital role in the environment. Wetlands are valuable for the many physical, hydrological, biological, and cultural functions which they provide. These include:

Physical

- Wetland vegetation and shallow waters absorb coastal wave energy and reduce shore erosion
- Wetlands slow water velocity and reduce sediment in the water.
- Wetland plants and bottom sediments are sinks or collectors of excess nutrients such as nitrates and phosphorous.
- Wetlands trap water-borne heavy metals, herbicides, and pesticides.
- Wetland plants re-oxygenate water thereby lowering biological oxygen demand.

Hydrological

- Wetlands act as floodways when associated with rivers and adjacent floodplains which convey water downstream.
- Wetlands store water during floods and release volumes slowly, reducing drastic flood urges.
- Wetlands, while most often are water discharged areas, also may act as water recharge areas.

Biological

- Wetland plants and invertebrates serve as the basis of a highly productive food chain.
- Wetlands are nursery and spawning areas for many species of finfish and shellfish. From 60 to 90 percent of commercially caught fish depend on coastal wetlands for food spawning.
- Wetlands are also an important habitat for many waterfowl and wildlife species, serving as protective areas for feeding, resting, and breeding.
- Wetlands are habitat for many rare and endangered species, almost 35 percent of protected animal species are found in wetlands, although wetlands cover only about 5 percent of the nation's land area.

Cultural

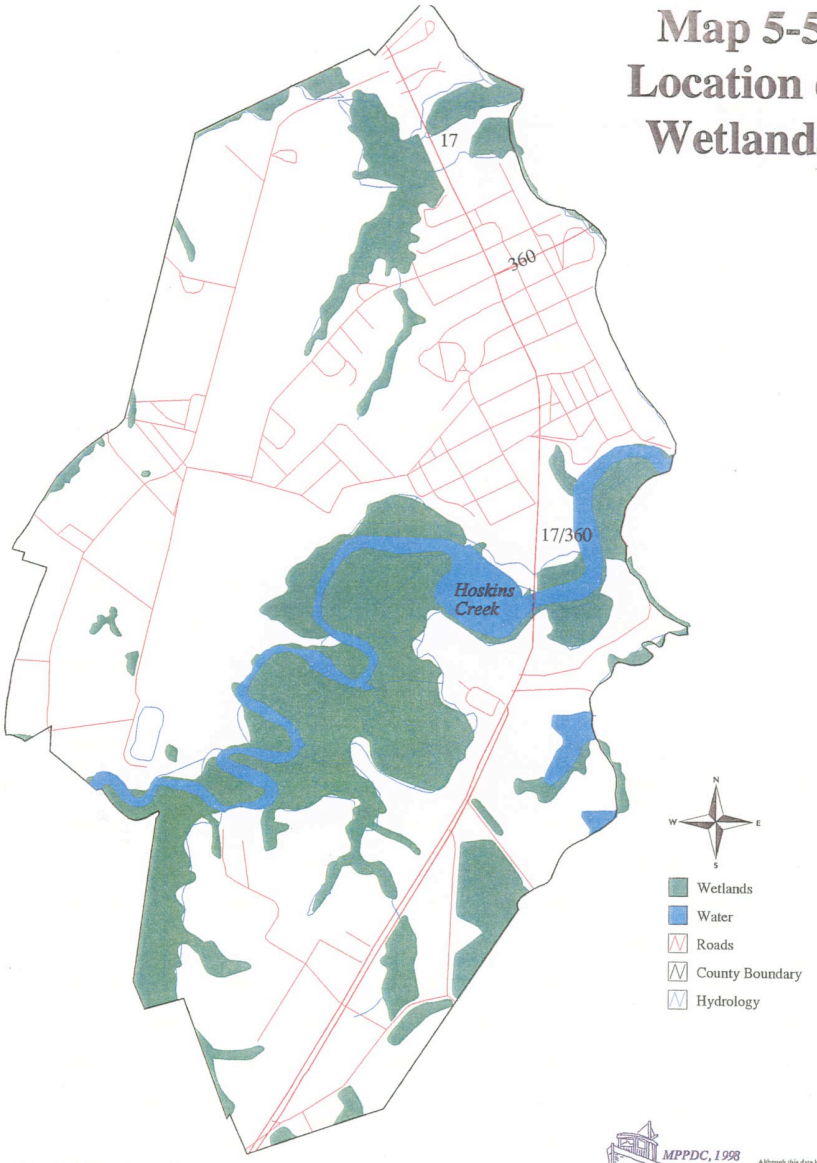
- Wetlands often contain important historical and archeological sites since they were early sources of food.
- Wetlands serve important recreational and commercial values for fishing, hunting and trapping.
- Wetlands which are forested may be managed for valuable timber production.
- Wetlands provide scenic open space and often serve as areas for bird and wildlife observation.

In light of the above described benefits, tidal wetlands in the Commonwealth are protected by the 1972 Wetlands Protection Act, as amended. This law requires a special permit prior to starting construction, dredging, or filling a tidal wetlands The Act also empowers local jurisdictions to establish Wetlands Boards which may review and decide permit requests. Essex County has a Wetlands Board. The Virginia Marine Resources Commission has the ultimate authority to administer the Wetlands Protection Act and reviews all decisions issued by local boards.

Nontidal wetlands are currently federally regulated by Section 404 of the 1977 Clean Water Act, as amended, which prohibits disposal of dredged or fill material into "waters of the United States" and adjacent wetlands. This has been broadly interpreted by the Environmental Protection Agency (EPA) to include virtually all surface waters in the nation, regardless of size.

The Chesapeake Bay Preservation Act and Chesapeake Bay Preservation Area Designation and Management Regulations establish mandatory requirements for the town to obtain evidence from a developer of all wetland permits required by law prior to authorizing any site grading or other on-site land disturbing activities. Wetlands located in the Town of Tappahannock are shown on Map 5-5 prepared by the Middle Peninsula Planning District Commission. The most extensive area of wetlands co-occurs with the location of Hoskins Creek which bisects the town. Comparison with Map 5-4 suggests there are a number of locations where the presence of hydric soils does not necessarily indicate the presence of wetlands.

Map 5-5:
Location of Wetlands



Map 5-5 Location of Wetlands

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77

Map 5-6:
Location of Steep Slopes

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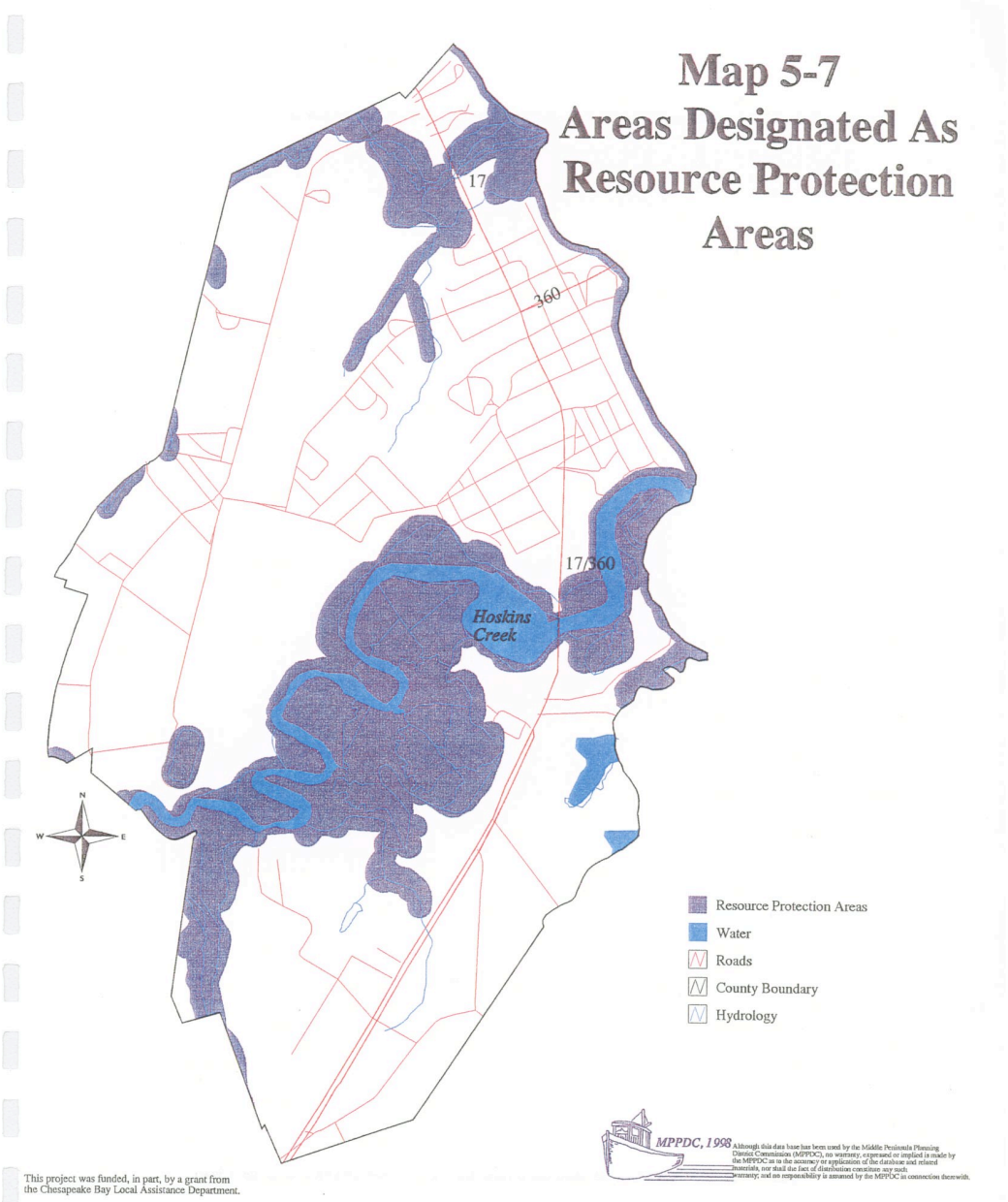
Summary

Analysis of the location of sensitive resources including wetlands, steep slopes, highly erodible and highly permeable soils, and hydric soils indicates that with the exception of hydric soils near the town's western border, should pose few limitations for the nature and types of development to be accommodated in land use plan (see chapter 3). The presence of hydric soil conditions in areas south and southwest of the airport, planned for industrial and/or residential development (see land use plan map #3-1) may limit develop in these areas. Proposals for development in this area should be required to conduct soils analysis to determine their suitability for development. The presence of hydric soils in this area suggests the possible location of nontidal wetlands. Where their location can be confirmed by field investigation, development proposals should be designed to avoid any disturbances to wetlands and minimize impacts to their hydrology.

Finally areas designated as Resource Protection Areas under the terms of the Chesapeake Bay Preservation Act represent areas of severe constraint to development and should remain undisturbed. These areas are identified on Map 5-7.

Map 5-7:
Areas Designated as Resource Protection Areas under the Terms of the Chesapeake Bay Preservation Act


Map 5-7
Areas Designated As Resource Protection Areas
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83

Implementation: The Chesapeake Bay Preservation Act

The primary tool for implementing the resource protection objectives of the town is the Chesapeake Bay Preservation initiative. The Chesapeake Bay Preservation program launched by the state in 1988 establishes a baseline for protection of town resources that disturbance or overutilization can and often have adversely impacted water quality in those Bay system tributaries that border and penetrate the town.

In response to recent interstate regional agreements between Virginia, Maryland, Washington D.C., and Pennsylvania to clean-up the Chesapeake
Bay, the State of Virginia has adopted the Chesapeake Bay Preservation Act which mandates all Tidewater Virginia localities to establish program, plans, and ordinances to protect and improve Bay water quality. These 'local programs" must be in conformance with the Chesapeake Bay Preservation Area Designation and Management Regulations adopted by the Virginia Legislature in September, 1989.

Purpose of the Act

The purpose of the regulations is to protect and improve the water quality of the Chesapeake Bay, its tributaries, and other state waters by minimizing the effects of human activity upon these waters and implementing the Chesapeake Bay Preservation Act, which provides for the definition and protection of certain lands called Chesapeake Bay Preservation Areas, which if improperly used or developed may result in substantial damage to water quality of the Chesapeake Bay and its tributaries.

The regulations establish the criteria that Tappahannock has used to determine the extent of the Chesapeake Bay Preservation Areas within its jurisdiction. The regulations establish criteria for use by the town in granting, denying, or modifying requests to rezone, subdivide, or to use and develop land in Chesapeake Bay Preservation Areas. Regulations identity the requirements for changes which local government like Tappahannock must incorporate into their comprehensive plans, zoning ordinances, and subdivision regulations to protect the quality of state waters pursuant to the Chesapeake Bay Preservation Act.

The purpose of the Tappahannock Chesapeake Bay Preservation Program Comprehensive Plan Element is to collect and analyze data, explore issues and alternatives, and develop policies and implementation strategies, providing a basis to take local action to protect and improve the water quality of the Chesapeake Bay, its tributaries, and other state waters.

Data Collection and Analysis

The Chesapeake Bay Preservation Program for Tappahannock relies on the collection and analysis of water and land use data and characteristics. The information sources utilized for the adoption of the program are those which are the best in accuracy and currently available. Recognizing that in some areas data may be incomplete or on a reduced level of accuracy, the county/town, in conjunction with the Department of Conservation and Recreation Division of the Chesapeake Bay Local Assistance Department (CBLAD) and the Middle Peninsula Planning

District Commission (MPPDC), will strive to produce future inventories and studies to best reflect the current and changing characteristics of the lands and waters.

The goal of the inventory of natural and manmade features is to identify the areas within the town which require and should be considered for preservation under the Chesapeake Bay Preservation Act (CBPA) regulations. These areas include: tidal wetlands, nontidal wetlands connected by surface flow and contiguous to tidal wetlands or tributary streams, tidal shores, floodplain, highly erodible soils, highly permeable soils, other nontidal wetlands, and other lands whose characteristics may have a significant impact on water quality protection.

Tappahannock contracted with the MPPDC to produce an inventory of the land categories identified above. The MPPDC utilized the following information sources in conjunction with an automated geographic information system to analyze, compile, and map the inventoried features:

- United States Geological Survey - Digital Line Graph: includes tidal wetlands, tributary streams, tidal shores, roadways, and county boundaries.

- U.S. Fish and Wildlife Service - National Wetlands Inventory: includes tidal and nontidal wetland and classification of each.

- Virginia Geographic Information System - Digital Information of the U.S. Department of Agriculture Soil Conservation Service Soil Survey of Essex County, Virginia: includes soil characteristics necessary to determine permeability and erodibility of soils.

- Federal Emergency Management Agency - Flood Insurance Rate Map: includes 100-year event floodplain for Essex.

The MPPDC has published the Comprehensive Water Quality Management Plan for the Middle Peninsula which provides water quality and issues data, analysis, and policy review. Specifically, the two elements of the Management Plan provide information relevant to Middle Peninsula localities' on-site wastewater treatment, potable water supply, boating facilities, living resources, waterfront access, existing land use and water quality (including pollution sources), and a general economic analysis of the region.

Other documents referenced directly or through familiarity include the CBLAD's Local Assistance Manual: the Virginia Institute of Marine Science's (VIMS) Shoreline Situation Report for Essex County; and other federal, state, and local studies.

Shoreline Erosion

The 1998 Comprehensive Plan for the Town of Tappahannock indicated a need for coordinated collaboration between the Middle Peninsula Planning District Commission (MPPDC) and the Virginia Institute of Marine Science (VIMS) to develop a comprehensive shoreline management plan. The Town recognizes shorelines as a valuable asset and should be managed appropriately. With financial assistance from the Chesapeake Bay Local Assistance Department, Essex County, and the Town of Tappahannock were surveyed for a comprehensive shoreline situation report.

Since the Town of Tappahannock is bordered by the Rappahannock River and contains both Tickners and Hoskins Creeks, shoreline erosion management is of critical concern. Soil erosion along shorelines occurs when water or wind carries off soil particles. The transport of soil particles is generally referred to as runoff. Runoff can wash fertilizer and other pollutants into Hoskins Creek and the Rappahannock River and should be kept to a minimum. The Town uses the Virginia Erosion and Sediment Control Handbook for guidance related to overland flow and erosion control. Additionally, the Department of Conservation and Recreation's Shoreline and Erosion Advisory Services (SEAS) provides guidance for tidal and non-tidal erosion. Interested parties are encouraged to visit www.state.va.us/~dcr/sw/seas.htm for additional information. The following characteristics generally identify erosion activity:

- Bare spots on land
- Exposed roots
- Small rills or gullies on slopes
- Sediment collects in low areas

Shoreline and streambank erosion are caused by wave and water energy, and can vary from low to moderate or high levels. Permanent structures, such as bulkheads and revetments, have been established along many parts of the Town's shoreline where moderate to high levels of erosion occur. Permanent erosion control structures built in the past have sometimes caused the erosion of downstream wetlands and the disappearance of downstream beaches, as the movement of sand or sediments is impeded by these structures. Unified treatment of whole reaches of shoreline can improve opportunities to assure that solutions to erosion conditions on one site do not create greater rates of erosion on adjacent sites.

Shorefronts subject to low and moderate rates of erosion may often represent candidate sites for non-structural shore protection through the use of wetland plantings and sills (continuous small rock breakwaters used to slow wave energy to establish inter-tidal marshes). Marsh vegetation and plantings in such areas can provide long term stabilization at a fraction of the cost of conventional structures such as bulkheads and stone revetments. Such treatment of shore erosion conditions also improves water quality and increases habitat availability.

The Virginia Institute of Marine Science completed a shoreline and erosion study of Essex County and the Town of Tappahannock in 2001. Several classifications of erosion are present along the shoreline of the Town boundary, but there are few areas where high erosion rates are present (APPENDIX A).

Most of the Town shoreline along the Rappahannock River has minimal erosion activity. The majority of the river shoreline is classified as greater than 10ft. bank height/low erosion. One 500ft. section around the Route 360 Bridge is classified as 0-5ft. bank height/low erosion area. Two small sections totaling 300ft. are classified as 5-10ft. bank height/low erosion area. The shoreline also includes about 400ft. of beach/low erosion area around the Route 360 Bridge and 1000ft. of marsh/low erosion area near Tickners Creek. Most of the shoreline is hardened. Bulkheads are the most common form of hardening. Groinfields are found along 1000ft. of

shoreline and there are scattered sections of riprap. There are numerous piers and wharfs along the river.

Hoskins Creek has several levels of erosion activity. The majority of shoreline is classified as 0-5ft. bank height/low erosion with marsh conditions. Two sections with a total of 2000ft. of shoreline are classified as 5-10ft. bank height/low erosion. Two shorter sections totaling about 400ft. are classified as greater than 10ft. bank height/low erosion. There are two isolated sections of high erosion, one with bank heights from 5-10ft. and one with bank heights greater than 10ft. These areas contain bulkheads, one associated with a pier and one with a boathouse. Bulkheads are present on the north shore near the mouth of the creek and there is a small bulkhead on the south shore. There are many piers and boathouses along this section of the creek.

Tickners Creek has two levels of erosion activity. Most of the shoreline is classified as0-5ft. bank height/low erosion with marsh conditions. There is a 100ft. section of 0-5ft. bank height/high erosion associated with riprap on the north side of the creek. This area is found on the downdrift side of a jetty at the mouth of the creek. There is a marina on the south side of the creek.

Overall the Town does not view erosion as a problem. However, if at such time erosion activities expand or citizens request assistance in dealing with erosion issues, Town staff will be available to assist citizens with mitigation strategies.

It should be noted that the 2001 erosion study of Essex County and the Town of Tappahannock did not contain data addressing the condition of shoreline structures or how these structures impact water quality. The Town will assist VIMS in the future with the collection and assessment of this data.

Resource Protection Areas

Resource Protection Areas (RPAs) perform natural pollution control functions. Biological activities and physical characteristics in these areas are especially effective in controlling runoff, trapping sediment, and recycling nutrients and pollutants. Components of RPAs are certain wetlands, tidal shorelines, and buffer areas.

Wetlands benefit water quality by acting as a filter in trapping and holding nutrients, microbes, and other pollutants which come from upland runoff. Wetlands also act as a sponge by slowing down fast moving erosion water, absorbing the energy of it for flood control and storm damage protection, and acting as a buffer against coastal erosion from wave action.

The tidal shoreline interface where water meets the land is the scene of dramatic changes caused by the natural forces of wind and water. Tidal shore stability is generally governed by three main determinants; the amount of beach material, the intensity of natural and human forces, and the stability of sea level. The occurrence of tidal shore erosions is considered a natural process

and becomes a serious problem only when human structures and activities unnaturally intrude into this process. Buffer areas are zones of undeveloped vegetated land that are managed to reduce the impact on water quality of land disturbing operations in adjacent areas. Vegetated buffer areas provide a wide variety of environmental benefits, including sediment control, nutrient assimilation, stream back stabilization, in-stream temperature maintenance, flood control and protection, groundwater recharge area protection, and runoff volume reduction.

The components of the RPA are prescribed by Virginia statute, with the local option to include other lands within the RPA designation as necessary to provide a high level of protection to the quality of state waters.

Tappahannock has designated a RPA which consists of all tidal wetlands; nontidal wetlands, including impounded lakes and ponds connected by surface flow and contiguous to tidal wetlands or tributary streams; tidal shores; and an additional buffer area of 100 feet in width, except where reductions are allowed, so located within its jurisdictional boundaries. The extent of the town RPA is shown on Map 5-7. The RPA serves the purpose of protecting environmentally sensitive land and water areas from the adverse effects of human activities to thus improve and protect the quality of water both locally and regionally.

The intent of RPA designation is to limit land disturbance and development to only those activities classified as "water dependent" or otherwise exempted in the Town Chesapeake Bay Preservation Area Overlay District. The integrity of the RPA and associated mechanisms with the CBPA Program will serve the goal of preserving those features most associated with the high standard in quality of life in Tappahannock, namely dean water and attractive landscapes for the beneficial use by both society and the natural ecosystem.

The implementation of the RPA goals will be through an overlay district contained in the Tappahannock Zoning Ordinance. The zoning ordinance will include a general designation RPA map in addition to the performance criteria to be included on specific site plans. The subdivision, erosion and sedimentation control, and floodplain ordinances will also include provisions to preserving water quality as related to CBPA. To truly provide for successful implementation, it is necessary to improve the capacity of both the county staff and general public through supporting educational opportunities related to Chesapeake Bay Program enforcement and management.

Resource Management Areas

The Chesapeake Bay Preservation Act and Criteria Regulations establish the Resource Management Area (RMA) as the landward component of Chesapeake Bay Preservation Areas. Lands to be considered for designation as RMA include the following: nontidal wetlands, floodplain, highly erodible soils, highly permeable soils, and other lands at local discretion.

RMAs are important in terms of water quality primarily because if improperly used or developed, they could release significant amounts of non-point source pollutants into the surface and ground water systems. The regulations do not limit the types of land use and development

that may occur within the RMA. Instead, a variety of performance criteria will be applied to any proposed use or development within RMAs to ensure that those land disturbances that do occur will minimize the adverse impact on water quality. The performance criteria apply to stormwater control, on-site sewage disposal, and land disturbance/stabilization.

The designation of RMAs in Tappahannock has been based on the consideration of the sensitive land types listed above and described below.

Floodplain are areas which are subject to predictably recurring overflows from nearby bodies of water, including streams, rivers, bays, and oceans. A floodplain acts as a natural reservoir for such an overflow by storing water and thus reducing the volume and speed of the flood water's effects downstream. The removal of natural vegetation through land development within a floodplain diminishes the natural flood control capacity of the area. The result can be an increase in non-point source pollution of the water body through severe soil erosion.

Highly erodible soils, if improperly disturbed or exposed, can contribute to water quality degradation through sedimentation and siltation of water bodies. In addition, nutrients and toxicant may be attached to soil particles which can be transported and released to the aquatic environment through erosion.

Highly permeable soils transmit water at such a rate that there is a potential for surface pollutants such as nutrient, sand, other chemicals, and sewage wastes to infiltrate, undegraded, into the nearby surface water and groundwater systems. This possibility of the highly permeable soil becoming a "highway" for pollutants indicates the need for management of development in these areas.

Local designation of other lands to be included in the RMA classification is based on several factors, including the distribution of the other land types listed above, the hydrology of the locality, and the general characteristics of the landform in the locality. The regulations of the CBPA also require the RMA to be contiguous to the RPA.

Tappahannock has chosen to designate the entire town as a Resource Management Area (RMA). The extent and distribution of the land features considered as RMA components are such that few areas of the town are lacking one or more of these features. It is also recognized that all lands within the town are contained within the Chesapeake Bay watershed and activities upon these lands can act to impact the water quality of the Bay. In order to maintain the goal of high water quality within the town, county and region, the policy of the town is to include all lands as RMAs when those lands are not designated as RPAS.

The implementation of the RMA goals will be accomplished by specific provision in the town zoning, subdivision, erosion and sedimentation control, and floodplain ordinances. Implementation will rely on an effort to improve the capacity of staff and general public through supporting educational opportunities related to managing and enforcing the Chesapeake Bay Program.

Development Suitability

The lands and waters within Tappahannock are varied in characteristics and natural function. Features such as topography, hydrology, soil type, vegetation, and geographic location all serve to influence land development. With the advances in construction methods and materials and sewage disposal technology together with the increase in population and property values, land which once may have been considered undevelopable is being engaged for development pursuits.

The Chesapeake Bay Preservation Act has highlighted the concern of land disturbing activities which cause water quality degradation through non-point source pollution. In addition, the use of methods of limiting or preventing non-point source pollution, such as Best Management Practices (BMP's), indicate that there are reasonable means to manage the potential impacts of most development. To further explore the compatibility of development to the land site, an additional step of analyzing the suitability and capacity of the site is needed.

Perhaps the most obvious factor to consider when analyzing a site for development suitability is the characteristics of the soils present. Soils play the important role of determining weight loading capacities, on-site sewage treatment assimilation, erosion potential, and vegetation growth.

An additional factor of importance is the location of "poorly" or “marginally" developable soils in relationship to streams, water bodies, and wetlands. Development on such soils, in close proximity to designated RPAS, can produce negative impacts on water quality. A development suitability analysis can provide the necessary detailed information on both the most and least desirable portion of a parcel for development. With this information in hand, the town and the land developer can arrive at the development design solution which presents the highest compatibility of the use and the environment.

Consideration has been given to the extent of analysis needed to determine the suitability of a site for development. A detailed, site-specific soils survey would provide the information necessary to match the suitability with the uses proposed for the site. The topography and hydrology of the site should be of a detail such that overland sheet flows of stormwater can be predicted. A knowledge of the vegetation and wildlife habitat is important for a site as well as for the surrounding areas. The comprehensive analysis of all these features can lead to development sensitive to the natural resources of Tappahannock.

To preserve the development rights of land owners, options to mitigate impacts and utilize BMPs should be allowed. It is envisioned that the level of detail of the suitability analysis will provide the owner with the information to balance the management options presented by the site.

Tappahannock has determined a comprehensive development suitability analysis to be necessary to the optimum function, design, and environmental preservation of land development sites. The comprehensive development suitability analysis should include a detailed inventory of soils with the capacities for on-site sewage treatment, weight loading, erosion potential, and vegetation growth documented. Discussion of wildlife habitat and other significant environment should be included. Mitigating factors, such as the use of BMPs should be included. This analysis should

be conducted for all proposed development exceeding 10,000 square feet in land disturbance within Chesapeake Bay Preservation Areas.

The requirement to conduct a comprehensive development suitability analysis will be implemented through the town's plan of development procedures, including zoning and subdivision ordinances.

Waterfront Access and Boating Facilities

The Rappahannock River and Hoskins Creek are resources belonging to the citizens of Virginia. The use of these waters for recreation and commerce are traditional and acceptable as the economic base for the area. With the subdivision of large tracts of waterfront property into numerous smaller lots, each under private ownership, comes the competing interests of those owners seeking privacy and the upland residents and tourists seeking use of the waters. The increasing use of our waterways leads to concern of environmental damage due to improper or reckless activities causing pollution or habitat destruction. This concern leads to the need for greater management capability over waterfront access and uses.

The only actual Marina facility in Tappahannock is the June Parker Marina or Tappahannock Marina located at the edge of the town along the Rappahannock shorefront just north of the Bridge. The facility provides slips for some 48 boats. Boat storage facilities are also provided to accommodate up to 96 watercraft. Services provided at this facility include fuel sales, a launching ramp, a hoist and hull repairs. Containers are provided on the site for solid waste and sanitary facilities are provided. Boat holding tank pump-out facilities consist of a portable pump with holding tank. A dump station is also provided for emptying portable marine toilets. Final disposal of sewage from boats and on-shore sanitary facilities is by connection to the town wastewater treatment plant. Review of the shoreline sanitary survey conducted by the Virginia Department of Health in January, 1997 indicated this to be the only boating facility in Essex County and did not reveal any particular impacts of concern.

Other privately owned facilities or publicly owned lands in the town provide only limited boat launching or swimming/fishing beach facilities. These facilities which are largely unimproved include:

- Boat Launching area at the foot of Prince Street in Tappahannock:
- Riverside Condominiums (maximum of 14 slips)
- The Haven Marina located on Hoskins Creek (maximum capacity of 20 slips)
- Southside Motel Marina located on Hoskins Creek (maximum capacity of 8 slips)
- Boat Launching facilities at Hoskins Creek in Tappahannock.

The location of these facilities which provide boating access to the Rappahannock is shown on Map 5-8.

The development of marinas and other boating related facilities can have a number of adverse impacts on water quality and near-shore habitats. Such impacts can include:

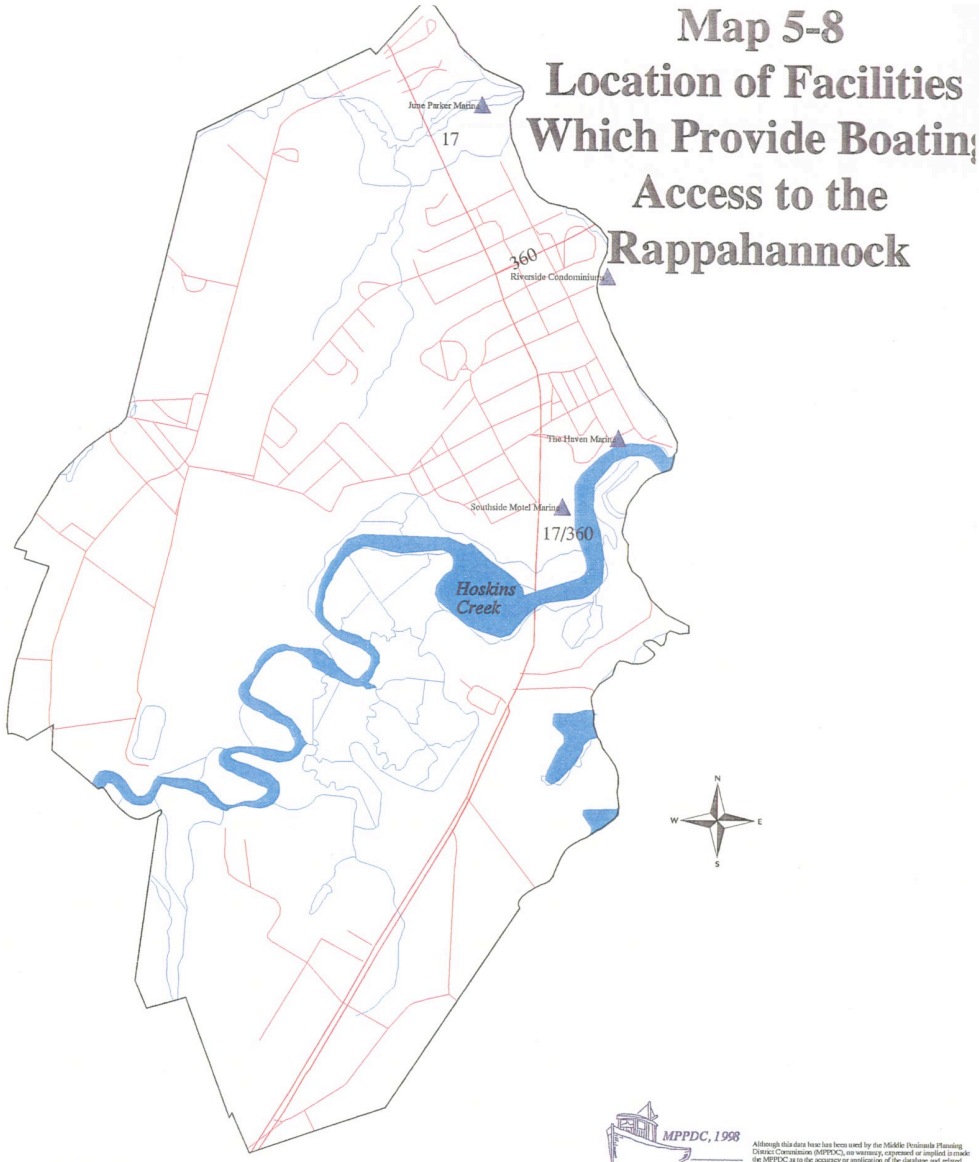
- Clearing of shoreline vegetation to provide access or accommodate parking facilities which can add impervious surface and in turn generates additional runoff carrying pollutants and sediment loads to adjacent waters which can be harmful to marine wildlife habitat;

- On-shore storage of fuel, oil, and sewage waste which may adversely impact water quality if not properly managed;
- Dredging or channel widening, often required to provide access to boating facilities which can release settled pollutants and increased turbidity in the water and adversely impact shellfish;

- Bulkheading to protect the shoreline which may obstruct the free passage of groundwater into the adjacent water body and/or may create reflection waves which tend to scour the bottom and increase turbidity;

Operation of boating facilities can induce activities which can also bring about impacts once facilities are constructed. These include propeller cutting of rooted aquatic plants or submerged aquatic vegetation, boat wakes which may accelerate the cutting action of waves on the shoreline, and disturbance of bottom sediments and increased turbidity due to turbulence caused by propellers.

Map 5-8:
Location of Facilities Which Provide Boating Access to the Rappahannock


Map 5-8
Location of Facilities
Which Provide Boatin
Access to the
Rappahannock
June Parker Marin
17
360
Riverside Condominium
The Haven Marin
Southside Motel Marin
17/360
Hoskins
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MPPDC, 1998
Although this data base has been used by the Middle Peninsula Planning
District Commission (MPPDC), no warranty, expressed or implied is made
the MPPDC as to the accuracy or application of the database and related
materials, nor shall the fact of distribution constitute any such
warranty; and no responsibility is assumed by the MPPDC in connection th
This project was funded, in part, by a grant from
the Chesapeake Bay Local Assistance Department.

95

Required maintenance of boats can involve periodic washing and scraping and repainting of boat bottoms. These activities, if pursued without regard to their introduction into the adjacent water body can also adversely impact water quality. Soaps can initiate algae blooms and thus reduce dissolved oxygen levels in surrounding waters. Anti-fouling paints can also introduce copper and other toxic substances into adjacent waters.

Due to the limited number of boating facilities and generally low level of boating activity in the town and Essex County no significant water quality problems are known to exist as a result of boating activity. Several factors indicate demand for additional boating facilities is low in both the county and town at the present time. The location of the town is upstream from saltwater fishing opportunities and therefore access to these opportunities can be more readily provided from facilities located downstream outside Essex County. The low population in the County of approximately 9500 residents does not significantly drive demand for waterfront boating facilities.

Potential for the location of additional Marina facilities is also limited by the features or characteristics of the town shorefront which is fully developed. Tidal marshes front 84% of the adjacent County shorefront. Along many of these reaches boating facilities would require wetland disturbances to secure access and would likely have adverse impact on wetland habitat. Moreover, shallow water depths in near shore locations would require dredging to provide access for boating causing bottom disturbance to fish and other aquatic habitat.

There are two broad uses involved in the waterfront issue. First, the use of the waterfront for boating access, whether it be at a marina, a boat dock, ramp and pier, or car-top boat landing. Second is the utilization of the shoreline and near-shore areas for recreational activities such as swimming, bank fishing, nature studying, and picnicking. Either public or private facilities can provide these activities. Both boating and shore recreation are allowed exemption as "water dependent facilities" under the requirements of the CBPA, provided that non-water dependent components are located outside of the RPA.

Boating access to the tidal waters of Tappahannock is provided at boat ramps at Dock and Prince Street and at the private marina in town. The management of waterfront access options and opportunities concerns the competing interests of costs of public facilities and private facilities and the protection of the environment. Opportunities for developing a waterfront park are discussed in Chapter 9, Parks and Recreation.

Tappahannock has determined that boating facilities should be located only where: there is sufficient water depth, without frequent dredging; there are not public or private shellfishing grounds which would be impacted; there is adequate tidal flushing; there are suitable soils for sanitary facilities or connection to a municipal sewer system; there is limited harm to fish and wildlife habitat; and there are compatible existing land and water uses nearby.

Existing marinas and boat repair facilities are encouraged to adopt operational procedures consistent with BMPS. When existing marinas remodel or expand their facilities, structural BMPs should also be constructed. For proposed boating facilities, BMPs should be required as a condition of development approval.

The town, with the county, should study the needs for waterfront public access in conjunction with state, federal, regional, and private agencies. The Planning District Commission should be encouraged to assist local efforts in planning water access, open space, and park facilities which will benefit education and habitat vital to water quality. In addition, when regional projects such as a regional airport, park, or solid waste landfill are being planned, there should be an open space/recreation/natural habitat component included in the development.

Existing Pollution Sources

Pollution discharges can be defined as either point or non-point in their origin. Point source inputs represent discharges from discrete and identifiable points, i.e., discharge pipes, and play a major role in determining the quality of surface waters. Such sources include both municipal and industrial dischargers which may contain an array of toxic and nutrient material. Often these discharges tend to vary in chemical and physical composition as well as fluctuate in their concentrations. The resulting impact to surface water could easily set up a menu of scenarios depending on receiving water conditions.

The other major category of physical, chemical, and biological factors impacting surface water quality is known as non-point sources. This category is by far the most significant in terms of its impact to surface water quality in the Middle Peninsula Planning District. Basically, non-point sources encompass all those inputs to surface water which cannot be identified as having originated from a discrete discharge point. Nationwide, non-point source pollutants are responsible for 73% of the oxygen demand, 84% of the nutrients, 98% of the bacteria counts, and 99% of suspended solids in surface waters.

The Virginia Water Control Board (VWCB) regulates existing point source pollution dischargers. Essex has little role in the enforcement of existing permit conditions however, compliance is tied to land use ordinance approvals. The Town Chesapeake Bay Preservation Program, Erosion and Sedimentation Control Ordinance, and participation in the activities of the local Soil and Water Conservation District are means of local management of non-point source pollution. A periodic review of the effectiveness of these local ordinances can determine where changes or amendments may be needed to achieve the goals of reducing non-point source pollution. To that end, the town should review all land use ordinances at least every five years to determine effective management of point and non-point source pollution sources. The town will also seek assistance from the Chesapeake Bay Local Assistance Board (CBLAD), VWCB, Division of Soil and Water Conservation, MTPDC, and other state and federal agencies to produce an inventory of land uses at such a degree of accuracy so as to provide management and modeling parameters necessary for effective control of pollution sources in the future.

Redevelopment of Intensely Developed Areas

The designation of Intensely Developed Areas (IDAs) is intended to address the unique land use patterns and water quality impacts of heavily urbanized areas. Such areas are characterized by industrial, commercial, residential, and institutional uses which are spatially concentrated, heavily trafficked, and largely devoid of natural vegetation. Development within these areas is usually confined to either redevelopment of previously developed sites or construction on small, vacant, or "infill" parcels. The concentration of intensive uses and prevalence of impervious surfaces in these areas may contribute a variety of non-point source pollutants, such as hydrocarbons and heavy metals, to surface waters.

The goal of designating IDAs is to focus development in areas where it is already concentrated and supported by existing infrastructure, while improving water quality. In recognition of the fact that the IDA is largely devoid of natural vegetation, activities within the IDA may be exempt from having to establish or maintain the full buffer areas within RPAs.

The CBPA regulations provide that IDAs may be designated in "areas of existing development and infill sites where little of the natural environment remains..." and "...provided at least one of the following conditions exists:

- Development has severely altered the natural state of the area such that it has more than 50% impervious surface;

- Public sewer and water is constructed and currently serves the area. This condition does not include areas planned for public sewer and water;

Housing density is equal to or greater than four dwelling units per acre."
The designation of IDAs is intended to allow reasonable development where development already exists or surrounds a site, while at the same time providing at least a 10% reduction in stormwater runoff transported pollutants. This reduction can be achieved through a variety of means, including: creation of vegetated buffer areas to the greatest extent possible, reduction of impervious areas, and use of water quality Best Management Practices (BMPs). Best Management Practices, such as low impact development, should be used on sites when and where they are feasible. The identification of areas which qualify for IDA designation in Tappahannock has revealed insignificant land area to justify the delineation as part of the local Chesapeake Bay Preservation Program. Individual hardship cases can be handled through the present exception and variance procedures outlined in the town Zoning Ordinance.

Through not identifying areas for IDA designation at the present time, the town reserves the option to make such designation in the future should the need arise and conditions of an area justify such designation consistent with the intent of the Chesapeake Bay Preservation Act. Should such designations be made in the future, the implementation of the IDA overlay district will be accomplished through the application of the zoning, subdivision, and erosion and sedimentation control ordinances and the development review and approval procedures of the town.

Tappahannock has also reviewed the existing land use pattern of development within designated Chesapeake Bay Resource Protection Areas to identify opportunities for water quality improvement through redevelopment even though no Intensely Developed Areas have been designated within the town. At the present time few clearly identifiable substandard areas or concentrations of development are evident that can be readily identified or targeted for redevelopment to ameliorate water quality conditions. One such location is the Essex Square Shopping Center located on the Route 17 corridor. Potential redevelopment of the shopping center would likely improve stormwater management in that area. Construction or extension of wastewater collection facilities north of Tichner's Creek on Route 17 North to the town corporate limits would eliminate use of septic systems in that area and likely sustain water quality improvements.

With the exception of these two locations, the town anticipates infill development of existing available lots will limit the market for redevelopment of sites. Areas currently developed for industrial use near the mouth of Hoskin's Creek may afford some potential for redevelopment if current uses become obsolete. This area will be monitored to assess opportunities for redevelopment should such conditions present themselves.

Regardless, the town will continue to seek opportunities to improve water quality through redevelopment, particularly as proposals for development within or adjacent to existing developed areas are submitted for review through the town development review and approval process. Where possible the town will encourage sites to be redeveloped to utilize low maintenance and native plant species to establish a buffer and reduce the area of paved surfaces on the site to minimize the extent of impervious land cover. Sites proposed for redevelopment will also be encouraged or required to utilize BMPs in the design of stormwater management facilities and encouraged to utilize stormwater runoff for irrigation of open spaces to minimize the volume of stormwater leaving the site. Proposals for redevelopment or new development in locations near the Town of Tappahannock will be encouraged to seek annexation by the town to minimize use of on site septic systems and utilize wastewater treatment facilities to afford greater protection to both groundwater and surface waters.

Local Program Development

The performance criteria for land use and development established in the Town Chesapeake Bay Preservation areas overlay zone district currently being reviewed by the State prior to town adoption are hereby included as part of Tappahannock's Comprehensive Plan. In addition to designation of Town Chesapeake Bay Preservation Areas, the town will incorporate these criteria into its subdivision regulations, and erosion and sediment control ordinance. The town will also establish a development review and approval process for building permit issuance for development within designated Chesapeake Bay Preservation Areas. The town will also establish administrative and enforcement procedures as part of its overall Local Program for Chesapeake Bay Preservation.

GOALS AND OBJECTIVES

Goal: Provide protection for the environment.

Objectives:

- Maintain and protect the extensive wetlands and steep slopes in and around Tappahannock for open space.

Goal: Ensure that shoreline structures are maintained and that erosion is minimized.

Objectives:

- Update shoreline situation report and correct any failing shoreline stabilization structures.
- Protect the non-hardened shoreline through available laws and regulations.
- If shoreline stabilization is necessary, the use of rip rap should be used.

Goal: Manage the negative impact on water quality from all point sources of pollution.

Objectives:

- Enforce existing point source pollution laws and regulations.
- Expansion of the town's sewage treatment plant should be anticipated relative to future demand.
- Identify opportunities for developers to construct stormwater management facilities to eliminate the impact of some existing as well as proposed discharge of untreated effluent into the Rappahannock River.

Goal: Reduce or eliminate the negative impact of nonpoint source pollution on water quality.

Objectives: Minimize impervious groundcover for all development projects.

- Require implementation of urban "Best Management Practices" throughout the town, as found in the Erosion and Sediment Control Handbook of the State Division of Soil and Water Conservation.
- Enforce existing laws and regulations to reduce nonpoint sources of water pollution.
- Promote the use of Water Conservation Measures among town residents and businesses.

- Seek State assistance to identify and eliminate leaking underground storage tanks and other potential sources of groundwater pollution.

Goal: To protect the water quality, flood prevention, and habitat values of the town's tributary streams.

Objectives:

- Identify projects which could negatively impact tributary streams and enforce available laws and regulations to minimize this impact.

- Avoid channelization of any tributary stream within the town's jurisdiction.

- Continue to protect Tappahannock's floodplain from development and removal of vegetative cover.

Goal: Limit land development and land disturbing activities on highly erodible, highly permeable, and hydric soils by enforcing available laws and regulations.

Objectives:

- In order to avoid the negative impact of individual septic systems on water quality, require any new development within the town to be connected with the sewage treatment plant.

- Provide strict enforcement of the Erosion and Sediment Control Law for all land disturbing activities.

Goal: Ensure there is no net loss of Tappahannock's remaining wetlands due to their ecological importance.

Objectives:

- Identify all projects potentially impacting wetlands and their functions and eliminate the possibility of or minimize by mitigation their destruction and damage through available law and regulations.

Goal: The town's natural resources should be recognized as assets and therefore receive adequate protection.

Objectives:

- Water sources, marshes and swamps should be recognized as assets and protected from pollution and where necessary restored to acceptable levels of quality by carefully regulating future shoreline activities.

- Marshes and swamps which contribute to storage, erosion control or life support of wildlife should not be drained, filled, or constructed upon.

- Destruction of trees during construction and development should be kept to a minimum and the planting of new trees and vegetation should be fostered.

Goal: To minimize shoreline erosion activity.

Objectives:

When financial resources are identified, the Town will conduct a "Reach Assessment" study to determine where erosion process and response mutually interact. The reach assessment will achieve the following:

- Determine the reach limits.
- Determine historic rate and pattern of erosion and accretion for the reach.
- Determine within the reach which sites supply sand.
- Determine wave climate and the direction of net littoral sand drift.
- Identify factors causing erosion and other than waves.
- Estimate potential and active sources of nutrient loading (nutrients do not impact erosion, but do impact water quality).

Goal: To protect wetlands and other natural resources from erosion due to increased drainage, filling, or construction.

Objectives:

- The Town will encourage the use of non-structural shore line protection such as wetland plantings and sills to provide long term protection, promote unified treatment of shoreline to assure that solutions to erosion conditions on one site do not create greater rates of erosion on adjacent sites, use Best Management Practices that minimize land disturbance, and will recommend minimizing of site clear-cutting during development.

Goal: To develop educational programs to promote conservation of the Town's natural resources and community assets.

Objectives:

- The Town will undertake community level education programs to promote better understanding of high water table issues and will develop educational programs about proper fertilizer application, safe disposal of hazardous household and toxic industrial waste, and the necessity of inventorying and monitoring underground storage tanks.

Goal: To protect groundwater and surface water from pollution, sedimentation, and depletion.

Objectives:

- The Town will consider repair or replacement of older sections of municipal water system and promote waste water connection of remaining houses to municipal water system. The Town will work with the Department of Environmental Quality to identify leaking underground/petroleum storage tanks and mitigate any associated water quality problems. The Town will conduct a town wide survey asking residents to locate abandoned wells and develop a program to provide citizens with assistance for well closure. The Town will develop an amnesty day for the disposal of unwanted chemicals, home hazardous waste, fertilizers, etc.

Goal: To conserve natural resources and forested lands by guiding residential, commercial, and industrial development to areas suitable for growth.

Objectives:

- The Town will update the Town's Subdivision and Zoning Ordinances to allow open space/cluster development.

Goal: To work with local, regional, state, and federal agencies to implement policies to protect Tappahannock's natural resources.

Objectives:

- The Town will work with local businesses or residents to assess development impacts and if necessary create appropriate mitigation strategies on a case by case basis. The Town will investigate stormwater management strategies associated with development of a waterfront park to use as a demonstration project for innovative storm water management techniques.

Goal: To revise local ordinances as needed to protect the Town's natural resources.

Objectives:

- The Town will explore the development of a Wellhead protection ordinance. The Town will develop policies that address future high volume water users.

IMPLEMENTATION RECOMMENDATIONS

The following is a list of specific measures the town should undertake to achieve its environmental quality goals and objectives set forth in this Chapter.

- The town should adopt a Local Program for Chesapeake Bay Preservation which contains the program elements and performance criteria for land use and development as outline in this chapter.

- The town should limit future development in this Plan's Resource Protection District to low intensity residential uses, passive park and recreation uses, and water dependent uses.

- The town should continue to require evidence of all federal, state and local environmental and health permits as a condition of development approval.

- The town should prohibit development within floodways and floodplain which limits natural water storage capacity. Use of floodway fringe areas for recreational, other non-structural uses and open space should be encouraged.

- Performance standards and controls are recommended to permit development design flexibility and to adapt to variable site characteristics. New environmentally sensitive development regulations are needed which recognize and protect natural site functions. Environmentally sensitive features such as wetlands and critical plan and wildlife habitats should be explicitly protected and buffered from development activities.

- Open space requirement should be put into effect. The extent to which a site can be covered by impervious surfaces should be limited. Requirement should specify minimum areas that must remain undisturbed and available for stormwater infiltration and site vegetation.

- No net change in runoff should be allowed at development sites. Drainage techniques normally channel stormwater runoff away from the structure and off the site. The volume and velocity of stormwater runoff leaving a developed site should be no greater than predevelopment levels, primarily for adjacent property protection and non-source point pollution control.

- Natural vegetation and trees should be preserved during development. Site clear-cutting for development purposes should be expressly prohibited. Mature trees should be protected. If tree removal is unavoidable, replacement should be established. Where vegetation is removed, temporary grass seeding should be required for erosion control if the site remains untreated for more than two months.

- There should be zoning incentives to promote cluster development. Cluster development makes wise use of land resources and is environmentally sensitive. The town development ordinances should be updated to provide greater incentives for clustering. Slope regulations should be enacted. A steeply sloped site cannot support the same development density as a flat site without severe disturbance. Permitted density should be used only on portion of a site not characterized by steep slopes. Grading activities should be limited in proportion to slope vulnerability.

- The town should coordinate with state and federal agencies and non-profit conservancy organizations to protect environmentally sensitive lands through acquisition and/or protective easement programs.

This chapter discusses the characteristics of environmentally sensitive town lands and waters. It describes some of the important reasons for protecting the various natural features which comprise and contribute to the quality of the town's environment. Recommended actions are stated which should achieve town goals and objectives. Particular focus is accorded to Comprehensive Plan requirements of the recently enacted Chesapeake Bay Preservation Act and Regulations.

The environmental attributes of Tappahannock strongly influence quality of life. The condition of the environment must be evaluated in terms of the potential impact upon the daily activities and the standard of living of the community. Environmental resources should be protected on behalf of the economic well-being of the general public with regard to both individual property interests and collective taxpayer investments. The quality of Tappahannock's environment is one of the factors which makes the town such a desirable place to live and work. The intent of town environmental protection measures is not to stop development, but rather to ensure the compatibility of development with the continued productivity and value of environmentally sensitive land and water areas.