Issue Analysis Form

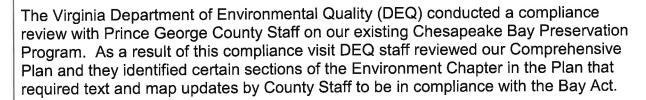
Date: March 27, 2018

Item: Comprehensive Plan - Environment Chapter

Lead Department: Community Development Contact Persons: Douglas Miles, Planning

Manager and Horace Wade III, Planner

Description and Current Status



NOTE: Red Text is proposed language and Green Text is relocated in the Chapter.

Government Path		
Does this require IDA action?	☐ Yes	⊠ No
Does this require BZA action?	☐ Yes	⊠ No
Does this require Planning Commission action?	is require IDA action?	
Planning Commission Recommended Approval 7-0 after the February 22, 2018 Public Hearing	⊠ Yes	□ No
Does this require Board of Supervisors action?		
Yes a Board Public Hearing on March 27, 2018	⊠ Yes	□ No

Fiscal Impact Statement

N/A There will be no fiscal impact to Prince George County other than the required public hearing notices within the Petersburg Progress-Index newspaper for notice.

Prince George County Summary

The Environment Chapter text was updated relative to Soil types and Septic suitability along with new maps; the Floodplain section was updated with 2012 and 2015 mapping information; Point and Non-point pollution sources were updated and new numbers on mineral resources were added. Most importantly the Chesapeake Bay Preservation Act (CBPA) section was updated with required text, shorelines data and new maps to be found in compliance by DEQ with the CBPA state requirements. Staff recommends amending the current Plan to achieve compliance with the state Bay Act requirements.



Board of Supervisors County of Prince George, Virginia

Ordinance

At a regular meeting of the Board of Supervisors of the County of Prince George held in the Boardroom, Third Floor, County Administration Building, 6602 Courts Drive, Prince George, Virginia this 27th day of March, 2018:

Present: Vote:

Alan R. Carmichael, Chairman Donald R. Hunter, Vice-Chairman Floyd M. Brown, Jr. Marlene J. Waymack T.J. Webb

NOTICE OF AMENDMENT AND ADOPTION OF THE COMPREHENSIVE PLAN:

THE PRINCE GEORGE COUNTY BOARD OF SUPERVISORS WILL CONDUCT A PUBLIC HEARING ON THE AMENDMENT RELATING TO ENVIRONMENT CHAPTER AND ADOPTION OF THE COMPREHENSIVE PLAN FOR PRINCE GEORGE COUNTY, VIRGINIA 23875, PURSUANT TO CHAPTER 22, SECTIONS 15.2, § 15.2-2204, 15.2-2225, OF THE CODE OF VIRGINIA (1950) AS AMENDED.

BE IT ORDAINED by the Board of Supervisors of Prince George County:

- (1) That the 2014 Comprehensive Plan be updated by incorporating the Department of Environmental Quality (DEQ) requirements into Chapter VI Environment for implementation purposes.
- (2) This ordinance shall be effective immediately upon adoption.

Adopted on March 27, 2018 pursuant to Sections § 15.2-2204 and 15.2-2225, of the Code of Virginia (1950), as amended and becoming effective immediately.

Table of Contents

CHAPTER I INTRODUCTION	<u>8</u> 9
Authority	<u>9</u> 10
Planning Horizon	<u>10</u> 11
Location	
Community Planning History	1011
CHAPTER II THE PLANNING AND COMMUNITY DEVELOPMENT PROCESS	<u>1415</u>
Community and Demographic Analysis	<u>1415</u>
CHAPTER III HISTORIC RESOURCES AND COMMUNITY HISTORY	
Historic Resources	<u>16</u> 17
Community History	<u>1718</u>
Revolutionary War Period	
Civil War Period	
Camp Lee and Fort Lee Periods	2021
Industrial Growth Period	
CHAPTER IV COMMUNITY DEMOGRAPHICS	<u>2425</u>
Introduction	2425
Population	<u>2425</u>
Age Distribution	<u>2425</u>
Median Age	
Racial Composition	
Future Population Growth	
Housing	
Manufactured Housing	
Occupancy and Vacancy	
Quality of Housing	
Median Housing Value	
Fort Lee Housing	
Labor Force	
Commuting Patterns Income	
Income	
CHAPTER V COMMUNITY FACILITIES AND SERVICES	
Introduction	
Schools	

	Library Facilities	<u>4445</u>
	Public Safety Facilities	<u>4647</u>
	Animal Services and Adoption Center	<u>47</u> 48
	Crime Prevention and Protection	<u>4748</u>
	Fire Prevention and Emergency Rescue Squad	<u>50</u> 51
	Water and Wastewater Facilities	<u>50</u> 51
	Water	<u>52</u> 53
	Wastewater	<u>52</u> 53
	Petersburg	<u>52</u> 53
	Hopewell	<u>5455</u>
	Private Facilities	<u>5455</u>
	Food Lion Distribution Center Industrial Water Supply	
	Route 301 Water System	<u>55</u> 56
	Johnson Road Water System	
	Eastwood Corporate Park	<u>5758</u>
	Water and Wastewater - Population Projections	<u>5758</u>
	Wastewater Service Areas	
	Puddledock Road Service Area	
	Route 460 Wastewater Service Area	<u>5960</u>
	Route 301 Wastewater Service Area	<u>60</u> 61
	Johnson Road Service Area	
	Solid Waste Management	
	Electrical Power	
	Natural Gas	
	Parks and Recreation.	<u>6263</u>
C	HAPTER VI ENVIRONMENT	
	Geology and Soils	
	Slope	
	Water ResourcesSteep Slopes	
	Surface Waters	
	Ground Water	
	Inter-relationship between Surface Water and Groundwater	
	Threats to Water Quality	
	Mineral Resources	<u>8776</u>

Forest Resources	<u>88</u> 77
Water Resources Critical Environmental Areas	<u>89</u> 78
Chesapeake Bay Preservation Act and Regulations	<u>90</u> 79
Floodplains	<u>93</u> 80
Wetlands	<u>9882</u>
Shorelines Public/Private Water Access	<u>99</u> 83
Shoreline	NO reven
Erosion.	
Air Quality	
CHAPTER VII AFFORDABLE HOUSING	
Introduction	
Regional Housing Market	
Affordable Housing	<u>110</u> 86
CHAPTER VIII TRANSPORTATION	<u>112</u> 87
Introduction	<u>112</u> 87
The Transportation Planning Process	<u>112</u> 87
Existing Transportation Facilities	<u>113</u> 88
Railroads	<u>116</u> 91
Mass Transit	<u>116</u> 91
Airport Service	<u>116</u> 91
Waterways	<u>116</u> 91
Bikeways and Pedestrian Opportunities	<u>117</u> 92
Assessment of Highway Facilities	<u>11792</u>
Transportation Policy Issues	<u>11893</u>
County-Wide Access Management Program	<u>11893</u>
Access Management and Its Benefits	<u>12095</u>
Recommendations	
Identify and Protect Critical Transportation Corridors	<u>122</u> 97
Recommendations	<u>122</u> 97
Promote a Balanced Transportation System	<u>12499</u>
Recommendations	
Link Transportation and Land Use Decisions	
Recommendations	
Promote and Implement Traffic Calming Measures for New Subdivisions	
Chapter IX FUTURE LAND USE	

	Introduction	<u>128103</u>
	Existing Land Use	
	Constraints to Future Development	<u>129104</u>
	Land Use Policy Issues	
	Agricultural Land and Open Space Preservation	
	Rural Preservation Tools	
	Agricultural and Forestal Districts	<u>131</u> 106
	Riparian Easements	
	Designation of County Planning Areas	
	County Utility Policies	
	Road Corridor Development	
	Future Land Use	
	Recommendations:	
C	CHAPTER X GOALS, OBJECTIVES AND STRATEGIES	<u> 142117</u>
	Community Facilities and Services	
	Housing	
	Economic Development	
	Transportation	
	Environment	
	Land Use	
Α	APPENDIX A CAPITAL IMPROVEMENT PLAN	
	APPENDIX B WATER & WASTEWATER STUDY	

CHAPTER VI ENVIRONMENT

This chapter presents information about the critical components and aspects of the County's natural environment including critical environmental areas, surface and groundwater resources, floodplains, wetlands, shorelines, air quality, slopes and Chesapeake Bay Preservation Act and Regulations.

Climate

The climate of Prince George County is modified continental, having mild winters and warm humid summers, with normally adequate rainfall for farming. According to the National Climatic Data Center, (NCDC) the mean, daily high temperature is approximately 69°F and the mean, daily low temperature is approximately 46°F. The County receives an annual average rainfall of approximately 44 inches. Most of this precipitation occurs in the form of rain that occurs throughout the year. Snow in normal winters seldom remains on the ground for any great length of time. The growing season averages approximately 190-200 days-.

Geology and Soils

Geology is a factor which is useful when determining appropriate types of development. By using the information available from geological surveys, and more refined site specific evaluations, it is possible to determine the strata of soils, elevations of groundwater, and location of rock. This information is important to identify because certain conditions can influence building or site design or make development costly or make it inappropriate.

The suitability and limitations of the soils in an area have a great impact on development. Soil factors such as depth, absorption, percolation, shrink-swell conditions, wetness and filtering action all have an effect on development.

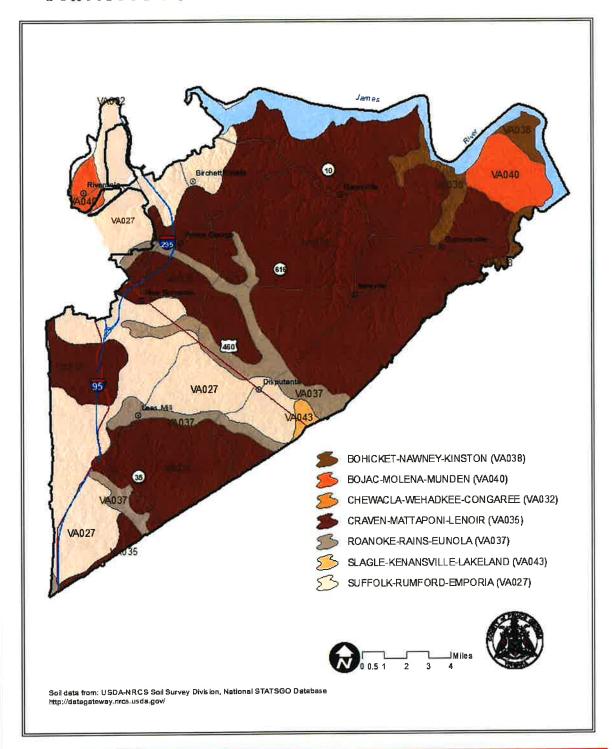
The County's altitude ranges from about sea level to 175 feet above sea level. Seven soil associations are found in the County, but approximately 80 83 percent of the County's land area is made up of four two of these associations. These are the Craven-Mattoponi-Lenoir (64 percent of the land area of the county) and Suffolk-Rumford-Emporia (19 percent of the land area of the county) soil associations. Ackwater Montross Ayeock (23 percent of the land area of the county), Slagle Emporia Bonneau (35 percent of the land area of the county), Peawick-

Emporia Wickham (17 percent of the land area of the county) and Pamunkey Argent Bolling (about 5 percent of the land area of the county) soil associations.

The Craven-Mattaponi-Lenoir and Suffolk-Rumford-Emporia soil associations each have moderately to well-drained soils and are not prone to flooding. The two (2) other soil associations with moderate to well-drained soils are Slagle-Kenansville-Lakeland (less than 0.5 percent of the percent of land area of the county) and Bojac-Molena-Munden (4.5 percent of the land area of the county). The remaining three soil associations frequently flood and have poor drainage. The Roanoke-Rains-Enola (8.5 percent of the land area of the county) soil association encompasses much of the Second Swamp, Blackwater Swamp, North Fork Blackwater Swamp, Warwick Creek, and Jones Hole Swamp, which drain to the Chowan River Basin. Bohicket-Nawney-Kinston (3.3 percent of the land area of the county) soil association encompasses much of Flowerdew Hundred Creek, Wards Creek, and Upper Chippokes Cree, which flow to the James River. The soil association of Chewacla-Wehadkee-Congaree (less than .05 percent of the land area of the county) is located adjacent to the Appomattox River in the northwest portion of the county. Ackwater Montross Aycock soil association is located predominantly in the center of the county extending from the eastern boundary to the City of Petersburg and northward from Second Swamp down to the James River. Slagle Emporia-Bonneau association is located predominantly in the southern and northwestern portions of the County, extending from Second Swamp southwest to the Sussex and Dinwiddie County lines and northward from the City of Petersburg to the Appomattex and James Rivers. Peawick-Emperia Wickham soil association is located predominantly in the northeast portion of the county Garysville east to the Upper Chippokes Creek. The Pamunkey-Argent-Bolling association is located predominantly in the northeastern portion of the County.

Each of the soil associations within Prince George County has some limitations with respect to development. These soils possess seasonal high water tables or severe limitations for the use of septic systems due to either wet soils, slow percolation characteristics, or both. Generally, the County soils are well suited for agricultural uses including cultivated crop lands, pasture lands and woodlands.

Soil Associations



Septic System Suitability

85 percent of the land in the county has been evaluated as soils that are unsuitable for traditional on-site septic systems for treatment of solid waste. Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and the observed performance of the soils. Permeability, a high water table, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock interfere with installation of septic systems.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Groundwater can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively.

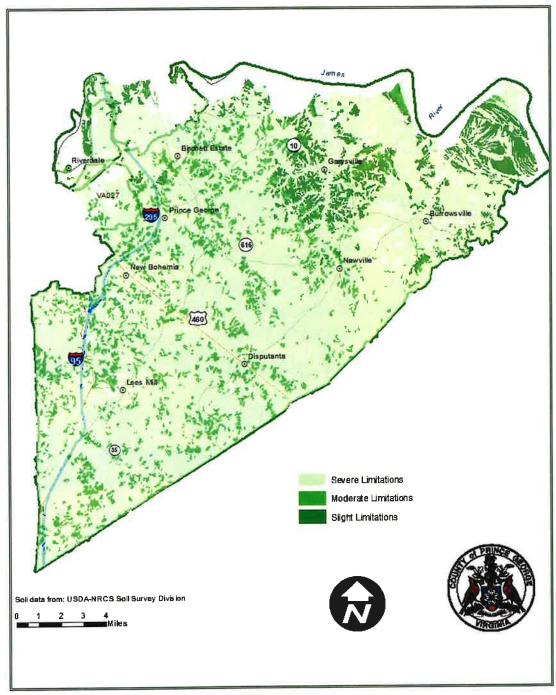
There are three categories of soil types given by the Prince George County Soil Survey that show the limitations they create for traditional on-site septic systems. They are 1) Slight – soil properties and site features that are generally favorable for the indicated use and limitations are minor and easily overcome; 2) moderate – soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and 3) severe – soil properties or site features are so unfavorable or so difficult to overcome that special designs, significant increases in construction costs, and possibly increased maintenance is required.

Conflicts are non-existent between the Plan and the soils categories in the Rural Conservation Area. Some conflicts exist within the Prince George Planning Area. The County's wastewater utility ordinance requiring mandatory connection in the Prince George Planning Area has alleviated much of the conflict. The implementation of an increased separation distance between the seasonal high water table and a septic field by the state Health Department has reduced another area of conflict on nonsubdivision activities. Additionally, through the use of the Water Utility Ordinance, Zoning Ordinance, Soil Erosion and Sedimentation Ordinance, and Subdivision Ordinance, the County has addressed the conflicts on non-subdivision activities in

the Prince George Planning Area. In areas where wetlands, whether tidal or nontidal exist, an identification of wetland boundaries is required with a permit from the U.S. Army Corps of Engineers before any land disturbance is permitted. The County will continue to enforce the Chesapeake Bay Preservation Areas regulations.

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Septic System Suitability



Slope

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Prince George County is nearly level, containing large areas which possess minimal slopes ranging from 0 to 15 percent. Slope refers to the angle between the earth's surface and a horizontal plane. It is expressed in percentage as measured by the number of feet change in elevation per 100 horizontal feet. Slopes in excess of 10 percent often contribute substantial expense to development costs either through elaborately designed structures or massive cut and fill activities.

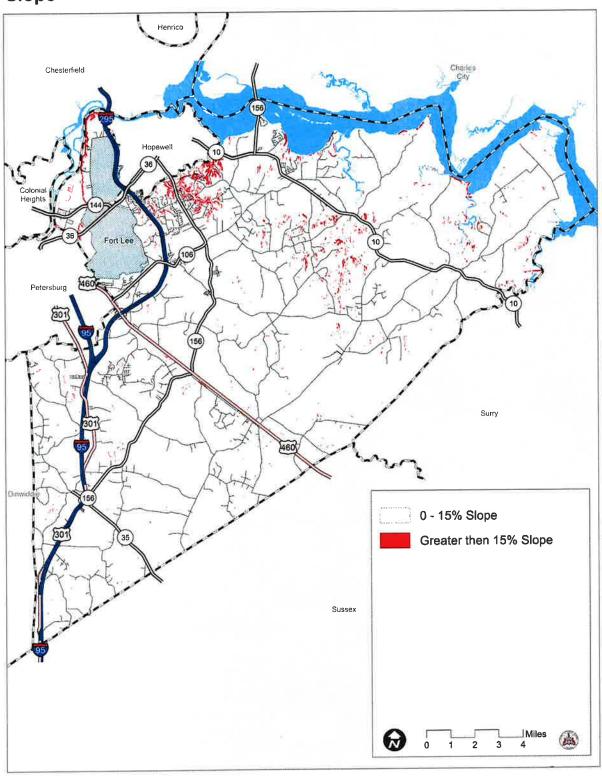
Moderate slopes of 15-25 percent to steep slopes greater than 25 percent are rare, but exist along some drainage ways and shorelines. These moderate and steep sloped areas are predominantly located in the northern portion of the County in the Prince George Planning Area and the Rural Conservation Area adjacent to the streams and tributaries which flow into the James River.

Slopes are a critical determinant of land development because they influence the direction and rate of water runoff, lend variety to the landscape, influence species of vegetation and wildlife, affect the formation of soils and affect the type and expense of land development. Disturbance of moderate sloped areas could cause the entire slope to slide, resulting in environmental damage, endangering not only any on-site construction activities, but also neighboring and downstream properties. Grading, disturbing or development of steep slopes of greater than 25 percent should be avoided.

Steep Slopes

Slope refers to the angle between the earth's surface and a horizontal plane. It is expressed in percentage as measured by the number of feet change in elevation per 100 horizontal feet. Slopes in excess of 10 percent often contribute substantial expense to development costs either through elaborately designed structures or massive out and fill activities.

Slope



While Prince George County is predominantly level, there are areas in which slopes vary from moderate to excessive. These areas present some constraints to normal development due to the high cost of site preparation prior to construction and potential drainage problems. The highly erodable soil in the County is found in these areas. A major portion of the moderate to excessive slopes is along drainage ways, some of which lie within flood hazard areas. Areas in excessive slopes, while not occurring over a large portion of the County, should be monitored for their appropriateness as desirable build sites and for the physical impact on the environment. In areas where such development would be undesirable, it should be restricted.

Water Resources

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There are four major watersheds in the County; The James River, the Appomattox River, the Blackwater River, and the Nottoway River watersheds. These water resources provide recreational opportunities and are a critical component of the County's infrastructure and quality of life. As such, the protection and enhancement of these water resources should be a primary County objective.

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Voluntary riparian easements and buffer programs implemented along the County's streams and rivers can mitigate the impacts of agricultural and non-agricultural non-point source runoff.

Similar benefits could be achieved from a regulatory approach that requires more stringent erosion control measures, and site and land use standards designed to protect and enhance these water resources. Prince George County adopted an Erosion and Sediment Control Ordinance in 2002 and has actively promoted certain erosion control measures to protect and enhance these water resources.

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Surface Waters

There are four major watersheds in the County; the James River watershed, the Appomattex River watershed, the Blackwater River watershed, and the Nottoway River watershed.

The James River watershed is located in the northern part of the County. The Appointed River watershed, a tributary of the James River, is relatively small and is located in the northwestern corner of the County lying between the cities of Petersburg and Hopewell in the area referred to as Puddledock. The James and Appointed Rivers, which converge at the northeastern boundary of the City of Hopewell and Prince George County, form the northern boundary of the

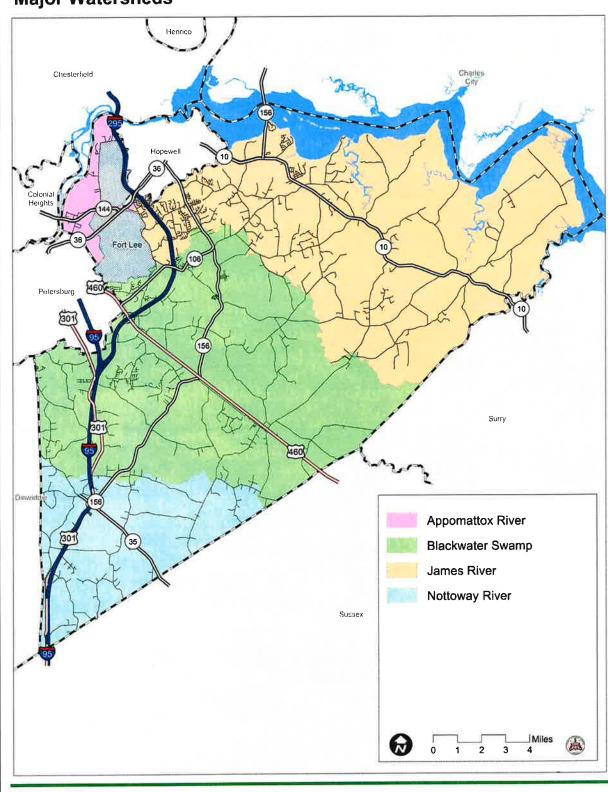
Chowan River Basins. In the northern part of the County, constituting about 48 percent of the total County land area, water drains into the Appomattox and the James Rivers and eventually reaches the Chesapeake Bay. These two rivers have an approximate combined flow of greater than 5,000 cubic feet per second at their confluence. This watershed falls under the protection of the Chesapeake Bay Preservation Act.

The remainder of the County is in the Nottoway River and Blackwater River watersheds. Their tributaries include Rowanty Creek, Jones Hole Swamp, Warwick Swamp, and Cypress Swamp. The Nottoway and Blackwater flow into the Chowan, and its final receiving estuary is the Albemarle-Pamlico Sound in North Carolina.

-The total drainage area of the James River Basin is 10,102 square miles. Surface water flowing from the northern part of the County enters the James and Appomattox Rivers through the major streams and creeks of Harrison Creek, Bailey's Creek, Walls Run, Wards Creek, Powell Creek and Upper Chippokes Creek. The James River flows into the southern end of the Chesapeake Bay.

The central portion of the County drains to the southeast into the Blackwater River watershed through the major drainage ways of the Blackwater Swamp, Second Swamp and Warwick Swamp. The southern portion of Prince George County also drains to the southeast into the Nottoway River watershed through the major streams and creeks of Joseph Swamp, Jones Hole Swamp and Indian Swamp. The Blackwater and Nottoway Rivers are tributaries of the Chowan River which flows into the Albemarle Sound in North Carolina.

Major Watersheds



Ground Water

Ground water is generally available in large quantities throughout the County and is the County's primary source of water supplied through either a public water system or private individual wells. The abundance of groundwater has been a factor that has influenced the pattern of residential development in the County. Because it is plentiful at relatively shallow depths, residential development locations and densities have not generally been restricted by water supply. Rather, rural zoning density standards, and the County's mandatory utility connection policies in the current Prince George Planning Area have had a much greater influence on shaping residential development character and patterns.

The development intensity and water demands of any future groundwater-dependent development proposal should be evaluated partially on the basis of the availability of groundwater. The Virginia Department of Environmental Quality has designated all land areas within the County, east of I-95, a Groundwater Management Area, limiting the possibility of future major withdrawals. The Eastern Virginia Groundwater Management Area was created to conserve the use and protect the quality of the groundwater for all areas east of Interstate 95. As a strategy to further manage and implement the County's growth strategies, the Board of Supervisors amended the County Code in the summer of 2006 to prohibit independent community (public) water systems in the County.

There are potential threats to groundwater. Groundwater contamination can come from a number of sources, suchas underground storage tanks, improper septic systems, uncontrolled hazardous waste, chemicals and road salts, and atmospheric contaminants. If groundwater is pumped out at a rate faster than it is replenished, it can cause groundwater depletion which can cause the lowering of the water table, increase cost to attain water, reduce surface water supplies, lead to the loss of support below ground (land subsidence), and poor water quality.

Inter-relationship between Surface Water and Groundwater

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Management of water resources has focused primarily on surface water or groundwater as if they were separate entities. As development of land and water resources increases, it is apparent that development of either of these resources affects the quantity and quality of the other. Nearly all surface water features (streams, lakes, reservoirs, wetlands, and estuaries) interact with ground water. These interactions take many forms. In many situations, surface

water bodies gain water and solutes from ground water systems and in others the surface water body is a source of ground water or conversely, pumpage of ground water can deplete water in streams, lakes, or wetlands. Pollution of surface water can cause degradation of ground water quality and conversely pollution of groundwater can degrade surface water. Land and water management thus requires a clear understanding of the linkages between ground water and surface water as it applies to any hydrologic setting.

Threats to Water Quality

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Major Watersheds Chesterfield Surry Appomattox River Blackwater Swamp James River Nottoway River Sussex Miles 4

Point Source Pollution

Water quality in the Appomattox River and James River is generally good as they each flow through Prince George County. However, based upon Federal Clean Water Act standards, portions of these rivers and various streams and swamps in the County that were monitored contain some impairments. In 20169, the Virginia Department of Environmental Quality (DEQ) identified impairments found in Prince George County. These impairments ranged from Escherichia Coli, Polychlorinated Biphenyl (PCB), and Mercury in Fish Tissue found in the James River Basin and the Chowan River Basin.

An inventory of existing pollution sources that may potentially harm groundwater and surface waters can help to identify areas in the County that may need to be monitored. Pollution sources can be classified as either point sources or nonpoint sources. Those sources coming from a well-defined location or source are known as point sources. The Virginia Department of Environmental Quality regulates point sources through the Virginia Pollution Discharge Elimination System (VPDES) permit program. As of November 2017, DEQ indicated that Prince George has eight (8) industrial stormwater permits, two (2) non-metallic mineral permits, three (3) concrete products permits, and five (5) domestic sewage (less than 1,000 gallons per day) permits.

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				Coln First	IMPL tenedol
8100	Wreter Maron	PCB in Water Column	Fish Consumption	2012	2024
nes River Basin	Bailey Creek and Cattail Creek	res in water estatus			
	2	Escherichia Coli	Recreation	1994	<u>2010</u>
		Hq	Aquatic Life	2004	2016
	James River	Нq	Aquatic Life	<u>2014</u>	<u>2026</u>
		PCB in Fish Tissue	Fish Consumption	2002	2014
		Escherichia Coli	Recreation	<u>2006</u>	2014
		Estaurine Bioassesments	Aquatic Life	2012	2024
	Appomattox River		Aquatic Life	<u>2010</u>	<u>2022</u>
		Sediment Biossays for Estuarine and Marine Water			
		Escherichia Coli	Recreation	2016	2028
	-	Aquatic Plants (Macrophytes)	Aquatic Life, Shallow- Water Submerged	<u>2006</u>	<u>2010</u>
			Aquatic Vegetation		
	Bailey Creek	Aldrin	Fish Consumption	2002	2014
	and the second second	Escherichia Coli	Recreation	2008	<u>2010</u>
		Benthic-Macroinvertebrate Bio assessments	<u>Aquatic Life</u>	2014	2026
	100	PCB in Fish Tissue	Fish Consumption	2002	2014
	Cattail Run	Escherichia Coli	Recreation	2012	2024
	Poythress Run	PCB in Water Column	Aquatic Life	2012	2024
		PCB in Water Column	Wildlife	2012	2024
		PCB in Water Column	Fish Consumption	2012	2024
	Walls Run	Escherichia Coli	Recreation	2006	2018
	Southerly Run	Escherichia Coli	Recreation	2008	2020
	Upper Chippokes Creek	Escherichia Coli	Recreation	2008	2020
	Flowerdew Hundred Creek	Escherichia Coli	Recreation	2016	2028
		Escherichia Coli	Recreation	2008	2020
	Powell Creek	AND A CONTRACT OF THE PARTY OF	70	2010	2022
nowan River and	Joseph Swamp Jones Hole Swamp/Moores	Escherichia Coli Escherichia Coli	Recreation Recreation	2010	2022
asin	Swamp				
	Gosee Swamp	Escherichia Coli	Recreation	2014	2026
	Rowanty Creek	Escherichia Coli	Recreation	2012	2024
	Blackwater River	Mercury in Fish Tissue	Fish Consumption	<u>2006</u>	2008
	Nottoway River	Mercury in Fish Tissue	Fish Consumption	2010	2020
	Blackwater Swamp	Escherichia Coli	Recreation	2006	2014
	Warwick Swamp	Escherichia Coli	Recreation	2008	2014
of.	Second Swamp	Escherichia Coli	Recreation	2010	2016
	North Fork Blackwater Swamp	Escherichia Coli	Recreation	<u>2010</u>	2022
	Otterdam Swamp	Escherichia Coli	Recreation	2016	2028

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Nonpoint Source Pollution

In contrast with point source pollution, it is difficult to pinpoint the exact source of nonpoint source pollution. Nonpoint source pollution occurs throughout an entire watershed. Nonpoint source pollution can result from several human activities including construction, runoff from impervious surfaces associated with development, agriculture, and forestry. Nonpoint pollutants can consist of fertilizers, pesticides, oil, sediment, and metals. DEQ is responsible for assessing nonpoint source pollution statewide by hydrologic unit and associated subwatersheds.

Farming remains a dominant land use and important component of the local economy of Prince George County. The County will continue to work with the James River Soil and Water Conservation District in reviewing and encouraging the use of soil conservation and water quality plans and nutrient management plans among farm land owners in the County, especially where such activity occurs in the RMA and RPA. Through the site plan review process, the County will continue to work with the land owners to minimize land disturbance and encourage the preservation of vegetation in every development in the Bay Watershed area in the County.

Bailey's Creek, Cattail Creek, Powell Creek, Harrison Creek, Nebletts Mill Run, Rowanty Creek, and Cosee, Second and Otterdam Swamps as impaired waters. Dissolved oxygen and feeal coli form were generally the impairments found within these water bodies.

Protection of Potable Water Supply

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Several efforts to assure safe water supplies and protecting the James River's water quality have been made:

(1) The County's water and wastewater utility ordinances within the Prince George Planning Area requires connection by all development to public water and wastewater systems.

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- (2) In the Rural Conservation Area a five acre lot size is required by zoning regulations. This size lot assures a lower water draw down rate and provides the potential for lower percentages of lot disturbance and coverage, thereby providing greater runoff filtering areas. The principal exception to this lot size being the State authorized family division which allows for one acre lot sizes for immediate family members throughout the County.
- (3) The County's policy implemented in the late 1980s which requires a 100% septic field reserve area that reduces the chance for failure of installed septic systems.

- (4) The County has had an active indoor plumbing program since 1989 through the Virginia Department of Housing and Community Development.
- (5) A pump-out program for septic tanks has been initiated on a phased five (5) year basis.

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Ground Water

Ground water is generally available in large quantities throughout the County and is the County's primary source of water supplied through either a public water system or private individual wells. The abundance of groundwater has been a factor that has influenced the pattern of residential development in the County. Because it is plentiful at relatively shallow depths, residential development locations and densities have not generally been restricted by water supply. Rather, rural zening density standards, and the County's mandatory utility sennection policies in the surrent Prince George Planning Area have had a much greater influence on chaping residential development character and patterns.

The development intensity and water demands of any future groundwater dependent development proposal should be evaluated partially on the basic of the availability of groundwater. The Virginia Department of Environmental Quality has designated all land areas within the County, east of LOE, a Groundwater Management Area, limiting the possibility of future major withdrawals. As a strategy to further manage and implement the County's growth strategies, the Board of Supervisors amended the County Code in the summer of 2006 to prohibit independent community (public) water systems in the County.

Mineral Resources

Prince George County is in the Coastal Plain province and is underlain primarily by sand, gravel and clay strata. In the past, clay materials were produced in the County for use in the manufacture of brick. Glauconitic or greensand marl occurs along the James River and was formerly produced near Hopewell and marketed for agricultural use. Some calcareous marl has also been obtained for agricultural purposes. Several hundred tons of manganese ore were reportedly mined at a site near Hopewell many years ago. Diatomaceous sediments occur in the vicinity of Petersburg but the presence of commercial deposits has not been established.

Mineral extraction activities in Prince George County contribute in a small way to the local economy. The Virginia Department of Mines, Minerals and Energy is responsible for monitoring the safety aspects of these mining operations. As of 2016, The department has currently issued active mineral extraction permits for six different locations in the County. These permits cover a total of approximately 1300 acres and authorize the extraction of sand, clay and gravel. Five Two of these locations were producing in 20112016. Of these, the largest operation is a 900 acre sand and gravel mine in the Puddledouck area of the County. -Combined, the five two operating locations had a combined production in excess of 1.3 million tons 700,000 tons.

Forest Resources

Forests are an important part of the natural landscape and economy of Prince George County. They provide habitats for many plant and wildlife species, natural resources for outdoor recreation, protection from erosion, and sedimentation, groundwater recharge areas and visual buffers between land uses.

Forests cover over 74% of the County's landscape. Primarily private individuals or private corporations own these forested areas. A very small percentage is owned by the State or Federal government. Over 50 percent of County timberland is composed of the yellow pine forest types. Of the hardwood species, the oak, hickory and gum trees are predominant. Of the 98 timber producing localities in Virginia, Prince George ranks 21st in total value of timber products. These products have an average annual harvest value exceeding 3.6 million dollars in 2006. Direct and indirect forestry-related employment in the Tri-Cities area exceeded 2000 jobs in 2007 with a total harvest value in excess of 73 million dollars.

The current annual growth quantities are more than the cut quantities at this time. Timber-growth potential is excellent in Prince George County. Good forest-management practices and forest-fire prevention must be maintained and continued to realize this potential. These two objectives are particularly important as continued County development permanently removes land from forestry potential and woodland home sites increase the risk of possible forest fires.

Critical Environmental Areas

Critical environmental areas have been legislatively defined as "areas of natural, scenic and historic value, including, but not limited to, wetlands, marshlands, shorelands and floodplains of rivers, lakes and streams, wilderness and wildlife habitats, historic buildings and areas." In

Prince George County, three areas were identified and delineated by the Commonwealth as Virginia's critical environmental areas. Three important areas affecting the development of the County are:

- Appomattox River Area
 Critical watershed and wildlife habitat, portions remain in relatively undisturbed condition.
- James River Area (including the James River National Wildlife Refuge)
 Critical watershed and fish habitat, scenic and natural areas of immense recreational value. Critical wetland areas occur along Powell Creek, Wards Creek and Chippokes Creek.
- Blackwater River and Bottomlands Area
 Swamp-like natural area, relatively inaccessible. Cypress Swamp contains critical watershed, scenic, and wildlife areas and is unsuitable for intense development.

With the exception of the James River National Wildlife Refuge which is federally owned, recognition of critical environmental areas does not protect these areas from environmental degradation or inappropriate land development. The above mentioned critical environmental areas have been delineated under Chesapeake Bay programs and those environmental lands in the James River Watershed that were designated as Chesapeake Bay Preservation Areas.

Water Resources

The Appenattox, James, Blackwater and Nettoway Rivers are just some of the many surface water features found in the County. These water resources provide recreational opportunities and are a critical component of the County's infrastructure and quality of life. As such, the protection and enhancement of these water resources should be a primary County objective.

Prince George County is divided between two major river basins, the James and Chowan River Basins. In the northern part of the County, constituting about 48 percent of the total County land area, water drains into the Appenattex and the James Rivers and then eventually reaches the Chesapeake Bay. This watershed falls under the protection of the Chesapeake Bay Preservation Act. The remainder of the County is in the Nottoway River and Blackwater River watersheds. Their tributaries include Rowanty Creek, Jones Hole Swamp, Warwick Swamp and

Cypress Swamp. The Nottoway and Blackwater flow into the Chowan, and its final receiving estuary is the Albemarle Pamlico Sound in North Carolina.

Groundwater resources are also important to Prince George County residents, as many homes in the County continue to use private wells for their water supply. With the exception of those areas subject to the Chesapeake Bay Act regulations, the surface and ground water resources of the County do not benefit from additional regulatory or programmatic protections designed to maintain or enhance their quality.

Voluntary riparian easement and buffer programs implemented along the County's streams and rivers can mitigate the impacts of agricultural and non-agricultural non-point source runoff. Similar benefits could be achieved from a regulatory approach that required more stringent erosion control measures, and site and land use standards designed to protect and enhance these water resources. Prince George County adopted an Erosion and Sediment Control Ordinance in 2002 and has actively promoted certain erosion control measures to protect and enhance these water resources.

Chesapeake Bay Preservation Act and Regulations

In 1988, the Virginia General Assembly passed the Chesapeake Bay Preservation Act (Bay Act) as Virginia's commitment to improving the health of the Chesapeake Bay and it became effective on October 1, 1989. Protection of the water quality of the Chesapeake Bay, the James River and its tributaries is essential to the welfare of the Commonwealth and the County of Prince George. As a natural resource, the Chesapeake Bay has always been essential to the growth and vitality of Virginia. It is an important body of water for aquaculture, recreation and transportation, and it has always been a critical component of the state's ecosystem.

The regulations, which apply to lands within the James River basin, provide a framework within which local governments are to handle development requests in environmentally sensitive areas. Prince George County was required to designate Chesapeake Bay Preservation Areas. The County has also adopted performance criteria and incorporated these required land use regulations into the comprehensive plan, zoning ordinance and subdivision ordinance. Citizen comments received during the 2007 planning process pointed out the inequities of having the Chesapeake Bay regulations apply to only the top-northern portion of the County. Many citizens

had commented that these inequities could be addressed, and the County's natural environment improved, by applying the Chesapeake Bay Act standards county-wide for more uniform and equal regulations and enforcement methods.

Certain land areas play a more important role in protecting water quality than others. The Bay Act attempts to identify and focus on those critical land areas, which if improperly developed, could result in substantial water quality degradation. These areas are called the Chesapeake Bay Preservation Areas (CBPAs) and include two components: the Resource Protection Area (RPA) and the Resource Management Area (RMA).

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A Resource Protection Area (RPA) includes land area at or near the shoreline that contains sensitive natural features that play an important role in protecting water quality through the ecological and biological processes they perform. The RPA regulations of the Prince George County Zoning Ordinance designate land areas meeting the following criteria:

- Tidal wetlands;
- 2. Non-tidal wetlands connected by surface flow to tidal wetlands or perennial tributary streams;
- 3. Tidal shores;
- 4. A 100 foot wide buffer area located adjacent to and landward of perennial tributary streams and the other above features.

The RPA features filter sediments and pollutants from runoff before they reach the Bay, thus improving the water quality. These lands, preserved in their natural state, work to prevent erosion, absorb water, prevent flooding, provide a protective buffering of the shore, reduce nutrients entering the water, and otherwise prevent sediments and pollutants from entering the water. The uses and development of RPA land, as well as land clearance and the removal of vegetation is extremely restricted and possible only under certain circumstances by special permitting. Few exceptions exist other than for development defined and determined to be water-dependent, redevelopment, or for lots recorded prior to October 1, 1989. Which due to their size, shape or other unique features, cannot be developed within the requirements from which relief is necessary to afford the reasonable use of the property. Even in such cases, specific applications and approvals are required for development within the RPA.

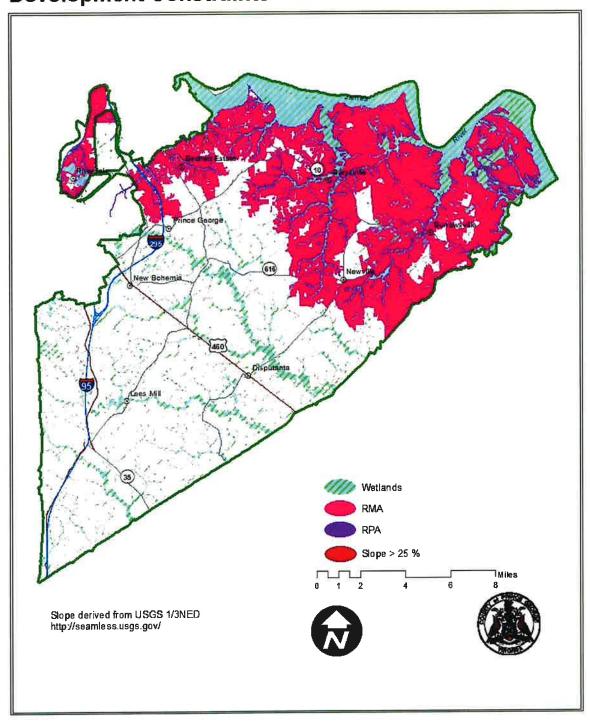
Formatte Formatte The Resource Management Area (RMA) is land area that protects and buffers the sensitive features of the RPA. The RMA is located landward and contiguous to the RPA. The RMA identifies the area as one hundred fifty (150) feet in width contiguous to and landward of the RPA, including all contiguous floodplains not included in the RPA overlay zoning district, and non-tidal wetlands converted by an intermittent stream to an RPA. These areas, if improperly developed, would result in erosion, flooding and other adverse impacts to the RPA, thereby preventing its proper functioning resulting in degraded water quality.

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The Chesapeake Bay Preservation Act allows local governments the option to designate Intensely Developed Areas (IDA) as an overlay of the Chesapeake Bay Preservation Area within the jurisdiction. The purpose of the IDA is to serve as redevelopment areas in which development is concentrated as of the local program adoption date. This designation is to address water quality impacts of heavily urbanized or development areas. Development in these areas are usually confined to either the redevelopment of existing developed sites or new construction on a limited number of remaining vacant parcels. IDAs are further characterized by one of three of the following conditions: 1) Development has severely altered the natural state of the area that it has more than 50% impervious surface; 2) Public sewer and water systems, or a constructed stormwater drainage system, or both, have been constructed and served the area by the original local program adoption date, or 3) Housing density is equal to or greater than four dwelling units per acre. The concentration of intensive uses coupled with the absence of natural vegetation and extensive impervious coverage contribute to non-point pollution of surface waters.

Currently, there are no areas designated as Intensely Developed Areas in the County. Even without the identification of IDAs, Prince George County will continue to seek ways to improve water quality on individual redevelopment and renovation projects.

Development Constraints



Floodplains

Floodplains are these areas along streams and rivers where flooding is likely to occur in the County. In addition to the James, Appomattox and Blackwater Rivers, which are State designated critical environmental areas in the County, there are several other low-lying areas which are floodplains or wetlands. These areas are along the banks of Blackwater Swamp Warwick Swamp, Second Swamp, Indian Swamp, Joseph, Jones Hole Swamp, Gosee Swamp, and Rowanty Creeak.

Floodplains are critical environmental resources due to their function as a natural and economical stormwater management system, as well as their value as wildlife habitats and recreational areas. Construction in floodplains is subject to damage by floodwaters, but substantial change to existing terrain can also affect the conveyance or storage of the natural channel to the detriment of upstream or downstream landowners. As such, the County has restricted land development in the flood hazard areas.

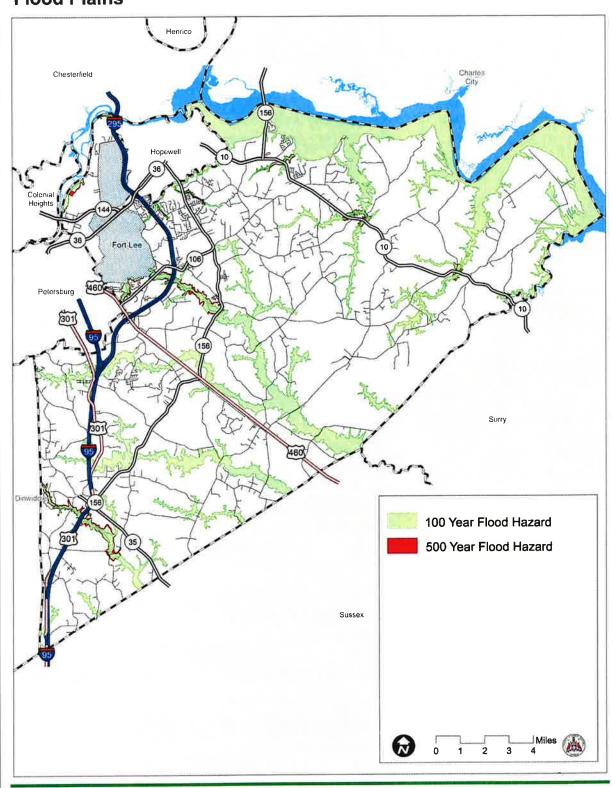
In 2012, Prince George County adopted new Flood Insurance Rate Maps (FIRM) that became effective on May 16, 2012 countywide and on June 2, 2015 in the northern portion of the County. Additionally, the Floodplain Ordinance was updated to reflect these changes required of localities by the National Flood Insurance Program to enact local legislation designed to enforce floodplain management regulations to help mitigate the effects of flooding on new and improved structures. By meeting the requirements, property owners and businesses located in proximity to a floodplain are eligible for flood insurance.

-These FIRM maps were created using digital mapping data and they were easily converted into the County's Geographic Information System (GIS) for more accurate floodplain determinations. All flood elevations shown in the Flood Insurance Study provided by FEMA are now referenced to the North American Vertical Datum of 1988 (NAVD 88). In order to perform the map conversion from the May 1, 1980 FIRM maps, the effective elevation values from the National Geodetic Vertical Datum of 1929 (NGVD 29) were adjusted downward by 1.1 foot. In general, the majority of the County's floodplain areas did not increase in area during this conversion process. They only changed in the immediate areas around both the City of Hopewell along the Appomattox and James Rivers and the City of Petersburg near Harrison

Flood Plains Henrico Chesterfield Surry 100 Year Flood Hazard 500 Year Flood Hazard Sussex

Creek. This was due to more urban based flood studies being performed for the long term benefit of their city residents and business owners for better flood protection purposes.

Flood Plains



Wetlands

Wetlands have traditionally been considered unproductive wastelands, which has in the past lead to their elimination by artificial draining or filling. This view has changed significantly as the connection between wetlands, wildlife, water quality and other ecological and economic values have been evaluated. Each wetland works in combination with other wetlands as part of a complex, integrated system that delivers these benefits and others to County landowners.

Wetlands are required by many types of animals and plants for survival. They are particularly important habitats for estuarine and marine fish and shellfish, various waterfowl, birds, and several mammals. Wetlands are among the most productive natural ecosystems in the world. They provide an important source of food for both people as well as for our aquatic animals.

Wetlands have often been referred to as natural sponges that absorb flood waters up naturally. By temporarily storing flood waters, wetlands help protect adjacent and downstream property owners from flood damage. Trees and other wetland plants help slow the speed of flood waters. This action, combined with water storage, allows wetlands to lower flood heights and reduce the flood water's erosive potential. One of the most important values of wetlands is their ability to help maintain good water quality in our nation's rivers and other bodies of water, and to improve degraded waters. Wetlands do this in several ways; removing and retaining nutrients, processing chemical and organic waters and reducing sediment loads to receiving waters. Wetlands are particularly good water filters. Due to their position between upland and deep water, wetlands can both intercept surface—water runoff from land before it reaches open water and help filter nutrients, wastes and sediment from flooding waters. This function is important in both suburban and agricultural areas alike and to people as well as to aquatic and other wildlife. In addition, wetlands serve as recharge areas for groundwater aquifers and play an important role in water supply. Other wetlands are sites of groundwater discharge and they provide important contributions to freshwater stream flow, especially during drought conditions.

In Prince George County there are approximately 1,500 acres of wetlands as identified on the National Wetlands Inventory (NWI). This is less than 1% of the County's 266 square miles of land. Most of the wetlands are located along the rivers and within stream valleys, predominantly in and around the floodplain areas. The NWI maps were developed by the U.S. Fish and Wildlife Service and show wetland boundaries as delineated from aerial photographs. The small scale

of the photography and inherent margins of error in photo interpretation render the maps most useful for general use planning.

ShorelinePublic/Private Water Access

There are over 92 linear miles of shoreline in the Prince George County area. This geographic area is composed of the County, the City of Hopewell and parts of the City of Petersburg. The shoreline's physiography ranges from low shore to high shore, with seventy-three percent being classified as either low or moderately low shore. Flooding is not a serious threat to most areas of the shoreline, as elevations average greater than 10 feet. Only in a few isolated areas in the County are structures endangered by flood waters.

Shorelines are also areas to access waterways. However, the land adjacent to the shore is not owned by the locality. The geographic area along the Appomattox River has several uses. The majority of the shorelandsine here are owned by the federal government: Fort Lee and the Federal Correctional Institute. The shorelandsine in this area also have industrial sand and gravel operations, railroad lines, recreational and agricultural uses.

The Jordan Point area, near the Benjamin Harrison Bridge and on the major route between Hopewell and Williamsburg, has a private marina, a country club-and a residential development. Most of the remaining shorelandsine areis contained within several large estates; Brandon, Flowerdew Hundred, Willow Hill and Upper Brandon. These estates, which have survived from the 1800s, directly control the use of much of the shorelandsine. From Jordan Point to the head of the Upper Chippokes Creek, ninety-six percent of the shorelandsine areis either wooded or agricultural. The other four percent of the shorelandsine areis divided among commercial, industrial, recreational and residential uses.

Access to the waterways are provided through privately owned land via marinas, docks, and piers. Currently, there are no plans for additional marinas in the County. The County, however, recognizes the need to provide additional public river access points for its citizens to take advantage of the recreation potential of its Rivers. It is Prince George's policy to minimize the water quality impacts of marine facilities. If the County is given the opportunity to establish a future waterfront access point, the County will evaluate the proposed facility upon Virginia

Marine Resources Commission's Criteria for the Siting of Marinas and Community Facility for Boat Moorings.

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Presently, there are 57 docks and 14 private ramps in the County. Individuals wishing to build private docks and ramps must work with The Virginia Marine Resources Commission and Prince George County Ordinances to construct one to access the waterway for their use.

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Marinas and recreational boating are very popular uses of coastal waters. The growth of recreational boating, along with the growth of coastal development in general, has led to an increased awareness of the need to protect the environmental quality of our waterways. Because marinas are located right at the water's edge, there is a strong potential for marina waters to become contaminated with pollutants generated from the various activities that occur at marinas, such as boat cleaning, fueling operations and marine head discharge, or from the entry of storm water runoff from parking lots and hull maintenance and repair areas into marina basins.

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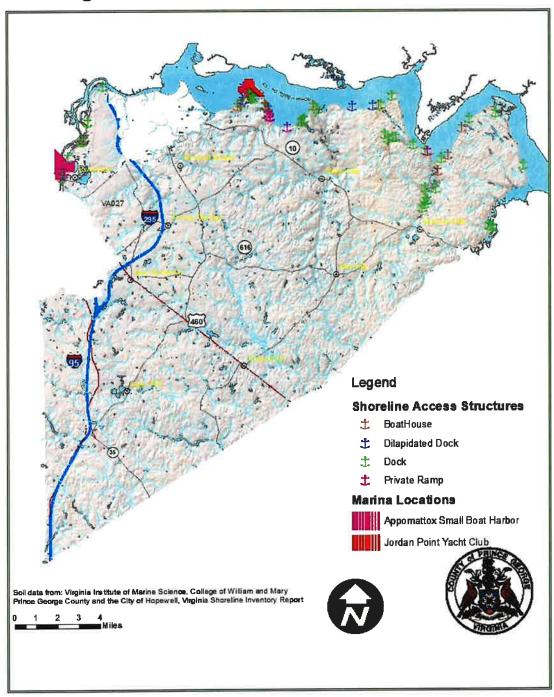
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Prince George County does not contain or border any commercial fisheries. However, the County does allow recreational fishing as permitted by the Virginia Department of Game and Inland Fisheries.

Existing Public/Private Water Access



Tidal marches comprise 30 percent of the County's cheroline. The march areas, copecially embayed and extensive marches, cheuld be preserved, as they are important fleed and crecien central agents and as they are valuable wildlife habitate. The beaches, which compremise eighteen percent of the cheroline, are poor, thin stripe, often with vegetation. Only two percent of the chero is artificially stabilized, which maybe higher due to the work in Jordan Point area.

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Shoreline Erosion

Shoreline erosion results from the combined impacts of waves, sea level rise, and tidal currents, in some cases, boat wakes, and shoreline hardening. Overall, the erosion is very low in most sections of Prince George County. Along the James River toward Upper Chippokes Creek, the erosion rates increase slightly, while Upper Chippokes Creek has the highest erosion rate in the County because of several areas of marsh that are eroding rapidly.

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An area of shoreline erosion concern specifically is areas with agriculture and grass within 100 feet of the shoreline. These uses have the highest potential for nutrient runoff due to fertilizer applications. Agricultural lands are also prone to high sediment loads since the adjacent banks are seldom restored when erosion problems persist. According to the Prince George County Shoreline Management Plan, the majority of the shoreline management in Prince George can be achieved without the use of traditional erosion control structures such as riprap and bulkheads, but can be managed by enhancing the riparian buffer or the marsh, if present.

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Tidal marshes comprise eighty (80) percent of the County's shoreline. The marsh areas, especially embayed and extensive marshes, should be preserved, as they are important flood and erosion control agents and as they are valuable wildlife habitats. The beaches, which compremise eighteen (18) percent of the shoreline, are poor, thin strips, often with vegetation. Only two (2) percent of the shore is artificially stabilized, which maybe higher due to the work in Jordan Point area.

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Typically, when shorelines exhibit erosion, property owners have tended to harden the shoreline, which has been the most common management solution to shoreline erosion. There is growing concern that the natural character of the shoreline cannot be preserved in perpetuity if shoreline management does not change.

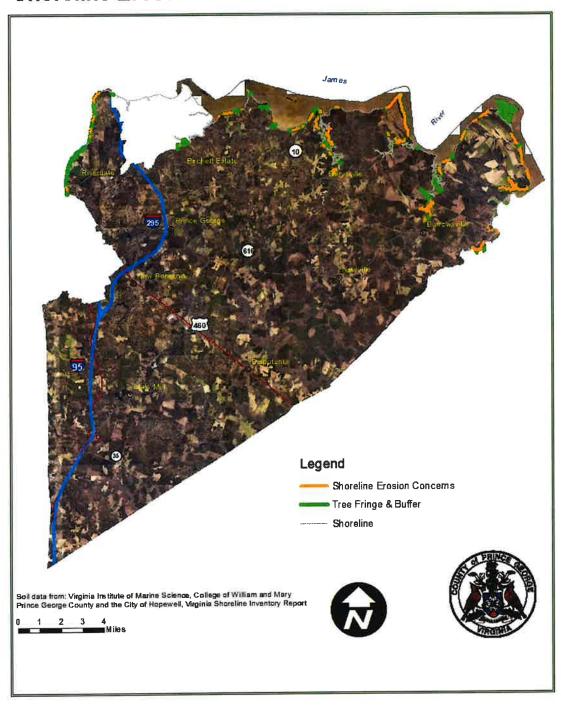
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The Prince George County Shoreline Management Plan, Shoreline Best Management

Practices, and the shoreline evolution of Prince George County are available via the Virginia
Institute of Marine Science (VIMS) online.

Shoreline Erosion



Comprehensive Coastal Resource for Tidewater Virginia Localities

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Coastal ecosystems reside at the interface between the land and water, and are naturally very complex. They perform a vast array of functions by way of shoreline stabilization, improved water quality, and habitat for fishes; from which humans derive direct and indirect benefits.

The science behind coastal ecosystem resource management has revealed that traditional resource management practices limit the ability of the coastal ecosystem to perform many of these essential functions. The loss of these services has already been noted throughout coastal communities in Virginia as a result of development in coastal zone areas coupled with common erosion control practices. Beaches and dunes are diminishing due to a reduction in a natural sediment supply. Wetlands are drowning in place as sea level rises and barriers to inland migration have been created by construction of bulkheads and revetments. There is great concern on the part of the Commonwealth that the continued armoring of shorelines and construction within the coastal area will threaten the long-term sustainability of coastal ecosystems under current and projected sea level rise.

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In the 1980s, interest arose in the use of planted wetlands to provide natural shoreline erosion control. Today, a full spectrum of living shoreline design options is available to address the various energy settings and erosion problems found. Depending on the site characteristics, they range from marsh plantings to the use of rock sills in combination with beach nourishment. Research continues to support that these approaches combat shoreline erosion, minimize impacts to the natural coastal ecosystem and reinforce the principle that an integrated approach for managing tidal shorelines enhances the probability that the resources will be sustained. Therefore, adoption of new guidance and shoreline best management practices for coastal communities is now necessary to insure that functions performed by coastal ecosystems will be preserved and the benefits derived by humans from coastal ecosystems will be maintained into the future.

Coastal Resource Management Policy Statement and Recommendations

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In 2011, the Virginia Assembly passed legislation to amend §28.2-1100 and §28.2-104.1 of the Code of Virginia and added section §15.2-2223.2, to codify a new directive for shoreline management in Tidewater Virginia. In accordance with section §15.2-2223.2, all local

governments shall include in the next revision of their comprehensive plan beginning in 2013, guidance prepared by the Virginia Institute of Marine Science (VIMS) regarding coastal resource management and, more specifically, guidance for the appropriate selection of living shoreline management practices. The legislation establishes the policy that living shorelines are the preferred alternative for stabilizing eroding shorelines.

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This guidance, known as Comprehensive Coastal Resource Management Guidance, is being prepared by VIMS for localities within the Tidewater region of Virginia and shared through their Comprehensive Coastal Resources Management Portal (CCRMP). It explicitly outlines where and what new shoreline best management practices should be considered where coastal modifications are necessary to reduce shoreline erosion and protect our fragile coastal ecosystems. This guidance will include a full spectrum of appropriate management options which can be used by local governments for site-specific applications and consideration of cumulative shoreline impacts. The guidance applies a decision-tree method using a based resource mapping database that will be updated from time to time, and a digital geographic information system model created by VIMS.

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- Refer to the guidance presented in the locality's Comprehensive Coastal Resource Management Portal (CCRMP) prepared by VIMS to guide regulation and policy decisions regarding shoreline erosion control.
- Utilize VIMS Decision Trees for onsite review and subsequent selection of appropriate erosion controls and shoreline best management practices that are found online.

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- Utilize VIMS' CCRMP Shoreline Best Management Practices for management recommendation for all tidal shorelines in Prince George County.
- Consider a policy where the above Shoreline Best Management Practices become the recommended adaptation strategy for erosion control, and where a departure from these recommendations by an applicant wishing to alter the shoreline must be justified at a hearing of the board(s).
- Encourage staff training on decision making tools developed by the Center for Coastal Resources Management at VIMS.
- Follow the development of the state-wide General Permit being developed by VMRC. Ensure that local policies are consistent with the provisions of the permit.
- Evaluate and consider a locality-wide permit to expedite shoreline applications that request actions consistent with the VIMS recommendation.

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- Seek public outreach opportunities to educate citizens and stakeholders on new shoreline management strategies including Living Shorelines.
- Follow the development of integrated shoreline guidance under development by VMRC.
- Evaluate and consider a locality-wide regulatory structure that encourages a more integrated approach to shoreline management.
- Consider preserving available open spaces adjacent to marsh lands to allow for inland retreat of the marshes under rising sea level.
- Evaluate and consider cost share opportunities for construction of living shorelines.

Air Quality

In 1990, the Congress passed and the President signed into law amendments to the federal Clean Air Act. These amendments require cleanup of polluted areas in accordance with a specific schedule, tighten emission standards and grant federal agencies greater powers to enforce the Act's requirements. Those portions of the Act having the most direct bearing on this plan are those relating to ozone pollution. Ozone is formed by chemical reactions in the atmosphere when hydrocarbons and nitrogen oxides emitted by motor vehicles, industries and power plants combine in sunlight. While ozone in the upper atmosphere is beneficial because it blocks the sun's ultraviolet rays, ozone at and near ground level is harmful to humans and particularly to children. Ozone levels are continually monitored at various locations in the Richmond Petersburg metropolitan area. Between 1990 and 2006, monitoring stations in Charles City County, Chesterfield County, Hanover County and Henrico County recorded multiple instances of ozone levels exceeding the Federal safety standard of 84 parts per billion. As of 2012, the Richmond area, to include the Tri-Cities and Prince George County, is now in attainment for all applicable national air quality standards, including ozone levels.

Constraints to Development

Not all land in the County is suitable for development. Environmental factors play a major role in delineating an area's suitability for development. Slope considerations, soil characteristics, the presence of floodplains and/or wetlands and air and water quality are just some of the many environmental factors that should be considered when planning for the future growth and development of the County. These factors, and others, should be considered for future development of the County, future policies, plans and ordinance recommendations.

PUBLIC NOTICE COUNTY OF PRINCE GEORGE

Notice is hereby given to all interested persons regarding the follow-ing public meeting: The Prince George County Board of Supervisors will hold a public hear-ing on Tuesday, March 27, Tuesday, March 27, 2018 beginning at 7:30 p.m. in the Board Room, third floor, County Ad-ministration Building, 6602 Courts Drive, Prince George, Virginia pursuant to Chapter 22, Sections 15.2-2204 and 15.2-2225 The Code of Virginia (1950, as Virginia (1950, as amended) concerning; NOTICE OF AMEND-MENTS AND ADOPTION OF THE COMPREHENS-IVE
PLAN - THE PRINCE
GEORGE COUNTY
BOARD OF SUPERVISORS WILL CONDUCT
A PUBLIC HEARING ON
THE AMENDMENT AND ADOPTION OF THE COMPREHENSIVE PLAN COMPREHENSIVE PLAN FOR PRINCE GEORGE COUNTY, VIRGINIA 23875, PURSUANT TO CHAPTER 22, SECTIONS 15.2, § 15.2-2204, 15.2-2225, OF THE CODE OF VIRGINIA. The Prince George County Compre-hensive Plan Amend-ment as recommended by the Planning Comby the Planning Comby the Planning Com-mission on February 22, 2018 will replace the ex-isting 2014 Compre-hensive Plan. The Plan for Prince George County is used by County citizens, staff, the Planning Commis-sion and the Board of Supervisors as a guide for future decisions affecting the county in-cluding, but not limited to, decisions related to future land use, road networks and zoning case actions. The Plan area encompasses all of Prince George County. The Plan does not rezone land, but it sug-gests ordinance amendments and other ac-tions that will facilitate the implementation of the Plan after adoption by the Board of Supervisors. Plan recommendations are to update the Environment Chapter text to include data, information, mapping, policy analysis, and the implementation meas-ures concerning loca-tion and extent of the Resource Management Area (RMA) and Area (RMA) and physical constraints to development, protec-tion of the public water supply, commercial and recreational fisheries, public and private wa-terfront access, mitiga-tion of water quality tion of water quality impacts from land use, and areas of shoreline streambank erosion as streambank erosion as required by the Ches-apeake Bay Preserva-tion Act (CBPA) and Regulations. The CBPA text will be added into the Plan as is mandated by DEQ for code compliby DEQ for code compliance purposes through the State audit. A copy of the related Plan material may be examined within Planning and Zoning in the County Administration Building and they are onen from 8:30 am to open from 8:30 am to 5:00 pm Monday – Fri-day or call 804,722,8678. All interested persons shall have the opportunity to be heard at said public hearing. Percy C. Ashcraft County Administrator