HENRICO 2010 LAND USE PLAN AMENDMENT

ENVIRONMENTAL ELEMENT AMENDMENT INFORMATION

Adopted by the Board of Supervisors February 12, 2002

This portion of the 2010 Land Use Plan presents the amendment to the Plan adopted relative to the Environmental Element. This amendment was approved by the Board of Supervisors on February 12, 2002.

The portion of the 2010 Plan affected is the current 2010 Land Use Plan Environmental Element (pp. 69-134). Specific sections of the text have been amended and new maps have been added:

1. Chesapeake Bay Preservation Act – Text (p. 71).
2. Data Collection and Analysis of Environmental Features – Text (p. 77).
3. Physical Constraints to Development – Text (p. 77).
4. Flood-Prone Areas – Text (p. 77).
5. Tidal/Nontidal Wetlands – Text (p. 81).
6. Topography/Steep Slopes – Text (p. 81).
7. Soil Suitability for Septic Tank Use – Text (p. 87).
8. Redevelopment in Intensely Developed Areas – Text (p. 117).
9. Appendix A – New Maps

    a. General Flood Plain Areas
    b. Wetland Areas
    c. Highly Erodible Soils Areas
    d. Highly Permeable Soils Areas
    e. Hydric Soils
    f. Septic Absorption Limitations

The attached document titled Environmental Element 2002 Amendments – Henrico 2010 Comprehensive Plan includes the amended text and new maps.

ENVIRONMENTAL ELEMENT
2002 AMENDMENTS
HENRICO 2010 COMPREHENSIVE PLAN

Chesapeake Bay Preservation Act

In July 1988, the Chesapeake Bay Preservation Act became law. The Act requires that localities protect the public interest in the Chesapeake Bay, its tributaries and other State waters, and to incorporate general water quality protection measures into comprehensive plans, zoning ordinances and subdivision ordinances. In addition, localities are also required to establish programs that (1) define and protect certain lands called Chesapeake Bay Preservation Areas which, if improperly developed, could result in substantial damage to the water quality of the Chesapeake Bay and its tributaries; (2) reduce non-point source pollution to State waters; and (3) promote and restore the high quality of State waters in order to provide for the health, safety and welfare of the present and future residents of the County and the Commonwealth of Virginia.

In September 1990, the Henrico County Board of Supervisors adopted amendments to the 2000 Land Use Plan to incorporate the requirements of the Chesapeake Bay Preservation Act. These water quality protection measures included expansion of the existing environmental protection classification of the land use plan map; related goals, objectives and policies; and new and revised definitions (i.e., Environmental Protection Area, Chesapeake Bay Preservation Area, etc.).

On November 13, 1991, the Henrico County Board of Supervisors adopted an amendment to Section 22-106.2 of the County Code to incorporate the Chesapeake Bay Preservation Area program into the Zoning Ordinance. Through this program, approximately 25% of the County was designated as Chesapeake Bay Preservation Area. The program consists of a map delineating these areas and amendments to the zoning, subdivision, landscape, controlled density, and erosion and sediment control ordinances as the means of implementing the performance criteria.

Chesapeake Bay Preservation Areas (see Map IV-I) are composed of Resource Protection Areas (RPAs) and Resource Management Areas (RMAs). Those lands which have intrinsic water quality benefit are designated as RPAs. Lands which have the potential of degrading water quality or diminishing the functional values of the Resource Protection Area, if not properly managed are designated as RMAs.

(1) The Resource Protection Area consists of:
   a. Tidal wetlands;
   b. Nontidal wetlands connected by surface flow and contiguous to tidal wetlands or tributary streams;
   c. Tidal shores;
   d. Other lands which the Board of Supervisors may designate by ordinance;
   e. A 100-foot buffer located contiguous to and landward of the components listed in subsection a. through d. above, and along both sides of any tributary stream.

(2) The Resource Management Area consists of:

a. All areas specifically designated as RMAs by ordinance by the Board of Supervisors because of their potential effect on water quality;

b. All of the following land types which are directly contiguous to RPAs:
   1. Highly erodible soils, including steep slopes;
   2. Highly permeable soils;
   3. Nontidal wetlands not included in RPAs.

c. Base flood hazard areas (100-year floodplains); and

d. Where the land contiguous to RPAs is not a RMA as defined above, the 100-foot area contiguous to the RPA.

The ~~2000-scale~~ Chesapeake Bay Preservation Areas Map (i.e., RPAs and RMAs) is a composite of individual sensitive environmental features maps showing 100-year flood plains, wetlands, highly erodible soils (including steep slopes), highly permeable soils, and hydric soils, and soils suitable for septic tanks in the County. The CBPA Map and the individual environmental maps are on file in the Planning Office. The individual maps are also on the County's GIS system and are included at the end of the Environmental Element as Appendix A. ~~Only the Chesapeake Bay Preservation Areas Map, a composite of these individual maps, has been included in the 2010 Land Use Plan. As time and other resources permit, highly erodible/highly permeable soils (including steep slopes), hydric soils, wetland areas, 100-year flood plains, and soil suitability for septic tanks (where appropriate) maps will be added to the list of maps in the Environmental Element (as an appendix or separate document) with future updates of the Land Use Plan.~~

DATA COLLECTION AND ANALYSIS OF ENVIRONMENTAL FEATURES

As part of the comprehensive plan development process, the County has clearly defined consistent policies on land use issues relative to water quality protection. The County uses data on sensitive features in developing land classifications and management policies.

Analysis of the County's environmental features provides a means for evaluating the development capabilities of the land. Once the analysis is completed, a land use classification system, e.g., open space/recreation, residential, office, etc., is selected and defined. This part of the process involves comparison of each classified land use with each classified land area. The classification system is then used to guide development recommendations in terms of intensity and scale.

The County's GIS system makes this analysis a more efficient process. With this system, physical features can be properly evaluated in relation to one another as a means of identifying varying degrees of suitability for development.

This analysis and the following goals, objectives, policies and implementation measures address the specific water quality policy areas (i.e., physical constraints to development, protection of potable water, shoreline/streambank erosion, public and private access to waterfront areas and redevelopment of intensely developed areas) identified in the Bay Regulations (i.e., Sections 10.1-2109.B of the Act and 2.2.C of the Regulations) and other issues (i.e., air and noise) necessary to protect environmental quality.

PHYSICAL CONSTRAINTS TO DEVELOPMENT

Assessing the location and prevalence of sensitive environmental features (steep slopes, wetlands, poor soils, etc.) is a primary consideration for site design and development and in formulating County policies addressing suitable areas for development in the County. The County recognizes that matching the intensity, type, and location of development with the capacity of the land to accommodate development is a sound and practical land use principle with fiscal, as well as water quality, benefits. Planning to avoid expensive site development or construction is much more cost-effective.

The County uses a number of implementation measures, common to all types of sensitive environmental areas (e.g., flood-prone (floodplains), wetlands, etc.), to manage their development through ordinances such as erosion and sediment control, zoning, subdivision, plan of development review, and other regulations.

For example, zoning governs development of a parcel. Every parcel has a zoning classification that dictates development features such as types of uses and lot sizes. A number of factors, including physical constraints, are considered when reviewing development applications. For a development application, such as a rezoning application, the land use designation of a property serves as a decision-making guide for citizens, developers, the County staff, the Planning Commission, and the Board of Supervisors.

Site plan review requirements have been expanded to ensure that all factors affecting water quality are taken into consideration prior to development (e.g., location and type of Best Management Practices (BMP); a drainage area map showing offsite drainage to the property and drainage to the BMP; existing and proposed storm drainage; accurate location of all wetlands, RPAs RMAs, and floodplains; etc.). In addition, as part of the County's site plan review process, steps are taken to protect unique and/or critically endangered resources wherever it appears that there is a potential for them to be negatively affected by proposed development.

Another of the County's general policies related to physical constraints to development is to delineate through on-site assessment, survey, and map environmentally sensitive lands such as floodplains, aquifer recharge areas, wetlands, steep slopes, woodlands, and natural habitat areas that should be protected from disruption.

Other development measures and policies, more specific to various sensitive features, are noted in the following sections.

Flood-Prone Areas

Flood-prone areas (or floodplains), designated by the County as Chesapeake Bay Resource Management Areas, are lands that would be inundated by flood water as a result of a storm event of a 100-year return interval (that is a flood with a one percent probability of occurring within any given year). They are found mainly along shorelines, wetlands, and low-lying areas adjacent to tributary and intermittent streams.

The floodplain acts as a natural reservoir for excess water during periods of flooding. Holding excess water during floods reduces the danger to life and property. Other benefits of floodplains are that they provide areas for recreation, and they usually contain substantial groundwater.

Flood activity has a potentially detrimental effect on water quality. Soil erosion that is a result of the flood event is a source of pollution. If floodplains are developed and the natural vegetative cover removed, the natural flood controls are altered or eliminated with the possible consequence of increasing the level of soil erosion.

The primary flood-prone areas in Henrico are associated with the Chickahominy and James Rivers. The Chickahominy River originates in the Eastern Piedmont region where it flows from a relatively narrow defined valley to an approximate point where U.S. Highway 1 crosses it. From this point eastward, the channel spreads out into a wide, flat, marshy area which can be described as a flood basin. Because of this terrain, even a small rise in elevation of the water will cause the river to overflow its banks for hundreds of feet on either side. With regard to the James River, maximum accumulation of floodwaters normally occurs two to three days after the cessation of heavy rainfall over the basin.

The County encourages owners of property located within the 100 year flood plain to seek C-1 Conservation District zoning in order to protect these environmentally sensitive areas and to minimize stormwater control problems. The County also consults the County's flood insurance program to update data and maps.

A number of eligible properties in the County have obtained special valuation and real estate assessment under the Open Space provisions of the Virginia Land Use Assessment Law. This is a tax incentive program to encourage landowners to apply for Open Space designation of their properties that contain extensive environmentally sensitive areas, such as flood-prone areas. Under this program, properties may qualify for open space "when so used as to be provided or preserved for park or recreational purposes, conservation of land or other natural resources, floodways, historic or scenic purposes, or assisting in the shaping of the character, direction, and timing of community development or for the public interest and consistent with the local land-use plan..."

Tidal/Nontidal Wetlands

Wetlands are areas of continually wet soils, where water is normally found on, or slightly below the surface of the land. They are transition areas between drier uplands and the deep waters of streams, rivers, lake and bays. Wetlands can be either vegetated or nonvegetated.

The ecological value of wetlands has become better understood in recent years. Wetland loss can be a major contributor to water quality damage. Wetlands help purify water by filtering-out nutrients, wastes, and sediment from runoff. They absorb the energy of fast-moving erosive water (as in a flood event), and help to minimize coastal erosion from wave action. Wetlands also serve as reservoirs from which groundwater supplies can be replenished during dry seasons.

Two extensive wetland features in Henrico County are the White Oak Swamp, located in the east end of the County, and the wetlands contiguous to the Chickahominy River.

Several resources are utilized for on-site environmental assessment studies. These resources include but are not limited to the County's Comprehensive Drainage Study, USGS 7.5 minute topographic maps, the County Soil Survey, testimony of long term residents, as well as the application of the U. S. Army Corps of Engineers Wetland Delineation Manual and analysis of onsite conditions in accordance with a method approved by the Chesapeake Bay Local Assistance Department. These resources provide data concerning tributary streams and wetlands for determining refinements to the delineation of Environmental Protection Areas (EPA) and Chesapeake Bay Preservation Areas.

Topography/Steep Slopes

Elevations in the County range from sea level along the lower James River to about 340 feet above sea level on the highest ridges in the western section of the County. Slopes in the County may be categorized into the following four groups:

1. Very steep (greater than 25 percent) - If disturbed by construction or forest removal, widespread failure is highly probable. These slopes may be better used as natural areas, trails and observation points. Least suitable for development.

2. Steep (16 to 25 percent) - If plant cover is removed, these slopes are highly susceptible to erosion and gully formation. Special design considerations are required for buildings on slopes greater than 15 percent. Suitable with restrictions.

3. Moderate (5 to 15 percent) - These slopes will support residential and agricultural land uses; if misused, they are susceptible to serious erosion. Moderately suitable.

4. Gentle (less than 5 percent) - These slopes will sustain the most intensive use with the least management. Most suitable.

Categorizing these slopes is useful for gauging the degree of caution required to evaluate and recommend a particular site for development.

Generally, the Coastal Plain consists of broad, nearly level and gently sloping ridges. Steep slopes occur more frequently in the Piedmont Plateau region than in the Coastal Plain. Areas of steep slopes may present limitations to certain types of development. The presence of steep slopes in combination with particular soil types may have the potential for severe erosion or slope failure.

Steep slopes are located in four general areas of the County. They are scattered along the James River; in the vicinity of Horse Swamp; along bluffs adjacent to the Chickahominy flood plain; and in the southeastern corner of the County. Some of the related policies for managing these sensitive features are:

1. Discourage land disturbance that is more than necessary to provide for the desired use or development. Land development activities must comply with the requirements of the Henrico County Erosion and Sediment Control ordinance. Where best management practices are utilized, regular or periodic maintenance is required in order to insure their continued functions.
2. Enforce soil erosion and sediment control ordinances with frequent inspection of construction sites.
3. Encourage land development practices that minimize impervious cover consistent with the use allowed.

Soil Suitability for Septic Tank Use

Suitability for septic systems is determined by degree of slope, wetness, soil erodibility and permeability. A suitable soil for a septic system should absorb all effluent, provide a high level of treatment before the effluent reaches the groundwater, and have a long useful life. Sand lets wastewater run through it too quickly, and heavy clays impede wastewater movement, allowing it to pool or pond on the surface instead of moving through the soil. ("Threats to Virginia's Groundwater," Virginia Water Resources Research Center, VPI)

The degree of limitation of the soils for septic tank absorption fields has a rating of slight, moderate and severe. A slight limitation means that soil properties are generally favorable and limitations can easily be overcome. A moderate limitation can be overcome or modified by planning, design, or by special maintenance. A severe limitation means that costly soil reclamation, special design or intense maintenance, or a combination of these is required (See Table IV-1 for limitations of each soil association in the County).

The Henrico County Code was amended in accordance with the Chesapeake Bay regulations to include the requirements for a 100% reserve drainfield area for all buildings served by on-site sewage disposal systems (septic systems) and a mandatory five-year pump out requirement for all septic tank systems. The Code was amended in 1998 to require the five-year pump-out only within Chesapeake Bay Preservation Areas. Estimates from the County's Septic Pump-out Notification Program in 1993 indicated that approximately 12,000 households in Henrico County were on septic systems. According to the Henrico County Health Department, the majority of the households on septic systems are in the east end of the County.

Approximately seven percent of recent construction in Henrico County is on septic systems (FY 1993/94). A review of the Health Department's report on Wells/Sanitary Disposal Systems for the '93-'94 fiscal year showed that of the 382 applications received for well and septic systems, a total of 86 applications (23%) were for septic system failures. The Health Department investigates reports of sewage system malfunctions and assists owners in correcting the problem consistent with State and County regulations.

The availability of public water and sewer is addressed through the Henrico 2010 Land Development Guide. Approximately 3% of the County residents live in the Outlying Area as designated on the Land Development Guide. In this area of the County, public water and sewer services generally are not available and are not planned through the year 2010. See the Land Use Plan Map and Guidelines for Growth for a detailed discussion of this element.

One of the County's policies for residential development is to encourage development of large tracts and to implement planned large tract development guidelines. This design concept can enhance resource protection, particularly in areas such as parts of eastern Henrico that are not served by public water and sewer and are dependent upon septic systems.

REDEVELOPMENT IN INTENSELY DEVELOPED AREAS

Intensely Developed Areas (IDAs) consist of existing development and infill sites where little of the natural environment remains. These areas represent urban centers, heavy industrial areas, and other densely developed areas characterized by extensive pavement and other impervious surfaces. Research has shown that the increase in stormwater runoff pollution is directly proportional to increases in impervious surfaces. Runoff in these areas typically is collected in an underground drainage network which carries untreated stormwater directly into adjacent waterways.

The Chesapeake Bay Program's intent is to reclaim some natural areas through stormwater quality management techniques as redevelopment occurs. ~~Pollution entering the Bay from older, densely developed areas is the primary reason that regulations now require redevelopment projects within IDAs to reduce stormwater runoff pollutant loadings by 10 percent.~~

The 2010 Land Development Guide provides specific guidance for land use and development in Henrico County. It serves as a tool for phasing development based on availability of public services. One of the areas identified in the Phasing Plan is the Existing Area. This area is generally ninety percent developed, includes vacant parcels less than ten acres, and undeveloped subdivision lots. It is characterized by a mixture of uses and densities. All levels of public services are available. These also are the areas of the County where impervious surfaces are most prevalent (see the 2010 Land Use Plan Map and Guidelines for Growth).

In addition, the 2010 Land Development Guide identifies Special Strategy Areas to recognize the need for special development guidelines in particular areas of the County. Identification of Special Strategy Areas is intended to focus attention on appropriate design considerations for development and redevelopment in these areas to minimize potential adverse effects. For Special Strategy Areas where redevelopment is likely, important water quality considerations include reestablishment of buffer areas and reduction of impervious surface to reduce stormwater pollutant loadings. In addition, the Capital Improvement Program is used to replace antiquated water and sewer lines as part of the County's water quality improvement strategy.

~~It should be noted that the County requires stormwater quality management, not only in Chesapeake Bay areas, but for all new and redevelopment sites whose impervious area is greater than 16%.~~ It should be noted that stormwater quality controls are applied throughout the County, not only in Chesapeake Bay areas, for all new and redevelopment sites whose impervious area is greater than 16%. The County's stormwater program was developed to be consistent with both the Chesapeake Bay Preservation Area Designation and Management Regulations and the Virginia Stormwater Management Regulations and applies to all development that results in 2,500 square feet or more of land disturbance.

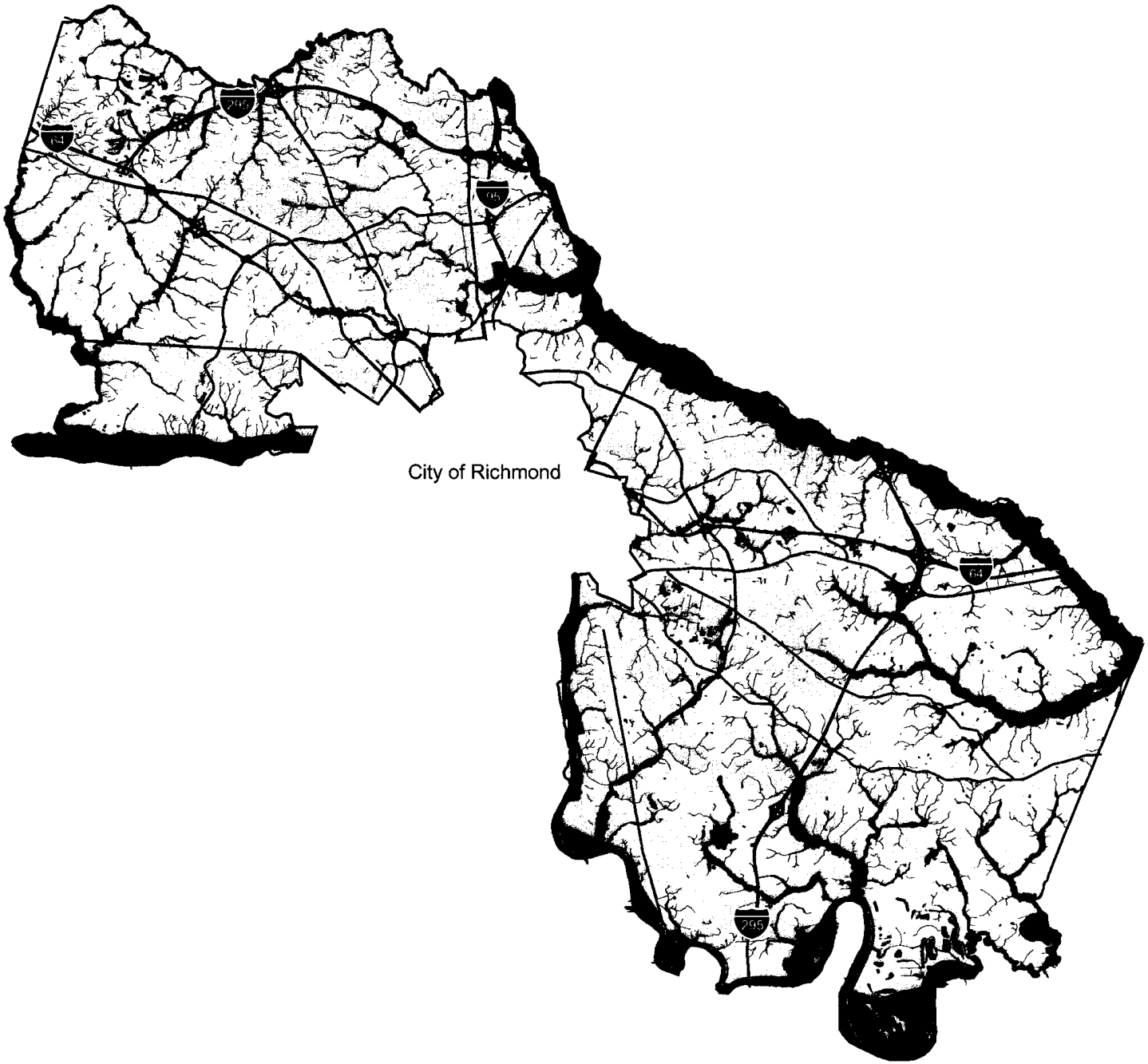
Additionally, through the County's NPDES program, all industrial activities are identified and prioritized as potential pollution sources to the storm sewer system. (Refer to the section on Protection of Potable Water for the list of permitted sites in Henrico County.) The County conducts inspections of these sites to ensure that all pollution prevention measures are being undertaken.

During the development of the Stream Assessment / Watershed Management Program, the County evaluated 440 miles of streams (approximately 220 miles of perennial streams and 220 miles of intermittent streams). In addition to identifying tems such as pipes, ditches, streambank erosion areas and road crossings within the stream corridors, areas were also identified where forested streamside buffers did not exist. These locations are mapped in the County's GIS and future projects will be conducted to restore a forested buffer in these areas.

APPENDIX A

New Maps

General Flood Plain Areas
Wetland Areas
Highly Erodible Soils Areas
Highly Permeable Soils Areas
Hydric Soils
Septic Absorption Limitations



General Flood Plain Areas

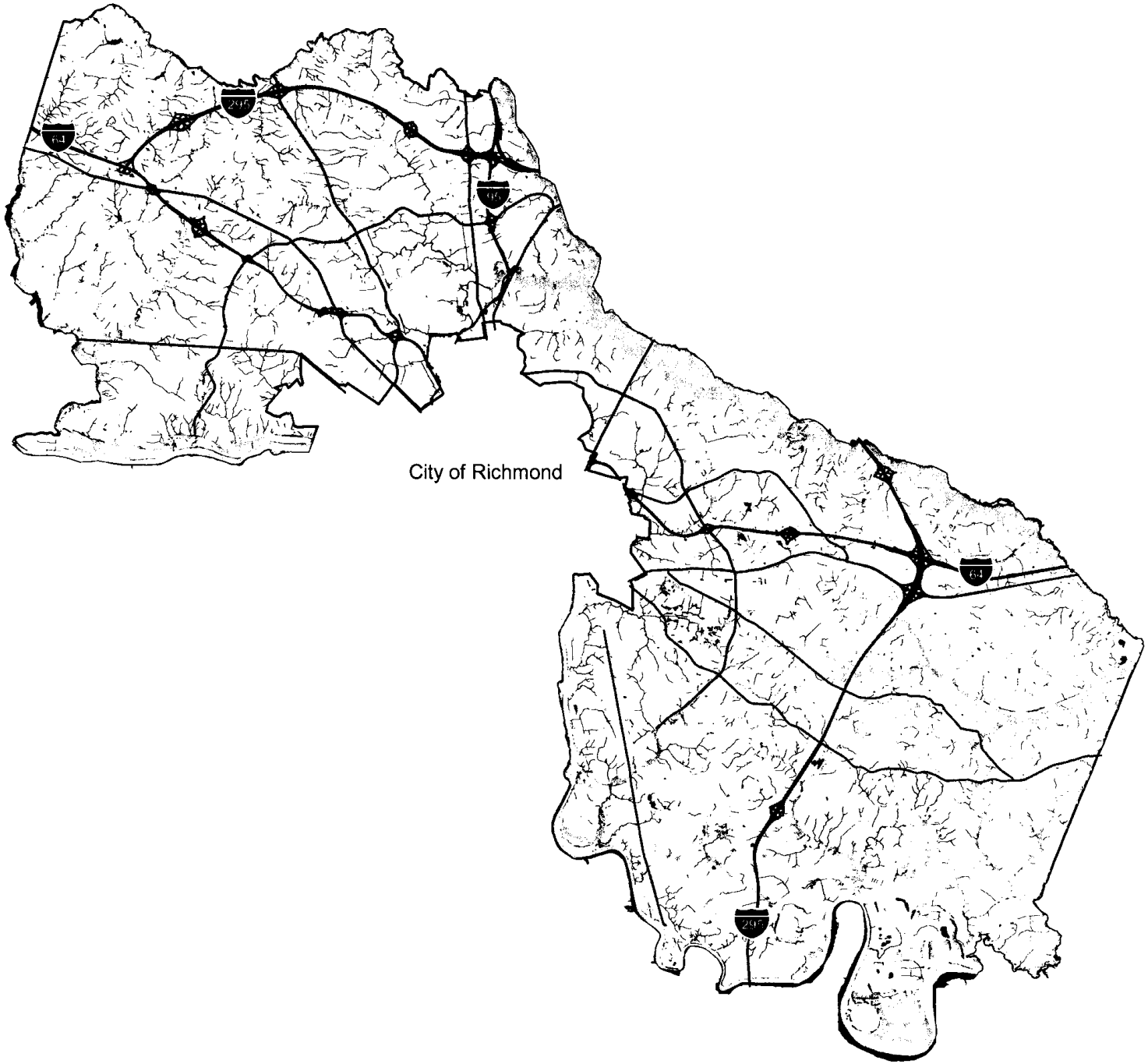
1 0 1 2 Miles

General Flood Plain
Water Body
Major Roads

Data Source: Henrico County 2010 Land Use Plan - Environmental Protection Areas

County of Henrico
Virginia

Prepared by the Henrico County Planning Office - August , 2001.



Wetland Areas

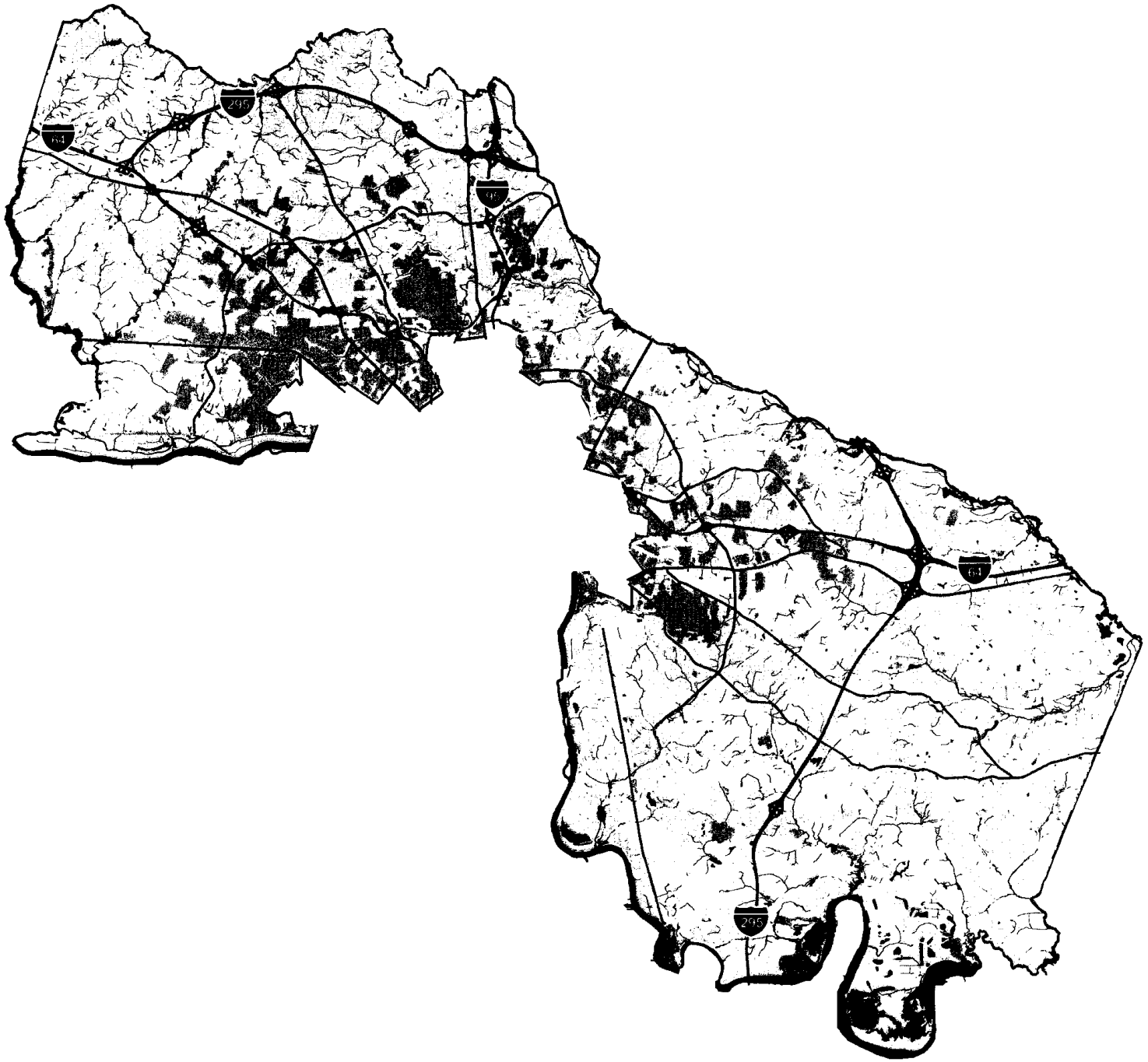
1 0 1 2 Miles

Wetlands
- Lacustrine
- Palustrine
- Riverine
- Water Body
- Major Roads

Data Source: National Wetlands Inventory
U.S. Fish and Wildlife Service, 1995

County of Henrico
Virginia

Prepared by the Henrico County Planning Office - August , 2001.



Highly Erodible Soils Areas

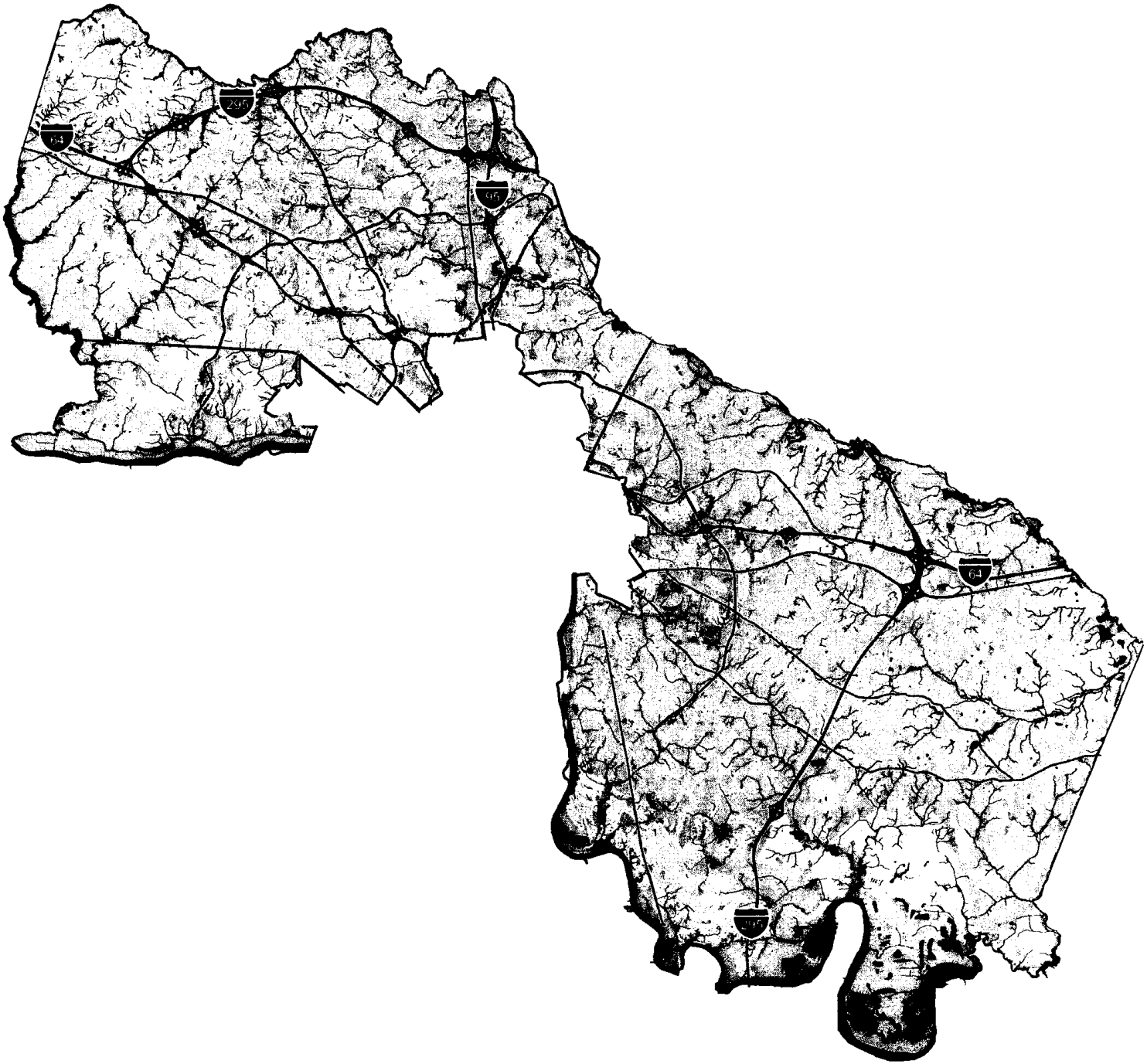
1 0 1 2 Miles

Highly Erodible Soils
Urban Land - Not Rated
Water Body
Major Roads

Data Source: USDA-NRCS Soil Survey of Henrico County, 1975

County of Henrico
Virginia

Prepared by the Henrico County Planning Office - August , 2001.



Highly Permeable Soils Areas

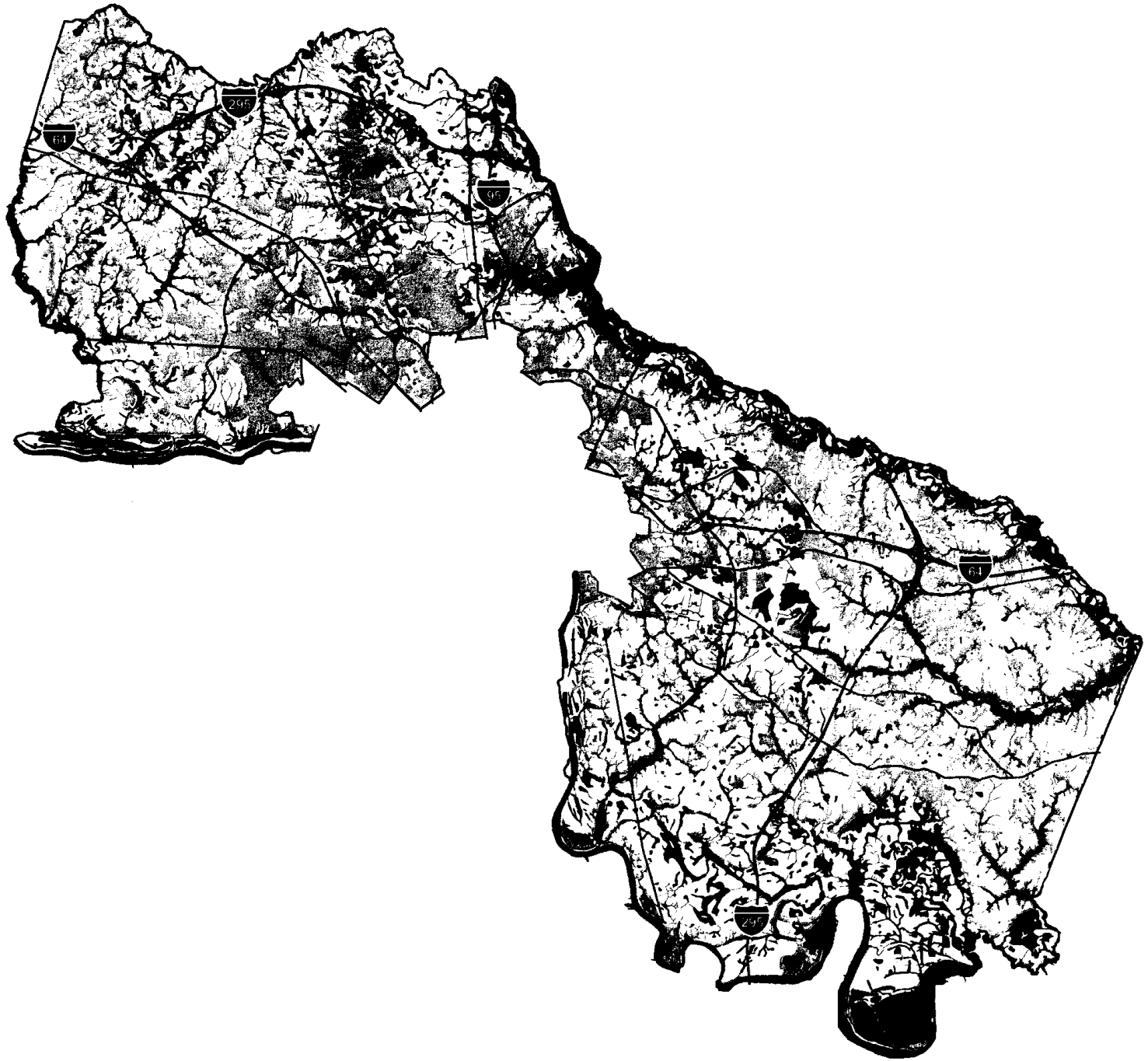
1 0 1 2 Miles

Highly Permeable Soils
Water Body
Major Roads

Data Source: USDA-NRCS Soil Survey of Henrico County, 1975

County of Henrico
Virginia

Prepared by the Henrico County Planning Office - August , 2001.



Hydric Soils

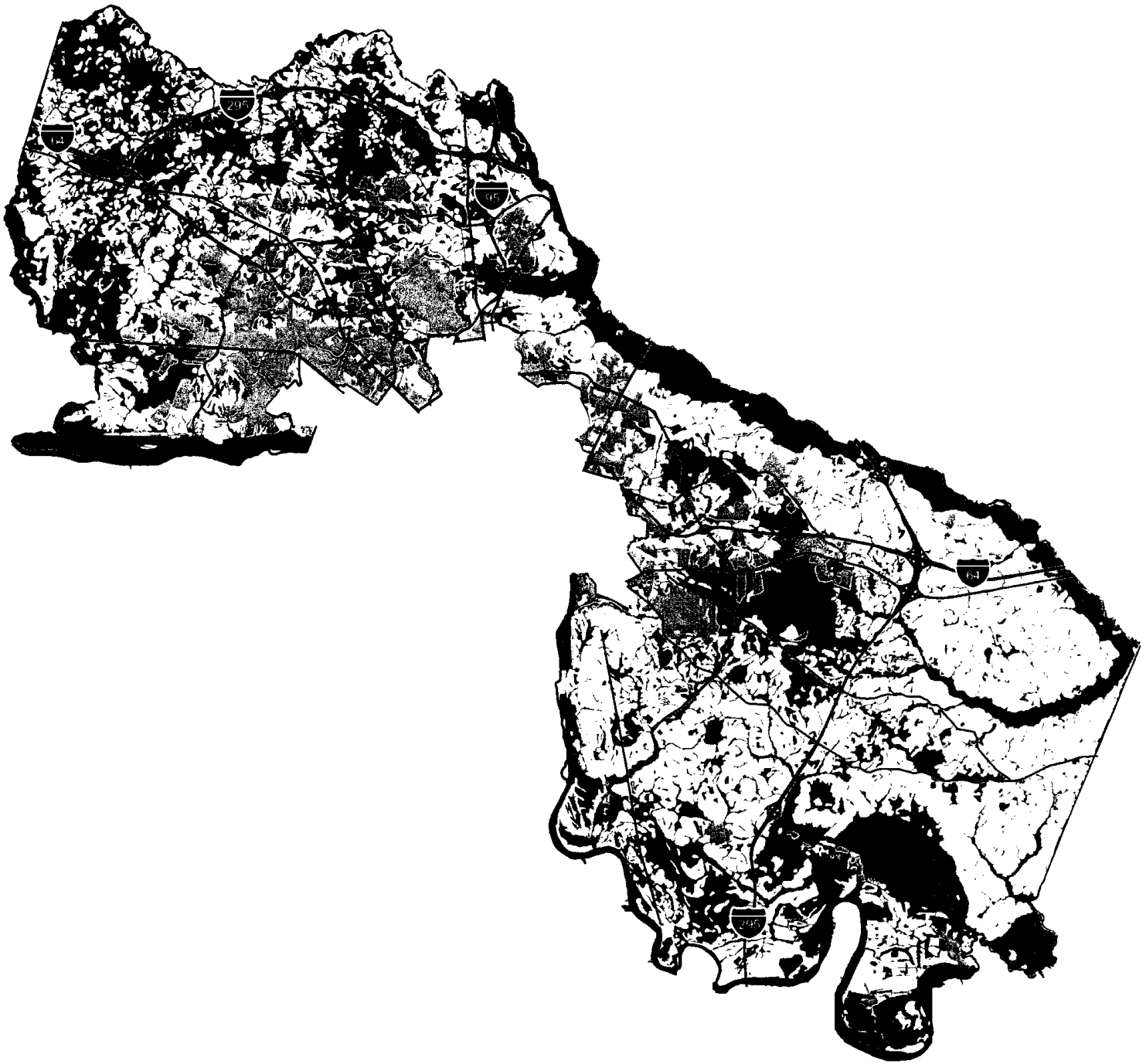
1 0 1 2 Miles

Hydric Soils Rating
- Hydric
- Not Rated
- Water Body
- Major Roads

Data Source: USDA-NRCS Soil Survey of Henrico County, 1975

County of Henrico
Virginia

Prepared by the Henrico County Planning Office - August , 2001.



Septic Absorption Limitations

1 0 1 2 Miles

Soil Septic Limitations
- Very Limited
- Somewhat Limited
- Not Rated
- Water Body
- Major Roads

Data Source: USDA-NRCS Soil Survey of Henrico County, 1975

County of Henrico
Virginia

Prepared by the Henrico County Planning Office - August , 2001.