Lancaster County Suitability of Land for Development Study and Plan

Lancaster County, VA
September, 1995

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Suitability of Land for Development

Lancaster County covers 134.8 square miles or approximately 86,267 acres of land. The County is rural in nature with little public infrastructure such as public water supplies and sewage collection/treatment works. Due to this lack of public infrastructure, development in Lancaster County usually requires on-site sewage facilities for disposal of waste and individual or community wells for domestic water supplies. Therefore, development of land in Lancaster County is closely tied to the physical characteristics of the land. These characteristics include the suitablility of the soil for septic systems, the degree of slope of the land, the depth of the soil to the watertable, the shrink-swell potential of the soil, and the proximity of the intended development to sensitive environmental features.

Sometimes the physical characteristics can act to preclude development such as when a parcel of land has steep slopes, wetlands, no suitable septic sites, or the presence of other environmentally sensitive features. Often development can occur, but with sensitivity to the unique physical properties of the particular parcel. The overall goal of the Lancaster County Suitablility of Land for Development Plan is to provide a comprehensive base of information concerning physical constraints to development in Lancaster County. This base will provide a resource from which to draw policies and recommendations concerning future development in the County.

I. Lancaster County Suitability of Land for Development Study

A. Constraints to Development

1. Chesapeake Bay Preservation Areas

The Chesapeake Bay Preservation Act of 1988 required each county in Tidewater Virginia to designate land areas in their county which, if improperly developed, would contribute to significant degradation of the water quality of the Chesapeake Bay and its tributaries. The required Chesapeake Bay Preservation Areas were broken into two classifications: Resource Protection Areas (RPAs) and Resource Management Areas (RMAs). Resource Protection Areas are those lands and features which have a **direct** water quality function or impact. Resource Management Areas are lands which, if not properly managed, have the **potential** to degrade water quality or impact the functioning of RPAs. Detailed descriptions of the two Chesapeake Bay Preservation Areas and lands included in each are given below.

a. Resource Protection Area (RPA)

The RPA is a landward 100' buffer area which is located adjacent to all tidal waters and wetlands in the County, as well as non-tidal wetlands connected by surface flow and contiguous to tidal wetlands or tributary streams. This buffer area acts to filter run-off from developed areas, to provide natural stabilization of soils from forces of tidal and upland erosion, and to provide a setback which protect dwellings from erosion, wave action, and flooding. The total amount of land designated as RPAs in Lancaster County is estimated to be 3,356 acres.

Resource Protection Areas are strictly regulated. Development in the RPA is limited to new water-dependent facilities, expansion of existing water-dependent facilities, and redevelopment. In the RPA, a 100 foot buffer area of vegetation that is effective in limiting runoff, preventing erosion, and filtering non-point source pollution from runoff must be retained if already present, or established if it does not exist. Clearing in the RPA is limited to what is necessary to provide for reasonable views of the water, access to the water, and for general woodland management purposes. Cleared vegetation must be replaced with other vegetation which is equally effective in protecting water quality.

b. Resource Management Area (RMA)

In Lancaster County all land outside of the designated RPA is classified as a Resource Management Area. The RMA is protected by the Chesapeake Bay Preservation Act and the Lancaster County Zoning Ordinance through the establishment of performance standards which apply to all development and redevelopment.

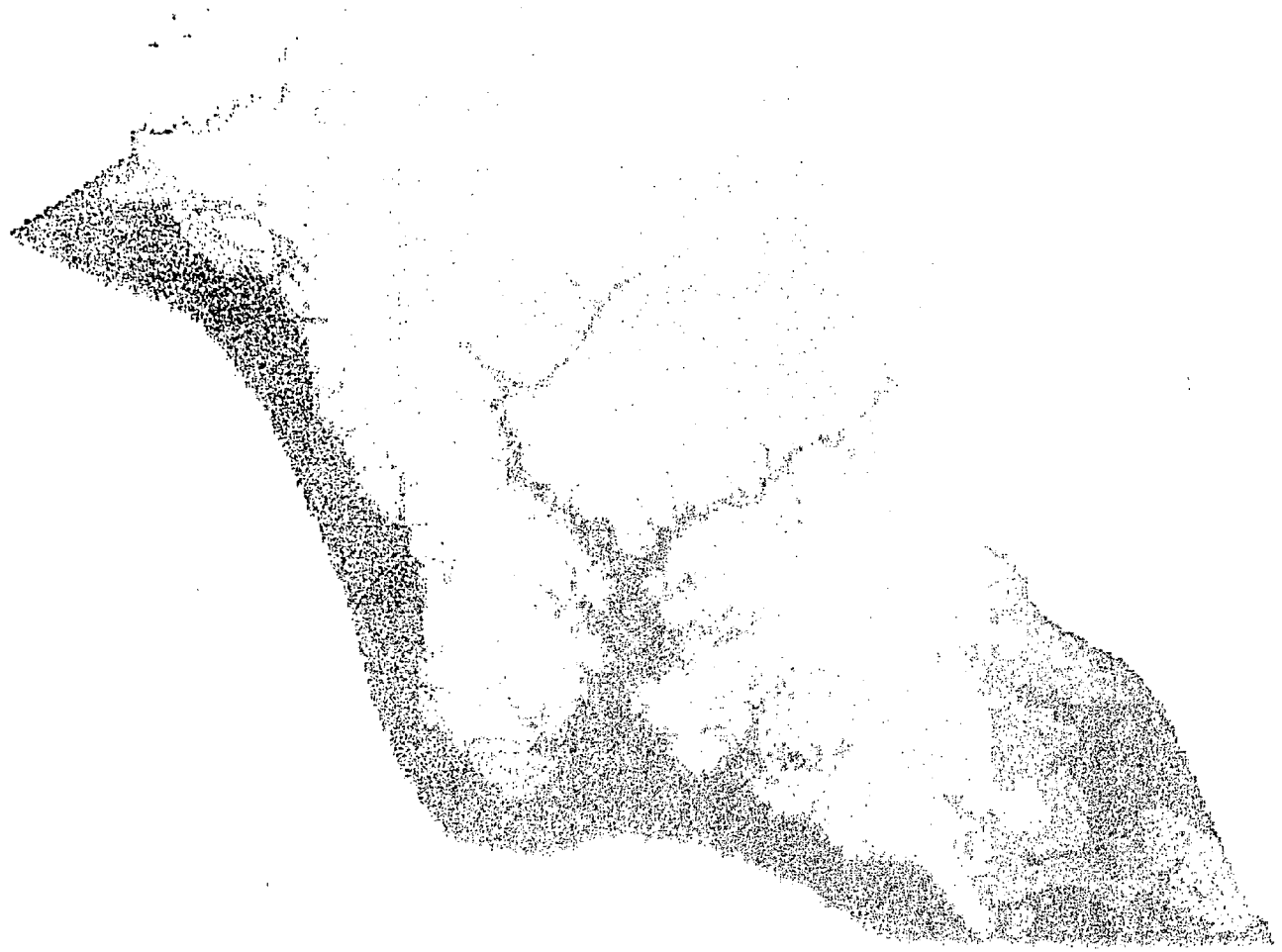
Generally, the performance standards require that no more land should be disturbed than is necessary to provide for the desired use or development. Additionally, on-site impervious cover must be minimized, indigenous vegetation must be preserved (if possible), on-site sewage disposal systems not requiring a VPDES permit must be pumped at out least once every five years, an on-site 100% reserve sewage disposal site must be provided, stormwater runoff must be controlled with use of best management practices, and on lands where agricultural activity is taking place a soil and water quality conservation plan is required.

2. Flood-Prone Areas

Due to its proximity to large tidal bodies of water, Lancaster County has a number of flood prone areas. Damage from flood waters in these areas can result in expensive repairs to structures, loss of use of structures (damaged homes), temporarily inoperable septic systems, contamination of water supplies, and quite possibly in bodily injury or loss of life. These are problems which can be further aggravated by the cumulative impact of development in flood-prone areas.

Once developed, land in the flood plain is lost as an area of filtration due to the resulting placement of structures and impervious cover. The result is that flood events can cause more damage than they did prior to development. For example, flood water will travel faster and crest higher if water is not allowed to filtrate into the ground, or travel down streams unimpeded from man-made structures. The increased velocity of flood waters can result in increased damage to properties and the higher flood elevations could result in damage to properties which were not affected previously.

In all, the County has approximately 12,448 acres, or 19.45 square miles, of land which lies within the 100 year flood plain. These areas are highlighted in the "100 Year Flood Map" and are summarized in the chart below.



100 Year Flood Areas

Water

100 Year Flood Area

Outside Flood Area

Lancaster Co., VA

July, 1995

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Office

Sources:
Digital Elevation Layer
ISSL Lab. VPI&SU

	Area in Acres	% of County
100 Year Flood Plain	12,448.02	14.43
Outside 100 Year Flood Plain	73,818.68	85.57
Total	86,266.70	100.00

3. Wetlands

Wetlands are defined by the United States Fish and Wildlife Service as "lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water" (Pg. 4, Atlas of National Wetlands Inventory Maps of Chesapeake Bay. U.S. Fish and Wildlife Services; September, 1986.). Generally, wetlands can be classified as either tidal or non-tidal. Locally, Lancaster County has approximately 4,504 acres of tidal wetlands and 1,349.26 acres of non-tidal wetlands (Figures were obtained using the Lancaster County Geographic Information System utilizing a digital National Wetland Inventory map layer). (Distribution of tidal and non-tidal wetlands in Lancaster County can be viewed on the "Tidal and Non-tidal Wetlands" Map.)

Wetlands are important natural resources which provide many positive benefits to the man-made and natural environments. Wetlands provide aesthetic, recreational, and economic benefits to the community. Furthermore, wetlands are spawning and nursery grounds for finfish and shellfish, feeding and wintering sites for migratory waterfowl, nesting habitat for shore birds, and homes to a wide variety of wildlife. Wetlands further serve as important areas for groundwater recharge, flood control, pollution absorption, and retention of sediment from stormwater run-off (Pg 1, Atlas of National Wetlands Inventory Maps of Chesapeake Bay. U.S. Fish and Wildlife Services; September, 1986.).

4. Steep Slopes

Development and disturbance of land on steep slopes (over 15%) can have many negative impacts. First, stabilization of soils after development is often costly and difficult due to the fact that highly erodible soils are often found on steep slopes. Disturbance of these areas can result in run-off of soils causing sedimentation of drainage courses surface water bodies. Furthermore, steep slopes, and the soils found there, are not suitable for septic systems. The combination of unstable soils and poor septic suitablility can result in higher construction costs if development is allowed to occur.

In Lancaster County, steep slopes are often found adjacent to the tributary streams and creeks of the Rappahannock River and Chesapeake Bay. In the County there is 19,414.8 acres of land which are classified as steep slopes. These areas can be seen in more detail on the "Slope Map"

LEGEND

Deepwater
Non-Tidal
Tidal
Upland

Tidal and Non-Tidal Wetlands

LANCASTER COUNTY, VA

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April, 1995

and are summarized in the following chart.

Degree of Slope	Area in Acres	% of County
0 - 6%	56,762.70	65.80
6 - 15%	10,002.40	11.59
15 - 45%	15,651.80	18.14
6 - 45%	3,763.00	4.36
N/A	87.16	0.10
Total	86,266.70	100.00

5. Shrink-Swell Soils

Shrink-swell soils are those which can greatly change in volume when their moisture level fluctuates normally throughout the year. The shrink-swell potential of the soil is a measurement of how much volume change can be expected in a soil with an increase or decrease in moisture levels. This measurement is important because continued expansion of shrink-swell soil can result in heaving, which places additional pressure on foundations. Contraction of these soils can lead to void areas which do not provide uniform, adequate support to the footing of the foundation.

The shrink-swell potential of Lancaster County soils was mapped using the County's Geographic Information Systems and the Lancaster and Northumberland Counties Soil Survey. Soil types in the County were studied as to their shrink-swell potential up to depths of 60". Sixty inches was chosen to account for any change in grade along the length of any planned or future structures. If any soil type was classified as having high shrink-swell potential anywhere in this 60" range, it was grouped in the "high" category. The extent of shrink-swell soils in Lancaster County can be seen on the "Shrink-Swell Potential Map" and are further described in the following chart.

Shrink-Swell Potential	Area in Acres	% of County
None	415.70	0.48
Low	24,991.90	28.97
Moderate	56,201.20	65.15
High	4,571.10	5.30
N/A	86.80	0.10
Total	86,266.70	100.00

Shrink–Swell Potential

- None
- Low
- Moderate
- High
- N/A

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Sources:
ISSL Lab, VPI&SU
Lancaster County
Soil Survey

Slope Map

0 — 6% Slopes

6 — 15% Slopes

15 — 45% Slopes

6 — 45% Slopes

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Sources:
ISSL Lab, VPI&SU
Lancaster County
Soil Survey

6. Septic Suitability

Septic Systems/Sewage Disposal

Approximately 83% of all private residences in Lancaster County utilize septic systems for sewage disposal purposes. The chart below gives some indication of the actual numbers of septic systems in the County and if they are located in or outside of the three towns.

Septic/Cesspool for Sewage Disposal
Lancaster County, VA - 1990

Towns	534	51.90% of Housing Units in Towns
County	4,370	89.38% of Housing Units in County
Total	4,904	82.87% of all Housing Units

Source: 1990 United States Census Statistics.

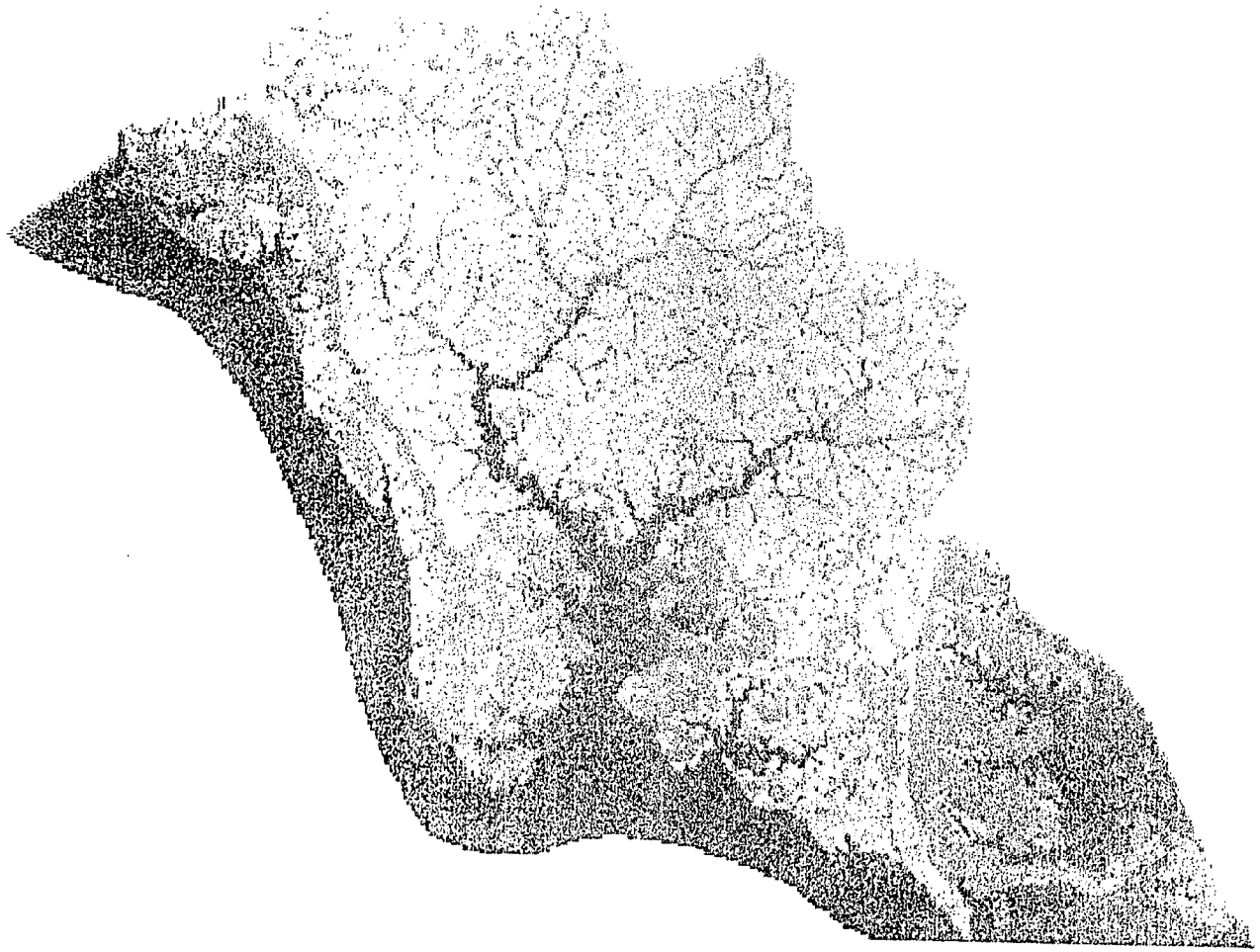
The potential for septic systems causing pollution of surface water bodies can stem from the initial improper siting of the system, or from the failing of aged or not properly maintained systems. Often septic systems have been placed in soils which can act to heighten the negative impact of the system. Specific soil characteristics which can impact operation of septic systems are discussed below.

a. Depth to Watertable

Depth to the watertable varies greatly throughout Lancaster County. In some areas of Lancaster County the seasonal high water level is as much as 40 or more feet below the ground surface. However, in other areas of the County the seasonal high water table is often less than 24 inches from the ground surface. The depth to the watertable is important because soils where the watertable is higher are not suitable for the use of septic systems.

First, in areas with high water tables, groundwater can rise into septic drainfields and intermix with untreated effluent. This situation can result in contamination of the water table aquifer which is used by 1,679, or 28.37%, of all homes in Lancaster County. Additionally, septic systems in areas with seasonally high water tables can act to contaminate nearby surface water bodies. During times of high water table levels, effluent in an effected system is not able to percolate down through the drainfield. Instead the effluent can rise to surface untreated and pool because of the high water table. During a rain storm, this pooled effluent can quickly drain into nearby surface water bodies.

Areas in Lancaster County with high water tables can be viewed in the "Depth to Water Table Map" and are further summarized in the following chart.



Depth to Watertable*

- < 24 inches
- > 24 inches
- Not Ranked

Lancaster Co., VA
July, 1995

* Depth Measured at Seasonal High Water Level

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Lancaster County
Planning and Land Use
Office

Sources:
ISSL Lab, VPI&SU
Lancaster County
Soil Survey

	Area in Acres	% of County
< 24" to Water Table	24,386.30	28.27
> 24" to Water Table	61,793.60	71.63
N/A	86.80	0.10
Total	86,266.70	100.00

b. Highly Permeable Soils

Highly permeable soils also can act to increase negative impacts of septic systems. These soils allow septic effluent to percolate more quickly through soils underneath the drainfield, while not allowing for proper filtration. If the effluent percolates before it is properly treated then it can become a threat to the ground or surface water which it acts to recharge.

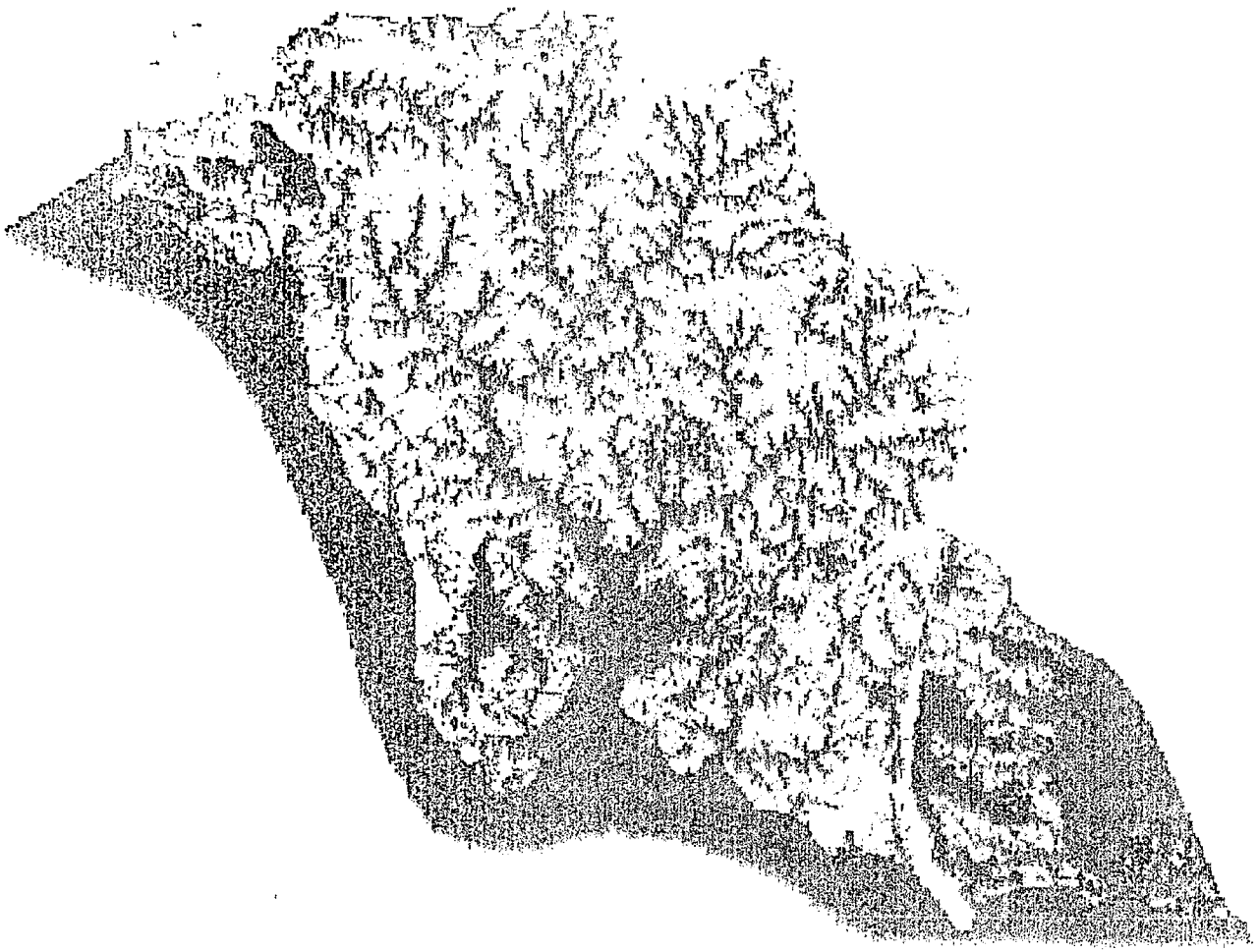
The combination of high water tables and highly permeable soils is particularly a problem in densely developed areas close to the county's shoreline. The high number of septic systems in conjunction with poor soil conditions can lead to elevated levels of fecal coliform bacteria in adjacent surface water bodies, which can then result in the condemnation of the area for shellfishing. (See "Septic Suitability Map")

Highly permeable soils in Lancaster County include the following types:

1. Coastal Beach (0.48%)
2. Dragston fine sandy loam (3.19%)
3. Lakeland loamy fine sand, gently sloping (0.61%)
4. Rumford loamy sand, gently sloping (0.16%)
5. Rumford loamy sand, sloping, eroded (0.05%)
6. Sloping sandy land (9.26%)
7. Steep sandy land (18.13%)

c. Low Permeability Soil

Clayey soils with low permeability are not desirable for septic systems. These types of soils do not allow effluent to percolate down properly out of the drainfield. If the effluent does not percolate down through the system's drainfield because of low permeability soil conditions, it could instead rise to the surface. This is an undesirable situation, which can be worsened in times of run-off when untreated effluent can runoff into nearby surface water bodies. (See "Septic Suitability Map")



Septic Suitability

- Poor
- Fair to Poor
- Fair
- Good
- N/A

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July, 1995

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Created By:
Lancaster County
Planning and Land Use
Office

Sources:
ISSL Lab, VPI&SU
Lancaster &
Northumberland
Cos. Soil Survey

d. Steep Slopes

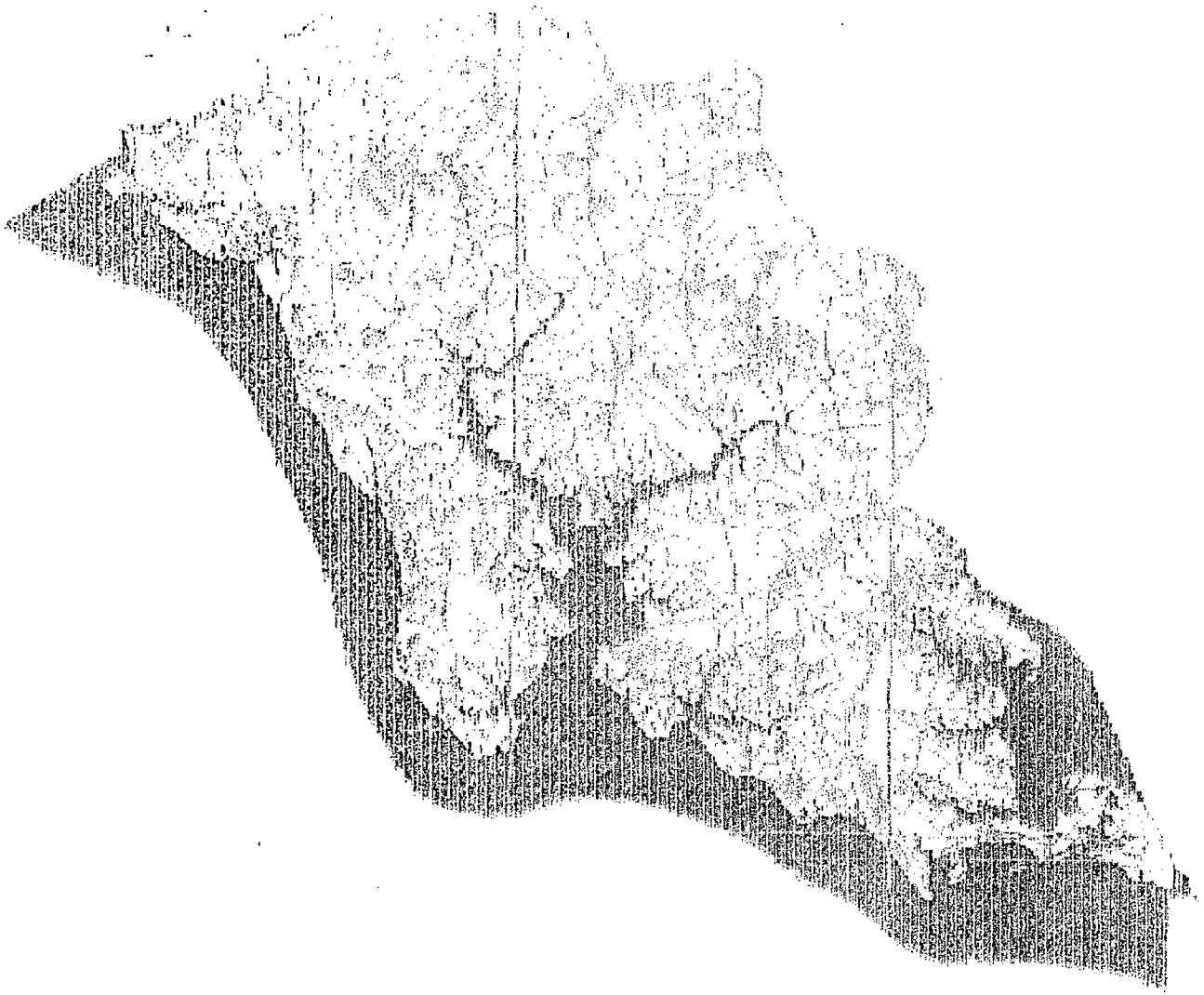
As discussed in the "Steep Slopes" Section, areas of steep slopes are not suitable for the placement of septic systems. Generally, septic systems need level areas for drainfields. Septic systems placed on slopes do not allow for the proper treatment of waste water because the resulting effluent will travel down-hill to the end of drainfield, where it can leach out, instead of slowly and evenly percolating through the entire length of the drainfield. (See "Slope Map" and Chart)

Septic Suitability	Area in Acres	% of County
Poor	30,336.10	35.17
Fair to Poor	742.20	0.86
Fair	21,901.80	25.39
Good	31,452.00	36.46
N/A	1,834.60	2.13
Total	86,266.70	100.00

7. Prime Farmlands

Lancaster County has a rich history of agriculture dating back to the Colonial Era. Agriculture and related services are important contributors to the local economy. Even though their role in the local economy has diminished, farms in Lancaster County still serve many important purposes. First, farmlands provide an aesthetically pleasing landscape, which is enjoyed by all residents of the County. The 1992 adopted comprehensive plan cites farmlands as strong contributors to the County's rural nature. Additionally, farmlands play an important environmental function in that they are prime areas for recharge of the County's groundwater aquifers. Areas of undeveloped, pervious land, such as woodland and farmland, are necessary for the purposes of aquifer recharge. It is because of these important roles that the 1992 Comprehensive Plan identified farmlands as resources which are worthy of conservation and preservation.

However, lands which have historically supported agriculture in Lancaster County are also the lands which are the most suitable for development. Lands in agricultural use are usually level, cleared, well drained, and consist of soils suitable for septic systems. These are conditions which are usually sought for other land uses such as residential development. This is further evident when it is seen that of the 42,929.59 acres of land in Lancaster County considered to prime for agricultural activity, only 17,014.13 acres were still in use in 1990 for farming purposes.



Prime Farmlands

Prime Farmland

Other Land

Water

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Sources:
ISSL Lab, VPI&SU
Lancaster County
Soil Survey

The Lancaster and Northumberland Counties Soils Survey ranks soils as to their potential for farming. The soils are grouped into eight different "capability units" which classify soils concerning their suitability for farming. The classifications are based on the limitations of the soils, the risk of damage when they are used, and the way they respond to treatment. Class I soils are the best soils for farming, descending to Class VIII soils which have limitations which make them unsuitable for farming, as well as most other uses. For purposes of this plan, all Class I and some Class II soils were considered to be prime soils for agriculture. Areas of prime agricultural soils can seen in the "Prime Farmlands" Map and are further detailed in the following chart. (A list of soil types which are considered prime for agricultural activity can be seen in the Appendix.)

Type of Land	Area in Acres	% of County
Prime Agricultural Land Being Farmed	17,014.13	19.72
Other Land Being Farmed	4,591.37	5.32
Prime Agricultural Land in Other Use	25,915.46	30.04
Other Land/ Other Use	38,745.74	44.91
Total	86,266.70	100.00

B. Existing Lancaster County Ordinances

1. Erosion and Sediment Control Ordinance

The Lancaster County Erosion and Sediment Control Ordinance establishes a program to protect and improve the water quality of the Chesapeake Bay which can be implemented on the local level. The ordinance regulates any land disturbance resulting in the disturbance of an area equal to or greater than 2,500 square feet in size. Before any site disturbance occurs an erosion and sediment control plan for the site must be submitted and approved by the County's erosion and sediment control officer. Furthermore, all land disturbing activities must comply with article 21, Chesapeake Bay Preservation, of the Lancaster County Zoning Ordinance.

2. Zoning Ordinance

a. Waterfront Residential Overlay Zone (Article 18)

The Waterfront Overlay Zone regulates all parcels of land recorded on or after May 11, 1988 which are for residential use or residential development and which lie within 800 feet of tidal waters and wetlands. This zone requires lots to have a 2 acre minimum size. Additionally, the zone requires a 100 foot waterside buffers from high water mark, tidal wetlands, and non-tidal wetlands, as wells as a 200 foot wide average waterfront requirement for new subdivision lots.

b. Chesapeake Bay Preservation (Article 21)

This zone and its requirements were discussed in the "Chesapeake Bay Preservation Areas" section on pages 1 and 2.

c. Flood Plain Overlay (Article 23)

The Flood Plain Overlay Zone applies to all lands within the County which are identified as being in the 100-year floodplain by the Federal Insurance Administration. All activities in the flood plain district can be undertaken only after issuance of a zoning permit, and any development has to strictly comply with the Virginia Statewide Building Code and the Lancaster County Subdivision Ordinance. All applications for development and building permits in the floodplain further require submission of a site plan. The site plan must detail the existing and proposed topography on the site, the 100 year flood elevation, and the elevation of the first floor.

3. Subdivision Ordinance

The Subdivision Ordinance of Lancaster County recognizes that the County's economic viability is dependent on the wise use of its land and other natural resources. Many water quality related issues are addressed by this ordinance including the proper siting of wastewater disposal systems, assurances of strict adherence to the requirements of the Chesapeake Bay Preservation Act, and the adequate provision of proper erosion and sedimentation control, drainage, stormwater management and flood control.

4. Wetlands (Article III., Environmental Ordinance; Lancaster County Code)

The Wetlands Ordinance of Lancaster County applies to all tidal, non-vegetated and vegetated wetlands in Lancaster County. This ordinance requires any person pursuing a permitted use in a wetlands area, to first file an application with the Lancaster County Wetlands Board or the Virginia Marine Resources Commission. The permit application details the intended use, the scale of the project, equipment to be used in construction and how the equipment will access the site, the cost of the project, the purpose of the project, and other applicable information. After submittal of the application, the proposed project will go to public hearing at a regularly scheduled meeting of the Lancaster County Wetlands Board, which has the authority to either approve or deny the permit application.

II. Assessment of Existing Conditions

Lancaster County is rural in nature and has little public infrastructure such as wastewater treatment plants and public water supplies to service existing or new development. Development in Lancaster County is closely tied to the physical characteristics of the site to be developed. This close bond with the land is further magnified by the wide variety of environmentally sensitive areas found in the County including steep slopes, flood plains, prime agricultural lands, wetlands, and soils not suitable for septic systems. In all 56,228.53 acres or 65.2% of Lancaster County land is limited in some form. There is still a large quantity of land which has no limitations and is suitable for development. In total 30,038.17 acres or 34.8% of Lancaster County land has no physical constraints to development. These areas can be seen on the "Areas with Development Limitations" Map, and the accompanying inset maps.

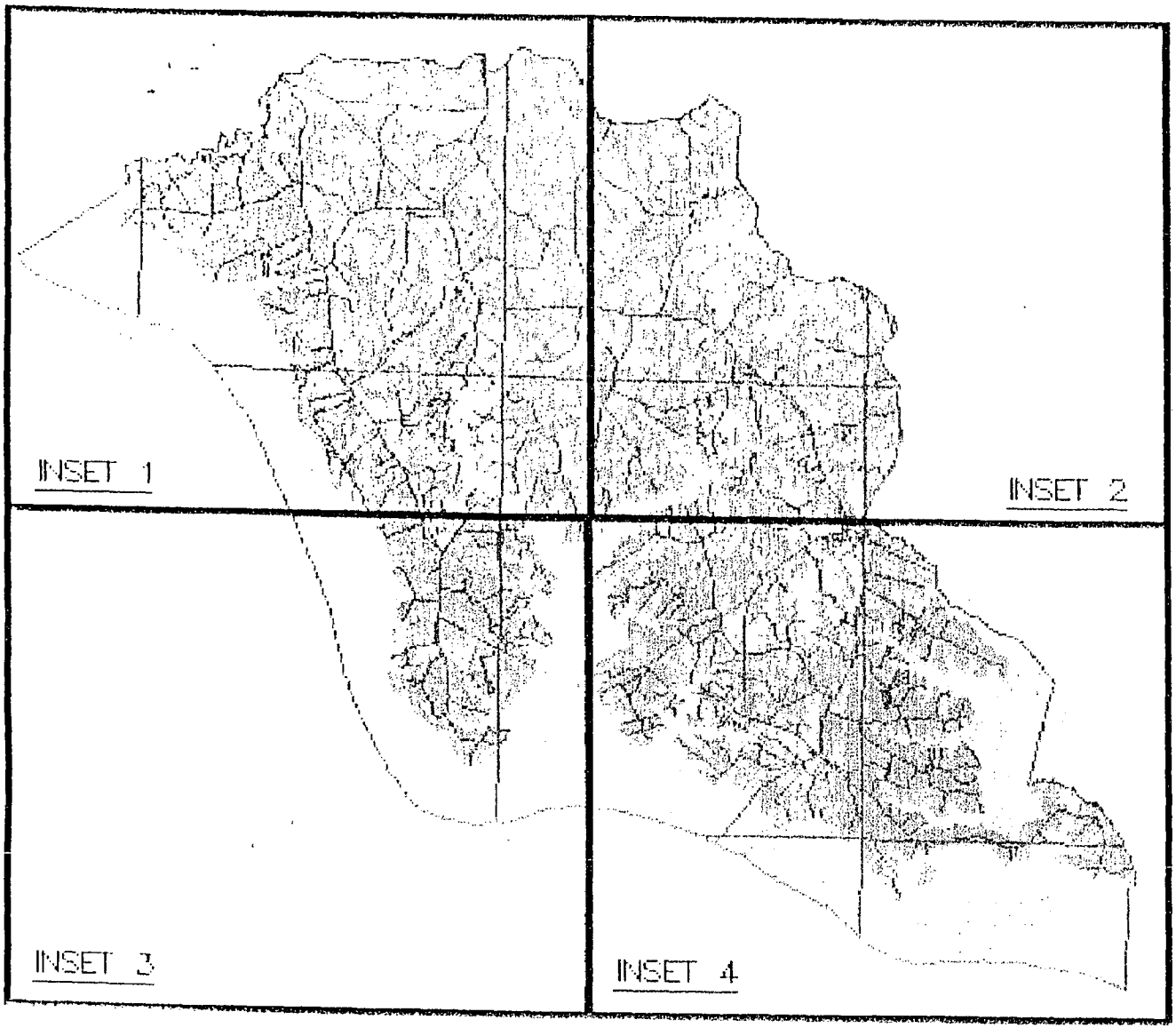
A. Physical Constraints to Development

Specific physical limitations to development which should cause concern in Lancaster County include the suitablility of soils for septic systems, the loss of prime agricultural farmlands to development, and the presence and location of shrink-swell soils in Lancaster County.

Approximately 30,336.10 acres, or 35.17%, of land in Lancaster County is classified as poor for suitability of its use for septic systems. Furthermore, approximately 83% of all private residences in Lancaster County are dependent on septic systems for their sewage disposal purposes. This number will only grow as land becomes developed, because outside of the Town of Kilmarnock there is no public sewage treatment service available. Therefore, continued protection of ground and surface water supplies in Lancaster County will be contingent on the proper siting of new septic systems. This is further significant because the water table aquifers (the Yorktown-Eastover and the Columbia), which are the ones most susceptible to contamination, are used by 1,679, or 28.37%, of all homes in Lancaster County.

Farmland in Lancaster County is a major contributor to the rural nature of which residents are so proud. However, of the 42,929.59 acres of land in Lancaster County considered to be prime for agricultural activity, only 17,014.13 acres were still in use in 1990 for farming purposes. This loss of farmland to other uses in Lancaster County is a trend which needs to be stabilized. Farmlands provide acres of pervious land surface which act as recharge areas for groundwater aquifers. As more land is developed, remaining recharge areas become increasingly important. This is of particular importance in Lancaster County, which is totally dependent on groundwater for its drinking water supply.

Shrink-swell soil can act to damage the foundations and walls of buildings, resulting in expensive repairs to affected structures. However, the negative impacts of shrink-swell soil can be prevented during the initial construction of a building, if the builder is aware of this soil condition. In Lancaster County there is approximately 4,571.10 acres (5.30% of the County), of soil with "high" shrink-swell potential. Awareness of this soil condition needs to be heightened in Lancaster County, in order to better protect property owners and their investments.



AREAS WITH
DEVELOPMENT LIMITATIONS

Limitations
No Limitations
Water

Lancaster Co., VA

August, 1995

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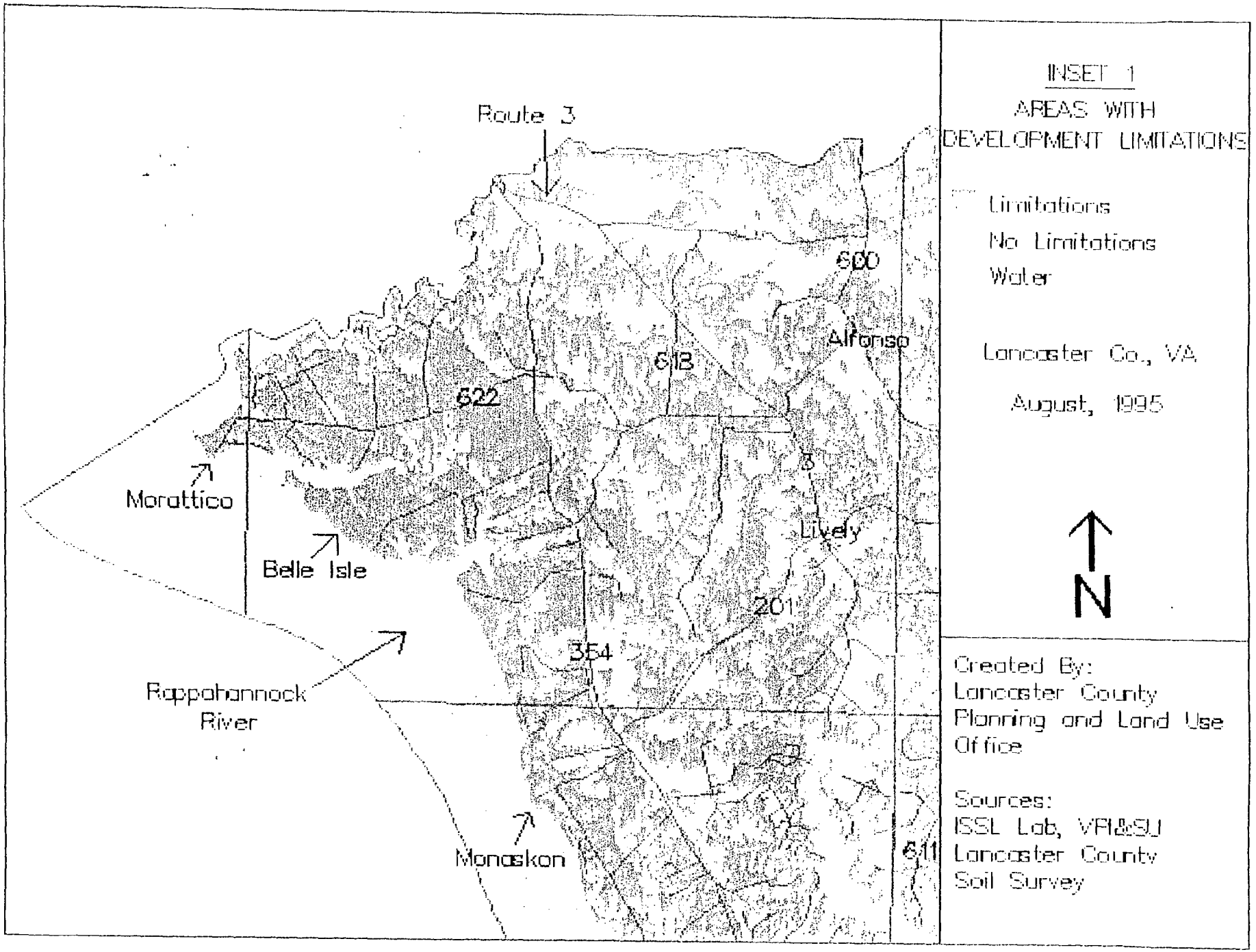
Sources:
VPI&SU, ISSL Lab
Lancaster County Soil
Survey



INSET 1

AREAS WITH
DEVELOPMENT LIMITATIONS

Limitations

No Limitations

Water

Lancaster Co., VA

August, 1995

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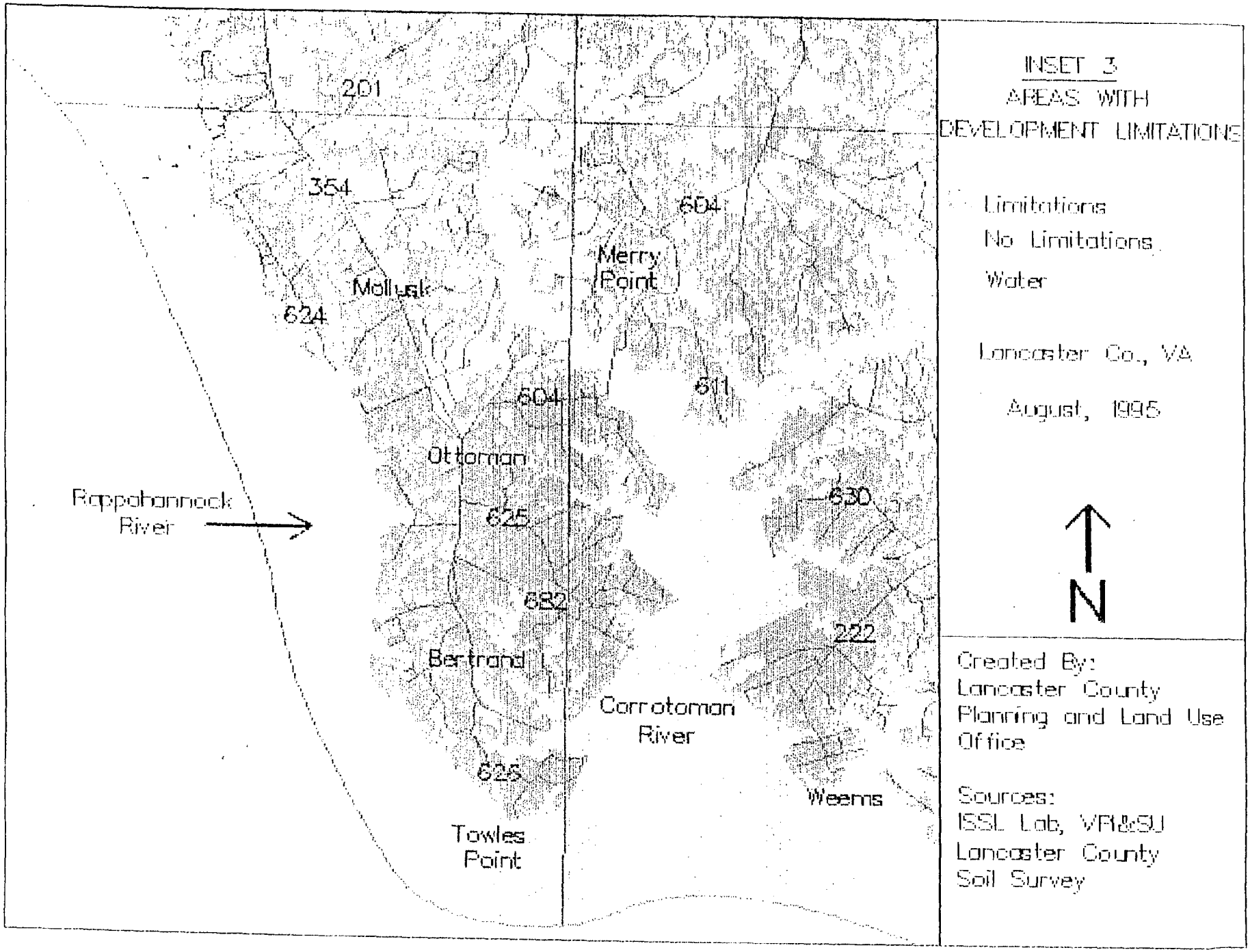
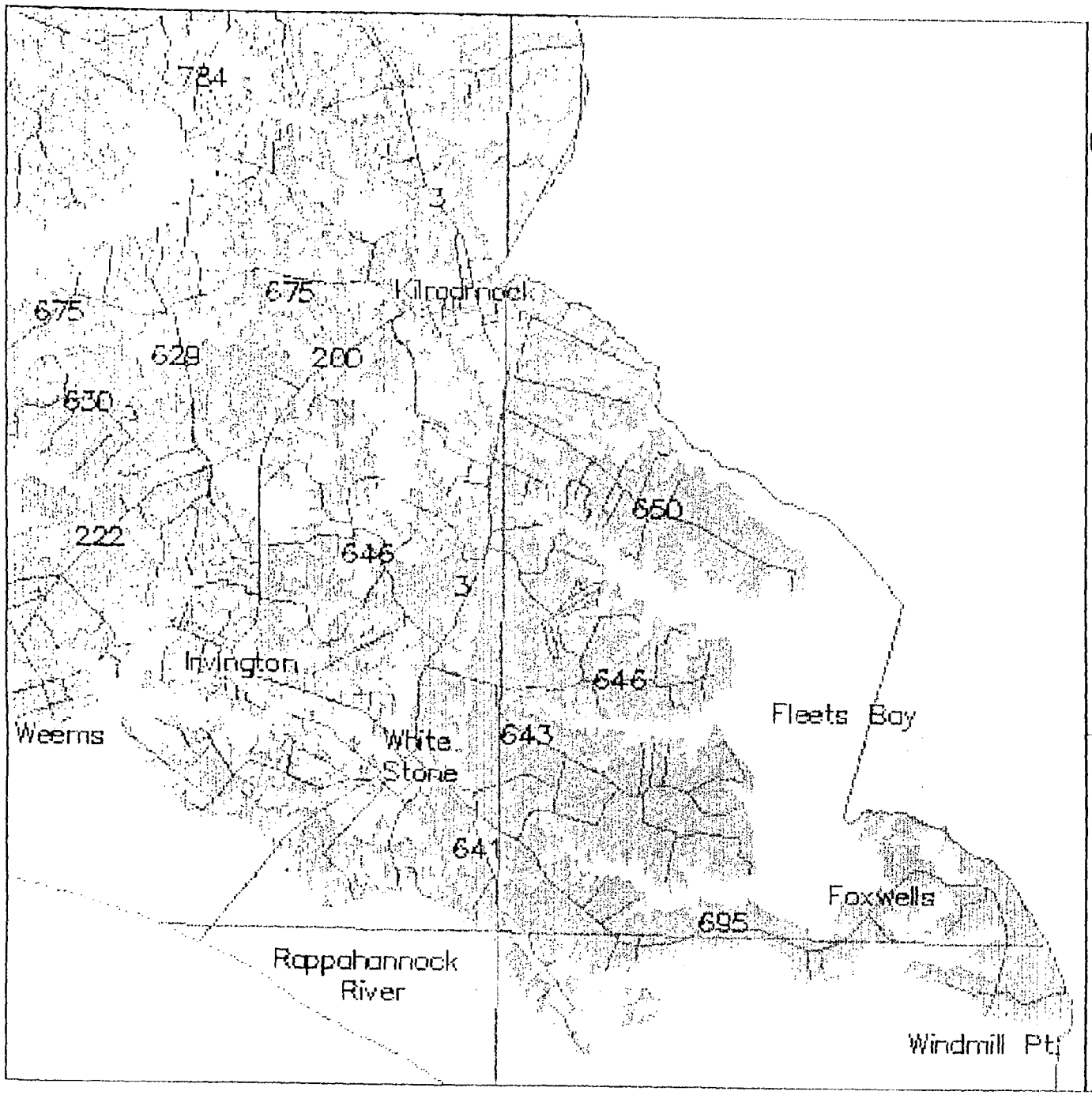
Planning and Land Use
Office

Sources:
ISSL Lab, VPI&SU
Lancaster County
Soil Survey


201
354
604
Merry Point
Mollusk
624
604
611
Ottoman
Rappahannock River
625
630
682
222
Bertrand
Corrotoman River
625
Weems
Towles Point
INSET 3
AREAS WITH DEVELOPMENT LIMITATIONS
Limitations
No Limitations
Water
Lancaster Co., VA
August, 1995
N
Created By:
Lancaster County Planning and Land Use Office
Sources:
ISSL Lab, VPI&SU
Lancaster County Soil Survey



INSET 4
AREAS WITH
DEVELOPMENT LIMITATIONS

Limitations
No Limitations
Water

Lancaster Co., VA

August, 1995

N

Created By:
Lancaster County
Planning and Land Use
Office

Sources:
ISSL Lab, VPI&SU
Lancaster County
Soil Survey

B. Existing County Ordinances

All new development in Lancaster County has to adhere to existing county ordinances and is often subject to the public hearing process. Lancaster County has many ordinances which regulate new and existing development including the Zoning Ordinance, the Wetlands Ordinance, the Subdivision Ordinance, and the Erosion and Sediment Control Ordinance. Included in the Zoning Ordinance are articles which deal specifically with Chesapeake Bay Preservation Areas, Flood Plain Areas, and parts of the County in the Waterfront Overlay District. Overall, Lancaster County's present ordinances are strong in the protection of water quality and the current level of enforcement is high.

C. Heightened Awareness

People in Lancaster County are very attuned to many environmental topics such as residential shoreline development, the Chesapeake Bay Preservation Regulations, the value of wetlands in protecting water quality, the location of flood-prone areas in the County, and the impact of land use on surface water quality. However, there is significantly less awareness of other sensitive environmental features which need to be considered in planning for new development. Many people in Lancaster County are not aware of the presence of shrink-swell soils in Lancaster County, the important role farmlands play in providing ground water recharge areas, the effect of development on steep slopes, and the impact of improper septic system placement on surface and groundwater supplies. Providing County residents this information, particularly in regard to their own property, will help them make environmentally sound decisions when considering new development on their lands.

The pace of development in Lancaster County, and the size of county is such that people developing sites have much interaction with County staff throughout the process. Having a system in place which enables County staff to warn citizens and potential property developers of limitations on their property, prior to development will prevent much of the negative impact of development before it occurs.

III. Goals and Objectives for Lancaster County Suitability of Land for Development Plan

Goal 1: **Encourage new development in areas of the County most suitable for new growth.**

Objective: Explore zoning incentives which help direct new development to areas of the County most suitable for growth.

Objective: Work in coordination with the local health department to inventory and map septic systems in the County to determine locations where there are already high concentrations of systems in use.

Goal 2: **Develop a county-wide, parcel specific information system which details physical constraints present on each parcel.**

Objective: Utilize the physical constraints database at the onset of the development process to better advise property owners/developers of on-site limitations, and possible solutions to these limitations.

Objective: Use the physical constraints database to heighten citizen awareness of soil limitations found in the county; such as soils with poor septic suitability, "high" shrink-swell potential, and high watertables.

Objective: Explore possible amendments to the zoning ordinance which would protect property owners from potential hazards of shrink-swell soil and high watertables.

Goal 3: **Assure that new development is designed in a manner which provides for continued protection of the surface and groundwater resources of Lancaster County and the State of Virginia.**

Objective: Continue consistent enforcement of the Chesapeake Bay Preservation Act and Erosion and Sediment Control Act Regulations to assure protection of the water quality of the Chesapeake Bay and its tributaries.

Objective: Continue review of local land use ordinances to assure that ordinances allow for siting of septic systems in the best location on new lots, and in the area of soils most suitable for their operation.

Objective: Explore possible water impoundment areas presented in the Lancaster County Protection of Potable Water Supply Plan.

Objective: Support enhancement of county ordinances to protect proposed impoundment areas.

Objective: Explore feasible methods of preserving prime farmlands in Lancaster County in order to protect groundwater recharge areas.

Objective: Encourage re-use and rehabilitation of existing, vacant structures in order to limit need for new construction and increases in impervious surface cover in the County.

IV. Lancaster County Suitability of Land for Development Plan

A. Physical Constraints/Limitations Database

To assure that new development occurs with full knowledge of site constraints prior to development occurring, it is recommended that the County develop a county-wide, parcel specific database highlighting the physical constraints present on each parcel of land. County staff can utilize the County's Geographic Information System in developing a customized database which can show the different types of limitations present on individual properties. Furthermore, this database can be used to make printouts which can be checked when property owners come in at the start of the development process. The printout can be similar in style to the current Lancaster County Strip Files, or it can be done as an addition to the Strip Files. The printout will let County staff and property owners know if there is the possibility of a physical constraint on the property at the onset of development plans. Alternative plans made necessary by the limitation can then be discussed at this point in the development process. Implementations of this type of system will save time in the initial planning stages, will save property owners from having to make costly repairs at a later date, and will prevent possible negative environmental impacts of development before they occur.

B. Septic System Inventory

To help identify areas of the county where there are already high concentrations of septic systems, it is recommended that Lancaster County inventory and map existing septic systems in the County. Information obtained from this inventory would be valuable in developing a future land use map for Lancaster County. Additionally, once compiled this information would aid in any future efforts to identify and prioritize areas for efficient placement of a waste water treatment works. This recommendation is further coordinated with a similar proposal in the Lancaster County Protection of Potable Water Supply Study and Plan, which was put forth to assure continued protection of Lancaster County's surface and groundwater resources. The proposed inventory would help to pinpoint high concentrations of septic systems in the County, which could act cumulatively to negatively impact the quality of Lancaster's surface and groundwater supplies.

C. Continue Present Enforcement and Planning Levels

To assure continued protection of the quality of Lancaster County's surface water bodies, it is recommended that the County continue its present, active enforcement of the Chesapeake Bay Preservation and Erosion & Sediment Control Ordinances.

D. Encourage Re-use of Suitable Abandoned Structures in County

To limit the need for new construction on undeveloped sites, and to limit increases in the amount of impervious surface cover in the County it is recommended that Lancaster County strongly

encourages re-use and rehabilitation of suitable, abandoned structures. This proposal is designed to serve many purposes. First, these properties are sometimes safety hazards and often have abandoned wells. Improvements to the on-site water and sewage facilities at these structures would act to protect water quality in Lancaster County. Additionally, improvements to abandoned properties would result in increased assessments, and in turn increased tax revenue. Lastly, by using an existing structure the user prevents undeveloped land from being developed at that time, and also prevents an increase in impervious surface cover in Lancaster County.

E. Investigate Feasible Methods of Preserving Prime Farmland in Lancaster County.
To assure continued protection of the quality of groundwater supplies and to assure that farming remains a viable occupation in the County, it is recommended that the County explore feasible methods of preserving prime farmland in Lancaster County. This proposal would look to expand utilization of the existing land use taxation program in Lancaster County, as well as explore new methods for farmland preservation.

F. Identify Possible Impoundment Areas
This recommendation would be carried out in conjunction with the similar proposal put forth in the Lancaster County Protection of Potable Water Supply Plan. It is further recommended that the County explore strengthened county ordinances to assure protection of proposed impoundment areas.

APPENDIX

Lancaster County Soils

Soil Type	Area (Acres)	% of Co.'s Soil	Septic Suitability	Slope	Depth to Seasonal High Watertable	Perm.	Shrink /Swell
BeA	497.20	0.58	Poor	0 - 2%	1-2'	Mod./Slow	Low
BeB	9.60	0.01	Poor	2 - 6%	1-2'	Mod./Slow	Moderate
BeB2	344.00	0.40	Poor	2 - 6%	1-2'	Mod./Slow	Moderate
Br	1,869.20	2.17	Poor	0 - 2%	1.5'	Moderate	Moderate
CaC3	43.70	0.05	Fr to Pr	6 - 10%	10'	Mod./Slow	High
CaD3	152.70	0.18	Fr to Pr	10 - 15%	10'	Slow	High
CfB2	400.60	0.46	Fr to Pr	2 - 6%	10'	Slow	High
CfC2	145.20	0.17	Fr to Pr	6 - 10%	10'	Mod./Slow	High
Co	415.70	0.48	Poor	0 - 2%	0'	Rapid	None
CrD3	184.50	0.21	Poor	6 - 15%	1-2'	Slow	High
CsA	252.30	0.29	Poor	0 - 2%	1-2'	Slow	High
CsB2	401.40	0.47	Poor	2 - 6%	1-2'	Slow	High
CsC2	18.90	0.02	Poor	6 - 10%	1-2'	Mod./Slow	High
Dr	2,753.80	3.19	Poor	0 - 2%	1-1.5'	Moderate	Moderate
Ek	8.20	0.01	Poor	0 - 2%	0'	Slow	High
Fa	1,633.90	1.89	Poor	0 - 2%	0'	Mod./Rapid	Moderate
KeA	2,516.00	2.92	Fair	0 - 2%	10'	Moderate	Moderate
KeB	2,519.00	2.92	Fair	2 - 6%	10'	Moderate	Moderate
KeB2	604.30	0.70	Fair	2 - 6%	10'	Moderate	Moderate
KeC2	90.60	0.11	Fair	6 - 10%	10'	Moderate	Moderate
KeC3	77.70	0.09	Fair	6 - 10%	10'	Moderate	Moderate
LaB	523.00	0.61	Good	0 - 6%	4-10'	Rapid	Low
Le	19.80	0.02	Poor	0 - 2%	I-1.5'	Slow	High
Lo	148.80	0.17	Poor	2 - 6%	3-10+'	Moderate	Moderate
MaA	683.60	0.79	Good	0 - 2%	6-10'	Moderate	Moderate
MaB	2.50	0.00	Good	2 - 6%	6-10'	Moderate	Moderate

MaC2	15.60	0.02	Good	6 - 10%	6-10'	Moderate	Moderate
MaB2	114.50	0.13	Good	2 - 6%	6-10'	Moderate	Moderate
MaD2	.80	0.00	Good	2 - 6%	6-10'	Moderate	Moderate
Mt	2,943.80	3.41	Fair	0 - 2%	1.5-2'	Moderate	High
Mx	3,763.00	4.36	Poor	6 - 45%	0'	Mod./Rapid	Moderate
Ot	2,277.20	2.64	Poor	0 - 2%	0'	Mod./Rapid	Moderate
RtB	162.00	0.19	Good	2 - 10%	40+'	Rapid	Low
RuB	138.40	0.16	Good	2 - 6%	40+'	Rapid	Low
RuC2	39.00	0.05	Good	6 - 10%	40+'	Moderate	Low
SaA	4,382.40	5.08	Good	0 - 2%	40+'	Moderate	Moderate
SaB	14,095.4	16.34	Good	2 - 6%	40+'	Moderate	Moderate
SaB2	777.80	0.90	Good	2 - 6%	40+'	Moderate	Moderate
SaC	4.90	0.01	Good	6 - 10%	40+'	Moderate	Moderate
SaC2	713.80	0.83	Good	6 - 10%	40+'	Moderate	Moderate
SaC3	393.40	0.46	Good	6 - 10%	40+'	Moderate	Moderate
SaD2	58.20	0.07	Good	10 - 15%	40+'	Moderate	Moderate
SaD3	72.20	0.08	Good	10 - 15%	40+'	Mod./Slow	Moderate
SfA	5,547.40	6.43	Good	0 - 2%	40+'	Mod./Rapid	Moderate
SfB	3,727.10	4.32	Good	2 - 6%	40+'	Mod./Rapid	Moderate
SsD	7,991.20	9.26	Fair	6 - 15%	10+'	Rapid	Low
StA	10.70	0.01	Fair	0 - 6 %	10+'	Rapid	Low
StE	15,641.1	18.13	Poor	15 - 45%	10+'	Rapid	Low
Th	95.80	0.11	Poor	0 - 2%	0'	N/A	Moderate
To	1,738.80	2.02	Poor	0 - 2%	0'	N/A	Moderate
Wo	5,159.20	5.98	Fair	0 - 2%	1.5-2'	Moderate	Moderate
Made Land	86.80	0.10	Poor	N/A	N/A	N/A	N/A
	86,266.7	100.00					

ırce: Soil Survey, Northumberland and Lancaster Counties, Virginia. United States Department of Agriculture, Soil Conservation Service in cooperation with The Virginia Agricultural Experiment Station; May, 1963.

Soil Symbol Key

Symbol	Soil Name
BeA	Beltsville very fine sandy loam, nearly level
BeB	Beltsville very fine sandy loam, gently sloping
BeB2	Beltsville very fine sandy loam, gently sloping, eroded
Br	Bertie silt loam
CaC3	Caroline clay loam, sloping, severely eroded
CaD3	Caroline clay loam, strongly sloping, severely eroded
CfB2	Caroline very fine sandy loam, gently sloping, eroded
CfC2	Caroline very fine sandy loam, sloping, eroded
Co	Coastal beach
CrD3	Craven clay loam, strongly sloping, severely eroded
CsA	Craven silt loam, nearly level
CsB2	Craven silt loam, gently sloping, eroded
CsC2	Craven silt loam, sloping, eroded
Dr	Dragston fine sandy loam
Ek	Elkton silt loam
Fa	Fallsington fine sandy loam
KeA	Kempsville fine sandy loam, nearly level
KeB	Kempsville fine sandy loam, gently sloping
KeB2	Kempsville fine sandy loam, gently sloping, eroded
KeC2	Kempsville fine sandy loam, sloping, eroded
KeC3	Kempsville fine sandy loam, sloping, severely eroded
LaB	Lakeland loamy fine sand, gently sloping
Le	Lenoir silt loam
Lo	Local alluvial land
MaA	Matapeake silt loam, nearly level
MaB	Matapeake silt loam, gently sloping
MaB2	Matapeake silt loam, gently sloping, eroded
MaC2	Matapeake silt loam, sloping, eroded
MaD2	Matapeake silt loam, strongly sloping, eroded
Mt	Mattapex silt loam
Mx	Mixed alluvial land
Ot	Othello silt loam

Symbol	Soil Name
RtB	Rumford loamy sand, thick surface, gently sloping
RuB	Rumford loamy sand, gently sloping
RuC2	Rumford loamy sand, sloping, eroded
SaA	Sassafras fine sandy loam, nearly level
SaB	Sassafras fine sandy loam, gently sloping
SaB2	Sassafras fine sandy loam, gently sloping, eroded
SaC2	Sassafras fine sandy loam, sloping, eroded
SaC3	Sassafras fine sandy loam, sloping, severely eroded
SaD2	Sassafras fine sandy loam, strongly sloping, eroded
SaD3	Sassafras fine sandy loam, strongly sloping, sev. eroded
SfA	Sassafras loamy fine sand, thick surface, nearly level
SfB	Sassafras loamy fine sand, thick surface, gently sloping
SsD	Sloping sandy land
StE	Steep sandy land
Th	Tidal marsh, high
To	Tidal marsh, low
Wo	Woodstown fine sandy loam

Soil Type	Capability Unit	Type of Farmland
Out of Study Area		Other Soil Areas
Unassigned		Other Soil Areas
Water		Other Soil Areas
Man Made		Other Soil Areas
Beltsville	IIIs-2	Other Soil Areas
Beltsville	IIIs-2	Other Soil Areas
Beltsville	IIIs-2	Other Soil Areas
Bertie Silt Loam	IIw-2	Other Soil Areas
Bladen Silt Loam	IIIw-2	Other Soil Areas
Caroline Clay Loam	VIe-1	Other Soil Areas
Caroline Clay Loam	VIIe-1	Other Soil Areas
Caroline Sandy Loam	IIe-2	Other Soil Areas
Caroline Sandy Loam	IVe-1	Other Soil Areas
Coastal Beach	VIIIw-1	Other Soil Areas
Craven Clay Loam	VIIe-1	Other Soil Areas
Craven Silt Loam	IIw-3	Other Soil Areas
Craven Silt Loam	IIe-2	Other Soil Areas
Craven Silt Loam	IVe-1	Other Soil Areas
Dragston Fine Sandy	IIw-2	Other Soil Areas
Elkton Silt Loam	IIIw-2	Other Soil Areas
Fallsington F/S Loam	IIIw-1	Other Soil Areas
Kempsville F/S Loam	I-1	Prime Farm Soils
Kempsville F/S Loam	IIe-1	Prime Farm Soils
Kempsville F/S Loam	IIe-1	Prime Farm Soils
Kempsville F/S Loam	IIIe-1	Other Soil Areas
Kempsville F/S Loam	IVe-1	Other Soil Areas
Lakeland Loamy F/S	IIIs-1	Other Soil Areas
Lenoir Silt Loam	IIIw-2	Other Soil Areas
Local Alluvial Land	IIw-1	Prime Farm Soils
Matapeake Silt Loam	I-1	Prime Farm Soils
Matapeake Silt Loam	IIe-1	Prime Farm Soils
Matapeake Silt Loam	IIe-1	Prime Farm Soils
Matapeake Silt Loam	IIIe-1	Other Soil Areas
Matapeake Silt Loam	IVe-1	Other Soil Areas
Mattapex Silt Loam	IIw-1	Prime Farm Soils
Mixed Alluvial Land	VIw-1	Other Soil Areas
Othello Silt Loam	IIIw-1	Other Soil Areas
Rumford Loamy Sand	IIIs-1	Other Soil Areas
Rumford Loamy Sand	IIs-1	Prime Farm Soils
Rumford Loamy Sand	IIIe-1	Other Soil Areas
Sassafras F/S Loam	I-1	Prime Farm Soils
Sassafras F/S Loam	IIe-1	Prime Farm Soils
Sassafras F/S Loam	IIe-1	Prime Farm Soils

Soil Type	Capability Unit	Type of Farmland
Sassafras F/S Loam	IIIe-1	Other Soil Areas
Sassafras F/S Loam	IVe-1	Other Soil Areas
Sassafras F/S Loam	IVe-1	Other Soil Areas
Sassafras F/S Loam	IVe-1	Other Soil Areas
Sassafras F/S Loam	IIs-1	Prime Farm Soils
Sassafras Loamy F/S	IIs-1	Prime Farm Soils
Sassafras Loamy F/S	VIe-2	Other Soil Areas
Sloping Sandy Land	VIIe-2	Other Soil Areas
Steep Sandy Land	VIIIw-1	Other Soil Areas
Tidal Marsh	VIIIw-1	Other Soil Areas
Tidal Marsh	IIw-1	Prime Farm Soils
Woodstown F/S Loam		

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