United States
Department of
Agriculture

Soil
Conservation
Service

In cooperation with
North Carolina
Department of
Environment, Health, and
Natural Resources; North
Carolina Agricultural
Research Service; North
Carolina Cooperative
Extension Service;
Northampton Soil and
Water Conservation
District; and Northampton
County Board of
Commissioners

Soil Survey of Northampton County, North Carolina

How To Use This Soil Survey

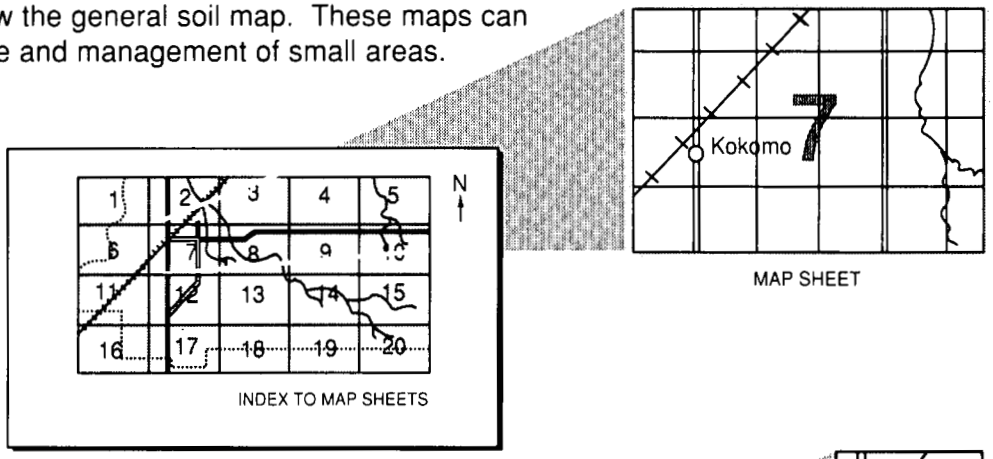
General Soil Map

The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

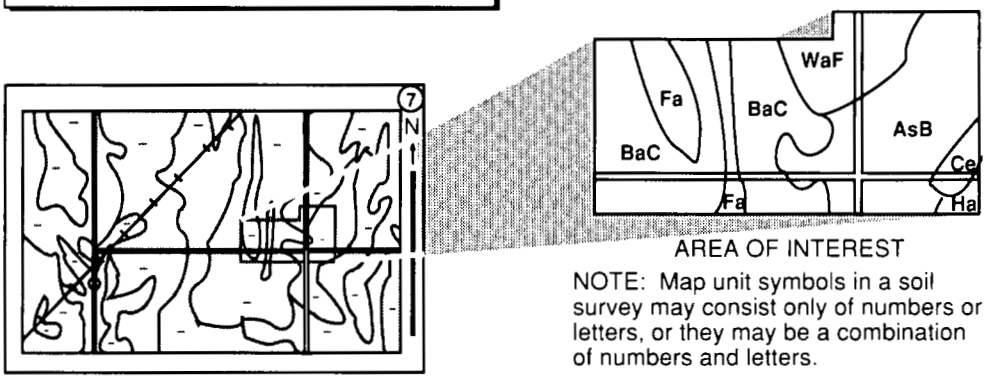
To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.



To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet, and turn to that sheet.



NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Index to Map Units** (see Contents), which lists the map units by symbol and name and shows the page where each map unit is described.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the North Carolina Agricultural Research Service, and local agencies. The Soil Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1986. Soil names and descriptions were approved in 1986. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1986. This soil survey was made cooperatively by the Soil Conservation Service; the North Carolina Department of Environment, Health, and Natural Resources; the North Carolina Agricultural Research Service; the North Carolina Cooperative Extension Service; the Northampton Soil and Water Conservation District; and the Northampton County Board of Commissioners. The survey is part of the technical assistance furnished to the Northampton Soil and Water Conservation District. The Northampton County Board of Commissioners provided financial assistance for the survey.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

The first soil survey of Northampton County was published in 1925 by the U.S. Department of Agriculture. This survey updates the first survey, provides more detailed maps on aerial photographs, and contains more interpretive information *(8)*.

All programs and services of the Soil Conservation Service are offered on a nondiscriminatory basis, without regard to race, color, national origin, religion, sex, age, marital status, or handicap.

Cover: Peanuts growing on Gritney sandy loam, 2 to 6 percent slopes. Peanuts are an important crop in Northampton County.

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AuA—Autryville loamy sand, 0 to 3 percent slopes 12
Be—Bethera silt loam 13
BoB—Bonneau loamy sand, 0 to 6 percent slopes 13
BoC—Bonneau loamy sand, 6 to 12 percent slopes 14
CaA—Caroline sandy loam, 0 to 2 percent slopes 14
CaB—Caroline sandy loam, 2 to 6 percent slopes 15
Ch—Chastain silt loam, frequently flooded 16
CnB—Conetoe loamy sand, 0 to 5 percent slopes 16
Co—Congaree silt loam, 0 to 4 percent slopes, occasionally flooded 17
CrA—Craven fine sandy loam, 0 to 1 percent slopes 18
CrB—Craven fine sandy loam, 1 to 4 percent slopes 19
CrC—Craven fine sandy loam, 4 to 10 percent slopes 20
CsB2—Craven sandy clay loam, 1 to 4 percent slopes, eroded 20
CuB—Craven-Urban land complex, 0 to 4 percent slopes 21
ExA—Exum loam, 0 to 2 percent slopes 22
GoA—Goldsboro sandy loam, 0 to 2 percent slopes 22
GuA—Goldsboro-Urban land complex, 0 to 2 percent slopes 23
GxB—Gritney sandy loam, 2 to 6 percent slopes 23
GxC—Gritney sandy loam, 6 to 10 percent slopes 25
GyB2—Gritney sandy clay loam, 2 to 6 percent slopes, eroded 25
GyC2—Gritney sandy clay loam, 6 to 10 percent slopes, eroded 26
HeB—Helena sandy loam, 1 to 6 percent slopes 26
Le—Lenoir silt loam 27
LtD—Lillington-Turbeville complex, 8 to 15 percent slopes 28
Ly—Lynchburg fine sandy loam 29
NoA—Norfolk sandy loam, 0 to 2 percent slopes 30
NoB—Norfolk sandy loam, 2 to 6 percent slopes 30
NoC—Norfolk sandy loam, 6 to 10 percent slopes 31
NuB—Norfolk-Urban land complex, 0 to 6 percent slopes 31
OcA—Ocilla loamy fine sand, 0 to 3 percent slopes 32
PcB2—Pacolet sandy clay loam, 2 to 8 percent slopes, eroded 33
PcD2—Pacolet sandy clay loam, 8 to 15 percent slopes, eroded 33
PcE2—Pacolet sandy clay loam, 15 to 30 percent slopes, eroded 34
PgE2—Pacolet gravelly sandy clay loam, 15 to 30 percent slopes, eroded 34
PtA—Pactolus loamy fine sand, 0 to 2 percent slopes 35
Ra—Rains fine sandy loam 36
Ro—Roanoke silt loam, occasionally flooded 36
Se—Seabrook loamy sand, rarely flooded 37
StA—State sandy loam, 0 to 3 percent slopes, rarely flooded 38
TaB—Tarboro sand, 0 to 5 percent slopes 38
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Foreword

This soil survey contains information that can be used in land-planning programs in Northampton County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow over bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the North Carolina Cooperative Extension Service.

Coy A. Garrett
State Conservationist
Soil Conservation Service

Soil Survey of Northampton County, North Carolina

By Karl A. Shaffer, North Carolina Department of Environment, Health, and Natural Resources

Soils surveyed by Karl A. Shaffer and Richard D. Hayes, North Carolina Department of Environment, Health, and Natural Resources, and Steven F. Stokes, R. Bruce Rider, Clarence E. Brandon, Linda D. Monds, John A. Gagnon, and Eugene W. Mellette, Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service,
in cooperation with
North Carolina Department of Environment, Health, and Natural Resources; North Carolina Agricultural Research Service; North Carolina Cooperative Extension Service; Northampton Soil and Water Conservation District; and Northampton County Board of Commissioners

NORTHAMPTON COUNTY is in northeastern North Carolina (fig. 1). It has a total area of 351,757 acres, or about 550 square miles. The State of Virginia is to the north of the county. Hertford and Bertie Counties are to the east. Halifax County is across the Roanoke River to the south and southwest. Warren County is to the west.

In 1985, the population of the county was 22,584 *(7)*. Jackson, the county seat, is near the center of the county. Garysburg, the largest town, is along U.S. Highway 301 in the western part of the county. Other towns in the county are Rich Square in the southeastern part, Woodland and Conway in the eastern part, Severn in the northeastern part, Seaboard in the north-central part, and Gaston in the western part.

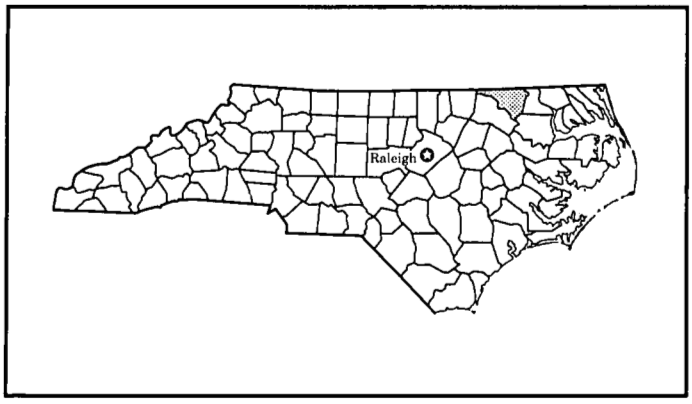

Figure 1.—Location of Northampton County in North Carolina.

General Nature of the County

This section gives general information about Northampton County. It describes settlement; physiography, relief, and drainage; water resources; transportation facilities and industry; and climate.

Settlement

Northampton County was formed from a part of Bertie County in 1741. That same year, Jackson was established as the county seat. The early settlers were principally Scotch and Scotch-Irish immigrants from the British Isles. Later settlers included English and French immigrants from Virginia and other northern colonies *(8)*.

Physiography, Relief, and Drainage

Most of Northampton County is in the Coastal Plain physiographic province. The extreme northwestern part

of the county is in the Piedmont province. The Coastal Plain physiographic province has two distinct divisions. The Lower Coastal Plain, in the southeastern part of the county, is generally characterized by nearly level topography and a high water table. Poorly drained and somewhat poorly drained, clayey soils are dominant. The Upper Coastal Plain is generally nearly level and gently sloping. The soils are predominantly well drained and moderately well drained. The poorly drained soils are in the low areas and along drainageways. The Piedmont province is gently sloping to steep. Most of the soils in this province are well drained.

The county slopes toward the east. According to U.S. Geological Survey topographic maps, the highest elevation in the county is 360 feet, west of Vultare near St. Lukes Church. The lowest elevation is 5 feet, where the Meherrin River leaves the northeastern part of the county.

The county is drained by the Meherrin and Roanoke Rivers and their tributaries. Most of the drainage enters the Meherrin River.

Water Resources

Northampton County has an abundant supply of ground water for use by households and farms. Most of the towns have public water supplies drawn from wells. Irrigation water for farms is predominantly supplied by deep wells. Some of the farms adjacent to the Roanoke and Meherrin Rivers use river water for irrigation.

Roanoke Rapids Lake and Lake Gaston are along the southwestern boundary of the county. A hydroelectric plant at Roanoke Rapids Lake provides electricity for Northampton County and the surrounding counties. Both lakes offer potential future water supplies.

Transportation Facilities and Industry

Three U.S. highways, Interstate Highway 95, and numerous State roads provide access to Northampton County. The Seaboard Coast Line Railroad provides rail service.

The major industries are lumber, wood products, chemicals, and farm equipment.

Climate

Northampton County has long, hot summers because moist tropical air from the Gulf of Mexico persistently covers the area. Winters are cool and fairly short. Cold waves are rare and moderate in 1 or 2 days. Precipitation is fairly heavy throughout the year, and prolonged droughts are rare. Summer precipitation, mainly in the form of afternoon thunderstorms, is adequate for all crops.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Jackson, North Carolina, in the period 1951 to 1984. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 42 degrees F and the average daily minimum temperature is 31 degrees. The lowest temperature on record, which occurred at Jackson on February 10, 1979, is -4 degrees. In summer, the average temperature is 77 degrees and the average daily maximum temperature is 88 degrees. The highest recorded temperature, which occurred at Jackson on July 31, 1953, is 105 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is about 46 inches. Of this, 24 inches, or 50 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 21 inches. The heaviest 1-day rainfall during the period of record was 5.8 inches at Jackson on August 12, 1955. Thunderstorms occur on about 46 days each year.

The average seasonal snowfall is 8 inches. The greatest snow depth at any one time during the period of record was 16 inches. On an average of 3 days, at least 1 inch of snow is on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 90 percent. The sun shines 60 percent of the time possible in summer and 60 percent in winter. The prevailing wind is from the southwest. Average windspeed is highest, 10 miles per hour, in spring.

Severe local storms, including tornadoes, strike occasionally in or near the county. They are short in duration and cause variable and spotty damage. Every few years in summer or autumn, a tropical depression or remnant of a hurricane that has moved inland causes extremely heavy rains for 1 to 3 days.

How This Survey Was Made

This survey was made to provide information about the soils in Northampton County. The information

includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; and the kinds of bedrock. They studied many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. It extends from the surface down into the material from which the soil formed.

Soils occur in an orderly pattern that results from the combined influence over time of climate, parent material, relief, and plants and animals. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils and relating their position to specific segments of the landscape, soil scientists develop a concept, or model, of how the soils were formed. This model enables the soil scientists to predict with a considerable degree of accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify the soils. After describing the soils and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area are generally collected for laboratory analyses and for engineering tests. The data from these analyses and tests and from field-observed characteristics and soil properties are used to predict behavior of the soils under different uses. Interpretations are field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a relatively high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will be at a specific level in the soil on a specific date.

Soil boundaries are drawn on aerial photographs and each delineation is identified as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in accurately locating boundaries.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by two or three kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soils for which it is named and some soils that belong to other taxonomic classes. In the detailed soil map units, these latter soils are called inclusions or included soils. In the general soil map units, they are called minor soils.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar)

inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are identified in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soils on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

General Soil Map Units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or a building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

1. Pacolet-Wedowee

Gently sloping to moderately steep, well drained soils that have a loamy surface layer and a clayey subsoil; on ridgetops and side slopes

This map unit is in the western part of the county. The landscape is characterized by gently sloping soils on ridgetops above strongly sloping or moderately steep soils on side slopes that are dissected by numerous drainageways. The native vegetation is mostly hardwoods and a few pines.

About 10 percent of the acreage in this map unit has been cleared of trees. The cleared areas are on the ridgetops and are used for corn, soybeans, or cotton. Many other areas on the ridgetops and some areas on the side slopes have been planted to pine. The ridgetops and some areas of the side slopes that are adjacent to Lake Gaston are used mainly for residential development. The soils in steep areas mainly support hardwoods, but in a few areas they support pines. A few areas adjacent to Roanoke Rapids Lake are used as homesites.

This map unit makes up about 3 percent of the county. It is about 48 percent Pacolet soils, 38 percent Wedowee soils, and 14 percent soils of minor extent.

Pacolet soils are gently sloping to moderately steep. The surface layer is dark brown sandy clay loam. The subsoil is yellowish red sandy clay loam in the upper part and red clay in the lower part. The underlying material is mottled yellowish red, red, and gray saprolite that crushes to sandy clay loam or sandy loam.

Wedowee soils are gently sloping and strongly sloping. The surface layer is grayish brown sandy loam. The subsoil is reddish yellow sandy clay loam in the upper part, yellowish red clay loam in the next part, and yellowish red clay loam that has red mottles and pockets of saprolite in the lower part. The underlying material is yellowish red, red, strong brown, white, and brownish yellow saprolite that crushes to sandy clay loam.

The minor soils in this unit are those in the Lillington, Helena, Wehadkee, and Turbeville series. Lillington soils are gravelly and are on the strongly sloping side slopes. Helena soils are moderately well drained and are at the base of slopes or at the head of drainageways. Wehadkee soils are poorly drained and are on the narrow flood plains. Turbeville soils are deep, red, and clayey and are adjacent to and intermingled with areas of the Pacolet and Wedowee soils.

The gently sloping major soils are suited to cultivated crops and pasture. The effects of past erosion and the hazard of further erosion are the main management concerns affecting cultivated crops and pasture. The strongly sloping major soils are not suited to cultivated crops. They are used as pasture in a few areas. The slope and the hazard of erosion are the main management concerns affecting pasture. The major soils on the moderately steep slopes generally are not suited to cultivated crops or pasture.

Few limitations affect woodland use and management on the gently sloping and strongly sloping soils. Loblolly pine is the dominant commercial species. The use of equipment is restricted in areas that have moderately steep slopes, and erosion is a

hazard along logging roads and skid trails.

The clayey subsoil is a moderate limitation on sites for dwellings, local roads and streets, and septic tank absorption fields. The slope is a severe limitation affecting urban development in the strongly sloping and moderately steep areas.

2. Turbeville-Caroline

Nearly level to strongly sloping, well drained soils that have a loamy surface layer and a clayey subsoil; on uplands

This map unit is in the northwestern part of the county, between Garysburg and Vultare. The landscape is characterized by broad ridges and narrow side slopes adjacent to drainageways. The native vegetation is mixed hardwoods and pines.

About 50 percent of the acreage in this map unit has been cleared of trees and is used for peanuts, cotton, corn, soybeans, or small grain. Some areas have been planted to pine. The soils on the narrow side slopes mainly support hardwoods, but in a few areas they support pines.

This map unit makes up about 6 percent of the county. It is about 39 percent Turbeville soils, 29 percent Caroline soils, and 32 percent soils of minor extent.

Turbeville soils are nearly level to strongly sloping. The surface layer is reddish brown sandy loam. The subsoil is red sandy clay in the upper part, red clay in the next part, and red sandy clay loam in the lower part.

Caroline soils are nearly level and gently sloping. The surface layer is yellowish brown sandy loam. The subsoil is strong brown clay loam in the upper part, strong brown clay that has yellowish red and yellowish brown mottles in the next part, and mottled red, strong brown, yellowish brown, and light brownish gray clay and clay loam in the lower part.

The minor soils in this map unit are those in the Pacolet and Lillington series. They are on the strongly sloping side slopes leading into drainageways or toward Roanoke Rapids Lake. They are used as woodland. Lillington soils are gravelly.

The nearly level and gently sloping major soils are suited to cultivated crops and pasture. Erosion in areas that have a slope of more than 2 percent is the main hazard affecting cropland. In some eroded areas the surface layer is sticky and has poor tilth.

Few limitations affect woodland use and management. Loblolly pine is the dominant commercial species. Erosion is a hazard on the narrow, strongly sloping side slopes along logging roads and skid trails.

The clayey subsoil and the shrink-swell potential are moderate limitations on sites for dwellings, commercial buildings, shallow excavations, and septic tank absorption fields.

3. Gritney-Caroline

Nearly level to strongly sloping, moderately well drained and well drained soils that have a loamy surface layer and a clayey subsoil; on ridgetops and side slopes

Most of this map unit is in the north-central part of the county, from Jackson to Garysburg and north to Pleasant Hill. A few smaller areas are around Faisons Old Tavern and Galatia. The landscape is characterized by nearly level and gently sloping soils on undulating ridges and by strongly sloping soils on side slopes adjacent to drainageways. The native vegetation is mixed hardwoods and pines.

About 40 percent of the acreage in this map unit has been cleared of trees and is used for peanuts, cotton, corn, soybeans, or small grain. Much of the forested area is planted to pine. The soils on the narrow side slopes mainly support hardwoods, but in a few areas they support pines.

This map unit makes up about 14 percent of the county. It is about 43 percent Gritney soils, 13 percent Caroline soils, and 44 percent soils of minor extent (fig. 2).

Gritney soils are gently sloping and strongly sloping. They are moderately well drained. The surface layer is dark brown sandy loam. The subsoil is mottled yellow, brown, and red clay loam or clay in the upper part and mottled yellow, brown, red, and gray sandy clay loam in the lower part.

Caroline soils are nearly level and gently sloping. They are well drained. The surface layer is yellowish brown sandy loam. The upper part of the subsoil is strong brown clay loam, the next part is strong brown clay that has yellowish red and yellowish brown mottles, and the lower part is mottled red, strong brown, yellowish brown, and light brownish gray clay and clay loam.

The minor soils in this map unit are those in the Bonneau, Lenoir, Norfolk, Craven, and Rains series. Bonneau soils have a thick, sandy surface layer and are well drained. They are in the uplands. Lenoir soils are somewhat poorly drained and are in the lower landscape positions. Norfolk soils are well drained and have a loamy, moderately permeable subsoil. They are in scattered areas throughout the map unit. Craven soils are moderately well drained and are intermingled with areas of the Gritney and Caroline soils throughout the map unit. Rains soils are poorly drained and are in flat, wet areas or in low areas along drainageways.

The nearly level and gently sloping major soils are

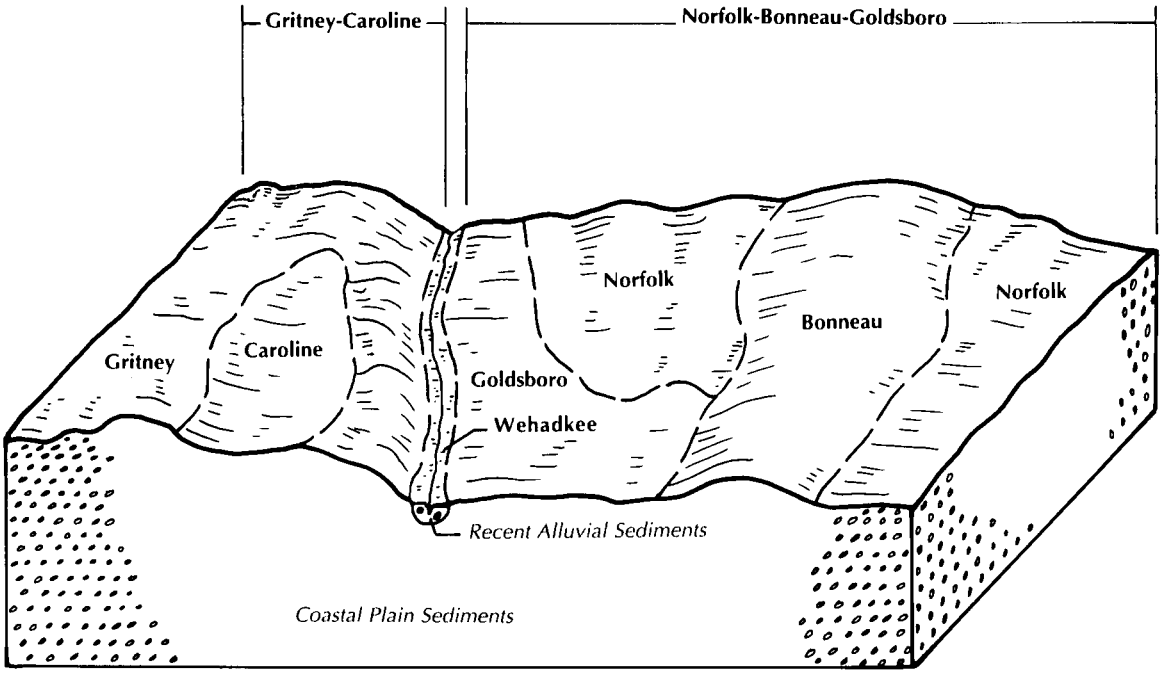

Figure 2.—Typical relationship of soils and landscape in the Gritney-Caroline and Norfolk-Bonneau-Goldsboro general soil map units.

suited to cultivated crops and pasture. Erosion is a hazard in areas that have a slope of more than 2 percent. In some eroded areas the surface layer is sticky and has poor tilth. The hazard of erosion is severe if the strongly sloping soils are cleared of trees. These soils generally are not used for cultivated crops.

Few limitations affect woodland use and management. Loblolly pine is the dominant commercial species. Erosion is a hazard on the strongly sloping soils during logging.

The clayey subsoil and the shrink-swell potential are moderate limitations on sites for dwellings, commercial buildings, shallow excavations, and septic tank absorption fields. The slope is a limitation affecting urban development in the strongly sloping areas. The wetness is a severe limitation on sites for dwellings and septic tank absorption fields in areas of the Gritney soils.

4. Norfolk-Bonneau-Goldsboro

Nearly level to strongly sloping, well drained and moderately well drained soils that have a sandy or loamy surface layer and a loamy subsoil; on ridgetops and side slopes

This map unit is mostly in the north-central to northeastern parts of the county, from Seaboard through Conway to the Hertford County line. The landscape is characterized by nearly level and gently sloping soils on ridges and by strongly sloping soils on side slopes adjacent to drainageways. The native vegetation is mixed hardwoods and pines.

This map unit makes up about 28 percent of the county. It is about 32 percent Norfolk soils, 22 percent Bonneau soils, 16 percent Goldsboro soils, and 30 percent soils of minor extent.

Norfolk soils are nearly level to strongly sloping. They are well drained. The surface layer is dark brown sandy loam. The subsurface layer is light yellowish brown sandy loam. The subsoil is yellowish brown sandy clay loam in the upper part and strong brown clay loam in the lower part.

Bonneau soils are nearly level to strongly sloping. They are well drained. The surface layer is grayish brown loamy sand. The subsurface layer is pale brown loamy sand. The subsoil is yellowish brown sandy clay loam in the upper part and mottled yellowish brown, strong brown, and light brownish gray sandy clay loam in the lower part.

Goldsboro soils are nearly level. They are moderately well drained. The surface layer is dark grayish brown sandy loam. The subsoil is light yellowish brown and yellowish brown sandy clay loam in the upper part and

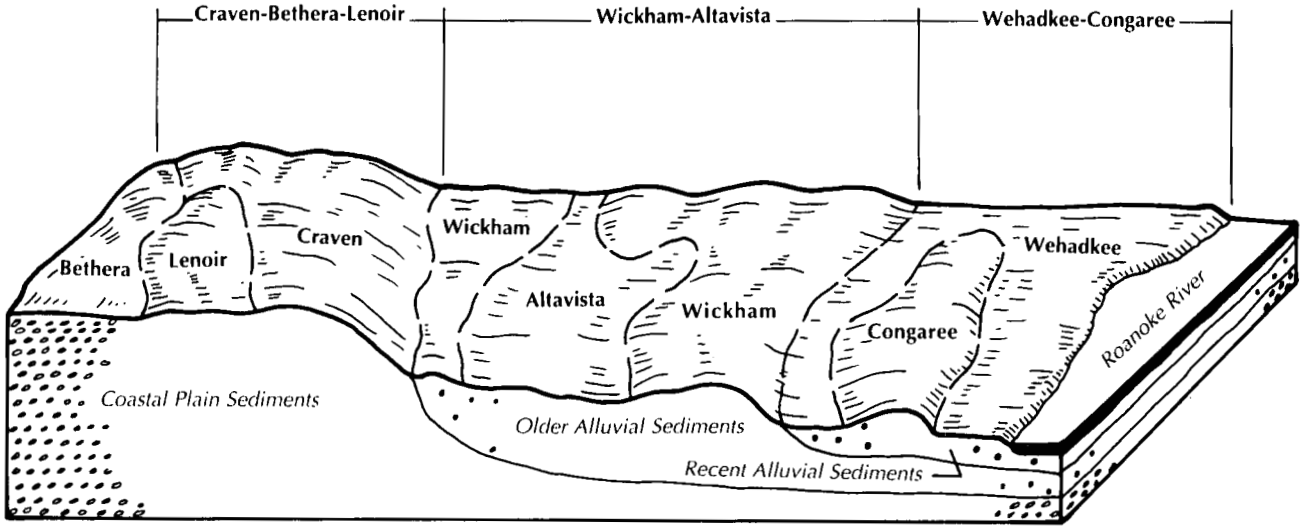

Figure 3.—Typical relationship of soils and landscape in the Craven-Bethera-Lenoir, Wickham-Altavista, and Wehadkee-Congaree general soil map units.

mottled light gray, strong brown, and red sandy clay loam in the lower part.

The minor soils in this map unit include those in the Rains, Lynchburg, Gritney, Winton, and Wehadkee series. Rains soils are poorly drained and are in broad, flat, wet areas and low areas along drainageways. Lynchburg soils are somewhat poorly drained and are in the low, wetter areas. Gritney soils are moderately well drained and have a clayey subsoil. They are intermingled with areas of the Norfolk soils on gently sloping uplands. Winton soils are moderately steep and steep and are on side slopes adjacent to flood plains throughout the map unit. Wehadkee soils are poorly drained and are on the narrow flood plains.

The nearly level and gently sloping major soils are suited to cultivated crops. Erosion is a hazard in areas that have a slope of more than 2 percent. The Bonneau soils are subject to soil blowing and droughtiness. A drainage system is needed on the Goldsboro soils. The hazard of erosion is severe if the strongly sloping soils are cleared of trees. These soils generally are not used for crops.

These soils are used for timber production. Loblolly pine is the dominant commercial species. The wetness is a limitation affecting the use of logging equipment on the Goldsboro soils. Erosion is a hazard on the strongly sloping soils during logging.

These soils generally are suited to urban development. The wetness in the Norfolk and Goldsboro soils is a limitation on sites for dwellings, commercial buildings, local roads and streets, and septic tank absorption fields. A slope of more than 8 percent is a limitation affecting urban development on the Norfolk and Bonneau soils.

5. Craven-Bethera-Lenoir

Nearly level to strongly sloping, moderately well drained to poorly drained soils that have a loamy surface layer and a clayey subsoil; on uplands

This map unit is in the southern part of the county. The landscape is characterized by broad ridges, large flats, and broad interstream areas. The map unit is divided by wide and narrow flood plains. The soils on side slopes adjacent to flood plains are strongly sloping. The native vegetation is mixed hardwoods and pines.

About 25 percent of the acreage in this map unit has been cleared of trees and is used for corn, soybeans, or small grain and, to a lesser extent, peanuts and cotton. Much of the forested area is planted to pine. The soils on the narrow side slopes mainly support hardwoods, but in a few areas they support pines.

This map unit makes up about 26 percent of the county. It is about 39 percent Craven soils, 30 percent Bethera soils, 19 percent Lenoir soils, and 12 percent minor soils (fig. 3).

Craven soils are nearly level to strongly sloping. They are moderately well drained. The surface layer is

brown fine sandy loam. The subsoil is brownish yellow clay loam and clay in the upper part and mottled gray, red, light yellowish brown, and strong brown clay loam in the lower part.

Bethera soils are nearly level. They are poorly drained. The surface layer is very dark grayish brown silt loam. The subsoil is gray clay that has yellow, red, and brown mottles.

Lenoir soils are nearly level. They are somewhat poorly drained. The surface layer is dark grayish brown silt loam. The subsoil is brownish yellow clay loam in the upper part and light brownish gray and gray clay in the lower part.

The minor soils in this map unit are those in the Caroline, Wehadkee, Winton, and Gritney series. Caroline soils are well drained and are on the highest ridges. Wehadkee soils are poorly drained and are on narrow flood plains throughout the map unit. Winton soils are on moderately steep and steep side slopes adjacent to flood plains. Gritney soils are on undulating and rolling landscapes in the northern part of the map unit.

The moderately well drained, nearly level and gently sloping areas of the Craven soils are suited to cultivated crops. The wetness and the hazard of erosion in areas that have a slope of more than 1 percent are the main management concerns. The wetness is a severe limitation affecting the use of the Lenoir and Bethera soils as cropland. Installing a drainage system in these areas generally is difficult and costly.

The wetness is the main limitation affecting woodland use and management. Logging roads are soft and slippery when wet. The use of equipment causes rutting and soil compaction, and seedling mortality can be a problem on the poorly drained Bethera soils.

The wetness and the clayey subsoil are the main limitations on sites for dwellings, commercial buildings, local roads and streets, and septic tank absorption fields.

6. Wickham-Altavista

Nearly level and gently sloping, well drained and moderately well drained soils that have a loamy surface layer and a loamy subsoil; on low river terraces

This map unit is adjacent to the Meherrin and Roanoke Rivers. The landscape is characterized by narrow flood plains. The native vegetation is mostly mixed hardwoods and a few pines.

About 50 percent of the acreage in this map unit has been cleared of trees and is used for peanuts, tobacco, corn, soybeans, cotton, or small grain. The forested areas support pine, sycamore, or mixed hardwoods.

This map unit makes up about 10 percent of the county. It is about 36 percent Wickham soils, 17 percent Altavista soils, and 47 percent minor soils.

Wickham soils are nearly level and gently sloping. They are well drained. The surface layer is dark brown fine sandy loam. The subsoil is reddish brown sandy clay loam in the upper part and yellowish red sandy clay loam and sandy loam in the lower part. The underlying stratified material is strong brown sand or loamy sand.

Altavista soils are nearly level. They are moderately well drained. The surface layer is dark brown fine sandy loam. The subsoil is yellowish brown sandy clay loam in the upper part and yellowish brown sandy loam in the lower part. The underlying material is yellowish brown and light brownish yellow loamy sand and sandy loam.

The minor soils in this map unit are those in the Tomotley, Wehadkee, Roanoke, and Tarboro series. Tomotley, Wehadkee, and Roanoke soils are poorly drained. Tomotley and Roanoke soils are in nearly level, low areas, and Wehadkee soils are on narrow flood plains. Tarboro soils are somewhat excessively drained and are sandy throughout. They generally are on the high ridges.

The major soils are suited to cultivated crops. Erosion is a hazard in areas that have a slope of more than 2 percent. The wetness is a limitation in areas of the Altavista soils.

These soils generally are suited to woodland use and management. Loblolly pine is the dominant commercial species. The wetness is a limitation for the use of equipment on the Altavista soils. Unsurfaced roads are soft and slippery when wet.

The Wickham soils are well suited to sites for dwellings, commercial buildings, local roads and streets, and septic tank absorption fields. The wetness and the flooding are limitations affecting urban development on the Altavista soils.

7. Wehadkee-Congaree

Nearly level and gently sloping, poorly drained, well drained, and moderately well drained soils that have a loamy surface layer and a loamy subsoil; on flood plains

This map unit is directly adjacent to the Meherrin and Roanoke Rivers. The landscape is characterized by low, broad areas and by a few slightly higher, sloping ridges. The native vegetation is water-tolerant hardwoods, such as water tupelo, baldcypress, water oak, and sycamore. The soils in the map unit are frequently flooded.

Almost all areas of this map unit support hardwoods.

A few very small areas of the Congaree soils have been cleared of trees and are used for corn or soybeans.

This map unit makes up about 6 percent of the county. It is about 59 percent Wehadkee soils, 36 percent Congaree soils, and 5 percent soils of minor extent.

Wehadkee soils are nearly level and are poorly drained. The surface layer is light brownish gray loam. The subsoil is light brownish gray loam in the upper part and gray loam in the lower part. The underlying material is light gray sandy loam.

Congaree soils are nearly level and gently sloping. They are well drained and moderately well drained. The surface layer is dark brown silt loam. The underlying material is dark brown, strong brown, and dark yellowish brown loam and clay loam.

The minor soils in this map unit include those in the Altavista, Roanoke, Tomotley, and Wickham series. Altavista soils are moderately well drained, and Wickham soils are well drained. Both of these soils are on ridges on the river terraces adjacent to the major soils. In a few areas they are intermingled with areas of the major soils. Roanoke and Tomotley soils are poorly drained. They are on the adjacent river terraces in low areas and are not flooded so often as the Wehadkee soils.

The Wehadkee soils are not suited to cultivated crops. The wetness and the flooding are severe limitations. The Congaree soils are suited to cultivated crops if the flooding can be controlled.

The Wehadkee soils generally are not suited to woodland. The wetness and the flooding are the main limitations. The Congaree soils are better suited to timber production than the Wehadkee soils, but the flooding is a limitation.

The flooding and the wetness are severe limitations affecting urban development.

8. Wehadkee-Chastain

Nearly level, poorly drained soils that have a loamy surface layer and a loamy or clayey subsoil; on flood plains

This map unit is along major creeks and streams throughout the county. The landscape is characterized by low, wooded areas along creeks and streams. The hazard of flooding is common. The native vegetation is water-tolerant hardwoods, such as water tupelo, baldcypress, water oak, and sycamore.

All areas of this map unit support hardwoods. It is not used for cultivated crops.

This map unit makes up about 7 percent of the county. It is about 48 percent Wehadkee soils, 32 percent Chastain soils, and 20 percent soils of minor extent.

Wehadkee soils are nearly level. The surface layer is light brownish gray loam. The subsoil is light brownish gray loam in the upper part and gray loam in the lower part. The underlying material is light gray sandy loam.

Chastain soils are nearly level. The surface layer is dark brown silt loam. The subsoil is gray loam in the upper part and gray clay that has yellowish red, yellow, and brown mottles in the lower part. The underlying stratified material is gray or mottled and ranges from sand to loam.

The minor soils in this map unit are those in the Bethera and Rains series. The poorly drained Bethera and Rains soils are in the slightly higher landscape positions adjacent to the flood plains. Flooding is not a hazard on the minor soils.

The frequent flooding and the wetness are severe limitations affecting cultivated crops, pasture, woodland use and management, and all urban development.

Detailed Soil Map Units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of the dominant soils within the map unit for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit is given under the heading "Use and Management of the Soils."

The map units on the detailed soil maps represent areas on the landscape and consist mainly of the dominant soils for which the units are named.

Symbols identifying the soils precede the map unit names in the map unit descriptions. The descriptions include general facts about the soils and give the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series.* Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases.* Most of the areas shown on the detailed soil maps are named as phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Turbeville loamy sand, 0 to 2 percent slopes, is a phase of the Turbeville series.

Some map units are made up of two or more major soils. These map units are called soil complexes. A *soil complex* consists of two or more contrasting soils, or miscellaneous land areas, in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Craven-Urban land complex, 0 to 4 percent slopes, is an example.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soils. Such differences could significantly affect use and management of the soils in the map unit. Included soils are identified in each map unit description. Some small areas of strongly contrasting soils may be identified by a special symbol on the soil maps.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and suitabilities for many uses. The "Glossary" defines many of the terms used in describing the soils.

AtA—Altavista fine sandy loam, 0 to 3 percent slopes, rarely flooded. This nearly level and gently sloping, moderately well drained soil is on stream terraces along the Roanoke and Meherrin Rivers and the larger streams in the county. Individual areas commonly are long and narrow and generally range from 5 to 20 acres in size. Some areas are as large as about 50 acres.

Typically, the surface layer is dark brown fine sandy loam 8 inches thick. The subsoil extends to a depth of 33 inches. The upper part is yellowish brown sandy clay loam with strong brown and very pale brown mottles. The next part is yellowish brown sandy clay loam with light gray mottles. The lower part is yellowish brown sandy loam with gray mottles. Gray mottles are within 30 inches of the surface. The underlying material extends to a depth of 65 inches. The upper part is yellowish brown loamy sand. The next part is light brownish yellow loamy sand with light brownish gray mottles. The lower part is yellowish brown sandy loam.

Permeability and available water capacity are moderate. The seasonal high water table is at a depth of 1.5 to 2.5 feet during wet periods. The soil is subject to rare flooding.

Included with this soil in mapping are a few small areas of the well drained State and Wickham soils in the slightly higher landscape positions and the somewhat poorly drained Wahee and poorly drained

Tomotley soils in depressions or the lower landscape positions. Also included are small areas of soils that have a higher content of sand or silt than the Altavista soil. Included soils make up about 25 percent of the map unit.

Most of the acreage of the Altavista soil is used for cultivated crops. The rest is used as woodland, hayland, or pasture.

The major crops grown on this soil are corn, soybeans, peanuts, cotton, and small grain. The flooding and the moderate wetness are the main limitations affecting cultivated crops. Winter cover crops, conservation tillage, and crop residue management help to maintain tilth and conserve soil moisture. Conservation measures, such as no-till planting, grassed waterways, field borders, and crop rotations, conserve moisture and help to control erosion in the upper part of the slope. A surface drainage system that includes field borders and grassed waterways is generally required to remove surface water during wet periods. In the areas used as pasture, proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

The dominant overstory trees are black cherry, yellow-poplar, sweetgum, hickory, red maple, willow oak, white oak, southern red oak, water oak, and loblolly pine. The understory vegetation consists mainly of flowering dogwood, sourwood, American holly, southern waxmyrtle, and sassafras. No major limitations affect woodland use and management.

The wetness and the flooding are the main limitations on sites for dwellings, shallow excavations, landscaping, and septic tank absorption fields. A well designed drainage system is needed. Protection from flooding requires major land shaping and expense.

The wetness is a moderate limitation affecting recreational uses, such as picnic areas, playgrounds, and hiking trails. The flooding is a severe hazard affecting camp areas. A complete drainage system is needed.

The land capability subclass is IIw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9A.

AuA—Autryville loamy sand, 0 to 3 percent slopes. This nearly level and gently sloping, well drained soil is on uplands in the northern part of the county, between Seaboard and Severn. Individual areas are irregular in shape and generally range from 10 to 50 acres in size. Some areas are as large as about 100 acres.

Typically, the surface layer is dark brown loamy sand 8 inches thick. The subsurface layer is light yellowish brown loamy sand 16 inches thick. The subsoil extends to a depth of 78 inches. It is yellowish brown or brownish yellow sandy loam and loamy sand in the upper part, light yellowish brown fine sand with light gray mottles in the next part, and yellowish brown sandy loam with strong brown and light gray mottles in the lower part.

Permeability is moderately rapid in the upper part of the soil and moderate in the lower part. Available water capacity is low. The soil is subject to soil blowing and the leaching of nutrients. The seasonal high water table is at a depth of 4 to 6 feet.

Included with this soil in mapping are areas of the well drained Bonneau soils in landscape positions similar to those of the Autryville soil. Also included are some areas of soils that are sandy throughout. These soils are intermingled with areas of the Autryville soil throughout the map unit. Included soils make up about 25 percent of the map unit.

Most of the acreage of the Autryville soil is used for cultivated crops. The rest is used as pasture or woodland.

The major crops grown on this soil are peanuts, corn, soybeans, and small grain. Droughtiness, soil blowing, and the leaching of plant nutrients are the main limitations. Conservation measures, such as winter cover crops, conservation tillage, and crop residue management, help conserve moisture, maintain tilth, and control soil blowing. Because of leaching, fertilizers, particularly those that are nitrogen-based, should be added in split applications. Pasture forages, such as coastal bermudagrass, also are grown on this soil.

The major trees grown are loblolly pine, red maple, hickory, sweetgum, American beech, southern red oak, white oak, and post oak. The understory vegetation consists mainly of flowering dogwood, sassafras, American holly, sourwood, and southern waxmyrtle. The thick, sandy surface layer is a moderate limitation affecting the use of equipment. The thick, sandy surface layer and low available water capacity are moderate limitations affecting seedling mortality.

The wetness is a moderate limitation on sites for septic tank absorption fields or dwellings with basements. A drainage system may be needed. The sandy texture causes droughty conditions for lawns and landscaping and causes shallow excavations to cave in. Irrigation may be necessary to maintain lawns and landscaping during dry periods, and shallow excavations need extra support to prevent sidewalls from caving in.

The thick, sandy surface layer is the main limitation affecting recreational uses, such as camp areas, picnic areas, playgrounds, or hiking trails.

The land capability subclass is IIs. Based on loblolly pine as the indicator species, the woodland ordination symbol is 7S.

Be—Bethera silt loam. This nearly level, poorly drained soil is on broad flats or in shallow depressions on the uplands in the southern part of the county, mainly south of Potecasi Creek and extending as far as Jackson. Slopes are 0 to 2 percent. Individual areas commonly are large and irregular in shape and range from 100 to more than 500 acres in size. A few areas are less than 50 acres.

Typically, the surface layer is very dark grayish brown silt loam 3 inches thick. The subsurface layer is gray silt loam 4 inches thick. The subsoil extends to a depth of 58 inches. The upper part is gray clay loam with brownish yellow mottles. The next part is gray clay with strong brown and brownish yellow mottles. The lower part is gray clay with yellowish red, strong brown, and yellowish brown mottles.

Permeability is slow, and available water capacity is high. The shrink-swell potential is moderate. Runoff is very slow. The seasonal high water table is at or near the surface for 3 to 5 months in most years.

Included with this soil in mapping are a few small areas of the somewhat poorly drained Lenoir soils, which are in the slightly higher landscape positions, and the poorly drained Rains soils, which are in landscape positions similar to those of the Bethera soil. Included soils make up about 15 percent of the map unit.

Most of the acreage of the Bethera soil is wooded. The rest is mainly used for cultivated crops or as pasture.

Drained areas of this soil are used for corn, soybeans, or small grain. The soil commonly is not used for the production of peanuts or cotton. The severe wetness and the slow permeability are the main limitations. Surface drainage systems are common. The effectiveness of a tile drainage system is restricted by the slow permeability and by the unavailability of suitable outlets. Tillage may be delayed in spring because of the wetness and the low soil temperatures. Conservation tillage and crop residue management help to maintain tilth and conserve soil moisture. Pasture forages, such as fescue, are grown in some areas. Proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

The major overstory trees grown are loblolly pine, sweetgum, and water oak. The understory vegetation consists of greenbrier, southern bayberry, sourwood, American holly, and switchcane. The wetness is a severe limitation affecting the use of equipment. Unsurfaced roads and skid trails are soft and slippery when wet. Operating standard equipment results in the formation of ruts and in compaction. The wetness is a major cause of seedling mortality. Special site preparation, such as bedding, helps to establish seedlings and reduces the seedling mortality rate.

The wetness and the slow permeability are severe limitations on sites for dwellings, commercial buildings, local roads and streets, lawns and landscaping, and septic tank absorption fields. A drainage system is necessary to prevent structural damage and to keep septic tank absorption fields functioning properly during wet periods. The slow permeability restricts the use of many types of conventional drainage systems.

The wetness is a severe limitation affecting recreational uses, such as camp areas, picnic areas, playgrounds, or hiking trails. A properly designed drainage system is needed.

The land capability subclass is IIIw (drained) and VIw (undrained). Based on sweetgum as the indicator species, the woodland ordination symbol is 8W.

BoB—Bonneau loamy sand, 0 to 6 percent slopes. This nearly level and gently sloping, well drained soil is in the uplands, generally in the northern part of the county. Individual areas are irregular in shape and generally range from 10 to 100 acres in size. Some areas are as large as 300 acres.

Typically, the surface layer is grayish brown loamy sand 9 inches thick. The subsurface layer is pale brown and light yellowish brown loamy sand 24 inches thick. The subsoil extends to a depth of 65 inches. The upper part is yellowish brown sandy clay loam with strong brown mottles. The next part is yellowish brown sandy clay loam with light brownish gray, strong brown, and red mottles. The lower part is mottled yellowish brown, strong brown, and light brownish gray sandy clay loam.

Permeability is moderate, and available water capacity is low. The soil is subject to soil blowing and the leaching of nutrients. The seasonal high water table is at a depth of 3.5 to 5.0 feet.

Included with this soil in mapping are a few areas of the well drained Norfolk soils, which are in landscape positions similar to those of the Bonneau soil, and the moderately well drained Goldsboro and Ocilla soils in the slightly lower landscape positions. Also included are areas of Autryville soils intermingled with areas of the Bonneau soil throughout the map unit. Included soils make up about 20 percent of the map unit.

Most of the acreage of the Bonneau soil is used for cultivated crops. The rest is used mainly as woodland or pasture.

The major crops grown on this soil are corn, soybeans, peanuts, tobacco, and small grain. Droughtiness, soil blowing, and the leaching of plant

nutrients are the main limitations. Winter cover crops, conservation tillage, and crop residue management help conserve moisture and maintain tilth. Conservation measures, such as field borders, reduce deposition of sediments and nutrients in streams. Fertilizers, particularly those that are nitrogen-based, should be added in split applications. Pasture forages, such as coastal bermudagrass, also are grown on this soil.

The major overstory trees are loblolly pine, red maple, hickory, sweetgum, black cherry, American beech, southern red oak, white oak, and post oak. The understory vegetation consists mainly of flowering dogwood, sassafras, American holly, sourwood, and southern waxmyrtle. The thick, sandy surface layer is a moderate limitation affecting the use of equipment. The thick, sandy surface layer and low available water capacity are moderate limitations affecting seedling mortality.

No major limitations affect sites for dwellings without basements, commercial buildings, or local roads and streets. The thick, sandy surface layer causes droughty conditions on sites for lawns and landscaping. The wetness is the main limitation on sites for septic tank absorption fields. Installing a subsurface drainage system can help to overcome the wetness.

Slight limitations affect recreational uses, such as camp areas, picnic areas, playgrounds, and hiking trails.

The land capability subclass is IIs. Based on loblolly pine as the indicator species, the woodland ordination symbol is 10S.

BoC—Bonneau loamy sand, 6 to 12 percent slopes. This gently sloping and strongly sloping, well drained soil is on uplands, generally in the northern part of the county. Individual areas commonly are long and narrow and range from 10 to 30 acres in size. Some areas are as large as 100 acres.

Typically, the surface layer is grayish brown loamy sand 9 inches thick. The subsurface layer is pale brown and light yellowish brown loamy sand 24 inches thick. The subsoil extends to a depth of 65 inches. The upper part is yellowish brown sandy clay loam with strong brown mottles. The next part is yellowish brown sandy clay loam with light brownish gray, strong brown, and red mottles. The lower part is mottled yellowish brown, strong brown, and light brownish gray sandy clay loam.

Permeability is moderate, and available water capacity is low. The hazard of water erosion is moderate. The soil is subject to soil blowing and the leaching of nutrients. The seasonal high water table is at a depth of 3.5 to 5.0 feet.

Included with this soil in mapping are a few small areas of the well drained Norfolk soils, which are intermingled with areas of the Bonneau soil throughout the map unit. Also included are a few areas that are more sandy throughout and a few areas that have more clay than is typical for the Bonneau soil. Included soils make up about 25 percent of the map unit.

Most of the acreage of the Bonneau soil is wooded. A few areas are used for cultivated crops.

This soil generally is not used for cultivated crops. The hazard of erosion, the slope, soil blowing, and the leaching of plant nutrients are the main limitations. Corn, soybeans, and small grain are the major crops grown in areas that have been cleared of trees. Conservation practices, such as no-till planting, field borders, and crop residue management, conserve soil moisture and help to control water erosion and soil blowing. Pasture forages, such as coastal bermudagrass and bahiagrass, grow well on this soil. Establishing a stand is difficult because of the slope and the hazard of erosion.

The major overstory trees grown are loblolly pine, red maple, hickory, sweetgum, black cherry, American beech, southern red oak, white oak, and post oak. The understory vegetation consists mainly of flowering dogwood, sassafras, American holly, sourwood, and southern waxmyrtle. The thick, sandy surface layer is a moderate limitation affecting the use of equipment. The thick, sandy surface layer and low available water capacity are moderate limitations affecting seedling mortality.

The slope is the main limitation on sites for dwellings, commercial buildings, local roads and streets, and lawns and landscaping. Special design may be needed to overcome this limitation. The wetness is the main limitation on sites for septic tank absorption fields. Installing a subsurface drainage system helps to overcome the wetness.

The slope and the thick, sandy surface layer are the main limitations affecting recreational uses, such as camp areas, picnic areas, playgrounds, and hiking trails.

The land capability subclass is IIIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 10S.

CaA—Caroline sandy loam, 0 to 2 percent slopes. This nearly level, well drained soil is on uplands in the southern part of the county, from Rich Square to Jackson, and in the central and western parts of the county, from Faisons Old Tavern to Vultare. Individual areas are irregular in shape and generally range from 10 to 50 acres in size. Some areas are as large as 150 acres.

Typically, the surface layer is yellowish brown sandy loam 8 inches thick. The subsoil extends to a depth of

80 inches. The upper part is strong brown clay loam. The next part is strong brown clay with yellowish red and yellowish brown mottles. The next part is mottled red, strong brown, light yellowish brown, and light brownish gray clay. The lower part is mottled yellowish red, strong brown, brownish yellow, and light brownish gray clay loam.

Permeability is moderately slow or slow, and available water capacity is high. The shrink-swell potential is moderate. A perched seasonal high water table is at a depth of 3.5 to 5.0 feet.

Included with this soil in mapping are a few small areas of the moderately well drained Craven and somewhat poorly drained Lenoir soils in the lower landscape positions and in slight depressions. Also included are areas of the red Turbeville and the loamy Norfolk soils in landscape positions similar to those of the Caroline soil. Included soils make up about 15 percent of the map unit.

Most of the acreage of the Caroline soil is used for cultivated crops. A few areas are used as woodland, hayland, or pasture.

The major crops grown on this soil are corn, soybeans, peanuts, cotton, and small grain. No major limitations affect cultivated crops. Winter cover crops, conservation tillage, and crop residue management help to maintain tilth and conserve soil moisture. They also control the hazard of erosion in the sloping areas.

The major overstory trees are loblolly pine, red maple, hickory, yellow-poplar, black cherry, southern red oak, and white oak. The understory vegetation consists mainly of flowering dogwood, sassafras, sourwood, and southern waxmyrtle. No major limitations affect woodland use and management.

The moderately slow or slow permeability is a severe limitation on sites for septic tank absorption fields. The clayey subsoil and the moderate shrink-swell potential are moderate limitations on sites for shallow excavations, dwellings, and commercial buildings. The wetness is a moderate limitation on sites for dwellings with basements and shallow excavations. Low strength is a severe limitation on sites for local roads and streets.

The clayey, moderately slowly permeable subsoil is a moderate limitation affecting recreational uses, such as camp areas, picnic areas, and playgrounds. No major limitations affect hiking trails.

The land capability class is I. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8A.

CaB—Caroline sandy loam, 2 to 6 percent slopes. This gently sloping, well drained soil is on uplands in the southern part of the county, from Rich Square to Jackson, and in the central and western parts of the county, from Faisons Old Tavern to Vultare. Individual areas are irregular in shape and generally range from 10 to 50 acres in size. Some areas are as large as 150 acres.

Typically, the surface layer is yellowish brown sandy loam 8 inches thick. The subsoil extends to a depth of 80 inches. The upper part is strong brown clay loam. The next part is strong brown clay with yellowish red and yellowish brown mottles. The next part is mottled red, strong brown, light yellowish brown, and light brownish gray clay. The lower part is mottled yellowish red, strong brown, brownish yellow, and light brownish gray clay loam.

Permeability is moderately slow or slow, and available water capacity is high. The shrink-swell potential is moderate. The hazard of erosion also is moderate. A perched seasonal high water table is at a depth of 3.5 to 5.0 feet.

Included with this soil in mapping are a few areas of the moderately well drained Craven and somewhat poorly drained Lenoir soils in the lower landscape positions and in slight depressions. Also included are a few small, eroded areas, which are identified by a spot symbol on the soil maps. Also included are a few areas of the red Turbeville, the loamy Norfolk, and the moderately well drained Gritney soils in landscape positions similar to those of the Caroline soil. Included soils make up about 20 percent of the map unit.

Most of the acreage of the Caroline soil is used for cultivated crops. The rest is used mainly as woodland, hayland, or pasture.

The major crops grown on this soil are corn, soybeans, peanuts, cotton, and small grain. Winter cover crops, conservation tillage, and crop residue management help to control runoff and erosion and maintain tilth. Conservation measures, such as no-till planting and terraces or diversions, also conserve water and help to control erosion.

The major overstory trees are loblolly pine, red maple, hickory, yellow-poplar, black cherry, American beech, southern red oak, and white oak. The understory vegetation consists mainly of flowering dogwood, sassafras, sourwood, and southern waxmyrtle. No major limitations affect woodland use and management.

The moderately slow or slow permeability is a severe limitation on sites for septic tank absorption fields. The clayey subsoil and the moderate shrink-swell potential are moderate limitations on sites for shallow excavations, dwellings, and commercial buildings. The wetness is a moderate limitation on sites for dwellings with basements and shallow excavations. The slope is a moderate limitation on sites for commercial buildings.

Low strength is severe limitation on sites for local roads and streets.

The clayey, moderately slowly permeable subsoil is a moderate limitation affecting recreational uses, such as camp areas, picnic areas, and playgrounds. The slope also is a moderate limitation in areas used as playgrounds. No major limitations affect hiking trails.

The land capability subclass is IIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8A.

Ch—Chastain silt loam, frequently flooded. This nearly level, poorly drained soil is on flood plains in the central and eastern parts of the county. Slope is 0 to 2 percent. The individual map units are long and narrow and generally are more than 200 acres in size.

Typically, the surface layer is dark brown silt loam 8 inches thick. The subsoil extends to a depth of 41 inches. The upper part is gray clay loam with strong brown mottles. The next part is gray clay with yellowish red and reddish yellow mottles. The lower part is gray clay with pale yellow and strong brown mottles. The underlying material to a depth of 60 inches is gray loam with very pale brown and light yellowish brown mottles in the upper part and gray loamy sand with light yellowish brown mottles in the lower part.

Permeability is slow, and available water capacity is moderate. The shrink-swell potential also is moderate. The seasonal high water table is at or near the surface most of the year. The soil is frequently flooded.

Included with this soil in mapping are small areas of soils that are better drained than the Chastain soil, some areas of soils that have a higher content of sand, and some areas of soils that have a thin organic surface layer. Included soils are intermingled with areas of the Chastain soil throughout the map unit. They make up about 15 percent of the map unit.

All of the acreage of the Chastain soil is wooded. It is not used as cropland or pasture because of the seasonal high water table and the hazard of flooding.

The dominant overstory trees are sweetgum, baldcypress, water oak, water tupelo, and red maple (fig. 4). The understory vegetation consists mainly of switchcane, sourwood, and southern waxmyrtle. The wetness and the flooding are severe limitations affecting woodland use and management because of the restricted use of equipment and the seedling mortality rate. Drainage of these areas is not feasible because of the unavailability of suitable outlets. Unsurfaced roads and skid trails are soft and slippery when wet. Operating standard equipment results in the formation of ruts and in compaction.

The flooding and the wetness are severe limitations on sites for dwellings, commercial buildings, local roads and streets, lawns and landscaping, and septic tank absorption fields. The limitations can be overcome only by a major drainage and flood-control system, which would be very costly to install.

The flooding and the wetness also are severe limitations affecting recreational uses, such as camp areas, picnic areas, playgrounds, and hiking trails. The limitations are too severe and costly to overcome.

The land capability subclass is VIw. Based on sweetgum as the indicator species, the woodland ordination symbol is 8W.

CnB—Conetoe loamy sand, 0 to 5 percent slopes. This nearly level and gently sloping, well drained soil is on stream terraces of the Meherrin River and other streams in the northeastern part of the county. Individual areas are irregular in shape and generally range from 5 to 30 acres in size. Some areas are as large as about 75 acres.

Typically, the surface layer is brown loamy sand 8 inches thick. The subsurface layer is light yellowish brown and brownish yellow loamy sand 16 inches thick. The subsoil extends to a depth of 58 inches. The upper part is strong brown sandy loam, and the lower part is strong brown sandy loam with light yellowish brown mottles. The underlying material to a depth of 84 inches is light yellowish brown loamy sand with strong brown and brownish yellow mottles in the upper part and brownish yellow loamy sand in the lower part.

Permeability is moderately rapid. Available water capacity is low. The soil is subject to soil blowing and the leaching of nutrients. The seasonal high water table is at a depth of more than 6 feet.

Included with this soil in mapping are a few areas of the somewhat excessively drained Tarboro and well drained Wickham and State soils. These soils are in landscape positions similar to those of the Conetoe soil. They are intermingled with areas of the Conetoe soil throughout the map unit. Also included are small areas of wetter soils in the slightly lower landscape positions. Included soils make up about 25 percent of the map unit.

Most of the acreage of the Conetoe soil is used for cultivated crops. The rest is mainly used as woodland or pasture.

The major crops grown on this soil are corn, soybeans, peanuts, and small grain. Low available water capacity, soil blowing, and the moderately rapid permeability, which results in droughtiness, are the main limitations. Winter cover crops, conservation tillage, and crop residue management help conserve moisture and maintain tilth. These practices also help to reduce damage and losses from soil blowing. Fertilizers, particularly those that are nitrogen-based,

Figure 4.—A stand of baldcypress and water tupelo in an area of Chastain silt loam, frequently flooded.

should be added in split applications. The soil also is used for pasture forages, such as coastal bermudagrass.

The major overstory trees are loblolly pine, red maple, hickory, sweetgum, black cherry, American beech, southern red oak, white oak, and post oak. The understory vegetation consists mainly of flowering dogwood, sassafras, American holly, sourwood, and southern waxmyrtle. The thick, sandy surface layer is a moderate limitation affecting the use of equipment. The thick, sandy surface layer and low available water capacity are moderate limitations affecting seedling mortality.

No major limitations affect sites for dwellings, commercial buildings, septic tank absorption fields, or local roads and streets. The sandy texture causes droughty conditions on sites for lawns and landscaping and causes shallow excavations to cave in.

The sandy surface layer is a moderate limitation affecting recreational uses, such as camp areas, picnic areas, playgrounds, and hiking trails.

The land capability subclass is IIs. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8S.

Co—Congaree silt loam, 0 to 4 percent slopes, occasionally flooded. This nearly level and gently sloping, well drained and moderately well drained soil is on flood plains along the Roanoke and Meherrin Rivers. Individual areas commonly extend for long distances along the river systems. Typically, areas of the soil are reached by crossing poorly drained guts off the rivers. A few areas are less than 100 acres in size.

Typically, the surface layer is dark brown silt loam 8

inches thick. The underlying material extends to a depth of 84 inches. The upper part is strong brown loam with yellowish red and very pale brown mottles. The next part is dark brown loam with yellowish red mottles. The next part is dark brown loam with yellowish brown mottles. The next part is dark yellowish brown loam. The next part is dark brown clay loam with yellowish brown mottles. The lower part is dark yellowish brown loam with reddish brown and very pale brown mottles.

Permeability is moderate, and available water capacity is high. The soil is occasionally flooded for brief periods. The seasonal high water table is at a depth of 2.5 to 4.0 feet.

Included with this soil in mapping are a few areas of the poorly drained Wehadkee soils in slight depressional areas and along drainageways. Also included are soils that have a higher content of sand than is typical for the Congaree soil. Included soils make up about 20 percent of the map unit.

Most of the acreage of the Congaree soil is wooded. A few small areas are used for cultivated crops.

The major crops grown on this soil are corn and soybeans. The flooding is the main limitation. Conservation tillage and crop residue management help to maintain tilth. Because of the flooding, flood-control measures and a surface drainage system that includes field borders and grassed waterways generally are required if crops are grown. In the areas used as pasture, proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

The major overstory trees are loblolly pine, sweetgum, yellow-poplar, eastern cottonwood, American sycamore, scarlet oak, willow oak, and red maple. The understory vegetation consists mainly of sourwood, southern waxmyrtle, and American holly. No major limitations affect woodland use and management. The occasional flooding leaves the soil wet and may restrict the use of equipment.

The flooding is a severe hazard on sites for dwellings, commercial buildings, and local roads and streets. The wetness also is a limitation on sites for septic tank absorption fields. Installing a drainage system helps to overcome the wetness, but flood-control measures are not feasible.

The flooding is a severe hazard in areas used for camping and a moderate hazard in areas used as playgrounds. No major limitations affect sites for picnic areas or hiking trails.

The land capability subclass is IIw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 10A.

CrA—Craven fine sandy loam, 0 to 1 percent slopes. This nearly level, moderately well drained soil is on broad, smooth ridges in the uplands in the central and southern parts of the county, between Jackson and Rich Square. Individual areas are irregular in shape and generally range from 25 to 100 acres in size. Some areas are as large as about 200 acres.

Typically, the surface layer is brown fine sandy loam 8 inches thick. The subsoil extends to a depth of 65 inches. It is brownish yellow clay with strong brown mottles in the upper part; brownish yellow clay with light brownish gray, yellowish brown, and yellowish red mottles in the next part; gray clay with yellowish red and yellowish brown mottles in the next part; and gray clay loam with yellowish brown and red mottles in the lower part.

Permeability is slow, and available water capacity is moderate. The shrink-swell potential also is moderate. The seasonal high water table is at a depth of 2 to 3 feet during the winter and spring.

Included with this soil in mapping are a few small areas of Caroline, Lenoir, and Bethera soils. Caroline soils are on slightly higher ridges. Lenoir and Bethera soils are in the slightly lower landscape positions and are generally in slight depressions and in broad, level areas. Also included with this soil in mapping are small areas of soils that have more sand than is typical for the Craven soil. Areas of these soils generally are less than 3 acres in size and are intermingled with areas of the Craven soil throughout the map unit. Included soils make up about 15 percent of the map unit.

Most of the acreage of the Craven soil is used for cultivated crops. The rest is used as woodland, hayland, or pasture.

The major crops grown on this soil are corn, soybeans, peanuts, cotton, and small grain. The wetness and the slow permeability are the main limitations affecting cultivated crops. Winter cover crops, conservation tillage, and crop residue management help to maintain soil tilth and conserve soil moisture. The slow permeability in the subsoil is a major factor affecting the installation of a drainage system. In the areas used as pasture, proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

The major overstory trees are loblolly pine, black cherry, yellow-poplar, sweetgum, hickory, red maple, American beech, willow oak, white oak, post oak, southern red oak, and water oak. The understory vegetation consists mainly of flowering dogwood, sourwood, American holly, southern waxmyrtle, and sassafras. The wetness is a moderate limitation

affecting the use of equipment. Trafficability is limited because the soil is slippery and sticky when wet. Operating standard equipment results in the formation of ruts and in compaction.

The wetness and the moderate shrink-swell potential are the main limitations on sites for dwellings, commercial buildings, and local roads and streets. The slow permeability and the wetness are severe limitations on sites for septic tank absorption fields. A properly designed drainage system helps to overcome the wetness and minimize the damage caused by shrinking and swelling. The slow permeability in the subsoil limits the use of some types of conventional drainage systems.

The wetness and the slow permeability are moderate limitations affecting recreational uses, such as camp areas, picnic areas, and playgrounds. The slow permeability restricts the use of some types of drainage systems. Installing a properly designed drainage system helps to overcome the wetness and the slow permeability. No major limitations affect hiking trails.

The land capability subclass is IIw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9C.

CrB—Craven fine sandy loam, 1 to 4 percent slopes. This nearly level and gently sloping, moderately well drained soil is on uplands in the central and southern parts of the county. Individual areas are irregular in shape and generally range from 20 to 50 acres in size. Some areas are as large as about 300 acres.

Typically, the surface layer is brown fine sandy loam 8 inches thick. The subsoil extends to a depth of 65 inches. It is brownish yellow clay with strong brown mottles in the upper part; brownish yellow clay with light brownish gray, yellowish brown, and yellowish red mottles in the next part; gray clay with yellowish red and yellowish brown mottles in the next part; and gray clay loam with yellowish brown and red mottles in the lower part.

Permeability is slow, and available water capacity is moderate. The shrink-swell potential also is moderate. The hazard of erosion is moderate. The seasonal high water table is at a depth of 2 to 3 feet during the winter and spring.

Included with this soil in mapping are a few areas of the somewhat poorly drained Lenoir soils in the lower landscape positions. Also included with this soil in mapping are small areas of soils that have more sand in the subsoil than is typical for the Craven soil. Also included are a few small areas of soils that are moderately eroded and have a surface layer of sandy clay loam. These soils are intermingled with areas of the Craven soil throughout the map unit. Included soils make up about 15 percent of the map unit.

Most of the acreage of the Craven soil is used for cultivated crops. Some areas are used as woodland or pasture.

The major crops grown on this soil are corn, soybeans, peanuts, cotton, and small grain. The hazard of erosion, the wetness, and the slow permeability are the main limitations. Winter cover crops, conservation tillage, and crop residue management help to maintain tilth and control erosion. In some areas conservation practices, such as field borders, terraces, and grassed waterways, are used to control erosion. The slow permeability in the subsoil is a limitation to the installation of drainage systems. The wetness and the slow permeability are the main limitations affecting pasture. In the areas used as pasture, proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

The major overstory trees are loblolly pine, black cherry, yellow-poplar, sweetgum, hickory, red maple, American beech, willow oak, white oak, post oak, southern red oak, and water oak. The understory vegetation consists mainly of flowering dogwood, sourwood, American holly, southern waxmyrtle, and sassafras. The wetness is a moderate limitation affecting the use of equipment. Trafficability is restricted because the soil is slippery and sticky when wet. Operating standard equipment results in the formation of ruts and in compaction.

The wetness and the moderate shrink-swell potential are the main limitations on sites for dwellings, commercial buildings, and local roads and streets. The slow permeability and the wetness are severe limitations on sites for septic tank absorption fields. A properly designed drainage system helps to overcome the wetness and minimize the damage caused by shrinking and swelling. The slow permeability in the subsoil limits the use of some types of conventional drainage systems.

The wetness and the slow permeability are moderate limitations affecting recreational uses, such as camp areas, picnic areas, and playgrounds. The slope also affects the use of the soil as a site for playgrounds. The slow permeability restricts the use of some types of drainage systems. Installing a properly designed drainage system helps to overcome the wetness and the slow permeability. No major limitations affect hiking trails.

The land capability subclass is IIIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9C.

CrC—Craven fine sandy loam, 4 to 10 percent slopes. This gently sloping and strongly sloping, moderately well drained soil is on side slopes along drainageways in the central and southern parts of the county, between Jackson and Rich Square. Individual areas are long and narrow and generally range from 5 to 25 acres in size.

Typically, the surface layer is brown fine sandy loam 8 inches thick. The subsoil extends to a depth of 65 inches. It is brownish yellow clay with strong brown mottles in the upper part; brownish yellow clay with light brownish gray, yellowish brown, and yellowish red mottles in the next part; gray clay with yellowish red and yellowish brown mottles in the next part; and gray clay loam with yellowish brown and red mottles in the lower part.

Permeability is slow, and available water capacity is moderate. The shrink-swell potential also is moderate. Runoff is rapid. The potential hazard of erosion is severe. The seasonal high water table is at a depth of 2 to 3 feet.

Included with this soil in mapping are a few small areas of the well drained Caroline soils on narrow ridges and the higher landscape positions. Also included with this soil in mapping are small areas of soils that have more sand in the subsoil than is typical for the Craven soil, soils that have an eroded surface layer of sandy clay loam, soils that have less clay than is typical for the Craven soil, and soils that have gray mottles near the surface. Included soils are generally less than 3 acres in size and make up about 20 percent of the map unit.

Most of the acreage of the Craven soil is used as woodland. The rest is used mostly as pasture. A few acres are used for cultivated crops.

The soil generally is not used for cultivated crops. The slope, runoff, and the hazard of erosion are the main management concerns affecting cultivated crops. Corn, soybeans, and small grain are the common crops in areas where the soil has been cleared of trees. Winter cover crops, conservation tillage, and crop residue management help to control runoff and erosion in cleared areas. Conservation practices, such as field borders, diversions, and grassed waterways, also help to control erosion.

The major overstory trees are loblolly pine, black cherry, yellow-poplar, sweetgum, hickory, red maple, American beech, willow oak, white oak, post oak, and southern red oak. The understory vegetation consists mainly of flowering dogwood, sourwood, American holly, southern waxmyrtle, and sassafras. The wetness is a moderate limitation affecting the use of equipment. Trafficability is restricted because the soil is slippery and sticky when wet. Operating standard equipment results in the formation of ruts and in compaction. The soil is subject to erosion in unprotected areas.

The wetness, the shrink-swell potential, and the slope are limitations on sites for dwellings, small commercial buildings, shallow excavations, and septic tank absorption fields. Low strength is a severe limitation on sites for local roads and streets. A properly designed drainage system, including surface and subsurface drains, helps to overcome the wetness and minimize the damage caused by shrinking and swelling. The slow permeability in the subsoil limits the use of some types of conventional drainage systems. Foundations and roads may need special reinforcement designs.

The wetness, the slow permeability, and the slope are the main limitations affecting recreational uses, such as camp areas, picnic areas, and playgrounds. Erosion is a hazard on hiking trails. A surface drainage system is needed in areas of high intensity recreational uses.

The land capability subclass is IVe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9C.

CsB2—Craven sandy clay loam, 1 to 4 percent slopes, eroded. This nearly level and gently sloping, moderately well drained soil is on narrow ridges in the uplands in the central and southern parts of the county, between Jackson and Rich Square. Individual areas are irregular in shape and generally range from 10 to 20 acres in size.

Typically, the surface layer is pale brown sandy clay loam 5 inches thick. The subsoil extends to a depth of 52 inches. It is brownish yellow clay with strong brown mottles in the upper part and mottled brownish yellow, strong brown, red, and light brownish gray clay in the lower part. The underlying material to a depth of 70 inches is mottled brownish yellow, red, and light gray sandy clay loam.

Permeability is slow, and available water capacity is moderate. The shrink-swell potential also is moderate. The hazard of further erosion is severe. Tilth generally is poor because the plow layer is made up mainly of subsoil material. The soil is susceptible to compaction. The seasonal high water table is at a depth of 2 to 3 feet.

Included with this soil in mapping are a few small areas of Caroline soils in the higher landscape positions and some areas of Lenoir soils, generally in slight depressions or at the base of slopes. Also included are a few small areas of soils that have more sand than is typical for the Craven soil, areas of soils that are severely eroded, and areas of soils that are not eroded or only slightly eroded. Included soils are intermingled

with areas of the Craven soil throughout the map unit. Individual areas of included soils generally are less than 2 acres in size. They make up about 20 percent of the map unit.

Most of the acreage of the Craven soil is used for cultivated crops. The rest is used mainly as pasture, hayland, or woodland.

The major crops grown on this soil are corn, soybeans, peanuts, cotton, and small grain. The wetness, the hazard of erosion, the poor tilth, and the slow permeability are the main limitations. Winter cover crops, conservation tillage, and crop residue management help to maintain tilth and control erosion. Conservation practices, such as terraces, field borders, grassed waterways, and crop rotations that include close-growing crops, also help conserve soil moisture, control erosion, and prevent compaction of the subsoil. The slow permeability in the subsoil is a major factor affecting the installation of a drainage system. Managing excess surface water also is a concern. In the areas used as pasture, proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

The major overstory trees are loblolly pine, black cherry, yellow-poplar, sweetgum, hickory, red maple, American beech, willow oak, white oak, post oak, southern red oak, and water oak. The understory vegetation consists mainly of flowering dogwood, sourwood, American holly, southern waxmyrtle, and sassafras. The wetness is a moderate limitation affecting the use of equipment. Trafficability is limited because the soil is slippery and sticky when wet. Operating standard equipment results in the formation of ruts and in compaction.

The wetness and the moderate shrink-swell potential are the main limitations on sites for dwellings, commercial buildings, and local roads and streets. The slow permeability and the wetness are severe limitations on sites for septic tank absorption fields. A properly designed drainage system helps to overcome the wetness and minimize the damage caused by shrinking and swelling. The slow permeability in the subsoil limits the use of some types of conventional drainage systems.

The wetness and the slow permeability are moderate limitations affecting recreational uses, such as camp areas, picnic areas, and playgrounds. The slope also affects the use of the soil as a site for playgrounds. The slow permeability restricts the use of some types of drainage systems. Installing a properly designed drainage system helps to overcome the wetness and the slow permeability. No major limitations affect hiking trails.

The land capability subclass is IVe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8C.

CuB—Craven-Urban land complex, 0 to 4 percent slopes. This map unit consists of areas of a moderately well drained Craven soil and areas of Urban land in or around the towns of Rich Square, Jackson, and Woodland. The Craven soil and Urban land occur as areas so small and so intricately mixed that mapping them separately was not feasible. About 50 percent of the map unit is Craven soil and 35 percent is Urban land. Individual areas are irregular in shape and range from 20 to 150 acres in size.

Typically, the surface layer of the Craven soil is brown fine sandy loam 8 inches thick. The subsoil extends to a depth of 65 inches. It is brownish yellow clay with strong brown mottles in the upper part; brownish yellow clay with light brownish gray, yellowish brown, and yellowish red mottles in the next part; gray clay with yellowish red and yellowish brown mottles in the next part; and gray clay loam with yellowish brown and red mottles in the lower part.

Permeability is slow in the Craven soil, and available water capacity is moderate. The shrink-swell potential also is moderate. The seasonal high water table is at a depth of 2 to 3 feet.

The areas of Urban land are used for commercial buildings, municipal buildings, factories, homes, parking lots, or other closely spaced structures or are covered with pavement. The slope generally has been modified during construction. The extent of modification varies greatly. Many areas are mostly undisturbed. Other areas have been graded or cut and filled.

The runoff rate generally is high in areas of this map unit because much of the surface of this unit is covered by impervious material. Runoff is particularly heavy during intense storms.

Included with this unit in mapping are areas of the moderately well drained Goldsboro and somewhat poorly drained Lenoir soils. Also included are areas where the original soils have been altered or disturbed. Included areas are intermingled with areas of the Craven soil and Urban land throughout the map unit. They make up about 15 percent of the map unit.

The wetness, the slow permeability, and the moderate shrink-swell potential of the Craven soil are the main limitations on sites for dwellings, commercial buildings, local roads and streets, and septic tank absorption fields. A properly designed drainage system helps to overcome the wetness and minimize some of the damage caused by shrinking and swelling. The slow permeability in the subsoil limits the use of some types of conventional drainage systems.

The land capability subclass is IIIe for the Craven soil and VIIIs for Urban land. This map unit was not assigned a woodland ordination symbol.

ExA—Exum loam, 0 to 2 percent slopes. This nearly level, moderately well drained soil is on uplands in the central part of the county, around Jackson. Individual areas are irregular in shape and range from 30 to 100 acres in size.

Typically, the surface layer is brown loam 7 inches thick. The subsoil is 73 inches thick. It is yellowish brown clay loam in the upper part, yellowish brown clay loam with light yellowish brown and strong brown mottles in the next part, yellowish brown clay loam with light brownish gray and strong brown mottles in the next part, and mottled light brownish gray, yellowish brown, light yellowish brown, and yellowish red clay in the lower part.

Permeability is moderately slow, and available water capacity is high. The shrink-swell potential is low. The seasonal high water table is at a depth of 2 to 3 feet.

Included with this soil in mapping are a few small areas of somewhat poorly drained soils in the slightly lower landscape positions and a few areas of fine loamy Goldsboro soils in landscape positions similar to those of the Exum soil. Included soils make up about 10 percent of the map unit.

Most of the acreage of the Exum soil is used for cultivated crops. A few small areas are used as pasture or woodland.

The major crops grown on this soil are corn, soybeans, peanuts, cotton, and small grain. The wetness is the main limitation. Winter cover crops, conservation tillage, and crop residue management help to maintain tilth. A drainage system is needed in some areas. Pasture and hay crops generally are not grown on this soil; however, they can be grown on this soil.

The major overstory trees are loblolly pine, sweetgum, yellow-poplar, southern red oak, white oak, and red maple. The understory vegetation consists mainly of flowering dogwood, American holly, sourwood, southern waxmyrtle, and greenbrier. No major limitations affect woodland use and management.

The wetness is the main limitation on sites for dwellings, local roads and streets, and septic tank absorption fields. A drainage system is needed. The moderately slow permeability in the subsoil affects drainage.

The wetness and the moderately slow permeability are the main limitations affecting recreational uses, such as camp areas, picnic areas, and playgrounds. Installing a properly designed drainage system helps to overcome the wetness and the moderately slow permeability. No major limitations affect hiking trails.

The land capability subclass is IIw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8A.

GoA—Goldsboro sandy loam, 0 to 2 percent slopes. This nearly level, moderately well drained soil is on uplands throughout the northern part of the county. Individual areas are irregular in shape and generally range from 20 to 50 acres in size. Some areas are as large as about 200 acres.

Typically, the surface layer is dark grayish brown sandy loam 9 inches thick. The subsoil is 75 inches thick. The upper part is light yellowish brown and yellowish brown sandy clay loam. The next part is yellowish brown sandy clay loam with brownish yellow mottles. The next part is brownish yellow sandy clay loam with yellowish brown and light brownish gray mottles. The next part is mottled brownish yellow, light gray, and reddish gray sandy clay loam. The next part is strong brown sandy clay loam with gray and red mottles. The next part is gray sandy clay loam with red, strong brown, and dark reddish brown mottles. The lower part is light gray sandy clay loam with red, reddish brown, and yellowish brown mottles.

Permeability and available water capacity are moderate. The seasonal high water table is at a depth of 2 to 3 feet.

Included with this soil in mapping are a few small areas of the somewhat poorly drained Lynchburg soils in the lower landscape positions and the well drained Norfolk soils in the slightly higher landscape positions. Also included are a few small areas of Exum soils in landscape positions similar to those of the Goldsboro soil, soils that have slopes of more than 2 percent, and soils that have more sand than is typical for the Goldsboro soil. Included soils make up about 20 percent of the map unit.

Most of the acreage of the Goldsboro soil is used for cultivated crops. The rest is mainly used as woodland, hayland, or pasture.

The major crops grown on this soil are corn, soybeans, peanuts, tobacco, cotton, and small grain. The wetness is the main limitation. A drainage system is practical. Surface and subsurface drains may be necessary to remove excess water. Winter cover crops, conservation tillage, and crop residue management help to maintain tilth and conserve soil moisture. They also help to control erosion on slopes of as much as 2 percent. In the areas used as pasture, proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

The major overstory trees are loblolly pine, black cherry, yellow-poplar, sweetgum, hickory, red maple,

white oak, post oak, southern red oak, and water oak. The understory vegetation consists mainly of flowering dogwood, sourwood, American holly, greenbrier, southern waxmyrtle, and sassafras. No major limitations affect woodland use and management.

The wetness is the main limitation on sites for dwellings, commercial buildings, local roads and streets, and septic tank absorption fields. Installing a drainage system helps to overcome this limitation.

The wetness also is a moderate limitation affecting recreational uses, such as camp areas, picnic areas, and playgrounds. Installing a drainage system helps to overcome the wetness. No major limitations affect hiking trails.

The land capability subclass is IIw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9A.

GuA—Goldsboro-Urban land complex, 0 to 2 percent slopes. This map unit consists of intermingled areas of Goldsboro soil and areas of Urban land in or around the towns of Jackson, Garysburg, Seaboard, and Severn. The Goldsboro soil and Urban land occur as areas so small and intricately mixed that mapping them separately was not feasible. About 50 percent of the map unit is Goldsboro soil and 30 percent is Urban land. Most areas are irregular in shape and range from 10 to 60 acres in size.

Typically, the surface layer of the Goldsboro soil is dark grayish brown sandy loam 9 inches thick. The subsoil is 75 inches thick. The upper part is light yellowish brown and yellowish brown sandy clay loam. The next part is yellowish brown sandy clay loam with brownish yellow mottles. The next part is brownish yellow sandy clay loam with yellowish brown and light brownish gray mottles. The next part is mottled brownish yellow, light gray, and reddish gray sandy clay loam. The next part is strong brown sandy clay loam with gray and red mottles. The next part is gray sandy clay loam with red, strong brown, and dark reddish brown mottles. The lower part is light gray sandy clay loam with red, reddish brown, and yellowish brown mottles.

Permeability and available water capacity are moderate in the Goldsboro soil. The seasonal high water table is at a depth of 2 to 3 feet.

The areas of Urban land are used for factories, commercial buildings, municipal buildings, homes, parking lots, or other closely spaced structures or are covered with pavement. The slope generally has been modified during construction. The extent of site modification varies greatly. Many areas are mostly undisturbed. Others have been graded or cut and filled.

The rate of runoff is higher in areas of this map unit than in areas that consist only of the Goldsboro soil because much of the surface of this unit is covered by impervious material. Runoff is particularly heavy during intense storms.

Included in mapping are small areas of the well drained Norfolk and somewhat poorly drained Lynchburg soils. Also included are areas where the original soils have been altered or disturbed. Included soils are intermingled with areas of the Goldsboro soil and Urban land throughout the map unit. They make up about 20 percent of the map unit.

The wetness is the main limitation on sites for dwellings, commercial buildings, local roads and streets, and septic tank absorption fields. Installing a drainage system helps to overcome the wetness.

The land capability subclass is IIw for the Goldsboro soil and VIIIs for Urban land. This map unit was not assigned a woodland ordination symbol.

GxB—Gritney sandy loam, 2 to 6 percent slopes. This gently sloping, moderately well drained soil is on uplands in the central and western parts of the county, between Conway and Gaston. Individual areas are irregular in shape and commonly range from 20 to 200 acres in size. Some areas are as large as about 500 acres.

Typically, the surface layer is brown sandy loam 6 inches thick. The subsoil is 52 inches thick. The upper part is yellowish brown sandy loam with yellowish red mottles. The next part is yellowish brown clay with red and dark red mottles. The next part is yellowish brown clay with light brownish gray and red mottles. The next part is mottled yellowish brown, strong brown, red, and light brownish gray clay and sandy clay. The underlying material to a depth of 70 inches is mottled strong brown, red, light brownish gray, and yellowish brown sandy clay loam.

Permeability is slow, and available water capacity is moderate. The hazard of erosion also is moderate. The seasonal high water table is at a depth of 1.5 to 3.0 feet.

Included with this soil in mapping are some areas of the well drained Norfolk and Caroline soils on higher ridges and level landscape positions. Also included are areas of the moderately well drained Goldsboro soils, which are intermingled with areas of the Gritney soil throughout the map unit, and areas of wetter soils at the base of slopes. A few areas of eroded soils that have a surface layer of sandy clay loam are identified by a spot symbol on the soil maps. Included soils make up about 20 percent of the map unit.

Most of the acreage of the Gritney soil is used for cultivated crops. The rest is mainly used as woodland, hayland, or pasture.

Figure 5.—Field borders in a cotton field on Gritney sandy loam, 2 to 6 percent slopes, effectively reduce the runoff of sediment.

The major crops grown on this soil are corn, soybeans, cotton, peanuts, and small grain. The wetness, the hazard of erosion, and the slow permeability are the main limitations affecting cultivated crops. Winter cover crops, conservation tillage, and crop residue management help to control erosion and maintain tilth. Field borders, crop rotations that include close-growing crops, terraces, and no-till planting also help to control erosion and conserve moisture (fig. 5).

The major overstory trees are loblolly pine, sweetgum, yellow-poplar, hickory, red maple, white oak, and southern red oak. The understory vegetation consists mainly of flowering dogwood, sourwood, American holly, southern waxmyrtle, and sassafras. No major limitations affect woodland use and management.

The wetness and the moderate shrink-swell potential are the main limitations on sites for dwellings, commercial buildings, and local roads and streets. The wetness is a severe limitation on sites for shallow excavations and septic tank absorption fields. A surface drainage system helps to overcome the wetness. The slow permeability in the subsoil limits the use of some types of conventional drainage systems.

The wetness and the slow permeability are moderate limitations affecting recreational uses, such as camp areas, picnic areas, playgrounds, and hiking trails. The slow permeability restricts the use of some types of drainage systems. Installing a properly designed drainage system helps to overcome the wetness and the slow permeability.

The land capability subclass is IIIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8A.

GxC—Gritney sandy loam, 6 to 10 percent slopes. This gently sloping and strongly sloping, moderately well drained soil is on side slopes and in rolling areas on uplands in the central and western parts of the county, between Conway and Gaston. Individual areas commonly are long and narrow and generally range from 5 to 20 acres in size. Some areas are as large as 100 acres.

Typically, the surface layer is brown sandy loam 6 inches thick. The subsoil is 52 inches thick. The upper part is yellowish brown sandy loam with yellowish red mottles. The next part is yellowish brown clay with red and dark red mottles. The next part is yellowish brown clay with light brownish gray and red mottles. The next part is mottled yellowish brown, strong brown, red, and light brownish gray clay and sandy clay. The underlying material to a depth of 70 inches is mottled strong brown, red, light brownish gray, and yellowish brown sandy clay loam.

Permeability is slow, and available water capacity is moderate. In cleared areas the hazard of erosion is severe. The seasonal high water table is at a depth of 1.5 to 3.0 feet.

Included with this soil in mapping are areas of Norfolk and Bonneau soils in landscape positions similar to those of the Gritney soil. These soils are intermingled with areas of the Gritney soil throughout the map unit. Also included are wetter soils at the base of slopes and a few areas of soils that have slopes of more than 10 percent. Included soils make up about 25 percent of the map unit.

Most of the acreage of the Gritney soil is wooded. A few small areas are used as pasture or hayland or for cultivated crops.

Corn, soybeans, and small grain are grown in areas where the soil has been cleared of trees. The hazard of erosion, the slope, and the slow permeability are the major limitations affecting cultivated crops. Winter cover crops, conservation tillage, and crop residue management help to control erosion and maintain tilth. Field borders, crop rotations that include close-growing crops, and no-till planting also help to control erosion and conserve moisture. The slope and the hazard of erosion are the main management concerns affecting pasture.

The major overstory trees are loblolly pine, sweetgum, yellow-poplar, hickory, red maple, white oak, and southern red oak. The understory vegetation consists mainly of flowering dogwood, sourwood, American holly, southern waxmyrtle, and sassafras. No major limitations affect woodland use and management.

The wetness, the slope, and the moderate shrink-swell potential are the main limitations on sites for dwellings, commercial buildings, and local roads and streets. The wetness is a severe limitation on sites for shallow excavations and septic tank absorption fields. A surface drainage system helps to overcome the wetness.

The wetness, the slope, and the slow permeability are the main limitations affecting recreational uses, such as camp areas, picnic areas, and hiking trails. The slope is a severe limitation in areas used as playgrounds. A surface drainage system is needed.

The land capability subclass is IVe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8A.

GyB2—Gritney sandy clay loam, 2 to 6 percent slopes, eroded. This gently sloping, moderately well drained, eroded soil is on uplands in the central and western parts of the county, between Conway and Gaston. Individual areas are irregular in shape and generally range from 5 to 25 acres in size.

Typically, the surface layer is brown sandy clay loam 6 inches thick. The subsoil is 52 inches thick. It is strong brown clay loam that has yellowish red and brownish yellow mottles in the upper part and mottled brownish yellow, red, strong brown, and light brownish gray clay in the lower part. The underlying material to a depth of 65 inches is mottled brownish yellow, red, yellowish brown, and light brownish gray sandy clay loam.

Permeability is slow, and available water capacity is moderate. The hazard of further erosion is severe. The seasonal high water table is at a depth of 1.5 to 3.0 feet.

Included with this soil in mapping are some areas of the well drained Norfolk and Caroline soils on higher ridges and level areas on the landscape. Also included are areas of the moderately well drained Goldsboro soils and areas of soils that are not so eroded as the Gritney soil. These soils are intermingled with areas of the Gritney soil in the map unit. Also included are a few small areas of wetter soils at the base of slopes. Included soils make up about 20 percent of the map unit.

Most of the acreage of the Gritney soil is used for cultivated crops. The rest is mainly used as woodland, hayland, or pasture.

The major crops grown on this soil are corn, soybeans, cotton, and small grain. Peanuts are grown where the hazard of erosion is not too severe. The hazard of erosion, the poor tilth, the wetness, and the slow permeability are the major limitations affecting cultivated crops. Winter cover crops, conservation tillage, and crop residue management help to control erosion and maintain tilth. Field borders, crop rotations that include close-growing crops, and no-till planting

also conserve soil moisture. During wet periods, grazing should be rotated to reduce compaction.

The major overstory trees are loblolly pine, sweetgum, yellow-poplar, hickory, red maple, white oak, and southern red oak. The understory vegetation consists mainly of flowering dogwood, sourwood, American holly, southern waxmyrtle, and sassafras. The higher content of clay in the eroded surface layer is a moderate limitation affecting the use of equipment. When the soil is wet, unsurfaced roads and skid trails become slippery and soft and may be impassable. Inadequate moisture in the surface layer during summer can cause seedling mortality. The larger trees can be left to provide shade for seedlings.

The wetness and a moderate shrink-swell potential are the main limitations on sites for dwellings, commercial buildings, and local roads and streets. The wetness is a severe limitation on sites for shallow excavations and septic tank absorption fields. A surface drainage system helps to overcome the wetness. The slow permeability in the subsoil limits the use of some types of conventional drainage systems.

The wetness and the slow permeability are moderate limitations affecting recreational uses, such as camp areas, picnic areas, playgrounds, and hiking trails. The slope also affects the use of the soil as a site for playgrounds. The slow permeability restricts the use of some types of drainage systems. Installing a properly designed drainage system helps to overcome the wetness and the slow permeability.

The land capability subclass is IVe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8C.

GyC2—Gritney sandy clay loam, 6 to 10 percent slopes, eroded. This gently sloping and strongly sloping, moderately well drained, eroded soil is on side slopes and in rolling areas on uplands in the central and western parts of the county, between Conway and Gaston. Individual areas are irregular in shape and generally range from 5 to 15 acres in size.

Typically, the surface layer is brown sandy clay loam 6 inches thick. The subsoil is 52 inches thick. It is strong brown clay in the upper part and mottled brownish yellow, red, strong brown, and light brownish gray clay in the lower part. The underlying material to a depth of 65 inches is mottled brownish yellow, red, yellowish brown, and light brownish gray sandy clay loam.

Permeability is slow, and available water capacity is moderate. The hazard of further erosion is severe. Tilth generally is poor. Runoff is rapid. The seasonal high water table is at a depth of 1.5 to 3.0 feet.

Included with this soil in mapping are areas of wetter soils at the base of slopes and a few areas of soils that have slopes of less than 6 percent or more than 10 percent. Also included are a few areas of soils that have more sand throughout than is typical for the Gritney soil. Included soils make up about 15 percent of the map unit.

About half of the acreage of the Gritney soil is used for cultivated crops. The rest is used as woodland, hayland, or pasture.

The major crops grown on this soil are corn, soybeans, cotton, and small grain. The hazard of further erosion, the poor tilth, the slope, and the slow permeability are the major limitations affecting cultivated crops. Winter cover crops, conservation tillage, and crop residue management improve tilth, conserve soil moisture, and help to control erosion. Conservation measures, such as grassed waterways and field borders, help to control erosion and keep soil material and nutrients from entering streams. The slope and the hazard of erosion are the main management concerns affecting pasture.

The major overstory trees are loblolly pine, sweetgum, yellow-poplar, hickory, red maple, white oak, and southern red oak. The understory vegetation consists mainly of flowering dogwood, sourwood, American holly, southern waxmyrtle, and sassafras. The higher content of clay in the eroded surface layer is a moderate limitation affecting the use of equipment. When the soil is wet, unsurfaced roads and skid trails become slippery and soft and may be impassable. Inadequate moisture in the surface layer during summer can cause seedling mortality. The larger trees can be left to provide shade for seedlings.

The wetness, the slope, and a moderate shrink-swell potential are the main limitations on sites for dwellings, commercial buildings, and local roads and streets. The wetness is a severe limitation on sites for shallow excavations and septic tank absorption fields. A surface drainage system helps to overcome the wetness.

The wetness, the slope, and the slow permeability are the main limitations affecting recreational uses, such as camp areas, picnic areas, and hiking trails. The slope is a severe limitation in areas used as playgrounds. Installing properly designed surface and subsurface drainage systems helps to overcome the wetness and the slow permeability.

The land capability subclass is VIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8C.

HeB—Helena sandy loam, 1 to 6 percent slopes. This nearly level and gently sloping, moderately well drained soil is on smooth ridgetops and at the head of draws or drainageways in the Piedmont. It is in the

western part of the county, around Vultare and Henrico. Individual areas commonly are elliptical in shape and generally range from 4 to 20 acres in size. Some areas are as large as 40 acres.

Typically, the surface layer is brown sandy loam 6 inches thick. The subsoil is 41 inches thick. The upper part is light yellowish brown sandy clay loam. The next part is yellowish brown clay loam with strong brown mottles. The next part is mottled yellowish brown, strong brown, light brownish gray, and yellowish red clay. The next part is mottled yellowish brown and gray clay. The lower part is gray clay loam with yellowish brown mottles. The underlying material to a depth of 62 inches is white loam saprolite with yellowish brown mottles.

Permeability is slow, and available water capacity is moderate. A perched seasonal high water table is at a depth of 1.5 to 2.5 feet during the winter and spring. The shrink-swell potential is high.

Included with this soil in mapping are areas of wetter soils in draws or adjacent to drainageways. Also included are a few areas of soils that have a higher content of sand in the subsoil than is typical for the Helena soil. Included soils make up about 20 percent of the map unit.

Most of the acreage of the Helena soil is wooded. A few small areas are used for residential developments.

The soil generally is not used for cultivated crops. The wetness and the slow permeability are the main limitations. Most areas of the Helena soil receive additional surface water from the adjacent soils because of their position on the landscape. A drainage system, including surface and subsurface drains, is needed. The slow permeability restricts most conventional types of subsurface drainage systems.

The major overstory trees are loblolly pine, sweetgum, white oak, southern red oak, yellow-poplar, and hickory. The understory vegetation consists mostly of flowering dogwood, American holly, sassafras, and red maple. No major limitations affect woodland use and management.

The wetness and the high shrink-swell potential are severe limitations on sites for dwellings, commercial buildings, local roads and streets, septic tank absorption fields, and shallow excavations. A drainage system, including surface and subsurface drains, is necessary to protect improvements and to keep septic tank absorption fields functioning properly. The slow permeability in the subsoil severely restricts the use of a subsurface drainage system. The high shrink-swell potential is a limitation for foundations or for local roads and streets. Special design is needed.

The wetness is the main limitation affecting recreational uses, such as camp areas, picnic areas, playgrounds, and hiking trails. A slope of more than 2 percent is a moderate limitation in areas used as playgrounds. A drainage system is needed wherever feasible.

The land capability subclass is IIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8A.

Le—Lenoir silt loam. This nearly level, somewhat poorly drained soil is in broad interstream areas on uplands in the central and southern parts of the county. Slopes are 0 to 2 percent. Individual areas are broad and generally range from 25 to 200 acres in size. Some areas are as large as 500 acres.

Typically, the surface layer is dark grayish brown silt loam 4 inches thick. The subsoil is 61 inches thick. The upper part is brownish yellow clay loam with light brownish gray mottles. The next part is light brownish gray clay with brownish yellow and red mottles. The next part is mottled gray and yellowish brown clay. The next part is gray clay with yellowish red and yellowish brown mottles. The lower part is gray clay with yellowish brown and strong brown mottles.

Permeability is slow, and available water capacity is moderate. The shrink-swell potential also is moderate. Runoff is slow. The seasonal high water table is at a depth of 1.0 foot to 2.5 feet during wet periods.

Included with this soil in mapping are areas of the poorly drained Bethera soils in the slightly lower landscape positions and the moderately well drained Craven soils in the higher landscape positions. Included soils make up about 15 percent of the map unit.

About half of the acreage of the Lenoir soil is used for cultivated crops. The rest is used as woodland or pasture.

The major crops grown on this soil are corn and soybeans. The wetness and the slow permeability are the main limitations. A well planned and constructed drainage system helps to control runoff, but the slow permeability limits internal drainage. Planting may be delayed in the spring because of the wetness and the low soil temperatures. In the areas used as pasture, proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

The major overstory trees are loblolly pine, sweetgum, red maple, water oak, southern red oak, and yellow-poplar (fig. 6). The understory vegetation consists mainly of flowering dogwood, American holly, greenbrier, and switchcane. The wetness is a moderate limitation affecting the use of equipment. Operating standard equipment when the soil is wet results in the formation of ruts and in compaction. Surface and subsurface drainage systems are needed. Unsurfaced

Figure 6.—A stand of loblolly pine on Lenoir silt loam. Loblolly pine is the major commercial forest species in Northampton County.

roads are slippery when wet and may be impassable.

The wetness is a severe limitation on sites for dwellings, commercial buildings, local roads and streets, lawns and landscaping, and septic tank absorption fields. A drainage system is necessary to prevent structural damage and to keep septic tank absorption fields functioning properly during wet periods. The slow permeability restricts the use of some types of conventional drainage systems and septic tank absorption fields.

The wetness is the main limitation affecting recreational uses, such as camp areas, picnic areas, playgrounds, and hiking trails. A surface and subsurface drainage system is needed where practical.

The land capability subclass is IIIw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9W.

LtD—Lillington-Turbeville complex, 8 to 15 percent slopes. This map unit consists of areas of strongly sloping, well drained, gravelly Lillington and Turbeville soils on side slopes along the contact zone where Coastal Plain sediments are underlain by crystalline Piedmont rocks. It is in the western part of the county, between Gaston and Henrico. It is about 50 percent Lillington soils, 30 percent Turbeville soils, and 20 percent soils of minor extent. The Lillington and Turbeville soils are so intricately mixed that mapping them separately was not practical.

Field observations of these soils were limited

because the content of gravel on the surface made digging or boring with hand tools impractical. Enough areas were investigated in detail to determine the composition of the map unit. Individual mapped areas are irregular in shape and commonly range from 25 to 200 acres in size.

Typically, the surface layer of the Lillington soil is dark brown very gravelly sandy loam 5 inches thick. The subsoil to a depth of 48 inches is brown gravelly sandy loam and red very gravelly sandy clay loam. The underlying material to a depth of 65 inches is yellowish red gravelly loamy coarse sand.

Typically, the surface layer of the Turbeville soil is dark brown gravelly sandy loam 8 inches thick. The subsoil extends to a depth of 71 inches. The upper part is strong brown sandy clay loam, the middle part is red clay, and the lower part is dark red gravelly sandy clay.

Permeability is moderate in both soils. Available water capacity is low in the Lillington soil and moderate in the Turbeville soil. The shrink-swell potential is low in the Lillington soil and moderate in the Turbeville soil. The seasonal high water table is at a depth of more than 6 feet in both soils. Pebbles from 0.5 inch to 1.5 inches in size range from 15 to 50 percent on the surface.

Included with these soils in mapping are small areas of Pacolet soils and soils that have a surface layer of Coastal Plain sediments underlain by residual Piedmont material. Also included are a few areas of soils that have a thick surface layer of gravelly loamy sand and a few areas of soils that have an extremely gravelly surface layer. Included soils make up about 20 percent of the map unit.

Most of the acreage of the unit is wooded. This map unit generally is not used as cropland or pasture. The slope and the high content of pebbles on the surface are severe limitations.

The major overstory trees on this map unit are loblolly pine, yellow-poplar, southern red oak, white oak, hickory, and sweetgum. The understory vegetation consists mainly of flowering dogwood, American holly, sourwood, and red maple. No major limitations affect woodland use and management.

The slope is a moderate limitation on sites for dwellings, local roads and streets, shallow excavations, and septic tank absorption fields and is a severe limitation on sites for commercial buildings. The content of gravel is a severe limitation for lawns and landscaping. The shrink-swell potential is a moderate limitation affecting urban uses in areas of the Turbeville soil. Because of several different soil conditions, onsite investigations are needed when urban uses are planned.

The pebbles on the surface are a severe limitation affecting recreational uses, such as camp areas, picnic areas, playgrounds, and hiking trails. The slope is a severe limitation in areas of the soils used as playgrounds.

The land capability subclass is IVs for the Lillington soil and IVe for the Turbeville soil. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9A for the Lillington soil and 6A for the Turbeville soil.

Ly—Lynchburg fine sandy loam. This nearly level, somewhat poorly drained soil is on uplands in the northern part of the county, from Gaston to Conway. Slopes are 0 to 2 percent. Individual areas are irregular in shape and generally range from 5 to 50 acres in size. Some areas are more than 100 acres.

Typically, the surface layer is dark grayish brown fine sandy loam 9 inches thick. The subsoil extends to a depth of 84 inches. The upper part is pale brown sandy clay loam with brownish yellow and light gray mottles. The next part is light brownish gray sandy clay loam with light gray and brownish yellow mottles. The next part is gray sandy clay loam with strong brown and brownish yellow mottles. The next part is light gray sandy clay loam with brownish yellow and yellowish red mottles. The next part is light gray sandy clay with red and brownish yellow mottles. The lower part is light gray sandy clay loam with brownish yellow mottles.

Permeability and available water capacity are moderate. The seasonal high water table is at a depth of 0.5 foot to 1.5 feet.

Included with this soil in mapping are a few small areas of the moderately well drained Goldsboro soils in the slightly higher landscape positions and the poorly drained Rains soils in lower or depressional areas. Also included are a few areas of soils that have a thick, sandy surface layer or areas of soils that have a higher content of clay than is typical for the Lynchburg soil. Included soils make up about 15 percent of the map unit.

Most of the acreage of the Lynchburg soil is used for cultivated crops. The rest is used as woodland or pasture.

The major crops grown in drained areas of this soil are corn, soybeans, and small grain. In a few areas peanuts and cotton also are grown. Conservation tillage and crop residue management help to maintain tilth. Because of the wetness, a drainage system is generally required if peanuts or cotton is grown. Planting may be delayed in spring because of the wetness and the low soil temperatures. In the areas used as pasture, proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

The major overstory trees are loblolly pine, blackgum, black cherry, yellow-poplar, sweetgum, red maple, willow oak, white oak, southern red oak, and water oak. The understory vegetation consists mainly of flowering dogwood, sweetbay, sourwood, American holly, southern waxmyrtle, greenbrier, and sassafras. The wetness is a moderate limitation affecting the use of equipment. When the soil is wet, unsurfaced roads become slippery and soft and may be impassable. Operating standard equipment may result in the formation of ruts and in compaction. A surface and subsurface drainage system is needed.

The wetness is a severe limitation on sites for dwellings, commercial buildings, local roads and streets, lawns and landscaping, and septic tank absorption fields. It also is a severe limitation affecting recreational uses, such as camp areas, picnic areas, playgrounds, and hiking trails. Installing and maintaining a well designed drainage system can help to overcome the wetness. In some areas suitable outlets for drainage are unavailable.

The land capability subclass is IIw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9W.

NoA—Norfolk sandy loam, 0 to 2 percent slopes. This nearly level, well drained soil is on uplands in the northern half of the county, between the Hertford County line and Gaston. Individual areas are irregular in shape and generally range from 10 to 50 acres in size. Some areas are as large as 100 acres.

Typically, the surface layer is grayish brown sandy loam 8 inches thick. The subsoil extends to a depth of 76 inches. The upper part is yellowish brown sandy clay loam. The next part is yellowish brown sandy clay loam with red and light yellowish brown mottles. The next part is brownish yellow clay loam with red and light gray mottles. The lower part is mottled light gray, red, and brownish yellow clay loam.

Permeability and available water capacity are moderate. The seasonal high water table is at a depth of 4 to 6 feet.

Included with this soil in mapping are a few areas of the moderately well drained Goldsboro soils in the slightly lower landscape positions; the well drained, clayey Caroline soils in landscape positions similar to those of the Norfolk soil; and the well drained Bonneau soils in areas where the sandy surface layer is more than 20 inches thick. Included soils make up about 15 percent of the map unit.

Most of the acreage of the Norfolk soil is used for cultivated crops. A few areas are used as pasture or woodland.

The major crops grown on this soil are corn, soybeans, peanuts, tobacco, cotton, and small grain. No major limitations affect cultivated crops. Winter cover crops, conservation tillage, and crop residue management help to maintain tilth and conserve moisture.

The major overstory trees are loblolly pine, red maple, hickory, yellow-poplar, blackgum, black cherry, American beech, southern red oak, and white oak. The understory vegetation consists mainly of flowering dogwood, sassafras, sourwood, greenbrier, and southern waxmyrtle. No major limitations affect woodland use and management.

No major limitations affect dwellings, commercial buildings, local roads and streets, or lawns and landscaping. The wetness is a moderate limitation on sites for shallow excavations and septic tank absorption fields. Installing a subsurface drainage system can help to overcome the wetness.

No major limitations affect recreational uses, such as camp areas, picnic areas, playgrounds, and hiking trails.

The land capability class is I. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8A.

NoB—Norfolk sandy loam, 2 to 6 percent slopes. This gently sloping, well drained soil is on uplands in the northern half of the county, between the Hertford County line and Gaston. Individual areas are irregular in shape and generally range from 20 to 50 acres in size. Some areas are as large as 200 acres.

Typically, the surface layer is grayish brown sandy loam 8 inches thick. The subsoil extends to a depth of 76 inches. The upper part is yellowish brown sandy clay loam. The next part is yellowish brown sandy clay loam with red and light yellowish brown mottles. The next part is brownish yellow clay loam with red and light gray mottles. The lower part is mottled light gray, red, and brownish yellow clay loam.

Permeability and available water capacity are moderate. The hazard of erosion also is moderate. The seasonal high water table is at a depth of 4 to 6 feet.

Included with this soil in mapping are a few areas of the well drained, clayey Caroline and well drained Bonneau soils in landscape positions similar to those of the Norfolk soil. Also included are areas of eroded soils that have a surface layer of sandy clay loam, areas of soils in which the lower part of the subsoil is denser and less permeable than that of the Norfolk soil, and areas of clayey, moderately well drained Gritney soils. Included soils make up about 25 percent of the map unit.

Most of the acreage of the Norfolk soil is used for cultivated crops. The rest is mainly used as pasture or woodland.

The major crops grown on this soil are corn, soybeans, peanuts, tobacco, cotton, and small grain. Winter cover crops, conservation tillage, and crop residue management help to control runoff and erosion and maintain tilth. Conservation practices, such as no-till planting, field borders, grassed waterways, and terraces and diversions, also conserve water and help to control erosion. Few limitations affect the use of the soil as pasture.

The major overstory trees are loblolly pine, red maple, hickory, yellow-poplar, blackgum, black cherry, American beech, southern red oak, and white oak. The understory vegetation consists mainly of flowering dogwood, sassafras, greenbrier, sourwood, and southern waxmyrtle. No major limitations affect woodland use and management.

No major limitations affect sites for dwellings, local roads and streets, or lawns and landscaping. The slope is a moderate limitation on sites for small commercial buildings. The wetness is a moderate limitation on sites for shallow excavations and septic tank absorption fields. Installing a subsurface drainage system can help to overcome the wetness.

No major limitations affect recreational uses, such as camp areas, picnic areas, and hiking trails. The slope is a moderate limitation in areas used as playgrounds.

The land capability subclass is IIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8A.

NoC—Norfolk sandy loam, 6 to 10 percent slopes. This gently sloping and strongly sloping, well drained soil is on side slopes that drain into creeks in the central and northern parts of the county, between the Hertford County line and Gaston. Individual areas are long and narrow and generally range from 10 to 25 acres in size.

Typically, the surface layer is grayish brown sandy loam 8 inches thick. The subsoil extends to a depth of 76 inches. The upper part is yellowish brown sandy clay loam. The next part is yellowish brown sandy clay loam with red and light yellowish brown mottles. The next part is brownish yellow clay loam with red and light gray mottles. The lower part is mottled light gray, red, and brownish yellow clay loam.

Permeability and available water capacity are moderate. The hazard of erosion is severe. Runoff is medium. The seasonal high water table is at a depth of 4 to 6 feet.

Included with this soil in mapping are areas of Bonneau soils in landscape positions similar to those of the Norfolk soil, areas of soils that have more clay or sand in the subsoil than is typical for the Norfolk soil, and a few areas of soils where the seasonal high water table is closer to the surface. Included soils are intermingled with areas of the Norfolk soil throughout the map unit. They make up about 25 percent of the map unit.

The Norfolk soil is mostly wooded. A few areas are used for cultivated crops or as pasture.

The soil generally is not used for cultivated crops, except for areas adjacent to Norfolk sandy loam, 2 to 6 percent slopes, that have been cleared of trees. Winter cover crops, conservation tillage, and crop residue management help to control runoff and erosion. Conservation practices, such as no-till planting, field borders, grassed waterways, and terraces and diversions, conserve water and help to control erosion. Erosion control practices may be needed to keep the pasture in good condition.

The major overstory trees are loblolly pine, red maple, hickory, yellow-poplar, blackgum, black cherry, American beech, southern red oak, and white oak. The understory vegetation consists mainly of flowering dogwood, sassafras, greenbrier, sourwood, and southern waxmyrtle. No major limitations affect woodland use and management.

The slope is a moderate limitation on sites for dwellings, commercial buildings, local roads and streets, lawns and landscaping, shallow excavations, and septic tank absorption fields. Special design may be needed to overcome this limitation. The wetness also is a limitation on sites for shallow excavations and septic tank absorption fields. Installing a subsurface drainage system can help to overcome the wetness.

The slope also is a moderate limitation in areas used for camping and picnicking and a severe limitation in areas used for playgrounds.

The land capability subclass is IIIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8A.

NuB—Norfolk-Urban land complex, 0 to 6 percent slopes. This map unit consists of areas of Norfolk soil and areas of Urban land in the towns of Jackson, Seaboard, Garysburg, and Conway. The Norfolk soil and Urban land occur as areas so small and so intricately mixed that mapping them separately was not feasible. About 50 percent of the map unit is Norfolk soil and 30 percent is Urban land. Most areas are irregular in shape and range from 50 to 100 acres in size.

Typically, the surface layer of the Norfolk soil is grayish brown sandy loam 8 inches thick. The subsoil extends to a depth of 76 inches. The upper part is

yellowish brown sandy clay loam. The next part is yellowish brown sandy clay loam with red and light yellowish brown mottles. The next part is brownish yellow clay loam with red and light gray mottles. The lower part is mottled light gray, red, and brownish yellow clay loam.

Permeability and available water capacity are moderate in the Norfolk soil. The seasonal high water table is at a depth of 4 to 6 feet.

The areas of Urban land are used for commercial buildings, municipal buildings, factories, homes, parking lots, or other closely spaced structures or are covered with pavement. The slope generally has been modified during construction. The extent of modification varies greatly. Many areas are mostly undisturbed. Other areas have been graded or are cut and filled.

The runoff rate is higher in areas of this map unit than in areas that consist only of the Norfolk soil because much of the surface of this unit is covered by impervious material. Runoff is particularly heavy during intense storms.

Included in this unit in mapping are small areas of Goldsboro and Bonneau soils, which are intermingled with areas of the Norfolk soil and Urban land throughout the map unit. Also included are areas where the original soils have been altered or disturbed. Included soils make up about 20 percent of the map unit.

No major limitations affect sites for dwellings, local roads and streets, or lawns and landscaping. The slope is a moderate limitation on sites for small commercial buildings. The wetness is a moderate limitation on sites for shallow excavations and septic tank absorption fields. Installing a subsurface drainage system helps to overcome the wetness.

The land capability subclass is IIe for the Norfolk soil and VIIIs for Urban land. This map unit was not assigned a woodland ordination symbol.

OcA—Ocilla loamy fine sand, 0 to 3 percent slopes. This nearly level and gently sloping, somewhat poorly drained soil is on uplands in the northern part of the county, from Severn to Garysburg. It is typically at the base of slopes or in natural draws at the head of drainageways. Individual areas are irregular in shape and generally range from 3 to 10 acres in size.

Typically, the surface layer is dark grayish brown loamy fine sand 8 inches thick. The subsurface layer is light yellowish brown loamy fine sand 16 inches thick. The subsoil extends to a depth of 68 inches. The upper part is yellowish brown sandy clay loam with light brownish gray and yellowish brown mottles; the next part is mottled light brownish gray, light yellowish brown, yellowish brown, and strong brown sandy clay loam; and the lower part is light gray sandy clay loam with yellowish brown, light yellowish brown, and strong brown mottles.

Permeability is moderate, and available water capacity is low. The seasonal high water table is at a depth of 1.0 foot to 2.5 feet during wet periods.

Included with this soil in mapping are small areas of the moderately well drained Goldsboro and somewhat poorly drained Lynchburg soils. These soils are intermingled at random with areas of the Ocilla soil. Also included are a few small areas of the well drained Bonneau soils in higher landscape positions and areas of soils that are sandy throughout. Included soils make up about 20 percent of the map unit.

Most of the acreage of the Ocilla soil is used for cultivated crops. The rest is used as woodland or pasture.

The major crops grown on this soil are corn, soybeans, peanuts, and small grain. If peanuts are grown, a drainage system that includes subsurface drains and surface grading generally is required for timely planting in the spring. Conservation tillage and crop residue management help to maintain tilth and conserve soil moisture. Erosion may be a hazard in some areas of the soil. Conservation tillage and field borders help to control erosion. In the areas used as pasture, proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

The major overstory trees are loblolly pine, yellow-poplar, sweetgum, red maple, water oak, southern red oak, and white oak. The understory vegetation consists mainly of flowering dogwood, sweetbay, American holly, southern waxmyrtle, switchcane, and greenbrier. The wetness is a moderate limitation affecting the use of equipment. When the soil is wet, unsurfaced roads become soft and may be impassable. Operating standard equipment results in the formation of ruts and in compaction. The wetness also is a moderate limitation affecting seedling mortality. A combination of surface and subsurface drainage systems is needed during wet periods.

The wetness is the major limitation on sites for dwellings, commercial buildings, local roads and streets, lawns and landscaping, shallow excavations, and septic tank absorption fields. The sidewalls of shallow excavations may cave in. The wetness can be overcome by a drainage system that includes surface and subsurface drains.

The wetness is a moderate limitation affecting recreational uses, such as camp areas, picnic areas, playgrounds, and hiking trails. Installing a well designed drainage system can help to overcome this limitation. The sandy surface layer also is a moderate limitation affecting recreational uses.

The land capability subclass is IIIw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8W.

PcB2—Pacolet sandy clay loam, 2 to 8 percent slopes, eroded. This gently sloping, well drained, eroded soil is on ridges and flats in uplands on the Piedmont. It is in the western part of the county, around Henrico and Lake Gaston. Individual areas are irregular in shape and generally range from 10 to 50 acres in size. Some areas are as large as 200 acres.

Typically, the surface layer is dark yellowish brown sandy clay loam 4 inches thick. The subsoil extends to a depth of 32 inches. It is yellowish red sandy clay loam in the upper part, red clay in the next part, and red clay loam in the lower part. The underlying material to a depth of 62 inches is multicolored loam or sandy loam saprolite.

Permeability and available water capacity are moderate. The shrink-swell potential is low. Runoff is rapid. The soil is subject to further erosion if not protected. The seasonal high water table is at a depth of more than 6 feet.

Included with this soil in mapping are a few areas of uneroded soils and a few areas of the brown Wedowee soils. Also included are a few areas of soils that have a gravelly surface layer. Included soils make up about 15 percent of the map unit.

About half of the acreage of the Pacolet soil is wooded. The rest is used as pasture or are idle fields. A few areas are still used for cultivated crops.

The major crops grown in cultivated areas of this soil are cotton, corn, and soybeans. The moderate hazard of erosion and the poor tilth are the major limitations that affect crops. Winter cover crops, conservation tillage, and crop residue management help to maintain tilth and conserve moisture. Conservation measures, such as terraces and diversions, field borders, and contour planting, conserve soil moisture and help to control erosion.

The major overstory trees are loblolly pine, yellow-poplar, hickory, sweetgum, white oak, and southern red oak. The understory vegetation consists mainly of flowering dogwood, American holly, sourwood, grapes, and red maple. The higher content of clay in the eroded surface layer is a moderate limitation affecting the use of equipment. When the soil is wet, unsurfaced roads and skid trails become slippery and soft and may be impassable. Inadequate moisture in the surface layer during summer can cause seedling mortality. The larger trees can be left to provide shade for seedlings.

No major limitations affect sites for dwellings or lawns and landscaping. The moderate permeability of the clayey subsoil is a moderate limitation on sites for shallow excavations and septic tank absorption fields. Changing the design of excavations generally can overcome this limitation. The slope is a moderate limitation on sites for small commercial buildings. Low strength is a severe limitation on sites for local roads and streets.

No major limitations affect recreational uses, such as camp areas, picnic areas, and hiking trails. The slope is a moderate limitation in areas used as playgrounds.

The land capability subclass is IIIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 6C.

PcD2—Pacolet sandy clay loam, 8 to 15 percent slopes, eroded. This strongly sloping, well drained soil is on side slopes on the Piedmont. It is in the western part of the county, around Henrico and along Lake Gaston and Roanoke Rapids Lake to near Gaston. Individual areas are irregular in shape and generally range from 25 to 100 acres in size. Some areas are as large as 300 acres.

Typically, the surface layer is dark yellowish brown sandy clay loam 4 inches thick. The subsoil extends to a depth of 32 inches. It is yellowish red sandy clay loam in the upper part, red clay in the next part, and red clay loam in the lower part. The underlying material to a depth of 62 inches is multicolored loam or sandy loam saprolite.

Permeability and available water capacity are moderate. The shrink-swell potential is low. Runoff is rapid. The soil is subject to further erosion unless it is protected. The seasonal high water table is at a depth of more than 6 feet.

Included with this soil in mapping are small areas of the brown Wedowee soils in landscape positions similar to those of the Pacolet soil. Also included are areas of Lillington soils that have gravelly layers. These soils are on the higher parts of the map unit or are intermingled with areas of the Pacolet soil in an intricate pattern. Included soils make up about 20 percent of the map unit.

The Pacolet soil is mostly wooded. A few small areas are used for lakefront development or as pasture.

The soil generally is not used for cultivated crops. The slope and the surface texture are the main limitations.

The major overstory trees are loblolly pine, yellow-poplar, hickory, sweetgum, white oak, and southern red oak. The understory vegetation consists mainly of flowering dogwood, grapes, American holly, sourwood, and red maple. The higher content of clay in the eroded surface layer is a moderate limitation affecting the use of equipment. When the soil is wet, unsurfaced roads and skid trails become slippery and soft and may be

impassable. Inadequate moisture in the surface layer during summer can cause seedling mortality. The larger trees can be left to provide shade for seedlings.

The slope is the major limitation on sites for dwellings, commercial buildings, lawns and landscaping, shallow excavations, and septic tank absorption fields. The clayey, slowly permeable subsoil also is a limitation on sites for shallow excavations and septic tank absorption fields. Low strength is a severe limitation on sites for local roads and streets. Special design may be needed on slopes of more than 10 percent.

The slope is a moderate limitation in areas used for camping and picnicking and a severe limitation in areas used for playgrounds.

The land capability subclass is VIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 6C.

PcE2—Pacolet sandy clay loam, 15 to 30 percent slopes, eroded. This moderately steep and steep, well drained soil is on side slopes on the Piedmont. It is in the western part of the county, around Henrico and along Lake Gaston and Roanoke Rapids Lake to near Gaston. Most of the individual areas are long and narrow and range from 20 to more than 200 acres in size.

Typically, the surface layer is dark yellowish brown sandy clay loam 4 inches thick. The subsoil extends to a depth of 32 inches. It is yellowish red sandy clay loam in the upper part, red clay in the next part, and red clay loam in the lower part. The underlying material to a depth of 62 inches is multicolored loam or sandy loam saprolite.

Permeability and available water capacity are moderate. The shrink-swell potential is low. Runoff is rapid. The soil is subject to further erosion unless it is protected. The seasonal high water table is at a depth of more than 6 feet.

Included with this soil in mapping are small areas of shallower soils that are generally at the base of the steep slopes and have rock outcrops. Also included in the highest landscape positions are some areas of Lillington soils that have gravelly layers. Small gullies are present in some areas. Included soils make up about 15 percent of the map unit.

Most of the acreage of the Pacolet soil is wooded. The soil generally is not used for cultivated crops or as pasture. The slope is the main limitation.

The major overstory trees are loblolly pine, yellow-poplar, hickory, sweetgum, white oak, and southern red oak. The understory vegetation consists mainly of flowering dogwood, American holly, sourwood, grapes, and red maple. The slope and the higher content of clay in the eroded surface layer are moderate limitations affecting the use of equipment. When the soil is wet, unsurfaced roads and skid trails become slippery and soft and may be impassable. Inadequate moisture in the surface layer during summer can cause seedling mortality. The larger trees can be left to provide shade for seedlings. Harvesting by a cable system results in less damage to the soil and reduces the limitation of the slope for the use of equipment. Maintaining a good cover of vegetation helps to control erosion and the sedimentation of streams.

The slope is a severe limitation on sites for dwellings, commercial buildings, lawns and landscaping, local roads and streets, septic tank absorption fields, and shallow excavations. Special design may be needed to overcome this limitation. Low strength also is a limitation on sites for local roads and streets.

The slope also is a severe limitation affecting recreational uses, such as camp areas, picnic areas, and playgrounds, and a moderate limitation affecting hiking trails.

The land capability subclass is VIIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 6C.

PgE2—Pacolet gravelly sandy clay loam, 15 to 30 percent slopes, eroded. This moderately steep and steep, well drained soil is on side slopes on the upper Coastal Plain and the Piedmont. It is in the western part of the county, between Gaston and Henrico, mostly along the steeper slopes bordering Lake Gaston and Roanoke Rapids Lake. Most of the individual areas are irregular in shape and range from 50 to 200 acres in size.

Field observations of this soil were limited because the content of gravel on the surface made digging or boring with hand tools impractical. Enough areas were investigated in detail to determine the composition of the map unit.

Typically, the surface layer is dark yellowish brown and reddish brown gravelly sandy clay loam 6 inches thick. The subsoil is 28 inches thick. It is red clay loam in the upper part, red clay in the next part, and red clay loam in lower part. The underlying material to a depth of 62 inches is multicolored loam saprolite.

Permeability and available water capacity are moderate. The shrink-swell potential is low. Runoff is rapid. Pebbles from about 0.5 inch to 1.5 inches in size range from 20 to 35 percent on the surface. Unless the soil is protected, it is subject to further erosion if it is used for cultivated crops or logging operations. The seasonal high water table is at a depth of more than 6 feet.

Included with this soil in mapping are small areas of soils that have little or no gravel and small areas of

soils that have a very gravelly surface layer. Also included are a few areas of soils that have rock outcrops. These areas are identified on the soil maps by a spot symbol. Also included are some areas of Lillington soils on adjacent slopes that have a very high content of gravel throughout. Included soils make up about 20 percent of the map unit.

Most of the acreage of the Pacolet soil is wooded. The soil generally is not used as cropland or pasture. The slope and gravel on the surface are severe limitations for agricultural uses.

The major overstory trees are loblolly pine, yellow-poplar, sweetgum, and white oak. The understory vegetation consists mainly of flowering dogwood, American holly, sourwood, grapes, and red maple. The slope and the higher content of clay in the eroded surface layer are moderate limitations affecting the use of equipment. When the soil is wet, unsurfaced roads and skid trails become slippery and soft and may be impassable. Inadequate moisture in the surface layer during summer can cause seedling mortality. The larger trees can be left to provide shade for seedlings. Harvesting by a cable system results in less damage to the soil and reduces the limitation of the slope for the use of equipment. Maintaining a good cover of vegetation helps to control erosion and the sedimentation of streams. Large amounts of rock fragments in the soil reduce the seedling survival rate. Planting a higher number of seedlings for the larger trees can help to reduce the seedling mortality rate.

The slope is a severe limitation on sites for dwellings, commercial buildings, lawns and landscaping, local roads and streets, septic tank absorption fields, and shallow excavations. Special design may be needed to overcome this limitation. Low strength also is a limitation on sites for local roads and streets.

The slope also is a severe limitation affecting recreational uses, such as camp areas, picnic areas, and playgrounds. A slope of more than 25 percent is a severe limitation affecting hiking trails. Gravel on the surface also is a severe limitation in areas used as playgrounds.

The land capability subclass is VIIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 6C.

PtA—Pactolus loamy fine sand, 0 to 2 percent slopes. This nearly level, moderately well drained soil is on uplands in the northeastern part of the county, around Pendleton and Galatia. Individual areas are irregular in shape and generally range from 10 to 200 acres in size.

Typically, the surface layer is dark brown loamy fine sand 9 inches thick. The underlying material extends to a depth of 72 inches. The upper part is yellowish brown loamy fine sand with strong brown mottles. The next part is light yellowish brown loamy fine sand with reddish yellow and light gray mottles. The lower part is light gray sand with brownish yellow mottles.

Permeability is rapid, and available water capacity is low. The seasonal high water table is at a depth of 1.5 to 3.0 feet. The soil is subject to soil blowing during dry periods.

Included with this soil in mapping are a few areas of soils that have a higher content of clay in the subsoil than is typical for the Pactolus soil. Also included are small areas of wetter soils in the lower landscape positions. Included soils make up about 25 percent of the map unit.

About half of the acreage of the Pactolus soil is used for cultivated crops. The rest is used mostly as woodland or pasture.

The major crops grown on this soil are corn, soybeans, peanuts, and small grain. The wetness and the susceptibility to leaching are the main limitations. Low available water capacity is a limitation during dry periods. Winter cover crops, no-till planting, and crop residue management help to maintain tilth and conserve moisture. Fertilizers, especially those that are nitrogen-based, should be added in split applications. Pasture forage species, such as coastal bermudagrass, also are grown on this soil.

The major overstory trees are loblolly pine, sweetgum, hickory, red maple, willow oak, white oak, water oak, and southern red oak. The understory vegetation consists mainly of flowering dogwood, sourwood, American holly, southern waxmyrtle, greenbrier, and sassafras. The sandy layers are a moderate limitation affecting the use of equipment and seedling mortality. Low available water capacity during dry periods is also a moderate limitation affecting seedling mortality.

The wetness is a moderate limitation on sites for dwellings, commercial buildings, and local roads and streets. The wetness and the thick, sandy layers are severe limitations on sites for septic tank absorption fields and shallow excavations. A subsurface drainage system is needed. Ditching may not be suited to the soil because the sandy layers cave in. Installing a drainage system may result in droughty conditions on sites for lawns and landscaping.

The wetness also is a moderate limitation affecting recreational uses, such as camp areas, picnic areas, playgrounds, and hiking trails. A drainage system is needed. The sandy surface layer also is a moderate limitation affecting recreational uses.

The land capability subclass is IIIs. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9S.

Ra—Rains fine sandy loam. This nearly level, poorly drained soil is on uplands in the northern half of the county, between the Hertford County line and Gaston. Slope is 0 to 2 percent. Individual areas are irregular in shape and generally range from 10 to 100 acres in size. Some areas are as large as 200 acres.

Typically, the surface layer is very dark gray fine sandy loam 4 inches thick. The subsurface layer is light brownish gray fine sandy loam 3 inches thick. The subsoil is 61 inches thick. The upper part is light gray sandy clay loam with brownish yellow mottles. The next part is gray sandy clay loam with yellowish brown and brownish yellow mottles. The next part is gray sandy clay loam with red, yellow, and brownish yellow mottles. The lower part is gray sandy clay with red, brown, and yellowish brown mottles. The underlying material to a depth of 84 inches is light gray sandy clay loam with brownish yellow mottles.

Permeability and available water capacity are moderate. The seasonal high water table is at a depth of 1 foot during wet periods. The soil is subject to ponding in low areas for brief periods.

Included with this soil in mapping are a few small areas of the clayey Bethera soils in landscape positions similar to those of the Rains soil and the somewhat poorly drained Lynchburg soils in the slightly higher landscape positions. Included soils make up about 20 percent of the map unit.

Most of the acreage of the Rains soil is wooded. The rest is used mostly for cultivated crops or as pasture.

Drained areas of this soil are used for corn, soybeans, and small grain. It generally is not used for tobacco, peanuts, or cotton. The wetness is the main limitation. Tillage may be delayed in the spring because of the wetness and the low soil temperatures. The effectiveness of drainage systems is restricted by the unavailability of suitable outlets. Pasture forages, such as fescue, are grown in some areas. In the areas used as pasture, proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

The major overstory trees are loblolly pine, white oak, red maple, hickory, sweetgum, blackgum, water oak, and willow oak. The understory vegetation consists mainly of American holly, sourwood, southern waxmyrtle, switchcane, greenbrier, and sassafras. The wetness is a moderate limitation affecting the use of equipment and seedling mortality. Unsurfaced roads and skid trails are soft and slippery when wet. Operating standard equipment results in the formation of ruts and in compaction. Surface and subsurface drainage systems help to overcome the wetness and increase the seedling survival rate. Special site preparation, such as bedding, helps to establish seedlings.

The wetness is a severe limitation on sites for dwellings, commercial buildings, local roads and streets, lawns and landscaping, shallow excavations, and septic tank absorption fields. A well designed surface and subsurface drainage system helps to overcome the wetness.

The wetness is a severe limitation affecting recreational uses, including camp areas, picnic areas, playgrounds, and hiking trails. A surface and subsurface drainage system helps to overcome the wetness.

The land capability subclass is IIIw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 10W.

Ro—Roanoke silt loam, occasionally flooded. This nearly level, poorly drained soil is on stream terraces along the Meherrin and Roanoke Rivers in the northeastern and southern parts of the county. Slopes are 0 to 2 percent. Individual areas are irregular in shape and generally range from 10 to more than 50 acres in size.

Typically, the surface layer is light brownish gray silt loam 5 inches thick. The subsoil is 48 inches thick. The upper part is light gray silty clay loam that has brownish yellow mottles. The lower part is gray silty clay or clay that has yellowish brown or brownish yellow mottles. The underlying material extends to a depth of 84 inches. The upper part is strong brown loam with gray mottles. The lower part is mottled light brownish gray, light yellowish brown, and yellowish red sandy loam.

Permeability is slow or very slow, and available water capacity is high. The seasonal high water table is at a depth of 1 foot during wet periods. The soil is occasionally flooded in low areas for brief periods.

Included with this soil in mapping are a few small areas of the somewhat poorly drained Wahee soils in the slightly higher landscape positions and a few areas of the poorly drained Tomotley and Wehadkee soils in landscape positions similar to those of the Roanoke soil. Included soils are intermingled with areas of the Roanoke soil throughout the map unit. They make up about 20 percent of the map unit.

Most of the acreage of the Roanoke soil is wooded. A few small areas are used for cultivated crops or as pasture.

Drained areas of this soil are used for corn, soybeans, and small grain. The soil generally is not used for tobacco, cotton, and peanuts. The wetness and the flooding are the main limitations. Conservation

tillage can help to maintain tilth. Tillage may be delayed in the spring because of the wetness and the low soil temperatures. The effectiveness of drainage systems is restricted by the unavailability of suitable outlets. Pasture forages, such as fescue, are grown in some areas. In the areas used as pasture, proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

The major overstory trees are loblolly pine, white oak, red maple, sweetgum, blackgum, water oak, and willow oak. The understory vegetation consists mainly of American holly, sourwood, reeds, switchcane, southern waxmyrtle, and sassafras. The wetness and the flooding are severe limitations affecting the use of equipment and seedling mortality. Unsurfaced roads and skid trails are soft and slippery when wet. Operating standard equipment results in the formation of ruts and in compaction. Drainage is often impractical because of the low position of the soil on the landscape. Special site preparation, such as bedding, helps to establish seedlings and prevents seedling mortality during wet periods.

The wetness and the flooding are severe limitations on sites for dwellings, commercial buildings, local roads and streets, lawns and landscaping, shallow excavations, and septic tank absorption fields. The slow or very slow permeability also is a limitation on sites for septic tank absorption fields. A well designed drainage system is needed. The slow permeability in the subsoil limits some types of conventional drainage systems. The flooding requires major land shaping and expense.

The wetness and the slow or very slow permeability are severe limitations affecting most recreational uses, such as camp areas, picnic areas, playgrounds, and hiking trails. The flooding also is a hazard affecting camp areas. A well designed drainage and flood-control system is needed but is costly to install.

The land capability subclass is IIIw (drained) and IVw (undrained). Based on loblolly pine as the indicator species, the woodland ordination symbol is 7W.

Se—Seabrook loamy sand, rarely flooded. This nearly level, moderately well drained soil is on stream terraces of the Meherrin River and other creeks in the northern part of the county. Slopes are 0 to 2 percent. Individual areas are irregular in shape and generally range from 5 to 15 acres in size.

Typically, the surface layer is dark grayish brown and brown loamy sand 9 inches thick. The underlying material to a depth of 72 inches is brownish yellow loamy sand with strong brown and very pale brown mottles in the upper part, light yellowish brown loamy sand with strong brown and very pale brown mottles in the next part, very pale brown loamy sand with light gray and strong brown mottles in the next part, and light gray loamy sand with olive gray and very pale brown mottles in the lower part.

Permeability is rapid, and available water capacity is low. The seasonal high water table is at a depth of 2 to 4 feet. The soil is subject to rare flooding.

Included with this soil in mapping are a few small areas of the somewhat excessively drained Tarboro soils in the higher landscape positions. Also included are areas of soils that have a higher content of clay than is typical for the Seabrook soil. Included soils make up about 20 percent of the map unit.

Most of the acreage of the Seabrook soil is wooded. A few small areas are used for cultivated crops or as pasture.

Drained areas on this soil are used for corn, soybeans, peanuts, and small grain. The wetness and the susceptibility to leaching are the main limitations. Low available water capacity is a limitation during dry periods. Winter cover crops, conservation tillage, and crop residue management help to maintain tilth and conserve moisture. Fertilizers, especially those that are nitrogen-based, should be added in split applications.

The major overstory trees are loblolly pine, blackgum, black cherry, yellow-poplar, sweetgum, hickory, red maple, American beech, willow oak, white oak, southern red oak, and water oak. The understory vegetation consists mainly of flowering dogwood, sourwood, switchcane, American holly, southern waxmyrtle, and sassafras. The sandy layers are a moderate limitation affecting the use of equipment and seedling mortality. Low available water capacity during dry periods may result in seedling mortality in the summer.

The wetness and the flooding are the major limitations on sites for dwellings, small commercial buildings, local roads and streets, shallow excavations, and septic tank absorption fields. Because of the sandy texture, shallow excavations cave in and renovation on sites for septic tank absorption fields is poor. A drainage system is needed. Installing a flood-control system requires major landshaping and expense. Ditching may not be suited to the soil because the sandy layers cave in.

The wetness is a moderate limitation affecting recreational uses, such as camp areas, picnic areas, and playgrounds. The flooding is a severe hazard in camp areas. An extensive flood-control and drainage system is needed but may not be feasible to install for this land use.

The land capability subclass is IIIs. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8S.

StA—State sandy loam, 0 to 3 percent slopes, rarely flooded. This nearly level and gently sloping, well drained soil is on stream terraces along the Meherrin River and the larger creeks in the northern part of the county. Individual areas are irregular in shape and generally range from 10 to 50 acres in size.

Typically, the surface layer is brown sandy loam 9 inches thick. The subsoil is 39 inches thick. It is yellowish brown sandy loam in the upper part, strong brown sandy clay loam in the next part, and yellowish brown sandy loam in the lower part. The underlying material to a depth of 68 inches is yellowish brown loamy sand.

Permeability and available water capacity are moderate. The soil is subject to rare flooding. The seasonal high water table is at a depth of 4 to 6 feet.

Included with this soil in mapping are a few small areas of the moderately well drained Altavista soils in the slightly lower landscape positions and the well drained Wickham and Conetoe and somewhat excessively drained Tarboro soils on the higher ridges. Also included are some small areas of soils that have sandy material at a depth of less than 40 inches. These soils are intermingled with areas of the State soil throughout the map unit. Included soils make up about 15 percent of the map unit.

Most of the acreage of the State soil is used for cultivated crops. The rest is used mostly as woodland or pasture.

The major crops grown on this soil are corn, soybeans, peanuts, cotton, and small grain. The flooding is the main hazard affecting cultivated crops. Winter cover crops, conservation tillage, and crop residue management help to control erosion in areas that have a slope of more than 2 percent, maintain tilth, and conserve soil moisture.

The major overstory trees are loblolly pine, red maple, hickory, yellow-poplar, blackgum, black cherry, American beech, southern red oak, and white oak. The understory vegetation consists mainly of flowering dogwood, sassafras, sourwood, and southern waxmyrtle. No major limitations affect woodland use and management.

The flooding is the major limitation on sites for dwellings, commercial buildings, local roads and streets, and septic tank absorption fields. The wetness also is a moderate limitation on sites for septic tank absorption fields. A surface drainage system and flood-control measures are needed. A subsurface drainage system can help to overcome the wetness.

No major limitations affect recreational uses, such as picnic areas, playgrounds, or hiking trails. The flooding is a severe hazard in camp areas.

The land capability class is I. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9A.

TaB—Tarboro sand, 0 to 5 percent slopes. This nearly level and gently sloping, somewhat excessively drained soil is on stream terraces along the Meherrin River and other large creeks in the northeastern part of the county. Individual areas commonly are long and narrow and generally range from 5 to 50 acres in size. Some areas are as large as about 100 acres.

Typically, the surface layer is very dark grayish brown sand 6 inches thick. The underlying material to a depth of 84 inches is brownish yellow, yellowish brown, and light yellowish brown sand.

Permeability is rapid, and available water capacity is very low. The soil is subject to soil blowing and droughtiness. The seasonal high water table is at a depth of more than 6 feet.

Included with this soil in mapping are a few small areas of the well drained Conetoe soils, which are intermingled with areas of the Tarboro soil throughout the map unit, and the moderately well drained Seabrook soils in the slightly lower landscape positions. Included soils make up about 15 percent of the map unit.

About half of the acreage of the Tarboro soil is used for cultivated crops. The rest is used mostly as woodland, hayland, or pasture.

The major crops grown on this soil are peanuts, corn, and soybeans. Very low available water capacity, the leaching of plant nutrients, the rapid permeability, and soil blowing are the main limitations. Windblown particles of sand strike young plants. Conservation tillage, crop residue management, windbreaks, and close-growing grasses and legumes in the cropping system help to control soil blowing and conserve moisture. Fertilizers, particularly those that are nitrogen-based, should be added in split applications. Droughtiness and the leaching of nutrients are the main limitations affecting pasture.

The major overstory trees are loblolly pine, sweetgum, American beech, southern red oak, white oak, and post oak. The understory vegetation consists mainly of flowering dogwood, sassafras, and American holly. Very low available water capacity and the sandy surface layer are moderate limitations affecting the use of equipment and seedling mortality. Trafficability is limited because the sandy surface layer is soft when the soil is dry. Very low available water capacity causes seedling mortality during the summer and the slow growth of older trees because of droughtiness and the leaching of nutrients.

No major limitations affect sites for dwellings, commercial buildings, and local roads and streets. The

deep, sandy layers and droughtiness are limitations on sites for lawns and landscaping. The deep, sandy layers also result in cave-ins on sites for shallow excavations and are not suited to use as a filter on sites for septic tank absorption fields. A finer fill material is needed.

The thick, sandy layers are a severe limitation affecting recreational uses, such as camp areas, picnic areas, playgrounds, and hiking trails.

The land capability subclass is IIIs. Based on loblolly pine as the indicator species, the woodland ordination symbol is 7S.

Te—Tomotley fine sandy loam, rarely flooded. This nearly level, poorly drained soil is on river terraces along the Meherrin and Roanoke Rivers. Slopes are 0 to 2 percent. Individual areas are irregular in shape and generally range from 10 to 50 acres in size.

Typically, the surface layer is dark grayish brown fine sandy loam 10 inches thick. The subsurface layer is light brownish gray fine sandy loam to a depth of 14 inches. The subsoil extends to a depth of 47 inches. It is gray sandy clay loam with yellowish brown mottles in the upper part and light gray sandy clay loam with yellowish brown and strong brown mottles in the lower part. The underlying material to a depth of 62 inches is light gray sandy loam with yellowish brown mottles and lenses of loamy sand.

Permeability and available water capacity are moderate. The seasonal high water table is at a depth of 1 foot during wet periods. The soil is subject to rare flooding for brief periods.

Included with this soil in mapping are a few small areas of the moderately well drained Altavista and Seabrook soils, which are in the slightly higher landscape positions. Also included are areas of the clayey Roanoke soils in landscape positions similar to those of the Tomotley soil. Included soils make up about 20 percent of the map unit.

Most of the acreage of the Tomotley soil is wooded. The rest is used mainly for cultivated crops.

Drained areas on this soil are used for corn, soybeans, and small grain. Tobacco, cotton, and peanuts generally are not grown on this soil. The wetness is the main limitation. Conservation tillage, including grasses and legumes in the conservation system, can help to maintain tilth. Tillage may be delayed in the spring because of the wetness and the low soil temperatures. The effectiveness of drainage systems is restricted by the unavailability of suitable outlets. Pasture forages, such as fescue, are grown in some areas. If used for pasture, proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

The major overstory trees are loblolly pine, sweetgum, and water tupelo. The understory vegetation consists mainly of sourwood, greenbrier, switchcane, American holly, and southern waxmyrtle. The wetness is a moderate limitation affecting the use of equipment and seedling mortality. Installing a drainage system may be impractical because of the position of the soil on the landscape. Unsurfaced roads and skid trails are soft and slippery when wet. Operating standard equipment results in the formation of ruts and in compaction. Bedding of rows can help to prevent seedling mortality during wet periods.

The wetness and the flooding are severe limitations on sites for dwellings, commercial buildings, local roads and streets, lawns and landscaping, shallow excavations, and septic tank absorption fields. A well designed drainage system, including surface and subsurface drains, and flood-control measures are needed. Installing a drainage system is difficult because of the low position of the soil on the landscape.

The wetness is a severe limitation affecting recreational uses, such as camp areas, picnic areas, playgrounds, and hiking trails. The flooding also is a hazard in camp areas. Surface and subsurface drainage systems are needed but may be costly to install.

The land capability subclass is IIIw (drained) and IVw (undrained). Based on loblolly pine as the indicator species, the woodland ordination symbol is 10W.

TrA—Turbeville loamy sand, 0 to 2 percent slopes. This nearly level, well drained soil is on uplands, from Gaston to Vultare. Individual areas are irregular in shape and commonly range from 20 to 50 acres in size. Some areas on broad, smooth landscape positions are as large as 150 acres in size.

Typically, the surface layer is yellowish brown loamy sand 8 inches thick. The subsoil extends to a depth of 72 inches. The upper part is yellowish red sandy clay loam. The next part is red clay. The lower part is dark red clay.

Permeability and available water capacity is moderate. The shrink-swell potential also is moderate. The seasonal high water table is at a depth of more than 6 feet.

Included with this soil in mapping are a few small areas of the brown Caroline soils in landscape positions similar to those of the Turbeville soil and a few areas of soils that have a higher content of sand in the subsoil than is typical for the Turbeville soil. Also included are a few areas of soils that have gravel throughout and some areas of soils that have a sandy surface layer as much as 25 inches thick. Included soils make up about 15 percent of the map unit.

Most of the acreage of the Turbeville soil is used for

cultivated crops. A few areas are used as woodland or pasture.

The major crops grown on this soil are peanuts, cotton, and soybeans. Some corn and small grain are also grown. No major limitations affect cultivated crops. Winter cover crops and crop residue management help conserve soil moisture, improve tilth, and reduce the hazard of soil blowing.

The major overstory trees are loblolly pine, red maple, southern red oak, yellow-poplar, white oak, and hickory. The understory vegetation consists mainly of flowering dogwood, sourwood, blueberry, and sassafras. No major limitations affect woodland use and management.

The moderate shrink-swell potential and the high content of clay in the subsoil are moderate limitations on sites for dwellings, commercial buildings, shallow excavations, and septic tank absorption fields. Low strength is a limitation on sites for local roads and streets. Special design may be needed to overcome these limitations.

No major limitations affect recreational uses, such as camp areas, picnic areas, playgrounds, and hiking trails.

The land capability class is I. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8A.

TrB—Turbeville loamy sand, 2 to 6 percent slopes. This gently sloping, well drained soil is on uplands, from Gaston to Vultare. Individual areas are irregular in shape and generally range from 20 to 50 acres in size. Some areas are as large as 100 acres.

Typically, the surface layer is brown loamy sand 8 inches thick. The subsoil extends to a depth of 72 inches. The upper part is yellowish red sandy clay loam. The next part is red clay. The lower part is dark red clay.

Permeability and available water capacity are moderate. The shrink-swell potential also is moderate. Runoff is medium. Erosion is a hazard in areas of bare, unprotected soil. The seasonal high water table is at a depth of more than 6 feet.

Included with this soil in mapping are a few small areas of the brown Caroline soils, a few areas of soils that have a surface layer of sandy loam, a few areas of soils where the surface layer has been subject to erosion, a few areas of soils that have a higher content of sand than is typical for the Turbeville soil, and a few areas of soils that have gravel throughout. Included soils are intermingled with areas of the Turbeville soil. They make up about 15 percent of the map unit.

Most areas of the Turbeville soil are used for cultivated crops. A few areas are used as woodland or pasture.

The major crops grown on this soil are peanuts, cotton, and soybeans. Some corn and small grain also are grown. Erosion is a hazard in unprotected areas. Winter cover crops, conservation tillage, and crop residue management help to control runoff and erosion and conserve soil moisture. Other conservation measures, such as field borders and diversions, can greatly reduce the hazard of erosion.

The major overstory trees are loblolly pine, red maple, southern red oak, yellow-poplar, white oak, and hickory. The understory vegetation consists mainly of flowering dogwood, sourwood, blueberry, and sassafras. No major limitations affect woodland use and management.

The moderate shrink-swell potential and the high content of clay in the subsoil are moderate limitations on sites for dwellings, commercial buildings, shallow excavations, and septic tank absorption fields. A slope of more than 4 percent is an additional limitation on sites for commercial buildings. Low strength is a limitation on sites for local roads and streets. Special design may be needed to overcome these limitations.

No major limitations affect recreational uses, such as camp areas, picnic areas, and hiking trails. The slope is a moderate limitation in areas used as playgrounds.

The land capability subclass is IIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8A.

TsA—Turbeville sandy loam, 0 to 2 percent slopes. This nearly level, well drained soil is on broad, smooth landscape positions in the uplands, from Garysburg to Vultare. Individual areas are irregular in shape and generally range from 20 to more than 150 acres in size.

Typically, the surface layer is reddish brown sandy loam 9 inches thick. The subsoil, to a depth of 84 inches, is red clay or sandy clay.

Permeability and available water capacity are moderate. The shrink-swell potential also is moderate. The seasonal high water table is at a depth of more than 6 feet.

Included with this soil in mapping are a few small areas of the brown Caroline soils in landscape positions similar to those of the Turbeville soil and a few areas of soils that have a higher content of sand in the subsoil than is typical for the Turbeville soil. Also included are a few areas of soils that have gravel on the surface and some gravel in the profile. Included soils make up about 10 percent of the map unit.

Most areas of the Turbeville soil are used for cultivated crops. A few areas are used as woodland, hayland, or pasture.

The major crops grown on this soil are corn, soybeans, peanuts, cotton, and small grain. No major limitations affect crop production. Winter cover crops, conservation tillage, and crop residue management help to maintain tilth and conserve moisture.

The major overstory trees are loblolly pine, red maple, southern red oak, yellow-poplar, white oak, and hickory. The understory vegetation consists mainly of flowering dogwood, sourwood, blueberry, and sassafras. No major limitations affect woodland use and management.

The moderate shrink-swell potential and the high content of clay in the subsoil are moderate limitations on sites for dwellings, commercial buildings, shallow excavations, and septic tank absorption fields. Low strength is a limitation on sites for local roads and streets. Special design may be needed to overcome these limitations.

No major limitations affect recreational uses, such as camp areas, picnic areas, playgrounds, and hiking trails.

The land capability class is I. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8A.

TsB—Turbeville sandy loam, 2 to 6 percent slopes. This gently sloping, well drained soil is on uplands, from Garysburg to Vultare. Individual areas are irregular in shape and generally range from 20 to 150 acres in size. Some areas are as large as 300 acres.

Typically, the surface layer is reddish brown sandy loam 9 inches thick. The subsoil, to a depth of 84 inches, is red clay or sandy clay.

Permeability and available water capacity are moderate. The shrink-swell potential also is moderate. Runoff is medium in areas where the soil has been cleared of trees. The seasonal high water table is at a depth of more than 6 feet.

Included with this soil in mapping are a few small areas of the brown Caroline soils, a few areas of soils in which the surface layer has been subject to erosion, a few areas of soils that have a higher content of sand than is typical for the Turbeville soil, and a few areas of soils that have gravel on the surface or in the profile. Included soils are intermingled with areas of the Turbeville soil. They make up about 15 percent of the map unit.

Most areas of the Turbeville soil are used for cultivated crops. A few areas are used as woodland or pasture.

The major crops grown on this soil are corn, soybeans, peanuts, cotton, and small grain. Erosion is a hazard in unprotected areas. Winter cover crops, conservation tillage, and crop residue management help to control runoff and erosion. Conservation practices, such as no-till planting, field borders, and terraces, also help conserve water and control erosion.

The major overstory trees are loblolly pine, red maple, southern red oak, yellow-poplar, white oak, and hickory. The understory vegetation consists mainly of flowering dogwood, sourwood, blueberry, and sassafras. No major limitations affect woodland use and management.

The moderate shrink-swell potential and the high content of clay in the subsoil are moderate limitations on sites for dwellings, commercial buildings, shallow excavations, and septic tank absorption fields. A slope of more than 4 percent is an additional limitation on sites for commercial buildings. Low strength is a limitation on sites for local roads and streets. Special design may be needed to overcome these limitations.

No major limitations affect recreational uses, such as camp areas, picnic areas, and hiking trails. The slope is a moderate limitation in areas used as playgrounds.

The land capability subclass is IIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8A.

TsC—Turbeville sandy loam, 6 to 12 percent slopes. This gently sloping and strongly sloping, well drained soil is on rolling uplands and side slopes adjacent to small streams in the western part of the county, from Garysburg to Vultare. Individual areas are irregular in shape and generally range from 10 to 30 acres in size.

Typically, the surface layer is reddish brown sandy loam 9 inches thick. The subsoil, to a depth of 84 inches, is red clay or sandy clay.

Permeability and available water capacity are moderate. The shrink-swell potential also is moderate. Runoff is rapid in areas where the soil has been cleared of trees. Erosion is a severe hazard where the surface layer is left unprotected. The seasonal high water table is at a depth of more than 6 feet.

Included with this soil in mapping are a few areas of Bonneau soils in landscape positions similar to those of the Turbeville soil and a few areas of moderately eroded soils that have a surface layer of sandy clay loam. Also included are a few areas of the gravelly Lillington soils. Included soils make up about 20 percent of the map unit.

Almost all of the acreage of the Turbeville soil is wooded. A few small areas are used for cultivated crops or as pasture.

The major crops grown in areas of this soil that have been cleared of trees are corn, soybeans, and cotton.

Erosion is a hazard in unprotected areas. Winter cover crops, conservation tillage, and crop residue management help to control erosion and runoff, conserve soil moisture, and improve tilth. Conservation measures, such as diversions, grassed waterways, and field borders, help to control erosion and keep sediments and nutrients from entering streams. The slope and the hazard of erosion are the major management concerns affecting pasture.

The major overstory trees are loblolly pine, red maple, southern red oak, yellow-poplar, white oak, and hickory. The understory vegetation consists mainly of flowering dogwood, sourwood, blueberry, and sassafras. No major limitations affect woodland use and management.

The moderate shrink-swell potential, the slope, and the high content of clay in the subsoil are moderate limitations on sites for dwellings, commercial buildings, shallow excavations, and septic tank absorption fields. A slope of more than 8 percent is a severe limitation on sites for commercial buildings. Low strength is a limitation on sites for local roads and streets. Special design may be needed to overcome these limitations.

The slope is a moderate limitation affecting recreational uses, such as camp areas and picnic areas, and a severe limitation in areas used as playgrounds. No major limitations affect hiking trails.

The land capability subclass is IIIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8A.

TtB2—Turbeville sandy clay loam, 2 to 6 percent slopes, eroded. This gently sloping, well drained, moderately eroded soil is on uplands, from Garysburg to Vultare. Individual areas are irregular in shape and generally range from 10 to 25 acres in size.

Typically, the surface layer to a depth of 7 inches is intermingled reddish brown sandy loam and sandy clay loam. The subsoil extends to a depth of 84 inches. The upper part is red clay, and the lower part is dark red clay.

Permeability and available water capacity are moderate. The shrink-swell potential also is moderate. Runoff is medium or rapid. The seasonal high water table is at a depth of more than 6 feet.

Included with this soil in mapping are a few areas of uneroded soils, a few areas of severely eroded soils, and a few areas of soils that have gravel throughout. Inclusions are intermingled at random with areas of the Turbeville soil in the map unit. They make up about 20 percent of the map unit.

Most areas of the Turbeville soil are used for cultivated crops. A few areas are used as woodland or pasture.

The major crops grown on this soil are corn, soybeans, cotton, small grain, and peanuts. Further erosion is a hazard in unprotected areas. Tilth is poor. Management concerns, such as reduced seed germination and lower crop yields, occur in eroded areas of the soil. Winter cover crops, conservation tillage, and crop residue management help to control runoff and erosion. Conservation practices, such as no-till planting, field borders, and terraces, conserve water and help to control erosion. In the areas used as pasture, the hazard of erosion limits productivity.

The major overstory trees are loblolly pine, red maple, southern red oak, yellow-poplar, white oak, and hickory. The understory vegetation consists mainly of flowering dogwood, sourwood, blueberry, and sassafras. No major limitations affect woodland use and management.

The moderate shrink-swell potential and the high content of clay in the subsoil are moderate limitations on sites for dwellings, commercial buildings, shallow excavations, and septic tank absorption fields. A slope of more than 4 percent is an additional limitation on sites for commercial buildings. Low strength is a limitation on sites for local roads and streets. Special design may be needed to overcome these limitations.

No major limitations affect recreational uses, such as camp areas, picnic areas, and hiking trails. The slope is a moderate limitation in areas used as playgrounds.

The land capability subclass is IIIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8A.

TuB—Turbeville gravelly sandy loam, 2 to 8 percent slopes. This gently sloping, well drained soil is on ridgetops and side slopes along the contact zone where the Coastal Plain sediments are underlain by crystalline Piedmont rocks. This area is in the western part of the county, between Gaston and Vultare. Individual areas commonly are oval and generally range from 10 to 30 acres in size.

Field observations were limited on this soil because the content of gravel on the surface made digging or boring with hand tools impractical. Enough areas were investigated in detail to determine the composition of the map unit.

Typically, the surface layer is dark brown gravelly sandy loam 8 inches thick. The subsoil extends to a depth of 71 inches. The upper part is strong brown sandy clay loam, the middle part is red clay, and the lower part is dark red gravelly clay.

Permeability and available water capacity are moderate. The shrink-swell potential also is moderate. Runoff from cultivated areas is medium. Pebbles from

about 0.5 inch to 1.5 inches in diameter range from about 15 to 35 percent on the surface. The seasonal high water table is at a depth of more than 6 feet.

Included with this soil in mapping are a few areas of the brown Caroline soils that have a gravelly surface layer, some areas of soils that have a surface layer of gravelly loamy sand, a few areas of soils that have little or no gravel on the surface, and a few eroded spots that have a surface layer of gravelly sandy clay loam. Some areas of soils are very gravelly on the surface. Also included on adjacent slopes are some areas of Lillington soils that have a very high content of gravel throughout. Included soils make up about 25 percent of the map unit.

Most areas of the Turbeville soil are used as woodland or are being planted back to woodland. Some areas are fields that have not been cultivated for some time. A few areas are used for cultivated crops, and other areas are used as pasture.

The major crops grown in cultivated areas of this soil are cotton, soybeans, and corn. The soil is subject to erosion if not protected. Pebbles on the surface limit the use of some types of equipment and seedbed preparation. The gravelly surface layer can inhibit seed germination and reduce plant density. Conservation practices, such as no-till planting, field borders, terraces, crop residue management, and winter cover crops, help to control erosion, conserve water, and improve tilth. The gravelly surface layer is the main limitation affecting pasture.

The major overstory trees are loblolly pine, southern red oak, white oak, yellow-poplar, hickory, and sweetgum. The understory vegetation consists mainly of flowering dogwood, sassafras, and American holly. No major limitations affect woodland use and management.

The moderate shrink-swell potential and the high content of clay in the subsoil are moderate limitations on sites for dwellings, commercial buildings, shallow excavations, and septic tank absorption fields. A slope of more than 4 percent also is a moderate limitation on sites for commercial buildings. Low strength is a severe limitation on sites for local roads and streets. Pebbles on the surface are a limitation on sites for lawns and landscaping. Special design may be needed to overcome these limitations.

The gravel on the surface is a moderate limitation affecting recreational uses, such as camp areas, picnic areas, playgrounds, and hiking trails. A slope of more than 6 percent is a severe limitation in areas used as playgrounds.

The land capability subclass is IIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8A.

TxB—Turbeville-Urban land complex, 0 to 8 percent slopes. This map unit consists of areas of Turbeville gravelly sandy loam or sandy loam and areas of Urban land in the towns of Gaston and Garysburg. The gravelly Turbeville soils are dominant in Gaston, and the nongravelly Turbeville soils are dominant in Garysburg. The Turbeville soil and Urban land occur as areas so small and so intricately mixed that mapping them separately was not feasible. About 50 percent of the map unit is Turbeville gravelly sandy loam or Turbeville sandy loam and 30 percent is Urban land.

Typically, the surface layer of the Turbeville soil is reddish brown sandy loam 9 inches thick. The subsoil, to a depth of 84 inches, is red clay or sandy clay.

Permeability and available water capacity are moderate in the Turbeville soil. The shrink-swell potential also is moderate. Rounded pebbles from 0.5 inch to 1.5 inches in diameter range from 15 to 35 percent on the surface of Turbeville gravelly sandy loam. The seasonal high water table is at a depth of more than 6 feet.

The areas of Urban land are used for commercial buildings, municipal buildings, factories, homes, parking lots, or other closely spaced structures or are covered with pavement. The slope generally has been modified during construction. The extent of modification varies greatly. Many areas are mostly undisturbed. Other areas have been graded or filled over.

The runoff rate for this map unit is higher than that in areas of only gravelly Turbeville soils because the surface of this map unit is covered by impervious material. Runoff is particularly heavy during intense storms.

Included in this unit are small areas of the brown Caroline soils that have a gravelly surface layer, some areas of soils that have a surface layer of gravelly loamy sand, and a few areas of soils that have a high content of gravel throughout. Also included are areas where the original soils have been disturbed or altered. Included soils are intermingled with areas of the Turbeville soil and Urban land throughout the map unit. They make up about 20 percent of the map unit.

The moderate shrink-swell potential and the high content of clay in the subsoil are moderate limitations on sites for dwellings, commercial buildings, shallow excavations, and septic tank absorption fields. A slope of more than 4 percent also is a limitation on sites for commercial buildings. Low strength is a limitation on sites for local roads and streets. Pebbles on the surface are a severe limitation on sites for lawns and landscaping. Special design may be needed to overcome these limitations.

The land capability subclass is IIe for the Turbeville

soil and VIIIs for Urban land. This map unit was not assigned a woodland ordination symbol.

Ud—Udorthents, loamy. This map unit consists of areas in which earthmoving has disturbed the natural soil layering sequence. Scraping, backfilling, trenching, or excavating have completely altered the characteristics of the natural soil. In this map unit three distinct variations of the Udorthents are related to how the areas are disturbed. They are borrow pits, cut and fill areas, and landfills. Areas of less than 3 acres in size are identified with a spot symbol on the soil maps and are not named. The mapped areas range from 3 to more than 50 acres in size.

Borrow pits are areas from which the topsoil, subsoil, and parent material have been dug out and are used as fill for construction. The cuts are 3 to more than 15 feet deep. Some of the base slopes of the cuts are level to gently sloping. Others have irregular topography with mounds of spoil material that have been pushed aside during excavation. Included in mapping are small areas of intermittent ponds and small areas of fill material.

Most areas have not been reclaimed. They now support scattered stands of weeds, pines, and hardwoods. The soils in the borrow pits commonly have a loamy texture and poor physical properties for plant growth. The rooting depth generally is shallow, and available water capacity, soil fertility, and the content of organic matter are low. Reseeded areas have the potential for use as wildlife habitat.

Cut and fill areas have been altered by removing soil from the high areas and filling in the low areas. These are commonly at major highway interchanges and dam sites and are adjacent to built-up areas.

The cut areas have more than 2 feet of soil material removed, and the fill areas have more than 2 feet of fill material over the natural soil. The soil material commonly has a loamy texture. The rooting depth and available water capacity are variable. Soil fertility and the content of organic matter generally are low. These areas generally are reseeded with annual perennial grasses. Some cut and fill areas support pines and hardwoods.

Landfills are areas where the natural soils have been altered by landfill operations. These are excavated areas consisting of deeply graded trenches that are backfilled with alternate layers of solid refuse and spoil material. The final surface commonly is covered with 2 to 3 feet of spoil material. Closed landfills have landscapes that have slopes of 0 to 6 percent and are covered by perennial grasses, pines, hardwoods, and annual weeds.

Included in landfills are some areas of undisturbed soil. These areas commonly are just outside the area of the landfill. The soil between the trenches is relatively undisturbed, except for the final cover used to smooth the entire area. Landfills that are still active have trenches 20 to 30 feet deep with steep walls that are subject to caving in.

The characteristics of the soil material within these different areas of Udorthents, loamy, have been altered to such an extent that detailed interpretive statements cannot be made, except where onsite examinations are made.

The land capability subclass is VIIe. The unit has not been assigned a woodland ordination symbol.

WaA—Wahee fine sandy loam, 0 to 2 percent slopes, rarely flooded. This nearly level, somewhat poorly drained soil is on river terraces along the Roanoke and Meherrin Rivers. Individual areas are irregular in shape and generally range from 10 to 20 acres in size.

Typically, the surface layer is brown fine sandy loam 7 inches thick. The subsoil is 43 inches thick. It is yellowish brown clay loam with light brownish gray mottles in the upper part, yellowish brown clay with gray and strong brown mottles in the next part, gray clay with yellowish brown and strong brown mottles in the next part, and light gray clay loam with reddish yellow mottles in the lower part. The underlying material to a depth of 62 inches is light gray sandy loam with brownish yellow mottles.

Permeability is slow, and available water capacity is high. In undrained areas, the seasonal high water table is commonly at a depth of 0.5 foot to 1.5 feet during wet periods. The soil is subject to rare flooding for brief periods.

Included with this soil in mapping are a few small areas of Roanoke soils in the slightly lower landscape positions and a few areas of Altavista soils in the higher landscape positions. Included soils make up about 20 percent of the map unit.

Most of the acreage of the Wahee soil is used for cultivated crops. The rest is used as woodland or pasture.

The major crops grown on this soil are corn and soybeans. The wetness and the clay in the subsoil are the main limitations. Tillage may be delayed in the spring because of the wetness or the flooding. A surface drainage system is needed. The effectiveness of a subsurface drainage system is restricted by the slow permeability in the subsoil. Field borders and grassed waterways help to remove surface water. In the areas used as pasture, proper stocking rates, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

The major overstory trees are loblolly pine, sweetgum, water oak, red maple, southern red oak, and yellow-poplar. The understory vegetation consists mainly of switchcane, bayberry, American holly, and greenbrier. The wetness is a moderate limitation affecting the use of equipment and seedling mortality. When the soil is wet, unsurfaced roads are slippery and sticky and may be impassable. Operating standard equipment when the soil is wet may result in the formation of ruts and in compaction. Bedding can help to prevent seedling mortality during wet periods or brief periods of flooding.

The wetness and the flooding are severe limitations on sites for dwellings, commercial buildings, local roads and streets, lawns and landscaping, shallow excavations, and septic tank absorption fields. The slow permeability also is a limitation on sites for septic tank absorption fields. Low strength is a limitation on sites for local roads and streets. A well designed drainage system, including surface and subsurface drains, and flood-control measures are needed. The slow permeability restricts the use of some types of conventional drainage systems.

The wetness is a severe limitation affecting recreational uses, such as camp areas, picnic areas, playgrounds, and hiking trails. The flooding also is a hazard in camp areas.

The land capability subclass is IIw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9W.

WdB—Wedowee sandy loam, 2 to 8 percent slopes. This gently sloping, well drained soil is on upland ridges and side slopes on the Piedmont, between Vultare and the Warren County line. Most areas are irregular in shape and generally range from 10 to 100 acres in size.

Typically, the surface layer is grayish brown sandy loam 5 inches thick. The subsurface layer is 3 inches of very pale brown sandy loam. The subsoil is 20 inches thick. The upper part is reddish yellow sandy clay loam. The next part is yellowish red clay. The lower part is yellowish red clay loam with red mottles and pockets of saprolite. The underlying material to a depth of 60 inches is multicolored sandy clay loam saprolite.

Permeability and available water capacity are moderate. The shrink-swell potential also is moderate. The hazard of erosion is moderate in areas where cultivated crops are grown. The seasonal high water table is at a depth of more than 6 feet.

Included with this soil in mapping are a few areas of soils that have a thicker clayey subsoil than that of the Wedowee soil, a few areas of eroded soils, and a few areas of soils that have a gravelly surface layer. Inclusions are intermingled with areas of the Wedowee soil. They make up about 20 percent of the map unit.

Most of the acreage of the Wedowee soil is wooded or is reverting to woodland. Some areas are used for cultivated crops or as pasture.

The major crops grown in areas of this soil that have been cleared of trees are corn, soybeans, cotton, and tobacco. The slope and the hazard of erosion are the main limitations. Contour farming, conservation tillage, and crop residue management help to control erosion and conserve moisture. Conservation practices, such as field borders and terraces and diversions, also help to control erosion.

The major overstory trees on this soil are loblolly pine, southern red oak, white oak, black oak, yellow-poplar, and hickory. The main understory vegetation includes flowering dogwood, American holly, grapes, and sourwood. No major limitations affect woodland use and management.

The shrink-swell potential and the moderate permeability of the clayey subsoil are moderate limitations on sites for commercial buildings, shallow excavations, and septic tank absorption fields. A slope of more than 4 percent also is a limitation on sites for commercial buildings. Low strength is a hazard on sites for local roads and streets. Special design may be needed to overcome these limitations.

No major limitations affect recreational uses, such as camp areas, picnic areas, and hiking trails. The slope is a moderate limitation in areas used as playgrounds.

The land capability subclass is IIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8A.

WeD2—Wedowee sandy clay loam, 8 to 15 percent slopes, eroded. This strongly sloping, well drained soil is on side slopes on the Piedmont, between Vultare and the Warren County line. Most of the individual areas are elongated or irregular in shape and generally range from 20 to 150 acres in size.

Typically, the surface layer is brown sandy clay loam 5 inches thick. The subsoil is 21 inches thick. The upper part is strong brown clay with red mottles. The lower part is strong brown clay loam with reddish yellow mottles and pockets of saprolite. The underlying material to a depth of 60 inches is multicolored clay loam or sandy loam saprolite.

Permeability and available water capacity are moderate. The shrink-swell potential also is moderate. The hazard of erosion is severe in areas where the soil has been cleared of trees. The seasonal high water table is at a depth of more than 6 feet.

Included with this soil in mapping are a few areas of the red Pacolet soils in landscape positions similar to

those of the Wedowee soil. Also included are some shallow soils and small outcroppings of rock, generally at the base of the steeper slopes. Inclusions make up about 20 percent of the map unit.

The Wedowee soil is used mainly as woodland. A few small areas are used as pasture.

The main limitations affecting cultivated crops are the slope and the severe hazard of erosion. The slope also is a limitation in areas used as pasture. Proper pasture management ensures an adequate protective cover of vegetation.

The major overstory trees are loblolly pine, southern red oak, white oak, yellow-poplar, and hickory. The understory vegetation consists mainly of flowering dogwood, American holly, and sourwood. The slope and the effects of past erosion are moderate limitations affecting woodland use and management. The slope also limits the use of equipment. The hazard of further erosion is accelerated along logging roads and in areas that have been cleared of trees.

The slope, the shrink-swell potential, and the clayey, moderately permeable subsoil are limitations on sites for dwellings, commercial buildings, lawns and landscaping, shallow excavations, and septic tank absorption fields. Special design may be needed to overcome these limitations. Low strength is a limitation on sites for local roads and streets.

The slope is a moderate limitation in areas used for camping and picnicking and a severe limitation in areas used for playgrounds.

The land capability subclass is VIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 6C.

Wh—Wehadkee loam, frequently flooded. This nearly level, poorly drained soil is on flood plains along the major rivers and smaller creeks throughout the county. Slopes are 0 to 2 percent. Individual areas generally are long and narrow. Some areas along the Roanoke River are broad and extensive. Some smaller areas are along the smaller creeks. Mapped areas generally range from 400 to more than 1,000 acres in size.

Typically, the surface layer is light brownish gray loam 6 inches thick. The subsoil is 30 inches thick. It is light brownish gray loam with strong brown mottles in the upper part and gray loam with yellowish brown mottles in the lower part. The underlying material to a depth of 60 inches is light gray sandy loam with yellowish brown mottles.

Permeability is moderate, and available water capacity is high. The soil is frequently flooded for long periods. The seasonal high water table is at or near the surface during wet periods. The content of organic matter in the surface layer is moderate.

Included with this soil in mapping are areas of soils that have more sand in the subsoil than the Wehadkee soil and areas of soils that have a higher content of organic matter in the surface layer. Both of these soils are intermingled with areas of the Wehadkee soil throughout the map unit. Also included along the Roanoke and Meherrin Rivers are a few areas of better drained soils that are in the slightly higher landscape positions. Included soils make up about 25 percent of the map unit.

All of the acreage of the Wehadkee soil is wooded. The soil is not used for cultivated crops or as pasture because of the flooding and the seasonal high water table.

The major overstory trees grown on this soil are baldcypress, water tupelo, yellow-poplar, sweetgum, water oak, and sycamore. Because of the flooding, the soil generally has little understory growth. The flooding and the wetness are severe limitations affecting the use of equipment and moderate limitations affecting seedling mortality. When the soil is wet, unsurfaced roads are soft and slippery and are impassable. Special site preparation, such as bedding, helps to establish seedlings and may prevent seedling mortality during wet periods. Installing a drainage system is not feasible because of the position of the soil on the landscape.

The flooding and the wetness are severe limitations on sites for dwellings, commercial buildings, local roads and streets, lawns and landscaping, shallow excavations, and septic tank absorption fields. They also are severe limitations affecting recreational uses, such as camp areas, picnic areas, playgrounds, and hiking trails. A major drainage and flood-control system is required to overcome the flooding and the wetness. Since this type of system is not feasible in the county, this soil is not used for urban or recreational development.

The land capability subclass is VIw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8W.

WkA—Wickham fine sandy loam, 0 to 2 percent slopes. This nearly level, well drained soil is on stream terraces along the Roanoke and Meherrin Rivers. Individual areas are oblong and generally range from 20 to 300 acres in size. Some areas are as large as 500 acres.

Typically, the surface layer is dark brown fine sandy loam 6 inches thick. The subsoil is 44 inches thick. It is reddish brown sandy clay loam in the upper part, yellowish red sandy clay loam in the next part, and strong brown sandy clay loam and loam in the lower

part. The underlying material to a depth of 78 inches is strong brown sand or loamy sand.

Permeability and available water capacity are moderate. The seasonal high water table is at a depth of more than 6 feet.

Included with this soil in mapping are a few small areas of the moderately well drained Altavista soils in the slightly lower landscape positions. Also included are a few areas of State and Conetoe soils in landscape positions that are similar to those of the Wickham soil. Both of these soils are intermingled with areas of the Wickham soil. Also included are areas of soils that have more clay and slower permeability in the subsoil than that of the Wickham soil. Included soils make up about 15 percent of the map unit.

Most of the acreage of the Wickham soil is used for cultivated crops. The rest is used mainly as woodland or pasture.

The major crops grown on this soil are corn, soybeans, peanuts, tobacco, cotton, and small grain. Winter cover crops, conservation tillage, and crop residue management help to maintain tilth and conserve moisture. Field borders and grassed waterways conserve moisture and help to control erosion in some areas of the soil that have a slope of more than 1 percent.

The major overstory trees are loblolly pine, red maple, yellow-poplar, hickory, black cherry, American beech, southern red oak, water oak, and white oak. The understory vegetation consists mainly of flowering dogwood, sassafras, sourwood, and southern waxmyrtle. No major limitations affect woodland use and management.

No major limitations affect sites for dwellings, commercial buildings, local roads and streets, lawns and landscaping, shallow excavations, and septic tank absorption fields; or recreational uses, such as camp areas, picnic areas, playgrounds, or hiking trails.

The land capability class is I. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9A.

WkB—Wickham fine sandy loam, 2 to 8 percent slopes. This gently sloping, well drained soil is on stream terraces along the Roanoke and Meherrin Rivers. Individual areas commonly are long and narrow and generally range from 20 to 150 acres in size. Some areas are as large as 300 acres.

Typically, the surface layer is brown fine sandy loam 7 inches thick. The subsoil is 53 inches thick. It is strong brown clay loam in the upper part and strong brown sandy clay loam in the lower part. The underlying material to a depth of 65 inches is strong brown sandy loam.

Permeability and available water capacity are moderate. Erosion is a hazard in areas where slopes are left bare or unprotected. The seasonal high water table is at a depth of more than 6 feet.

Included with this soil in mapping are areas of soils that have a higher content of sand than is typical for the Wickham soil. These soils are intermingled with areas of the Wickham soil throughout the map unit. Also included are areas of wetter soils at the base of slopes adjacent to drainageways. Included soils make up about 20 percent of the map unit.

Most of the acreage of the Wickham soil is used for cultivated crops. The rest is used as pasture or woodland.

The major crops grown on this soil are corn, soybeans, cotton, peanuts, and small grain. Winter cover crops, conservation tillage, and crop residue management help to control runoff and erosion and maintain tilth. Conservation measures, such as field borders, terraces, and grassed waterways, also help to control erosion and conserve water.

The major overstory trees are loblolly pine, red maple, yellow-poplar, hickory, black cherry, American beech, southern red oak, water oak, and white oak. The understory vegetation consists mainly of flowering dogwood, sassafras, sourwood, and southern waxmyrtle. No major limitations affect woodland use and management.

No major limitations affect sites for dwellings, local roads and streets, lawns and landscaping, shallow excavations, and septic tank absorption fields. A slope of more than 4 percent is a moderate limitation on sites for commercial buildings.

No major limitations affect recreational uses, such as camp areas, picnic areas, and hiking trails. The slope is a moderate limitation on sites used as playgrounds.

The land capability subclass is IIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9A.

WtE—Winton fine sandy loam, 10 to 25 percent slopes. This strongly sloping and moderately steep, moderately well drained soil is on slopes along rivers and their tributaries in the central and eastern parts of the county. Individual areas are long and narrow and generally range from 25 to 200 acres in size. Some areas are as large as 400 acres.

Typically, the surface layer is dark brown fine sandy loam 6 inches thick. The subsoil is 35 inches thick. The upper part is strong brown clay loam. The lower part is strong brown clay loam with pinkish gray and yellowish brown mottles. The underlying material to a depth of 62 inches is yellowish brown sandy loam with light brownish gray and strong brown mottles and brownish

yellow clay loam with pinkish gray and yellowish red mottles.

Permeability and available water capacity are moderate. A perched seasonal high water table is at a depth of 2 to 4 feet. The hazard of erosion is severe if the soil is left exposed.

Included with this soil in mapping are a few areas of the well drained Bonneau and Norfolk and moderately well drained Craven soils. These soils generally are intermingled with areas of the Winton soil in the upper part of the map unit. Also included are areas of soils that have more sand throughout than is typical for the Winton soil and some areas of well drained soils. Included soils make up about 25 percent of the map unit.

Most of the acreage of the Winton soil is wooded. A few areas in the uplands are used as pasture.

The slope is the main limitation affecting cultivated crops. The hazard of erosion is severe, and the slope limits the use of equipment. The slope and the hazard of erosion are management concerns affecting pasture.

The dominant overstory trees are southern red oak, sweetgum, loblolly pine, hickory, and American beech. The understory vegetation consists mainly of flowering dogwood, American holly, sourwood, red maple, and sassafras. The slope is a moderate limitation affecting the erosion hazard and the use of equipment for woodland use and management. A cable yarding logging system results in less damage to the soil and reduces the limitation for the use of equipment. Maintaining a cover of vegetation and specially designing logging roads help to control erosion.

The slope is a severe limitation on sites for dwellings, commercial buildings, local roads and streets, lawns and landscaping, shallow excavations, and septic tank absorption fields. Special design may be needed to overcome this limitation. The wetness also is a limitation on sites for septic tank absorption fields and shallow excavations.

The slope is a severe limitation affecting recreational uses, such as camp areas, picnic areas, and playgrounds, and a moderate limitation affecting hiking trails.

The land capability subclass is VIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 10R.

WtF—Winton fine sandy loam, 25 to 50 percent slopes. This steep, moderately well drained soil is on bluffs along rivers and their major tributaries in the central and eastern parts of the county. Individual areas are long and narrow and generally range from 25 to 200 acres in size. Some areas are as large as 400 acres.

Typically, the surface layer is dark brown fine sandy loam 6 inches thick. The subsoil is 35 inches thick. The upper part is strong brown clay loam. The lower part is strong brown clay loam with pinkish gray and yellowish brown mottles. The underlying material to a depth of 62 inches is yellowish brown sandy loam with light brownish gray and strong brown mottles and brownish yellow clay loam with pinkish gray and yellowish red mottles.

Permeability and available water capacity are moderate. A perched seasonal high water table is at a depth of 2 to 4 feet. The hazard of erosion is severe if the soil is left exposed. Runoff is rapid or very rapid.

Included with this soil in mapping are a few areas of soils that have a slope of less than 25 percent and a few areas of steep bluffs that have a slope of more than 50 percent. Also included are areas of soils that have more sand throughout than is typical for the Winton soil and some wetter soils at the base of slopes. Included soils make up about 25 percent of the map unit.

All of the acreage of the Winton soil is wooded. The slope is the main limitation affecting cultivated crops. The hazard of erosion is severe, and the slope limits the use of equipment. The slope also is a severe limitation for use as pasture.

The dominant overstory trees are southern red oak, sweetgum, loblolly pine, hickory, and American beech. The understory vegetation consists mainly of flowering dogwood, American holly, sourwood, red maple, and sassafras. Because of the slope, the hazard of erosion affecting woodland use and management is severe. The slope also is a severe limitation affecting the use of equipment. A cable yarding logging system results in less damage to the soil and reduces the limitation for the use of equipment. Maintaining a cover of vegetation helps to control erosion. Specially designing logging roads to avoid the steeper slopes helps to control erosion along logging roads and skid trails. Planting seedlings on the contour can help to control runoff and increase water intake into the soil.

The slope is a severe limitation on sites for dwellings, commercial buildings, local roads and streets, lawns and landscaping, shallow excavations, and septic tank absorption fields. Special design may be needed to overcome this limitation. The wetness also is a limitation on sites for septic tank absorption fields and shallow excavations.

The slope is a severe limitation affecting recreational uses, such as camp areas, picnic areas, playgrounds, and hiking trails.

The land capability subclass is VIIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 10R.

Prime Farmland

In this section, prime farmland is defined and the soils in Northampton County that are considered prime farmland are listed.

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that government at local, State, and Federal levels, as well as individuals, must encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland soils, as defined by the U.S. Department of Agriculture, are soils that are best suited to food, feed, forage, fiber, and oilseed crops. Such soils have properties that favor the economic production of sustained high yields of crops. The soils need only to be treated and managed by acceptable farming methods. The moisture supply must be adequate, and the growing season must be sufficiently long. Prime farmland soils produce the highest yields with minimal expenditure of energy and economic resources. Farming these soils results in the least damage to the environment.

Prime farmland soils may presently be used as cropland, pasture, or woodland or for other purposes. They are used for food or fiber or are available for these uses. Urban or built-up land, public land, and water areas cannot be considered prime farmland. Urban or built-up land is any contiguous unit of land 10 acres or more in size that is used for such purposes as housing, industrial, and commercial sites, sites for institutions or public buildings, small parks, golf courses, cemeteries, railroad yards, airports, sanitary landfills, sewage treatment plants, and water-control structures. Public land is land not available for farming in National forests, National parks, military reservations, and State parks.

Prime farmland soils usually receive an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The acidity or alkalinity level of the soils is acceptable. The soils have few or no rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods and are not frequently flooded during the growing season. The slope ranges mainly from 0 to 8 percent.

The following map units are considered prime farmland in Northampton County. The location of each map unit is shown on the detailed soil maps at the back of this publication. The extent of each unit is given in table 4. The soil qualities that affect use and management are described in the section "Detailed Soil Map Units." This list does not constitute a recommendation for a particular land use.

Some soils that have a seasonal high water table qualify as prime farmland only in areas where this limitation has been overcome by drainage measures. If applicable, the need for this measure is indicated in parentheses after the map unit name in the following list. Onsite evaluation is necessary to determine if this limitation has been overcome by corrective measures.

The soils identified as prime farmland in Northampton County are:

AtA	Altavista fine sandy loam, 0 to 3 percent slopes, rarely flooded
CaA	Caroline sandy loam, 0 to 2 percent slopes
CaB	Caroline sandy loam, 2 to 6 percent slopes
Co	Congaree silt loam, 0 to 4 percent slopes, occasionally flooded
CrA	Craven fine sandy loam, 0 to 1 percent slopes
CrB	Craven fine sandy loam, 1 to 4 percent slopes
CsB2	Craven sandy clay loam, 1 to 4 percent slopes, eroded
ExA	Exum loam, 0 to 2 percent slopes
GoA	Goldsboro sandy loam, 0 to 2 percent slopes
GxB	Gritney sandy loam, 2 to 6 percent slopes
HeB	Helena sandy loam, 1 to 6 percent slopes
Ly	Lynchburg fine sandy loam (where drained)
NoA	Norfolk sandy loam, 0 to 2 percent slopes
NoB	Norfolk sandy loam, 2 to 6 percent slopes
PcB2	Pacolet sandy clay loam, 2 to 8 percent slopes, eroded
Ra	Rains fine sandy loam (where drained)

StA	State sandy loam, 0 to 3 percent slopes, rarely flooded
Te	Tomotley fine sandy loam, rarely flooded (where drained)
TrA	Turbeville loamy sand, 0 to 2 percent slopes
TrB	Turbeville loamy sand, 2 to 6 percent slopes
TsA	Turbeville sandy loam, 0 to 2 percent slopes
TsB	Turbeville sandy loam, 2 to 6 percent slopes
TtB2	Turbeville sandy clay loam, 2 to 6 percent slopes, eroded
TuB	Turbeville gravelly sandy loam, 2 to 8 percent slopes
WdB	Wedowee sandy loam, 2 to 8 percent slopes
WkA	Wickham fine sandy loam, 0 to 2 percent slopes
WkB	Wickham fine sandy loam, 2 to 8 percent slopes

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help to prevent construction failures caused by unfavorable soil properties.

Generally, the soils in Northampton County that are well suited to crops are also well suited to urban uses. The data concerning specific soils in the county can be used in planning future land use patterns. The potential for farming should be considered relative to any soil limitations and the potential for nonfarm development.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern that is in harmony with nature.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

Tony R. Short, district conservationist, and Bobby G. Brock, conservation agronomist, Soil Conservation Service, helped prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units" and in the tables. Specific information can be obtained from the local office of the Soil Conservation Service or the North Carolina Cooperative Extension Service.

In 1984 about 99,300 acres in Northampton County was used as cropland and about 2,000 acres was used as pasture and hayland *(6)*. Corn was grown on about 21,000 acres, flue-cured tobacco on about 300 acres, soybeans on about 27,285 acres, peanuts on about 28,500 acres, cotton on about 13,800 acres, and small grain on about 7,150 acres. All other crops were grown on the remaining 1,265 acres. The pasture and hayland were planted almost entirely to tall fescue.

Cropland Management

Erosion is a hazard on cropland and pasture in areas of the soils that have a slope of more than 2 percent. Examples are Bonneau, Caroline, Craven, Pacolet, Gritney, Norfolk, Turbeville, Wedowee, and Wickham soils. Autryville, Bonneau, Conetoe, Norfolk, Seabrook, and Tarboro soils are subject to soil blowing.

Erosion is damaging for various reasons. As the topsoil is lost, productivity decreases and tilth deteriorates. Costly and potentially harmful herbicides, fertilizers, and lime, as well as the valuable topsoil and organic matter, are removed from the field. Erosion degrades water quality by increasing the amount of sediments deposited into streams, lakes, and

reservoirs. Effectively controlling erosion maintains productivity and improves water quality.

Resource management systems can control erosion by providing a protective surface cover, controlling runoff, and increasing the rate of water infiltration. Maintaining the plant cover on the soil for an extended period of time also helps to control erosion. A conservation cropping system that leaves a substantial plant cover should be used. The proper amount of crop residue, cover crops, and grasses helps to establish a substantial plant cover.

Conservation tillage is a system of growing crops in a cover of mulch and minimizing the disturbance of the surface. It is especially helpful on soils that have a hazard of erosion but can be helpful on any soil. It is also suited to erodible soils on short slopes, such as Gritney and Craven soils.

A compacted plowpan has formed between the surface layer and the subsoil in several of the soils in the county. Plowpans are common in Autryville, Bonneau, Conetoe, Norfolk, Pactolus, and Turbeville soils. A plowpan reduces the rate of water infiltration, the extent of root penetration, and permeability. It increases the hazard of erosion on sloping soils. A conservation tillage system that uses rippers, subsoilers, and chisels effectively reduces the occurrence of a plowpan. The formation of a plowpan is related to the number of trips across the field and the amount of tillage during wet periods.

Properly designed terraces and diversions help to control erosion by intercepting excess surface runoff and safely routing this water to suitable outlets. Grassed waterways, which are generally planted to tall fescue, provide safe disposal of the surface runoff. Field borders of fescue help filter sediments from the runoff. These measures are practical and highly effective on soils that have a uniform slope, such as Norfolk, Bonneau, Caroline, Gritney, Turbeville, and Wickham soils. Contour tillage is an effective conservation measure on the sloping soils in the county if used with terraces or diversions.

Soil blowing is common on soils that have a sandy surface layer. Many tons of topsoil are lost from Autryville, Bonneau, Conetoe, Norfolk, Tarboro, and Seabrook soils each year. This windblown material is carried into drainage ditches and hoedrains, generally during March, April, and May. Most of the damage caused by soil blowing is the result of windblown soil particles striking young plants. Damage from soil blowing can be greatly reduced by using a conservation cropping system that includes cover crops and crop residue management or conservation tillage. Narrow strips of tall-growing small grain can be used to reduce wind damage late in the spring to young row crops. Windbreaks are effective in large open areas.

Tilth is an important factor affecting crop production. Seed germination and water infiltration are influenced by tilth. Soils that have good tilth have a granular, porous surface layer.

The surface layer of most of the soils in the county is loamy sand, sandy loam, or fine sandy loam and is low in content of organic matter. Most of the soils, especially those that have a fine textured surface layer, such as Bethera, Lenoir, Roanoke, and Congaree soils, are subject to surface crusting after rainfall. Other soils, such as the more sloping Craven soils, have an eroded surface layer that tends to crust. Adding crop residue, manure, or mulch or using a rotation of conservation tillage and sod minimize crusting and improve soil structure and tilth.

Because in the fall most of the soils form a hard crust after intense rains, fall plowing is not recommended on the soils in the county. The crust slows the infiltration of water and increases runoff and erosion during the winter. It also subjects the area to soil blowing in the spring. A protective cover of crop residue or winter cover crops helps to prevent erosion.

The poorly drained and somewhat poorly drained Rains, Lenoir, Bethera, Lynchburg, Roanoke, Tomotley, and Wahee soils stay wet until late in spring unless a drainage system is installed. If they are plowed when wet, they become cloddy when dry and a good seedbed is difficult to prepare.

Information on the design and applicability of resource management systems for each kind of soil can be obtained from the local office of the Soil Conservation Service.

Drainage

Excessive wetness is a limitation on about 40,000 acres used as cropland in Northampton County. Many of the poorly drained and somewhat poorly drained soils, such as Rains, Lynchburg, Bethera, Lenoir, Roanoke, Wahee, and Tomotley soils, require a drainage system that includes tile drainage, open ditches, and land smoothing. Land smoothing is necessary to successfully produce crops, such as corn, soybeans, and small grain. The loamy Rains, Lynchburg, and Tomotley soils respond well to tile drainage. Peanuts and tobacco can be grown on Goldsboro, Exum, Lynchburg, and Craven soils if an adequate surface and subsurface drainage system is installed and maintained.

Most of the wet soils respond well to artificial drainage. The clayey Bethera, Lenoir, Roanoke, Wahee, and Craven soils, however, respond more slowly than the other soils. The less responsive soils require an

Figure 7.—Pasture in an area of Wedowee sandy clay loam, 8 to 15 percent slopes, eroded. Many previously cultivated areas in the western part of Northampton County have been converted to pasture.

extensive surface drainage system that includes open channels, filter strips, field borders, and land grading.

Information concerning the design and applicability of drainage practices for each soil type can be obtained from the local office of the Soil Conservation Service and from the office of the Northampton Soil and Water Conservation District.

Pasture Management

Tall fescue is the major grass grown in Northampton County for pasture and hayland; however, other species of grasses, such as hybrid bermudagrass, common bermudagrass, and bahiagrass, are better adapted to some of the soils. Livestock producers should plant the grass that is best adapted to the soil. Planting an adapted grass and using good management techniques, such as proper annual applications of fertilizer, weed control, and controlled grazing, result in higher returns from pasture and hayland.

The deep, well drained and moderately well drained Norfolk, Craven, Exum, Caroline, and Goldsboro soils are suited to all of the major grasses common to the county. Fescue, fescue and clover, common bermudagrass, and bahiagrass produce 6 to 9 animal-unit-months each year. Hybrid bermudagrass produces an average of 10 animal-unit-months per year. Other warm-season grasses may become available.

The deep, sandy Conetoe, Bonneau, Autryville, and Tarboro soils that are subject to moisture stress and fertilizer leaching are not well suited to fescue. These soils are best suited to such grasses as hybrid bermudagrass and common bermudagrass. They produce 5 to 9 animal-unit-months per year.

If adequately drained, the wetter Bethera, Rains, Roanoke, Lenoir, and Wehadkee soils are best suited to fescue or to a mixture of fescue and legumes. These soils produce 5 to 9 animal-unit-months per year, depending on the management techniques used.

Effective pasture and hayland management includes the use of summer grasses, such as bermudagrass, and cool-season grasses or a grass-legume mixture. If proper fencing is installed to allow for rotation of grazing and fertilizer is carefully applied, many pastures can be grazed from March through November (fig. 7).

Chemical Weed Control

The use of herbicides for weed control is a common practice on the cropland in Northampton County. It decreases the need for tillage and is an integral part of modern farming. Selected soil properties, such as content of organic matter and texture of the surface layer, affect the rate of herbicide application. Estimates of both of these properties were determined for the soils in the county. Table 14 shows a general range of organic matter content in the surface layer of the soils. The texture of the surface layer is shown in the USDA texture column in table 13.

In some areas the content of organic matter projected for the different soils is outside the range shown in the table. The content can be higher in soils that have received high amounts of animal or manmade waste. Soils that have recently been brought into cultivation can have a higher content of organic matter in the surface layer than similar soils that have been cultivated for a long time. Conservation tillage can increase the content of organic matter in the surface layer. A lower content of organic matter is common where the surface layer has been partly or completely removed by erosion, land smoothing, or intensive cultivation. Current soil tests should be used for specific organic matter content determinations.

Soil Fertility

The soils in Northampton County generally are low in natural fertility. They are naturally acid. Additions of lime and fertilizer are needed for the production of most kinds of crops.

Liming requirements are a major concern on cropland. The acidity level in the soil affects the availability of many nutrients to plants and the activity of beneficial bacteria. Lime also neutralizes exchangeable aluminum in the soil and thus counteracts the adverse effects of high levels of aluminum on many crops. Liming adds calcium (from calcitic lime) or calcium and magnesium (from dolomitic lime) to the soil.

A soil test is a guide to what amount and kind of lime should be used. The desired pH levels may differ, depending on the soil properties and the crop to be grown.

Nitrogen fertilizer is required for most crops. It generally is not required, however, for peanuts and clover, in some rotations of soybeans, or for alfalfa that is established. A reliable soil test is not available for predicting nitrogen requirements. Appropriate rates of nitrogen application are described in the section "Yields per Acre."

Soil tests can indicate the need for phosphorus and potassium fertilizer. They are needed because phosphorus and potassium tend to build up in the soil.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of each map unit also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

A high level of management includes maintaining proper soil reaction and fertility levels as indicated by standard soil tests. The application rate of nitrogen for corn on soils that have a yield potential of 125 to 150 bushels per acre should be 140 to 160 pounds per acre. If the yield potential for corn is 100 bushels per acre or less, a rate of 100 to 120 pounds of nitrogen per acre should be used. The application of nitrogen in excess of that required for potential yields generally is not recommended. The excess nitrogen fertilizer that is not utilized by a crop is an unnecessary expense and causes a hazard of water pollution. If corn or cotton is grown after the harvest of soybeans or peanuts, nitrogen rates can be reduced by about 20 to 30 pounds per acre. Because nitrogen can be readily leached from sandy soils, applications may be needed on these soils more than once during the growing season.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the North Carolina Cooperative Extension Service can provide

information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for use as cropland *(10)*. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland and for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode, but they have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main hazard is the risk of erosion unless a close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

There are no subclasses in class I because the soils of this class have few limitations. The soils in class V are subject to little or no erosion, but they have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation. Class V contains only the subclasses indicated by *w, s,* or *c.*

The capability classification of each map unit component is given in the section "Detailed Soil Map Units" and in table 5.

Woodland Management and Productivity

Owners of woodland in Northampton County have many objectives. These objectives include producing timber; conserving wildlife, soil, and water; preserving aesthetic quality; and providing opportunities for recreational activities, such as commercial hunting. Public demand for clean water and recreational areas creates pressures and opportunities for owners of woodland.

The landowner interested in timber production is faced with the challenge of producing greater yields from smaller areas. Meeting this challenge requires intensive management and silvicultural practices. Many modern silvicultural techniques resemble those long practiced in agriculture. They include establishing, weeding, and thinning a desirable young stand; propagating the more productive species and genetic varieties; providing short rotations and complete fiber utilization; controlling insects, diseases, and weeds; and improving tree growth by applications of fertilizer and the installation of a drainage system. Even though timber crops require decades to grow, the goal of intensive management is similar to the goal of intensive agriculture. This goal is to produce the greatest yield of the most valuable crop as quickly as possible.

Commercial forest is land that is producing or is capable of producing crops of industrial wood and that has not been withdrawn from timber production. Loblolly pine is the most important timber species in the county because it grows fast, is adapted to the soil and climate, brings the highest average sale value per acre, and is easy to establish and manage.

One of the first steps in planning intensive woodland management is to determine the potential productivity of the soil for several alternative tree species. The most productive and valued trees are then selected for each soil type. Site and yield information enables a forest manager to estimate future wood supplies. These

estimates are the basis of realistic decisions concerning expenses and profits associated with intensive woodland management, land acquisition, or industrial investments.

The potential productivity of woodland depends on physiography, soil properties, climate, and the effects of past management. Specific soil properties and site characteristics, including soil depth, texture, structure, and depth to the water table, affect forest productivity primarily by influencing available water capacity, aeration, and root development. The net effects of the interaction of these soil properties and site characteristics determine the potential site productivity.

Other site factors are also important. The gradient and length of slopes affect water movement and availability. Sites on south-facing slopes are warmer and drier than those on north-facing slopes. The best sites generally are on north- and east-facing slopes. The amount of rainfall and length of the growing season influence site productivity.

This soil survey can be used by woodland managers planning ways to increase the productivity of forest land. Some soils respond better to applications of fertilizer than others, and some are more susceptible to landslides and erosion after roads are built and timber is harvested. Some soils require special reforestation efforts. In the section "Detailed Soil Map Units," the description of each map unit in the survey area suitable for timber includes information about productivity, limitations in harvesting timber, and management concerns in producing timber. The common forest understory plants also are listed. Table 6 summarizes this forestry information and rates the soils for a number of factors to be considered in management. *Slight, moderate*, and *severe* are used to indicate the degree of the major soil limitations to be considered in forest management.

Table 6 lists the *ordination symbol* for each soil. The first part of the ordination symbol, a number, indicates the potential productivity of a soil for the indicator species in cubic meters per hectare per year. The larger the number, the greater the potential productivity. Potential productivity is based on the site index and the point where mean annual increment is the greatest.

The second part of the ordination symbol, a letter, indicates the major kind of soil limitation affecting use and management. The letter *R* indicates a soil that has a significant limitation because of the slope. The letter *W* indicates a soil in which excessive water, either seasonal or year-round, causes a significant limitation. The letter *C* indicates a soil that has a limitation because of the kind or amount of clay in the upper part of the profile. The letter *S* indicates a dry, sandy soil. The letter *A* indicates a soil having no significant limitations that affect forest use and management. If a soil has more than one limitation, the priority is as follows: R, W, C, and S.

Ratings of the *erosion hazard* indicate the probability that damage may occur if site preparation or harvesting activities expose the soil. The risk is *slight* if no particular preventive measures are needed under ordinary conditions; *moderate* if erosion-control measures are needed for particular silvicultural activities; and *severe* if special precautions are needed to control erosion for most silvicultural activities. Ratings of moderate or severe indicate the need for construction of higher standard roads, additional maintenance of roads, additional care in planning harvesting and reforestation activities, or the use of special equipment.

Ratings of *equipment limitation* indicate limits on the use of forest management equipment, year-round or seasonal, because of such soil characteristics as slope, wetness, stoniness, and susceptibility of the surface layer to compaction. As slope gradient and length increase, the use of wheeled equipment becomes more difficult. On the steeper slopes, tracked equipment is needed. On the steepest slopes, even tracked equipment cannot be operated and more sophisticated systems are needed. The rating is *slight* if equipment use is restricted by wetness for less than 2 months and if special equipment is not needed. The rating is *moderate* if slopes are so steep that wheeled equipment cannot be operated safely across the slope, if wetness restricts equipment use from 2 to 6 months per year, or if special equipment is needed to prevent or minimize compaction. The rating is *severe* if slopes are so steep that tracked equipment cannot be operated safely across the slope, if wetness restricts equipment use for more than 6 months per year, or if special equipment is needed to prevent or minimize compaction. Ratings of moderate or severe indicate a need to choose the best suited equipment and to carefully plan the timing of harvesting and other management activities.

Ratings of *seedling mortality* refer to the probability of the death of the naturally occurring or properly planted seedlings of good stock in periods of normal rainfall, as influenced by kinds of soil or topographic features. Seedling mortality is caused primarily by too much water or too little water. The factors used in rating a soil for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, and rooting depth. The mortality rate generally is highest on soils that have a sandy or clayey surface layer. The risk is *slight* if, after site preparation, expected mortality is less than 25 percent; *moderate* if expected mortality is

Figure 8.—Loblolly pine in an area of Goldsboro sandy loam, 0 to 2 percent slopes. This species is well suited to the Goldsboro soils.

between 25 and 50 percent; and *severe* if expected mortality exceeds 50 percent. Ratings of moderate or severe indicate that it may be necessary to use containerized or larger than usual planting stock or to make special site preparations, such as bedding, furrowing, installing a surface drainage system, and providing artificial shade for seedlings. Reinforcement planting is often needed if the risk is moderate or severe.

The *potential productivity* of *common trees* on a soil is expressed as a *site index* and a *volume* number. The predominant common trees are listed in table 6 in the order of their observed occurrence. Additional species that commonly occur on the soils may be listed in the detailed soil map unit descriptions. Generally, only two or three tree species dominate. The first tree listed for each soil is the indicator species for that soil. An indicator species is a tree that is common in the area and that is generally the most productive on a given soil.

For soils that are commonly used for timber production, the yield is predicted in cubic feet per acre per year. It is predicted at the point where mean annual increment culminates. The productivity of the soils in this survey is based mainly on loblolly pine and sweetgum *(3, 5)* (fig. 8).

The *site index* is determined by taking height measurements and determining the age of selected trees within stands of a given species. This index is the average height, in feet, that the trees attain in a specified number of years (50 years in this survey). This index applies to fully stocked, even-aged, unmanaged stands. Productivity of a site can be improved through management practices, such as

bedding, ditching, managing water, applying fertilizer, and planting genetically improved species.

The *volume* is the yield likely to be produced by the most important trees, expressed in cubic feet per acre per year.

Trees to plant are those that are used for reforestation or, under suitable conditions, natural regeneration. They are suited to the soils and can produce a commercial wood crop. The desired product, topographic position (such as a low, wet area), and personal preference are three factors among many that can influence the choice of trees for use in reforestation. If hardwoods are desired on a forest site, acceptable species should naturally reproduce from seeds and sprouts. Special site preparation techniques may be required.

Recreation

The natural features in Northampton County, such as the favorable climate, manageable soils, gentle topography, and abundant wildlife, provide excellent opportunities for outdoor recreation. Roanoke Rapids Lake and Lake Gaston, the major bodies of water, offer fishing, boating, swimming, and camping (fig. 9). The county has many smaller lakes and ponds and many miles of streams, including the Meherrin and Roanoke Rivers. These areas offer excellent opportunities for fishing and hunting. The mild climate permits year-round outdoor recreation. No large population centers or intensive-use recreational areas are in the county. The information in this section relating the soil types to their suitability for recreational use and development may become more applicable as public demand increases.

In table 7, the soils of the survey area are rated according to the limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 7, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 7 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 10 and interpretations for dwellings without basements and for local roads and streets in table 9.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have gentle slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes, stones, or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

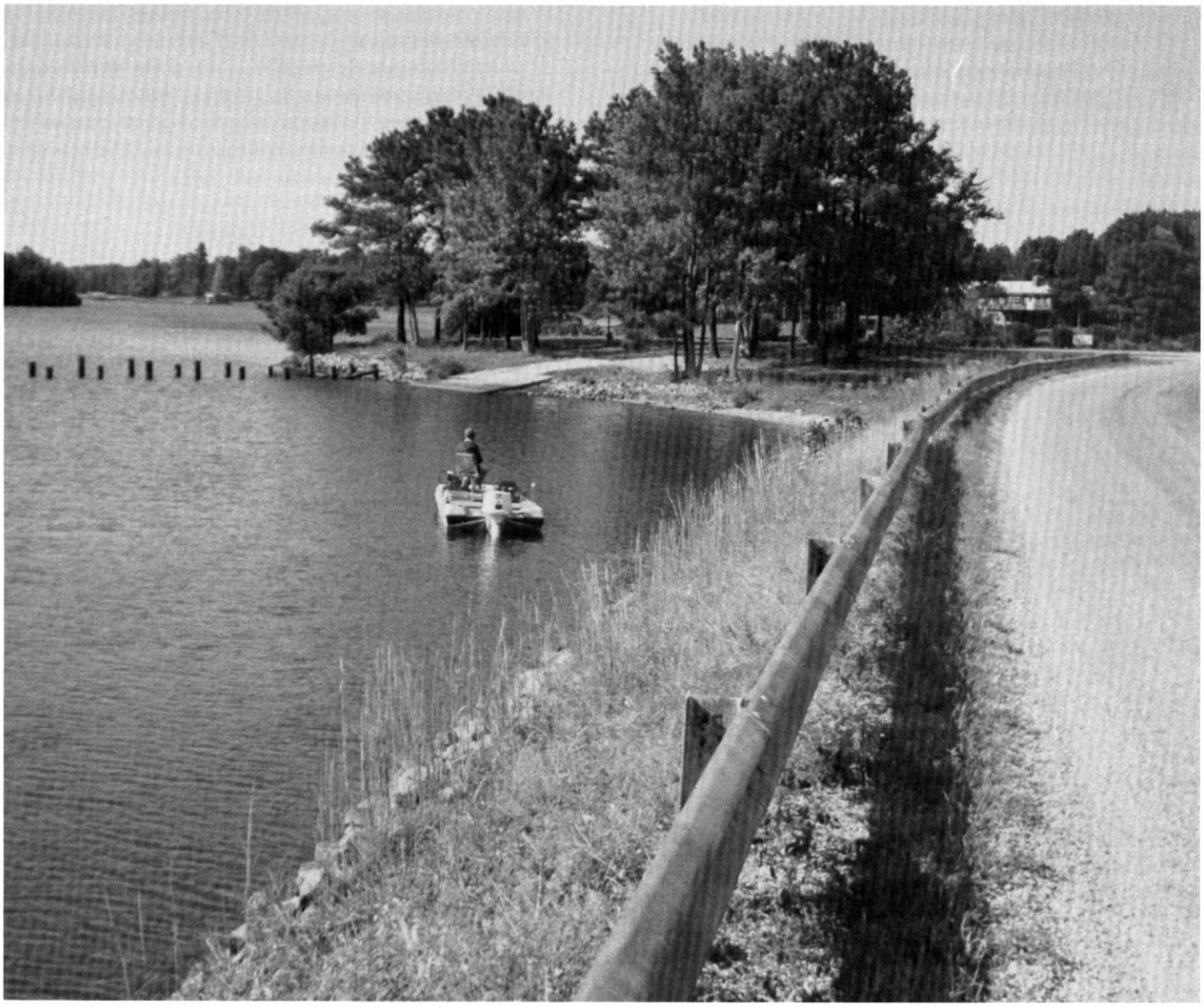

Figure 9.—Lake Gaston provides numerous recreational opportunities.

Wildlife Habitat

John P. Edwards, biologist, and Steven F. Stokes, soil scientist, Soil Conservation Service, helped prepare this section.

The landscapes of Northampton County were formed by natural processes, such as the receding of the oceans, the cutting of channels by rivers and streams, erosion, sedimentation, and deposition. Four distinct landforms or regions can be described in relation to the processes of soil formation and development. These regions are the Piedmont, the Coastal Plain, immediate stream terraces, and flood plains. Each region is characterized by specific soils. These soils hold water and nutrients for certain plant species that are required by wildlife.

Although the relationship among plants, soils, and wildlife is indirect, a direct relationship exists between landscapes and wildlife because of human activities. Changes in land use, such as logging, agriculture, and housing developments, can dramatically impact wildlife populations. Depending on the species, these changes can have a positive, neutral, or negative effect. For

example, clearcutting an area of woodland negatively affects woodland wildlife species, especially canopy birds. Clearcutting has a positive effect, however, on early successional species, such as sparrows, cotton rats, quail, and cottontail rabbits *(12)*.

The soils in the county produce a wide variety of plants that provide cover and protection for wildlife. Wildlife species are classified into three groups—woodland, wetland, and openland. The woodland wildlife group includes turkey, bear, white-tailed deer, gray squirrel, woodpeckers, and songbirds. The wetland wildlife group includes beaver, waterfowl, mink, muskrat, raccoon, woodcock, and crayfish. The openland wildlife group includes quail, rabbits, mourning dove, and meadowlarks.

The Piedmont region makes up 10,446 acres of the Wedowee and Pacolet soils. These well drained, clayey soils formed in material derived from granite and occur on gently sloping to steep landscapes. The region is north of Lake Gaston and Roanoke Rapids Lake and west of Vultare. It is primarily used for woodland wildlife habitat. A few small individual farms are also in this region. Many farms have been replanted to loblolly pine. The steeper slopes are dominated by red oak, white oak, hickory, dogwood, sourwood, loblolly pine, sumac, and muscadine grape. Wildlife species attracted to this area include songbirds, woodpeckers, gray squirrel, gray fox, rabbit, and raccoon. Development restricts the turkey and deer populations, and the lack of clearings and edge habitat discourages the use of this region by openland wildlife. The heavy use of Lake Gaston for recreational activities also limits the use of the area as wildlife habitat.

The Coastal Plain region makes up 279,051 acres. It extends from Bryantown in the south to north of Margarettsville and from the Hertford County line west to Vultare. The soils north of Potecasi Creek are fine loamy. They include the well drained Norfolk and Bonneau and poorly drained Rains soils. South of Potecasi Creek the soils are clayey. They include the moderately well drained Craven and poorly drained Bethera soils. Some vegetation and wildlife habitat occur throughout the region. Because the Coastal Plain region is the largest land area in the county, wildlife habitat is most prevalent in this region.

The Coastal Plain region is used primarily for agricultural purposes. It is dissected by numerous streams and narrow flood plains. Many fields are larger than 200 acres. The size of the fields decreases the amount of edge habitat available for wildlife. The fields are often plowed to the edges of flood plains and slopes, and a buffer strip for feeding and nesting is not possible.

Many species of woodland, wetland, and openland wildlife are abundant, but turkey and bear do not thrive because of agricultural practices and other human disturbances. Deer, quail, rabbit, gray squirrel, and duck are the most prevalent game species. Beavers dam creeks, and the dammed areas support the native wood duck population.

The immediate stream terrace region occurs along the Roanoke and Meherrin Rivers, but it is separated from the rivers by the flood plain region. Wickham, Tomotley, and Roanoke soils formed in river sediments making up most of the 34,137 acre stream terrace region. The Wickham soils are well drained and loamy. They occur on broad, nearly level and gently sloping landscapes. The Tomotley and Roanoke soils are poorly drained. They occur on nearly level flats and in slight depressions. The Tomotley soils are loamy, and the Roanoke soils are clayey. The Wickham soils are used mostly for cultivated crops, pasture, and the production of loblolly pine. Good stands of mast bearing hardwoods, such as red oak, white oak, hickory, beech, dogwood, and red maple, however, are scattered within the units. The undrained areas of the Tomotley and Roanoke soils support loblolly pine, sweetgum, American holly, and greenbrier.

Openland, woodland, and wetland wildlife abound in this region because the diverse landscape offers a wide variety of habitat types adjacent to the flood plain. Turkey and bear feed in these areas late in the evening and early in the morning. The fingering of the wetter soils into areas of the Wickham soils creates edge habitat and provides food and cover for deer, quail, and rabbits. The Roanoke soils are used as pond sites. The ponds attract ducks and are used for fishing, irrigation, or crayfish farming.

The flood plain region along the first bottoms of the Roanoke and Meherrin Rivers make up 20,891 acres of the Congaree and Wehadkee soils. These soils have high natural fertility because they are derived from weathered Piedmont material. The Congaree soils are well drained or moderately well drained and are loamy. They occur on broad, nearly level or gently sloping surfaces. The poorly drained, loamy Wehadkee soils occur in depressions. The Congaree soils support large stands of mixed hardwoods, red oak, white oak, hickory, red maple, beech, dogwood, and loblolly pine. Tupelo and cypress grow well on the wetter, frequently flooded Wehadkee soils. This region supports woodland and wetland wildlife, such as turkey, bear, deer, beaver, mink, muskrats, and ducks. Because this region has little development, turkey and bear thrive. This region has large, relatively open tracts of mast bearing trees and scattered stands of mature loblolly pine used by wildlife for roosting and hibernating. Wood ducks thrive

because tupelo and cypress swamps provide excellent nesting sites.

The four regions of the county, as shown on the general soil map, indicate where the largest wildlife populations exist, their distribution, and the elements that affect their growth. Creating habitat to manage wildlife, however, is the key to increasing the abundance of wildlife. The placement of field borders, food strips, no-till farming, and plant management along waterways and drainage ditches are essential for healthy openland wildlife. Woodland wildlife management includes preserving the habitat, selectively cutting or thinning mast producing trees, reforesting, prescribed burning, and seeding logging roads with plants, such as bahiagrass, VA-70 lespedeza, Korean lespedeza, Kobe lespedeza, and autumn-olive, that produce food for wildlife. Wetland wildlife management includes properly placing ponds, controlling logging, preserving habitat, and using the three log drainage system as an alternative to beaver pond control.

Other measures can be used to enhance the growth of the wildlife population without removing large tracts of land from cultivation. The local office of the Soil Conservation Service provides assistance to landowners in developing a plan to manage wildlife habitat.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 8, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat. The ratings in table 8 are intended to be used as a guide and are not site specific. Onsite investigation is needed for individual management plans.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, grama, and lespedeza.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine and cedar.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites.

Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, cordgrass, cattail, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, meadowlark, field sparrow, mourning dove, white-tailed deer, groundhog, cottontail rabbit, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, white-tailed deer, and black bear.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, muskrat, mink, and beaver.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the "Glossary."

Building Site Development

Table 9 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local

roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if 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 *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock or a very firm dense layer, stone content, soil texture, and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. Depth to a high water table, depth to bedrock, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock, depth to a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, depth to a high water table, depth to bedrock, and the available water capacity in the upper 40 inches affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established. Soil tests are essential to determine liming and fertilizer needs. Help in making soil tests or in deciding what soil additive, if any, should be used can be obtained from the office of the Northampton Soil and Water Conservation District or the local office of the North Carolina Cooperative Extension Service.

Sanitary Facilities

Table 10 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if 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 *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 10 also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and that good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

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 observed performance of the soils. Permeability, depth to a high water table, depth to bedrock, and flooding affect absorption of the effluent. Large stones and bedrock interfere with installation.

Unsatisfactory performance of septic tank absorption

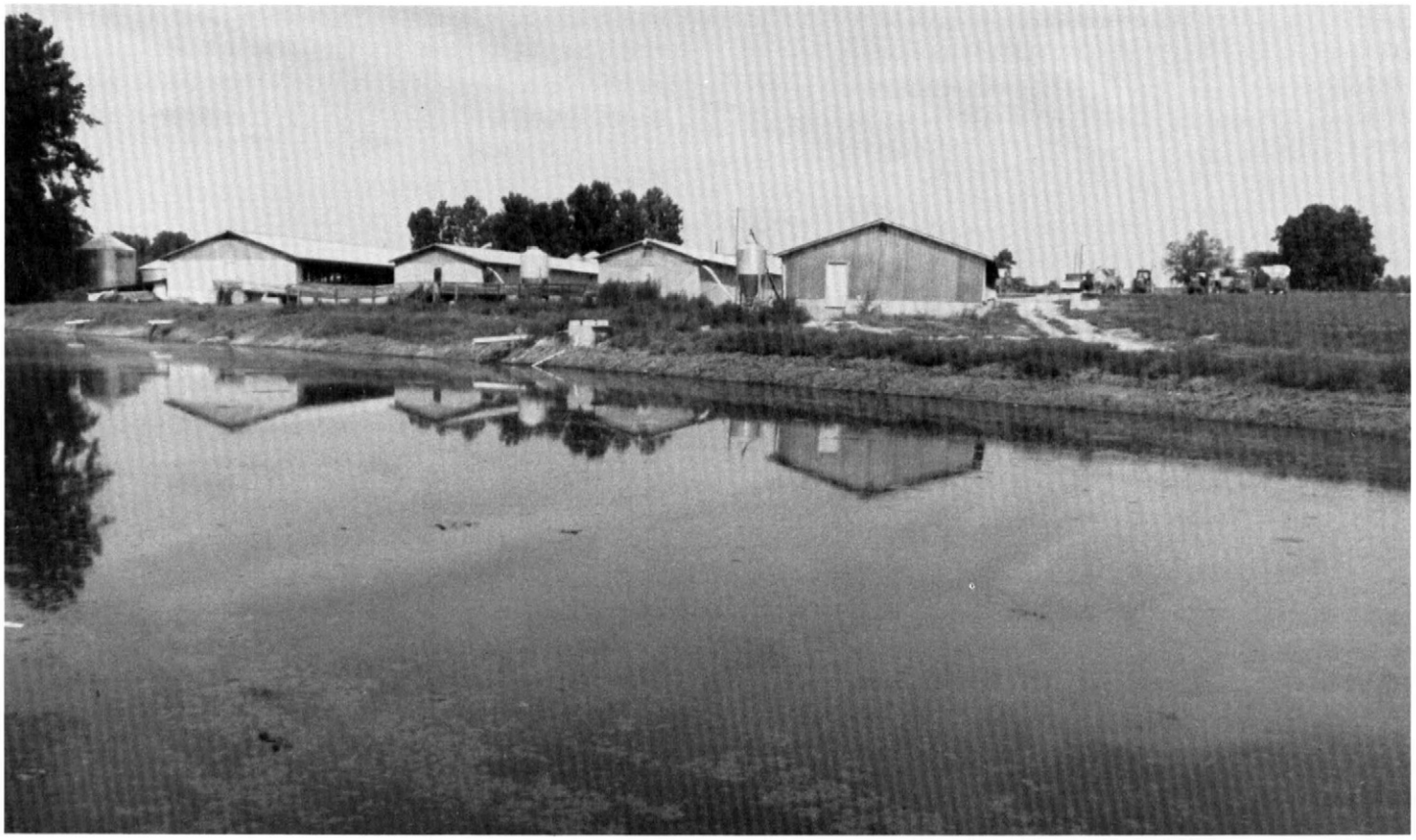

Figure 10.—Sewage lagoons are designed to keep harmful bacteria and nutrients from entering streams. Suitable soil material is needed for construction to ensure adequate waste treatment and to prevent contamination of ground water.

fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water 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. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. The animal waste lagoons commonly used in farming operations are not considered in the ratings. They are generally deeper than the lagoons referred to in the table and rely on anaerobic bacteria to decompose waste materials (fig. 10).

Table 10 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, depth to a high water table, depth to bedrock, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope or bedrock can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation should be considered.

The ratings in table 10 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock, depth to a water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, and soil reaction affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material may be obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 11 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* have more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet and have a water table at a depth of less than 1 foot. These soils have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 11, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of

rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as siltstone and weathered granite saprolite, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock, and toxic material.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are naturally fertile or respond well to fertilizer and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel or stones, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel or stones, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and releases a variety of plant nutrients as it decomposes.

Water Management

Table 12 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if 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 *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives the restrictive features that affect each soil for drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area. Ponds that are less than about 2 acres in size are not shown on the soil maps because of the scale of mapping.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, or organic matter. Depth to a high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table and permeability in the aquifer. The depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and

effectively the soil is drained depends on the depth to bedrock or to other layers that affect the rate of water movement, permeability, depth to a high water table or depth of standing water if the soil is subject to ponding, slope, and susceptibility to flooding. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock, large stones, slope, and the hazard of cutbanks caving. Availability of drainage outlets is not considered in the ratings.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope and wetness affect the construction of terraces and diversions. Maintenance of terraces and diversions is adversely affected by a restricted rooting depth, a severe hazard of soil blowing or water erosion, an excessively coarse texture, and restricted permeability.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Wetness and slope affect the construction of grassed waterways. A hazard of soil blowing, low available water capacity, restricted rooting depth, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed *(13)*. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. These results are reported in table 16.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 13 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages, by weight, of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 15 percent, by volume, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the "Glossary."

Classification of the soils is determined according to the Unified soil classification system *(2)* and the system adopted by the American Association of State Highway and Transportation Officials *(1)*.

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20, or higher, for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 16.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-

weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

Physical and Chemical Properties

Table 14 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate, or component, consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated content of clay of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence the shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at ⅓-bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of movement of water through the soil when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage in each major soil layer is stated in inches of water per inch of soil. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time. It is the difference between the amount of soil water at field moisture capacity and the amount at wilting point.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, more than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE)

to predict the average annual rate of soil loss by sheet and rill erosion. Losses are expressed in tons per acre per year. These estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur over a sustained period without affecting crop productivity. The rate is expressed in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to soil blowing in cultivated areas. The groups indicate the susceptibility to soil blowing. Soils are grouped according to the following distinctions:

1. Coarse sands, sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.
2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, and sapric soil material. These soils are very highly erodible. Crops can be grown if intensive measures to control soil blowing are used.
3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams. These soils are erodible. Crops can be grown if intensive measures to control soil blowing are used.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control soil blowing are used.
5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material. These soils are slightly erodible. Crops can be grown if measures to control soil blowing are used.
6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay. These soils are very slightly erodible. Crops can be grown if ordinary measures to control soil blowing are used.
7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material. These soils are very slightly erodible. Crops can be grown if ordinary measures to control soil blowing are used.
8. Soils that are not subject to soil blowing because of coarse fragments on the surface or because of surface wetness.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 14, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 15 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils are assigned to one of four groups. They are grouped according to the infiltration of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep or very deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep to very deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

The Rains and Tomotley soils listed in table 15 are assigned to two hydrologic groups. The first letter is for drained areas and the second is for undrained areas.

Flooding, the temporary covering of the surface by flowing water, is caused by overflowing streams, by runoff from adjacent slopes, or by inflow from high

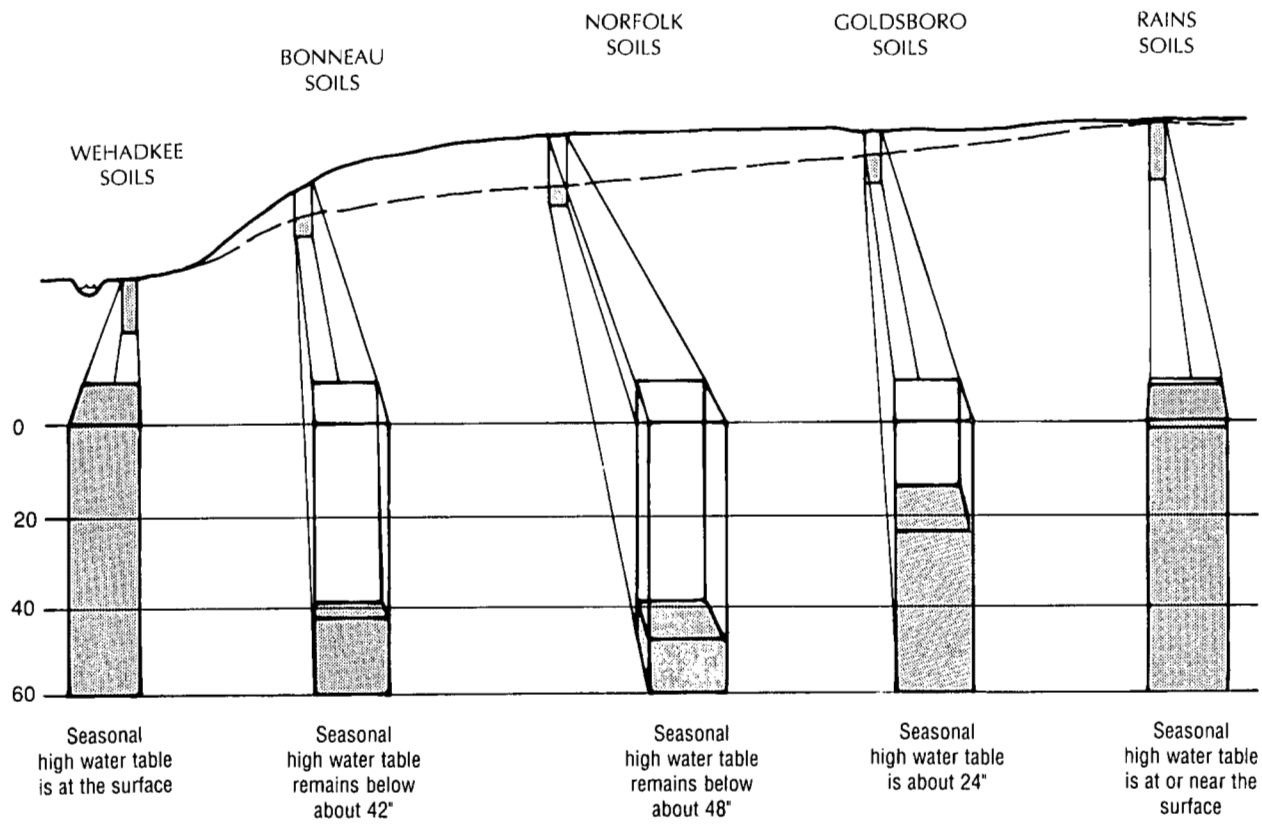

Figure 11.—Soil-landscape-seasonal high water table relationship among several soils in Northampton County.

tides. Shallow water standing or flowing for short periods after rainfall or snowmelt is not considered flooding. Standing water in swamps and marshes or in a closed depression is considered ponding.

Table 15 gives the frequency and duration of flooding and the time of year when flooding is most likely to occur.

Frequency, duration, and probable dates of occurrence are estimated. Frequency generally is expressed as *none, rare, occasional,* or *frequent. None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year). *Occasional* means that flooding occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year). *Frequent* means that flooding occurs often under normal weather conditions (the chance of flooding is more than 50 percent in any year). Duration is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 days to 1 month), and *very long* (more than 1 month). The time of year that floods are most likely to occur is expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information on flooding is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered is local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil (fig. 11). Indicated in table 15 are the depth to the seasonal high water table; the kind of water table, that is, *perched* or *apparent*; and the months of the year that the water table commonly is highest. A water table that is seasonally high for less than 1 month is not indicated in table 15.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Two numbers in the column showing depth to the water table indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and the amount of sulfates in the saturation extract.

Engineering Index Test Data

Table 16 shows laboratory test data for a few pedons sampled at carefully selected sites in the survey area. The pedons are typical of the series and are described in the section "Soil Series and Their Morphology." The soil samples were tested by the North Carolina Department of Transportation and Highway Safety, Materials and Test Unit, Raleigh, North Carolina.

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM).

The tests and methods are Unified classification—D 2487 (ASTM); AASHTO classification—M 145 (AASHTO), D 3282 (ASTM); Mechanical analysis—T 88 (AASHTO), D 422 (ASTM), D 2217 (ASTM); Liquid limit—T 89 (AASHTO), D 4318 (ASTM); Plasticity index—T 90 (AASHTO), D 4318 (ASTM); and Moisture density—T 99 (AASHTO), D 698 (ASTM).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(11)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or on laboratory measurements. Table 17 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Ultisol.

SUBORDER. Each order is divided into suborders, primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udult (*Ud*, meaning humid climate, plus *ult*, from Ultisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludults (*Hapl*, meaning minimal horizonation, plus *udult*, the suborder of the Ultisols that has an udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Hapludults.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, thermic Typic Hapludults.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. There can be some variation in the texture of the surface layer or of the underlying material within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described (fig. 12). The location of the typical pedon is described, and coordinates are identified by the State plane grid system. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" *(9)*. Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" *(11)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Altavista Series

The Altavista series consists of moderately well drained, moderately permeable soils that formed in

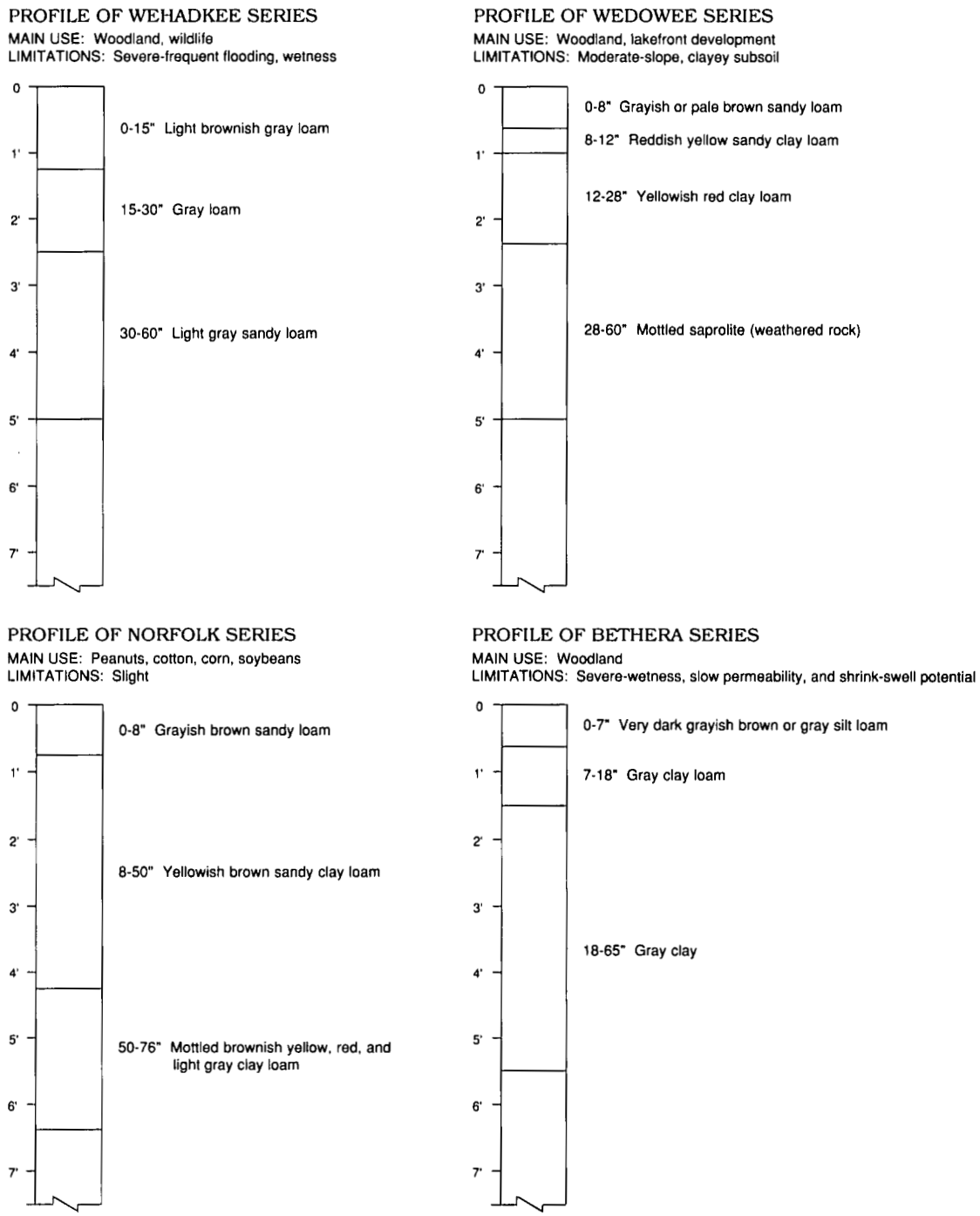

Figure 12.—Properties, main uses, and limitations of four contrasting soils in Northampton County.

fluvial material on stream terraces. Slopes range from 0 to 3 percent.

Altavista soils are similar to State soils and are commonly adjacent to State, Wickham, Wahee, Tomotley, Roanoke, and Wehadkee soils. Wickham and State soils are well drained. Wahee soils are somewhat poorly drained and have a finer textured Bt horizon than that of the Altavista soils. Tomotley and Roanoke soils are poorly drained and are on low flats or in drainageways. Wehadkee soils are poorly drained and are frequently flooded.

Typical pedon of Altavista fine sandy loam, 0 to 3 percent slopes, rarely flooded; about 6.7 miles southeast of Severn on Secondary Road 1351, about 0.9 mile northeast on Secondary Road 1354, about 0.3 mile northwest along a farm path, and 40 feet north of the path, in a cultivated field (State plane coordinates 2,553,000 feet E., 1,008,000 feet N.):

Ap—0 to 8 inches; dark brown (10YR 4/3) fine sandy loam; weak medium granular structure; friable; few fine roots; neutral; abrupt smooth boundary.

Bt1—8 to 18 inches; yellowish brown (10YR 5/8) sandy clay loam; few fine distinct strong brown (7.5YR 5/6) and few medium distinct very pale brown (10YR 7/4) mottles; weak medium subangular blocky structure; friable; few fine roots; few fine flakes of mica; sand grains coated and bridged with clay; strongly acid; gradual wavy boundary.

Bt2—18 to 25 inches; yellowish brown (10YR 5/6) sandy clay loam; few medium distinct light gray (10YR 7/2) mottles; weak medium subangular blocky structure; friable; few fine roots; few fine flakes of mica; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt3—25 to 33 inches; yellowish brown (10YR 5/6) sandy loam; few medium prominent gray (10YR 6/1) mottles; weak medium subangular blocky structure; friable; few fine flakes of mica; sand grains coated and bridged with clay; very strongly acid; clear wavy boundary.

C1—33 to 36 inches; yellowish brown (10YR 5/6) loamy sand; massive; very friable; very strongly acid; clear wavy boundary.

C2—36 to 50 inches; light brownish yellow (10YR 6/4) loamy sand; few medium faint light brownish gray (10YR 6/2) mottles; massive; very friable; common coarse sand grains; very strongly acid; clear wavy boundary.

C3—50 to 65 inches; yellowish brown (10YR 5/6) sandy loam; massive; friable; very strongly acid.

The thickness of the solum ranges from 30 to more than 60 inches. Reaction is extremely acid to moderately acid, except where the surface layer has been limed.

The Ap or A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. The E horizon, if it occurs, has hue of 10YR, value of 6 or 7, and chroma of 3 or 4. The BA horizon, if it occurs, has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 3 to 6. The E and BA horizons are fine sandy loam or sandy loam.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 4 to 8. It has gray mottles within 30 inches of the surface. In some pedons it has a gray matrix and high-chroma mottles in the lower part. The Bt horizon is sandy clay loam, clay loam, or sandy loam.

The BC horizon, if it occurs, has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 4 to 8; has a gray matrix; or is mottled. It is sandy loam or sandy clay loam.

The C horizon has hue of 10YR, value of 5 to 7, and chroma of 1 to 8, or it is mottled. It is loamy sand, sandy loam, or loamy coarse sand.

Autryville Series

The Autryville series consists of well drained soils that formed in sandy and loamy marine sediments in the uplands on the Coastal Plain. Slopes range from 0 to 3 percent. These soils are moderately rapidly permeable in the upper part and moderately permeable in the lower part.

Autryville soils are adjacent to Bonneau, Norfolk, and Pactolus soils. Bonneau and Norfolk soils have a deep, loamy subsoil. Norfolk soils have a thinner surface layer than that of the Autryville soils. Pactolus soils are sandy throughout and are moderately well drained.

Typical pedon of Autryville loamy sand, 0 to 3 percent slopes; about 2.5 miles west of Severn on Secondary Road 1333, about 1.5 miles north on Secondary Road 1340, about 0.15 mile northeast on a farm road, and 100 feet south of the road, in a field (State plane coordinates 2,523,000 feet E., 1,010,000 feet N.):

Ap—0 to 8 inches; dark brown (10YR 4/3) loamy sand; weak fine granular structure; very friable; common fine and medium roots; moderately acid; abrupt smooth boundary.

E—8 to 24 inches; light yellowish brown (10YR 6/4) loamy sand; weak fine granular structure; very friable; common fine roots; strongly acid; clear smooth boundary.

Bt—24 to 37 inches; yellowish brown (10YR 5/6) sandy loam; weak medium subangular blocky structure;

friable; few fine roots; sand grains coated and bridged with clay; very strongly acid; gradual wavy boundary.

BC—37 to 52 inches; brownish yellow (10YR 6/8) loamy sand; weak fine subangular blocky structure; very friable; sand grains weakly bridged with clay; very strongly acid; gradual wavy boundary.

E′—52 to 70 inches; light yellowish brown (10YR 6/4) fine sand; common medium distinct light gray (10YR 7/2) mottles; single grained; loose; very strongly acid; clear wavy boundary.

B′t—70 to 78 inches; yellowish brown (10YR 5/8) sandy loam; few medium faint strong brown (7.5YR 5/8) and few fine distinct light gray (10YR 7/2) mottles; weak fine subangular blocky structure; friable; sand grains coated and bridged with clay; very strongly acid.

Autryville soils have bisequal sandy and loamy horizons more than 60 inches thick. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed.

The Ap or A horizon has hue of 10YR, value of 4 or 5, and chroma of 3. The E horizon has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 3 or 4. It is loamy sand or fine sand.

The Bt horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 to 8. The BC horizon, if it occurs, has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. It is loamy sand or loamy fine sand.

The E′ horizon has hue of 10YR, value of 6 or 7, and chroma of 2 to 8. It is loamy sand, sand, or fine sand.

The B′t horizon has hue of 10YR, value of 5 or 6, and chroma of 2 to 8. It has mottles in shades of brown, yellow, red, and gray. It is sandy loam or sandy clay loam.

Bethera Series

The Bethera series consists of poorly drained, slowly permeable soils that formed in clayey marine sediments on uplands. Slopes range from 0 to 2 percent.

Bethera soils are similar to Lenoir soils and are commonly adjacent to Lenoir, Craven, and Chastain soils. Lenoir soils are somewhat poorly drained. Craven soils are moderately well drained and are higher on the landscape than the Bethera soils. Chastain soils are on flood plains.

Typical pedon of Bethera silt loam; about 0.6 mile east of Jackson on U.S. Highway 158, about 4.6 miles southeast on North Carolina Highway 305, and about 80 feet east of the highway, in a wooded area (State plane coordinates 2,488,000 feet E., 951,000 feet N.):

A—0 to 3 inches; very dark grayish brown (10YR 3/2) silt loam; weak medium granular structure; friable; many fine roots; very strongly acid; clear smooth boundary.

Eg—3 to 7 inches; gray (10YR 5/1) silt loam; weak medium granular structure; friable; many fine and medium roots; very strongly acid; clear wavy boundary.

Btg1—7 to 18 inches; gray (10YR 5/1) clay loam; common medium prominent brownish yellow (10YR 6/6) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg2—18 to 44 inches; gray (10YR 5/1) clay; few fine prominent strong brown (7.5YR 5/6) and common medium prominent brownish yellow (10YR 6/6) mottles; moderate medium subangular blocky structure; very firm, sticky and plastic; few fine roots; few distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg3—44 to 65 inches; gray (10YR 5/1) clay; few fine prominent yellowish red (5YR 5/6), common medium prominent strong brown (7.5YR 5/6), and few medium prominent yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; very firm, sticky and plastic; common distinct clay films on faces of peds; very strongly acid.

The thickness of the solum ranges from 60 to more than 80 inches. Reaction is extremely acid to moderately acid, except where the surface layer has been limed.

The A or Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. The Eg horizon, if it occurs, has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It is silt loam or loam.

The BEg horizon, if it occurs, has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. It is loam or clay loam.

The Btg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. It has few to many mottles in shades of yellow, red, and brown. It is clay, silty clay, or clay loam.

The BCg horizon, if it occurs, has hue of 10YR, value of 6, and chroma of 1 or 2. It has common or many mottles in shades of yellow, red, and brown. It is clay or sandy clay.

The Cg horizon, if it occurs, has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. It has common or many mottles in shades of yellow, red, and brown. It is clay or clay loam.

Bonneau Series

The Bonneau series consists of well drained, moderately permeable soils that formed in loamy marine sediments in the uplands on the Coastal Plain. Slopes range from 0 to 12 percent.

Bonneau soils are adjacent to Autryville, Norfolk, Goldsboro, Ocilla, Pactolus, and Winton soils. Autryville soils have sandy layers in the subsoil. Norfolk and Goldsboro soils have a thinner surface layer than that of the Bonneau soils. Goldsboro soils are moderately well drained. Ocilla soils are somewhat poorly drained and are in depressions or drainageways. Pactolus soils are moderately well drained and are sandy throughout. Winton soils are on strongly sloping to steep side slopes adjacent to streams and rivers.

Typical pedon of Bonneau loamy sand, 0 to 6 percent slopes; about 5.2 miles north of Garysburg on North Carolina Highway 46, north on Secondary Road 1200 to the Virginia State line, about 0.3 mile west on a farm road, and about 60 feet south of the road, in a field (State plane coordinates 2,413,000 feet E., 1,015,000 feet N.):

Ap—0 to 9 inches; grayish brown (10YR 5/2) loamy sand; weak medium granular structure; very friable; few fine roots; slightly acid; abrupt smooth boundary.

E1—9 to 22 inches; pale brown (10YR 6/3) loamy sand; weak medium granular structure; very friable; slightly acid; gradual wavy boundary.

E2—22 to 33 inches; light yellowish brown (10YR 6/4) loamy sand; common medium distinct brownish yellow (10YR 6/8) mottles; weak medium granular structure; very friable; very strongly acid; abrupt smooth boundary.

Bt1—33 to 46 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt2—46 to 55 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium distinct light brownish gray (10YR 6/2), common medium faint strong brown (7.5YR 5/6), and common medium prominent red (2.5YR 4/8) mottles; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt3—55 to 65 inches; mottled yellowish brown (10YR 5/6), strong brown (7.5YR 5/6), and light brownish gray (10YR 6/2) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; very strongly acid.

The thickness of the solum ranges from 60 to more than 80 inches. Reaction is very strongly acid to moderately acid, except where the surface layer has been limed.

The A or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. The E horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 6. The BE horizon, if it occurs, has hue of 10YR, value of 5 or 6, and chroma of 4 to 8. It is sandy loam.

The Bt horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. It commonly has mottles in shades of red, brown, and yellow or is mottled in shades of red, brown, yellow, and gray in the lower part. It has gray mottles within a depth of 60 inches. It is sandy clay loam or sandy loam.

Caroline Series

The Caroline series consists of well drained, moderately slowly permeable or slowly permeable soils that formed in clayey marine sediments in the uplands on the Coastal Plain. Slopes range from 0 to 6 percent.

Caroline soils are adjacent to Craven, Gritney, Lenoir, Turbeville, and Norfolk soils. Craven and Gritney soils are moderately well drained. Lenoir soils are somewhat poorly drained and are lower on the landscape than the Caroline soils. Turbeville soils have a sticky, red subsoil. Norfolk soils have a loamy subsoil.

Typical pedon of Caroline sandy loam, 2 to 6 percent slopes; about 1.75 miles east of Gaston on North Carolina Highway 46 and about 300 feet north of the highway, in a field (State plane coordinates 2,406,000 feet E., 999,000 feet N.):

Ap—0 to 8 inches; yellowish brown (10YR 5/4) sandy loam; moderate fine granular structure; very friable; common fine and medium roots; slightly acid; abrupt smooth boundary.

Bt1—8 to 24 inches; strong brown (7.5YR 5/6) clay loam; moderate medium subangular blocky structure; firm; common fine roots; very strongly acid; clear smooth boundary.

Bt2—24 to 50 inches; strong brown (7.5YR 5/6) clay; common medium faint yellowish red (5YR 5/6) and yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; few fine roots; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt3—50 to 70 inches; mottled red (2.5YR 4/8), strong brown (7.5YR 5/6), light yellowish brown (10YR 6/4), and light brownish gray (10YR 6/2) clay;

moderate medium subangular blocky structure; firm; common prominent clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt4—70 to 80 inches; mottled yellowish red (5YR 5/6), strong brown (7.5YR 5/6), brownish yellow (10YR 6/8), and light brownish gray (10YR 6/2) clay loam; weak coarse subangular blocky structure; firm; few distinct clay films on faces of peds; very strongly acid.

The thickness of the solum ranges from 45 to more than 70 inches. Reaction is extremely acid to strongly acid, except where the surface layer has been limed.

The Ap horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 6. The E horizon, if it occurs, has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 6. It is sandy loam.

The Bt horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 6 to 8. It has common mottles in shades of yellow, brown, or red in the middle part and is commonly mottled in shades of brown, yellow, red, and gray in the lower part. The Bt horizon is clay, clay loam, or sandy clay.

The BC horizon, if it occurs, is mottled in hue of 2.5YR to 10YR, value of 4 to 6, and chroma of 1 to 8. It is clay loam or sandy clay loam.

The C horizon, if it occurs, has hue of 2.5YR to 10YR, value of 4 to 6, and chroma of 1 to 8, or is mottled in these colors. It is clay loam or sandy clay loam.

Chastain Series

The Chastain series consists of poorly drained, slowly permeable, frequently flooded soils that formed in clayey fluvial sediments on flood plains. Slopes are less than 2 percent.

Chastain soils are adjacent to Bethera, Lenoir, and Craven soils. Bethera soils are on uplands and are not flooded. Lenoir soils are somewhat poorly drained and are slightly higher on the landscape than the Chastain soils. Craven soils are higher on the landscape than the Chastain soils and are moderately well drained.

Typical pedon of Chastain silt loam, frequently flooded; about 1.6 miles south of Rehoboth on Secondary Road 1121, about 1.8 miles east on Secondary Road 1119, 100 feet west of a bridge, and 100 feet south, on Quarter Swamp Flood Plain (State plane coordinates 2,485,000 feet E., 935,000 feet N.):

A—0 to 8 inches; dark brown (10YR 4/3) silt loam; few fine prominent strong brown (7.5YR 5/6) and common medium distinct dark brown (7.5YR 4/4) mottles; weak medium subangular blocky structure; firm; common fine, medium, and coarse roots; common fine and medium pores; very strongly acid; clear smooth boundary.

Bg1—8 to 19 inches; gray (10YR 6/1) clay loam; common fine prominent strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; very firm; few fine and medium roots; common fine and medium pores; very strongly acid; gradual wavy boundary.

Bg2—19 to 36 inches; gray (10YR 6/1) clay; few fine prominent yellowish red (5YR 5/8) and common medium prominent reddish yellow (7.5YR 6/8) mottles; moderate medium subangular blocky structure; very firm; few fine roots; common fine and medium pores; very strongly acid; gradual wavy boundary.

Bg3—36 to 41 inches; gray (10YR 6/1) clay; few fine distinct pale yellow (2.5Y 7/4) and common medium prominent strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; very firm; very strongly acid; gradual wavy boundary.

Cg1—41 to 52 inches; gray (10YR 6/1) loam; few medium distinct very pale brown (10YR 7/4) and common medium distinct light yellowish brown (10YR 6/4) mottles; massive; firm; very strongly acid; clear wavy boundary.

2Cg2—52 to 60 inches; gray (10YR 6/1) loamy sand; few medium faint light yellowish brown (10YR 6/4) mottles; massive; very friable; very strongly acid.

The thickness of the solum ranges from 40 to more than 60 inches. Reaction is very strongly acid to moderately acid throughout the profile.

The A horizon has hue of 10YR, value of 4, and chroma of 2 or 3. The Bg horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. It has common mottles in shades of yellow and brown. The Bg horizon is clay, clay loam, or silty clay loam.

The Cg or 2Cg horizon has hue of 10YR, value of 5 or 6, and chroma of 1. It has common mottles in shades of yellow or brown. It is commonly stratified and ranges from sand to loam.

Conetoe Series

The Conetoe series consists of well drained, moderately rapidly permeable soils that formed in fluvial material on stream terraces. Slopes range from 0 to 5 percent.

Conetoe soils are adjacent to Wickham, State, Tarboro, Seabrook, and Wehadkee soils. Wickham and State soils have a thinner surface layer and a finer textured Bt horizon than those of the Conetoe soils. Tarboro and Seabrook soils are sandy throughout. Seabrook soils are moderately well drained. Wehadkee soils are poorly drained and are frequently flooded.

Typical pedon of Conetoe loamy sand, 0 to 5 percent slopes; about 4.8 miles southeast of Severn on Secondary Road 1351, about 1 mile northeast on Secondary Road 1354, and 50 feet east of the road, in a cultivated field (State plane coordinates 2,537,000 feet E., 1,016,000 feet N.):

Ap—0 to 8 inches; brown (10YR 5/3) loamy sand; weak medium granular structure; very friable; common fine roots; few fine flakes of mica; slightly acid; abrupt smooth boundary.

E1—8 to 12 inches; light yellowish brown (10YR 6/4) loamy sand; single grained; loose; few fine roots; few fine flakes of mica; strongly acid; clear smooth boundary.

E2—12 to 24 inches; brownish yellow (10YR 6/6) loamy sand; single grained; loose; few fine roots; few uncoated sand grains; few fine flakes of mica; strongly acid; abrupt wavy boundary.

Bt1—24 to 31 inches; strong brown (7.5YR 5/6) sandy loam; weak medium subangular blocky structure; friable; sand grains bridged and coated with clay; few fine roots; few fine flakes of mica; strongly acid; gradual wavy boundary.

Bt2—31 to 42 inches; strong brown (7.5YR 5/8) sandy loam; weak medium subangular blocky structure; friable; sand grains bridged and coated with clay; few fine flakes of mica; very strongly acid; gradual wavy boundary.

Bt3—42 to 58 inches; strong brown (7.5YR 5/8) sandy loam; common coarse distinct light yellowish brown (10YR 6/4) mottles; weak medium granular structure; friable; common pockets of loamy sand; few fine flakes of mica; very strongly acid; gradual wavy boundary.

C1—58 to 78 inches; light yellowish brown (10YR 6/4) loamy sand; few fine distinct strong brown (7.5YR 5/6) and few medium faint brownish yellow (10YR 6/6) mottles; massive; very friable; few fine flakes of mica; strongly acid; gradual wavy boundary.

C2—78 to 84 inches; brownish yellow (10YR 6/6) loamy sand; massive; very friable; few fine flakes of mica; strongly acid.

The thickness of the solum ranges from 40 to more than 60 inches. Reaction is very strongly acid to moderately acid, except where the surface layer has been limed.

The Ap or A horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3. The E horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 4 to 8. It is loamy sand or sand.

The Bt horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 6 to 8. It is sandy loam or sandy clay loam.

The BC horizon, if it occurs, has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 6 to 8. It is sandy loam or loamy sand.

The C horizon has hue of 7.5YR or 10YR, value of 6 or 7, and chroma of 4 to 8. It is loamy sand or sand.

Congaree Series

The Congaree series consists of well drained and moderately well drained, moderately permeable soils that formed in loamy fluvial deposits on flood plains on the Coastal Plain. Slopes range from 0 to 4 percent.

Congaree soils are adjacent to Wehadkee soils. The adjacent soils are poorly drained, are in low areas, and are frequently flooded.

Typical pedon of Congaree silt loam, 0 to 4 percent slopes, occasionally flooded; 2 miles southwest of Garysburg on U.S. Highways 158 and 301, 1.2 miles southeast on a farm road that leads to the Roanoke River, and 150 feet north of the river (State plane coordinates 2,414,000 feet E., 975,000 feet N.):

A—0 to 8 inches; dark brown (7.5YR 4/4) silt loam; weak medium granular structure; friable; common fine and medium roots; few fine flakes of mica; strongly acid; clear smooth boundary.

C1—8 to 20 inches; strong brown (7.5YR 4/6) loam; few fine faint yellowish red (5YR 4/6) and few fine prominent very pale brown (10YR 7/4) mottles; massive; friable; common fine and medium roots; common fine flakes of mica; moderately acid; gradual wavy boundary.

C2—20 to 34 inches; dark brown (7.5YR 4/4) loam; few fine distinct yellowish red (5YR 4/6) mottles; massive; friable; few fine roots; few black wormcasts; few fine flakes of mica; moderately acid; gradual wavy boundary.

Ab—34 to 40 inches; dark brown (10YR 3/3) loam; few medium faint yellowish brown (10YR 5/4) mottles; weak fine granular structure; friable; few fine fragments of charcoal; common fine flakes of mica; moderately acid; clear smooth boundary.

Bb—40 to 56 inches; dark yellowish brown (10YR 3/4) loam; few thin distinct strong brown (7.5YR 5/4) streaks; weak medium subangular blocky structure; friable; few medium and fine roots; few fine flakes of mica; moderately acid; gradual wavy boundary.

C'1—56 to 72 inches; dark brown (7.5YR 4/4) clay loam; few fine distinct yellowish brown (10YR 5/6) mottles; massive; friable; few fine and medium roots; few fine fragments of charcoal; few fine flakes of mica; moderately acid; gradual wavy boundary.

C'2—72 to 84 inches; dark yellowish brown (10YR 4/4) loam; few fine prominent reddish brown (5YR 4/3) and few medium distinct very pale brown (10YR

7/3) mottles; massive; friable; few fine flakes of mica; moderately acid.

Congaree soils have loamy material to a depth of 80 inches or more. Reaction is very strongly acid to neutral, except where the surface layer has been limed.

The Ap or A horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 3 or 4. The C horizon, to a depth of about 34 inches, has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 3 to 6. It is loam, fine sandy loam, or silty clay loam.

The Ab and Bb horizons have hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. They are loam, fine sandy loam, or sandy loam.

The lower part of the C horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 3 to 6. In most pedons it has common mottles in shades of brown, yellow, and red. In some pedons it has gray mottles or matrix colors below a depth of about 60 inches. It is loam, fine sandy loam, clay loam, or silty clay loam that has thin strata of sandier or more clayey material.

Craven Series

The Craven series consists of moderately well drained, slowly permeable soils that formed in clayey marine sediments in the uplands on the Coastal Plain. Slopes range from 0 to 10 percent.

Craven soils are similar to Lenoir soils and are adjacent to Lenoir, Bethera, Caroline, Chastain, and Winton soils. Lenoir soils are somewhat poorly drained. Bethera soils are poorly drained and are in broad, flat areas or in depressions. Caroline soils are well drained. Chastain soils are poorly drained and are on flood plains. Winton soils are on strongly sloping to steep side slopes along drainageways and streams.

Typical pedon of Craven fine sandy loam, 0 to 1 percent slopes; about 3.6 miles south of Jackson on Secondary Road 1108, about 2.5 miles west on Secondary Road 1125, about 0.2 mile north on a farm road, and 25 feet east of the road, in a field (State plane coordinates 2,453,000 feet E., 945,000 feet N.):

Ap—0 to 8 inches; brown (10YR 5/3) fine sandy loam; weak medium granular structure; very friable; neutral; abrupt smooth boundary.

Bt1—8 to 24 inches; brownish yellow (10YR 6/6) clay; few medium distinct strong brown (7.5YR 5/6) mottles; moderate fine and medium subangular blocky structure; very firm, sticky and plastic; few distinct clay films on faces of peds; very strongly acid; clear wavy boundary.

Bt2—24 to 36 inches; brownish yellow (10YR 6/6) clay; common fine distinct light brownish gray (10YR 6/2), common fine faint yellowish brown (10YR 5/8), and common medium prominent yellowish red (5YR 5/6) mottles; moderate medium subangular blocky structure; very firm, sticky and plastic; common distinct clay films on faces of peds; few fine and medium black concretions; very strongly acid; gradual wavy boundary.

Btg1—36 to 42 inches; gray (10YR 6/1) clay; few medium faint light brownish gray (2.5Y 6/2) and common medium prominent yellowish red (5YR 5/6) and yellowish brown (10YR 5/8) mottles; strong medium subangular blocky structure; very firm, sticky and plastic; many prominent clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg2—42 to 49 inches; gray (10YR 6/1) clay; common medium prominent yellowish brown (10YR 5/8) and yellowish red (5YR 5/6) mottles; weak coarse subangular blocky structure; very firm, sticky and plastic; few distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

BCg—49 to 65 inches; gray (10YR 6/1) clay loam; many medium prominent yellowish brown (10YR 5/8) and few medium prominent red (2.5YR 4/8) mottles; weak coarse subangular blocky structure; firm, sticky and plastic; very strongly acid.

The thickness of the solum ranges from 40 to more than 60 inches. Reaction is extremely acid to strongly acid, except where the surface layer has been limed.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 2 or 3. The upper part of the Bt horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 4 to 8. The lower part has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 1 or 2. The Bt horizon has few to many mottles in shades of gray, brown, yellow, and red. It is clay or clay loam.

The BC horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. It has mottles in shades of red, yellow, or brown, or the horizon is mottled. It is clay loam, clay, or sandy clay loam.

The C horizon, if it occurs, has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 to 6, or is mottled. It is sandy clay loam or sandy loam.

Exum Series

The Exum series consists of moderately well drained, moderately slowly permeable soils that formed in loamy marine sediments in the uplands on the Coastal Plain. Slopes range from 0 to 2 percent.

Exum soils are similar to Goldsboro soils and are adjacent to Goldsboro, Norfolk, Gritney, Lynchburg, and Rains soils. Goldsboro and Norfolk soils have a sandier subsoil than that of the Exum soils. Norfolk soils are well drained. Gritney soils are gently sloping or strongly

sloping and have a clayey subsoil. Lynchburg soils are somewhat poorly drained. Rains soils are poorly drained and are in depressions and broad, flat areas.

Typical pedon of Exum loam, 0 to 2 percent slopes; about 4 miles northeast of Jackson on U.S. Highway 158, about 0.6 mile west on Secondary Road 1311, about 0.4 mile north on Secondary Road 1331, and 100 feet east of the road, in a cultivated field (State plane coordinates 2,478,000 feet E., 984,000 feet N.):

Ap—0 to 7 inches; brown (10YR 5/3) loam; weak medium granular structure; friable; common fine roots; moderately acid; abrupt smooth boundary.

Bt1—7 to 16 inches; yellowish brown (10YR 5/6) clay loam; moderate medium subangular blocky structure; firm; common fine roots; strongly acid; clear smooth boundary.

Bt2—16 to 26 inches; yellowish brown (10YR 5/6) clay loam; common medium faint light yellowish brown (10YR 6/4) and few fine faint strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; firm, sticky and slightly plastic; few faint clay films on faces of peds; very strongly acid; clear wavy boundary.

Bt3—26 to 42 inches; yellowish brown (10YR 5/8) clay loam; common medium prominent light brownish gray (10YR 6/2) and common medium faint strong brown (7.5YR 5/8) mottles; weak coarse subangular blocky structure; firm, sticky and slightly plastic; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt4—42 to 80 inches; mottled light brownish gray (10YR 6/2), yellowish brown (10YR 5/6), light yellowish brown (10YR 6/4), and yellowish red (5YR 5/8) clay; weak coarse subangular blocky structure; firm, sticky and plastic; common distinct clay films on faces of peds; very strongly acid.

The Exum soils have a loamy A horizon and loamy and clayey Bt horizons that range from 60 to more than 80 inches thick. Reaction is very strongly acid to moderately acid, except where the surface layer has been limed. The content of silt plus very fine sand is more than 50 percent, by weight, in the control section.

The A or Ap horizon has hue of 10YR, value of 4 to 6, and chroma of 2 or 3. The BE horizon, if it occurs, has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 8. It is loam, silt loam, or fine sandy loam.

The upper part of the Bt horizon has hue of 10YR, value of 5 to 7, and chroma of 6 to 8. The middle part has the same colors as those in the upper part. It has few to many mottles in shades of yellow, brown, gray, or red. The lower part is mottled in shades of yellow, gray, brown, and red. The upper part is clay loam or silty clay loam, and in most pedons below a depth of 40 inches it is clay or silty clay.

The C horizon, if it occurs, has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 to 7, or is mottled in these colors. It generally ranges from fine sandy loam to clay.

Goldsboro Series

The Goldsboro series consists of moderately well drained, moderately permeable soils that formed in loamy marine sediments in the uplands on the Coastal Plain. Slopes range from 0 to 2 percent.

Goldsboro soils are similar to Exum and Norfolk soils and are adjacent to Exum, Norfolk, Gritney, Bonneau, Lynchburg, Ocilla, and Rains soils. Exum soils have a siltier subsoil than that of the Goldsboro soils. Norfolk soils are well drained. Gritney soils are gently sloping or strongly sloping and have a firm, clayey subsoil. Bonneau soils have a thick, sandy surface layer and are well drained. Lynchburg and Ocilla soils are somewhat poorly drained. Ocilla soils have a thick, sandy surface layer. Rains soils are poorly drained.

Typical pedon of Goldsboro sandy loam, 0 to 2 percent slopes; about 3 miles east of Conway on U.S. Highway 158 to Secondary Road 1536, about 1.4 miles south on Secondary Road 1536, and 75 feet east of the road, in a cultivated field (State plane coordinates 2,541,000 feet E., 977,000 feet N.):

Ap—0 to 9 inches; dark grayish brown (2.5Y 4/2) sandy loam; weak medium granular structure; very friable; common fine and medium roots; moderately acid; abrupt smooth boundary.

Bt1—9 to 13 inches; light yellowish brown (10YR 6/4) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; strongly acid; clear wavy boundary.

Bt2—13 to 20 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; very strongly acid; gradual wavy boundary.

Bt3—20 to 25 inches; yellowish brown (10YR 5/4) sandy clay loam; common medium distinct brownish yellow (10YR 6/8) mottles; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few faint clay bridges between mineral grains; very strongly acid; gradual wavy boundary.

Bt4—25 to 32 inches; brownish yellow (10YR 6/8) sandy clay loam; common medium distinct yellowish brown (10YR 5/4) and common medium prominent light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; friable, slightly

sticky and slightly plastic; common distinct clay bridges between mineral grains; very strongly acid; gradual wavy boundary.

Bt5—32 to 40 inches; mottled brownish yellow (10YR 6/8), light gray (10YR 7/1), and reddish gray (5YR 5/2) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common distinct clay bridges between mineral grains; very strongly acid; gradual wavy boundary.

Bt6—40 to 54 inches; strong brown (7.5YR 5/8) sandy clay loam; common medium prominent gray (10YR 6/1) and few medium prominent red (2.5YR 4/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few faint clay skins on faces of peds; very strongly acid; gradual wavy boundary.

Btg—54 to 69 inches; gray (10YR 6/1) sandy clay loam; pockets of clay; common medium prominent red (2.5YR 4/8), many coarse prominent strong brown (7.5YR 5/8), and few medium prominent dark reddish brown (5YR 3/2) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; very strongly acid; gradual wavy boundary.

BCg—69 to 84 inches; light gray (10YR 7/1) sandy clay loam; lenses of sandy clay and sandy loam; few medium prominent red (2.5YR 4/6), few fine prominent reddish brown (5YR 5/4), and common medium prominent yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; very strongly acid.

Goldsboro soils have a solum that extends to a depth of more than 60 inches. Reaction is extremely acid to strongly acid, except where the surface layer has been limed.

The Ap or A horizon has hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 1 or 2. The BA horizon, if it occurs, has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 to 6. It is sandy loam or fine sandy loam.

The upper part of the Bt horizon has hue of 7.5YR to 2.5Y, value of 5 or 6, and chroma of 4 to 8. The lower part has hue of 7.5YR to 2.5Y, value of 3 to 8, and chroma of 1 to 8. It has gray mottles within a depth of 30 inches. The Bt horizon is sandy clay loam, clay loam, or sandy loam.

The BCg horizon, if it occurs, has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. It is sandy clay loam, sandy loam, or loam. It has thin lenses of finer or coarser textures. It has common or many mottles in shades of brown, yellow, or red.

Gritney Series

The Gritney series consists of moderately well drained, slowly permeable soils that formed in clayey marine sediments on ridgetops and side slopes on the Coastal Plain. Slopes range from 2 to 10 percent.

Gritney soils are adjacent to Caroline, Exum, Norfolk, and Goldsboro soils. Caroline soils are well drained. Exum soils have a loamy subsoil that is more permeable than that of the Gritney soils. Norfolk and Goldsboro soils have a loamy subsoil. Norfolk soils are well drained.

Typical pedon of Gritney sandy loam, 2 to 6 percent slopes; about 5.6 miles east of Jackson on U.S. Highway 158, 100 feet south of the highway, and about 90 feet east of the cemetery, in a cultivated field (State plane coordinates 2,490,200 feet E., 983,600 feet N.):

Ap—0 to 6 inches; brown (10YR 5/3) sandy loam; weak medium granular structure; very friable; many fine roots; moderately acid; abrupt smooth boundary.

BE—6 to 9 inches; yellowish brown (10YR 5/6) sandy loam; few fine prominent yellowish red (5YR 5/8) mottles; weak medium subangular blocky structure; friable; few fine roots; moderately acid; abrupt smooth boundary.

Bt1—9 to 17 inches; yellowish brown (10YR 5/6) clay; common medium prominent red (2.5YR 4/8) and few medium prominent dark red (2.5YR 3/6) mottles; moderate medium subangular blocky structure; firm, slightly plastic and slightly sticky; few fine roots; few faint clay films on faces of peds; strongly acid; clear smooth boundary.

Bt2—17 to 37 inches; yellowish brown (10YR 5/6) clay; common medium distinct light brownish gray (10YR 6/2) and common medium prominent red (2.5YR 4/8) mottles; moderate medium subangular blocky structure; very firm, plastic and sticky; few fine roots; common distinct clay films on faces of peds; very strongly acid; clear wavy boundary.

Bt3—37 to 49 inches; mottled yellowish brown (10YR 5/6), strong brown (7.5YR 5/6), red (2.5YR 4/8), and light brownish gray (10YR 6/2) clay; weak coarse subangular blocky structure; firm, plastic and sticky; few fine roots; few distinct clay films on faces of peds; very strongly acid; clear wavy boundary.

BC—49 to 58 inches; mottled strong brown (7.5YR 5/6), red (2.5YR 4/8), light brownish gray (10YR 6/2), and yellowish brown (10YR 5/6) sandy clay; weak coarse subangular blocky structure; friable, slightly plastic and sticky; very strongly acid; gradual wavy boundary.

C—58 to 70 inches; mottled strong brown (7.5YR 5/6), red (2.5YR 4/8), light brownish gray (10YR 6/2), and

yellowish brown (10YR 5/6) sandy clay loam; massive; friable; very strongly acid.

The thickness of the solum ranges from 35 to more than 60 inches. Reaction is extremely acid to strongly acid, except where the surface layer has been limed.

The A or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. The E horizon, if it occurs, has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 6. It is sandy loam or fine sandy loam.

The BA or BE horizon, if it occurs, has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. It is sandy clay loam or sandy loam.

The Bt horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 to 8. The lower part has mottles in shades of red, gray, and yellow. The Bt horizon is clay, clay loam, or sandy clay.

The BC horizon, if it occurs, has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 to 8. It has mottles in shades of brown, red, gray, and yellow, or it is mottled in these colors. It is sandy clay, clay, or clay loam.

The C horizon is mottled in hue of 2.5YR to 10YR, value of 4 to 7, and chroma of 2 to 8. It generally is sandy clay loam but ranges from sandy loam to clay.

Helena Series

The Helena series consists of moderately well drained, slowly permeable soils that formed in material weathered from mixed acid and basic crystalline rocks. They are in draws and on flats in the Piedmont. Slopes range from 1 to 6 percent.

Helena soils are adjacent to Pacolet and Wedowee soils. The adjacent soils are well drained, are on uplands, and are gently sloping to moderately steep.

Typical pedon of Helena sandy loam, 1 to 6 percent slopes; about 0.5 mile west of Henrico on Secondary Road 1214 to a church, about 0.15 mile north on a dirt road, and 200 feet west of the road, in a stand of pines (State plane coordinates 2,346,000 feet E., 1,014,000 feet N.):

A—0 to 6 inches; brown (10YR 5/3) sandy loam; moderate fine granular structure; very friable; common fine and medium roots; about 3 percent fine and medium quartz gravels; strongly acid; clear smooth boundary.

BE—6 to 10 inches; light yellowish brown (2.5Y 6/4) sandy clay loam; weak fine subangular blocky structure; friable; common fine and medium roots; about 3 percent fine and medium quartz gravels; very strongly acid; clear smooth boundary.

Bt1—10 to 20 inches; yellowish brown (10YR 5/6) clay loam; common medium distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; common fine roots; common distinct clay films on faces of peds; about 5 percent fine and medium quartz gravels; very strongly acid; clear wavy boundary.

Bt2—20 to 30 inches; mottled yellowish brown (10YR 5/8), strong brown (7.5YR 5/8), light brownish gray (10YR 6/2), and yellowish red (5YR 5/8) clay; moderate medium subangular blocky structure; very firm, very sticky and very plastic; few fine roots; many distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt3—30 to 41 inches; mottled yellowish brown (10YR 5/6) and gray (10YR 6/1) clay; moderate medium subangular blocky structure; very firm, very sticky and very plastic; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

BCg—41 to 47 inches; gray (10YR 6/1) clay loam; many medium prominent yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; firm; few pockets of sandy clay loam saprolite; very strongly acid; diffuse wavy boundary.

Cg—47 to 62 inches; white (10YR 8/1) loam saprolite; many medium prominent yellowish brown (10YR 5/8) mottles; massive; friable; few pockets of gray (10YR 6/1) clay; very strongly acid.

The thickness of the solum ranges from 40 to 60 inches. Reaction is extremely acid to strongly acid, except where the surface layer has been limed. Coarse fragments range as much as 10 percent throughout.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4. The E horizon, if it occurs, has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 to 4. It is sandy loam.

The BE horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 4 to 6. It is sandy clay loam or clay loam.

The upper part of the Bt horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 4 to 8. The lower part has hue of 7.5YR to 2.5Y, value of 5 to 8, and chroma of 1 to 8, or is mottled. The Bt horizon is clay, sandy clay, or clay loam.

The BCg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 to 8, or is mottled. It is clay loam or sandy clay loam.

The C horizon has hue of 7.5YR to 5Y, value of 5 to 8, and chroma of 1 to 8, or is mottled. It is loam or sandy loam saprolite.

Lenoir Series

The Lenoir series consists of somewhat poorly drained, slowly permeable soils that formed in clayey

marine sediments in the uplands on the Coastal Plain. Slopes range from 0 to 2 percent.

Lenoir soils are similar to Craven and Bethera soils and are adjacent to Craven, Bethera, Caroline, and Chastain soils. Craven soils are nearly level to strongly sloping and are moderately well drained. Bethera soils are poorly drained. Caroline soils are nearly level or gently sloping and are well drained. Chastain soils are poorly drained and are on flood plains.

Typical pedon of Lenoir silt loam; about 2 miles south of Rich Square on North Carolina Highway 308, about 0.5 mile northeast on Secondary Road 1104, about 0.3 mile south on a farm road, and 200 feet south of the road, in a wooded area (State plane coordinates 2,505,000 feet E., 910,000 feet N.):

A—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable; many fine roots; very strongly acid; abrupt smooth boundary.

Bt—4 to 14 inches; brownish yellow (10YR 6/6) clay loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; very strongly acid; clear wavy boundary.

Btg1—14 to 28 inches; light brownish gray (10YR 6/2) clay; common medium distinct brownish yellow (10YR 6/6) and few medium prominent red (2.5YR 5/6) mottles; moderate medium subangular blocky structure; very firm, sticky and plastic; few distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg2—28 to 42 inches; mottled gray (10YR 6/1) and yellowish brown (10YR 5/6) clay; moderate medium subangular blocky structure; very firm, sticky and plastic; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg3—42 to 50 inches; gray (10YR 6/1) clay; few medium prominent yellowish red (5YR 5/6) and common medium prominent yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; very firm, sticky and plastic; few distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg4—50 to 65 inches; gray (10YR 6/1) clay; common medium prominent yellowish brown (10YR 5/6) and few fine prominent strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; very firm, sticky and plastic; few faint clay films on faces of peds; very strongly acid.

The thickness of the solum ranges from 60 to more than 80 inches. Reaction is extremely acid to strongly acid, except where the surface layer has been limed.

The Ap or A horizon has hue of 10YR, value of 3 to 6, and chroma of 2. The E horizon, if it occurs, has hue of 10YR, value of 5 or 6, and chroma of 1 to 4. It is silt loam, loam, or fine sandy loam.

The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 3 to 8. It has few or common mottles that have chroma of 2 or less. It is clay loam or silty clay loam.

The Btg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It has common or many mottles in shades of yellow, brown, or red. It is clay, silty clay, or silty clay loam.

The BCg horizon, if it occurs, has hue of 10YR, value of 6 or 7, and chroma of 1. It is clay or clay loam.

Lillington Series

The Lillington series consists of well drained, moderately permeable, gravelly soils on ridgetops and side slopes. These soils formed in loamy alluvium from old stream terraces. Slopes range from 8 to 15 percent.

Lillington soils are mapped in a complex with Turbeville soils and are adjacent to Turbeville, Pacolet, and Wedowee soils. The adjacent soils have less gravel throughout than the Lillington soils. Pacolet and Wedowee soils are clayey.

Typical pedon of Lillington very gravelly sandy loam, in an area of Lillington-Turbeville complex, 8 to 15 percent slopes; about 1.3 miles west of Gaston on North Carolina Highway 46 to Squire School and across from the school, in a roadbank on the south side of the road (State plane coordinates 2,393,000 feet E., 1,004,000 feet N.):

A—0 to 5 inches; dark brown (10YR 4/3) very gravelly sandy loam; moderate fine granular structure; friable; common fine and medium roots; about 45 percent fine and medium quartz fragments; moderately acid; clear smooth boundary.

BE—5 to 8 inches; brown (7.5YR 5/4) gravelly sandy loam; weak fine subangular blocky structure; friable; common fine and medium roots; about 30 percent fine and medium quartz fragments; strongly acid; clear smooth boundary.

Bt—8 to 48 inches; red (2.5YR 4/8) very gravelly sandy clay loam; weak medium subangular blocky structure; friable; common fine roots; coarse fragments coated and bridged with clay; about 47 percent fine and medium quartz fragments; very strongly acid; gradual wavy boundary.

C—48 to 65 inches; yellowish red (5YR 5/8) gravelly loamy coarse sand; massive; very friable; about 33 percent fine quartz fragments; very strongly acid.

The thickness of the solum is more than 60 inches. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. The E horizon, if it occurs, has hue of 10YR, value of 6, and chroma of 3 or 4. It is gravelly sandy loam or very gravelly sandy loam.

The BA or BE horizon, if it occurs, has hue of 5YR to 10YR, value of 5 or 6, and chroma of 4 to 6. It is gravelly sandy loam or very gravelly sandy loam.

The Bt horizon has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 6 to 8. It is very gravelly sandy clay loam or very gravelly clay loam.

The BC horizon, if it occurs, has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 6 to 8. It is gravelly sandy loam or very gravelly sandy loam.

The C horizon has hue of 2.5YR to 10YR, value of 4 to 6, and chroma of 6 to 8, or is mottled in these colors. It is gravelly loamy sand, very gravelly loamy sand, loamy coarse sand, or sandy loam.

Lynchburg Series

The Lynchburg series consists of somewhat poorly drained, moderately permeable soils that formed in loamy marine sediments in the uplands on the Coastal Plain. Slopes range from 0 to 2 percent.

Lynchburg soils are similar to Rains soils and are adjacent to Rains, Goldsboro, Norfolk, Exum, and Ocilla soils. Rains soils are poorly drained. Goldsboro soils are moderately well drained. Norfolk soils are well drained and are nearly level to strongly sloping. Exum soils are moderately well drained and have a siltier subsoil than that of the Lynchburg soils. Ocilla soils have a thick, sandy surface layer.

Typical pedon of Lynchburg fine sandy loam; about 3 miles east of Conway on U.S. Highway 158, about 2.4 miles south on Secondary Road 1536, about 0.6 mile south on Secondary Road 1541, and 150 feet west of the road, in a cultivated field (State plane coordinates 2,538,000 feet E., 968,000 feet N.):

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak medium granular structure; very friable; common fine and medium roots; moderately acid; abrupt smooth boundary.

Bt—9 to 13 inches; pale brown (10YR 6/3) sandy clay loam; few medium distinct brownish yellow (10YR 6/6) and common medium faint light gray (10YR 7/2) mottles; weak medium subangular blocky structure; friable; few fine roots; strongly acid; clear smooth boundary.

Btg1—13 to 19 inches; light brownish gray (10YR 6/2) sandy clay loam; common medium faint light gray (10YR 7/1) and common medium prominent brownish yellow (10YR 6/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg2—19 to 35 inches; gray (10YR 6/1) sandy clay loam; few fine prominent strong brown (7.5YR 5/8) and common medium prominent brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg3—35 to 50 inches; light gray (10YR 7/1) sandy clay loam; common medium prominent brownish yellow (10YR 6/6) and yellowish red (5YR 5/6) mottles; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg4—50 to 78 inches; light gray (10YR 7/1) sandy clay; common fine prominent red (2.5YR 4/8) and common medium prominent brownish yellow (10YR 6/6) mottles; weak coarse subangular blocky structure; firm, slightly sticky and slightly plastic; very strongly acid; gradual wavy boundary.

BCg—78 to 84 inches; light gray (10YR 7/1) sandy clay loam; common fine and medium prominent brownish yellow (10YR 6/6) mottles; weak coarse subangular blocky structure; friable; pockets of sandy loam; very strongly acid.

The thickness of the solum is more than 60 inches. Reaction is extremely acid to strongly acid, except where the surface layer has been limed.

The Ap or A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. The E horizon, if it occurs, has hue of 10YR, value of 4 to 6, and chroma of 2 to 4. In some pedons it has yellow, brown, or gray mottles. It is fine sandy loam.

The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. It has few to many mottles that have chroma of 2 or less. The Btg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It has common or many mottles that have chroma of 3 or more. The Bt and Btg horizons are dominantly sandy clay loam or clay loam, but in some pedons below a depth of 40 inches sandy clay is common.

The BCg horizon, if it occurs, has hue of 10YR, value of 6 or 7, and chroma of 1. It is sandy clay, sandy clay loam, or sandy loam.

Norfolk Series

The Norfolk series consists of well drained, moderately permeable soils that formed in loamy marine

sediments in the uplands on the Coastal Plain. Slopes range from 0 to 10 percent.

Norfolk soils are similar to Goldsboro soils and are adjacent to Goldsboro, Autryville, Bonneau, Caroline, Gritney, Exum, Lynchburg, and Winton soils. Goldsboro soils are moderately well drained. Autryville and Bonneau soils have a thick, sandy surface layer. Caroline and Gritney soils have a finer textured subsoil than that of the Norfolk soils. Gritney and Exum soils are moderately well drained. Exum soils have a siltier subsoil than that of the Norfolk soils. Lynchburg soils are somewhat poorly drained and are in low, wet areas. Winton soils are on steep side slopes that lead into drainageways.

Typical pedon of Norfolk sandy loam, 0 to 2 percent slopes; about 3.3 miles east of Conway on U.S. Highway 158, about 1.1 miles south on Secondary Road 1536, and 200 feet east of the road, in a cultivated field (State plane coordinates 2,541,000 feet E., 980,000 feet N.):

Ap—0 to 8 inches; grayish brown (10YR 5/2) sandy loam; weak medium granular structure; very friable; few fine and medium roots; moderately acid; abrupt smooth boundary.

Bt1—8 to 28 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; few fine roots; very strongly acid; gradual wavy boundary.

Bt2—28 to 50 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium prominent red (2.5YR 4/8) and few medium distinct light yellowish brown (10YR 6/4) mottles; weak medium subangular blocky structure; friable; few faint clay skins on faces of peds; very strongly acid; gradual wavy boundary.

Bt3—50 to 59 inches; brownish yellow (10YR 6/8) clay loam; common medium prominent red (2.5YR 4/8) and light gray (10YR 7/2) mottles; weak medium subangular blocky structure; firm, slightly sticky and slightly plastic; few distinct clay skins on faces of peds; very strongly acid; gradual wavy boundary.

Bt4—59 to 76 inches; mottled light gray (10YR 7/2), red (2.5YR 4/8), and brownish yellow (10YR 6/8) clay loam; lenses of sandy clay loam; weak medium subangular blocky structure; firm, slightly sticky and plastic; very strongly acid.

The thickness of the solum is more than 60 inches. Reaction is extremely acid to strongly acid, except where the surface layer has been limed.

The Ap or A horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4. The E horizon, if it occurs, has hue of 10YR, value of 5 to 7, and chroma of 4. It is loamy sand or sandy loam.

The BA or BE horizon, if it occurs, has hue of 10YR, value of 5 or 6, and chroma of 4 to 8. It is sandy loam.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 5 or 6, and chroma of 6 to 8. It has gray mottles at a depth of 48 inches or more. In some pedons, the lower part is mottled in shades of red, brown, gray, and yellow. The Bt horizon is sandy clay loam or clay loam.

The BC horizon, if it occurs, has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 2 to 8, or is mottled in these colors. It is sandy clay loam or clay loam.

The C horizon, if it occurs, has hue of 2.5YR to 5Y, value of 4 to 8, and chroma of 1 to 8, or is mottled in these colors. It generally is sandy but in some pedons it is clay.

Ocilla Series

The Ocilla series consists of somewhat poorly drained, moderately permeable soils that formed in loamy marine sediments in the uplands on the Coastal Plain. Slopes range from 0 to 3 percent.

Ocilla soils are adjacent to Bonneau, Goldsboro, Lynchburg, and Rains soils. Bonneau soils are well drained. Goldsboro, Lynchburg, and Rains soils do not have a thick, sandy surface layer. Goldsboro soils are moderately well drained, and Rains soils are poorly drained.

Typical pedon of Ocilla loamy fine sand, 0 to 3 percent slopes; about 1 mile east of Galatia on Secondary Road 1341 and 150 feet south of the road, in a field (State plane coordinates 2,503,000 feet E., 994,000 feet N.):

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) loamy fine sand; weak fine granular structure; very friable; common fine and medium roots; moderately acid; abrupt smooth boundary.

E—8 to 24 inches; light yellowish brown (10YR 6/4) loamy fine sand; weak fine granular structure; very friable; common fine roots; strongly acid; clear smooth boundary.

Bt1—24 to 35 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium distinct light brownish gray (10YR 6/2) and few medium faint yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable, nonsticky and nonplastic; sand grains coated and bridged with clay; very strongly acid; gradual wavy boundary.

Bt2—35 to 48 inches; mottled light brownish gray (10YR 6/2), light yellowish brown (10YR 6/4), yellowish brown (10YR 5/6), and strong brown (7.5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable, nonsticky and nonplastic; sand

grains coated and bridged with clay; very strongly acid; gradual wavy boundary.

Btg—48 to 68 inches; light gray (10YR 6/1) sandy clay loam; common medium prominent yellowish brown (10YR 5/6), light yellowish brown (10YR 6/4), and strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable, nonsticky and nonplastic; sand grains coated and bridged with clay; stratified lenses of sandy loam; very strongly acid.

The thickness of the solum ranges from 60 to more than 80 inches. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. The E horizon has hue of 10YR, value of 5 or 6, and chroma of 2 to 4. It is loamy fine sand or loamy sand.

The BE horizon, if it occurs, has hue of 10YR, value of 5 or 6, and chroma of 3 to 6. It is sandy loam.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 to 8. It has mottles in shades of gray, yellow, brown, or red. It is sandy clay loam or sandy loam.

The Btg horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. It has common or many mottles in shades of yellow, brown, or red. It is sandy clay loam or sandy loam.

Pacolet Series

The Pacolet series consists of well drained, moderately permeable, gently sloping to steep soils that formed in material weathered from acid crystalline rocks. These soils are on narrow ridges and on side slopes. Slopes range from 2 to 30 percent.

Pacolet soils are similar to Wedowee soils and are adjacent to Wedowee, Wehadkee, Helena, and Lillington soils. Wedowee soils have hue of 5YR or browner in the subsoil. Wehadkee soils are poorly drained and are on narrow flood plains. Helena soils are moderately well drained and are at the head of drainageways. Lillington soils have gravel on the surface and in the profile.

Typical pedon of Pacolet sandy clay loam, 8 to 15 percent slopes, eroded; about 1.4 miles west of Henrico on Secondary Road 1214, about 1.1 miles northwest on Secondary Road 1221, about 0.8 mile north on a gravel road, and 50 feet south of the road (State plane coordinates 2,337,000 feet E., 1,013,000 feet N.):

Ap—0 to 4 inches; dark yellowish brown (10YR 4/4) sandy clay loam; weak fine granular structure; very friable; very strongly acid; abrupt smooth boundary.

BE—4 to 8 inches; yellowish red (5YR 5/6) sandy clay loam; weak fine subangular blocky structure; friable; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt—8 to 19 inches; red (2.5YR 5/6) clay; moderate fine subangular and angular blocky structure; firm; common distinct clay films on faces of peds; common fine flakes of mica; very strongly acid; gradual wavy boundary.

BC—19 to 32 inches; red (2.5YR 4/6) clay loam; weak fine subangular blocky structure; friable; few distinct clay films on faces of peds; few lenses of saprolite; very strongly acid; gradual wavy boundary.

C1—32 to 49 inches; yellowish red (5YR 5/8) saprolite that crushes to loam; common medium distinct red (2.5YR 4/6) mottles; massive; friable; common flakes of mica; very strongly acid; gradual wavy boundary.

C2—49 to 62 inches; yellowish red (5YR 5/6), yellow (10YR 7/6), and reddish brown (2.5YR 5/4) sandy loam saprolite; massive; very friable; many flakes of mica; very strongly acid.

The thickness of the solum ranges from 20 to 40 inches. Reaction is very strongly acid to moderately acid, except where the surface layer has been limed.

The A or Ap horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 2 to 4. It is sandy clay loam or gravelly sandy clay loam.

The E horizon, if it occurs, has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It is sandy loam.

The Bt horizon dominantly has hue of 2.5YR, value of 4 or 5, and chroma of 6 to 8. In some pedons, however, it has hue of 5YR in the upper part. It is dominantly clay or clay loam, but in some pedons the upper part is sandy clay loam.

The BC horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 to 8. It commonly has mottles in shades of yellow or brown. It is clay loam or sandy clay loam.

The C horizon is mottled red, yellow, brown, or white sandy loam, loam, or sandy clay loam saprolite.

Pactolus Series

The Pactolus series consists of moderately well drained, rapidly permeable soils that formed in sandy marine sediments in the uplands on the Coastal Plain. Slopes range from 0 to 2 percent.

Pactolus soils are similar to Seabrook soils and are adjacent to Autryville, Bonneau, and Rains soils. Seabrook soils are on stream terraces and are rarely flooded. Autryville and Bonneau soils have a thick, sandy surface layer and are well drained. Rains soils are poorly drained and are in low, wet areas.

Typical pedon of Pactolus loamy fine sand, 0 to 2 percent slopes; about 2.6 miles west of Severn on Secondary Road 1333, about 0.4 mile south on a farm road, and 50 feet east of the road, in a field (State plane coordinates 2,521,000 feet E., 1,008,000 feet N.):

Ap—0 to 9 inches; dark brown (10YR 4/3) loamy fine sand; weak medium granular structure; very friable; common fine roots; slightly acid; abrupt smooth boundary.

C1—9 to 23 inches; yellowish brown (10YR 5/6) loamy fine sand; few medium distinct strong brown (7.5YR 5/8) mottles; single grained; loose; few fine roots; moderately acid; gradual wavy boundary.

C2—23 to 30 inches; light yellowish brown (10YR 6/4) loamy fine sand; common medium distinct reddish yellow (7.5YR 6/8) and light gray (10YR 7/2) mottles; single grained; loose; very strongly acid; gradual wavy boundary.

Cg—30 to 72 inches; light gray (10YR 7/1) sand; common medium prominent brownish yellow (10YR 6/8) mottles; single grained; loose; very strongly acid.

Pactolus soils have a sandy horizon more than 60 inches thick. Reaction is extremely acid to strongly acid, except where the surface layer has been limed.

The A or Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 3. The C horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 8 in the upper part and chroma of 1 or 2 in the lower part. It has common mottles in shades of yellow, brown, and gray throughout. It is sand, loamy sand, or loamy fine sand.

Rains Series

The Rains series consists of poorly drained, moderately permeable soils that formed in loamy marine sediments in the uplands on the Coastal Plain. Slopes range from 0 to 2 percent.

Rains soils are similar to Lynchburg soils and are adjacent to Lynchburg, Ocilla, Pactolus, Exum, and Goldsboro soils. Lynchburg and Ocilla soils are somewhat poorly drained. Ocilla soils have a thick, sandy surface layer. Pactolus, Exum, and Goldsboro soils are moderately well drained. Pactolus soils are sandy throughout, and Exum soils have a siltier subsoil than that of the Rains soils.

Typical pedon of Rains fine sandy loam; about 3.3 miles east of Conway on U.S. Highway 158, about 2.5 miles south on Secondary Road 1536, about 0.8 mile south on Secondary Road 1541, and 75 feet west of the road, in a wooded area (State plane coordinates 2,538,000 feet E., 967,000 feet N.):

A—0 to 4 inches; very dark gray (10YR 3/1) fine sandy loam; weak fine granular structure; very friable; common fine and medium roots; very strongly acid; abrupt smooth boundary.

E—4 to 7 inches; light brownish gray (10YR 6/2) fine sandy loam; weak medium granular structure; very friable; few fine roots; very strongly acid; abrupt smooth boundary.

Btg1—7 to 11 inches; light gray (10YR 7/2) sandy clay loam; few fine distinct brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; friable; few fine roots; very strongly acid; gradual wavy boundary.

Btg2—11 to 24 inches; light gray (10YR 7/2) sandy clay loam; common fine distinct brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; friable; few fine roots; very strongly acid; gradual wavy boundary.

Btg3—24 to 38 inches; gray (10YR 6/1) sandy clay loam; common medium prominent yellowish brown (10YR 5/8) and brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg4—38 to 51 inches; gray (10YR 6/1) sandy clay loam; few fine prominent red (2.5YR 5/8), common medium prominent yellow (10YR 7/6), and many coarse prominent brownish yellow (10YR 6/8) mottles; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine pores; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg5—51 to 68 inches; gray (10YR 6/1) sandy clay; few fine prominent red (2.5YR 5/8), common medium distinct brown (10YR 5/3), and many coarse prominent yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; firm, slightly sticky and slightly plastic; very strongly acid; gradual wavy boundary.

Cg—68 to 84 inches; light gray (10YR 7/1) sandy clay loam; few fine prominent brownish yellow (10YR 6/6) mottles; massive; friable; few pockets of light gray (5Y 7/2) clay; very strongly acid.

The thickness of the solum is more than 60 inches. Reaction is extremely acid to strongly acid, except where the surface layer has been limed.

The Ap or A horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 2. The E horizon, if it occurs, has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2. It is fine sandy loam or sandy loam.

The BAg horizon, if it occurs, has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. It is sandy loam or fine sandy loam.

The Btg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. It commonly has few to many mottles that have chroma of 3 or more. It is sandy clay loam or clay loam and ranges to sandy clay in the lower part.

The BCg horizon, if it occurs, has hue of 10YR, value of 4 to 7, and chroma of 1. It commonly has few to many mottles that have chroma of 2 or more. It is sandy loam, sandy clay loam, or sandy clay.

The Cg horizon, if it occurs, has hue of 10YR, value of 5 to 7, and chroma of 1 or 2, or it is neutral in hue and has value of 5 to 7. In some pedons it has mottles that have chroma of 3 or more. It generally ranges from sand to sandy clay, or it is stratified.

Roanoke Series

The Roanoke series consists of poorly drained, slowly permeable or very slowly permeable soils that formed in clayey fluvial sediments on river terraces. Slopes range from 0 to 2 percent.

Roanoke soils are adjacent to Altavista, Wahee, Tomotley, and Wehadkee soils. Altavista soils are moderately well drained and have a loamy subsoil. Wahee soils are somewhat poorly drained. Tomotley and Wehadkee soils have a loamy subsoil. Wehadkee soils are frequently flooded and are on flood plains.

Typical pedon of Roanoke silt loam, occasionally flooded; about 7.7 miles west of Jackson on U.S. Highway 158, about 3.8 miles south on Secondary Road 1128, about 0.2 mile east on a forestry road, and 100 feet north of the road (State plane coordinates 2,433,000 feet E., 964,000 feet N.):

A—0 to 5 inches; light brownish gray (10YR 6/2) silt loam; weak medium granular structure; friable; many fine roots; few fine flakes of mica; very strongly acid; abrupt smooth boundary.

BEg—5 to 11 inches; light gray (10YR 6/1) silty clay loam; few fine prominent brownish yellow (10YR 6/6) mottles; weak fine subangular blocky structure; friable; common fine roots; very strongly acid; clear smooth boundary.

Btg1—11 to 18 inches; gray (10YR 6/1) silty clay; common medium prominent brownish yellow (10YR 6/6) mottles; moderate medium subangular blocky structure; firm; few fine roots; few fine flakes of mica; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg2—18 to 40 inches; gray (10YR 6/1) clay; many medium prominent brownish yellow (10YR 6/6) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; few fine flakes of mica; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg3—40 to 53 inches; gray (10YR 6/1) silty clay; few medium prominent yellowish brown (10YR 5/6) and gray (5YR 6/1) mottles; weak medium subangular blocky structure; firm, sticky and plastic; few fine roots; few fine flakes of mica; few faint clay films on faces of peds; very strongly acid; clear wavy boundary.

2C1—53 to 66 inches; strong brown (7.5YR 5/8) loam; few medium prominent gray (10YR 6/1) mottles; massive; friable, slightly sticky; few medium angular cemented nodules; few fine flakes of mica; very strongly acid; gradual wavy boundary.

2C2—66 to 84 inches; mottled light brownish gray (10YR 6/2), light yellowish brown (10YR 6/4), and yellowish red (5YR 4/8) sandy loam; massive; friable; few fine flakes of mica; very strongly acid.

The thickness of the solum ranges from 40 to 60 inches. Reaction is extremely acid to strongly acid, except where the surface layer has been limed.

The A horizon has hue of 10YR, value of 3 to 6, and chroma of 1 or 2. The BA or BE horizon, if it occurs, has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. It is silt loam, clay loam, or silty clay loam.

The Btg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2, or it is neutral in hue and has value of 4 to 7. It has mottles in shades of yellow, brown, red, or gray. It is silty clay, clay, or clay loam.

The BC horizon, if it occurs, has hue of 10YR to 5Y, value of 4 to 7, and chroma of 2, or it is neutral in hue and has value of 4 to 7. It is clay loam or sandy clay loam.

The 2C horizon varies in color and texture. Some pedons are stratified and range from sand to clay. The content of coarse fragments ranges from none to common.

Seabrook Series

The Seabrook series consists of moderately well drained, rapidly permeable soils that formed in sandy fluvial sediments on river terraces on the Coastal Plain. Slopes range from 0 to 2 percent.

Seabrook soils are similar to Pactolus soils but are on stream terraces. Seabrook soils are adjacent to Conetoe, Tarboro, Wickham, Wehadkee, and Tomotley soils. Conetoe and Wickham soils are well drained and have a loamy subsoil. Tarboro soils are somewhat excessively drained. Wehadkee and Tomotley soils are poorly drained and have a loamy subsoil. Wehadkee soils are on flood plains and are frequently flooded.

Typical pedon of Seabrook loamy sand, rarely flooded; about 2.1 miles southeast of Severn on

Secondary Road 1351, about 0.5 mile northeast on a farm road, and 100 feet east of the road, in a cutover wooded area (State plane coordinates 2,543,000 E., 1,010,000 feet N.):

A1—0 to 3 inches; dark grayish brown (10YR 4/2) loamy sand; few fine faint dark brown (10YR 3/3) mottles; weak fine granular structure; very friable; common fine roots; very strongly acid; abrupt smooth boundary.

A2—3 to 9 inches; brown (10YR 5/3) loamy sand; weak fine granular structure; very friable; strongly acid; clear smooth boundary.

C1—9 to 20 inches; brownish yellow (10YR 6/6) loamy sand; few fine distinct strong brown (7.5YR 5/6) and few medium distinct very pale brown (10YR 7/3) mottles; single grained; very friable; few fine flakes of mica; strongly acid; gradual wavy boundary.

C2—20 to 29 inches; light yellowish brown (10YR 6/4) loamy sand; common medium distinct strong brown (7.5YR 5/6) and common coarse faint very pale brown (10YR 7/3) mottles; single grained; very friable; few fine flakes of mica; strongly acid; gradual wavy boundary.

C3—29 to 41 inches; very pale brown (10YR 7/3) loamy sand; common medium faint light gray (10YR 7/2) and common medium distinct strong brown (7.5YR 5/6) mottles; single grained; very friable; few fine flakes of mica; strongly acid; gradual wavy boundary.

Cg—41 to 72 inches; light gray (5Y 7/2) loamy sand; few medium faint olive gray (5Y 5/2) and few coarse prominent very pale brown (10YR 7/4) mottles; single grained; very friable; few fine prominent strong brown (7.5YR 5/6) streaks; few fine flakes of mica; strongly acid.

Seabrook soils have a sandy horizon that is more than 72 inches thick. Reaction is very strongly acid to slightly acid, except where the surface layer has been limed.

The A or Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3. The C horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 3 to 8 in the upper part and chroma of 1 or 2 in the lower part. It has common mottles in shades of yellow, brown, or gray throughout. It is sand or loamy sand.

State Series

The State series consists of well drained, moderately permeable soils that formed in loamy fluvial deposits on river terraces on the Coastal Plain. Slopes range from 0 to 3 percent.

State soils are similar to Altavista soils and are adjacent to Altavista, Conetoe, and Wehadkee soils. Altavista soils are moderately well drained. Conetoe soils have a thick, sandy surface layer. Wehadkee soils are poorly drained and are frequently flooded.

Typical pedon of State sandy loam, 0 to 3 percent slopes, rarely flooded; about 1 mile north of Severn on North Carolina Highway 35, about 0.6 mile northeast on Secondary Road 1350, about 1.2 miles northeast of the end of Secondary Road 1350 along a farm road, and 75 feet south of the road, in a field (State plane coordinates 2,536,000 feet E., 1,017,000 feet N.):

Ap—0 to 9 inches; brown (10YR 4/3) sandy loam; weak medium granular structure; very friable; common fine and medium roots; slightly acid; abrupt smooth boundary.

BE—9 to 13 inches; yellowish brown (10YR 5/6) sandy loam; weak medium subangular blocky structure; very friable; few fine roots; slightly acid; clear smooth boundary.

Bt—13 to 44 inches; strong brown (7.5YR 5/6) sandy clay loam; moderate medium subangular blocky structure; friable, slightly sticky; few fine flakes of mica; few fine roots; sand grains coated and bridged with clay; strongly acid; clear wavy boundary.

BC—44 to 48 inches; yellowish brown (10YR 5/6) sandy loam; weak medium subangular blocky structure; very friable; few fine flakes of mica; strongly acid; clear wavy boundary.

C—48 to 68 inches; yellowish brown (10YR 5/6) loamy sand; single grained; very friable; few fine flakes of mica; strongly acid.

The thickness of the solum ranges from 30 to 60 inches. Reaction is extremely acid to strongly acid, except where the surface layer has been limed.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. The E horizon, if it occurs, has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 to 6. It is sandy loam.

The BE horizon, if it occurs, has hue of 10YR, value of 4 to 6, and chroma of 4 to 8. It is sandy loam or fine sandy loam.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. The BC horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 6 to 8.

The C horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 4 to 8. It is coarse sand, sand, or loamy sand.

Tarboro Series

The Tarboro series consists of somewhat excessively drained, rapidly permeable soils that formed in sandy

fluvial deposits on river terraces on the Coastal Plain. Slopes range from 0 to 5 percent.

Tarboro soils are adjacent to Conetoe, Wickham, Seabrook, and Wehadkee soils. Conetoe and Wickham soils are well drained and have a loamy subsoil. Seabrook soils are moderately well drained. Wehadkee soils are poorly drained, are on flood plains, and are frequently flooded.

Typical pedon of Tarboro sand, 0 to 5 percent slopes; about 2.3 miles southeast of Severn on Secondary Road 1351, about 0.6 mile northeast on a farm road to a high voltage power line, and about 0.1 mile west of a farm road, along the power line right-of-way (State plane coordinates 2,543,000 feet E., 1,013,000 feet N.):

A—0 to 6 inches; very dark grayish brown (10YR 3/2) sand; weak fine granular structure; very friable; common fine roots; strongly acid; abrupt smooth boundary.

C1—6 to 20 inches; brownish yellow (10YR 6/8) sand; single grained; loose; few fine roots; strongly acid; gradual wavy boundary.

C2—20 to 36 inches; brownish yellow (10YR 6/6) sand; single grained; loose; strongly acid; gradual wavy boundary.

C3—36 to 47 inches; yellowish brown (10YR 5/6) sand; single grained; loose; strongly acid; gradual wavy boundary.

C4—47 to 68 inches; brownish yellow (10YR 6/6) sand; single grained; loose; strongly acid; gradual wavy boundary.

C5—68 to 84 inches; light yellowish brown (10YR 6/4) sand; single grained; loose; few fine gravels; few fine flakes of mica; strongly acid.

Tarboro soils have a sandy horizon that is more than 80 inches thick. Reaction is very strongly acid to slightly acid, except where the surface layer has been limed.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 to 4. The C horizon has hue of 10YR or 7.5YR, value of 5 to 7, and chroma of 3 to 8. It is sand or loamy sand.

Tomotley Series

The Tomotley series consists of poorly drained, moderately permeable soils that formed in loamy fluvial deposits on river terraces on the Coastal Plain. Slopes range from 0 to 2 percent.

Tomotley soils are adjacent to Roanoke, Wehadkee, Altavista, Seabrook, and Wickham soils. Roanoke soils have a finer textured subsoil than that of the Tomotley soils. Wehadkee soils are on flood plains and are frequently flooded. Altavista and Seabrook soils are moderately well drained. Seabrook soils are sandy throughout. Wickham soils are well drained and are higher on the landscape than the Tomotley soils.

Typical pedon of Tomotley fine sandy loam, rarely flooded; about 1 mile west of Jackson on U.S. Highway 158, about 2.3 miles south on Secondary Road 1126, about 1.1 miles south on Secondary Road 1127, and 30 feet southeast of the road, in a field (State plane coordinates 2,446,000 feet E., 948,000 feet N.):

Ap—0 to 10 inches; dark grayish brown (10YR 4/2) fine sandy loam; moderate fine granular structure; friable; common fine roots; strongly acid; abrupt smooth boundary.

Eg—10 to 14 inches; light brownish gray (10YR 6/2) fine sandy loam; moderate medium granular structure; friable; few fine roots; strongly acid; clear smooth boundary.

Btg1—14 to 35 inches; gray (10YR 6/1) sandy clay loam; common medium prominent yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; firm, sticky; few faint clay films on faces of peds; common fine flakes of mica; strongly acid; gradual wavy boundary.

Btg2—35 to 47 inches; light gray (10YR 7/1) sandy clay loam; common medium prominent yellowish brown (10YR 5/8) and few fine prominent strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; sand grains bridged with clay; common fine flakes of mica; strongly acid; gradual wavy boundary.

Cg—47 to 62 inches; light gray (10YR 7/1) sandy loam; many medium prominent yellowish brown (10YR 5/8) mottles; massive; very friable; common fine flakes of mica; lenses of loamy sand; strongly acid.

The thickness of the solum ranges from 30 to 60 inches. Reaction is extremely acid to strongly acid, except where the surface layer has been limed.

The Ap or A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. The Eg horizon, if it occurs, has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. It is fine sandy loam, loam, or sandy loam.

The BA horizon, if it occurs, has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. It is fine sandy loam or sandy loam.

The Btg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. It has common or many mottles in shades of yellow, brown, red, or gray. It is sandy clay loam, loam, or clay loam.

The BCg horizon, if it occurs, has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. It has common or many mottles in shades of yellow, brown, red, or gray. It is sandy loam or fine sandy loam.

The Cg horizon has hue of 10YR or 2.5Y, value of 6

or 7, and chroma of 1, or it is neutral in hue and has value of 6 or 7. It has common or many mottles in shades of yellow, brown, and olive. It generally ranges from sand to sandy clay but in some pedons has pockets of gravel.

Turbeville Series

The Turbeville series consists of deep, well drained, moderately permeable soils on uplands. These soils formed from old clayey river sediments of the upper Coastal Plain. Slopes range from 0 to 12 percent.

Turbeville soils are adjacent to Caroline and Lillington soils. Caroline soils have a brown subsoil and are in similar positions on the uplands as the Turbeville soils. Lillington soils are gravelly and are on side slopes adjacent to the nearly level or gently sloping uplands.

Typical pedon of Turbeville sandy loam, 0 to 2 percent slopes; about 1 mile west of Gaston on North Carolina Highway 46 to Squire School, about 0.4 mile south on a farm road, 150 feet west on a farm road, and about 50 feet north of the road, in a cultivated field (State plane coordinates 2,390,000 feet E., 1,002,000 feet N.):

Ap—0 to 9 inches; reddish brown (5YR 4/4) sandy loam; weak medium granular structure; very friable; few fine roots; moderately acid; abrupt smooth boundary.

Bt1—9 to 16 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; few faint clay films on faces of peds; moderately acid; clear smooth boundary.

Bt2—16 to 68 inches; red (10R 4/8) clay; moderate fine and medium subangular blocky structure; firm, very sticky and plastic; few fine roots; common distinct clay films on faces of peds; strongly acid; diffuse wavy boundary.

Bt3—68 to 84 inches; red (10R 4/6) sandy clay; weak coarse subangular blocky structure; friable, nonsticky and nonplastic; common distinct clay films on faces of peds; very strongly acid.

The thickness of the solum ranges from 60 to more than 80 inches. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed.

The A or Ap horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 3 or 4. In the eroded areas, it has hue of 2.5YR to 7.5YR, value of 3 to 5, and chroma of 3 to 6.

The BA or BE horizon, if it occurs, has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It is sandy loam or sandy clay loam.

The Bt horizon has hue of 10R or 2.5YR, value of 3 or 4, and chroma of 4 to 8. It is clay, clay loam, or sandy clay.

Wahee Series

The Wahee series consists of somewhat poorly drained, slowly permeable soils that formed in clayey fluvial deposits on river terraces on the Coastal Plain. Slopes range from 0 to 2 percent.

Wahee soils are adjacent to Altavista and Roanoke soils. Altavista soils have a loamy subsoil and are moderately well drained. Roanoke soils are poorly drained and are in low, wet areas.

Typical pedon of Wahee fine sandy loam, 0 to 2 percent slopes, rarely flooded; about 0.8 mile east of Margarettsville on North Carolina Highway 186, about 0.6 mile north on a farm road, and 150 feet west of the road, in a cultivated field (State plane coordinates 2,487,000 feet E., 1,019,000 feet N.):

Ap—0 to 7 inches; brown (10YR 5/3) fine sandy loam; weak medium granular structure; very friable; few fine roots; slightly acid; abrupt smooth boundary.

Bt1—7 to 12 inches; yellowish brown (10YR 5/8) clay loam; few fine prominent light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; firm; few faint clay films on faces of peds; moderately acid; clear smooth boundary.

Bt2—12 to 25 inches; yellowish brown (10YR 5/6) clay; common medium prominent gray (10YR 6/1) and common medium distinct strong brown (7.5YR 5/8) mottles; moderate coarse subangular blocky structure; firm, sticky and plastic; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg—25 to 31 inches; gray (10YR 6/1) clay; common medium distinct yellowish brown (10YR 5/4) and many medium prominent strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

BCg—31 to 50 inches; light gray (10YR 7/1) clay loam; common medium prominent reddish yellow (7.5YR 6/8) mottles; weak medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.

Cg—50 to 62 inches; light gray (10YR 7/1) sandy loam; common medium prominent brownish yellow (10YR 6/8) mottles; massive; friable; very strongly acid.

The thickness of the solum is 40 to more than 60 inches. Reaction is extremely acid to strongly acid, except where the surface layer has been limed.

The Ap or A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 to 3. The E horizon, if it occurs, has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 2 to 4. It is fine sandy loam, silt loam, or loam.

The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 6 to 8. It has mottles in shades of gray, brown, or yellow.

The Btg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It has mottles in shades of yellow or brown. It is clay or clay loam. The weighted clay average is more than 35 percent for the particle-size control section.

The BCg horizon, if it occurs, has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It has mottles in shades of yellow or brown. It is clay loam or sandy clay loam.

The Cg horizon has hue of 10YR, value of 6 or 7, and chroma of 1. It has common mottles in shades of yellow or brown. It varies in texture but is commonly sandy loam, loam, or sandy clay loam.

Wedowee Series

The Wedowee series consists of well drained, moderately permeable soils that formed in weathered igneous and metamorphic rocks. These soils are on narrow ridges and side slopes in the uplands. Slopes range from 2 to 15 percent.

Wedowee soils are similar to Pacolet soils and are adjacent to Pacolet, Wehadkee, Helena, and Lillington soils. Pacolet soils have hue of 2.5YR or 10R in the subsoil and are on slopes that are similar to or steeper than those of the Wedowee soils. Wehadkee soils are poorly drained and are on flood plains. Helena soils are moderately well drained and are in draws at the head of drainageways. Lillington soils are gravelly and are on side slopes.

Typical pedon of Wedowee sandy loam, 2 to 8 percent slopes; 1.1 miles southeast of Virginia Highway 668 on an unpaved road in North Carolina and 50 feet west of the road (State plane coordinates 2,331,000 feet E., 1,017,000 feet N.):

A—0 to 5 inches; grayish brown (10YR 5/2) sandy loam; weak medium granular structure; friable; many fine and medium roots; very strongly acid; clear smooth boundary.

E—5 to 8 inches; very pale brown (10YR 7/4) sandy loam; weak medium granular structure; friable; few fine and medium roots; very strongly acid; abrupt smooth boundary.

BE—8 to 12 inches; reddish yellow (7.5YR 6/6) sandy clay loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; very strongly acid; clear wavy boundary.

Bt—12 to 20 inches; yellowish red (5YR 5/6) clay; moderate medium subangular blocky structure; firm, sticky and plastic; common distinct clay films on faces of peds; few weathered gravels; very strongly acid; gradual wavy boundary.

BC—20 to 28 inches; yellowish red (5YR 5/6) clay loam; common medium distinct red (2.5YR 4/8) mottles; weak medium subangular blocky structure; firm, sticky and plastic; few distinct clay films on faces of peds; common pockets of saprolite; very strongly acid; clear wavy boundary.

C1—28 to 33 inches; yellowish red (5YR 5/6) sandy clay loam saprolite; massive; friable, slightly sticky and slightly plastic; few fine flakes of mica; very strongly acid; clear wavy boundary.

C2—33 to 60 inches; mottled light red (2.5YR 6/8) and reddish yellow (7.5YR 6/8) sandy clay loam saprolite; massive; friable, slightly sticky and slightly plastic; very strongly acid.

The thickness of the solum ranges from 20 to 40 inches. The soil is very strongly acid or strongly acid, except where the surface layer has been limed.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4. The E horizon, if it occurs, has hue of 10YR, value of 5 to 7, and chroma of 3 or 4.

The BE horizon, if it occurs, has hue of 5YR to 10YR, value of 5 to 7, and chroma of 4 to 6. It is loam or sandy clay loam.

The Bt horizon has hue of 5YR to 10YR, value of 5 or 6, and chroma of 6 to 8. In some pedons it has mottles in shades of red or brown. It is clay, clay loam, or sandy clay. The weighted clay average is more than 35 percent for the particle-size control section.

The BC horizon has hue of 5YR to 10YR, value of 5 or 6, and chroma of 6 to 8. It has few to many mottles in shades of brown or red. It is sandy clay loam or clay loam.

The C horizon is multicolored. It is sandy clay loam, sandy loam, or clay loam saprolite.

Wehadkee Series

The Wehadkee series consists of poorly drained, moderately permeable soils that formed in recent alluvium on flood plains. Slope is less than 2 percent.

Wehadkee soils are adjacent to Pacolet, Wedowee, Wickham, State, Altavista, Seabrook, Tarboro, Conetoe, Roanoke, Tomotley, and Congaree soils. Pacolet and Wedowee soils are well drained, gently sloping to moderately steep soils in the uplands of the Piedmont. Wickham, State, Altavista, Seabrook, Tarboro, Conetoe, Roanoke, and Tomotley soils are on the adjacent stream terraces. Wickham and State soils are well drained. Altavista and Seabrook soils are moderately

well drained. Seabrook soils are sandy throughout. Tarboro soils are sandy and are somewhat excessively drained. Conetoe soils are well drained and have a thick, sandy surface layer. Roanoke and Tomotley soils are poorly drained. Roanoke soils are occasionally flooded, and Tomotley soils are rarely flooded. Roanoke soils have a clayey subsoil. Congaree soils are well drained and moderately well drained and generally are adjacent to the river channels.

Typical pedon of Wehadkee loam, frequently flooded; about 4 miles north of Jackson on North Carolina Highway 305 to Ramsey Creek and 200 feet south of the Ramsey Creek bridge, on the flood plain (State plane coordinates 2,460,000 feet E., 984,000 feet N.):

A—0 to 6 inches; light brownish gray (2.5Y 6/2) loam; weak medium granular structure; friable; many fine, medium, and coarse roots; strongly acid; clear wavy boundary.

Bg1—6 to 15 inches; light brownish gray (2.5Y 6/2) loam; few fine prominent strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; common fine, medium, and coarse roots; very strongly acid; gradual wavy boundary.

Bg2—15 to 36 inches; gray (5Y 6/1) loam; few fine prominent yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; friable; common fine and medium roots; few fine flakes of mica; very strongly acid; gradual wavy boundary.

Cg—36 to 60 inches; light gray (5Y 7/1) sandy loam; few medium prominent yellowish brown (10YR 5/4) mottles; massive; friable; few fine flakes of mica; moderately acid.

The thickness of the solum ranges from 30 to more than 60 inches. Reaction is very strongly acid to slightly acid. Most horizons contain few to many flakes of mica.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. The Bg horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2. It has few or common mottles in shades of yellow or brown. It is sandy clay loam, clay loam, silty clay loam, or loam.

The Cg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. It has mottles in shades of yellow or brown. It is dominantly sandy loam, but in some pedons it is stratified layers of sand, loam, and gravel.

Wickham Series

The Wickham series consists of well drained, moderately permeable soils that formed in loamy fluvial deposits on river terraces on the Coastal Plain. Slopes range from 0 to 8 percent.

Wickham soils are adjacent to Altavista, Seabrook, Conetoe, Tarboro, Tomotley, and Wehadkee soils. Altavista and Seabrook soils are moderately well drained. Seabrook soils are sandy throughout. Conetoe soils have a thick, sandy surface layer. Tarboro soils are somewhat excessively drained and are sandy throughout. Tomotley and Wehadkee soils are poorly drained. Wehadkee soils are on flood plains and are frequently flooded.

Typical pedon of Wickham fine sandy loam, 0 to 2 percent slopes; about 1.5 miles south of Rich Square on U.S. Highway 258, about 1.3 miles southeast on North Carolina Highway 308, about 2.6 miles southwest on Secondary Road 1106, 250 feet west on a farm path, and 120 feet southwest of the path, in a cultivated field (State plane coordinates 2,498,000 feet E., 900,000 feet N.):

Ap—0 to 6 inches; dark brown (7.5YR 4/4) fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; slightly acid; abrupt smooth boundary.

Bt1—6 to 11 inches; reddish brown (5YR 4/4) sandy clay loam; moderate medium subangular blocky structure; friable; few fine roots; few fine flakes of mica; sand grains coated and bridged with clay; moderately acid; clear smooth boundary.

Bt2—11 to 20 inches; yellowish red (5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; friable; few fine roots; common fine flakes of mica; few distinct clay films on faces of peds; few fine rounded gravels; strongly acid; gradual smooth boundary.

Bt3—20 to 36 inches; strong brown (7.5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; few fine roots; common fine flakes of mica; few faint clay films on faces of peds; few fine rounded gravels; strongly acid; gradual smooth boundary.

BC—36 to 50 inches; strong brown (7.5YR 5/6) loam; weak medium subangular blocky structure; very friable; few fine flakes of mica; very strongly acid; gradual smooth boundary.

C1—50 to 54 inches; strong brown (7.5YR 5/6) sand; single grained; loose; few fine flakes of mica; few coarse gravels; very strongly acid; gradual wavy boundary.

C2—54 to 78 inches; strong brown (7.5YR 5/6) loamy sand; single grained; loose; few fine flakes of mica; few coarse gravels; common pockets of sandy loam; very strongly acid.

The thickness of the solum ranges from 36 to more than 60 inches. Reaction is very strongly acid to

moderately acid, except where the surface layer has been limed.

The Ap horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 3 or 4. The E horizon, if it occurs, has hue of 7.5YR to 10YR, value of 4 or 5, and chroma of 3 or 4. It is sandy loam or fine sandy loam.

The Bt horizon has hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 4 to 8. It is sandy clay loam, sandy loam, clay loam, or loam.

The BC horizon has hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 6 to 8. It is loam, sandy loam, or loamy sand.

The C horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 6 to 8. It is coarse sand, sand, loamy sand, or sandy loam.

Winton Series

The Winton series consists of moderately well drained, moderately permeable soils that are on strongly sloping to very steep bluffs along rivers and their major tributaries in the Coastal Plain region. Slopes range from 10 to 50 percent.

Winton soils are adjacent to Craven, Norfolk, and Bonneau soils. Craven soils have more clay than the Winton soils. Norfolk and Bonneau soils are well drained. Craven, Norfolk, and Bonneau soils are on nearly level to strongly sloping side slopes that are higher than those of the steeper Winton soils.

Typical pedon of Winton fine sandy loam, 10 to 25 percent slopes; about 1.4 miles south on U.S. Highway 301 from the intersection of U.S. Highways 301 and 158 in Garysburg, about 0.3 mile southeast on a farm road, and 300 feet southeast of the road, in a wooded area (State plane coordinates 2,417,000 feet E., 977,000 feet N.):

A—0 to 6 inches; dark brown (10YR 4/3) fine sandy loam; moderate fine granular structure; friable; common fine and medium roots; strongly acid; abrupt smooth boundary.

Bt1—6 to 26 inches; strong brown (7.5YR 5/6) clay loam; moderate medium subangular blocky structure; firm; common fine roots; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt2—26 to 41 inches; strong brown (7.5YR 5/8) clay loam; common medium prominent pinkish gray (7.5YR 6/2) and common medium faint yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; few fine roots; common distinct clay films on faces of peds; very strongly acid; clear wavy boundary.

C1—41 to 50 inches; yellowish brown (10YR 5/6) sandy loam; common medium distinct light brownish gray (10YR 6/2) and strong brown (7.5YR 5/8) mottles; massive; friable; very strongly acid; clear wavy boundary.

C2—50 to 62 inches; brownish yellow (10YR 6/8) clay loam; common medium prominent pinkish gray (7.5YR 6/2) and yellowish red (5YR 5/8) mottles; massive; firm; very strongly acid.

The thickness of the solum ranges from 40 to more than 60 inches. Reaction is extremely acid to moderately acid, except where the surface layer has been limed.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 to 4. The E horizon, if it occurs, has hue of 10YR, value of 5 to 7, and chroma of 4 to 6. It is fine sandy loam, sandy loam, or loamy sand.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8. It has mottles in shades of red, brown, and yellow in most pedons. It has few or common gray mottles in the lower part. It is sandy clay loam or clay loam.

The BC horizon, if it occurs, has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8, or is mottled in shades of yellow, brown, gray, and red. It is sandy loam.

The C horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 to 8, or is mottled. It ranges from loamy sand to clay and is commonly stratified.

Formation of the Soils

This section provides general information about formation of the soils. It describes the soil-forming processes and the various geologic materials associated with the soils in Northampton County.

Factors of Soil Formation

Soils are the product of the combined effects of parent material, climate, plant and animal life, relief, and time. A combination of these environmental factors determines the characteristics of a soil in any specific place. All of these factors affect the formation of every soil, although some factors can have more influence than others *(4)*.

Parent Material

Parent material is the unconsolidated mass in which a soil forms. The three types of parent material in Northampton County are residual materials, Coastal Plain deposits, and materials moved by streams and rivers (fig. 13).

In the western part of the county, parent material is derived from the physical and chemical breakdown of residual acid-crystalline rocks. The Wedowee, Pacolet, and Helena soils are in this area.

Most of the soils in the county have characteristics of the Coastal Plain. The parent material of these soils is deposits of various sediments from the ocean. Clayey sediments are the parent material of the Caroline, Craven, Gritney, Bethera, and Turbeville soils. Loamy sediments are the parent material of the Norfolk, Goldsboro, and Rains soils. Soils that formed in sandy deposits include the Pactolus soils.

The soils on flood plains and stream terraces formed in material that was washed from coastal deposits or from residual soils. Stream terraces are in nearly level areas that formed in old flood plain deposits. The soils in these areas are the Wickham, Altavista, Conetoe, and Tarboro soils. Flood plains formed in recently deposited alluvium adjacent to a stream or river. The soils on flood plains include the Wehadkee, Congaree, and Chastain soils.

The soils are influenced by many characteristics of the parent material. For example, the kind and amount of clay in a soil is a direct result of the minerals that occur in the parent material. The kind of clay influences the response of the soil to fertilizer and the stability of the soil for building foundations. The amount of clay affects such soil properties as workability, retention of fertilizer and water, and suitability as a site for septic tank absorption fields. The parent material also basically determines the amount of silt and sand in the soil, reaction, color, erodibility, topography, surface texture, and other properties that affect use and management.

Climate

Climate affects the physical, chemical, and biological relationships in the soil, primarily through the influences of precipitation and temperature, which greatly influence the rates of weathering of rocks and decomposition of organic matter. The amount of leaching in a soil is related to the amount of rainfall and its movement through the soil. The effects of climate also determine the kinds of plants and animals in a region. Temperature influences the kinds and growth of organisms in the soil and the speed of chemical and physical reactions.

Northampton County has a warm, humid climate, which favors rapid chemical processes in decomposing organic matter and weathering of rocks. The mild temperatures and abundant rainfall cause a high rate of leaching and oxidizing; thus, most of the soils are acidic and low in natural fertility and content of organic matter.

Plant and Animal Life

Plant and animal life are significant factors in soil formation. The kind and amount of organisms on and in the soil are determined to a large extent by the climate and to a varying degree by parent material, relief, and the age of the soil. Bacteria, fungi, and other microscopic organisms increase the rate at which rocks weather and organic matter decomposes. Plants and animals provide organic matter and transfer minerals and moisture between the surface layer and the subsoil.

Plants generally determine the kinds and amount of

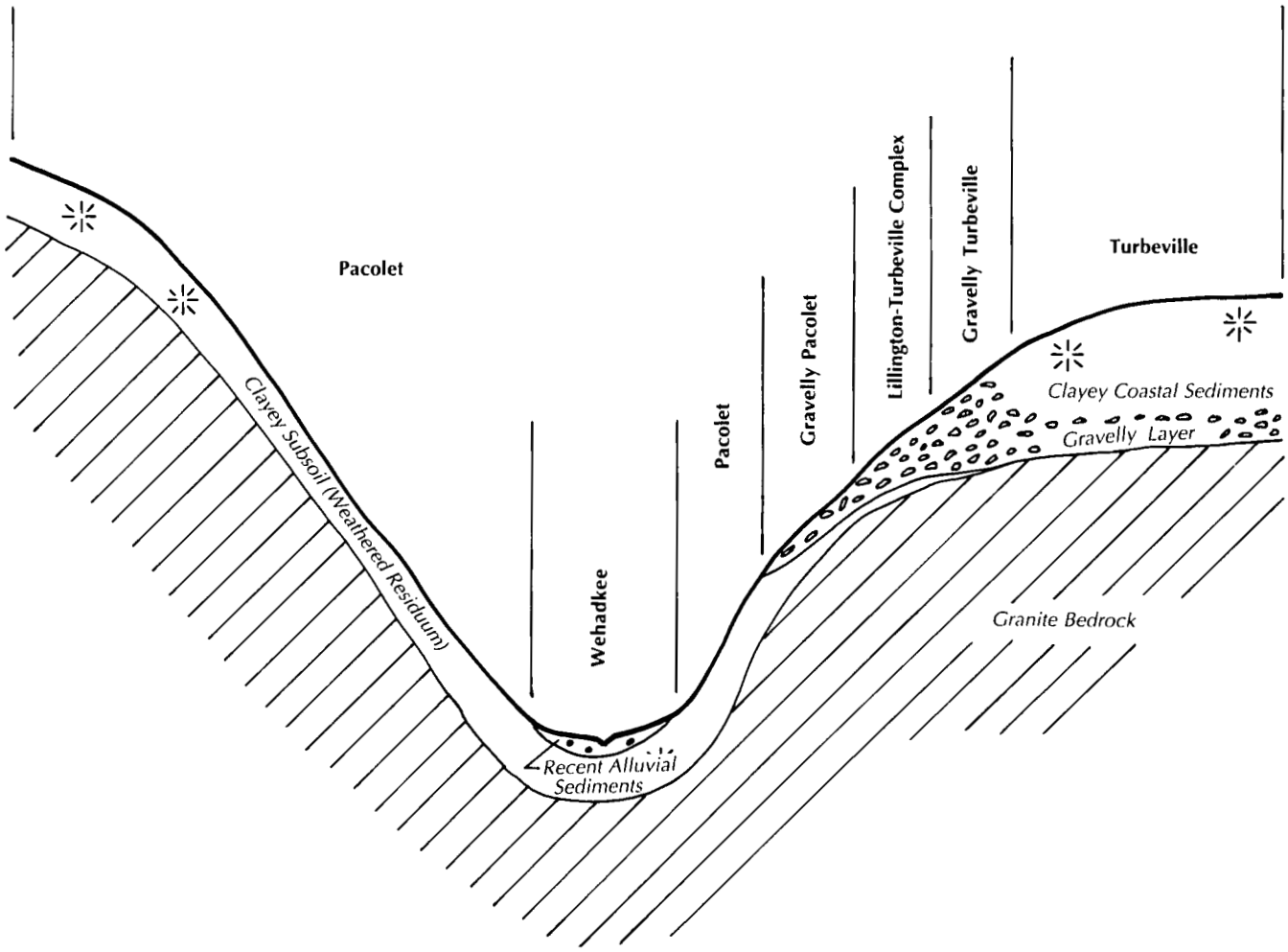

Figure 13.—A representative cross section of a landscape showing the location of some important soils and parent materials where the Upper Coastal Plain and Piedmont regions join.

organic matter that enter a soil under normal conditions and how the organic matter is added. Plants also are important in changing the base status of the soil and in the leaching process.

Animals convert complex compounds into simpler forms and add organic matter to the soil. They also modify certain chemical and physical properties of the soil. Organic matter accumulates on the surface. It is acted on by micro-organisms, fungi, and earthworms and by direct chemical reactions. The material is mixed with the uppermost part of the mineral layer of the soil by the activities of earthworms and other small invertebrates.

Trees take up elements from the subsoil and add organic matter to the surface in the form of leaves, roots, twigs, and eventually the whole tree. This material is acted on by organisms and chemical reactions to form a nutrient cycle. Organic materials decompose rather rapidly in the county because of the moderate temperatures and the adequate supply of rainfall. Organic matter decays more rapidly on the well drained soils in the uplands. Decomposition is slower and accumulation is greater in the wetter soils, such as Wehadkee, Tomotley, and Roanoke soils.

Relief

Relief, or topography, affects soil formation by causing differences in drainage, surface runoff, soil temperature, and the extent of geologic erosion. In Northampton County, relief varies greatly from the nearly level sediments in the Coastal Plain region to the steep side slopes on the Piedmont.

The percolation of water through the profile is affected by relief. Because the movement of water through the profile aids chemical reactions and is necessary for leaching, it is important in soil development. Leaching is reflected by the low amount of bases and the high acidity of most of the soils in the county.

In the western part of the county, the depth of the soils is directly related to slope. The soils in areas where the slope is less than 10 percent generally have deeper profiles that are better defined than those on the steeper slopes. The steeper slopes also favor a more rapid rate of geologic erosion.

The internal drainage of soils is directly affected by relief. In the uplands of the Coastal Plain region the gently sloping soils are generally well drained and the nearly level soils on broad flats are generally poorly drained and somewhat poorly drained. These soils formed in similar parent material and climatic conditions, but they have different characteristics because of their topographic position and internal drainage.

Time

The development of distinct soil horizons and profiles in Northampton County takes a very long time. The rate of development depends on climate, topography, parent material, and the activities of plants and animals.

The soils in the county vary in age. The oldest soils are deep or very deep and have well developed horizons. They are on smooth to gently sloping uplands in the Coastal Plain region. Examples are Norfolk, Caroline, Turbeville, and Bonneau soils. Soils that are intermediate in age are on stream terraces, which formed in older alluvial deposits. These soils have moderately developed profiles. Examples are Wickham, Conetoe, Altavista, and Roanoke soils. The soils that are subject to occasional or frequent flooding have weak profile development. Chastain, Congaree, and Wehadkee soils are examples of these younger soils.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Animal-unit-month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquifer. A water-bearing bed or stratum of permeable rock, sand, or gravel capable of fielding considerable quantities of water to wells or springs.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Atterberg limits. Atterberg limits are measured for soil materials passing the No. 40 sieve. They include the liquid limit (LL), which is the moisture content at which the soil passes from a plastic to a liquid state, and the plastic limit (PL), which is the water content corresponding to an arbitrary limit between the plastic and semisolid states of consistency of a soil.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Benchmark soil. A soil of large extent that holds a key position in the soil classification system or is of special significance to farming, engineering, forestry, or other uses.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but that have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clayey. A general textural term that includes sandy

clay, silty clay, and clay. According to family level criteria in the soil taxonomic system, a specific textural name referring to fine earth (particles less than 2 millimeters in size) containing 35 percent or more clay, by weight, within the control section. The content of rock fragments is less than 35 percent, by volume.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Coastal Plain. The physiographic region of eastern North Carolina that consists of ocean-deposited sediments of sand, silt, and clay. These areas of sediments are level to rolling and vary in thickness.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are:

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crop residue management. Use of that portion of the plant or crop left in the field after harvest for protection or improvement of the soil.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Dbh (diameter at breast height). The diameter of a tree at 4 feet above the ground level on the uphill side.

Delineation. The process of drawing or plotting features on a map with lines and symbols.

Depth class. Refers to the depth to a root-restricting layer. Unless otherwise stated, this layer is understood to be consolidated bedrock. The depth classes in this survey are:

Very shallow	less than 10 inches
Shallow	10 to 20 inches
Moderately deep	20 to 40 inches
Deep	40 to 60 inches
Very deep	more than 60 inches

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused

by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Engineering index test data. Laboratory test and mechanical analysis of selected soils in the county.

Erosion classes. Classes based on estimates of past erosion. The classes are as follows:

Class 1.—Soils that have lost some of the original A horizon but on the average less than 25 percent of the original A horizon or of the uppermost 8 inches (if the original A horizon was less than 8 inches thick). Throughout most of the area, the thickness of the surface layer is within the normal range of variability of the uneroded soil. Class 1 erosion typically is not designated in the name of the map unit or in the map symbol.

Class 2.—Soils that have lost an average of 25 to 75 percent of the original A horizon or of the uppermost 8 inches (if the original A horizon was less than 8 inches thick). Throughout most cultivated areas of class 2 erosion, the surface layer consists of a mixture of the original A horizon and material from below. Some areas may have intricate patterns ranging from uneroded spots to spots where all of the original A horizon has been removed.

Class 3.—Soils that have lost an average of 75 percent or more of the original A horizon or of the uppermost 8 inches (if the original A horizon was less than 8 inches thick). In most areas of class 3 erosion, material that was below the original A horizon is exposed. The plow layer consists entirely or largely of this material.

Class 4.—Soils that have lost all of the original A horizon or of the uppermost 8 inches (if the original A horizon was less than 8 inches thick) plus some or all of the deeper horizons throughout most of the area. The original soil can be identified only in spots. Some areas may be smooth, but most have an intricate pattern of gullies.

Erosion hazard. Terms describing the potential for future erosion, inherent in the soil itself, in inadequately protected areas. The following definitions are based on estimated annual soil loss in tons per acre (values determined by the Universal Soil Loss Equation assuming bare soil

conditions and using rainfall and climate factors for North Carolina):

0 tons per acre	None
Less than 1 ton per acre	Slight
1 to 5 tons per acre	Moderate
5 to 10 tons per acre	Severe
More than 10 tons per acre	Very severe

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.
Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.
Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grains are grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flooding. The temporary covering of the surface by flowing water from any source, such as overflowing streams, runoff from adjacent or surrounding slopes, and inflow from high tides. The frequency of flooding generally is expressed as none, rare, occasional, or frequent. *None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year). *Occasional* means flooding occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year). *Frequent* means that flooding occurs often under normal weather conditions (the chance of flooding is more than 50 percent in any year). The duration of flooding is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 days to 1 month), and *very long* (more than 1 month).

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Granite. A coarse grained igneous rock dominated by light colored minerals, consisting of about 50 percent orthoclase and 25 percent quartz with the balance being plagioclase feldspars and ferromagnesian silicates. Granites and granodiorites comprise 95 percent of all intrusive rocks.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hemic soil material (mucky peat). Organic soil

material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is, in part, a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as accumulation of clay, sesquioxides, humus, or a combination of these; prismatic or blocky structure; redder or browner colors than those in the A horizon; or a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Arabic numeral 2 precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated rock (unweathered bedrock) beneath the soil. The hard bedrock commonly underlies a C horizon but can be directly below an A or a B horizon.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Infiltration. The downward entry of water into the immediate surface of soil or other material. This contrasts with percolation, which is movement of water through soil layers or material.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Interstream area. The nearly level land between drainageways in relatively undissected parts of the Coastal Plain. It is in areas on uplands, low marine terraces, and stream terraces. Soils in these areas are generally poorly drained or very poorly drained.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the surface

through pipes or nozzles from a pressure system.
Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.
Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kaolinite. An aluminosilicate clay mineral with a 1:1 layer structure; that is, a silicon tetrahedral sheet alternating with an aluminum octahedral sheet. Little or no expansion occurs when water mixes with the clay.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loamy. A general textural term that includes coarse sandy loam, sandy loam, fine sandy loam, very fine sandy loam, loam, silt loam, silt, clay loam, sandy clay loam, and silty clay loam. According to family level criteria in the soil taxonomic system, a specific textural name referring to fine earth (particles less than 2 millimeters in size) of loamy very fine sand or finer textured material that contains less than 35 percent clay, by weight, within the control section. The content of rock fragments is less than 35 percent, by volume.

Low strength. The soil is not strong enough to support loads.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Micas. A group of silicate minerals characterized by sheet or scale cleavage. Biotite is the ferromagnesian black mica. Muscovite is the potassic white mica.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

No-till planting. A method of planting crops in which there is virtually no seedbed preparation. A thin slice of the soil is opened, and the seed is planted at the desired depth.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Overstory. The portion of the trees in a forest stand forming the upper crown cover.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch

Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piedmont. The physiographic region of central North Carolina characterized by rolling landscapes formed from the weathering of residual rock material.

Piping (in tables). Subsurface tunnels or pipelike cavities are formed by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	below 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Road cut. A sloping surface made by mechanical means during road construction. It is generally on the uphill section of a road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Runoff class (surface). Refers to the rate at which water flows away from the soil over the surface without infiltrating. Six classes of rate of runoff are recognized:

Ponded.—Little of the precipitation and water that runs onto the soil escapes as runoff, and free water stands on the surface for significant periods. The amount of water that is removed from ponded areas by movement through the soil, by plants, or by evaporation is usually greater than the total rainfall. Ponding normally occurs on level or nearly level soils in depressions. The water depth may fluctuate greatly.

Very slow.—Surface water flows away slowly, and free water stands on the surface for long periods or immediately enters the soil. Most of the water passes through the soil, is used by plants, or evaporates. The soils are commonly level or

nearly level or are very open and porous.

Slow.—Surface water flows away so slowly that free water stands on the surface for moderate periods or enters the soil rapidly. Most of the water passes through the soil, is used by plants, or evaporates. The soils are nearly level or very gently sloping, or they are steeper but absorb precipitation very rapidly.

Medium.—Surface water flows away so rapidly that free water stands on the surface for only short periods. Part of the precipitation enters the soil and is used by plants, is lost by evaporation, or moves into underground channels. The soils are nearly level or gently sloping and absorb precipitation at a moderate rate, or they are steeper but absorb water rapidly.

Rapid.—Surface water flows away so rapidly that the period of concentration is brief and free water does not stand on the surface. Only a small part of the water enters the soil. The soils are mainly moderately steep or steep and have moderate or slow rates of absorption.

Very rapid.—Surface water flows away so rapidly that the period of concentration is very brief and free water does not stand on the surface. Only a small part of the water enters the soil. The soils are mainly steep or very steep and absorb precipitation slowly.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandy. A general textural term that includes coarse sand, sand, fine sand, very fine sand, loamy coarse sand, loamy sand, loamy fine sand, and loamy very fine sand. According to family level criteria in the soil taxonomic system, a specific textural name referring to fine earth (particles less than 2 millimeters in size) of sand or loamy sand that contains less than 50 percent very fine sand, by weight, within the control section. The content of rock fragments is less than 35 percent, by volume.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saprolite (soil science). Unconsolidated, residual material underlying the soil and grading to hard bedrock below.

Seasonal high water table. The highest level of a saturated zone (the apparent or perched water table) over a continuous period of more than 2 weeks in most years, but not a permanent water table.

Second bottom. The first stream terrace above the present flood plain. It is slightly higher in elevation and may be subject to rare flooding. It is the result of uplift or the lowering of base level.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey area slope classes are as follows:

Nearly level	0 to 2 percent
Gently sloping	2 to 8 percent
Strongly sloping	8 to 15 percent
Moderately steep	15 to 25 percent
Steep	25 to 50 percent

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil compaction. An alteration of soil structure that ultimately can affect the biological and chemical properties of the soil. Soil compaction decreases the extent of voids and increases bulk density.

Soil map unit. A kind of soil or miscellaneous area or a combination of two or more soils or one or more soils and one or more miscellaneous areas that can be shown at the scale of mapping for the defined purposes and objectives of the soil survey. They are generally designed to reflect significant differences in use and management.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Soil strength. Load supporting capacity of a soil at specific moisture and density conditions.

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, thickness of the line can be one fragment or more. It generally overlies material that weathered in place, and it is overlain by recent sediments of variable thickness.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to soil blowing and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from soil blowing and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in organic matter content than the overlying surface layer.

Suitability ratings. Ratings for the degree of suitability of soils for pasture, crops, woodland, and engineering uses. The ratings and the general criteria used for their selection are as follows:

Well suited.—The intended use may be initiated and maintained by using only the standard materials and methods typically required for that use. Good results can be expected.

Moderately suited.—The limitations affecting the intended use make special planning, design, or maintenance necessary.

Poorly suited.—The intended use is difficult or costly to initiate and maintain because of certain soil properties, such as steep slopes, a high hazard of erosion, a high water table, low fertility, or a hazard of flooding. Major soil reclamation, special design, or intensive management practices are needed.

Very poorly suited, Not suited, or Unsuited.—The intended use is very difficult or costly to initiate and maintain, and thus it generally should not be undertaken.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth

from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Terrace. An embankment, or ridge, constructed on the contour or at a slight angle to the contour across sloping soils. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine." The textural classes are defined as follows:

Sands (coarse sand, sand, fine sand, and very fine sand). —Soil material in which the content of sand is 85 percent or more and the percentage of silt plus 1.5 times the percentage of clay does not exceed 15.

Loamy sands (loamy coarse sand, loamy sand, loamy fine sand, and loamy very fine sand). —Soil material in which, at the upper limit, sand is 85 to 90 percent and the percentage of silt plus 1.5 times the percentage of clay is not less than 15; at the lower limit, the content of sand is 70 to 85 percent and the percentage of silt plus twice the percentage of clay does not exceed 30.

Sandy loams (coarse sandy loam, sandy loam, fine sandy loam, and very fine sandy loam). —Soil material in which the content of clay is 20 percent or less, the percentage of silt plus twice the percentage of clay exceeds 30, and the content of sand is 52 percent or more, or soil material in which the content of clay is less than 7 percent, the content of silt is less than 50 percent, and the content of sand is 43 to 52 percent.

Loam.—Soil material that contains 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand.

Silt loam.—Soil material that contains 50 or more percent silt and 12 to 27 percent clay or 50 to 80 percent silt and less than 12 percent clay.

Silt.—Soil material that contains 80 or more percent silt and less than 12 percent clay.

Sandy clay loam.—Soil material that contains 20 to 35 percent clay, less than 28 percent silt, and 45 or more percent sand.

Clay loam.—Soil material that contains 27 to 40 percent clay and 20 to 45 percent sand.

Silty clay loam.—Soil material that contains 27 to 40 percent clay and less than 20 percent sand.

Sandy clay.—Soil material that contains 35 or more percent clay and 45 or more percent sand.

Silty clay.—Soil material that contains 40 or more percent clay and 40 or more percent silt.

Clay.—Soil material that contains 40 or more percent clay, less than 45 percent sand, and less than 40 percent silt.

Thin layer (in tables). An otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, such as zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Underlying material. Technically the C horizon; the part of the soil below the biologically altered A and B horizons.

Understory. The trees and other woody species growing under a more or less continuous cover of branches and foliage formed collectively by the upper portions of adjacent trees and other woody growth.

Universal Soil Loss Equation. An equation used to design water erosion control systems. The equation is A=RKLSPC wherein A is the average annual soil loss in tons per acre per year, R is the rainfall factor, K is the soil erodibility factor, L is the length of slope, S is the steepness of slope, P is the conservation practice factor, and C is the cropping and management factor.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Water table (apparent). A thick zone of free water in the soil. The apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Water table (perched). A saturated zone of water in the soil standing above an unsaturated zone.

Water table (seasonal high). The highest level of a saturated zone in the soil (the apparent or perched water table) over a continuous period of

more than 2 weeks in most years, but not a permanent water table.

Weathering. All physical and chemical changes produced by atmospheric agents in rocks or other deposits at or near the earth's surface. These changes result in disintegration and decomposition of the material.

Wetness. A general term applied to soils that hold water at or near the surface long enough to be a common management problem.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1951-84 at Jackson, North Carolina)

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average daily	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January-----	50.2	29.0	39.6	74	6	29	3.67	2.10	5.06	8	2.1
February----	53.5	31.0	42.3	77	9	31	3.85	2.44	5.13	7	2.7
March-------	61.8	37.6	49.7	84	19	119	3.97	2.83	5.02	8	1.5
April-------	72.9	46.2	59.6	90	28	293	3.14	1.89	4.25	6	.1
May---------	79.8	55.2	67.5	94	36	543	4.22	2.31	5.90	7	.0
June--------	86.0	62.5	74.3	98	46	729	3.61	2.29	4.79	7	.0
July--------	89.4	67.3	78.4	100	53	880	4.87	2.61	6.86	8	.0
August------	88.3	66.4	77.4	99	51	849	4.76	1.80	7.22	7	.0
September---	82.8	59.9	71.4	97	41	642	3.74	1.63	5.54	5	.0
October-----	72.5	48.6	60.6	89	27	335	3.15	1.11	4.83	5	.0
November----	63.1	38.6	50.9	83	19	96	2.95	1.51	4.20	5	.0
December----	53.7	31.7	42.7	76	9	53	3.66	2.17	4.98	7	1.1
Yearly:											
Average----	71.2	47.8	59.5	---	---	---	---	---	---	---	---
Extreme----	---	---	---	102	5	---	---	---	---	---	---
Total------	---	---	---	---	---	4,599	45.59	40.87	50.96	80	7.5

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1951-84 at Jackson, North Carolina)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than	Mar. 30	Apr. 12	Apr. 25
2 years in 10 later than	Mar. 23	Apr. 7	Apr. 20
5 years in 10 later than	Mar. 11	Mar. 28	Apr. 10
First freezing temperature in fall:			
1 year in 10 earlier than	Nov. 4	Oct. 25	Oct. 16
2 years in 10 earlier than	Nov. 9	Oct. 29	Oct. 19
5 years in 10 earlier than	Nov. 20	Nov. 7	Oct. 26

TABLE 3.--GROWING SEASON

(Recorded in the period 1951-84 at Jackson, North Carolina)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	230	201	182
8 years in 10	238	209	188
5 years in 10	254	224	199
2 years in 10	269	239	210
1 year in 10	277	247	216

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
AtA	Altavista fine sandy loam, 0 to 3 percent slopes, rarely flooded	6,827	1.9
AuA	Autryville loamy sand, 0 to 3 percent slopes	902	0.3
Be	Bethera silt loam	31,049	8.7
BoB	Bonneau loamy sand, 0 to 6 percent slopes	23,745	6.7
BoC	Bonneau loamy sand, 6 to 12 percent slopes	3,563	1.0
CaA	Caroline sandy loam, 0 to 2 percent slopes	5,408	1.5
CaB	Caroline sandy loam, 2 to 6 percent slopes	10,092	2.9
Ch	Chastain silt loam, frequently flooded	8,276	2.4
CnB	Conetoe loamy sand, 0 to 5 percent slopes	1,331	0.4
Co	Congaree silt loam, 0 to 4 percent slopes, occasionally flooded	7,930	2.3
CrA	Craven fine sandy loam, 0 to 1 percent slopes	18,821	5.4
CrB	Craven fine sandy loam, 1 to 4 percent slopes	16,206	4.6
CrC	Craven fine sandy loam, 4 to 10 percent slopes	2,019	0.6
CsB2	Craven sandy clay loam, 1 to 4 percent slopes, eroded	1,573	0.4
CuB	Craven-Urban land complex, 0 to 4 percent slopes	432	0.1
ExA	Exum loam, 0 to 2 percent slopes	638	0.2
GoA	Goldsboro sandy loam, 0 to 2 percent slopes	18,046	5.1
GuA	Goldsboro-Urban land complex, 0 to 2 percent slopes	238	0.1
GxB	Gritney sandy loam, 2 to 6 percent slopes	18,109	5.1
GxC	Gritney sandy loam, 6 to 10 percent slopes	4,425	1.3
GyB2	Gritney sandy clay loam, 2 to 6 percent slopes, eroded	2,306	0.7
GyC2	Gritney sandy clay loam, 6 to 10 percent slopes, eroded	271	0.1
HeB	Helena sandy loam, 1 to 6 percent slopes	276	0.1
Le	Lenoir silt loam	20,643	5.9
LtD	Lillington-Turbeville complex, 8 to 15 percent slopes	1,835	0.5
Ly	Lynchburg fine sandy loam	5,243	1.5
NoA	Norfolk sandy loam, 0 to 2 percent slopes	13,405	3.8
NoB	Norfolk sandy loam, 2 to 6 percent slopes	19,710	5.6
NoC	Norfolk sandy loam, 6 to 10 percent slopes	1,094	0.3
NuB	Norfolk-Urban land complex, 0 to 6 percent slopes	615	0.2
OcA	Ocilla loamy fine sand, 0 to 3 percent slopes	498	0.1
PcB2	Pacolet sandy clay loam, 2 to 8 percent slopes, eroded	1,354	0.4
PcD2	Pacolet sandy clay loam, 8 to 15 percent slopes, eroded	2,057	0.6
PcE2	Pacolet sandy clay loam, 15 to 30 percent slopes, eroded	1,904	0.5
PgE2	Pacolet gravelly sandy clay loam, 15 to 30 percent slopes, eroded	1,395	0.4
PtA	Pactolus loamy fine sand, 0 to 2 percent slopes	535	0.2
Ra	Rains fine sandy loam	13,615	3.9
Ro	Roanoke silt loam, occasionally flooded	3,228	0.9
Se	Seabrook loamy sand, rarely flooded	910	0.3
StA	State sandy loam, 0 to 3 percent slopes, rarely flooded	1,000	0.3
TaB	Tarboro sand, 0 to 5 percent slopes	2,887	0.8
Te	Tomotley fine sandy loam, rarely flooded	3,604	1.0
TrA	Turbeville loamy sand, 0 to 2 percent slopes	911	0.3
TrB	Turbeville loamy sand, 2 to 6 percent slopes	721	0.2
TsA	Turbeville sandy loam, 0 to 2 percent slopes	1,329	0.4
TsB	Turbeville sandy loam, 2 to 6 percent slopes	2,631	0.7
TsC	Turbeville sandy loam, 6 to 12 percent slopes	277	0.1
TtB2	Turbeville sandy clay loam, 2 to 6 percent slopes, eroded	1,187	0.3
TuB	Turbeville gravelly sandy loam, 2 to 8 percent slopes	1,306	0.4
TxB	Turbeville-Urban land complex, 0 to 8 percent slopes	402	0.1
Ud	Udorthents, loamy	1,561	0.4
WaA	Wahee fine sandy loam, 0 to 2 percent slopes, rarely flooded	106	*
WdB	Wedowee sandy loam, 2 to 8 percent slopes	2,197	0.6
WeD2	Wedowee sandy clay loam, 8 to 15 percent slopes, eroded	2,222	0.6
Wh	Wehadkee loam, frequently flooded	33,543	9.5
WkA	Wickham fine sandy loam, 0 to 2 percent slopes	7,604	2.2
WkB	Wickham fine sandy loam, 2 to 8 percent slopes	4,867	1.4
WtE	Winton fine sandy loam, 10 to 25 percent slopes	3,043	0.9
WtF	Winton fine sandy loam, 25 to 50 percent slopes	2,603	0.7
	Water	7,232	2.1
	Total	351,757	100.0

* Less than 0.1 percent.

TABLE 5.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Soil name and map symbol	Land capability	Cotton lint	Corn	Peanuts	Soybeans	Tobacco	Wheat	Pasture
		Lbs	Bu	Lbs	Bu	Lbs	Bu	AUM*
AtA---------- Altavista	IIw	650	125	---	42	3,000	55	11.5
AuA---------- Autryville	IIs	600	75	3,000	25	2,200	50	9.0
Be---------- Bethera	VIw	---	105	---	35	---	55	10.0
	IIIw**	---	---	---	---	---	---	---
BoB---------- Bonneau	IIe	700	85	2,900	30	2,600	45	8.5
BoC---------- Bonneau	IIIe	650	80	---	25	2,500	42	8.0
CaA---------- Caroline	I	600	115	2,900	40	2,800	60	8.0
CaB---------- Caroline	IIe	575	110	2,800	40	2,700	60	8.0
Ch---------- Chastain	VIw	---	---	---	---	---	---	8.0
CnB---------- Conetoe	IIs	---	75	3,000	25	2,200	40	9.0
Co---------- Congaree	IIw	---	160	---	45	---	---	10.0
CrA---------- Craven	IIw	600	115	2,900	40	2,700	55	10.0
CrB---------- Craven	IIIe	500	105	2,800	35	2,500	50	10.0
CrC---------- Craven	IVe	400	90	2,600	30	2,300	45	9.0
CsB2---------- Craven	IVe	450	95	2,600	30	2,300	40	8.0
CuB***:								
Craven---------	IIIe	---	---	---	---	---	---	---
Urban land-----	VIIIs	---	---	---	---	---	---	---
ExA---------- Exum	IIw	750	125	3,400	50	3,000	65	11.0
GoA---------- Goldsboro	IIw	700	125	3,600	42	3,000	60	11.5
GuA***:								
Goldsboro------	IIw	---	---	---	---	---	---	---
Urban land-----	VIIIs	---	---	---	---	---	---	---

See footnotes at end of table.

TABLE 5.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Cotton lint	Corn	Peanuts	Soybeans	Tobacco	Wheat	Pasture
		Lbs	Bu	Lbs	Bu	Lbs	Bu	AUM*
GxB---------- Gritney	IIIe	600	90	3,000	28	2,500	40	6.2
GxC, GyB2------- Gritney	IVe	550	80	2,600	24	2,200	35	6.0
GyC2---------- Gritney	VIe	---	---	---	---	---	---	5.5
HeB---------- Helena	IIe	575	80	---	---	2,100	40	6.2
Le---------- Lenoir	IIIw	525	100	2,700	40	2,200	45	10.0
LtD:								
Lillington-----	IVs	500	70	---	25	1,800	30	5.0
Turbeville-----	IVe	550	80	---	28	1,900	40	5.5
Ly---------- Lynchburg	IIw	675	115	3,800	45	2,800	---	---
NoA---------- Norfolk	I	700	110	4,000	40	3,000	60	10.5
NoB---------- Norfolk	IIe	650	100	3,700	35	2,900	55	10.0
NoC---------- Norfolk	IIIe	600	90	3,300	30	2,700	50	9.5
NuB***:								
Norfolk--------	IIe	---	---	---	---	---	---	---
Urban land-----	VIIIs	---	---	---	---	---	---	---
OcA---------- Ocilla	IIIw	---	75	2,200	35	2,600	40	8.5
PcB2---------- Pacolet	IIIe	500	75	---	25	1,900	35	6.0
PcD2---------- Pacolet	VIe	---	---	---	---	---	---	5.5
PcE2, PgE2------ Pacolet	VIIe	---	---	---	---	---	---	---
PtA---------- Pactolus	IIIs	---	65	2,200	25	1,800	---	6.0
Ra---------- Rains	IIIw	450	110	3,400	40	2,300	55	9.0
Ro---------- Roanoke	IVw	450	95	2,500	30	2,300	45	6.8
	IIIw**	---	---	---	---	---	---	5.2
Se---------- Seabrook	IIIs	---	75	---	30	---	---	4.0

See footnotes at end of table.

TABLE 5.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Cotton lint	Corn	Peanuts	Soybeans	Tobacco	Wheat	Pasture
		Lbs	Bu	Lbs	Bu	Lbs	Bu	AUM*
StA---------- State	I	---	130	3,300	45	3,000	60	---
TaB---------- Tarboro	IIIs	---	50	2,000	20	---	---	6.0
Te---------- Tomotley	IVw	---	130	---	40	---	55	10.0
	IIIw**	---	---	---	---	---	---	6.0
TrA---------- Turbeville	I	650	130	3,100	45	3,000	50	9.0
TrB---------- Turbeville	IIe	625	120	3,000	40	2,800	50	8.5
TsA---------- Turbeville	I	650	130	3,100	45	3,000	50	9.0
TsB---------- Turbeville	IIe	625	120	3,000	40	2,800	50	8.5
TsC---------- Turbeville	IIIe	575	110	2,800	36	2,600	50	8.0
TtB2---------- Turbeville	IIIe	575	100	2,800	33	2,600	40	8.0
TuB---------- Turbeville	IIe	600	120	---	40	2,700	50	8.0
TxB***:								
Turbeville-----	IIe	---	---	---	---	---	---	---
Urban land-----	VIIIs	---	---	---	---	---	---	---
Ud---------- Udorthents	VIIe	---	---	---	---	---	---	---
WaA---------- Wahee	IIw	---	110	---	45	---	---	9.0
WdB---------- Wedowee	IIe	525	80	2,300	27	2,000	35	6.0
WeD2---------- Wedowee	VIe	---	---	---	---	---	---	5.5
Wh---------- Wehadkee	VIw	---	---	---	---	---	---	8.5
WkA---------- Wickham	I	800	125	3,600	42	2,800	55	9.5
WkB---------- Wickham	IIe	750	115	3,300	38	2,600	53	9.5
WtE---------- Winton	VIe	---	---	---	---	---	---	5.2

See footnotes at end of table.

TABLE 5.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Cotton lint	Corn	Peanuts	Soybeans	Tobacco	Wheat	Pasture
		Lbs	Bu	Lbs	Bu	Lbs	Bu	AUM*
WtF---------- Winton	VIIe	---	---	---	---	---	---	5.0

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** Drained areas.

*** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available)

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Potential productivity: Common trees	Site index	Volume*	Trees to plant
AtA Altavista	9A	Slight	Slight	Slight	Loblolly pine	91	133	Loblolly pine.
					Longleaf pine	87	117	
					White oak	77	59	
					Shortleaf pine	---	---	
					Sweetgum	---	---	
					Red maple	---	---	
					Yellow-poplar	---	---	
					Southern red oak	---	---	
					Water oak	---	---	
					American beech	---	---	
					Hickory	---	---	
					Black cherry	---	---	
AuA Autryville	7S	Slight	Moderate	Moderate	Loblolly pine	77	105	Loblolly pine, longleaf pine.
					Longleaf pine	60	56	
					Southern red oak	---	---	
					Hickory	---	---	
					Sweetgum	---	---	
					Red maple	---	---	
					White oak	---	---	
					Post oak	---	---	
					American beech	---	---	
Be Bethera	8W	Slight	Severe	Severe	Sweetgum	95	122	Sweetgum, loblolly pine.
					Cypress	---	---	
					Water oak	---	---	
					Loblolly pine	---	---	
BoB, BoC Bonneau	10S	Slight	Moderate	Moderate	Loblolly pine	95	142	Loblolly pine, longleaf pine.
					Longleaf pine	75	90	
					White oak	---	---	
					Hickory	---	---	
					Red maple	---	---	
					Sweetgum	---	---	
					Black cherry	---	---	
					American beech	---	---	
					Southern red oak	---	---	
					Post oak	---	---	
CaA, CaB Caroline	8A	Moderate	Slight	Slight	Loblolly pine	76	103	Loblolly pine.
					Shortleaf pine	70	110	
					Virginia pine	70	109	
					Southern red oak	70	52	
					White oak	75	57	
					Yellow-poplar	---	---	
					Black cherry	---	---	
					Red maple	---	---	
					Hickory	---	---	
Ch Chastain	8W	Slight	Severe	Severe	Sweetgum	95	122	Sweetgum.
					Baldcypress	---	---	
					Water tupelo	---	---	
					Water oak	---	---	
					Red maple	---	---	

See footnote at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Potential productivity: Common trees	Site index	Volume*	Trees to plant
CnB---------- Conetoe	8S	Slight	Moderate	Moderate	Loblolly pine--------	85	120	Loblolly pine, longleaf pine.
					Longleaf pine--------	---	---	
					Southern red oak-----	---	---	
					Post oak----------	---	---	
					White oak----------	---	---	
					Hickory----------	---	---	
					Sweetgum----------	---	---	
					Black cherry---------	---	---	
					American beech-------	---	---	
Co---------- Congaree	10A	Slight	Moderate	Slight	Sweetgum----------	100	138	Loblolly pine.
					Yellow-poplar--------	107	119	
					Cherrybark oak-------	---	---	
					Loblolly pine--------	90	131	
					Eastern cottonwood---	107	147	
					American sycamore----	89	96	
					Black walnut---------	---	---	
					Scarlet oak----------	100	82	
					Willow oak----------	95	92	
					Green ash----------	---	---	
					American beech-------	---	---	
CrA, CrB, CrC------ Craven	9C	Slight	Moderate	Slight	Loblolly pine--------	88	127	Loblolly pine.
					White oak----------	90	72	
					Willow oak----------	85	80	
					Southern red oak-----	90	72	
					Sweetgum----------	---	---	
					Red maple----------	---	---	
					Post oak----------	---	---	
					Hickory----------	---	---	
					American beech-------	---	---	
CsB2---------- Craven	8C	Slight	Moderate	Moderate	Loblolly pine--------	80	110	Loblolly pine.
					Sweetgum----------	---	---	
					White oak----------	---	---	
ExA---------- Exum	8A	Slight	Slight	Slight	Loblolly pine--------	82	114	Loblolly pine.
					Longleaf pine--------	---	---	
					Sweetgum----------	---	---	
					Yellow-poplar--------	---	---	
					Southern red oak-----	---	---	
					White oak----------	---	---	
					Red maple----------	---	---	
GoA---------- Goldsboro	9A	Slight	Slight	Slight	Loblolly pine--------	90	131	Loblolly pine.
					Longleaf pine--------	73	86	
					Sweetgum----------	---	---	
					Southern red oak-----	---	---	
					White oak----------	---	---	
					Water oak----------	---	---	
					Yellow-poplar--------	---	---	
GxB, GxC---------- Gritney	8A	Slight	Slight	Slight	Loblolly pine--------	85	120	Loblolly pine.
					White oak----------	---	---	
					Southern red oak-----	---	---	
					Sweetgum----------	---	---	
					Yellow-poplar--------	---	---	
					Hickory----------	---	---	
					Red maple----------	---	---	

See footnote at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Potential productivity: Common trees	Site index	Volume*	Trees to plant
GyB2, GyC2 Gritney	8C	Slight	Moderate	Moderate	Loblolly pine	80	110	Loblolly pine.
					White oak	---	---	
					Southern red oak	---	---	
					Sweetgum	---	---	
					Yellow-poplar	---	---	
					Hickory	---	---	
					Red maple	---	---	
HeB Helena	8A	Slight	Slight	Slight	Loblolly pine	84	118	Loblolly pine, yellow-poplar.
					Shortleaf pine	66	101	
					White oak	---	---	
					Yellow-poplar	---	---	
					Sweetgum	---	---	
					Northern red oak	---	---	
					Southern red oak	---	---	
					Black oak	---	---	
					Hickory	---	---	
					Virginia pine	---	---	
					Willow oak	---	---	
					American elm	---	---	
Le Lenoir	9W	Slight	Moderate	Slight	Loblolly pine	87	125	Loblolly pine.
					Water oak	---	---	
					Sweetgum	---	---	
					Southern red oak	---	---	
					Yellow-poplar	---	---	
					Red maple	---	---	
LtD:								
Lillington	9A	Slight	Slight	Slight	Loblolly pine	86	123	Loblolly pine.
					Shortleaf pine	60	88	
					Longleaf pine	61	57	
					White oak	---	---	
					Southern red oak	---	---	
					Sweetgum	---	---	
					Yellow-poplar	---	---	
					Hickory	---	---	
Turbeville	6A	Slight	Slight	Slight	Loblolly pine	70	93	Loblolly pine.
					Shortleaf pine	60	88	
					Southern red oak	60	43	
Ly Lynchburg	9W	Slight	Moderate	Slight	Loblolly pine	86	123	Loblolly pine, American sycamore, sweetgum.
					Longleaf pine	74	88	
					Yellow-poplar	92	93	
					Sweetgum	90	106	
					Southern red oak	---	---	
					White oak	---	---	
					Blackgum	---	---	
					Black cherry	---	---	
NoA, NoB, NoC Norfolk	8A	Slight	Slight	Slight	Loblolly pine	84	118	Loblolly pine.
					Longleaf pine	77	94	
					Southern red oak	---	---	
					White oak	---	---	
					Yellow-poplar	---	---	
					Blackgum	---	---	
					Hickory	---	---	
					American beech	---	---	
					Red maple	---	---	
					Black cherry	---	---	

See footnote at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Potential productivity: Common trees	Site index	Volume*	Trees to plant
OcA Ocilla	8W	Slight	Moderate	Moderate	Loblolly pine	85	120	Loblolly pine.
					Longleaf pine	77	94	
					Water oak	---	---	
					Southern red oak	---	---	
					White oak	---	---	
					Yellow-poplar	---	---	
					Red maple	---	---	
					Sweetgum	---	---	
PcB2, PcD2 Pacolet	6C	Slight	Moderate	Moderate	Loblolly pine	70	93	Loblolly pine, shortleaf pine, yellow-poplar, eastern white pine.
					Shortleaf pine	60	88	
					Yellow-poplar	80	71	
					Sweetgum	---	---	
					White oak	---	---	
PcE2, PgE2 Pacolet	6C	Moderate	Moderate	Moderate	Loblolly pine	70	93	Loblolly pine, shortleaf pine, yellow-poplar, eastern white pine.
					Shortleaf pine	60	88	
					Yellow-poplar	80	71	
					Sweetgum	---	---	
					White oak	---	---	
PtA Pactolus	9S	Slight	Moderate	Moderate	Loblolly pine	86	123	Loblolly pine.
					Longleaf pine	---	---	
					Sweetgum	---	---	
					Water oak	---	---	
					Willow oak	---	---	
					Red maple	---	---	
					Black cherry	---	---	
					White oak	---	---	
					Hickory	---	---	
					Southern red oak	---	---	
Ra Rains	10W	Slight	Moderate	Moderate	Loblolly pine	94	140	Loblolly pine, sweetgum, American sycamore.
					Sweetgum	90	106	
					Water oak	---	---	
					White oak	---	---	
					Red maple	---	---	
					Hickory	---	---	
					Blackgum	---	---	
					Willow oak	---	---	
Ro Roanoke	7W	Slight	Severe	Severe	Sweetgum	90	106	Sweetgum, loblolly pine.
					Willow oak	76	68	
					White oak	75	57	
Se Seabrook	8S	Slight	Moderate	Moderate	Loblolly pine	81	112	Loblolly pine, longleaf pine.
					Longleaf pine	---	---	
					Southern red oak	---	---	
					Sweetgum	---	---	
					Red maple	---	---	
					Yellow-poplar	---	---	
					Water oak	---	---	
					Willow oak	---	---	
					American beech	---	---	
					Black cherry	---	---	

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Potential productivity: Common trees	Site index	Volume*	Trees to plant
StA State	9A	Slight	Slight	Slight	Loblolly pine	86	123	Loblolly pine, black walnut, yellow-poplar.
					Southern red oak	85	67	
					Yellow-poplar	100	107	
					Virginia pine	85	129	
					Hickory	---	---	
					American beech	---	---	
					White oak	---	---	
					Red maple	---	---	
					Blackgum	---	---	
					Black cherry	---	---	
TaB Tarboro	7S	Slight	Moderate	Moderate	Loblolly pine	72	96	Loblolly pine, longleaf pine.
					Longleaf pine	---	---	
					Southern red oak	---	---	
					White oak	---	---	
					Post oak	---	---	
					Sweetgum	---	---	
					American beech	---	---	
Te Tomotley	10W	Slight	Moderate	Moderate	Loblolly pine	97	147	Loblolly pine.
					Water oak	78	71	
					Willow oak	86	81	
					Sweetgum	---	---	
					Yellow-poplar	---	---	
					Red maple	---	---	
					Water tupelo	---	---	
TrA, TrB, TsA, TsB, TsC, TtB2, TuB Turbeville	8A	Slight	Slight	Slight	Loblolly pine	80	110	Loblolly pine, yellow-poplar.
					Yellow-poplar	84	79	
					Virginia pine	70	109	
					Shortleaf pine	70	110	
					Southern red oak	70	52	
					Sweetgum	---	---	
					Red maple	---	---	
					White oak	---	---	
					Hickory	---	---	
WaA Wahee	9W	Slight	Moderate	Moderate	Loblolly pine	86	123	Loblolly pine, slash pine, sweetgum, American sycamore, water oak.
					Sweetgum	90	106	
					Blackgum	---	---	
					Water oak	---	---	
					Swamp chestnut oak	---	---	
					Willow oak	---	---	
					Southern red oak	---	---	
					Red maple	---	---	
					Yellow-poplar	---	---	
WdB Wedowee	8A	Slight	Slight	Slight	Loblolly pine	80	110	Loblolly pine, Virginia pine, shortleaf pine, yellow-poplar.
					Virginia pine	70	109	
					Shortleaf pine	70	110	
					Southern red oak	70	52	
					Northern red oak	70	52	
					White oak	65	48	
					Black oak	---	---	
					Hickory	---	---	
					Yellow-poplar	---	---	

See footnote at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Potential productivity: Common trees	Site index	Volume*	Trees to plant
WeD2 Wedowee	6C	Slight	Moderate	Moderate	Loblolly pine	70	93	Loblolly pine, Virginia pine, shortleaf pine, yellow-poplar.
					Shortleaf pine	60	88	
					Virginia pine	60	91	
Wh Wehadkee	8W	Slight	Severe	Moderate	Yellow-poplar	100	107	Yellow-poplar, loblolly pine, green ash, sweetgum.
					Sweetgum	94	119	
					Loblolly pine	93	138	
					Willow oak	110	110	
					Water oak	91	87	
					Green ash	---	---	
					White ash	---	---	
					American sycamore	---	---	
					River birch	---	---	
					Baldcypress	---	---	
					Water tupelo	---	---	
					Sycamore	---	---	
WkA, WkB Wickham	9A	Slight	Slight	Slight	Loblolly pine	90	131	Loblolly pine.
					Yellow-poplar	89	88	
					White oak	84	66	
					Southern red oak	82	64	
					Sweetgum	---	---	
					Red maple	---	---	
					Northern red oak	---	---	
					Water oak	---	---	
					Hickory	---	---	
					Shortleaf pine	---	---	
					American beech	---	---	
					Black cherry	---	---	
WtE Winton	10R	Moderate	Moderate	Slight	Loblolly pine	93	138	Loblolly pine.
					Southern red oak	---	---	
					Sweetgum	---	---	
					White oak	---	---	
					Water oak	---	---	
					American beech	---	---	
					Hickory	---	---	
WtF Winton	10R	Severe	Severe	Slight	Loblolly pine	93	138	Loblolly pine.
					Southern red oak	---	---	
					Sweetgum	---	---	
					White oak	---	---	
					Water oak	---	---	
					American beech	---	---	
					Hickory	---	---	

* Volume is the yield in cubic feet per acre per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

TABLE 7.--RECREATIONAL DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AtA Altavista	Severe: flooding.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
AuA Autryville	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: droughty.
Be Bethera	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
BoB Bonneau	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
BoC Bonneau	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty, slope.
CaA Caroline	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: small stones, percs slowly.	Slight	Slight.
CaB Caroline	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones, percs slowly.	Slight	Slight.
Ch Chastain	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
CnB Conetoe	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
Co Congaree	Severe: flooding.	Slight	Moderate: slope, flooding.	Slight	Moderate: flooding.
CrA Craven	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Slight	Slight.
CrB Craven	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Slight.
CrC Craven	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: slope.	Slight	Slight.
CsB2 Craven	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: erodes easily.	Slight.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
CuB*:					
Craven	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Slight.
Urban land.					
ExA Exum	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Slight	Slight.
GoA Goldsboro	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Slight	Slight.
GuA*:					
Goldsboro	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Slight	Slight.
Urban land.					
GxB Gritney	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, small stones, wetness.	Moderate: wetness.	Moderate: wetness, droughty.
GxC Gritney	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Moderate: wetness.	Moderate: wetness.
GyB2 Gritney	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, small stones, wetness.	Moderate: wetness.	Moderate: wetness.
GyC2 Gritney	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Moderate: wetness.	Moderate: wetness, slope.
HeB Helena	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
Le Lenoir	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
LtD:					
Lillington	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Severe: small stones.	Severe: small stones.
Turbeville	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Ly Lynchburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
NoA Norfolk	Slight	Slight	Slight	Slight	Slight.
NoB Norfolk	Slight	Slight	Moderate: slope.	Slight	Slight.
NoC Norfolk	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: droughty.
NuB*:					
Norfolk	Slight	Slight	Moderate: slope.	Slight	Slight.
Urban land.					
OcA Ocilla	Moderate: wetness, too sandy.	Moderate: wetness, too sandy.	Moderate: wetness, too sandy.	Moderate: wetness, too sandy.	Moderate: wetness, droughty.
PcB2 Pacolet	Slight	Slight	Moderate: slope.	Slight	Slight.
PcD2 Pacolet	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
PcE2 Pacolet	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
PgE2 Pacolet	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
PtA Pactolus	Moderate: wetness, too sandy.	Moderate: wetness, too sandy.	Moderate: too sandy, wetness.	Moderate: wetness, too sandy.	Moderate: wetness, droughty.
Ra Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ro Roanoke	Severe: flooding, wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
Se Seabrook	Severe: flooding.	Moderate: wetness, too sandy.	Moderate: too sandy, wetness.	Moderate: too sandy.	Severe: droughty.
StA State	Severe: flooding.	Slight	Slight	Slight	Slight.
TaB Tarboro	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
Te Tomotley	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
TrA Turbeville	Slight	Slight	Moderate: small stones.	Slight	Slight.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
TrB Turbeville	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
TsA Turbeville	Slight	Slight	Moderate: small stones.	Slight	Slight.
TsB Turbeville	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
TsC Turbeville	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
TtB2, TuB Turbeville	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
TxB*:					
Turbeville	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
Urban land.					
Ud*. Udorthents					
WaA Wahee	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
WdB Wedowee	Slight	Slight	Moderate: slope.	Slight	Slight.
WeD2 Wedowee	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Wh Wehadkee	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
WkA Wickham	Slight	Slight	Slight	Slight	Slight.
WkB Wickham	Slight	Slight	Moderate: slope.	Slight	Slight.
WtE Winton	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
WtF Winton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--WILDLIFE HABITAT

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
AtA Altavista	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
AuA Autryville	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Be Bethera	Very poor.	Very poor.	Poor	Fair	Poor	Good	Good	Very poor.	Fair	Good.
BoB, BoC Bonneau	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
CaA, CaB Caroline	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Ch Chastain	Very poor.	Poor	Poor	Fair	Poor	Good	Good	Poor	Fair	Good.
CnB Conetoe	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Fair	Very poor.
Co Congaree	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
CrA Craven	Good	Good	Good	Good	Good	Poor	Good	Good	Good	Poor.
CrB Craven	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CrC Craven	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CsB2 Craven	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CuB*:										
Craven	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Urban land.										
ExA Exum	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
GoA Goldsboro	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
GuA*:										
Goldsboro	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Urban land.										
GxB, GxC, GyB2, GyC2 Gritney	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 8.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
HeB---------- Helena	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Le---------- Lenoir	Good	Good	Good	Good	Good	Poor	Fair	Good	Good	Poor.
LtD:										
Lillington--------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Turbeville--------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Ly---------- Lynchburg	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
NoA, NoB---------- Norfolk	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
NoC---------- Norfolk	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
NuB*:										
Norfolk----------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Urban land.										
OcA---------- Ocilla	Fair	Fair	Good	Fair	Good	Fair	Fair	Fair	Good	Fair.
PcB2---------- Pacolet	Poor	Poor	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
PcD2---------- Pacolet	Very poor.	Poor	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
PcE2, PgE2--------- Pacolet	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
PtA---------- Pactolus	Fair	Fair	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Ra---------- Rains	Fair	Fair	Fair	Good	Good	Good	Good	Fair	Good	Good.
Ro---------- Roanoke	Poor	Poor	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Se---------- Seabrook	Fair	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
StA---------- State	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
TaB---------- Tarboro	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
Te---------- Tomotley	Very poor.	Very poor.	Poor	Fair	Fair	Good	Good	Very poor.	Poor	Good.

See footnote at end of table.

TABLE 8.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
TrA, TrB, TsA, TsB- Turbeville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
TsC- Turbeville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
TtB2- Turbeville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
TuB- Turbeville	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
TxB*:										
Turbeville-	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Urban land.										
Ud*. Udorthents										
WaA- Wahee	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
WdB- Wedowee	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
WeD2- Wedowee	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Wh- Wehadkee	Very poor.	Poor	Poor	Fair	Fair	Good	Fair	Poor	Fair	Fair.
WkA, WkB- Wickham	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
WtE- Winton	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
WtF- Winton	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--BUILDING SITE DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AtA---------- Altavista	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding, low strength.	Moderate: wetness.
AuA---------- Autryville	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Moderate: droughty.
Be---------- Bethera	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding.	Severe: ponding.
BoB---------- Bonneau	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Moderate: droughty.
BoC---------- Bonneau	Severe: cutbanks cave.	Moderate: slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
CaA---------- Caroline	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
CaB---------- Caroline	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: slope, shrink-swell.	Severe: low strength.	Slight.
Ch---------- Chastain	Severe: wetness, cutbanks cave.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
CnB---------- Conetoe	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty.
Co---------- Congaree	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
CrA, CrB---------- Craven	Severe: wetness, cutbanks cave.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength.	Slight.
CrC---------- Craven	Severe: wetness, cutbanks cave.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: low strength.	Slight.
CsB2---------- Craven	Severe: wetness, cutbanks cave.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength.	Slight.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
CuB*:						
Craven	Severe: wetness, cutbanks cave.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength.	Slight.
Urban land.						
ExA Exum	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: low strength, wetness.	Slight.
GoA Goldsboro	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Slight.
GuA*:						
Goldsboro	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Slight.
Urban land.						
GxB Gritney	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: low strength.	Moderate: wetness, droughty.
GxC Gritney	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: wetness.	Severe: slope.	Severe: low strength.	Moderate: wetness.
GyB2 Gritney	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: low strength.	Moderate: wetness.
GyC2 Gritney	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: wetness.	Severe: slope.	Severe: low strength.	Moderate: wetness, slope.
HeB Helena	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Moderate: wetness.
Le Lenoir	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
LtD:						
Lillington	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: small stones.
Turbeville	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
Ly Lynchburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
NoA Norfolk	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Slight	Slight.

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
NoB---------- Norfolk	Moderate: wetness.	Slight---------	Moderate: wetness.	Moderate: slope.	Slight---------	Slight.
NoC---------- Norfolk	Moderate: wetness, slope.	Moderate: slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: slope.	Moderate: droughty.
NuB*:						
Norfolk----------	Moderate: wetness.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Slight.
Urban land.						
OcA---------- Ocilla	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
PcB2---------- Pacolet	Moderate: too clayey.	Slight---------	Slight---------	Moderate: slope.	Moderate: low strength.	Slight.
PcD2---------- Pacolet	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
PcE2, PgE2-------- Pacolet	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
PtA---------- Pactolus	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
Ra---------- Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ro---------- Roanoke	Severe: wetness, cutbanks cave.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness.
Se---------- Seabrook	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Moderate: flooding, wetness.	Severe: droughty.
StA---------- State	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: low strength, flooding.	Slight.
TaB---------- Tarboro	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty, too sandy.
Te---------- Tomotley	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness	Severe: wetness.
TrA---------- Turbeville	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
TrB---------- Turbeville	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
TsA---------- Turbeville	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
TsB---------- Turbeville	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
TsC---------- Turbeville	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
TtB2, TuB--------- Turbeville	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
TxB*:						
Turbeville-------	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
Urban land.						
Ud*. Udorthents						
WaA---------- Wahee	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness.	Severe: wetness.
WdB---------- Wedowee	Moderate: too clayey.	Slight---------	Slight---------	Moderate: shrink-swell, slope.	Moderate: low strength.	Slight.
WeD2---------- Wedowee	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
Wh---------- Wehadkee	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding, low strength.	Severe: wetness, flooding.
WkA---------- Wickham	Slight---------	Slight---------	Slight---------	Slight---------	Slight---------	Slight.
WkB---------- Wickham	Slight---------	Slight---------	Slight---------	Moderate: slope.	Slight---------	Slight.
WtE, WtF---------- Winton	Severe: wetness, slope.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Severe: slope.	Severe: slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--SANITARY FACILITIES

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AtA---------- Altavista	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness, too clayey.
AuA---------- Autryville	Moderate: wetness.	Severe: seepage.	Severe: wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Be---------- Bethera	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
BoB---------- Bonneau	Severe: wetness.	Severe: seepage.	Severe: wetness.	Severe: seepage.	Good.
BoC---------- Bonneau	Severe: wetness.	Severe: seepage, slope.	Severe: wetness.	Severe: seepage.	Fair: slope.
CaA---------- Caroline	Severe: percs slowly.	Slight----------	Severe: too clayey.	Slight----------	Poor: too clayey, hard to pack.
CaB---------- Caroline	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight----------	Poor: too clayey, hard to pack.
Ch---------- Chastain	Severe: flooding, wetness, percs slowly.	Severe: flooding, seepage.	Severe: flooding, wetness, seepage.	Severe: flooding, wetness.	Poor: wetness, too clayey, hard to pack.
CnB---------- Conetoe	Slight----------	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Co---------- Congaree	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
CrA---------- Craven	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: seepage, wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
CrB---------- Craven	Severe: wetness, percs slowly.	Moderate: slope, seepage.	Severe: seepage, wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
CrC---------- Craven	Severe: wetness, percs slowly.	Severe: slope.	Severe: seepage, wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
CsB2---------- Craven	Severe: wetness, percs slowly.	Moderate: slope, seepage.	Severe: seepage, wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
CuB*:					
Craven----------	Severe: wetness, percs slowly.	Moderate: slope, seepage.	Severe: seepage, wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
Urban land.					
ExA---------- Exum	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
GoA---------- Goldsboro	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
GuA*:					
Goldsboro----------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
Urban land.					
GxB---------- Gritney	Severe: wetness, percs slowly.	Moderate: slope.	Severe: seepage, wetness, too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
GxC---------- Gritney	Severe: wetness, percs slowly.	Severe: slope.	Severe: seepage, wetness, too clayey.	Moderate: wetness, slope.	Poor: too clayey, hard to pack.
GyB2---------- Gritney	Severe: wetness, percs slowly.	Moderate: slope.	Severe: seepage, wetness, too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
GyC2---------- Gritney	Severe: wetness, percs slowly.	Severe: slope.	Severe: seepage, wetness, too clayey.	Moderate: wetness, slope.	Poor: too clayey, hard to pack.
HeB---------- Helena	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
Le---------- Lenoir	Severe: wetness, percs slowly.	Slight----------	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
LtD:					
Lillington---------	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: small stones.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
LtD:					
Turbeville	Moderate: slope, percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
Ly: Lynchburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
NoA, NoB: Norfolk	Moderate: wetness, percs slowly.	Moderate: seepage, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
NoC: Norfolk	Moderate: wetness, percs slowly, slope.	Severe: slope.	Severe: wetness.	Moderate: wetness, slope.	Fair: too clayey, slope.
NuB*:					
Norfolk	Moderate: wetness, percs slowly.	Moderate: seepage, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
Urban land.					
OcA: Ocilla	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Fair: wetness.
PcB2: Pacolet	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Fair: too clayey.
PcD2: Pacolet	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: too clayey, slope.
PcE2, PgE2: Pacolet	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
PtA: Pactolus	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: seepage.
Ra: Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Ro: Roanoke	Severe: flooding, wetness, percs slowly.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
Se: Seabrook	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
StA: State	Moderate: flooding, wetness, percs slowly.	Severe: seepage.	Severe: seepage, wetness.	Moderate: flooding, wetness.	Fair: too clayey, thin layer.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
TaB: Tarboro	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Te: Tomotley	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
TrA: Turbeville	Moderate: percs slowly.	Slight	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
TrB: Turbeville	Moderate: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
TsA: Turbeville	Moderate: percs slowly.	Slight	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
TsB: Turbeville	Moderate: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
TsC: Turbeville	Moderate: slope, percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
TtB2, TuB: Turbeville	Moderate: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
TxB*:					
Turbeville	Moderate: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
Urban land.					
Ud*. Udorthents					
WaA: Wahee	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
WdB: Wedowee	Moderate: percs slowly.	Moderate: slope, seepage.	Moderate: too clayey.	Slight	Fair: too clayey.
WeD2: Wedowee	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
Wh: Wehadkee	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness, thin layer.
WkA: Wickham	Moderate: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight	Fair: too clayey.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
WkB---------- Wickham	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
WtE, WtF---------- Winton	Severe: wetness, percs slowly, slope.	Severe: seepage, slope, wetness.	Severe: slope.	Severe: slope.	Poor: slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--CONSTRUCTION MATERIALS

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
AtA: Altavista	Fair: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
AuA: Autryville	Good	Improbable: thin layer.	Improbable: too sandy.	Fair: too sandy.
Be: Bethera	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
BoB: Bonneau	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
BoC: Bonneau	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, slope.
CaA, CaB: Caroline	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Ch: Chastain	Poor: wetness.	Probable	Improbable: excess fines.	Poor: too clayey, wetness.
CnB: Conetoe	Good	Probable	Improbable: too sandy.	Fair: too sandy.
Co: Congaree	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
CrA, CrB, CrC, CsB2: Craven	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
CuB*:				
Craven	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Urban land.				
ExA: Exum	Fair: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
GoA: Goldsboro	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
GuA*:				
Goldsboro	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Urban land.				

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
GxB, GxC, GyB2, GyC2--Gritney	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
HeB--Helena	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Le--Lenoir	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
LtD:				
Lillington	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Turbeville	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Ly--Lynchburg	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
NoA, NoB, NoC--Norfolk	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
NuB*:				
Norfolk	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Urban land.				
OcA--Ocilla	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
PcB2, PcD2--Pacolet	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
PcE2, PgE2--Pacolet	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
PtA--Pactolus	Fair: wetness.	Probable	Improbable: too sandy.	Fair: too sandy.
Ra--Rains	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Ro--Roanoke	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Se--Seabrook	Fair: wetness.	Probable	Improbable: too sandy.	Fair: too sandy.
StA--State	Good	Probable	Improbable: too sandy.	Fair: too clayey.
TaB--Tarboro	Good	Probable	Improbable: too sandy.	Poor: too sandy.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Te: Tomotley	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
TrA, TrB, TsA, TsB, TsC, TtB2, TuB: Turbeville	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
TxB*:				
Turbeville	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Urban land.				
Ud*. Udorthents				
WaA: Wahee	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
WdB, WeD2: Wedowee	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Wh: Wehadkee	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
WkA, WkB: Wickham	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
WtE: Winton	Fair: wetness, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
WtF: Winton	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--WATER MANAGEMENT

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Terraces and diversions	Grassed waterways
AtA---------- Altavista	Moderate: seepage.	Severe: piping, wetness.	Moderate: deep to water, slow refill.	Favorable------	Wetness, soil blowing.	Favorable.
AuA---------- Autryville	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Too sandy, soil blowing.	Droughty.
Be---------- Bethera	Slight---------	Severe: ponding, hard to pack.	Severe: slow refill.	Ponding, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
BoB---------- Bonneau	Severe: seepage.	Severe: thin layer.	Severe: cutbanks cave.	Deep to water	Soil blowing---	Droughty.
BoC---------- Bonneau	Severe: slope, seepage.	Severe: thin layer.	Severe: cutbanks cave.	Deep to water	Slope, soil blowing.	Slope, droughty.
CaA---------- Caroline	Slight---------	Moderate: hard to pack.	Severe: no water.	Deep to water	Erodes easily, percs slowly.	Erodes easily, percs slowly.
CaB---------- Caroline	Moderate: slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Erodes easily, percs slowly.	Erodes easily, percs slowly.
Ch---------- Chastain	Severe: seepage.	Severe: hard to pack, wetness.	Severe: slow refill, cutbanks cave.	Percs slowly, flooding.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
CnB---------- Conetoe	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Too sandy, soil blowing.	Droughty, rooting depth.
Co---------- Congaree	Moderate: seepage.	Severe: piping.	Moderate: deep to water, slow refill.	Flooding-------	Erodes easily, wetness.	Erodes easily.
CrA, CrB---------- Craven	Moderate: seepage.	Severe: hard to pack.	Severe: slow refill, cutbanks cave.	Percs slowly---	Wetness, percs slowly.	Percs slowly.
CrC---------- Craven	Moderate: seepage, slope.	Severe: hard to pack.	Severe: slow refill, cutbanks cave.	Percs slowly, slope.	Wetness, percs slowly.	Percs slowly.
CsB2---------- Craven	Moderate: seepage.	Severe: hard to pack.	Severe: slow refill, cutbanks cave.	Percs slowly---	Erodes easily, wetness.	Erodes easily, percs slowly.
CuB*:						
Craven----------	Moderate: seepage.	Severe: hard to pack.	Severe: slow refill, cutbanks cave.	Percs slowly---	Wetness, percs slowly.	Percs slowly.
Urban land.						

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Terraces and diversions	Grassed waterways
ExA: Exum	Slight	Moderate: piping, wetness.	Severe: slow refill.	Favorable	Erodes easily, wetness, soil blowing.	Erodes easily.
GoA: Goldsboro	Moderate: seepage.	Moderate: piping, wetness.	Moderate: deep to water, slow refill.	Favorable	Wetness, soil blowing.	Favorable.
GuA*:						
Goldsboro	Moderate: seepage.	Moderate: piping, wetness.	Moderate: deep to water, slow refill.	Favorable	Wetness, soil blowing.	Favorable.
Urban land.						
GxB: Gritney	Moderate: slope.	Moderate: thin layer, hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Wetness, percs slowly.	Droughty, percs slowly.
GxC: Gritney	Severe: slope.	Moderate: thin layer, hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Slope, wetness, percs slowly.	Slope, droughty, percs slowly.
GyB2: Gritney	Moderate: slope.	Moderate: thin layer, hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Wetness, percs slowly.	Percs slowly.
GyC2: Gritney	Severe: slope.	Moderate: thin layer, hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Slope, wetness, percs slowly.	Slope, percs slowly.
HeB: Helena	Moderate: slope.	Severe: hard to pack.	Severe: no water.	Percs slowly, slope.	Wetness, percs slowly.	Percs slowly.
Le: Lenoir	Slight	Severe: wetness.	Severe: slow refill.	Percs slowly	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
LtD:						
Lillington	Severe: seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope	Slope, droughty.
Turbeville	Severe: slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Slope, soil blowing.	Slope.
Ly: Lynchburg	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Favorable	Wetness, soil blowing.	Wetness.
NoA: Norfolk	Moderate: seepage.	Severe: piping.	Moderate: deep to water, slow refill.	Deep to water	Soil blowing	Favorable.
NoB: Norfolk	Moderate: seepage, slope.	Severe: piping.	Moderate: deep to water, slow refill.	Deep to water	Soil blowing	Favorable.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Terraces and diversions	Grassed waterways
NoC: Norfolk	Severe: slope.	Severe: piping.	Moderate: deep to water, slow refill.	Deep to water	Slope, soil blowing.	Slope.
NuB*:						
Norfolk	Moderate: seepage, slope.	Severe: piping.	Moderate: deep to water, slow refill.	Deep to water	Soil blowing	Favorable.
Urban land.						
OcA: Ocilla	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Favorable	Wetness	Droughty.
PcB2: Pacolet	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Favorable	Favorable.
PcD2, PcE2, PgE2: Pacolet	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope.
PtA: Pactolus	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, soil blowing.	Droughty, rooting depth.
Ra: Rains	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Favorable	Wetness, soil blowing.	Wetness.
Ro: Roanoke	Severe: seepage.	Severe: wetness.	Severe: slow refill, cutbanks cave.	Percs slowly, flooding.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Se: Seabrook	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, too sandy, soil blowing.	Droughty.
StA: State	Severe: seepage.	Moderate: thin layer, piping.	Severe: cutbanks cave.	Deep to water	Soil blowing	Favorable.
TaB: Tarboro	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Too sandy, soil blowing.	Droughty, rooting depth.
Te: Tomotley	Moderate: seepage.	Severe: piping, wetness.	Severe: slow refill.	Favorable	Wetness, soil blowing.	Wetness.
TrA: Turbeville	Moderate: seepage.	Moderate: hard to pack.	Severe: no water.	Deep to water	Soil blowing	Favorable.
TrB: Turbeville	Moderate: seepage, slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Soil blowing, slope.	Favorable.
TsA: Turbeville	Moderate: seepage.	Moderate: hard to pack.	Severe: no water.	Deep to water	Soil blowing	Favorable.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Terraces and diversions	Grassed waterways
TsB: Turbeville	Moderate: seepage, slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Soil blowing	Favorable.
TsC: Turbeville	Severe: slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Slope, soil blowing.	Slope.
TtB2: Turbeville	Moderate: seepage, slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Favorable	Favorable.
TuB: Turbeville	Moderate: seepage, slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Soil blowing	Favorable.
TxB*:						
Turbeville	Moderate: seepage, slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Soil blowing	Favorable.
Urban land.						
Ud*. Udorthents						
WaA: Wahee	Slight	Severe: wetness, hard to pack.	Severe: slow refill.	Percs slowly	Wetness, soil blowing, percs slowly.	Wetness, percs slowly.
WdB: Wedowee	Moderate: slope, seepage.	Severe: piping.	Severe: no water.	Deep to water	Favorable	Favorable.
WeD2: Wedowee	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope.
Wh: Wehadkee	Moderate: seepage.	Severe: wetness, piping.	Moderate: slow refill.	Flooding	Wetness, soil blowing.	Wetness.
WkA: Wickham	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Soil blowing	Favorable.
WkB: Wickham	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Soil blowing	Favorable.
WtE, WtF: Winton	Severe: slope.	Moderate: piping, wetness.	Severe: no water.	Slope	Slope, wetness.	Slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--ENGINEERING INDEX PROPERTIES

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments >3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
AtA---------- Altavista	0-8	Fine sandy loam	ML, CL-ML, SM, SC-SM	A-4	0	95-100	90-100	65-99	35-60	<23	NP-7
	8-33	Clay loam, sandy clay loam, sandy loam.	CL, CL-ML, SC, SC-SM	A-4, A-6, A-7	0	95-100	95-100	60-99	45-75	20-45	5-28
	33-65	Variable---------	---	---	---	---	---	---	---	---	---
AuA---------- Autryville	0-24	Loamy sand-------	SP-SM, SM	A-2, A-3	0	100	100	50-100	5-20	---	NP
	24-37	Sandy loam, sandy clay loam, fine sandy loam.	SM	A-2	0	100	100	50-100	15-30	<25	NP-3
	37-70	Sand, loamy sand, loamy fine sand.	SP-SM, SM	A-2, A-3	0	100	100	50-100	5-20	---	NP
	70-78	Sandy loam, sandy clay loam, fine sandy loam.	SM, SC, SC-SM	A-2, A-4	0	100	100	60-100	20-49	<30	NP-10
Be---------- Bethera	0-7	Silt loam--------	CL	A-4, A-6	0	100	95-100	85-95	60-75	30-37	8-14
	7-65	Clay, clay loam, sandy clay.	CL, CH, ML, MH	A-6, A-7	0	100	98-100	93-100	55-95	37-55	12-30
BoB, BoC--------- Bonneau	0-33	Loamy sand-------	SM	A-2	0	100	100	50-95	15-35	<25	NP
	33-55	Sandy loam, sandy clay loam, fine sandy loam.	SC, SC-SM	A-2, A-6, A-4	0	100	100	60-100	30-50	21-40	4-21
	55-65	Sandy loam, sandy clay loam, sandy clay.	CL, SC, SC-SM, CL-ML	A-4, A-6, A-2	0	100	100	60-95	25-60	20-40	4-18
CaA, CaB--------- Caroline	0-8	Sandy loam-------	SM, ML, CL-ML, SC-SM	A-2, A-4	0	90-100	85-100	60-85	30-55	<25	NP-5
	8-80	Clay loam, clay, silty clay.	CL, CH	A-7	0	90-100	85-100	80-100	60-90	41-70	18-40
Ch---------- Chastain	0-8	Silt loam--------	ML, CL, CL-ML	A-4, A-6, A-7	0	100	100	90-100	70-95	23-45	3-18
	8-41	Silty clay loam, clay loam, silty clay.	CL, CH, ML, MH	A-6, A-7	0	100	100	95-100	85-98	35-75	12-40
	41-60	Loamy sand, sand, fine sand, loam.	SP, SM, SP-SM	A-2, A-3	0	90-100	85-100	51-90	4-25	---	NP
CnB---------- Conetoe	0-24	Loamy sand-------	SM, SP-SM	A-2, A-3	0	100	100	50-99	5-30	<20	NP
	24-58	Sandy loam, sandy clay loam, fine sandy loam.	SM, SC, SC-SM	A-2, A-4	0	100	100	50-99	20-40	<30	NP-10
	58-80	Loamy sand, sand	SM, SP, SP-SM	A-2, A-3, A-1	0	100	100	40-99	4-30	<20	NP
Co---------- Congaree	0-8	Silt loam--------	CL-ML, ML, CL	A-4	0	95-100	95-100	70-100	51-90	20-35	3-10
	8-56	Silty clay loam, fine sandy loam, loam.	SC, ML, CL, SM	A-4, A-6, A-7	0	95-100	95-100	70-100	40-90	25-50	3-22
	56-84	Variable---------	---	---	---	---	---	---	---	---	---
CrA, CrB, CrC---- Craven	0-8	Fine sandy loam	ML, CL, SM, SC	A-4, A-6	0	100	95-100	75-100	45-90	<35	NP-15
	8-65	Clay, silty clay, clay loam.	CH, CL	A-7	0	100	95-100	90-100	65-98	40-70	24-43

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag-ments >3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct					Pct	
CsB2---------- Craven	0-5	Sandy clay loam	CL, CH	A-6, A-7	0	100	95-100	80-100	55-98	35-60	15-35
	5-65	Clay, silty clay, clay loam.	CH, CL	A-7	0	100	95-100	90-100	65-98	40-70	24-43
CuB*:											
Craven----------	0-8	Fine sandy loam	ML, CL, SM, SC	A-4, A-6	0	100	95-100	75-100	45-90	<35	NP-15
	8-65	Clay, silty clay, clay loam.	CH, CL	A-7	0	100	95-100	90-100	65-98	40-70	24-43
Urban land.											
ExA---------- Exum	0-7	Loam----------	ML, CL-ML, CL	A-4	0	100	95-100	80-100	51-80	<25	NP-10
	7-42	Loam, clay loam, silty clay loam.	CL	A-4, A-6, A-7	0	100	95-100	90-100	60-90	22-49	8-30
	42-80	Variable---------	---	---	---	---	---	---	---	---	---
GoA---------- Goldsboro	0-9	Sandy loam-------	SM, SC-SM, SC	A-2, A-4, A-6	0	95-100	95-100	50-100	15-45	<25	NP-14
	9-54	Sandy clay loam, sandy loam.	SC-SM, SC, CL-ML, CL	A-2, A-4, A-6	0	98-100	95-100	60-100	25-55	16-37	4-18
	54-69	Sandy clay loam, clay loam, sandy clay.	SC, CL, CL-ML, CH	A-4, A-6, A-7-6	0	95-100	90-100	65-95	36-70	25-55	6-32
	69-84	Variable---------	---	---	---	---	---	---	---	---	---
GuA*:											
Goldsboro-------	0-9	Sandy loam-------	SM, SC-SM, SC	A-2, A-4, A-6	0	95-100	95-100	50-100	15-45	<25	NP-14
	9-54	Sandy clay loam, sandy loam.	SC-SM, SC, CL-ML, CL	A-2, A-4, A-6	0	98-100	95-100	60-100	25-55	16-37	4-18
	54-69	Sandy clay loam, clay loam, sandy clay.	SC, CL, CL-ML, CH	A-4, A-6, A-7-6	0	95-100	90-100	65-95	36-70	25-55	6-32
	69-84	Variable---------	---	---	---	---	---	---	---	---	---
Urban land.											
GxB, GxC--------- Gritney	0-9	Sandy loam-------	SM, SC, SC-SM, ML	A-2, A-4	0	90-100	80-100	60-95	30-90	<30	NP-8
	9-58	Clay, sandy clay, clay loam.	CH, CL, SC	A-7	0	95-100	90-100	80-100	45-80	45-70	22-40
	58-70	Stratified loamy sand to sandy clay loam.	SM, SC, ML, CL	A-1, A-2, A-4, A-6	0-2	70-100	55-100	30-90	20-60	<40	NP-25
GyB2, GyC2------- Gritney	0-6	Sandy clay loam	SC, CL	A-4, A-6	0	90-100	80-100	80-100	36-60	20-40	8-22
	6-58	Clay, sandy clay, clay loam.	CH, CL, SC	A-7	0	95-100	90-100	80-100	45-80	45-70	22-40
	58-70	Stratified loamy sand to sandy clay loam.	SM, SC, ML, CL	A-1, A-2, A-4, A-6	0-2	70-100	55-100	30-90	20-60	<40	NP-25
HeB---------- Helena	0-6	Sandy loam-------	SM, SC-SM, SC, ML	A-2, A-4	0-5	90-100	90-100	51-95	26-75	<35	NP-10
	6-10	Sandy clay loam, clay loam.	CL, SC	A-6, A-7	0-5	95-100	95-100	70-90	38-70	30-49	15-26
	10-47	Clay loam, sandy clay, clay.	CH	A-7	0-5	95-100	95-100	73-97	56-86	50-85	24-50
	47-62	Variable---------	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments >3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
Le---------- Lenoir	0-4	Silt loam--------	ML, CL, CL-ML	A-4	0	100	100	85-98	60-85	20-35	3-10
	4-65	Clay, silty clay, clay loam.	CL, CH	A-6, A-7	0	100	100	85-99	55-95	30-55	11-35
LtD:											
Lillington------	0-8	Very gravelly sandy loam.	GM, GP-GM, SM, SP-SM	A-1, A-2	0-10	55-90	25-65	20-55	10-30	---	NP
	8-48	Very gravelly sandy clay loam, very gravelly clay loam.	GM, GC, SM, SC	A-1, A-2, A-4, A-6	0-10	55-90	25-65	20-55	20-49	20-40	3-15
	48-65	Stratified gravelly loamy sand to extremely gravelly sandy clay loam.	GM, SM	A-1, A-2	0-10	30-80	25-65	20-55	15-30	---	NP
Turbeville------	0-8	Gravelly sandy loam.	SM, ML, CL-ML, SC-SM	A-2, A-4	0-2	80-100	75-100	50-85	25-55	<25	NP-5
	8-11	Loam, clay loam, gravelly sandy clay loam.	CL, SC	A-4, A-6, A-7	0-2	80-100	50-100	50-100	35-75	30-45	8-20
	11-71	Clay loam, gravelly sandy clay, gravelly clay.	CL, CH	A-7	0-5	80-100	50-100	50-100	45-95	45-65	20-35
Ly---------- Lynchburg	0-9	Fine sandy loam	SM, ML, SC-SM, CL-ML	A-2, A-4	0	92-100	90-100	75-100	25-55	<30	NP-7
	9-84	Sandy clay loam, sandy loam, clay loam, sandy clay.	SC-SM, SC, CL, CL-ML	A-2, A-4, A-6	0	92-100	90-100	70-100	25-67	15-40	4-18
NoA, NoB, NoC---- Norfolk	0-8	Sandy loam-------	SM, SC-SM, SC	A-2	0	95-100	95-100	50-91	15-33	<25	NP-14
	8-50	Sandy loam, sandy clay loam, clay loam.	SC, SC-SM, CL, CL-ML	A-2, A-4, A-6	0	95-100	91-100	70-96	30-63	20-38	4-15
	50-76	Sandy clay loam, clay loam, sandy clay.	SC, SC-SM, CL, CL-ML	A-4, A-6, A-7-6	0	100	98-100	65-98	36-72	20-52	4-23
NuB*:											
Norfolk---------	0-8	Sandy loam-------	SM, SC-SM, SC	A-2	0	95-100	95-100	50-91	15-33	<25	NP-14
	8-50	Sandy loam, sandy clay loam, clay loam.	SC, SC-SM, CL, CL-ML	A-2, A-4, A-6	0	95-100	91-100	70-96	30-63	20-38	4-15
	50-76	Sandy clay loam, clay loam, sandy clay.	SC, SC-SM, CL, CL-ML	A-4, A-6, A-7-6	0	100	98-100	65-98	36-72	20-52	4-23
Urban land.											
OcA---------- Ocilla	0-24	Loamy fine sand	SM, SP-SM	A-2, A-3	0	100	95-100	75-100	8-35	---	NP
	24-68	Sandy loam, sandy clay loam, fine sandy loam.	SM, CL, SC, ML	A-2, A-4, A-6	0	100	95-100	80-100	20-55	20-40	NP-18

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
PcB2, PcD2, PcE2-- Pacolet	0-4	Sandy clay loam	SC-SM, SC	A-4, A-6	0-1	95-100	90-100	65-85	36-50	20-40	4-17
	4-8	Sandy clay, clay loam, clay.	ML, MH, CL	A-6, A-7	0-1	80-100	80-100	60-95	51-75	38-65	11-33
	8-32	Clay loam, sandy clay loam, sandy loam.	CL, CL-ML, SC-SM, SC	A-2, A-4, A-6	0-2	80-100	70-100	60-80	30-60	20-35	5-15
	32-62	Sandy loam, fine sandy loam, loam.	SM, SC-SM	A-4, A-2-4	0-2	80-100	70-100	60-90	25-50	<28	NP-6
PgE2---------- Pacolet	0-6	Gravelly sandy clay loam.	SC-SM, SC	A-4, A-6	0-3	75-100	70-90	65-85	36-50	20-40	4-17
	6-28	Sandy clay, clay loam, clay.	ML, MH	A-6, A-7	0-1	80-100	80-100	60-95	51-75	38-65	11-30
	28-38	Clay loam, sandy clay loam, sandy loam.	CL-ML, SC-SM, SC, CL	A-2, A-4, A-6	0-2	80-100	70-100	60-80	30-60	20-35	5-15
	38-62	Sandy loam, fine sandy loam, loam.	SM, SC-SM	A-4, A-2-4	0-2	80-100	70-100	60-80	30-50	<28	NP-6
PtA---------- Pactolus	0-30	Loamy fine sand	SM, SP-SM	A-2, A-3	0	100	100	51-100	6-30	---	NP
	30-72	Sand, loamy sand, loamy fine sand.	SP-SM, SM	A-2, A-3	0	100	100	51-100	5-30	---	NP
Ra---------- Rains	0-7	Fine sandy loam	SM, ML	A-2, A-4	0	100	95-100	50-85	25-56	<35	NP-10
	7-51	Sandy clay loam, clay loam.	SC, SC-SM, CL, CL-ML	A-2, A-4, A-6	0	100	95-100	55-98	30-70	18-40	4-20
	51-68	Sandy clay loam, clay loam, sandy clay.	SC, SC-SM, CL, CL-ML	A-4, A-6, A-7	0	100	98-100	60-98	36-72	18-45	4-28
	68-84	Sandy loam, sandy clay loam, sandy clay.	SM, SC, ML, CL	A-2, A-4, A-6	0	100	95-100	60-95	30-60	15-40	3-18
Ro---------- Roanoke	0-5	Silt loam--------	SC-SM, CL-ML, CL, SC	A-4, A-6	0	95-100	85-100	60-100	35-90	20-35	5-16
	5-11	Clay loam, silty clay loam.	CL	A-6, A-7	0	95-100	85-100	80-100	80-95	35-45	14-20
	11-53	Clay, silty clay, clay loam.	CH, CL	A-7	0	90-100	85-100	85-100	65-95	45-70	22-40
	53-84	Stratified sand to clay.	CL-ML, GM-GC, CH, SM	A-1, A-2, A-4	0-5	40-100	35-100	25-95	15-90	10-60	NP-40
Se---------- Seabrook	0-9	Loamy sand-------	SM, SP-SM	A-2, A-3	0	95-100	90-100	85-99	5-25	---	NP
	9-72	Loamy fine sand, fine sand, sand.	SM, SP-SM	A-2, A-3	0	95-100	90-100	85-100	5-25	---	NP
StA---------- State	0-13	Sandy loam-------	SM, ML, CL-ML, SC-SM	A-2, A-4	0	95-100	95-100	45-85	25-55	<28	NP-7
	13-48	Loam, clay loam, sandy clay loam.	CL, SC	A-4, A-6	0	95-100	95-100	75-100	35-80	24-40	8-22
	48-68	Stratified sand to fine sandy loam.	SM, SC-SM, SP-SM	A-1, A-2, A-3, A-4	0	85-100	60-100	40-90	5-50	<25	NP-7

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
TaB---------- Tarboro	0-20	Sand----------	SM, SP-SM, SW-SM	A-2, A-3, A-1	0	95-100	95-100	40-99	8-35	---	NP
	20-84	Sand, coarse sand, loamy sand.	SP, SP-SM, SW-SM, SM	A-2, A-3, A-1	0	95-100	90-100	45-100	3-15	---	NP
Te---------- Tomotley	0-14	Fine sandy loam	SM, SC-SM	A-2, A-4	0	98-100	95-100	75-99	25-50	<30	NP-7
	14-47	Fine sandy loam, sandy clay loam, clay loam.	SC-SM, SC, CL-ML, CL	A-2, A-4, A-6	0	98-100	95-100	75-100	30-70	20-40	6-23
	47-62	Variable---------	---	---	---	---	---	---	---	---	---
TrA, TrB--------- Turbeville	0-8	Loamy sand-------	SM, ML, CL-ML, SC-SM	A-2, A-4	0-2	80-100	75-100	50-85	25-55	<25	NP-5
	8-11	Loam, clay loam, gravelly sandy clay loam.	CL, SC	A-4, A-6, A-7	0-2	80-100	50-100	50-100	35-75	30-45	8-20
	11-72	Clay loam, sandy clay, gravelly clay.	CL, CH	A-7	0-5	80-100	50-100	50-100	45-95	45-65	20-35
TsA, TsB, TsC---- Turbeville	0-9	Sandy loam-------	SM, ML, CL-ML, SC-SM	A-2, A-4	0-2	80-100	75-100	50-85	25-55	<25	NP-5
	9-84	Clay loam, sandy clay, gravelly clay.	CL, CH	A-7	0-5	80-100	50-100	50-100	45-95	45-65	20-35
TtB2---------- Turbeville	0-7	Sandy clay loam	CL, SC	A-4, A-6, A-7	0-2	80-100	75-100	60-100	35-75	30-45	8-20
	7-84	Clay loam, sandy clay, gravelly clay.	CL, CH	A-7	0-5	80-100	50-100	50-100	45-95	45-65	20-35
TuB---------- Turbeville	0-8	Gravelly sandy loam.	SM, ML, CL-ML, SC-SM	A-2, A-4	0-3	80-95	75-90	50-85	25-55	<25	NP-5
	8-11	Loam, clay loam, gravelly sandy clay loam.	CL, SC	A-4, A-6, A-7	0-2	80-100	50-100	50-100	35-75	30-45	8-20
	11-71	Clay loam, sandy clay, gravelly clay.	CL, CH	A-7	0-5	80-100	50-100	50-100	45-95	45-65	20-35
TxB*:											
Turbeville------	0-9	Sandy loam-------	SM, ML, CL-ML, SC-SM	A-2, A-4	0-2	80-100	75-100	50-85	25-55	<25	NP-5
	9-84	Clay loam, sandy clay, gravelly clay.	CL, CH	A-7	0-5	80-100	50-100	50-100	45-95	45-65	20-35
Urban land.											
Ud* Udorthents											

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments >3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
WaA---------- Wahee	0-7	Fine sandy loam	SM, SC-SM	A-2, A-4	0	100	95-100	50-98	30-50	<28	NP-7
	7-50	Clay, clay loam, silty clay.	CL, CH	A-6, A-7	0	100	100	85-100	51-92	38-81	16-54
	50-62	Variable---------	---	---	---	---	---	---	---	---	---
WdB---------- Wedowee	0-8	Sandy loam-------	SM, SC-SM	A-4, A-2-4	0	95-100	90-100	50-99	23-50	<30	NP-6
	8-12	Loam, sandy clay loam.	SM, SC, CL, ML	A-4, A-6	0	90-100	90-100	80-97	40-75	<32	NP-15
	12-28	Sandy clay, clay loam, clay.	SC, ML, CL, MH	A-6, A-7	0	95-100	95-100	65-97	45-75	30-58	10-30
	28-60	Sandy clay loam, clay loam, sandy loam.	SC, SC-SM, CL, CL-ML	A-2, A-4, A-6	0	80-100	70-100	60-80	30-60	20-35	5-15
WeD2---------- Wedowee	0-5	Sandy clay loam	SC, CL, CL-ML, SC-SM	A-4, A-6	0	90-100	90-100	80-95	45-75	<32	5-15
	5-26	Sandy clay, clay loam, clay.	SC, ML, CL, MH	A-6, A-7	0	95-100	95-100	65-97	45-75	30-58	10-30
	26-60	Sandy clay loam, clay loam, sandy loam.	SC, SC-SM, CL, CL-ML	A-2, A-4, A-6	0	80-100	70-100	60-80	30-60	20-35	5-15
Wh---------- Wehadkee	0-6	Loam----------	SM, SC, SC-SM	A-2, A-4	0	100	95-100	60-90	30-50	<30	NP-10
	6-36	Silt loam, silty clay loam, very fine sandy loam.	CL, CL-ML, ML, SC	A-6, A-7, A-4	0	100	99-100	85-100	45-98	20-58	6-25
	36-60	Variable---------	---	---	---	---	---	---	---	---	---
WkA, WkB--------- Wickham	0-6	Fine sandy loam	SM, SC-SM, ML, CL-ML	A-4	0	95-100	90-100	70-100	45-80	<25	NP-7
	6-50	Sandy clay loam, clay loam, loam.	CL-ML, CL, SC, SM	A-2, A-4, A-6, A-7-6	0	95-100	90-100	75-100	30-70	20-41	3-15
	50-78	Variable---------	---	---	---	---	---	---	---	---	---
WtE, WtF--------- Winton	0-6	Fine sandy loam	ML, SM, CL, SC	A-2, A-4, A-6	0-3	90-100	90-100	50-99	25-65	<30	NP-15
	6-41	Sandy clay loam, sandy loam, clay loam.	SC, CL	A-2, A-4, A-6, A-7	0-2	90-100	90-100	45-95	25-70	20-45	8-30
	41-62	Variable---------	---	---	---	---	---	---	---	---	---

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
AtA---------- Altavista	0-8	10-24	1.30-1.50	2.0-6.0	0.12-0.20	3.6-6.5	Low----------	0.24	5	3	.5-3
	8-33	18-35	1.30-1.50	0.6-2.0	0.12-0.20	3.6-6.0	Low----------	0.24			
	33-65	---	---	---	---	---	----------	----			
AuA---------- Autryville	0-24	2-10	1.60-1.70	>6.0	0.04-0.09	4.5-6.5	Low----------	0.10	5	2	.5-1
	24-37	10-25	1.40-1.60	2.0-6.0	0.08-0.13	4.5-5.5	Low----------	0.10			
	37-70	2-8	1.60-1.70	>6.0	0.03-0.08	4.5-5.5	Low----------	0.10			
	70-78	10-35	1.40-1.60	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.17			
Be---------- Bethera	0-7	10-20	1.20-1.40	0.6-2.0	0.11-0.16	3.6-6.0	Low----------	0.28	5	5	1-6
	7-65	35-50	1.30-1.50	0.06-0.2	0.14-0.18	3.6-6.0	Moderate-----	0.32			
BoB, BoC--------- Bonneau	0-33	5-15	1.30-1.70	6.0-20	0.05-0.11	4.5-6.0	Low----------	0.10	5	2	.5-2
	33-55	13-35	1.40-1.60	0.6-2.0	0.10-0.15	4.5-6.0	Low----------	0.20			
	55-65	15-40	1.40-1.60	0.6-2.0	0.10-0.16	4.5-6.0	Low----------	0.20			
CaA, CaB--------- Caroline	0-8	10-20	1.35-1.45	0.6-6.0	0.08-0.15	3.6-5.5	Low----------	0.43	5	3	.5-2
	8-80	35-55	1.40-1.50	0.06-0.6	0.14-0.22	3.6-5.5	Moderate-----	0.32			
Ch---------- Chastain	0-8	15-27	1.20-1.40	0.2-0.6	0.12-0.18	4.5-6.0	Moderate-----	0.32	5	5	1-6
	8-41	35-60	1.30-1.50	0.06-0.2	0.12-0.16	4.5-6.0	Moderate-----	0.37			
	41-60	2-10	1.50-1.70	6.0-20	0.03-0.06	4.5-6.0	Low----------	0.10			
CnB---------- Conetoe	0-24	2-10	1.60-1.75	6.0-20	0.05-0.10	4.5-6.0	Low----------	0.15	5	2	.5-2
	24-58	10-22	1.40-1.60	2.0-6.0	0.10-0.15	4.5-6.0	Low----------	0.15			
	58-80	2-10	1.60-1.70	6.0-20	0.05-0.10	4.5-6.0	Low----------	0.10			
Co---------- Congaree	0-8	10-25	1.20-1.40	0.6-2.0	0.12-0.20	4.5-7.3	Low----------	0.37	5	6	1-4
	8-56	18-35	1.20-1.50	0.6-2.0	0.12-0.20	4.5-7.3	Low----------	0.37			
	56-84	---	---	---	---	---	----------	----			
CrA, CrB, CrC---- Craven	0-8	7-27	1.30-1.45	0.2-2.0	0.12-0.15	3.6-6.5	Low----------	0.32	5	5	.5-2
	8-65	35-60	1.30-1.45	0.06-0.2	0.12-0.15	3.6-5.5	Moderate-----	0.32			
CsB2---------- Craven	0-5	27-40	1.30-1.45	0.06-0.2	0.12-0.15	3.6-5.5	Moderate-----	0.37	5	6	.5-2
	5-65	35-60	1.30-1.45	0.06-0.2	0.12-0.15	3.6-5.5	Moderate-----	0.32			
CuB*:											
Craven----------	0-8	7-27	1.30-1.45	0.2-2.0	0.12-0.15	3.6-6.5	Low----------	0.32	5	5	.5-2
	8-65	35-60	1.30-1.45	0.06-0.2	0.12-0.15	3.6-5.5	Moderate-----	0.32			
Urban land.											
ExA---------- Exum	0-7	6-18	1.30-1.50	2.0-6.0	0.15-0.20	3.6-6.0	Low----------	0.37	5	3	.5-2
	7-42	18-35	1.30-1.40	0.2-0.6	0.15-0.20	3.6-5.5	Low----------	0.37			
	42-80	---	---	---	---	---	----------	----			
GoA---------- Goldsboro	0-9	5-15	1.40-1.60	2.0-6.0	0.10-0.15	3.6-6.0	Low----------	0.20	5	3	.5-2
	9-54	18-30	1.30-1.50	0.6-2.0	0.11-0.17	3.6-5.5	Low----------	0.24			
	54-69	20-34	1.30-1.40	0.6-2.0	0.11-0.20	3.6-5.5	Low----------	0.24			
	69-84	---	---	---	---	---	----------	----			

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
GuA*:											
Goldsboro	0-9	5-15	1.40-1.60	2.0-6.0	0.10-0.15	3.6-6.0	Low	0.20	5	3	.5-2
	9-54	18-30	1.30-1.50	0.6-2.0	0.11-0.17	3.6-5.5	Low	0.24			
	54-69	20-34	1.30-1.40	0.6-2.0	0.11-0.20	3.6-5.5	Low	0.24			
	69-84	---	---	---	---	---		----			
Urban land.											
GxB, GxC Gritney	0-9	10-20	1.30-1.50	2.0-6.0	0.08-0.12	3.6-6.0	Low	0.32	3	3	.5-2
	9-58	35-60	1.30-1.50	0.06-0.2	0.10-0.17	3.6-5.5	Moderate	0.32			
	58-70	10-35	1.30-1.50	0.06-6.0	0.06-0.12	3.6-5.5	Low	0.20			
GyB2, GyC2 Gritney	0-6	20-35	1.30-1.50	0.6-2.0	0.10-0.15	3.6-5.5	Low	0.37	3	5	.5-1
	6-58	35-60	1.30-1.50	0.06-0.2	0.10-0.17	3.6-5.5	Moderate	0.32			
	58-70	10-35	1.30-1.50	0.06-6.0	0.06-0.12	3.6-5.5	Low	0.20			
HeB Helena	0-6	5-20	1.58-1.62	2.0-6.0	0.10-0.12	3.6-6.5	Low	0.24	4	5	.5-2
	6-10	20-35	1.46-1.56	0.2-0.6	0.13-0.15	3.6-5.5	Moderate	0.28			
	10-47	35-60	1.44-1.55	0.06-0.2	0.13-0.15	3.6-5.5	High	0.28			
	47-62	---	---	---	---	---		----			
Le Lenoir	0-4	6-20	1.30-1.50	0.6-2.0	0.14-0.18	3.6-5.5	Low	0.37	5	5	2-4
	4-65	35-60	1.20-1.35	0.06-0.2	0.13-0.15	3.6-5.5	Moderate	0.32			
LtD:											
Lillington	0-8	5-15	1.60-1.70	6.0-20	0.05-0.10	4.5-6.0	Low	0.15	5	8	.5-2
	8-48	10-35	1.50-1.60	2.0-6.0	0.05-0.10	4.5-5.5	Low	0.10			
	48-65	5-25	1.50-1.70	0.6-6.0	0.05-0.13	4.5-5.5	Low	0.10			
Turbeville	0-8	3-18	1.35-1.55	2.0-6.0	0.08-0.15	4.5-5.5	Low	0.32	5	3	.5-2
	8-11	25-40	1.30-1.45	0.6-2.0	0.12-0.18	4.5-5.5	Low	0.28			
	11-71	30-60	1.35-1.50	0.6-2.0	0.13-0.16	4.5-5.5	Moderate	0.24			
Ly Lynchburg	0-9	5-20	1.30-1.60	2.0-6.0	0.09-0.13	3.6-5.5	Low	0.20	5	3	.5-5
	9-84	18-35	1.30-1.50	0.6-2.0	0.12-0.16	3.6-5.5	Low	0.20			
NoA, NoB, NoC Norfolk	0-8	5-18	1.45-1.65	2.0-6.0	0.10-0.15	3.6-6.0	Low	0.20	5	3	.5-2
	8-50	18-35	1.30-1.65	0.6-2.0	0.10-0.18	3.6-5.5	Low	0.24			
	50-76	20-43	1.20-1.65	0.6-2.0	0.12-0.18	3.6-5.5	Low	0.24			
NuB*:											
Norfolk	0-8	5-18	1.45-1.65	2.0-6.0	0.10-0.15	3.6-6.0	Low	0.20	5	3	.5-2
	8-50	18-35	1.30-1.65	0.6-2.0	0.10-0.18	3.6-5.5	Low	0.24			
	50-76	20-43	1.20-1.65	0.6-2.0	0.12-0.18	3.6-5.5	Low	0.24			
Urban land.											
OcA Ocilla	0-24	4-10	1.45-1.65	2.0-20	0.05-0.08	4.5-5.5	Low	0.10	5	2	1-2
	24-68	15-35	1.55-1.70	0.6-2.0	0.09-0.12	4.5-5.5	Low	0.24			
PcB2, PcD2, PcE2- Pacolet	0-4	20-35	1.30-1.50	0.6-2.0	0.10-0.14	4.5-6.5	Low	0.24	2	5	.5-1
	4-8	35-65	1.30-1.50	0.6-2.0	0.12-0.15	4.5-6.0	Low	0.28			
	8-32	15-30	1.20-1.50	0.6-2.0	0.08-0.15	4.5-6.0	Low	0.28			
	32-62	10-25	1.20-1.50	0.6-2.0	0.08-0.15	4.5-6.0	Low	0.28			
PgE2 Pacolet	0-6	27-35	1.20-1.50	0.6-2.0	0.08-0.15	4.5-6.0	Low	0.20	2	4	.5-2
	6-28	35-65	1.30-1.50	0.6-2.0	0.12-0.15	4.5-6.0	Low	0.28			
	28-38	15-30	1.20-1.50	0.6-2.0	0.08-0.15	4.5-6.0	Low	0.28			
	38-62	10-25	1.20-1.50	0.6-2.0	0.08-0.15	4.5-6.0	Low	0.28			

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
PtA---------- Pactolus	0-30	2-12	1.60-1.75	6.0-20	0.05-0.10	3.6-5.5	Low----------	0.10	5	2	5-2
	30-72	2-12	1.60-1.75	6.0-20	0.03-0.07	3.6-5.5	Low----------	0.10			
Ra---------- Rains	0-7	5-20	1.30-1.60	2.0-6.0	0.10-0.14	3.6-6.5	Low----------	0.20	5	3	1-6
	7-51	18-35	1.30-1.60	0.6-2.0	0.11-0.15	3.6-5.5	Low----------	0.24			
	51-68	18-40	1.30-1.50	0.6-2.0	0.10-0.15	3.6-5.5	Low----------	0.28			
	68-84	15-45	1.30-1.60	0.6-2.0	0.10-0.15	3.6-5.5	Low----------	0.28			
Ro---------- Roanoke	0-5	10-27	1.20-1.50	0.6-2.0	0.14-0.20	3.6-5.5	Low----------	0.37	4	5	.5-2
	5-11	20-35	1.20-1.50	<20	0.16-0.19	3.6-5.5	Moderate-----	0.24			
	11-53	35-60	1.35-1.65	<0.6	0.10-0.19	3.6-5.5	Moderate-----	0.24			
	53-84	5-50	1.20-1.50	0.06-20	0.04-0.14	3.6-6.5	Moderate-----	0.24			
Se---------- Seabrook	0-9	2-12	1.30-1.60	6.0-20	0.05-0.11	4.5-6.5	Low----------	0.10	5	2	.5-2
	9-72	2-12	1.30-1.60	6.0-20	0.02-0.09	4.5-6.5	Low----------	0.10			
StA---------- State	0-13	5-15	1.25-1.40	0.6-6.0	0.08-0.15	3.6-5.5	Low----------	0.28	5	3	<2
	13-48	18-34	1.35-1.50	0.6-2.0	0.14-0.19	3.6-5.5	Low----------	0.28			
	48-68	2-15	1.35-1.50	>2.0	0.02-0.10	3.6-6.5	Low----------	0.17			
TaB---------- Tarboro	0-20	3-12	1.60-1.75	6.0-20	0.05-0.09	4.5-6.5	Low----------	0.10	5	2	.5-1
	20-84	2-7	1.60-1.75	>20	0.02-0.06	4.5-6.5	Low----------	0.10			
Te---------- Tomotley	0-14	5-20	1.30-1.60	2.0-6.0	0.10-0.15	3.6-5.5	Low----------	0.20	5	3	1-6
	14-47	18-35	1.30-1.50	0.6-2.0	0.12-0.18	3.6-5.5	Low----------	0.20			
	47-62	---	---	---	---	---	----------	----			
TrA, TrB--------- Turbeville	0-8	3-18	1.35-1.55	2.0-6.0	0.08-0.15	4.5-5.5	Low----------	0.32	5	3	.5-2
	8-11	25-40	1.30-1.45	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.28			
	11-72	30-60	1.35-1.50	0.6-2.0	0.13-0.16	4.5-5.5	Moderate-----	0.24			
TsA, TsB, TsC---- Turbeville	0-9	3-18	1.35-1.55	2.0-6.0	0.08-0.15	4.5-5.5	Low----------	0.32	5	3	.5-2
	9-84	30-60	1.35-1.50	0.6-2.0	0.13-0.16	4.5-5.5	Moderate-----	0.24			
TtB2---------- Turbeville	0-7	30-40	1.30-1.45	0.6-2.0	0.12-0.16	4.5-5.5	Low----------	0.28	4	6	.5-1
	7-84	30-60	1.35-1.50	0.6-2.0	0.13-0.16	4.5-5.5	Moderate-----	0.24			
TuB---------- Turbeville	0-8	3-18	1.35-1.55	2.0-6.0	0.08-0.15	4.5-5.5	Low----------	0.32	5	3	.5-2
	8-11	25-40	1.30-1.45	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.28			
	11-71	30-60	1.35-1.50	0.6-2.0	0.13-0.16	4.5-5.5	Moderate-----	0.24			
TxB*:											
Turbeville------	0-9	3-18	1.35-1.55	2.0-6.0	0.08-0.15	4.5-5.5	Low----------	0.32	5	3	.5-2
	9-84	30-60	1.35-1.50	0.6-2.0	0.13-0.16	4.5-5.5	Moderate-----	0.24			
Urban land.											
Ud* Udorthents											
WaA---------- Wahee	0-7	5-20	1.30-1.60	0.6-2.0	0.10-0.15	4.5-6.0	Low----------	0.24	5	3	.5-5
	7-50	35-60	1.40-1.60	0.06-0.2	0.12-0.20	3.6-5.5	Moderate-----	0.28			
	50-62	---	---	---	---	---	----------	----			
WdB---------- Wedowee	0-8	5-20	1.25-1.60	2.0-6.0	0.10-0.18	4.0-5.5	Low----------	0.24	3	3	<1
	8-12	14-30	1.30-1.55	0.6-2.0	0.12-0.18	4.0-5.5	Low----------	0.28			
	12-28	35-45	1.30-1.50	0.6-2.0	0.12-0.18	4.0-5.5	Low----------	0.28			
	28-60	15-30	1.20-1.50	0.6-2.0	0.08-0.15	4.0-5.5	Low----------	0.28			

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
WeD2---------- Wedowee	0-5	20-30	1.30-1.50	0.6-2.0	0.12-0.18	4.0-5.5	Low----------	0.28	2	5	<.5
	5-26	35-45	1.30-1.50	0.6-2.0	0.12-0.18	4.0-5.5	Low----------	0.28			
	26-60	15-30	1.20-1.50	0.6-2.0	0.08-0.15	4.0-5.5	Low----------	0.28			
Wh---------- Wehadkee	0-6	5-20	1.35-1.60	2.0-6.0	0.10-0.15	4.5-6.5	Low----------	0.24	5	3	2-5
	6-36	18-35	1.30-1.50	0.6-2.0	0.16-0.20	4.5-6.5	Low----------	0.32			
	36-60	---	---	---	---	---	----------	----			
WkA, WkB--------- Wickham	0-6	8-15	1.45-1.65	2.0-6.0	0.11-0.16	4.5-6.0	Low----------	0.24	5	3	.5-2
	6-50	18-35	1.30-1.50	0.6-2.0	0.12-0.17	4.5-6.0	Low----------	0.24			
	50-78	---	---	---	---	---	----------	----			
WtE, WtF--------- Winton	0-6	7-27	1.30-1.40	2.0-6.0	0.12-0.20	3.6-6.0	Low----------	0.20	5	5	.5-3
	6-41	18-35	1.30-1.50	0.2-0.6	0.12-0.20	3.6-6.0	Low----------	0.24			
	41-62	---	---	---	---	---	----------	----			

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--SOIL AND WATER FEATURES

("Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydrologic group	Flooding			High water table			Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Uncoated steel	Concrete
					Ft				
AtA---------- Altavista	C	Rare--------	---	---	1.5-2.5	Apparent	Dec-Apr	Moderate	Moderate.
AuA---------- Autryville	A	None--------	---	---	4.0-6.0	Apparent	Jan-Apr	Low------	High.
Be---------- Bethera	D	None--------	---	---	+1-1.5	Apparent	Dec-Apr	High-----	High.
BoB, BoC---------- Bonneau	A	None--------	---	---	3.5-5.0	Apparent	Dec-Mar	Low------	High.
CaA, CaB---------- Caroline	C	None--------	---	---	3.5-5.0	Perched	Jan-Apr	High-----	High.
Ch---------- Chastain	D	Frequent----	Very long	Dec-Apr	0-1.0	Apparent	Nov-May	High-----	High.
CnB---------- Conetoe	A	None--------	---	---	>6.0	---	---	Low------	High.
Co---------- Congaree	B	Occasional	Brief-----	Nov-Apr	2.5-4.0	Apparent	Nov-Apr	Moderate	Moderate.
CrA, CrB, CrC, CsB2---------- Craven	C	None--------	---	---	2.0-3.0	Apparent	Dec-Apr	High-----	High.
CuB*:									
Craven----------	C	None--------	---	---	2.0-3.0	Apparent	Dec-Apr	High-----	High.
Urban land.									
ExA---------- Exum	C	None--------	---	---	2.0-3.0	Apparent	Dec-Apr	Moderate	High.
GoA---------- Goldsboro	B	None--------	---	---	2.0-3.0	Apparent	Dec-Apr	Moderate	High.
GuA*:									
Goldsboro--------	B	None--------	---	---	2.0-3.0	Apparent	Dec-Apr	Moderate	High.
Urban land.									
GxB, GxC, GyB2, GyC2---------- Gritney	C	None--------	---	---	1.5-3.0	Perched	Dec-Apr	High-----	High.
HeB---------- Helena	C	None--------	---	---	1.5-2.5	Perched	Jan-Apr	High-----	High.
Le---------- Lenoir	D	None--------	---	---	1.0-2.5	Apparent	Dec-May	High-----	High.
LtD:									
Lillington-------	B	None--------	---	---	>6.0	---	---	Low------	Moderate.

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					Ft				
LtD:									
Turbeville	C	None	---	---	>6.0	---	---	High	High.
Ly: Lynchburg	C	None	---	---	0.5-1.5	Apparent	Nov-Apr	High	High.
NoA, NoB, NoC: Norfolk	B	None	---	---	4.0-6.0	Apparent	Jan-Mar	Moderate	High.
NuB*:									
Norfolk	B	None	---	---	4.0-6.0	Apparent	Jan-Mar	Moderate	High.
Urban land.									
OcA: Ocilla	C	None	---	---	1.0-2.5	Apparent	Dec-Apr	High	Moderate.
PcB2, PcD2, PcE2, PgE2: Pacolet	B	None	---	---	>6.0	---	---	High	High.
PtA: Pactolus	A	None	---	---	1.5-3.0	Apparent	Dec-Apr	Low	High.
Ra: Rains	B/D	None	---	---	0-1.0	Apparent	Nov-Apr	High	High.
Ro: Roanoke	D	Occasional	Brief	Nov-Jun	0-1.0	Apparent	Nov-May	High	High.
Se: Seabrook	C	Rare	---	---	2.0-4.0	Apparent	Dec-Mar	Low	Moderate.
StA: State	B	Rare	---	---	4.0-6.0	Apparent	Dec-Jun	Moderate	High.
TaB: Tarboro	A	None	---	---	>6.0	---	---	Low	Moderate.
Te: Tomotley	B/D	Rare	---	---	0-1.0	Apparent	Nov-Apr	High	High.
TrA, TrB, TsA, TsB, TsC, TtB2, TuB: Turbeville	C	None	---	---	>6.0	---	---	High	High.
TxB*:									
Turbeville	C	None	---	---	>6.0	---	---	High	High.
Urban land.									
Ud*. Udorthents									
WaA: Wahee	D	Rare	---	---	0.5-1.5	Apparent	Dec-Mar	High	High.
WdB, WeD2: Wedowee	B	None	---	---	>6.0	---	---	Moderate	High.

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Uncoated steel	Concrete
					Ft				
Wh---------- Wehadkee	D	Frequent----	Brief to long.	Nov-Jun	0-1.0	Apparent	Nov-May	High-----	Moderate.
WkA, WkB---------- Wickham	B	None--------	---	---	>6.0	---	---	Moderate	High.
WtE, WtF---------- Winton	C	None--------	---	---	2.0-4.0	Perched	Dec-May	Moderate	Moderate.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--ENGINEERING INDEX TEST DATA

(LL means liquid limit; PI, plasticity index; MD, maximum dry density; OM, optimum moisture; and NP, nonplastic)

Soil name, report number, horizon, and depth in inches*	Classification		Grain-size distribution							LL	PI	Moisture density	
			Percentage passing sieve--				Percentage smaller than--						
	AASHTO	Unified	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm			MD	OM
										Pct		Lb/ cu ft	Pct
Bonneau loamy sand:													
(S84NC-131-4)													
Ap----- 0 to 9	A-2-4(0)	SM	100	100	83	28	11	4	2	14	NP	116.3	11.2
Bt1---- 33 to 46	A-4(0)	SC	100	99**	78	40	27	20	17	23	9	125.3	9.9
Craven fine sandy loam:													
(S84NC-131-3)													
Ap----- 0 to 8	A-4(0)	ML	100	98	96	61	27	13	10	16	NP	116.2	11.9
Bt1---- 8 to 24	A-7-6(20)	CL	100	99	98	80	60	48	42	45	26	104.5	18.9

* Location of pedon sampled is the same as that given for the typical pedon in "Soil Series and Their Morphology."

** Value is slightly outside the range of the official series, but this does not affect use or management.

TABLE 17.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Altavista	Fine-loamy, mixed, thermic Aquic Hapludults
Autryville	Loamy, siliceous, thermic Arenic Paleudults
Bethera	Clayey, mixed, thermic Typic Paleaquults
Bonneau	Loamy, siliceous, thermic Arenic Paleudults
Caroline	Clayey, mixed, thermic Typic Paleudults
Chastain	Fine, mixed, acid, thermic Typic Fluvaquents
Conetoe	Loamy, mixed, thermic Arenic Hapludults
Congaree	Fine-loamy, mixed, nonacid, thermic Typic Udifluvents
Craven	Clayey, mixed, thermic Aquic Hapludults
Exum	Fine-silty, siliceous, thermic Aquic Paleudults
Goldsboro	Fine-loamy, siliceous, thermic Aquic Paleudults
Gritney	Clayey, mixed, thermic Aquic Hapludults
Helena	Clayey, mixed, thermic Aquic Hapludults
Lenoir	Clayey, mixed, thermic Aeric Paleaquults
Lillington	Loamy-skeletal, siliceous, thermic Typic Hapludults
Lynchburg	Fine-loamy, siliceous, thermic Aeric Paleaquults
Norfolk	Fine-loamy, siliceous, thermic Typic Kandiudults
Ocilla	Loamy, siliceous, thermic Aquic Arenic Paleudults
Pacolet	Clayey, kaolinitic, thermic Typic Kanhapludults
Pactolus	Thermic, coated Aquic Quartzipsamments
Rains	Fine-loamy, siliceous, thermic Typic Paleaquults
Roanoke	Clayey, mixed, thermic Typic Endoaquults
Seabrook	Mixed, thermic Aquic Udipsamments
State	Fine-loamy, mixed, thermic Typic Hapludults
Tarboro	Mixed, thermic Typic Udipsamments
Tomotley	Fine-loamy, mixed, thermic Typic Ochraquults
Turbeville	Clayey, mixed, thermic Typic Kandiudults
Udorthents	Udorthents
Wahee	Clayey, mixed, thermic Aeric Endoaquults
Wedowee	Clayey, kaolinitic, thermic Typic Kanhapludults
Wehadkee	Fine-loamy, mixed, nonacid, thermic Typic Fluvaquents
Wickham	Fine-loamy, mixed, thermic Typic Hapludults
Winton	Fine-loamy, mixed, thermic Aquic Hapludults

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